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NOTE BY THE SECRETARIAT.

The Preparatory Committee of the International Economic Conference, at its first session in April 1926, decided that it was necessary to submit to the Conference a series of memoranda setting out the present situation in certain great industries, including mechanical engineering. At the same time, the Committee sketched the general plan on which these studies should be prepared.

The Secretariat was charged with the preparation for the second session of the Committee of memoranda on certain key industries. On the other hand, in the case of some other important industries, among them that of mechanical engineering, the Committee decided that it was preferable to secure memoranda prepared by the competent organisations in certain countries. At its second meeting in November 1926, the Committee thus was placed in possession of a Memorandum on the Mechanical Engineering Industry throughout the World prepared by Dr. Karl Lange on behalf of the Verein Deutscher Maschinenbau-Anstalten and communicated by M. Clemens Lammers. It was decided at the November session that the memorandum of the German Association should be communicated by the Secretariat and through the members of the Committee to those countries which might be interested in examining it for their observations.

The Secretariat also received a Monograph on the Situation of the British Engineering Industry prepared by the British Engineering Association and communicated by Sir Arthur Balfour, and a short Monograph on the Situation of the Austrian Industry prepared by the Verband des Oesterreichischen Maschinenindustrie.

The Documentation Committee of Sub-Committee B of the Preparatory Committee for the International Economic Conference decided at its Paris meeting on February 23rd, 1927, that the Memorandum of the Verein deutscher Maschinenbau-Anstalten on the World Mechanical Engineering Industry should be published together with the British and Austrian memoranda. The Committee also expressed the desire that the observations received from the different countries with regard to the German memorandum should also be printed except in cases of simple corrections and annotations which could be inserted in the memorandum itself.

In accordance with these decisions, there are printed in the present volume: (1) the memorandum of the German Association, account being taken in the text or in the notes of the Swedish and Czechoslovak observations communicated respectively by Dr. Oerne and Dr. Hodac; (2) the observations made by the competent associations in France, Great Britain and Italy communicated by M. Peyerimhoff de Fontenelle, Sir Arthur Balfour and M. Guarneri, of which a detailed list is given in the table of contents. The monographs prepared by the English and Austrian Associations mentioned above are printed separately in Volume II.

The Secretariat has also received from the Verein deutscher Maschinenbau-Anstalten replies to the observations mentioned above. These replies are held by the Secretariat at the disposition of the members of the Conference.

Geneva, 1927.

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MEMORANDUM

ON

**THE WORLD'S MECHANICAL ENGINEERING
INDUSTRY**

prepared by

Dr. KARL LANGE

FOR THE

VEREIN DEUTSCHER MASCHINENBAU-ANSTALTEN

Communicated by M. C. LAMMERS.

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FOREWORD.

1. AIM OF THE MEMORANDUM.

The present Memorandum, which has been prepared in response to the request addressed to Germany by Commission B of the Preparatory Committee for the International Economic Conference of the League of Nations, is intended as a preliminary study of the position of the mechanical engineering industry throughout the world.

2. DEFINITION OF THE TERM " MECHANICAL ENGINEERING ".

In this work the term " mechanical engineering " is so defined as to exclude electro-technical products and boilers but to include locomotives. As regards more detailed definition, reference should be made to the preliminary remarks on the Statistical Material given in the Annex.

3. SOURCES FROM WHICH THE MEMORANDUM HAS BEEN COMPILED.

In collecting the material for the present Memorandum we have been obliged, apart from the German figures, to restrict ourselves to the foreign statistical material available in Germany. The figures relating to the individual points have, whenever possible, been taken from official sources; in particular, all the foreign trade figures are based upon the official statistics of the countries concerned. In the same way the particulars regarding Customs tariffs are also based on official data, while, in regard to production, the number of workmen employed, hours of labour, etc., we have had to have recourse to the data supplied by private organisations in addition to the official figures.

The difficulties which have arisen through the many omissions, the unreliability and the incomparability of the statistical material are especially set forth in the Preface to the Statistical Annex, but they also had to be dealt with in detail in the Memorandum itself, more particularly in Chapters 2 and 3. What is said there will show how desirable it would be to obtain a unification and improvement of international statistics referring to the mechanical engineering industry.

4. PLAN OF THE MEMORANDUM.

The Annex to the Memorandum is arranged according to the plan suggested by Commission B of the Preparatory Committee for the International Economic Conference of the League of Nations.

The statements contained in the Memorandum are based upon abundant statistical material which is reproduced in full in the Annex.

1.

PRELIMINARY SURVEY OF THE ESSENTIAL CONDITIONS GOVERNING THE DEVELOPMENT OF THE MECHANICAL ENGINEERING INDUSTRY IN RECENT YEARS.

A. OUTPUT AND OUTPUT CAPACITY.

Table 1. — Output and Output Capacity of the World's Engineering Industry.

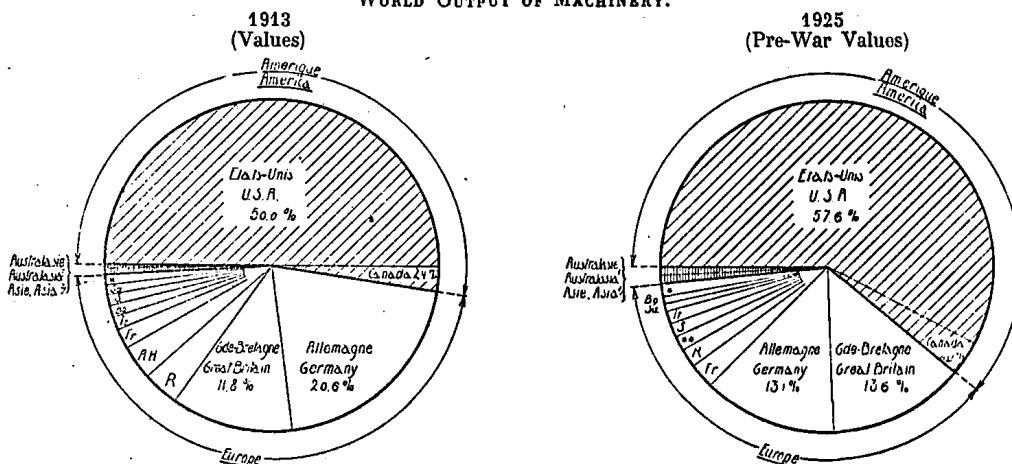
	1913		1925						
	Output ¹		At pre-war prices				Degree of activity	At current prices	
			Output		Output capacity			Output	Output capacity
	Mill. M.	%	Mill. M.	%	Mill. M.	%	Mill. M.	Mill. M.	
United States	6,775	50.0	8,465	57.6	11,330	57.1	74.5%	12,697	17,000
Great Britain	1,602	11.8	2,007	13.6	2,307	11.6	87.4%	3,010	3,460
Germany	2,800 (2,700) ²	20.6	1,933	13.1	3,359	16.9	(72.4%) ³	2,900	5,038
Other countries	2,378 (2,478) ¹	17.6	2,300	15.7	2,860	14.4	80.0%	3,452	4,280
Total	13,555	100.0	14,705	100.0	19,856	100.0	74%	22,059	29,778

¹ Capacity in 1913 is taken as equivalent to output (see Chapter 2); the degree of activity may be put at 100 per cent. ² The figures in brackets give production within post-war boundaries. ³ Capacity was not calculated with the help of this figure.

1. BEFORE THE WAR.

In 1913, when the curve of the last pre-war economic cycle was still at its highest point, the total value of the world's output of machinery, as will be seen from Table 1 above (see also Diagram 1), amounted roughly to 13½ milliards of marks, and output capacity at that time was, generally speaking, fully exploited. Half of this total fell to the United States¹, while Germany with one-fifth, Great Britain with a good tenth, and all the other producing countries combined with rather less than one-fifth, shared the remaining half.

DIAGRAM 1.
WORLD OUTPUT OF MACHINERY.



- 1 Australasia. Australia and New Zealand 0.6%.
- 2 Asia. Japan 0.3%.
- * Other European countries 1.1%.
- Sd. Sweden 0.9%.
- S. Switzerland 1.1%.
- Bg. Belgium 4.1%.
- It. Italy 4.3%.
- Fr. France 1.9%.
- A.H. Austria-Hungary 3.4%.
- R. Russia 3.5%.

- 1 Australasia. Australia and New Zealand 0.7%.
- 2 Asia. Japan 1.0%.
- * Other European countries 1.1%.
- Bg. Belgium 0.7%.
- Sd. Sweden 0.8%.
- It. Italy 1.2%.
- S. Switzerland 1.3%.
- ** Austro-Hungarian Succession States 1.5%.
- R. Russia 1.8%.
- Fr. France 2.4%.

The apparently steady development of the world output of machinery, which led to the position already described in 1913, cannot be followed from year to year for lack of statistical material. In 1914 the process was rudely interrupted by the outbreak of the war.

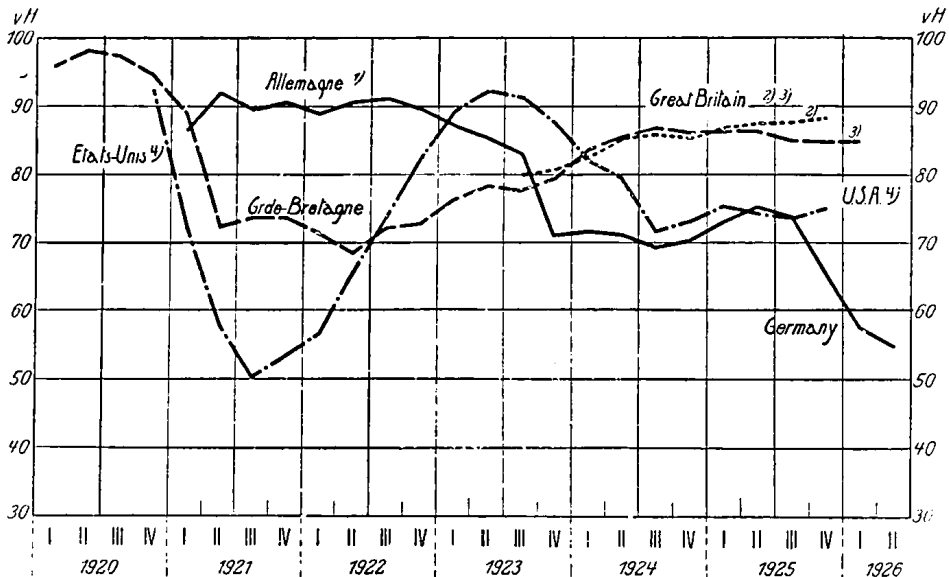
¹ See Note 2 on page 9.

2. SINCE THE WAR.

Development during the war and up to 1919 or 1920 also escapes statistical treatment. From then onwards it is reflected in the development of the degree of employment in the three chief producing countries (see Diagram 2). The remarkable fluctuations and contrasts which are thus revealed constitute, as it were, the after-effects of the storm created in the world economic system by the war.

DIAGRAM 2.

ACTIVITY IN THE MECHANICAL ENGINEERING INDUSTRY IN THE UNITED STATES,
GREAT BRITAIN AND GERMANY IN THE YEARS 1920-26.



- 1 Number of workers employed in percentage of the number required for working up to capacity (VDMA Statistics).
- 2 Employment calculated on the basis of the percentage of unemployment among insured persons in the general engineering and founding trades.
- 3 Employment calculated on the basis of the percentage of unemployment in mechanical engineering and shipbuilding.
- 4 Index number of activity in the foundries and mechanical engineering workshops of the United States (National Industrial Conference Board). June 1920 = 100.

Not until 1925 does it again become possible to make an estimate of the potential and actual output of the world's mechanical engineering industry (see Table 1 and Diagram 1).

(a) *Output Capacity.*

The total output capacity of the world in machinery reckoned in pre-war values ¹ has risen 46.5 per cent during the twelve years since 1913. As, however, owing to economic conditions, this output capacity was only utilised to the extent of 74 per cent in 1925, as compared with an estimated 100 per cent in 1913, the increase in actual output only amounts to a bare 10 per cent. Furthermore, in making a comparison between 1913 and the present day, it must be remembered that, in a period of improving trade, such as we may anticipate for the next few years, not only is actual output likely to approximate to output capacity but the latter also is likely to increase at the same time.

The shares of the different countries in the somewhat increased development of the whole industry since 1913 have undergone substantial changes. While Germany's capacity has increased by 20 per cent or (within its present-day frontiers) 24 per cent, that of the smaller producing countries has increased by 15 to 20 per cent, that of Great Britain by 44 per cent and that of the United States by 67 per cent.

(b) *Actual Output.*

Reckoned in pre-war values, the total production amounts to 14.7 milliards of marks, compared with 13.5 milliards in 1913.

As regards the shares in actual world production, that of the United States has risen from 50 to 57.6 per cent ² compared with 1913, that of Great Britain from 11.8 to 13.6 per cent, while Germany's share has fallen from 20.6 to 13.1 per cent and that of the other countries from 17.6 to 15.7 per cent (see Diagram 1).

Viewed as a whole, the situation of production in 1925 as compared to 1913 is that Germany has lost 900 million marks, or, calculating on the basis of her new frontiers, 800 millions ³, and the other countries from 100 to 200 millions of their production, while Great Britain has gained 400 millions and the United States 1,700 millions.

¹ In calculating pre-war values every effort was made to exclude the influence of the depreciation of gold which has taken place all the world over. For this purpose the post-war values in the tables were converted into pre-war values with the help of the Board of Trade Index reduced to gold, because in Great Britain the level of prices is least influenced by Customs duties. In the tables of exports and imports the same procedure was adopted for 1925, for the sake of preserving continuity, although in this case the British Index for special reasons does not exactly reflect the depreciation of gold. In the course of that year Great Britain reverted to the gold standard; this approximation of the pound to parity did not immediately bring about a fall of the index figure for wholesale trade. Thus in 1924 the index reduced to gold stood at 151, in 1925 at 159, and in the first half of 1926 at 147. Accordingly, in order to avoid the consequent error in conversion, the price increase was calculated in the tables at only 50 per cent.

² As we are concerned with production *values*, and as the production figures in the United States are naturally based upon prices in America, which are partly above world market prices and therefore exceed the export prices of the same machinery from the United States, the output and capacity of the United States appear unduly high in comparison with other countries, particularly for 1925 after the Customs tariff increases in 1922. The lack of sufficient material, however, makes it unfortunately impossible to reduce the figures to their proper proportions. The share of exports in production is for the same reason correspondingly larger than appears from a comparison of values.

³ See estimate in Chapter 2.

B. EXPORTS.

Table 2. — *Exports of Machinery throughout the World.*

	1913		1925				
			Pre-war prices			Current prices	
	Mill. M.	%	Mill. M.	%	Increase 1913 to 1925	Mill. M.	Increase 1913 to 1925
United States	680.6	26.8	853.2	34.8	+25.2%	1,279.8	+88.0%
Great Britain.	721.3	28.4	598.8	24.4	-17.0%	898.2	+24.5%
Germany. . .	738.4	29.0	489.9	20.0	-33.6%	734.9	- 0.5%
Other countries	396.9	15.8	508.3	20.8	+28.1%	762.5	+92.0%
Total . .	2,537.2	100.0	2,450.2	100.0	- 3.4%	3,675.4	+44.9%

1. BEFORE THE WAR.

The total exports of machinery for all the producing countries of the world amounted in 1913 to 2½ milliards of marks in value (see Table 2). It is possible, owing to the existence of official statistics of foreign trade in every country, to follow year by year the upward curve in exports which began in 1909 and the share of each country in that movement. Whereas in 1909 Great Britain's exports of machinery exceeded Germany's by nearly one-third, and those of the United States by a half, in the period of general prosperity lasting until 1913 Great Britain's figures were slightly exceeded by Germany and almost overtaken by the United States, so that each of these three countries controlled roughly two-sevenths of the world's machinery trade, leaving the remaining one-seventh to be divided between the other producing countries.

2. SINCE THE WAR.

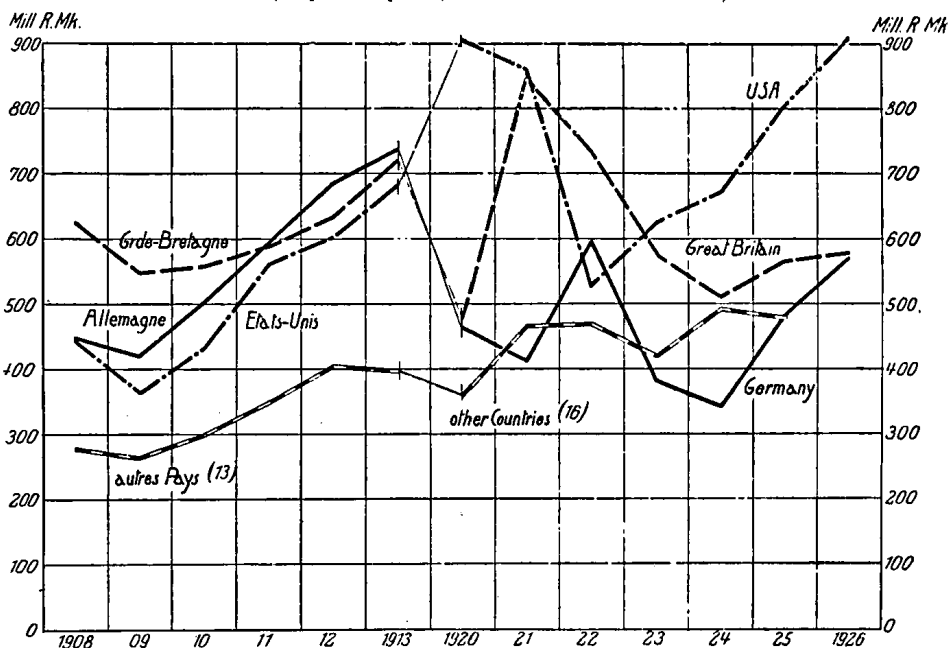
Since the war the development of foreign trade (Diagram 3), in strong contrast to the regularity and continuity of the pre-war development, presents a picture between 1920 and 1924 of the greatest irregularity and of sharp fluctuations, which are even more marked than those of the employment index; in this connection it is worth noting that, in the United States, the employment index fell much further in 1920-21 than the foreign trade figures, while in 1921-22 the reverse was the case.

Only Great Britain and the United States took full advantage of the exceptionally favourable economic situation culminating in 1921 and due to the accumulation of work in renewing, supplementing and converting products and plant consequent on the war; on the other hand, every one of the producing countries was affected by the subsequent depression. The revival — parallel with the general trade cycle — began in the United States in 1922, in most of the smaller producing countries

DIAGRAM 3.

EXPORTS OF MACHINERY FROM THE PRINCIPAL PRODUCING COUNTRIES IN THE YEARS
1908 TO 1913 AND 1920 TO 1926.

(At pre-war prices, in millions of Reichsmarks*.)



* For the pre-war years actual export values have been taken. For German export in the post-war years the figures by weight of the years' export have been multiplied by the average prices per ton of the export of machinery of 1913 (1,108 marks per ton); for the United States, Great Britain and the other countries the values in Reichsmarks reckoned at the average rate of exchange for each year have been reduced by the application of the wholesale Price Index of the British Board of Trade converted to a gold basis.

in 1923, and in Great Britain and Germany not until 1924. It is only after this date that we gain the impression that, at least as regards the three chief producing countries, a regular rise has begun in the export curve comparable to that observed before the war. In the first half of 1926, Great Britain and Germany, both absolutely and relatively, have returned to almost exactly the situation with regard to exports of machinery which existed between 1910-11, while the exports of the United States exceed

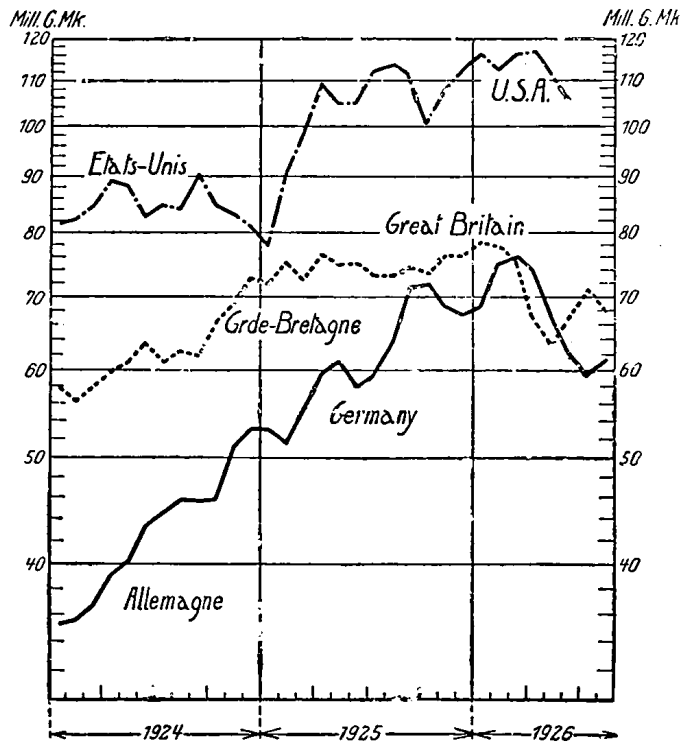
the exports from each of these countries by more than 50 per cent, and have topped the record figure of 1920.

If we follow the development of the exports of the three chief producing countries since 1924 from month to month until the third quarter of 1926 (Diagram 4), we find that the upward tendency, which since 1924 has on the whole been steady and constant, is not free from considerable set-backs if the figures are considered in detail, a fact which calls for considerable caution in forecasting future developments.

DIAGRAM 4.

AMERICAN, BRITISH AND GERMAN EXPORTS OF MACHINERY FROM 1924 TO 1926. FLUCTUATIONS MONTH BY MONTH OBTAINED BY RECKONING THREE-MONTHLY AVERAGES.

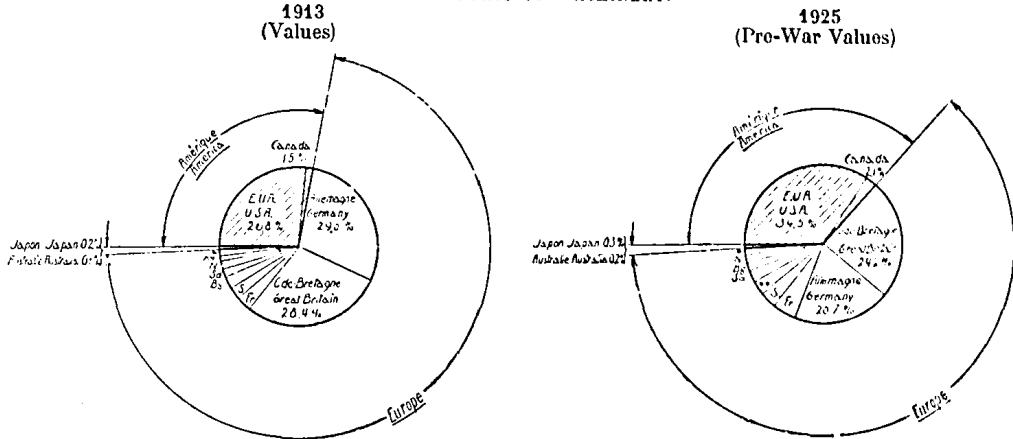
(From official monthly statistics of the countries concerned.)



In 1925, for which year we have statistics for every country, the total exports of all the producing countries of the world, converted into pre-war values, amounted to 2.45 milliards, or slightly less than in 1913 (2.5 milliards). Nevertheless, while the total figures have remained almost unchanged, the export figures of the individual countries are by no means the same. As compared with 1913, German exports have fallen by one-third and Great Britain's by quite one-sixth, while those of the United

States have increased by a quarter and those of the other small producing countries combined by more than one-fifth.

DIAGRAM 5.
WORLD EXPORTS OF MACHINERY.



* Other European countries 1.5.
A.H. Austria-Hungary 1.1.
N. Netherlands 1.5.
Sd. Sweden 1.9.
Bg. Belgium 2.5.
S. Switzerland 2.5.
Fr. France 3.0.

* Other European countries 1.7.
N. Netherlands 1.6.
Bg. Belgium 1.6.
Sd. Sweden 2.4.
** Austro-Hungarian Succession States 2.9%.
S. Switzerland 3.4.
Fr. France 4.6.

The share of the United States in the world's machinery export trade has risen from 26.8 to 34.8 per cent, while that of Germany has fallen from 29 to 20 per cent and that of Great Britain from 28.4 to 24.4 per cent (Table 2 and Diagram 5). Here, too, as in the case of production, Great Britain overtook Germany in 1925 and thereby took her place as the world's second largest exporter.

C. IMPORTS.

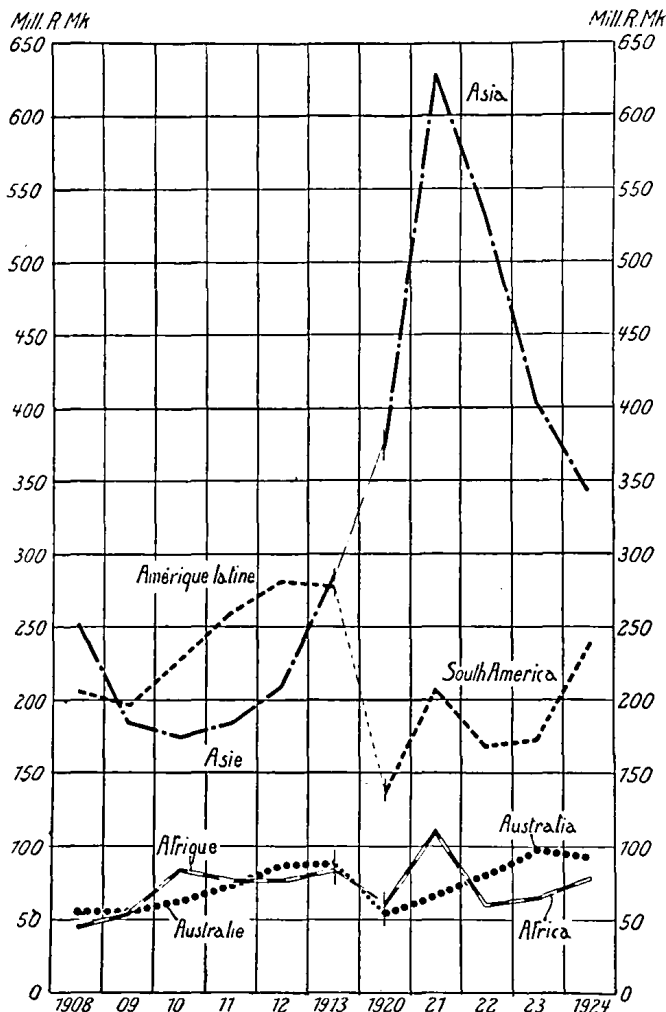
The distribution of the world's exports of machinery between the different importing countries which have no mechanical engineering industry of their own (Diagrams 6 and 7) combined for the sake of convenience into continents — once again shows the same characteristic differences between pre-war and post-war development. Between 1908 and 1913 the fluctuations were comparatively small, but between 1920 and 1924 we find very violent divergencies, which only begin to show signs of disappearing towards the end of that period.¹

¹ It is a striking fact and perhaps a noteworthy evidence of the laws governing trade cycles that, if for 1913 we unite at a single point the curves representing imports of machinery by the different continents, as has been done in Diagram 7, these curves again practically unite at a single point in 1909, in spite of their divergent courses before and since.

DIAGRAM 6.

IMPORTS OF MACHINERY INTO AREAS IN COURSE OF INDUSTRIALISATION BEFORE AND AFTER THE WAR IN THE YEARS 1908 TO 1913 AND 1920 TO 1924.

(At pre-war prices in millions of Reichsmarks *.)



* For the pre-war period actual values have been taken; for the post-war period prices have been reduced to pre-war values by the application of the wholesale Price Index of the British Board of Trade converted to a gold basis.

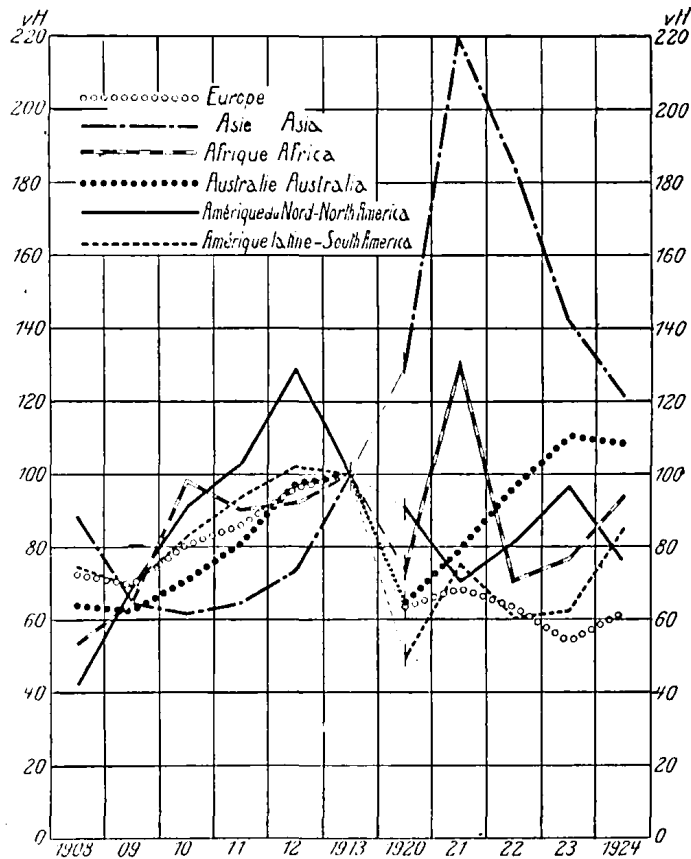
By far the greatest increase in imports, both absolutely and relatively, compared to the pre-war period, is shown by Asia; Latin America has remained below its pre-war

level; while Australia and Africa fluctuate in the neighbourhood of that level. We therefore find not so much an increased industrialisation of the former raw material districts as a relative displacement, within these increasingly industrialised districts, of the centre of gravity towards the Far East.¹

DIAGRAM 7.

INCREASE IN THE IMPORTS OF MACHINERY BY CONTINENTS; NORTH AMERICA AND LATIN AMERICA BEING SHOWN SEPARATELY.

(The imports into each continent on the basis 1913 = 100 *.)



* Post-war import figures have been reduced to pre-war values by the application of the Wholesale Price Index of the British Board of Trade converted to a gold basis.

¹ Total world trade also shows a relative displacement towards the East (see League of Nations Memorandum on Production and Trade, Geneva, 1926).

If the world's imports of machinery are divided into the imports interchanged by countries which themselves produce machinery and the imports of countries without a mechanical engineering industry of their own, we obtain the following figures:

Table 3.

	1913	1925	
		Pre-War values	Current values
	Reichsmarks (thousands)		
Imports of producing countries	1,659 = 65.4%	1,369 = 55.8%	2,053 = 55.8%
Other imports	878 = 34.6%	1,081 = 44.2%	1,622 = 44.2%
Total imports	2,537 = 100%	2,450 = 100%	3,675 = 100%

The imports of machinery of the countries in process of industrialisation have therefore somewhat increased in absolute figures; but the rise in their percentage from 35 to 44 per cent is due less to this absolute increase than to the substantial falling-off in exchanges between countries which themselves produce machinery.

Further, these figures show that exchanges between the countries producing machinery still play the most important part. We shall have occasion to revert to this point later.

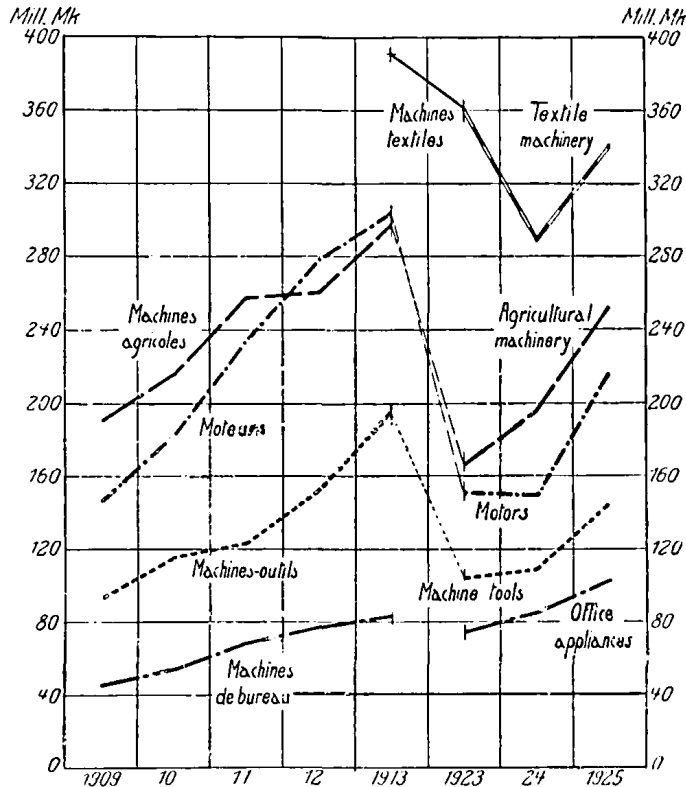
D. SHARE OF THE DIFFERENT TYPES OF MACHINERY IN FOREIGN TRADE.

The distribution of the world's foreign trade in machinery among a few important categories of machinery (Diagrams 8 and 9) once again shows the contrast, to which we have several times drawn attention, between the pre-war and post-war periods, and here, too, we find that since 1924 there has been a tendency for distribution to become more regular. Two changes are worthy of special notice — one temporary and the other permanent.

The share of textile machinery (Diagram 9) shows a disproportionate increase in 1923 (which would have been still more marked in 1921-22 if complete figures were available), but from 1924 onwards this branch once again follows more or less the development of the other categories of machinery. The striking similarity between the culminating points in the graphs shown in Diagrams 3, 6, 7 and 8 is not fortuitous. It is chiefly due to the intermittently exceedingly heavy exports of textile machinery from England, to India more particularly, but also to Japan and China.

DIAGRAM 8.

EXPORTS OF MACHINERY BY THE MOST IMPORTANT CATEGORIES FROM THE PRINCIPAL PRODUCING COUNTRIES (GERMANY, GREAT BRITAIN, UNITED STATES) TAKEN TOGETHER 1909 TO 1913 — 1923 TO 1925. (Absolute values *.)



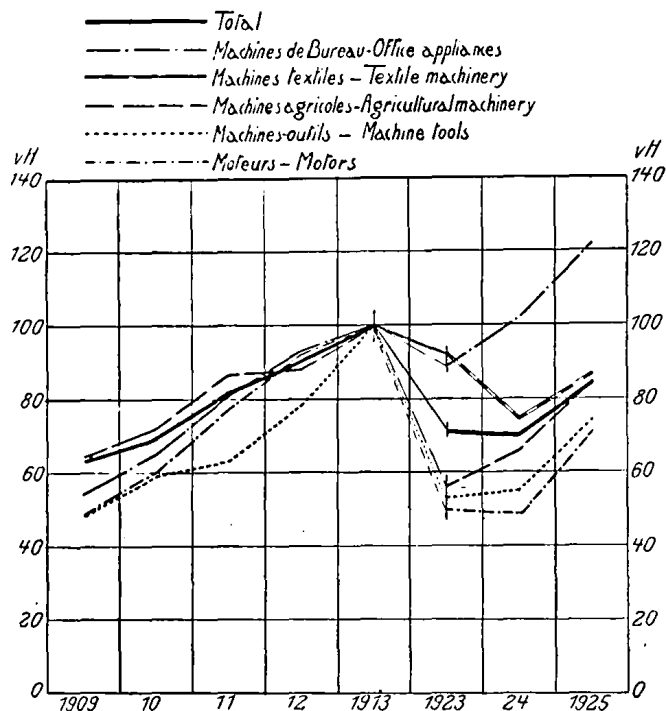
* For the pre-war period actual prices, for the post-war period prices reduced to pre-war values by the application of Wholesale Price Index of the British Board of Trade converted to gold bases.

It is not possible to give the pre-war exports of textile machinery for 1908 to 1912, since textile machinery was not indicated separately in the United States foreign trade statistics at that time.

The apparently permanent change consists in the fact that the proportion of office appliances to total exports (Diagram 9) has outrun all the other branches since the war, though, of course, in absolute figures it remains less than that of other types. Nevertheless, it should be noted in this connection that, as is shown by the Tables in Chapter 11, typewriters, which constitute the bulk of office appliances, have maintained their nominal pre-war price level (actually, therefore, they have fallen in price about 34 per cent), whereas the prices of other types of machinery have partly adapted themselves to the depreciation of gold and partly even risen still further. Office machinery is by far the most recently developed of the various branches of mechanical

DIAGRAM 9.

EXPORTS OF MACHINERY OF THE PRINCIPAL COUNTRIES (GERMANY, GREAT BRITAIN, UNITED STATES) BY TOTALS AND BY THE PRINCIPAL CATEGORIES.
1909 TO 1913 — 1923 TO 1925
(1913 = 100.)



industry. While foreign trade in other categories of machinery suffered a more or less serious fall in the post-war period as compared with 1913 and has only gradually returned to the pre-war level, the use of office appliances has developed on practically the same scale as before the war. Moreover, certain conditions which obtained in the first years after the war and which were an obstruction to general economic development in some European countries actually favoured the use of office appliances.

E. RELATION BETWEEN FOREIGN TRADE AND PRODUCTION.

The proportion of production finding its way into foreign trade, which in 1913 amounted to nearly one-fifth, in 1925, instead of rising, fell to one-sixth. This relative falling-off in foreign trade affects, as we have seen, only the interchange between countries producing machinery, as the exports to raw material areas in process of industrialisation have risen somewhat both absolutely and relatively.

The falling-off in the foreign trade in machinery constitutes, as we shall see, a particularly important symptom of a setback to the international division of labour, on which the whole modern development of the world economic system is based. The reason for this is, above all, the multiplication of Customs frontiers and the erection of Customs barriers which have taken place since the war, particularly in Europe (see Chapter 8). This legislative restriction of foreign trade by increased tariffs and numerous other obstacles put in the way of international trade, such as the passport difficulties, which greatly hamper the inspection of machinery in use and the setting-up of new machines, is still further increased by the fact that in some countries, such as Italy and Spain, the use of other than native products in the execution of public contracts is forbidden or rendered difficult, while in other countries a more or less intensive private propaganda has been instituted against the use of foreign products.

F. THE MECHANICAL ENGINEERING INDUSTRY AND THE ECONOMIC SITUATION.

The economic position of the mechanical engineering industry, which is *par excellence* the industry of the means of production, is peculiarly dependent upon the general economic world situation, and it reacts to this situation with quite unusual sensitiveness. For, while the fluctuations in the demand for commodities of mass consumption are naturally confined within relatively narrow limits, the demand for the means of production intended for new installations, extensions and improvements in industrial undertakings is not only liable to an extraordinary increase in times of a rising market and speculative activity but is liable, on the other hand, to fall very sharply, since it is quite easy in times of general crisis and shrinkage of markets to maintain production for a shorter or longer period with resources which were hitherto only partly utilised.

As will be shown in Chapter 4B in connection with the movement of the degree of employment in the most important machinery-producing countries, the trade cycle for the different countries in the post-war period has pursued a course by no means uniform. Even to-day there has not yet been a complete return to uniformity in the course of trade cycles, but it may be anticipated as the currencies of all the countries concerned are restored to a gold basis.

The present situation may be described as follows:

The United States, where the market has been rising since the middle of 1924 — Diagram 2 showed that since the middle of 1924 the degree of employment in the mechanical engineering industry has risen along with the upward movement of the whole market — is maintaining her position at its high level; there are no signs of a decline.

The conditions have been different in European countries with a stable currency. These countries reached their lowest point during the first half of 1926, and the degree of employment in the mechanical engineering industry in Germany had fallen to 50.5 per cent by the third quarter of the year. These countries, however, have already passed through the worst stage, and the markets are rising, as can be seen in Germany from the increased number of orders for the construction of machinery.

It is true that the movement is somewhat arrested in Europe by those countries which are either in process of stabilising their currency or have not yet done so, or which are pursuing a policy of deflation. The disturbing phenomena attendant upon currency operations will lessen the demand of those countries both for machinery which they themselves produce and for that which they import.

The present process of industrialisation in countries hitherto producing raw material and without a mechanical engineering industry of their own may be expected to continue and to increase in pace. It may be anticipated that a particularly strong impetus will be given to the mechanical engineering industry of the world when, for instance, a very densely populated country like China, having overcome its internal difficulties, resumes full contact with the world market.

An intermediate position is held by Russia; this country, it is true, has a mechanical engineering industry of its own, but for a long time to come its output capacity will not suffice to produce the machinery required for the industrialisation of so large a country; although the rapidity of this industrialisation will no doubt very largely depend on political circumstances.

G. THE MECHANICAL ENGINEERING INDUSTRY AND INDUSTRIALISATION.

Although above we have considered the industrialisation of countries hitherto mainly producers of raw materials exclusively from the positive point of view of the existing mechanical engineering industries and their market prospects, the example of Russia suggests the question whether this is not a short-sighted view, and whether there is not a danger that the countries in process of industrialisation may simultaneously develop a mechanical engineering industry of their own and within a measurable period build up a formidable competition with the mechanical engineering industries of older standing and thus destroy the present attractive prospects of expansion.

This question makes it necessary to examine briefly the conditions essential or at least particularly favourable to the creation of a fully equipped mechanical engineering industry in any given economic unit.

(1) In the first place, an adequate production of iron in its own territory may be regarded in normal conditions as a sound basis for the building up of a competitive iron industry in any country. The iron industry, in its turn, if it is to be on a sound and competitive basis, must have a sufficient supply of raw materials. The most important raw materials for iron and steel production are coking coal (which may in exceptional cases be replaced in steel production by electric current derived from water-power), iron ore and scrap iron. Without the presence in its own territory, in an adequate degree, of at least two of these factors, no country appears to be able to develop an iron production on any considerable scale.

It is true that manufacturers of iron goods in countries without an iron production of their own and without Customs duties on iron have hitherto enjoyed lower prices for iron than manufacturers in countries with a protected and cartellised home production,

owing to the fact that there has been unrestricted international competition between the iron-producing industries of the various countries. This advantage enjoyed by manufacturers in countries without an iron production of their own will, however, tend to diminish in proportion as the present tendency to international cartellisation of iron producers makes progress; under these circumstances, the existence of an adequate home production of iron will more and more recover its natural importance.

(2) The mechanical engineering industry is particularly dependent upon a supply of highly trained, intelligent and adaptable workers.

(3) Both scientific research (mathematics, physics and technical science) and technical training of all grades must be developed in order to allow of effective collaboration in the advancement of mechanical technique and to create the supply of the trained engineers and technicians required by the industry.

(4) The mechanical engineering industry requires a home market¹ of considerable dimensions, not only as is desirable in the case of every branch of production to obtain an assured market for its goods but still more because it is essential, indeed indispensable, for an industry which supplies the means of production to keep in permanent and direct contact and to exchange ideas with its clients.

The requirements enumerated under (2), (3) and (4), together with the scrap-iron factor mentioned under (1), presume a considerable degree of industrialisation in the economic organisation of any country before it can develop a successful mechanical engineering industry of its own. This preliminary industrialisation of the general economic organisation naturally demands in the transition period the importation of the mechanical means of production.

Once, however, the industrialisation of a country has sufficiently advanced with the help of imported means of production, and a home mechanical engineering industry begins to be built up on this basis, this later stage of development, which can only be attained after a considerable lapse of time, in no way constitutes a danger to the mechanical industries of the older industrial countries. The world trade in machinery, as we have shown above under Section C, despite the unfavourable developments of the post-war period in this respect, depends in a much greater degree on the reciprocal interchange of machinery by the different producing countries than on exports to countries in process of industrialisation. The countries which produce machinery are each other's best customers.

H. THE MECHANICAL ENGINEERING INDUSTRY AND THE INTERNATIONAL DIVISION OF LABOUR.

The reciprocal exchange of goods between nations in the domain of mechanical construction rests upon the fundamental principles of the division of labour. Each nation which collaborates in the development of technical science contributes effectively

¹ The suggestion that an export trade should be based on a large home market is subject to a certain modification as far as Sweden is concerned. Perhaps the most important engineering concerns in Sweden have been created in spite of the inability of the Swedish market to absorb more than an insignificant percentage of the output. Instances are the makers of cream separators, ball bearings, Primus stoves, etc., which are manufactured for export (Swedish note).

to the progress of civilisation, which knows no national boundaries. This collaboration enables each nation to go on to new discoveries and improvements in the domain of mechanical technique, which on the one hand must be protected by the international law of patents and on the other must be utilised by all the other collaborating nations if they do not wish to be left behind and lose their place in the vanguard of development.

We cannot, of course, go into the old question of protection and free trade, which indeed seems to have passed into a new phase as a result of recent events and policies. Whatever may be our view of the merits of the question in principle and with regard to other economic spheres, we are obliged, owing to the considerations set forth above, as far as tariffs on machinery are concerned, to admit that:

(a) So long as the other branches of a country's economic system are not sufficiently industrialised, it does not seem to be possible to build up and maintain the vitality of a successful mechanical engineering industry by duties on machinery. Indeed, tariffs would hinder the industrialisation of the other branches of the economic system by raising the price of the means of production, the final result of which would only be to prevent the creation of the conditions necessary for the growth of a national mechanical engineering industry.

(b) Once, however, the other branches of the national economy have been sufficiently industrialised with the help of imported means of production, and once the conditions for the growth of a national mechanical industry are present, the industry will develop of its own accord without the help of high protective tariffs. At most it would be a question, during this limited period of development, of imposing temporary duties (especially duties gradually decreasing in amount) to protect the industry in its infancy.

These duties would appear to become superfluous at the latest when the mechanical industry has become sufficiently strong to export its products and compete in the world market. From this moment onwards a protective duty would not only be no longer necessary but would become quite ineffective, for, in the case of an exporting industry, the Customs duty can only be included in the price on the home market when a cartel in possession of a monopoly exists to control prices, and the mechanical engineering industry does not, by its nature, lend itself to cartellisation.

This last fact serves also to prevent international cartellisation — a strong tendency towards which is at present manifest in international economic development, affecting particularly the most important raw material of the mechanical engineering industry: iron.

Nevertheless, it by no means follows from this difficulty of forming an international cartel that the mechanical engineering industry should remain outside the present movement towards international *rapprochement* and intelligent international collaboration.

On the contrary, mutual acquaintance and closer personal sympathy between the mechanical engineering industries of the different countries will tend to break down the mutual mistrust which is often the result of lack of knowledge and to the

In 1923 the degree of employment in the machinery industries was 90 per cent of the 1920 figure (boom year); actual production in 1923 was 15,334 millions of marks. This gives an output capacity of about 17,000 millions or, in pre-war values, 11,330 millions of marks. This manner of reckoning, however, takes no account of the influence of rationalisation.

2. *Great Britain.* With a degree of employment of 87.4 per cent (reckoned according to the percentage of unemployment among insured persons in the mechanical engineering industry as a whole), production in 1925 amounted to 3,010 million marks. The output capacity on the above basis may therefore be estimated at 3,460 million marks in post-war values and 2,307 million marks in pre-war values.

3. *Germany.* Germany's production in 1925 amounted to about 2,900 million marks with a degree of employment of about 72 per cent (according to the ratio of actual workers to the number of workers at full strength).

In this case, however, we cannot, as with the other two countries, deduce output capacity directly from the degree of employment, because in 1925, and particularly in the last quarter, there was a great deal of short time worked, which does not appear in the employment figures, and because, too, as always happens in the early stages of trade depression, employers sought to weather the crisis at that time impending by employing their men on short time and on other more or less unproductive work in the hope of better times.

Accordingly we shall arrive at a more reliable result if, in estimating output capacity, we start with the third quarter of 1926; first because the circumstances mentioned were no longer operative¹, and also because capacity did not increase in comparison with 1925 for the reason that there was no extension of plant in 1926, which was a year of crisis.

During the third quarter of 1926, the value of production, with a degree of employment of 50.5 per cent, amounted to 636 millions of marks, or for the whole year 2,544 million marks; estimated according to the degree of employment, this gives an output capacity of 5,038 million marks, or in pre-war values 3,359 million marks.

If we desire to compare output capacity for the post-war period with that of the pre-war period, a certain percentage must be deducted from the capacity in 1913 to represent ceded territory. We can arrive at approximate estimates for this percentage. According to the ratio of workmen employed in the mechanical engineering industry in Alsace-Lorraine to the total number of workmen employed in the mechanical engineering industry of Germany, Alsace-Lorraine contributed 2.6 per cent of total production. The mechanical engineering industry was not strongly represented in the territories surrendered to Poland, in which production may be estimated at about 1 per cent of total production. Accordingly, taking surrendered territory into account, we obtain an output capacity for the pre-war period of 2,700 million marks. The year 1925 therefore shows an increase of 24.3 per cent over 1913.

¹ According to the statistics of the V.D.M.A. (Verein Deutscher Maschinenbau-Anstalten) the degree of employment for the third quarter of 1926 was reckoned with due regard to short time.

dawn of the conviction that the producers of machinery in every country are fellow-workers in the progress of human civilisation and that the assistance of every country is indispensable if this progress is not to be retarded.

2.

OUTPUT CAPACITY.

None of the countries under review possesses statistics to show the output capacity of the mechanical engineering industry.

Estimates may be made in two ways:

1. In countries which possess statistics of production, actual production at the height of a boom could be compared with output capacity, on the assumption that at the height of the boom output capacity is as a rule fully utilised.

2. A comparison of the number of persons employed, expressed as a percentage of full strength, with the figures for actual production, gives the amount of production at full strength.

By this means, however, we only obtain estimates of output capacity for the post-war period, since, as regards the pre-war period, the necessary data to show the degree of employment are lacking. General considerations lead to the following result as regards the pre-war period.

The year 1913 marked the highest point of the last business cycle before the war, the production of iron and steel in all countries showing a considerable increase for 1913 over 1912. In accordance, therefore, with paragraph 1 above, output capacity may be placed alongside of actual production for the year 1913.

As regards the post-war period, we obtain the following data regarding output capacity for the different countries

1. *United States.* In the case of the United States, we have the production figures for the boom year 1919. But as the value of gold has greatly increased since that time, and the price of machinery has accordingly fallen, we should arrive at much too large a figure for output capacity if we used as a basis the value of production for that year. There is, however, no machinery index figure with the help of which we could exclude the influence of a fall of prices on the value of production. In this way, therefore, we arrive at no practical result owing to the abrupt fall in prices. Consequently, we must estimate output capacity with the help of the employment figures.

Annual Capacity of the Mechanical Engineering Industry of the World.

	In millions of marks at pre-war prices		1925 as % of 1913	In millions of marks at current prices 1925
	1913	1925		
United States	6,775	11,330	167	17,000
Great Britain	1,602	2,307	144	3,460
Germany	2,800	3,359	120	5,038
	(2,700)*		(124)*	
Other countries . . .	2,378	2,860	120	4,280
	(2,478)*		(115)*	
Total	13,555	19,856	147	29,778

* The figures within brackets in 1913 relate to the territory within post-war frontiers. The bracketed percentage of increase from 1913 to 1925 show capacity in comparison with 1913 within post-war frontiers.

3.

ACTUAL OUTPUT.

As will be seen from the figures of production given in the Annex (*Ad No. 3*), the available statistics for the output of machinery by the chief producing countries refer to different years, namely, in the pre-war period to 1913 and 1914 and in the post-war period to 1923, 1924 and 1925. An attempt must therefore be made to determine from the figures at our disposal the output of machinery in the pre-war period for the year 1913 and in the post-war period for the year 1925.

As regards the United States, the official output figure for 1914 is 5,420 million marks. In 1914, however, economic conditions were already substantially less favourable than in 1913. The output of crude iron fell in the United States from 1913 to 1914 by 23 per cent, the output of steel by 25 per cent, that of metal plates by 26 per cent and that of coal by 10 per cent. This reduction in output must have been chiefly due to the falling-off in orders from the railway construction, iron construction and building industries; it was no doubt due in a much lesser degree to a slump in the mechanical engineering industry. Hence it may be concluded that the reduction in the output of machinery comes somewhere between the reductions in the output of coal and iron. We shall therefore not go far wrong if we estimate the reduction in the output of machinery at about 20 per cent. In this way we obtain an output of 6,755 million marks for the United States in 1913.

As regards the post-war period, we have output figures for the United States in 1923, for Great Britain in 1924 and for Germany in 1925. In order to obtain the output of the United States in 1925, we can calculate the reduction in the degree of employment in the mechanical engineering industry in that country from 1923 to 1925. In 1923 the degree of employment was 90 per cent of the figure for June 1920 and in 1925 it was 74.5 per cent of this figure. If we calculate the 1925 output from the 1923 figures

by this method, we obtain 12,697 million marks in post-war values, and 8,465 million marks in pre-war values.

Calculating Great Britain's output for 1925 by the same method, we have, instead of 2,936 million marks in 1924, 3,010 million marks in 1925, since the degree of employment, according to the percentage of unemployment among insured workers in general engineering and founding rose from 84.7 per cent to 87.4 per cent in the latter year.

With regard to a few countries of small importance to total world production, there are no data from which to calculate production for the year 1913 or 1925. The total result, however, is not thereby affected, as the share of these countries in total production is only 2-3 per cent.

In this way we obtain the following table. The grouping of the individual countries is the same as in Diagram 1. In each case the mean has been taken between the maximum and minimum figures given in the Annex for the output of machinery of the different countries.

World Output of Machinery.

	1913		1925		
	At 1913 prices in mill. M.	In % of world production	At current prices in Mill. M.	At 1913 prices in Mill. M.	In % of world production
1. America :					
United States. . .	6,775	50.0	12,697	8,465	57.6
Canada.	320	2.4	710	473	3.2
2. Europe :					
Great Britain	1,602	11.8	3,010	2,007	13.6
Germany ¹	2,800	20.6	2,900	1,933	13.1
Russia.	475	3.5	405	270	1.8
Austria-Hungary, or Succession States	460	3.4	332	221	1.5
France.	263	1.9	520	347	2.4
Italy.	175	1.3	260	173	1.2
Belgium	154	1.1	162	108	0.7
Switzerland. . .	150	1.1	285	190	1.3
Sweden	122	0.9	170	113	0.8
Other European countries. . . .	136	1.1	241	161	1.1
3. Australasia ; Asia :					
Australia and New Zealand . .	76	0.6	152	101	0.7
Japan	47	0.3	215	143	1.0
	13,555	100.0	22,059	14,705	100.0

¹ In comparing the pre-war and post-war production of Germany, cessions of territory must be taken into account and the production of the present-day territory estimated for the pre-war period at 2,700 million marks.

France's production for 1913 is correspondingly increased by 75 million marks to 338 million marks, and Russia's, in consequence of the cessions to Poland, by 25 million marks to 500 million marks.

As regards the accuracy of the figures given in the table the following observations must be made:

	Pre-war	Post-war
Official statistics of production are available for countries whose share of total world production was	57½%	65%
Based on estimates of a more or less reliable nature (in particular, production figures supplied by private associations).	36½%	28%
Based on less reliable estimates	6%	7%

4.

NUMBER OF WORKMEN EMPLOYED; NUMBER OF UNEMPLOYED.

A. NUMBER OF EMPLOYED.

In ascertaining the number of persons employed on mechanical construction in the different countries and hence the number of employed in mechanical construction throughout the world, we are faced with the same difficulties as arise in determining world production of machinery. Not only are the statistics incomplete but the term "mechanical construction" has not the same connotation in the various countries, and the available statistics do not all apply to the same year. We can, however, for the years 1913 and 1925, form approximate estimates by the same means as were employed in the case of production.

Thus we obtain the following figures for the individual countries:

1. *United States.*

Figures are available showing the number of workmen for the year 1914, viz., 518,050. If we make the same assumption as was made in calculating production in 1913, that is to say, if we assume that there was 20 per cent less employment in 1914 than in 1913, the number of workmen for 1913 works out at 620,000.

With regard to the post-war period, we have figures to show the number of workmen in 1923. In that year 703,741 workmen were employed in machine construction in the

United States. If this figure is taken in conjunction with the figure for the degree of employment — for 1923, the degree of employment is given as 90 per cent of the degree in June 1920, and for 1925 as 74.5 per cent — and applied to the year 1925, we arrive at 582,000 as being the number of workmen.

2. *Great Britain.*

There are no figures for the pre-war period. If we reckon the same output value per head as in Germany and compare the increased production between 1913 and 1925, for which year the number of workmen is approximately known, we obtain for the year 1923 roughly 330,000 workmen.

With regard to the post-war period, we have the number of employed estimated by the number of persons insured against unemployment in the mechanical engineering industry in 1925. That number is 690,000. As the insurance limit is very high (£250), the number includes employees, who are not reckoned in the figures for the United States and Germany. In the two latter countries employees and officials make up 16 to 18 per cent. We shall therefore not be far wrong if we deduct about 12 per cent from the number of employed above mentioned. In this way the number of workmen for Great Britain for 1925 is about 500,000.

3. *Germany.*

The total number of persons employed in the German mechanical engineering industry in 1913 is estimated by the V.D.M.A. at from 500 thousand to 600 thousand. If we take the mean of these two figures (550 thousand) and work on the proportion of workmen to the total strength of firms belonging to the V.D.M.A. (83.7 per cent in the middle of 1914), the number of workmen for 1913 works out at about 460,000.

In 1925 the number of persons employed in the German mechanical engineering industry was 554,000. Reckoning in the same way (proportion of workmen to total strength = 81.5 per cent) we find that for 1925 the number of workmen was roughly 452,000.

4. For the *remaining countries* we obtain in the same way approximate figures showing the number of workmen employed on mechanical construction. In some cases the statistical data in the Annex could be used as they stood; in other cases there were figures available for previous years, which allowed fairly reliable estimates to be made of the number of workmen in 1913 and 1925; while in other cases the number of workmen in 1913 had to be deduced from the post-war figures, the output value per head furnishing some indication in countries with the same economic structure and in which that value is therefore more or less constant — further reference will be made to this point. By these means we arrive at the following table. The figures are not absolutely reliable, and what was said in regard to production applies here also; the figures for the principal producing countries are fairly accurate, while those estimated on a less reliable basis are of less importance. The margin of error in estimating the number of workmen employed in world mechanical construction probably does not exceed 10 per cent.

*Number of Workmen employed in the World's Mechanical Engineering Industry*¹.

	1913		1925	
	No. of workmen	Percentage of total	No. of workmen	Percentage of total
1. America:				
United States	620,000	32.8	582,000	28.3
Canada	40,000	2.1	40,000	1.9
2. Europe:				
Great Britain	330,000	17.4	500,000	24.4
Germany	460,000	24.3	452,000	22.0
Russia	130,000	6.9	98,000	4.8
Austria-Hungary, or the Succession States	80,000	4.2	66,000	3.2
France	45,000	2.4	85,000	4.1
Italy	30,000	1.6	35,000	1.7
Belgium	24,000	1.3	25,000	1.2
Switzerland	42,000	2.2	45,000	2.2
Sweden ²	25,000	1.3	20,000	1.0
Other European countries	30,000	1.6	40,000	1.9
3. Australasia, Asia:				
Australia and New Zealand	15,000	0.8	20,000	1.0
Japan	20,000	1.1	47,000	2.3
Total	1,891,000	100	2,055,000	100

¹ The total number of persons *employed* in the world's mechanical engineering industry (including employees), according to these figures and assuming a proportion of 82 workmen to 18 employees, would work out at about 2.3 millions for 1913 and about 2.5 millions for 1925. This proportion of 82 to 18 is approximately correct for Germany and the United States. In 1925 the number employed in the German mechanical engineering industry amounted to 554,000.

² This figure appears to be too low, even if a limitation in regard to the workshops that should be included is admitted. The statistical table on page 87 gives the number of workers in engineering shops (not specially mentioned) as 39,611 in 1913 and 36,585 in 1924. A good many undertakings not found under this heading should undoubtedly be included. Bearing this in mind it would seem that an even greater number of workers are employed in the Swedish engineering industry than is indicated by the last-mentioned figures (Swedish note.)

The first thing we see from the table is that the number of workmen, as may seem natural at first sight, has increased in about the same proportion as production (namely, by 8.5 per cent). It must be borne in mind, however, that this increase of 8.5 per cent is included within the possible error which may have been made in our estimates of the number of workmen. Accordingly, it is not permissible to conclude from this increase that production increases in the same ratio as the number of workmen.

That this is not the case is shown by the fact that the contribution of 28.3 per cent furnished by the United States towards the number of workmen in the world's

mechanical engineering industry in 1925 is much smaller than their share in world production, which amounted to 57.6 per cent; that is to say, then, the number of workmen and production in the different countries do not stand in any fixed relationship to one another; production per head is quite different in the separate countries.

If in those countries which possess fairly reliable statistics of production and the number of workmen, we compare the production per workman, the result is 21,790 marks for the United States in 1923 — this year is selected because production and the number of workmen are known from the official census figures — and 6,400 marks in Germany for 1925. The figures for Great Britain are inexact; output value per head may be estimated as approximately equal to the German figure.

The following is the principal factor which determines the varying amount produced per workman:

In the United States, production, both in industry as a whole and in the mechanical engineering industry, involves the employment of more machinery, because in that country high wages make the employment of machinery far more profitable than in Germany and other European countries.

That this factor is decisive is proved by the following facts:

Production in the United States has increased since 1913, although the number of workmen has remained the same; wages, on the other hand, in the United States have greatly risen since 1913 and have caused an increased use of machinery.

It further appears that in countries whose economic structure is similar to that of the United States, output value per head approximates to that of the United States, whereas in this respect European countries group themselves round Germany. In Canada the output value per head in 1922 was 16,380 marks, while, for example, it amounted in Sweden to 9,856 marks (1924), in Holland to 7,940 marks (1924), and in Russia to 4,400 marks (1924-25).

B. UNEMPLOYMENT AND DEGREE OF EMPLOYMENT.

The statistical data concerning the degree of employment in the mechanical engineering industry are very incomplete. Estimates are impossible. In so far as statistics are available, the following may be stated:

As regards the United States, Great Britain and Germany, the degree of employment for the post-war period is shown in the following table (compare also Diagram 2).

	United States	Great Britain	Germany
1920.	97.1	(96.5) *	—
1921.	58.4	(77.0) *	89.6
1922.	69.6	(71.2) *	90
1923	90	(77.9) *	81.7
1924	76.4	84.7	70.5
1925	74.5	87.4	71.8

* Figures are lacking for certain months.

It may be seen from the table that the movement of the degree of employment is quite different in the three countries. Great Britain and the United States were both hard hit by the world crisis which set in in 1921, whereas Germany, in consequence of inflation, escaped its effects. In 1922 there was a revival in the United States, which reached its highest point in 1923. From then onwards the degree of employment falls again sharply. As the trade revival in the United States originated in the American home market, Great Britain had no share in it; the degree of employment increased steadily until 1925. In the case of Germany stabilisation involved a diminution of employment, which, however, is not very considerable because foreign credits prevented the stabilisation crisis from exercising its full effects¹. The crisis did not arise until the end of 1925, and this does not appear in the annual figures for 1925 (compare Diagram 2); it is a movement in which the other countries are not involved.

The movement of the degree of employment in other countries also pursues a different course as far as can be judged from statistics. In most of these countries and with only very slight divergences, the trade cycle follows the cycle in Great Britain, as in the Scandinavian countries, the Netherlands and Switzerland. In countries with a depreciated currency the course of the cycle is, for obvious reasons, different, as in Belgium and Austria; for France, unfortunately, no figures are available.

To sum up, therefore, we may say that the post-war period has not yet re-established any uniform world cycle affecting the mechanical engineering industry in all States in the same way, because

- (1) The United States follows a separate curve; and
- (2) The countries with inflated currencies depart from the general curve, while the movement of the degree of employment in the other countries is fairly uniform.

5.

HOURS OF WORK; OUTPUT PER HEAD.

Statistics with regard to hours of labour in the mechanical engineering industry in the United States, Great Britain and Germany give the following results:

1. *United States.*

In the mechanical engineering industry of the United States a weighted average of 55½ hours was worked in 1914, 52 hours in 1923 — or 6 per cent less. The reduction is comparatively small because 1923 was also a boom year.

¹ Vgl. Karl LANGE: "Die Passivität der Deutschen Handelsbilanz als wirtschaftspolitisches Problem", Charlottenburg, 1925.

2. *Great Britain.*

In 1914, before the war, 53-54 hours were worked; from 1919 onwards the working week was fixed by tariff at 47 hours. It must be remembered, however, that employers can compel the workmen to do 30 hours overtime in four weeks. Leaving this overtime out of account in comparing the pre-war and post-war periods, and bearing in mind the fact that overtime was worked even before the war, we get a reduction of 11-13 per cent in the hours of work.

3. *Germany.*

In 1913 the weighted average of hours of labour for workers in the metal industry was something over 54 hours according to tariff; after the war (1925) the average working week, according to statistics of the V.D.M.A., was 51.4 hours, which amounts to a reduction of about 5 per cent. During 1924 and 1925 the working week fluctuated between 43.7 and 52.8 hours.

4. *Other Countries.*

The situation in all other countries is similar to that of the three countries mentioned. Before the war a working day of 9-10 hours was almost universal; since the war the figure has fluctuated in the neighbourhood of 8 hours, the time being longer or shorter according to market conditions. In Japan the working day was 9-10 hours, although this figure only applies to 1921.

In any case, these figures show that, except for Japan, none of the countries compared is distinguished from the others by a particularly long or particularly short working day, although, of course, it is not impossible that in comparing particular years the average number of hours worked may differ under the influence of market conditions.

There are no figures available regarding the output of work in the mechanical engineering industry.

6.

WAGES.

Any attempt to summarise and explain the wage statistics given in the Annex under No. 6 encounters peculiar difficulties. Not only do the statistical data in the different countries apply, as in the case of production, to different branches of industry, but we are also faced with the particular difficulties which are attendant upon a comparison of all wage statistics. One country gives the wages according to the wages scale, another the wages actually paid, etc.

The following table must therefore be read with all possible caution; its proper appreciation demands a reference to the material reproduced in the Annex, which

contains the necessary data with regard to the nature of wage statistics in the different countries. Where mention is made in the table of wages scales, the corresponding weekly earnings are larger (in consequence of agreements, overtime, etc.).

WAGES IN THE MECHANICAL ENGINEERING INDUSTRY.

(In marks per week.)

	Skilled			Unskilled		
	1913-14	End of 1925	End of 1925 expressed as percentage of 1913-14	1913-14	End of 1925	End of 1925 expressed as percentage of 1913-14
1. America:						
United States (actual earnings)	62.37	129.32	207	45.74	102.65	224
Canada (wages scale).	81	128.50	161	—	—	—
2. Europe:						
Great Britain (time-rate wages scale . .	41.74	60.23	144	23.29	40.91	176
Germany (wages scale)	36.92	46.24	126	23.55	31.16	132
Russia ¹	—	—	—	—	—	—
Austria (wages scale).	23.80	24.10	101	17.85	20.13	113
Hungary (average wages) . .	28.80	—	—	15.05	—	—
Czechoslovakia (wages scale) . . .	—	34.08	—	—	19.20	—
France (actual earnings)	—	35.75	—	—	21.80	—
Italy (wages scale) . .	—	28.60	—	—	22.08	—
Belgium (wages scale)	28.35	31.20	110	16.74	21.12	126
Switzerland (actual earnings).	30.90	59.25 ²	192	23.70	45.40 ²	192
Sweden ³	—	—	—	—	—	—
3. Australasia, Asia:						
Australia	70.90	110.75 ²	156	48.30	85.17 ²	180
New Zealand	66	85.30	129	—	—	—

¹ The average earnings of Russian metal-workers (skilled and unskilled) are given as 16.76 marks in 1913 and 43.50 in 1925, an increase, therefore of 260 per cent.

² 1924.

³ In Sweden the average weekly earnings of skilled and unskilled workers averaged 28 marks in 1913 and 62 marks in 1924, which means an increase of 221 per cent.

Although the actual figures and especially the exact percentages of increase cannot be vouched for, we can nevertheless see from the table what are the wage conditions in the mechanical engineering industries of the most important areas of production.

It must be remembered that the figures in the table show the nominal wage, and give no indication of its purchasing power and therefore of the standard of living of the workers in the different countries. In a comparison of real wages the differences in the wage level would be substantially less.

The figures, therefore, only give a survey of wages as an element in the cost of production in the different machinery-producing areas. The varying level of wages alone does not justify any conclusion being drawn as to the competitive capacity of the different mechanical engineering industries. Capacity to compete in the international market does not depend upon wages alone but upon all the elements in the cost of production. There is no exact data from which to estimate these other elements. So much may be said, however, namely, that, as between the United States and Germany, Germany pays lower wages but higher social charges and taxes.

As the table shows, the highest wages in 1925 are paid by those countries whose economic development was promoted by the war, or at any rate not hampered by it, and in which also there is a shortage of labour maintained by restrictions on immigration. These countries include the United States, Canada, Australia and New Zealand.

Next to this group come the countries which were neutral in the war — Sweden, Switzerland and the Netherlands — and Great Britain, where wages remain at about the same level.

Then follow countries which have gone through, or are still experiencing, a period of inflation. Of these the highest wages are paid in Germany, followed by France, Czechoslovakia, Belgium, Italy, Hungary and Austria.

On the whole those countries where wages were highest in 1925 can also point to the largest increases since 1913.

The table further shows that the wages of unskilled workmen expressed in percentages have in almost every country risen further than the wages of skilled workmen.

7.

RAW MATERIALS USED.

Nearly half the costs of production in the mechanical engineering industry are accounted for by the cost of material. In Germany¹ the share of material in the cost of production at the beginning of 1925 was estimated at approximately 47 per cent²,

¹ According to the estimates of costs of production made by the Verein Deutscher Maschinenbau-Anstalten.

² In Sweden, the relation between the cost of materials and other costs corresponds more closely to the figures given for the United States than for Germany in consequence of the comparatively high wages costs (Swedish note).

in Great Britain¹ at the beginning of 1924 at about 46 per cent, and in the United States² in 1919 at about 42 per cent.

Of these material costs about 20 per cent may be estimated to be in respect of working material (coal, oil, leather, etc.), and about 80 per cent in respect of raw materials worked up as part of the machinery.

The share of the different raw materials in the cost of materials differs with the various branches of mechanical engineering. The most important are iron, metal alloys and wood. Metal alloys and wood are employed in only a few branches of mechanical engineering in such quantities that their price has no appreciable effect on the cost of production. In all other groups the consumption of wood and metal alloys falls far below that of iron.

The total weight of the kinds of iron ordinarily contained in a piece of machinery is estimated to consist on the average of about 40 per cent to 50 per cent pig-iron and about 30 to 35 per cent bar-iron. These two kinds of iron are therefore the most important raw materials used in mechanical engineering. The share of pig-iron fluctuates according to the amount of broken machine-castings employed instead of pig-iron in the manufacture of castings.

8.

CUSTOMS TARIFFS, AND IMPORT AND EXPORT PROHIBITIONS LICENCES.

Two tendencies can be noted in the Customs legislation of countries since the war in so far as the products of mechanical engineering are concerned:

(1) The tendency towards the most minute subdivision of the different tariff items. This is particularly noticeable in the case of Spain, Italy, the Succession States of Austria-Hungary and Belgium.

(2) The tendency towards increased duties. This is most marked in the case of countries where the mechanical engineering industry is in its early stages, while countries which already possess a well-developed machinery industry and an export surplus show only slight increases, if any. An exception, however, is furnished by the United States, which, in spite of a huge export surplus, has substantially increased her duties as compared with the pre-war period.

Table A on page 37 shows the increase of Customs duties since the pre-war period. The following observations may be made with regard to the table:

When considering the increase in duties by weight, it must be remembered that, compared with 1913, the value of gold has fallen, so that an increase in duties of 150 per

¹ According to an enquiry made among its members by the Engineering Employers' Federation, which included about 1,000 engineering workshops (65 per cent of the members of the Federation).

² According to "A Graphic Analysis of the Census of Manufacturers, 1849-1919" published by the National Industrial Conference Board.

cent over the pre-war figure means about the same *ad valorem* taxation as before the war. The increase in *ad valorem* duties cannot, of course, be compared directly with the increase in duties by weight; in their case it is further necessary, of course, to take into account the depreciation of gold.

Table A does not show the burden of Customs duties in the different countries for the year 1926; this is shown in Table B on pages 39-41, which places side by side the *ad valorem* duties or *ad valorem* equivalents on important categories of machinery in the different countries.

Import prohibitions play no part in most countries. The most important exception is Poland. In Czechoslovakia there is an import licence system, from which, however, some categories of machinery are exempt.

Table A.

POSITION OF DUTIES ON MACHINERY IN TWENTY-TWO COUNTRIES IN THE AUTUMN OF 1926 COMPARED WITH 1913.

(An increase is indicated by a plus sign, a reduction by a minus sign.)

Country	Machine Tools	Textile Machinery	Agricultural Machinery	Motive Machinery	Printing Machinery	Machinery not otherwise mentioned
1. America:						
United States	+ 100 % <i>ad valorem</i>	+ 40 % <i>ad valorem</i>	Free, as before	0 % to + 50 % <i>ad valorem</i>	+ 100 % <i>ad valorem</i>	+ 50 % <i>ad valorem</i>
Canada, general tariff	0 % <i>ad valorem</i>	0 % <i>ad valorem</i>	-70% to 12.5% <i>ad valorem</i>	0 % <i>ad valorem</i>	0 % <i>ad valorem</i>	0 % <i>ad valorem</i>
Argentina	- 100 % <i>ad valorem</i>	- 100 % <i>ad valorem</i>	- 100 % to 0 % <i>ad valorem</i>	- 100 % <i>ad valorem</i>	- 100 % <i>ad valorem</i>	- 100 % <i>ad valorem</i>
Brazil	Before the war an <i>ad valorem</i> duty; since the war, specific	Before the war an <i>ad valorem</i> duty; since the war, specific	- 100 % <i>ad valorem</i>	Before the war an <i>ad valorem</i> duty; since the war, specific		Before the war an <i>ad valorem</i> duty; since the war, specific
2. Europe:						
Great Britain	Free, as before	Free, as before	Free, as before	Free, as before	Free, as before	Free, as before
Germany, general tariff	0 %	+ 40 % to + 100 %	0 % to + 100 %	0 %	0 %	0 %
Germany, treaty tariff			+ 100 %			
Austria, general tariff	+ 33.3 % to + 192 %	- 100 % to + 33.3 %	0 % to + 67 %	+ 40 % to + 87 %	+ 33 % to + 133 %	+ 33 % to + 133 %
Austria, treaty tariff	+ 33.3 % to + 94.5 %	- 100 % to + 14 %	- 12 % to - 10 %	0 % to + 36 %	+ 38 % to + 82 %	+ 25 % to + 87 %
Czechoslovakia: General tariff	+ 265 %	- 56 %	+ 163 % to + 339 %	+ 265 %	- 56 %	+ 265 %
Treaty tariff	+ 152 % to 290 %		+ 40 % to + 55 %	+ 53 % to 73 %		+ 83 % to + 258 %
France: General tariff	+ 162 %	+ 260 % to + 300 %	+ 90 % to + 258 %	+ 144 %	+ 130 % to + 138 %	+ 152 %
Minimum tariff	0 %	+ 49 %	-40% to -11%	- 9 %	- 10 %	- 5 %
Italy: Autonomous tariff	+ 220 % to + 1,400 %	+ 50 % to + 260 %	- 100 % to + 200 %	+ 125 % to + 1,400 %	+ 80 % to + 476 %	+ 380 % to + 1,060 %
Treaty tariff	+ 184 % to + 780 %	+ 150 %	- 100 % to + 200 %	+ 50 % to + 734 %	+ 50 % to + 476 %	
Belgium, minimum tariff ¹	+ 132 % to + 2,200 %	+ 100 % to + 400 %	- 10 % to + 800 %	+ 100 % to + 2,180 %	+ 50 % to + 1,640 %	+ 45 % to + 1,640 %

¹ Previously to the war a uniform tariff; a comparison of these rates with the present maximum rates would reveal a still larger increase.

Table A (continued).

POSITION OF DUTIES ON MACHINERY IN TWENTY-TWO COUNTRIES IN THE AUTUMN OF 1926 COMPARED WITH 1923.

(An increase is indicated by a plus sign, a reduction by a minus sign.)

Country	Machine Tools	Textile Machinery	Agricultural Machinery	Motive Machinery	Printing Machinery	Machinery not otherwise mentioned
Switzerland: General tariff ¹	+ 150 % to + 233 %	+ 213 %	+ 275 %	+ 150 % to + 233 %	+ 400 %	+ 150 % to + 233 %
Treaty tariff	+ 119 % to + 200 %	+ 275 %	+ 186 % to — 275 %	+ 119 % to + 200 %	+ 400 % to + 900 %	+ 119 % to + 200 %
Sweden	0 %	0 % <i>ad valorem</i>	0 %	0 %	— 100 % or 0 %	0 % <i>ad valorem</i>
Netherlands	Free, as before	Free, as before	Free, as before	Free, as before	Free, as before	Free, as before
Denmark.	0 % <i>ad valorem</i>	0 % <i>ad valorem</i>	— 100 % <i>ad valorem</i> or 0 % <i>ad valorem</i>	0 % <i>ad valorem</i>	0 % <i>ad valorem</i>	0 % <i>ad valorem</i>
Norway	+ 50 % <i>ad valorem</i>	+ 50 % <i>ad valorem</i>	+ 50 % <i>ad valorem</i>	+ 50 % <i>ad valorem</i>	+ 50 % <i>ad valorem</i>	+ 50 % <i>ad valorem</i>
Spain:						
Series 1	+ 350 % to + 1,000 %	+ 875 %	+ 300 % to + 1,200 %	— 14 % to + 1,157 %	+ 309 % to + 355 %	+ 720 % to + 1,120 %
Series 2	+ 50 % to + 350 %	+ 225 %	+ 100 % to + 400 %	— 71 % to + 530 %	+ 36 % to + 82 %	+ 170 % to + 377 %
3. Australasia, Asia:						
Australia, general tariff	— 60 % <i>ad valorem</i> to + 140 % <i>ad valorem</i>	+ 140 % <i>ad valorem</i>	— 33 % <i>ad valorem</i> to + 40 % <i>ad valorem</i>	+ 200 % <i>ad valorem</i>	From free to 10 % <i>ad valorem</i>	— 60 % <i>ad valorem</i> to + 140 % <i>ad valorem</i>
British India	Free to 2 ½ % <i>ad valorem</i>	Free to 2 ½ % <i>ad valorem</i>	Free as before	Free to 2 ½ % <i>ad valorem</i>	Free to 2 ½ % <i>ad valorem</i>	Free to 2 ½ % <i>ad valorem</i>
China	0 % <i>ad valorem</i>	0 % <i>ad valorem</i>	0 % <i>ad valorem</i>	0 % <i>ad valorem</i>	0 % <i>ad valorem</i>	0 % <i>ad valorem</i>
Japan	Before the war	<i>ad valorem</i> duties; since the war mostly specific, with a large increase in <i>ad valorem</i> duties				+ 33 % <i>ad valorem</i>
4. Africa:						
Union of South Africa, general tariff	— 100 % <i>ad valorem</i> to 0 % <i>ad valorem</i>	— 100 % <i>ad valorem</i> to 0 % <i>ad valorem</i>	— 100 % <i>ad valorem</i>	— 100 % <i>ad valorem</i> to 0 % <i>ad valorem</i>	0 % <i>ad valorem</i>	— 100 % <i>ad valorem</i> to 0 % <i>ad valorem</i>

¹ The new Swiss general tariff is not yet in operation.

Table B.
COMPARATIVE TABLE OF AD VALOREM DUTIES OR AD VALOREM EQUIVALENTS ON CERTAIN PRODUCTS
OF THE MECHANICAL ENGINEERING INDUSTRY IN THE MOST IMPORTANT IMPORTING COUNTRIES.
 (According to situation on September 1st, 1926.)

Products	Dutiable weight in kg.	Prices in Reichsmarks per 100 kg.	Percentage <i>ad valorem</i> duty in the different countries (Figures in brackets denote Customs tariff numbers)				
			U. S. A. Minimum tariff (most-favoured nations)	GREAT BRITAIN	GERMANY Autonomous tariff	FRANCE	
						For Germany	For most-favoured nations minimum tariff
Narrow-gauge locomotive with two drivers' seats	8,800	124.—	15 (372)	free	7.2 (892)	14.4* (512)	9.7
Triple-expansion steam engine, with 600 h.p. condensation .	70,000	129.—	15 (372)	»	4.7 (894)	28 (510)	7
Compressor (with pistons)	1,900	109.—	30 (372)	»	5 (906d)	11.8* (510)	9.6
Fixed 100 h.p. single-cylinder Diesel engine without fly-wheel	17,500	127.—	30 (372)	»	5.5 (894)	9.9* (510)	8.1
Capstan lathe	28,000	88.—	30 (372)	»	4.9 (904)	31.6 (525)	7.9
Paper machine.	94,000	114.—	30 (372)	»	2.8 (906d)	14.9 (520)	3.7
Wool-weaving loom.	2,000	125.—	35 (372)	»	6.6 (900)	27.2 (518)	6.8
Travelling crane of 5 tons capacity without electric part	6,000	76.—	30 (372)	»	9.4 (894)	11 * (525*)	8.8
Revolving mercerising machine.	12,900	200.—	35 (372)	»	3 (902)	7.8 (516)	6.4
Platine steam press	920	242.—	30 (372)	»	2.9 (906d)	6 (521)	3.2
Steam thrashing machine	5,000	95.—	free	»	5.8 (906d)	12.3* (522)	10

Notes: With reference to France: At rate of franc of September 1st, 1926, 100 francs = 12.51 marks.
 * In virtue of the provisional Agreement of June 6th, 1926 (valid until February 20th, 1927).

Products	Dutiable weight in kg.	Prices in Reichsmarks per 100 kg.	Percentage <i>ad valorem</i> duty in the different countries (Figures in brackets denote Customs tariff numbers)					
			SWITZERLAND		SWEDEN For most-favoured nations, minimum tariff	CANADA		
			Tariff at present in use	New general tariff		British preference	Treaty tariff	General tariff
Narrow-gauge locomotive with two drivers' seats	8,800	124.—	16.5 (883a)	16.5 (883a)	10 (1,033)	22	30	35 (438)
Triple-expansion steam engine, with 600 h.p. condensation .	70,000	129.—	10.3 (894c)	12.4 (894c)	10 (1,034)	15	25	27½ (453)
Compressor (with pistons)	1,900	109.—	14.7 (896b)	29.4 (896b)	10 (1,034)	15	25	27½ (453)
Fixed 100 h.p. single-cylinder Diesel engine without fly-wheel	17,500	127.—	10.4 (894d)	12.5 (894d)	9 (995)	15	25	27½ (453)
Capstan lathe	28,000	88.—	15.9 (894d)	18 (894d)	6.8 (1,011)	15	25	27½ (453)
Paper machine.	94,000	114.—	11.5 (894c)	14 (894c)	10 (1,034)	15	25	27½ (453)
Wool-weaving loom.	2,000	125.—	11.7 (886)	16 (886)	10 (1,034)	15	25	27½ (453)
Travelling crane of 5 tons capacity without electric part	6,000	76.—	23.7 (895b)	31.5 (895b)	10 (1,034)	15	25	27½ (453)
Revolving mercerising machine.	12,900	200.—	6 (894d)	8 (894d)	10 (1,034)	15	25	27½ (453)
Platine steam press	920	242.—	6.6 (890a)	9.9 (890a)	5.5 (1,018)	15	25	27½ (453)
Steam thrashing machine	5,000	95.—	17 (895b, M4)	25 (895b, M4)	8.4 (1,027)	5	10	10 (447b)

Table B (continued).

COMPARATIVE TABLE OF AD VALOREM DUTIES OR AD VALOREM EQUIVALENTS ON CERTAIN PRODUCTS OF THE MECHANICAL ENGINEERING INDUSTRY IN THE MOST IMPORTANT IMPORTING COUNTRIES.
(According to situation on September 1st, 1926.)

Products	Dutiable weight in kg.	Prices in Reichsmarks per 100 kg.	Percentage <i>ad valorem</i> duty in the different countries (Figures in brackets denote Customs tariff numbers)			
			BELGIUM Minimum tariff (most-favoured nations)	CZECHO-SLOVAKIA Treaty tariff (most-favoured nations)	AUSTRIA * Treaty tariff (most-favoured nations)	ITALY Treaty tariff (most-favoured nations)
Narrow-gauge locomotive with two drivers' seats.	8,800	124.—	7.2 (1,030)	58 (527a)	20.2 (463) <i>25.2</i>	65.3 (528)
Triple-expansion steam engine, with 600 h.p. condensation .	70,000	129.—	3.7 (1,025a)	26.4 (528d)	15.8 (438b) <i>20.3</i>	17.8 (396a I)
Compressor (with pistons) . .	1,900	109.—	8.9 (1,025a)	41.4 (ex 538)	27.3 (441c II) <i>33.3</i>	16.4 (431a I)
Fixed 100 h.p. single-cylinder Diesel engine without fly-wheel	17,500	127.—	4.7 (1,025a)	21.7 (528d)	16.8 (438b) <i>21.3</i>	32.2 (396a II)
Capstan lathe	28,000	88.—	6.5 (1,040)	51 (538)	23.2 (441a II) <i>29.2</i>	36.3 (403a)
Paper machine	94,000	114.—	3.1 (1,064b)	39.4 (ex 538)	19.4 (441c) <i>25.4</i>	16.6 (409)
Wool-weaving loom.	2,000	125.—	3.8 (1,048)	4.8 (534a)	8.8 (440b*) <i>12.8</i>	15.2 (415)
Travelling crane of 5 tons capacity, without electric part	6,000	76.—	6.2 (1,029)	48.7 (ex 538)	50.3 (441c*) <i>56.3</i>	43.4 (446)
Revolving mercerising machine.	12,900	200.—	2.4 (1,041)	22.4 (538c)	free (441c)	14 (525)
Platine steam press	920	242.—	3.5 (1,064b)	21.6 (538b)	14 (441c*) <i>20</i>	12 (412)
Steam thrashing machine . .	5,000	95.—	9.4 (1,057b)	16 (530b)	13.4 (439b) <i>19.9</i>	18.9 (407b)

* With reference to Austria: Figures in *italic type* show the duty increased by the turnover tax.

Products	Dutiable weight in kg.	Prices in Reichsmarks per 100 kg.	Percentage <i>ad valorem</i> duty in the different countries (Figures in brackets denote Customs tariff numbers)				
			DENMARK Most-favoured nation tariff	JAPAN New tariff, April 1926	POLAND For Germany, autonomous tariff		NORWAY Minimum tariff (most-favoured nations)
Narrow-gauge locomotive with two drivers' seats.	8,800	124.—	5 (224)	31.4 (573)	18.3 (167 ²)	—	15 (424)
Triple-expansion steam engine, with 600 h.p. condensation .	70,000	129.—	5 (224)	15 (576)	24.5 (167 ⁹) (167 ⁷)	—	15 (424)
Compressor (with pistons) . .	1,900	109.—	5 (224)	59.5 (587)	29.1 (167 ⁹) (167 ⁷)	—	15 (424)
Fixed 100 h.p. single-cylinder Diesel engine without fly-wheel	17,500	127.—	5 (224)	35.4 (577)	19.6 (167 ¹⁰) (167 ⁷)	—	15 (424)
Capstan lathe	28,000	88.—	5 (224)	33 (596)	31 (167 ¹⁸) (167 ¹³)	—	15 (424)
Paper machine	94,000	114.—	5 (224)	20 (602)	21.8 (167 ¹)	—	15 (424)
Wool-weaving loom.	2,000	125.—	5 (224)	15.2 (598)	26.2 (167 ²⁰) (167 ^{15b})	15.7	free (424)
Travelling crane of 5 tons capacity, without electric part	6,000	76.—	5 (224)	43.4 (583)	33 (167 ⁷) (167 ⁸)	—	15 (424)
Revolving mercerising machine.	12,900	200.—	5 (224)	15 (601)	15.4 (167 ^{24b})	—	15 (424)
Platine steam press	920	242.—	5 (224)	25 (603)	10.3 (167 ¹⁰)	—	15 (424)
Steam thrashing machine . .	5,000	95.—	5 (224)	20 (604)	20 (167 ⁴⁰)	—	15 (424)

With reference to Poland: At the rate of the zloty on September 1st, 1926, 45 zl. = £1 sterling.

Table B (continued).

COMPARATIVE TABLE OF AD VALOREM DUTIES OR AD VALOREM EQUIVALENTS ON CERTAIN PRODUCTS OF THE MECHANICAL ENGINEERING INDUSTRY IN THE MOST IMPORTANT IMPORTING COUNTRIES.

(According to situation on September 1st, 1926.)

Products	Dutiable weight in kg.	Prices in Reichsmarks per 100 kg.	Percentage <i>ad valorem</i> duty in the different countries (Figures in brackets denote Customs tariff numbers)				
			AUSTRALIA		SPAIN	KINGDOM OF THE SERBS, CROATS AND SLOVENES Most-favoured nations (Treaty tariff)	INDIA
			British preferential tariff	General tariff	For Germany		
Narrow-gauge locomotive with two drivers' seats	8,800	124.—	40 (177)	55 (177)	125	12.9 (648)	2.5 (81a)
Triple-expansion steam engine, with 600 h.p. condensation	70,000	129.—	45 (176)	60 (176)	31	9.4 (650)	2.5 (81a)
Compressor (with pistons)	1,900	109.—	free	10 (175)	46.9	11.2 (652)	2.5 (81b)
Fixed 100 h.p. single-cylinder Diesel engine without fly-wheel	17,500	127.—	45 (178)	60 (178)	14.9	9.4 (650)	2.5 (81a)
Capstan lathe	28,000	88.—	45 (176)	60 (176)	34	27.3 (654)	2.5 (81b)
Paper machine	94,000	114.—	45 (176)	60 (176)	11.4	14 (658*)	2.5 (81b)
Wool-weaving loom	2,000	125.—	45 (176)	60 (176)	65	free (657 ¹)	2.5 (81b)
Travelling crane of 5 tons capacity, without electric part	6,000	76.—	35 (176d)	50 (176d)	73.6	21 (658 ¹¹)	2.5 (81b)
Revolving mercerising machine	12,900	200.—	45 (176)	60 (176)	26 (554)	free (657 ³)	2.5 (81b)
Platine steam press	920	242.—	free	10 (169)	11.6 (579)	6.7 (658*)	2.5 (81b)
Steam thrashing machine	5,000	95.—	22½ (165)	35 (165)	26.3 (570)	12.6 (653) 1a	free (65)

Products	Dutiable weight in kg.	Prices in Reichsmarks per 100 kg.	Percentage <i>ad valorem</i> duty in the different countries (Figures in brackets denote Customs tariff numbers)					
			DUTCH INDIES	UNION OF SOUTH AFRICA		ARGENTINA	BRAZIL	
				British preferential tariff	Minimum tariff	Maximum tariff		
Narrow-gauge locomotive with two drivers' seats	8,800	124.—	free (29)	free	free	3 (138)	5 (26)	5.3 (1,008)
Triple-expansion steam engine, with 600 h.p. condensation	70,000	129.—	6 (16)	»	»	3 (118d)	free	4.7 (1,008)
Compressor (with pistons)	1,900	109.—	6 (16)	»	»	3 (118d)	»	5.5 (1,009)
Fixed 100 h.p. single-cylinder Diesel engine without fly-wheel	17,500	127.—	6 (16)	»	»	3 (118d)	»	4.8 (1,008)
Capstan lathe	28,000	88.—	6 (16)	»	»	3 (118d)	»	5.5 (1,009)
Paper machine	94,000	114.—	6 (16)	»	»	3 (118d)	»	5.3 (1,009)
Wool-weaving loom	2,000	125.—	6 (16)	»	»	3 (118d)	»	4.8 (1,009)
Travelling crane of 5 tons capacity, without electric part	6,000	76.—	6 (16)	»	»	3 (97)	»	15 (1,004)
Revolving mercerising machine	12,900	200.—	6 (16)	»	»	3 (118d)	»	3 (1,009)
Platine steam press	920	242.—	6 (16)	»	»	3 (118d)	»	15 (1,014)
Steam thrashing machine	5,000	95.—	6 (16)	»	»	free (118a)	»	free

9.

EXPORTS AND IMPORTS.

A. EXPORTS.

(1) *Total machinery exports of the machinery-producing countries.* The following table gives the exports and export or import surpluses of machinery-producing countries for the years 1913 and 1925.

	1913			1925			
	Exports: current values, in mill. of Reichsmarks	% of total exports	Surplus or deficit in millions of Reichsmks.	Exports: current values, in mill. of Reichsmarks	% of total exports	Surplus or deficit, in millions of Reichsmarks	Exports in 1925 expressed as % of those of 1913
<i>1. America:</i>							
United States	680.6	26.8	+652.3	1,279.8	34.8	+1,222.2	188.0
Canada	36.9	1.5	-119.6	76.7	2.1	- 166.8	208.0
<i>2. Europe:</i>							
Great Britain	721.3	28.4	+600.5	898.2	24.4	+ 676.9	124.5
Germany	738.4	29.0	+637.2	734.9	20.0	+ 636.0	99.5
Russia ¹			-341.3			- 156.1	
Austria - Hungary, or Succession States	27.5	1.1	- 84.9	98.5	2.7	- 31.6	305.8
France	76.7	3.0	-146.7	169.4	4.6	- 42.9	221.0
Italy	18.1	0.7	- 83.2	26.3	0.7	- 127.0	145.2
Belgium	62.6	2.5	- 25.5	58.6	1.6	- 37.2	93.5
Switzerland	62.3	2.5	+ 28.1	125.3	3.4	+ 73.5	201.0
Sweden	48.9	1.9	+ 24.4	90.2	2.4	+ 48.3	184.5
Other European countries	53.9	2.3	-101.2	99.7	2.8	- 172.6	185.0
<i>3. Australasia; Asia:</i>							
Australia and New Zealand ²	5.8	0.1	-100.2	5.7	0.2	- 191.2	98.3
Japan	4.2	0.2	- 61.3	12.1	0.3	- 109.3	288.0
Total	2,537.2	100.0	+878.6	3,675.4	100.0	+1,622.2	144.9

¹ Russian exports amounted to less than one million Reichsmarks.

² New Zealand exports amounted to less than one million Reichsmarks.

The above table calls for the following observations:

In estimating the increase in exports between 1913 and 1925, it must be borne in mind that an increase of 150 per cent in the value of exports since 1913 signifies that, generally speaking, the amount actually exported has remained the same¹.

The increase in exports from Austria-Hungary or its Succession States, exceeding that of all other countries, is to be attributed to the breaking-up of Austria-Hungary into various independent States, the effect of which is that what was formerly internal trade between these territories now appears as foreign trade.

The total export surplus of all producing countries as shown in the table represents the amount available in the different years to meet the import requirements of countries which are not themselves producers of machinery.

The table can be studied from very different points of view. The most important changes which the table reveals between 1913 and 1925 have already been dealt with above, but attention may be drawn to the following points:

It appears from the table that countries which seek to protect their mechanical industry by high Customs barriers can record no increase of exports compared with 1913 but in most cases have experienced a reduction of exports in pre-war values.

(2) *Exports of the different kinds of machinery.* Diagrams 8 and 9 furnish information on this matter. If we examine the nature of the exports of the different countries, we find that the biggest exports are in respect of those kinds of machinery which themselves have a large home market in the producing country. Thus in the United States the first place among exports is held by agricultural machinery, in Great Britain by textile machinery, and in Germany also by textile machinery or — excluding sewing machines — by machine-tools. Among Belgian exports mining machinery comes first; in the case of Sweden, milk separators.

(3) *Exports according to purchasing markets.* If we arrange the exports of the three most important exporting countries, which together furnished 84.2 per cent of world requirements in 1913, 74.4 per cent in 1924 and 79.2 per cent in 1925, according to the purchasing markets, we obtain the three following tables:

¹ Export figures having been reduced to pre-war values in Chapter I, the actual post-war values are here given.

The Ten Most Important Markets of the United States in 1913 and 1924¹.

1913		1924	
Country	Million Reichsmarks	Country	Million Reichsmarks
1. Canada	145.9	1. Canada.	158.6
2. Great Britain and Ireland	68.5	2. Argentine.	105.8
3. Brazil.	30.7	3. Great Britain and Ireland.	103.2
4. Mexico	26.6	4. France.	70.4
5. France	20.5	5. Mexico.	59.9
6. Russia	19.9	6. Japan	59.5
7. Argentine	19.6	7. Cuba.	58.4
8. Australia	19.2	8. Australia.	52.6
9. Cuba	18.1	9. Brazil	28.4
10. Japan.	15.5	10. Union of S. Africa .	22.4
Total	384.5	Total	719.2
(Equals about 57 per cent of the total machinery exports of the United States).		(Equals about 71 per cent of the total machinery exports of the United States.)	

The Ten Most Important Markets of Great Britain in 1913 and 1924¹.

1913		1924	
Country	Millions Reichsmarks	Country	Millions Reichsmarks
1. India	102.1	1. India.	186.3
2. Russia	77.7	2. Australia.	58.1
3. France	45.6	3. France.	53.8
4. Australia	43.6	4. Japan	51.0
5. Argentine	34.7	5. Union of S. Africa . .	38.2
6. Japan.	33.9	6. Brazil	28.9
7. Union of S. Africa .	28.9	7. Belgium	27.1
8. Brazil.	25.9	8. Argentine.	24.4
9. Belgium.	21.3	9. Spain	22.4
10. Netherlands	19.9	10. China	22.0
	433.6		512.2
(Equals about 60 per cent of total machinery exports of Great Britain).		(Equals about 67 per cent of total machinery exports of Great Britain).	

¹ The figures for 1925 are not available.

The Ten Most Important Markets of Germany in 1913, 1924 and 1925.

1913		1924		1925	
Country	Mill. Reichs-marks	Country	Mill. Reichs-marks	Country	Mill. Reichs-marks
Russia	136.5	Netherlands . .	34.9	Italy	59.9
Austria-Hungary	84.4	Poland	33.0	Netherlands . .	48.1
France	74.6	Italy	31.3	Brazil	43.9
Great Britain . .	39.9	Austria	29.5	Russia	39.9
Italy	39.2	Czechoslovakia .	24.8	Czechoslovakia .	34.7
Belgium	37.1	Brazil	23.9	Poland	34.2
Netherlands . . .	35.0	Switzerland . . .	23.4	Great Britain . .	33.3
Spain	26.0	Argentina	19.8	Argentina	29.6
Switzerland . . .	25.6	Great Britain . .	19.2	Switzerland . . .	29.3
Brazil	24.8	Sweden	17.9	Spain	28.7
	523.1		257.7		381.6
(Equals 72 per cent of total machinery exports of Germany).		(Equals 49.7 per cent of total machinery exports of Germany).		(Equals 51.8 per cent of total machinery exports of Germany).	

As may be seen from the tables, the importance of the purchasing markets for the individual exporting countries is determined by the four following considerations:

(1) *The amount of the total import requirements of a country.* This of course determines to a large extent the absolute amount furnished to the country by exporting States. This, for instance, is the reason why in 1913 Russia and France are included among the first six markets for all three countries. In the case of France the same still applies in 1924. The fact that Germany's exports to France have fallen so low — even below the tenth place — is due to the political and commercial discrimination still shown against German machines in France.

(2) *The distance of markets from the exporting countries,* that is to say, freight. Freight conditions make Europe the market for German exports, while the United States dispose of their products to a very large extent in the continent of America.

(3) *Politico-commercial conditions.* The influence of these is particularly strong in the case of Germany's markets; as already mentioned, it was due to their influence that France is not included among Germany's first ten markets in either 1924 or 1925, and also that Italy advanced from third place in 1924 to first place in 1925, that Poland — in consequence of the German-Polish Customs war, which, however, only started in the latter half of the year — in 1925 occupied sixth place instead of the second place as in 1924, that Spain, which in 1924 was not even included among the

first ten markets, moves up to fifth place in 1925 as a result of the conclusion of a commercial treaty.

(4) *Political union*, for the most part bound up with politico-commercial privileges; this factor causes the bulk of British exports to go to the British Dominions.

B. IMPORTS.

The following table gives the ten principal importing countries arranged in order of importance. The figures for 1925 are not quite complete, those for Australia and Brazil are based on estimates (see Annex), as the official import statistics are not yet available.

The Ten Principal Machinery-Importing Countries in the World.

1913		1924		1925	
Country	Import of machinery in Reichsmks. (thousands)	Country	Import of machinery in Reichsmks. (thousands)	Country	Import of machinery in Reichsmks. (thousands)
Russia	341,347	France	213,115	Canada	243,499
France	223,446	India	195,979	India	225,392
Canada	156,451	Great Britain .	179,227	Great Britain .	221,316
India	139,189	Japan	178,174	France	212,303
Great Britain .	120,797	Canada	162,190	Russia	156,075
Austria-Hung.	112,370	Australia . . .	140,305	Italy	153,334
Brazil	101,922	Belgium	134,486	Australia . . .	145,000
Italy	101,291	Argentine . . .	128,382	Argentine . . .	142,756
Germany . . .	101,235	Netherlands . .	111,315	Netherlands . .	125,205
Argentine . . .	90,623	Brazil	103,594	Japan	121,361
	1,488,671		1,546,767	Brazil	120,000
(Equals about 59 per cent of total imports of machinery.)		(Equals about 51 per cent of total imports of machinery.)		(Equals about 47.5 per cent of total imports of machinery.)	1,866,241

10.

CONSUMPTION PER HEAD IN EACH COUNTRY.

The consumption of machinery in the principal countries is shown in the following table:

World Consumption of Machinery.

(Current values.)

	1913 ¹		1925 ¹	
	In millions of Reichsmarks	Per head. In millions of Reichsmarks	In millions of Reichsmarks	Per head. In millions of Reichsmarks
Total consumption	13,555		22,059	
1. <i>America:</i>				
United States	6,122	63.5	11,475	99.4
Canada	419	55.9	876	98.5
South and Central America.	359	4.9	509	6.6
2. <i>Europe:</i>				
Great Britain ²	1,002	22.2	2,357	42.8
Germany	2,163	32.3	2,264	36.2
Russia	816	4.9	561	4.3
Austria-Hungary, or Succession States	566	11.0	364	12.8
France	410	13.8	570	14.5
Other European countries which produce machinery	893	13.3	1,332	13.3
Other European countries	160	3.5	211	2.9
3. <i>Australasia; Asia:</i>				
Australia	152	33.0	279	46.5
New Zealand	24	24.0	47	33.6
India	139	0.4	225	0.7
China	20	0.06	88	0.2
Japan	109	2.0	381	6.4
4. <i>Africa:</i>				
Union of South Africa	64	10.5	99	14.1

¹ For some countries, but not for the three principal producing countries, the figures refer to other years than those given. For details, see the two tables in the Annex (Ad No. 10).

² The figures for Great Britain are inclusive of Ireland for the year 1925 also. Without the Irish Free State the consumption of machinery per head for Great Britain in 1925 is 51.8 Reichsmarks.

If we compare the three principal countries producing machinery regarded as areas of consumption, we are struck by the extraordinary difference in the amounts consumed. This difference is not only absolute — this is largely explained by the varying size of the three economic areas — but also applies to the consumption per head of population.

The following are some of the reasons which explain these differences:

1. The German figure in 1925 is lower than that of the two other countries, because Germany still has a comparatively large agricultural population. So has America, but in that country agriculture is much more highly industrialised, that is to say, it employs a far larger amount of machinery than Germany. One of the reasons why the British figure for 1925 is higher than the German is the lesser importance of agriculture in Great Britain.

2. As machinery can replace labour, the extent to which it is used depends upon wages and the rate of interest (compare what was said in Chapter 4A). The lower the rate of interest and the higher the wages, the more machinery is used and *vice versa*. The rate of interest in the United States is lower than in Germany, but wages are about three times as high, which easily explains why more machinery is consumed in the former country. The same applies to a smaller extent to England and Germany. No doubt, the difference in the rise of wages compared with the pre-war period is a reason why the consumption of machinery per head in England has increased more quickly than in Germany.

3. In the United States there is a more expansive demand than in Germany and England, economic development being more rapid in America than in Europe.

4. In Germany the crisis dating from the last quarter of 1925 served to diminish consumption.

These reasons explain the difference in consumption per head in the United States and the two European countries.

Other countries show great differences in the figures for consumption per head. Similar figures to those for the United States are shown by Canada only. Then come Australia, Great Britain and Germany. The extraordinarily high figure for Australia is explained by the sparsity of its population.

In the industrial countries of Europe (apart from Great Britain and Germany) the consumption of machinery per head of the population averages about 13 Reichsmarks; in the Balkan States and other less industrialised European countries, particularly Russia, the figure is still below 5 Reichsmarks.

In some of the countries furnishing the raw materials, we obtain consumption figures per head of the population approaching those of the industrial countries of Europe. For example, the consumption of machinery in Cuba per head is 22 Reichsmarks, for Argentina 16 Reichsmarks. These figures are partly explained by the same factors as determine the figures for the United States, namely, industrialised agriculture, a large and growing demand and the high level of wages.

The lowest figures refer to China and India, with a consumption per head of respectively 0.7 and 0.2 Reichsmarks. These two figures prove that the use of machinery in the world, and therefore its export by exporting countries, is still capable of a considerable increase.

11.

PRICES.

The only regular monthly figures for prices of machinery refer to Germany. In the following table the index figures for machinery published monthly by the German Statistical Department are combined into yearly averages:

Index Figures for Prices of Machinery in Germany.

(Unit for July 1914 = 100.)

	Yearly average for 1924	Yearly average for 1925	Average for first ten months of 1926
Machinery as a whole . . .	136.1	144.0	145.4
Agricultural machinery . .	132.8	129.0	130.0
Metal-working machinery .	135.4	143.6	144.8
Wood-working machinery . .	135.1	137.1	135.5
Combustion engines . . .	125.5	122.3	118.5
Typewriters	103.3	99.7	99.5

12.

INDUSTRIAL ORGANISATION ; BUYING AND SELLING ORGANISATION.

The industrial organisation of the mechanical engineering industry in the different countries, as far as information is available, is shown in the following table:

Industrial Associations of the Mechanical Industry.

(Central Associations.)

Country	Association
1. United States	American Supply and Machinery Manufacturers' Association, New York.
2. Great Britain.	British Engineers' Association, London.
3. Germany.	Verein Deutscher Maschinenbau-Anstalten (VDMA), Berlin-Charlottenburg.
4. France.	Fédération des syndicats de la construction mécanique, électrique et métallique de France, Paris.
5. Switzerland	Verein Schweizerischer Maschinenindustrieller, Zurich.
6. Sweden	Sveriges Maskinindustri-förening, Stockholm.
7. Czechoslovakia	Sdruzeni kovodelneko prumyslu ceskoslovenskeho, Prague.
8. Austria	Verband der österreichischen Maschinenindustrie, Vienna. Verein der Montan-Eisen- und Maschinen-Industriellen in Oesterreich, Vienna.
9. Hungary	Landesverein der ungarischen Eisenwerke und Maschinenfabriken, Budapest.
10. Norway	De mekaniske verksteders landsforening, Oslo.

The above table calls for the following observations:

Ad. 1. From the particulars available ¹ it is not clear whether the association named (American Supply and Machinery Manufacturers' Association) is the central

¹ United States Department of Commerce: *Trade Association Activities*. Washington, 1923, pages 353 *et seq.*

association of the American engineering industry or whether there is no central association embracing the entire engineering industry (as for example in Germany), but only specialised associations for the individual branches of the industry. An organisation approximately corresponding to the Verein Deutscher Ingenieure is the Machinery Builders' Society, New York, an association of individuals for the treatment of technical questions.

Ad. 3. The Verein Deutscher Maschinenbau-Anstalten is an industrial association representing the whole of the German mechanical industry. The discharge of special functions is left to the 95 specialised associations incorporated in the VDMA, which themselves are combined into 13 technical groups, as follows:

- Group I. Tool-machines and machine-tools.
- » II. Textile machines, including accessories and tools for textile machinery and machine needles.
- » III. Agricultural machinery and implements.
- » IV. Locomotives.
- » V. Power engines.
- » VI. Driving engines.
- » VII. Smelting, steel and rolling plant and machinery.
- » VIII. Mechanical means of conveyance (cranes, lifts, hoisting gear, etc.), weighing machines.
- » IX. Machines for the paper and graphic industries.
- » X. Machinery for the foodstuff and chemical industries.
- » XI. Crushing and ore-dressing machinery.
- » XII. Special machines and parts of machines.
- » XIII. Apparatus.

Within the Reichsverband der Deutschen Industrie, which includes all branches of German industry, the VDMA constitutes the specialised group for mechanical engineering. In addition, it is responsible for the management of the Arbeitsgemeinschaft der Eisenverarbeitenden Industrie (AVI).

Labour questions are not dealt with by the VDMA, but by a special association of employers known as the Gesamtverband Deutscher Metallindustrieller, which is organised by districts.

Technical questions are handled by the Verein Deutscher Ingenieure; whereas the VDMA is an association of firms and unions, the VDI is an association of individuals.

Ad. 8. For Austria, the first-named association, the Verband der oesterreichischen Maschinenindustrie, is the central association of the mechanical construction industry, constituting a branch of the Hauptverband der Industrie Oesterreichs and embracing the greater part of the Austrian mechanical engineering industry, although individual machinery works as well as locomotive works belong to the Verein der Montan-, Eisen- und Maschinen-Industriellen in Oesterreich. A few engineering works belong to both associations.

ANNEX.

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Statistical Material.

PRELIMINARY REMARKS WITH REFERENCE TO THE STATISTICAL MATERIAL.

THE PRESENT SITUATION WITH REGARD TO INTERNATIONAL ENGINEERING STATISTICS.

Owing to the inadequacy of the available statistical material, it is exceedingly difficult to compare the situation and development of the various branches of industry in the different countries. As regards mechanical engineering, the available figures are also incomplete. In some countries there are no available figures at all for the engineering industry, while in others the statistics are so different in their content and method of compilation and are in some cases so incomplete that it is frequently impossible to compare them one with another. Accordingly, the attached statistical material must be introduced with the following critical remarks:

A. STATISTICS, AVAILABLE OR LACKING.

Ad No. 2. Output capacity. — No countries possess reliable figures to show the output capacity of the engineering industry. The methods of arriving at an approximate estimate were discussed above in the body of the memorandum.

Ad No. 3. Actual output. — The principal data from which to estimate the output of the engineering industry throughout the world are the statistics showing the extent of production in this branch of industry in the different countries. There are many lacunæ, so that in order to obtain any conception of the international development of the industry, it is in some cases necessary to resort to estimates. Of the twenty-one countries which possess a considerable mechanical engineering industry¹, only nine, so far as is known, institute regular official enquiries into the value of production of the industry. Leaving out of account the comparability of the respective statistics, these countries are: the United States (formerly every five, now every two years), Sweden (annually), Canada (annually), the Netherlands (annually since 1920), Denmark (annually), Hungary (annually), Australia (annually), New Zealand (annually), and Russia (annually). In Great Britain, an official enquiry into production was carried out in 1925, but the results are not yet to hand. In the case of Great Britain and Germany, however, we have the results of private investigations (enquiries by central organisations). France, Switzerland, Belgium, Czechoslovakia, Austria, Italy, Poland, Norway and Finland have no statistics of output, although it is not impossible that one or other of these countries possesses private statistics which have not been published.

Ad No. 4. Number of men employed, number of men unemployed. — In the absence of output statistics, an indication of the output of the engineering industry is given by *the total number employed or number of workmen employed* in the industry in question. Taken in conjunction with output statistics, these figures also serve to estimate the importance of labour as an element in production in the different engineering industries. Our sources are the general, occupational or industrial censuses held at varying intervals, which are available in a number of countries but which are to a large extent out of date, or, owing to their method of compilation, cannot be utilised. In the nine countries mentioned above which publish output statistics annually or biennially, enquiry is also made into the total number employed or the number of workmen employed. Further, several countries possess census figures collected by factory inspectors (Germany, Switzerland, Sweden) or by insurance authorities (Great Britain, Austria, Norway). Finally, private enquiries are carried out in respect of the German engineering industry (periodical Union statistics) and in respect of Austria (enquiry by the Metal-Workers' Union). There are no recent statistics for France, Belgium, Czechoslovakia, Italy, Poland or Finland.

¹ These are (approximately in order of their machinery exports since the war): United States, Great Britain, Germany, France, Switzerland, Sweden, Canada, the Netherlands, Belgium, Czechoslovakia, Austria, Italy, Denmark, Hungary, Japan, Poland, Norway, Finland, Australia, New Zealand and Russia.

The material regarding the *degree of employment and unemployment* is also incomplete. Part of it is collected by industrial or employers' associations, part by organisations of the workers or by national insurance authorities. Statistics of the former kind are continuously available for Germany and the United States. Unemployment figures¹, mostly the result of enquiries by the Metal-Workers' Unions, are available in the following countries: Great Britain (trade union figures for the metallurgical industry, engineering and shipbuilding, also data collected by the insurance authorities in respect of engineering), Germany, Switzerland, Sweden, Canada, the Netherlands, Belgium, Austria (Vienna), Italy, Denmark (smiths and machine workers), Hungary, Norway, Australia. There are no statistics for France, Czechoslovakia, Japan, Poland, Finland or Russia.

Ad No. 5. Hours of work; output per head. — The material regarding *hours of work* in the engineering industry is still more meagre, since here we are concerned not so much with the hours of work as laid down by legislation or agreement, for which there are in most cases sufficient data, as with the actual time worked. The exceptions allowed by law or agreement are largely made use of in nearly every country, while in times of crisis a great deal of short time is worked. Subject to this limitation, statistics exist concerning the hours of work in the United States, Germany, France, Switzerland, Canada, the Netherlands, Austria, Hungary, Italy, Denmark, Norway, Finland, Australia and New Zealand, but mostly for only few periods of time; as far as is known, regular monthly enquiries into the hours of work in machine shops are instituted in Germany alone (statistics of the *Verein Deutscher Maschinenbau-Anstalten*).

As regards *output per head* in the engineering industry, there is no utilisable material.

Ad No. 6. Wages. — Owing to the sociological importance of this question there is abundant material concerning wages in the engineering industry of the different countries. The variety of methods employed, however, renders international comparison difficult.

Ad No. 7. Raw materials used. — With regard to the supply of raw materials for the engineering industry, the available data are insufficient, since in the case of most countries there are no figures to show the proportion of raw materials as a whole and the proportion of individual raw and auxiliary materials, which go to make up the total value of the finished product. Only a few of the countries which regularly institute official enquiries into production also publish the value of the raw and auxiliary materials used in manufacture. These are countries in which the statistics are complete in other respects also, namely, the United States, Australia, New Zealand, Canada and Hungary².

Ad No. 8. Customs tariffs, prohibitions and licences. — Material concerning commercial policy (Customs duties, import restrictions, etc.) is abundant in all countries which import machinery, since in most cases this policy is embodied in legislative measures.

Ad No. 9. Exports and imports. — Apart from defects in the arrangement of many statistics, the foreign trade figures may be regarded on the whole as complete. If there are gaps in the foreign trade tables of the Annex (Tables 1a and b, 2a and b), this is either because the complete depreciation of the national currency made it impossible to give values for certain post-war years (Germany 1920-22 or 1923, Austria 1921, Hungary 1920-23, Baltic States 1920-1922, Poland 1920-21, Russia 1920), or because the foreign trade statistics of certain countries (almost exclusively importing countries) for the past year were not available (Portugal, Denmark, Bulgaria, Greece, Morocco, Dutch Indies, Australia, Brazil, Chile, Colombia)³, or, again, because in the case of some countries the import figures for certain years were lacking (Portugal 1913, Jugoslavia 1913, Morocco 1908, New Zealand 1913 and 1920-1924, Mexico 1922, Cuba 1920-25). Finally, because, in the case of a few countries whose share of world trade is relatively small, there are no import statistics, or only very incomplete figures (e.g. Turkey, Algeria, Tunis, Peru, Bolivia, Uruguay, Colombia). In the two main schedules, however, it was possible to make good many of these lacunæ by estimates.

Ad No. 10. Consumption per head in each country. — Statistical data showing a country's requirements are furnished by the import figures of machinery for that country, combined, in the case of countries producing machinery, with statistics of output and export. What was said under Nos. 3 and 9 applies to this chapter also.

Ad No. 11. Prices. — Only a few isolated statistics have hitherto been published with regard to prices in mechanical engineering, namely, for certain kinds of agricultural machinery in the United

¹ As regards Germany, there are also figures to show the proportion of short-time workers to the total number of trade union members.

² Particulars regarding this chapter are contained in the body of the memorandum.

³ The exact *export figures* for Czechoslovakia and Norway will be found in the year-books for 1925, which have not yet been published.

States and monthly index figures of machinery prices in Germany (established by the Statistical Department of the Reich).

Ad No. 12. Industrial organisation; buying and selling organisation. — Finally, the material from which to estimate the industrial organisation of the world's mechanical engineering industry is very incomplete. With a few exceptions, there are no adequate data to show either the importance of engineering associations from the point of view of the national industry and their internal organisation and work, or the growth and activity of cartels and trusts. The present memorandum, therefore, has confined itself to naming the central industrial associations in the engineering industry of the different countries. ¹

B. THE METHODS OF COMPILING ENGINEERING STATISTICS.

I. General.

1. Definition of Mechanical Engineering.

All international comparison of machinery statistics is complicated, in the first place, by the fact that hitherto no internationally uniform meaning has been given to the terms "machinery" and "mechanical engineering". Thus, for example, mechanical engineering has frequently been combined with other branches of the metallurgical industry, so that it becomes impossible to determine the branches of production comprised in mechanical engineering proper ². It would therefore seem to be particularly necessary to fix upon a uniform definition of the term "machinery" for all countries. The same applies to an international understanding for establishing a distinction between foundry products and machinery, and between machinery construction and repair workshops.

In preparing the material for the present memorandum, the following kinds of machinery were as far as possible taken into account, in addition to products customarily regarded as machinery and included within the sphere of activity of the V.D.M.A.:

- Office appliances (typewriters and calculating machines, cash registers, copying presses, multigraphs etc.);
- Sewing and knitting machines for domestic purposes (in addition to industrial machines);
- Other machinery for domestic use (washing and wringing machinery, etc);
- Locomotives, except electric;
- Other traction engines (tractors, locomobiles, etc);
- Power and driving engines for conveyances by water, land and air (except when an integral part thereof);
- Mechanical agricultural implements (ploughs, harrows, rollers, horse-rakes, etc.);
- Mechanical tools (compressed air hammers, etc.);
- Scales (weighing appliances, except precision machinery products like letter scales and chemist's scales);
- All finished (worked up) parts of machinery (component parts, spare parts and accessories);
- Fittings for steam and water-piping (cocks, valves, slides).

On the other hand, the following products have been left out of account or eliminated as *not* belonging to the mechanical engineering industry:

- Electric generators, dynamos, transformers, motors and other electrical machines;
- Electrical apparatus (telephones, telegraphic, wireless and signalling apparatus, etc.);
- Steam boilers, steam generators and steam boiler accessories;
- Non-mechanical receptacles, tanks, etc.;
- Bicycles, motor-bicycles, motor-cars, ships, railway coaches [and] wagons, aeroplanes, carriages and other vehicles;
- Non-mechanical agricultural tools and implements (scythes, sickles, spades, shovels, hand-hoes, hand-rakes, etc.);

¹ Compare the list given in the body of the memorandum.

² In preparing the material for the present memorandum, production and foreign trade figures were, as far as possible, "purged", a process which was only possible with the help of estimates.

Bridges and other superstructures;
Clocks and watches, counting machines, gas and water meters, optical and medical instruments and apparatus, photographic and cinematographic apparatus, including projecting apparatus, slot machines and other precision machinery products.

2. *Classification of Engineering Products.*

In this respect, too, the statistics of the different countries are deficient, partly through the lack of clear principles of classification and of subdivision to make it possible to recognise the conditions governing certain important kinds of machinery, partly through the lack of international uniformity and therefore comparability, particularly as regards production and foreign trade statistics as well as Customs matters.

It is true that classification in the different countries is frequently determined by reasons of expediency and particularly by the importance of the different branches of the industry. For purposes of international machinery statistics, however, it would seem essential that an internationally uniform list should be drawn up for the principal groups of machinery in order that these at least may be internationally comparable. The treatment and classification of machinery in the "international headings for foreign trade statistics classification" established by the resolutions of the Brussels Conference of 1913 cannot permanently satisfy the requirements of circles interested in statistics of foreign trade in machinery.

3. *Use of Quantity Units.*

Both production and foreign trade statistics frequently quote *values* only, without at the same time including *figures of weight or number of pieces*. The great disadvantage of this from the statistical and industrial point of view is strongly emphasised by post-war conditions; in the absence of data regarding weight or number of pieces and with the value of money subject to violent fluctuations, particularly in countries with a depreciating currency, there is no standard by which to calculate the volume of actual output or sales.

II. *Special Statistics.*

Mention should here be made in the first place of all those defects which render international comparison difficult in all branches of industry and not only in engineering. One of these is, for example, the inclusion in production statistics of the value of the final product only and not of the value which the particular finishing branch of the industry has added to the material employed; secondly, production and foreign trade statistics of different countries are particularly difficult to compare, because the statistics of some countries do not refer to calendar years but to financial or business years. Reference should further be made to the various and in some cases unsatisfactory methods of determining values in foreign trade statistics and finally to the question of wage statistics, which have been compiled according to very different methods in the various countries, with the result that a comparison of wages between one country and another is made extremely difficult. It is impossible, however, to enter into these details here. Only those problems can be discussed which are peculiar to the mechanical engineering industry.

(1) *In the case of statistics referring to orders, production, despatch of goods, sales and turnover*, account must be taken of the exceptionally long period for delivery which is generally allowed in the engineering industry, so that the receipt of the order and the despatch of the goods may be separated by a comparatively long interval. Further, manufacture for stock plays an important part in certain branches. In other branches it does not enter into consideration at all. Special adjustments are also required in the repairing industry in order that statistics of despatch and turnover may be comparable.

(2) With regard to *employment statistics* in the engineering industry, it is most desirable that the ratio of skilled, semi-skilled and unskilled workers and of apprentices to the total number of workmen should be ascertained, as well as the numerical ratio of employees (officials) and workmen. The official American statistics, for example, present the great drawback that they do not also determine the proportion of unskilled labour to the total number of workmen. In this respect the Union statistics of the V.D.M.A. may be taken as exemplary.

(3) With regard to *foreign trade statistics*, attention must once more be drawn to the necessity of a uniform definition of engineering products as distinct from kindred products and to the uniform classification of machinery.

Furthermore, the definition of the repairing trade is of particular importance in the engineering industry. For example, a completely false picture is given of the export activities of an engineering industry if, on re-exportation, repaired machinery is included in the foreign trade figures at its *full* value or weight.

Ad No. 3.

ACTUAL OUTPUT.

1. UNITED STATES.

(a) SOURCES AND METHOD OF COMPILATION.

Before the war official statistics of production were collected in the United States every five years (1909 and 1914); since the war they have been compiled every two years (1919, 1921, 1923, 1925), and the results are published in the *Statistical Abstract of the United States*¹. The products of the engineering industry are shown under several headings, each factory² being classified according to its principal product³.

The following are the relevant headings:

1. Agricultural implements.
2. Foundry and machine-shop products.
3. Cash registers and calculating machines.
4. Locomotives not made by railroad companies.
5. Pumps⁴.
6. Scales and balances.
7. Sewing-machines, cases and attachments.
8. Typewriters and supplies.
9. Washing machines and clothes-wringers.
10. Windmills.
11. Engines and water wheels^{5 6}.
12. Gas machines and gas and water meters⁶.
13. Machine tools⁷.
14. Textile machinery and parts⁷.

These headings contain a large number of products which cannot be classed as machinery; for example, No. 1 includes in addition to machinery and mechanical implements, such simple non-mechanical tools and implements as scythes, sickles, hoes, spades, etc., but these are not of very great

¹ Results for 1919 in *Statistical Abstract 1921*; for 1914, 1919, 1921 and 1923 in *Statistical Abstract 1924*. The results for 1925 are not yet published.

² The returns for 1909, 1914 and 1919 include all factories with an annual production of 500 dollars or more in value, the returns for 1921 and 1923 only those factories with an output value of 5,000 dollars or more. Applied to the whole production of the engineering industry, this change is of no great importance. (Compare *Statistical Abstract 1924*, page 723.)

³ Thus the products of the engineering industry sometimes include also other products than machinery, while on the other hand the products of various factories of which machinery is a subsidiary manufacture are not included. (Compare *Commerce Year-Book 1924*, page 276.)

⁴ Since 1914 two headings: "Pumps, hand" and "Pumps, power".

⁵ In *Commerce Year-book 1924*, page 277, the description is "Steam or internal combustion engines and water wheels, not including steam boilers made for sale as separate units".

⁶ Included in the 1909 census under the heading "Foundry and machine-shop products".

⁷ Included in the 1909 and 1914 Censuses under the heading "Foundry and machine-shop products".

importance in relation to total production. A serious defect in compilation, however, is the inclusion of foundry products under No. 2 (foundry and machine-shop products), because not only does this include the production of so-called commercial cast iron (for building purposes, household objects, etc.) but the production of machine-casting is frequently reckoned twice—once as a foundry product and then again in the value of the final product ¹. It is not possible to eliminate foundry products from this heading even by means of estimates. Certain iron and steel products not made in steel-works and rolling-mills (“iron and steel, processed and welded” and “steel barrels, drums and tanks, portable”) were only included under “foundry and machine-shop products” in 1909 and 1914. In other years these products are shown under a special heading, and are not taken into account in the following table ².

(b) STATISTICAL RESULTS.

Output Value of the Engineering Industry in the United States (in thousands of dollars).

	1909	1914	1919	1921	1923
Total	1,504,946	1,290,613	3,026,973	2,503,113	3,650,943
Classified as follows ³ :					
1. Agricultural machinery and implements.	146,329	164,087	304,961	163,817	151,286
2. Locomotives.	31,582	43,374	156,270	102,023	215,393
3. Engines	—	72,121	464,775	199,499	266,997
					(295,976)
4. Machine tools	—	—	212,400	67,729	137,206
				(69,254)	(140,911)
5. Textile machinery and parts	—	—	122,089	128,935	140,661
				(129,854)	(141,899)
6. Office appliances (typewriters, calculating machines, cash registers)	43,427	55,020	136,277	95,443	147,604
7. Sewing machines.	28,262	27,238	57,938	35,608	45,967
8. Pumps and pumping machines	—	27,457	66,456	69,255	92,815
9. Elevators	—	17,228	70,187	40,931	64,297
10. Metal-working machines other than machine tools	—	17,420	57,541	19,288	56,817
11. Wood-working machines	—	13,393	36,763	25,682	49,544
12. Mining and oil-drilling machines	—	23,823	79,594	57,705	99,748
13. Cranes	—	4,194	52,534	20,445	42,197
14. Machines for manufacture of cellulose and paper.	—	8,588	27,421	31,581	30,342

¹ See *Statistical Abstract*, page 723.

² The change is not of great importance in relation to the total production of the engineering industry.

³ The figures in brackets opposite Nos. 3 - 5 and all the figure opposite Nos. 8 - 14 include the output of factories which only manufacture the particular kinds of machinery as a subsidiary industry (*Commerce Year-Book*, 1924, page 277, and, with slight difference, *Statistical Abstract*, 1924, page 773).

(c) OTHER PRODUCTION FIGURES FOR CERTAIN KINDS OF MACHINERY.

Further figures are available regarding the production of railway locomotives and agricultural machinery which permit of a closer survey of the post-war development of these industries, for they cover every year since the war and, as they give the number of units produced, changes of price may be left out of account.

*Production of Railway Locomotives*¹ (number of units).

Yearly average or year	For railways in U.S.A. and Canada	For other railways	Total
1906-1910	4,354	516	4,860
1911-1915	3,064	556	3,619
1916-1920	2,629	1,959	4,588
1921-1925	1,759	333	2,095
1913	4,561	771	5,332
1918	3,668	2,807	6,475
1919	2,162	1,110	3,272
1920	2,022	1,650	3,672
1921	1,185	638	1,823
1922	1,303	231	1,534
1923	3,505	280	3,785
1924	1,810	226	2,036
1925	994	291	1,285

*Output of the Agricultural Machinery Industry in the United States*².

Year	Value of total output, in millions of dollars	Output of tractors	
		Value in millions of dollars	Number
1914	234.8	16.4 ⁶	—
1919	524.9	175.0 ⁶	315,000 ⁷
1920	536.9 ³	198.6 ⁶	203,207
1921	328.0	53.2	74,366
1922	209.6	53.2	—
1923	364.9	93.8	136,584
1924	323.4	83.2	120,643
1925	383.7 ^{4 5}	120.6	167,543

¹ See *Commerce Year-Book*, 1925, page 379 (statistics from the *Railway Age*) — including, for the years 1906 to 1911, Canada's production; and, for the years 1912 to 1923, the output of the railway workshops.

² *Commerce Year-Book*, 1924, pages 292 and 293, and 1925, page 387. In contrast, however, to the figures given above, these figures include also the output of agricultural tractors and vehicles and certain other agricultural appliances.

³ See Francis H. Sisson: "The Agricultural Machinery Industry in the United States" in the periodical *Agricultural Machinery*, sixth year, 1926, page 204 (No. 13 of March 27th, 1926).

⁴ See *Iron Age* of August 12th, 1926. The figure of 380.3 million dollars given in the *Commerce Year-Book*, 1925, page 387, is estimated from provisional figures.

⁵ Of the total sales, amounting to 397.8 million dollars (excluding retail sales), 83.7 per cent (332.3 million dollars) were on the home market, 16.3 per cent (64.9 million dollars) representing exports.

⁶ Calculated according to the following data supplied by F. H. Sisson, *op. cit.*: 1914 — 7 per cent of value of total output of agricultural machinery industry, 1919; — one-third of value of total output of agricultural machinery industry; 1920 — 37 per cent of value of total output of agricultural machinery industry.

⁷ See F. H. Sisson, *op. cit.*

*Production of Principal Agricultural Machines in the United States*¹ (number of units).

Category of Machinery	1914	1921	1923	1924	1925
Ploughs	1,070,193	427,904	687,425	550,469	535,162
Harrows	764,666	434,004	481,822	378,229	388,489
Corn planters	216,507	111,222	106,277	82,553	89,316
Cotton planters	191,256	7,889	20,825	24,536	30,199
Combination corn and cotton planters	—	35,011	43,744	56,749	62,600
Seeders	50,297	49,542	78,438	75,480	78,452
Cultivators	873,357	404,066	553,567	491,620	531,062
Grain binders	215,386	72,314	62,764	55,731	42,405
Corn binders	52,087	5,773	15,719	17,267	20,829
Threshers	13,548	15,923	13,957	10,929	14,876
Combined harvesters and thres- hers	270	5,027	4,012	5,828	5,124
Mowers	274,521	103,826	130,374	126,448	112,299
Hay-rakes	183,082	83,285	80,647	77,542	78,117
Corn-shellers	74,319	26,119	45,771	38,967	42,818
Cream separators	—	74,108	162,169	143,977	182,239
Feed-grinders and crushers . . .	—	18,049	99,425	93,207	98,051
Ensilage cutters	—	12,251	12,846	14,208	13,677
Tractors and traction engines . .	—	74,336	137,204	120,926	167,640

2. GREAT BRITAIN.

(a) SOURCES AND METHOD OF COMPILATION.

Official enquiries into production comprising the whole of the engineering industry were carried out in 1907 and 1925. Owing to the system of compilation and the time that has elapsed, the 1907 results are not suitable for reproduction here. The results for 1925 are not yet published and will probably not appear until the middle of 1927.

Turning to private sources, however, we find that the Engineering and Allied Employers' National Federation have instituted enquiries into the output of the British engineering industry. The results are published in the periodical *World Power*² for the years 1913, 1923 and 1924. According to these figures, the total production and export of the British engineering industry amounted to:

	1913	1923	1924
Total production:			
Quantity in thousands of tons	2,499	1,872	2,190
Value in millions of pounds sterling . .	87.0	193.0	211.7
Export:			
Quantity in thousands of tons	801	531	567
Value in millions of pounds sterling . .	39.0	54.7	54.8

¹ *Commerce Year-Book*: 1924, page 293, and 1925, page 387. The table includes, in addition to the output of factories counted as belonging to the agricultural implement industry, also such agricultural machinery as was manufactured by other factories as a subsidiary industry.

² *World Power*, 1925, pages 182 *et seq.*

If we compare these export figures with those of the British foreign trade statistics, it will be found that these returns include, in addition to steam-boilers and electrical machinery, other electrical goods and apparatus, but not locomotives, tractors and marine-engineering products. It may be assumed, however, that the export ratios (export expressed as percentage of total production), upon which the above figures are based, also apply to the engineering industry proper. The proportion exported was:

	1913	1923	1924
Calculated on values ¹	45%	28%	26%

With the help of these export ratios and the known figures for the export of machinery from Great Britain (machinery proper)², we may make the following estimates of the total output of British machinery:

(b) RESULTS.

	1913	1923	1924
Value in millions of pounds sterling.	78.4	125.1	159.4
= in millions of Reichsmarks	1,602	2,402	2,936

3. GERMANY.

(a) SOURCES AND METHOD OF COMPILATION.

There have been no official returns showing the output of the German engineering industry since the single enquiry held in 1897. The absence of statistical data concerning production caused the central association of the German engineering industry, the V.D.M.A., even before the war to institute its own enquiries among its members. Owing to the fact, however, that before the war only about one-fifth of the German engineering industry furnished regular figures, the basis of the inquiry was too narrow to allow any reliable conclusions to be drawn as to the total output of the whole engineering industry in Germany. Nevertheless, these enquiries, which extended to the quantity and value of orders received and consignments despatched (divided into home and foreign), made it possible to obtain an idea of the proportion of exports of the German engineering industry and then, with the help of the official foreign trade statistics, to arrive at a fairly accurate estimate of total output.

The enquiries by the V.D.M.A. were resumed in 1921 in a somewhat altered form and, by the inclusion of a larger number of engineering firms, which still further increased as time went on, were placed upon a sufficiently broad basis. During 1924 and 1925 some 700 firms, normally employing

¹ Another publication called "Report on the Present Condition and Future Prospects of the Engineering Industry" (compiled by the British Engineers' Association), London, March 1925, page 8, gives the export ratio for 1923 and 1924 as 26.5 per cent. It also mentions that, according to the enquiry into production of 1907, the proportion of foreign sales to the total output of the engineering industry amounted in value to 53.35 per cent. This shows that, in the course of 17 years, the export ratio of the British engineering industry diminished by 50 per cent.

² See Table 2 (a), under *Ad No. 9* of this Annex.

300,000 to 350,000 persons (= about half the total German engineering industry), furnished regular data every three months on the following points:

1. Orders received (weight and value, divided into home and foreign);
2. Consignments despatched (weight, divided into home and foreign);
3. Turnover (value, divided into home and foreign) ¹;
4. Number of employed (workmen and employees), together with number normally employed when the factories are working at full capacity.

The results of these enquiries by the V.D.M.A. serve, above all, to show the course of trade cycles in the German engineering industry. They also enable approximate information to be obtained regarding the output of the whole engineering industry (including engineering works not covered by the inquiry). This is not possible by direct means, as the proportion of the values and quantities quoted to the figures of orders, consignments and turnover for the *whole* engineering industry is difficult to estimate. It has therefore been necessary to resort to the following indirect method.

From the orders, consignments and turnover figures calculated per head of actual workers are first excluded the fluctuations in the degree of employment, which are shown by the ratio between the number of men actually employed and the number when the factory is working at full capacity ². If we multiply these figures by the degree of employment at the moment, we obtain the orders, consignments and turnover figures per man employed at full capacity; and, as it is possible, with the help of estimates, to ascertain the approximate number of men employed in the whole of the German engineering industry when the factories are working at full pressure (750,000) ³, it is also possible to determine fairly accurately the actual orders, consignments and turnover figures for the whole engineering industry. The consignment and turnover figures ought also approximately to agree with the figures for production (including work in hand) if account is taken of market conditions for a whole year, since on the whole manufacture for stock in one year balances that of the previous or following year, and since, too, manufacture for stock by the engineering industry has not been very large, at any rate in the last few years.

A means of checking the figures of production thus calculated is furnished by the official foreign trade statistics. The foreign sales, according to the V.D.M.A. figures, should approximately coincide with the official figures for the export of machinery, at any rate over considerable periods of time. Actually the V.D.M.A. figures are a few points per cent higher than the latter, which is explained by the fact that the returns made to the V.D.M.A. do not need to take account of foreign duties, while in the official export returns many consignments of engineering accessories or parts appear not as engineering but as iron products, etc., and still more by the fact that the firms which notify the V.D.M.A. of their export figures are more particularly the larger firms with a relatively heavy export business, so that the export ratio resulting from the returns would be too high if applied to the whole industry ⁴.

(b) RESULTS.

For 1913 the V.D.M.A. statistics established the share of foreign trade as 30.9 per cent of consignments (*in values*). For the whole engineering industry we may reckon with a somewhat smaller export ratio (about 26 to 27 per cent), so that, exports being 738.4 million marks ⁵, the total production of the German engineering industry for the year 1913 works out at about 2,800 million marks.

During the inflation years from 1920 to 1923 the fluctuations and collapse in the value of the mark made it impossible to obtain figures for total output, especially as the Statistical Department

¹ The turnover for a given period does not exactly coincide with the figures for consignment values, because the turnover only includes payments actually received but leaves out of account payments made at an earlier date or not due until later.

² It is, however, impossible to take account of short-time work, to which much resort has been had owing to slack business in the last few years.

³ *Exact* figures for 1925 may be expected from the results of the official industrial census of June 1925.

⁴ The reduction of the export ratio, however, would not affect the total volume of production, because the sales on the home markets would have to be correspondingly increased.

⁵ See Tables 2a and 2b under *Ad* No. 9 of this Annex.

of the Reich had to suspend the publication of foreign trade figures during this period. Not until 1924 and 1925 are figures for values again available which can be utilised.

The following are the output values for the years 1913, 1924, 1925 and the first half of 1926.

Year	Value of production (in millions of Reichsmarks)					
	For the home market		For foreign markets		Total	
1923	2,050	73%	750	27%	2,800	100%
1924	1,630	74%	570	26%	2,200	100%
1925	2,120	73%	780	27%	2,900	100%
First half of 1926	780	65%	420	35%	1,200	100%

4. FRANCE.

There are no official or private figures showing the output of the French engineering industry. Only as regards the pre-war period is it possible by means of official estimates¹ to ascertain approximately the value of the total engineering output.

France's Engineering Output for 1913¹ (in millions of francs).

Engines ²	75
Machine tools	15
Agricultural machinery	120
Machinery and apparatus for foodstuffs and kindred industries	44
Textile machinery	20
Miscellaneous machinery (printing presses, sewing machines, typewriters, etc.)	23
Locomotives ³	40
Total	337

Allowing for certain inaccuracies in these estimated figures, the *pre-war production* of the French engineering industry may be reckoned at 300 to 350 million francs.

As regards post-war production there are no data at all. Bearing in mind, however, that, through the acquisition of Alsace-Lorraine, France took over a large number of engineering factories in working order (particularly textile machinery works), and that the French engineering industry developed considerably during and after the war, we may estimate *present output* on the basis of 1925 prices at about double, that is to say, at 600 to 700 million gold francs⁴.

¹ See "Rapport général sur l'Industrie française", Paris, 1919, pages 304 *et seq.* and page 454.

² Excluding boilers, the output value of which was given as 25 million francs

³ Output of locomotives is given as 650 to 700. Their value may be estimated at about 40 million francs.

⁴ This estimate is confirmed by the following consideration: Exports of French machinery increased in gold value between 1913 and 1924-25 by 121 per cent. Owing to the fact, however, that a depreciated currency has favoured the export industry to some extent at the expense of sales on the home market, an increase of 100 per cent in the total output may be considered as corresponding to facts.

5. SWITZERLAND.

There are no official or private statistics or estimates to show the output of the Swiss engineering industry. Nor can the available data, giving the number of workmen employed in the machinery and apparatus industry, furnish a basis for such an estimate, because both the figures of the Swiss factory inspectors and those of the Union of Swiss machinery manufacturers include not only boilers, instruments and other branches of the industry but also all electrical goods, which, in Switzerland, are relatively important. Accordingly, we can only form rough estimates from the official figures for the export of machinery, on the assumption that the export ratio of the Swiss engineering industry is somewhere between 40 and 50 per cent of total production¹. The export of machinery proper from Switzerland amounted in 1913 to 62.25 million marks, and in 1925 to double that sum (125.25 million marks). According to our estimate, therefore, the total output should lie between the following limits:

1913	120 to 180 million marks
1925	250 to 320 " "

6. SWEDEN.

(a) SOURCES AND METHOD OF COMPILATION.

In Sweden the whole of the industrial output is ascertained by an annual official enquiry. The results are published by the Swedish *Kommerskollegium*². The output of the engineering industry is included in the group "Andra Maskiner och maskindelar"³ and divided into about thirty headings, so that output figures are available for all the principal kinds of machinery. In the following table, however, the heading "Boilers, heaters and condensers" is left out of account as not belonging to the machine-construction industry proper. No figures have yet been published for 1925.

(b) RESULTS.

Production of the Swedish Engineering Industry (in thousands of crowns).

	1913	1919	1920	1921	1922	1923	1924
Total output ⁴	108,362	306,582	326,471	206,929	112,804	127,723	163,879
Classified as follows:							
<i>Motors</i>	20,505	46,131	60,346	31,069	16,582	18,293	19,957
Steam engines	2,397	7,902	13,065	6,900	3,678	2,481	2,764
Combustion engines	15,537	29,654	39,626	17,422	8,341	11,453	13,006
Water turbines	2,505	8,477	7,535	6,671	4,518	4,307	4,148
<i>Machine tools</i>	10,991	51,703	49,993	19,213	9,409	14,381	14,286
Metal-working	3,978	31,951	25,189	8,987	3,864	4,578	6,050
Wood and cork working	4,129	14,344	19,433	8,035	4,297	7,531	5,706
Stone and mineral working	2,884	5,408	5,371	2,191	1,248	2,272	2,530
<i>Agricultural machinery</i>	15,268	41,553	34,268	20,424	7,983	11,576	16,609

¹ The export ratios given in the *Handbuch der Schweizerischen Wirtschaft 1926* — before the war about 65 per cent, 1925 about 55 per cent — are somewhat high, being evidently based only upon conditions applying to the large exporting firms; these figures also include electrical goods, which would largely explain the reduction of the export ratio.

² Sveriges officiella Statistik "Industri". Berättelse för år . . . av Kommerskollegium.

³ Machinery and parts of machinery other than electrical.

⁴ Excluding boilers, heaters and condensers.

(b) RESULTS.

*Production of the Swedish Engineering Industry (in thousands of crowns).
(Continued.)*

	1913	1919	1920	1921	1922	1923	1924
Dairy machinery	15,331	40,933	34,093	16,774	10,214	14,033	23,809
Textile machinery:	2,468	5,628	5,943	4,418	3,543	4,859	4,935
Sewing and knitting machines	2,283	4,638	5,209	3,925	2,858	4,094	4,149
Machinery for cellulose and paper industries	4,397	9,733	13,786	7,741	2,683	4,724	4,835
Machinery for foodstuffs and kindred industries ¹	883	3,788	4,406	3,546	2,625	1,399	1,640
Pumps, blowers, ventilators and compressors	2,244	5,345	7,344	3,832	2,386	2,793	3,217
Mechanical conveyors	4,824	14,235	15,558	10,873	4,477	5,733	6,836
Roller, ball and other axle bearings and power transmission plant:	—	37,037	50,480	26,655	4,868	6,143	12,884
Ball bearings ²	—	—	35,626	20,201	3,004	5,031	11,187
Locomotives and tenders.	3,321	10,461	7,024	38,898	31,919	24,189	29,706

7. CANADA.

(a) SOURCES AND METHOD OF COMPILATION.

Until the war official statistics of production in Canada were collected every five years (in 1911 for the industrial year 1910, and in 1916 for the industrial year 1915); since 1918 they have been collected yearly. Results are published in the *Canada Year-Book*³.

The statistics are compiled on the lines of the United States census. In Canada also, engineering products are shown under several headings, but the number of items, their designation and the combination of different branches is not the same in all years. Moreover in Canada, as in the United States, the output of ordinary agricultural implements and foundry products is included among the production figures. The total output of the engineering industry proper cannot therefore be exactly determined from the statistics.

¹ Machinery for breweries, distilleries, refineries, sugar-refineries, the yeast, margarine and mineral-water industries, and mills, bakeries, the chocolate industry, etc.

² Ball bearings are mainly employed in the vehicle industry and therefore do not strictly belong to engineering. Leaving these products strictly out of account the above figures work out as follows:

1920	290,846
1921	186,728
1922	109,800
1923	122,692
1924	152,692

For 1913 and 1919, however, no such distinction is possible.

³ We were unable to obtain the figures for 1923 and 1924.

(b) RESULTS.

Designation	Output value (in thousands of dollars)			
	1910	1915	1921	1922
Agricultural implements	20,723	13,373	36,763	18,240
Foundry and machine-shop products .	45,611	36,736	42,205	36,508
Boilers and engines ¹	11,874	8,546	6,960	4,905
Elevators	1,507	1,441	1,212	} 15,418
Industrial machinery	—	—	21,608	
Gas machines	731	414	—	—
Scales	506	856	1,092	—
Sewing machines	975	—	—	—
Pumps and windmills	1,613	1,224	580	—
Cream separators	640	—	1,605	—
Washing machines and wringers . . .	420	275	1,321	—
Office and household machines	—	—	—	7,010
Typewriters	—	—	469	454
Calculating machines	—	—	2,721	—
Total	84,600	62,865	116,536	82,535

From the above figures the output value of the engineering industry proper can be estimated as follows:

1910	70 to 80 million dollars (equals about 300 to 340 million marks)
1915	50 to 60 " " " " 210 to 250 " "
1921	90 to 110 " " " " 380 to 460 " "
1922	70 to 80 " " " " 300 to 340 " "
1925 ²	160 to 180 " " " " 670 to 750 " "

8. THE NETHERLANDS.

(a) SOURCES AND METHOD OF COMPILATION.

Figures for the output of Dutch industry for 1920 and the following years have only recently been officially published ³. The engineering output is shown under the heading "Machinery and boiler factories, workshops for conduit pipes, plate welding and railway rolling-stock". Electrical goods, the cycle industry, shipbuilding and repairing, iron and steel foundries, repair workshops and ironware manufactories are combined shown under special headings and therefore not included in the following figures. It is not possible, however, to eliminate the output of boilers, tanks and other receptacles (plate welding) and of coaches and wagons. These products may be estimated at about 10 per cent of the total output under this heading. The figures include only factories employing 25 or more workmen.

(b) RESULTS.

Output of the Dutch Engineering Industry ⁴ (in thousands of Dutch florins).

	1920	1921	1922	1923	1924
1. Including boilers, receptacles, coaches and wagons . . .	112,641	121,247	73,179	57,218	67,754
2. Excluding ditto (estimated) .	101,400	109,100	65,900	51,500	61,000

¹ Designation for 1921 was "Boilers, tanks and engines".

² Estimated on basis of export figures (increase from 9.1 million dollars in 1921 to 18.3 million dollars in 1925).

³ In *Maandschrift van het Centraal Bureau voor de Statistiek*, 21st year, Volume 5, May 31st, 1926, page 586 and pages 702 *et seq.*

⁴ Value of products, repairs and auxiliary work.

There are no data showing the output of the Dutch engineering industry before the war. Taking into account the increased output capacity of this branch of industry by reason of the war and the pre-war level of prices, which was about one-third lower than at present, and on the other hand the slump in 1924, the output value of the Dutch engineering industry for 1913 may be estimated at about 50 million Dutch florins (equals about 85 million marks).

9. BELGIUM.

According to a monograph on the engineering industry published in 1914 by the Belgian Ministry for Industry and Labour, the value of the output of machinery and parts of machinery, excluding locomotives, boilers and electrical machinery, amounted in 1907 to 121 million marks¹. If, in order to obtain an estimate for the last years before the war, it is assumed that the total output of machinery has increased in about the same proportion as exports, the figure for 1912-1913 works out at about 155 to 180 million francs, to which must be added a further 25 million francs for locomotives², so that *the total output of machinery* had a value of about 180 to 200 million francs. It is estimated that this sum was made up as follows:

Locomotives	25	million francs.
Steam engines	15 to 17	" "
Combustion engines	9 to 10	" "
Machine tools (metal-working machinery)	5	" "
Wood-working machinery	3	" "
Textile machinery	5	" "
Cranes and hoisting gear	5 to 6	" "
Conveyors	2	" "
Cream separators	8 to 10	" "
Other machinery for agriculture and for the utilisation of agricultural products	20 to 25	" "

During the post-war years 1924-1925 the output of machinery cannot have far exceeded 200 million gold francs.

10. CZECHOSLOVAKIA.

There are no official or private statistics or estimates regarding the output of the Czechoslovak engineering industry.

We may form an approximate estimate if we consider the machinery export figures for Czechoslovakia, bearing in mind that the Czechoslovak engineering industry works to a large extent for export. If we estimate exports at about 30 per cent of total output, the output figure for the last two years (1924-1925) works out at: 1,170 to 1,430 million Czechoslovak crowns (equals 150 to 180 million Reichsmarks).

11a. AUSTRIA-HUNGARY.

There are no output statistics at all for the engineering industry of former Austria-Hungary. If in this case too we take an export ratio of 30 per cent, the output figure for 1912³ works out at about 540 million crowns (equals about 460 million marks).

¹ Compare "Die Hauptindustrien Belgiens", Part 2, "Metal-working Industries", published, on behalf of the Department for Trade and Commerce attached to the Governor-General in Belgium, by the Belgian Raw Material Dept., Munich, 1919, page 22.

² "Die Hauptindustrien Belgiens", Part 2, page 10.

³ The year 1913 is not suitable for this calculation owing to the events in the Balkans.

11b. AUSTRIA.

In regard to present-day Austria also, it is only possible to obtain an approximate idea of output by means of rough estimates. The number of workmen employed in the engineering industry in 1925 is known, and this number represented about one twenty-seventh of the workmen employed in the German engineering industry, so that, allowing for a somewhat smaller output per head than in Germany, the output value for 1925 may be reckoned at 100 million marks. The figure will be only slightly larger if output is reckoned from the export figures for 1925 (105 to 120 million Reichsmarks) on the basis of an export ratio of 35 to 40 per cent. The output of machinery in Austria in 1925 must therefore have amounted to about 100 to 120 million Reichsmarks.

12. ITALY.

There are no official or private statistics or estimates regarding the output of the Italian engineering industry. The available figures showing the degree of employment in 1911 afford no reliable indications, as they include the motor industry among others.

If we take the export figures of the Italian engineering industry and bear in mind that the export trade forms a comparatively small part of the total production of this industry¹ — the export ratio may be estimated at about 10 per cent — the output value of the Italian engineering industry may be estimated as follows:

1913 : 150 to 200 million marks.
1924-25 : 240 to 280 million marks.

13. DENMARK.

(a) SOURCES AND METHOD OF COMPILATION.

In Denmark an enquiry into industrial output was held in 1914 in connection with the general industrial census, and it was based upon the conditions of production in 1913 or the industrial year nearest to 1913².

Within the category "Iron foundries, engineering works and cycle factories" enquiries were made from 274 establishments (employing 14,072 workmen), of which 231 manufactured machinery³. During the year dealt with in the report, these 231 establishments manufactured machinery, apparatus, iron constructions, etc., to a total value of 32.4 million crowns. This figure does *not* include the production of castings by factories connected with iron foundries. On the other hand, it does include a few other manufactures which cannot be counted as products of engineering proper, but which, thanks to the minute subdivision of the statistics according to the nature of the goods, can be almost entirely eliminated. After deducting electrical machinery and plant, agricultural tools, iron constructions, vehicles, etc., we obtain an output value of 28.3 million crowns for the engineering industry proper. For the post-war years from 1919 to 1923, we have only the figures of production in the Danish *Statistical Year-book*⁴, in which the group "Jernstøberier, Maskinfabrikker m. v." (iron foundries, machinery factories, etc.) is only subdivided into castings, parts of machinery, machines, etc. and repairs. The output value for the three last items (without castings) amounted in thousands of crowns to:

1919	1920	1921	1922	1923
87,917	124,719	73,668	52,192	68,876

¹ High duties on machinery in Italy and heavy costs of production are obstacles to competition in foreign markets.

² The results of the enquiry are reproduced in the publications of the V.D.M.A., 1918, No. 5.

³ Workshops for repairs by hand were for the most part excluded.

⁴ *Statistisk Aarbog*: 1922, page 69; 1923, page 69; 1925, page 69. No figures for 1924-25 have yet been published.

If, however, we deduct from these figures the percentage representing the output which cannot be considered machinery proper for the year 1913 (13%), we obtain approximately accurate figures for the output value of the engineering industry proper. On the basis of the expansion of the Danish machinery export figures we can then arrive at an estimate for 1924.

(b) RESULTS.

In accordance with what was said under (a), we obtain the following figures or estimates for the output of the Danish engineering industry.

1913	1919	1920	1921	1922	1923	1924
Millions of crowns						
28.3	76.5	108.5	64.1	45.4	59.9	75.4
In millions of gold marks						
31.8	72.8	71.7	47.9	39.9	46.2	53.1

The production of machinery in 1913 was made up as follows:

	(Thousands of kronen)	
<i>Engines</i> (including boilers)		8,915
Steam engines and boilers	1,612	
Petrol engines	2,943	
Diesel engines	2,362	
Wind motors	1,044	
<i>Agricultural machinery</i> (excluding dairy machinery)		4,748
Threshers and threshing appliances	1,960	
Seed drills	418	
Corn cleaners	358	
Chaff cutters	337	
<i>Machines and accessories for dairy farms</i>		1,704
<i>Cement and tile-making machinery</i>		2,295
<i>Machinery and accessories for foodstuffs and kindred industries</i> ¹		1,805
<i>Machine tools</i>		1,189
Metal-working machinery	787	
Wood-working machinery	402	

14. HUNGARY.

As regards the Hungarian engineering industry, we have the results of enquiries into production covering the years 1913, 1922, and 1923²:

	1913 (present frontiers)	1922	1923
Number of establishments	138	180	179
Number of workers	44,595	40,859	41,848
Value of material consumed (thousands of gold crowns).	—	56,279	61,133
Value of wages paid (thousands of gold crowns).	91,610 (?)	21,144	24,258
Value of goods produced (thousands of gold crowns).	126,280	103,937	87,256

¹ For breweries, distilleries, etc., for bakeries, mills, slaughter-houses, sausage factories and margarine factories.

² See *Die weltwirtschaftliche Lage Ende* (publication of the Institut für Konjunktur of the Statistical Department of the Reich), 1925, page 130.

Owing to the organisation of Hungarian industry, the above figures also include electro-technical goods, which must amount to at least 10 per cent of the output value of this whole branch of industry. Moreover, according to data regarding the degree of employment in the Hungarian iron and machinery industry, economic conditions were very much less favourable in 1924 and 1925 than in the preceding years, so that the value of engineering products proper for 1924-25 may be estimated at about 65-70 million gold crowns (= about 55-60 million marks), which represents an export ratio of 20-24 per cent.

15. JAPAN.

We are not in possession of any official publications with regard to the several enquiries into production which have been held since the war, and in which, as far as we know, the engineering industry was included. A recent work¹ gives production figures for most other branches of industry but not for engineering. According to "*The Japan Year-Book*"², a private publication, whose figures, however, are not always reliable, the production of all works employing at least thirty hands amounted in the years 1920 and 1923 to the following:

	Production (in millions of yen)	
	1920	1923
Engines, pumps, hoisting gear, etc.	49.8	54.1
Machine tools and other industrial machinery . . .	23.9	14.2
Total	73.7	68.3

These figures leave out of account, among other things, agricultural machinery and locomotives. The same publication gives the output of certain leading works producing engines as follows (in millions of yen):

	1914 ³	1919 ³	1920 ³	1920 ⁴	1921 ⁴	1922 ⁴
Steam engines.	—	14.0	5.7	15.0	29.5	15.3
Boilers and steam turbines	5.0	24.0	13.0	4.8	2.1	1.5
Pumps, etc.	1.0	6.6	6.5	6.9	13.1	6.1
Combustion engines	1.0	8.6	8.0	—	—	—
Water wheels	0.1	2.4	4.5			

On the basis of the employment figures given in the above-mentioned official source⁵, we can make a rough estimate of the output of the Japanese engineering industry for 1923. We must, however, leave out of account the figures for locomotive construction, because these are shown in conjunction with those for coach- and wagon-building. On the other hand, the heading "Machinery for the munition industry" appears to include products which do not belong to engineering proper, so that the total of 54,117 persons employed may be assumed to be approximately correct for the engineering industry proper. Comparing this figure with the employment figures in the German engineering industry and taking into account the fact that the output per worker in Japan is much smaller than in Germany, we arrive at an estimated figure for 1923 of 180-250 million marks.

¹ "The Statistics of Agriculture Industries and Commerce, 1923" (Section of Statistics, Department of Agriculture and Commerce, Tokyo, March 1925.

² 1924-25, page 240, and 1926, page 505.

³ *The Japan Year-Book*, 1924-25, page 240.

⁴ *The Japan Year-Book*, 1926, page 505.

⁵ Cf. Ad No. 4A of this Annex.

For 1914 Japan's output of machinery is estimated by a German source¹ at 40 million yen, but this includes the production of boilers (5.5 million yen) and of electrical machines and apparatus. The output of machinery proper, therefore, would amount to about 20-25 million yen (= 42-52 million marks), of which about 8 million yen would be accounted for by steam engines and about 10 million yen by textile machinery.

16. POLAND.

There are no statistics or estimates to show the output of the Polish engineering industry. Moreover, the available data concerning output or the number of hands employed in the metallurgical industries and agricultural machinery and implements industries of the different provinces² are not sufficiently complete to indicate the output value of the Polish engineering industry proper.

If we take as our basis the machinery export figures ascertainable for 1925³ and reckon with an export ratio of 15-20 per cent, the Polish output of machinery for that year works out at about 50-60 million marks.

17. NORWAY.

We are not in possession of any official or private figures or estimates for the output of the Norwegian engineering industry. Nor can the number of "insured workmen"⁴ given for the industry of "Maskiner, apparater, etc." furnish us with material for an estimate, since these figures cover the whole of the mechanical industry including shipbuilding.

According to the Norwegian machinery export figures, however, Norway's output of machinery is substantially smaller than that of Denmark, for example, so that the output value of the engineering industry proper probably lay within the limits of the following figures:

1913	1925
Million marks	
10-14	15-20

18. FINLAND.

In Finland, industrial output is annually ascertained by an official enquiry, but the engineering industry is combined with foundries, shipbuilding and repairing and other "machine shops" into a group called "Mechanical industry", and from the available publications it is impossible to give separate figures for the output of the engineering industry proper.

Finland's output of machinery cannot as yet be said to have reached any considerable size. To judge by the export figures, the output value before the war was about 6-8 million marks, and for the years 1924-1925 amounted to about 10-15 million marks.

19. AUSTRALIA.

In Australia, official enquiries into production are held annually for the whole industry. The results, which are published in the *Official Year-Book of the Commonwealth of Australia*, refer before the war to calendar years, since the war to financial years (July 1st to June 30th)⁵.

¹ From the periodical *Deutscher Dienst* of November 1st, 1916 (taken from the "Mitteilungen des V.D.M.A., 1917, page 38).

² Cf. "Enquête sur la Production"; published by the International Labour Office, Volume II, 1923, pages 939 and 940.

³ Cf. Table 2b under Ad No. 9 of this Annex. These export figures, however, doubtless include a fairly large amount of machinery exported abroad by factories which have closed down (especially textile factories).

⁴ Cf. Ad No. 4A of this Annex.

⁵ Results for 1908-1913 are taken from the *Official Year-Book*, No. 8 of 1914; those for 1919-1920 to 1923-1924 from the *Official Year-Book*, No. 18 of 1925.

The output figures for the engineering industry come under two headings, namely:

1. Agricultural implements.
2. Engineering works, ironworks and foundries, whose value of production (in thousands of pounds sterling) was as follows:

Year or financial year	Agricultural implements	Engineering works, ironworks and foundries
1908	879.4 *	4,568.7
1909	1,227.3	4,822.2
1910	1,560.9	5,636.0
1911	1,656.4	6,614.5
1912	1,538.4	7,930.1
1913	1,536.4	8,315.3
1919-20	1,282.9 **	20,209.3
1920-21	2,288.7	24,361.1
1921-22	2,863.9	21,468.6
1922-23	2,685.3	18,260.9
1923-24	3,132.2	24,151.4

* Exclusive of Tasmania.

** Exclusive of three enterprises in Western Australia.

The headings mentioned, however, include many branches of production which do not belong to machine construction proper, such as the manufacture of agricultural implements, ironworks, foundries, factories for the manufacture of nails, springs, etc. ¹

As other data regarding the output of the engineering industry proper are also lacking it is difficult to make an estimate on the basis of the figures given above. The output of non-agricultural machinery should not, however, be very much in excess of that of agricultural machinery, so that we may suppose the value of the entire mechanical engineering output to have been somewhere between the following figures:

1913 £ 3-4 million (= approx. 60-80 million marks)
 1923-24 £ 6-8 » (= " 120-160 " ")

20. NEW ZEALAND.

Before and during the war, the Government of New Zealand collected production statistics for all industries every five years (1911 and 1916); since 1919 the enquiries have been held annually. The results, which are published in the *New Zealand Official Year-Book*, apply to financial years (ending on March 31st).

Engineering products are first included under the two headings "Engineering works" and "Agricultural and dairying machinery and implement-making", which include, besides machinery proper, simple tools, electro-technical products, the output of repair workshops, etc. ² Another part of the book ³, however, gives other special figures for the "Machines, tools and implements" industry, and this heading includes also the agricultural machinery industry. The value of production under these three headings was (in thousands of pounds sterling):

	1910-11	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24
1. Engineering works	751.5	1123.3	1250.6	1837.7	1454.4	1459.9	
2. Agricultural and dairying machinery and implement- making	220.0 ¹	380.0	519.0	800.7	591.2	484.0	598.0 ⁴
3. Machines, tools and implements	—	462.9	609.1	938.3	705.0	602.3	—

¹ The headings do not include, among other things, railway workshops, cyanide, smelting, pyrites and metallurgical works, factories for the manufacture of tinplate, stoves and ovens, and wire (cf. *Official Year-Book*, No. 18 of 1925, page 846).

² See *New Zealand Official Year-Book*, 1925, pages 506 *et seq.* Iron foundries, motor-vehicle construction and ship-building do not belong to this group.

³ See *New Zealand Official Year-Book*, 1925, pages 486 *et seq.*

⁴ See *The Manchester Guardian Commercial* of April 29th, 1926, Special Section, p. VI.

The figures shown under number 3 are probably approximately correct for the total production of "machines", since, except for agricultural and dairying machinery and implement-making, New Zealand only manufactures a few kinds of machines. If we deduct about 10 per cent from these figures to represent manufactures not belonging to the engineering industry proper (tools, electrical machinery, etc.), and if we supply the missing figures for 1910-1911 and 1923-1924 on the basis of the figures of the two other headings, we obtain as the value of the engineering output proper in New Zealand:

1910-1911	£ 230,000 to £ 270,000
1923-1924	£ 665,000 to £ 675,000

21. RUSSIA.

The following table combines the pre-war and post-war figures for the output of the Russian engineering industry, as contained in various publications. These figures, it must be admitted, are not very accurate, in the first place because, as can be seen from the table, even official figures show considerable variations, and secondly because it is not always clear from the figures what products are included in the term "Machinery". At any rate it does not include the manufacture of locomotives (nor of railway rolling-stock and other vehicles, and electro-technical products), for which quantitative figures are given below. As regards the manufacture of agricultural machinery and implements, however, scythes, sickles and other non-mechanical implements are included, and although the value of these goods does not counterbalance the item "Locomotive construction", which is not included in the table, the figures given for the total engineering output are nevertheless probably too high rather than too low.

Russia's Output of Machinery.

Period	Agricultural machinery and implements (in millions of pre-war roubles)	General engineering (in millions of pre-war roubles)	Total (in millions of pre-war roubles)
1907	24.0 ¹		
1908	29.6 ¹		
1909	35.0 ¹		
1910	41.0 ¹		
1911	61.5 ¹		
1913	65-70 ²	173.0 ³	238.0-243.0
1918	6.4 ⁴		
1919	4.2 ⁴		
1920	1.7 ⁵ -2.8 ⁴		
1921	9.2 ⁴		
1922	5.7 ⁴ -6.9 ⁵		

¹ Reports on Industry, Trade and Agriculture, 1913, No. 137 (Report by the German Consul at Saratow).

² Calculated from figures in *The Economist* of June 19th, 1926, page 1188, according to which the output anticipated according to programme for the economic year 1925-26, valued at 80.3 million roubles, amounts to 122.5 per cent of the pre-war output.

³ *Aus der Volkswirtschaft der U.d.S.S.R.*, 4th year, No. 1, January 1st, 1925, page 20.

⁴ " " " " " " 5th year, Nos. 1/2, January 1926, page 57.

⁵ Calculated from figures for the total supply of agricultural machinery (same source as for note ³ on following page), taken in conjunction with import statistics.

Russia's Output of Machinery.
(Continued.)

Period	Agricultural machinery and implements (in millions of pre-war roubles)	General engineering (in millions of pre-war roubles)	Total (in millions of pre-war roubles)
Economic Year ⁹ 1922-23	9.1 ¹	43.8 ¹	52.9
1923	11.8 ²		
Economic Year ⁹ 1923-24	13.4 ¹	62.9 ¹	76.3
1924	17.8 ²		
Economic Year ⁹ 1924-25	44.3 ³ -45.4 ⁴ -52.1 ⁵	149.1 ⁵	193.4-201.2
1925	40.0 ⁶		
Economic Year ⁹ 1925-26	73.0 ⁸ -80 ³ 7-76.7 ⁷		

Taking into consideration what was said above, we may estimate the total Russian output of machinery proper, according to these figures, at:

1913	450-500 million marks
1923-4	150-160 " "
1924-5	380-430 " "

Below are given in detail the results of the Russian census of 1924-25 as far as they concern the engineering industry ¹⁰.

The following table furnishes information regarding the form of ownership of factories engaged in engineering work, but all the transport industries (locomotives, coaches and wagons, automobiles, etc.), shipbuilding and electro-technical production are also included under engineering. Nevertheless, the high proportion of State undertakings (comprising 77.6 per cent of factories, 97.4 per cent of workmen and 96.4 per cent of the value of production) no doubt applies also to machine construction proper.

¹ *Aus der Volkswirtschaft der U.d.S.S.R.*, 4th year, No. 1, January 1925, pages 80 *et seq.*
² " " " " " " 5th year, Nos. 1/2, January 1926, page 57.
³ *Die Volkswirtschaft der U.d.S.S.R.*, 5th year, No. 1/2, page 10.
⁴ Calculated from figures in *The Economist* of June 19th, 1926, page 1188.
⁵ Results of the industrial census of 1924-1925 in chervonetz. See *Die Volkswirtschaft der U.d.S.S.R.*, 5th year, 1926, No. 7, page 72.
⁶ Provisional figures (source as for ²).
⁷ Programme of production for the economic year 1925-1926 (*The Economist* of June 19th, 1926, page 1188).
⁸ Programme of production for the economic year 1925-1926 (source as for ³). The same source states that in the first half of this economic year the programme could only be carried out to the extent of 70 per cent.
⁹ The economic year extends from October 1st to September 30th.
¹⁰ See *Die Volkswirtschaft der U. d. S.S.R.*, 5th year, 1926, No. 7, page 72. Provisional results from the industrial statistics furnished by the Central Statistical Office. The census of industry includes all works employing more than sixteen hands if they have machine plant, or over thirty hands if they have not.

Number of Factories and Workmen and Value of Output of the Russian Mechanical Engineering Industry¹, classified according to the Form of Ownership of Workshops in the Economic Year 1924-25².

	State-owned	Co-operative	Private	Concessions	Total
Largest number of <i>workshops</i> in operation	402	57	58	1	518
Average number of <i>hands</i> employed (including boys)	174,521	2,908	1,674	164	179,267
<i>Gross output</i> according to revised calculation (in thousands of chervonetz)	347,502.7	5,977.7	6,183.3	656.5	360,320

Within this group, "machine-construction", the census figures for the agricultural machinery industry and the industry producing "Machinery for purposes of production" are still shown separately under Nos. 29 and 30. (Locomotive construction cannot be eliminated from No. 27, "Railway construction and other means of transport"):

Number of Factories, Workers and Working Days and Value of Production of the Russian Mechanical Engineering Industry in the Economic Year 1924-1925.

	Agricultural machinery	Machinery for purposes of production	Total
Largest number of <i>workshops</i> in operation (according to figures at end of quarter)	109	231	340
Average number of <i>hands</i> employed (including boys)	25,090	73,751	98,841
Total number of <i>working days</i> (in thousands)	6,351.3	19,443.7	25,795
<i>Gross output</i> according to revised calculation (in thousands of chervonetz)	52,143.6	149,081.0	201,224.6

As regards locomotives (including narrow-gauge locomotives) and certain agricultural machines, we are in possession of the following further output figures³:

¹ See the footnotes on the preceding page.

² *Ekonomitscheskoje Obosrenije* (Russian), Moscow, 1926, No. 4, pages 210-211, gives the following figures for the group "Manufacture of machinery, instruments and apparatus" for the year 1924-25 and the previous years:

Economic year	Number of undertakings	Number of workers	Gross output (in millions of chervonetz)
1922-23	485	126,300	153.7
1923-24	508	136,000	193.3
1924-25	515	179,100	356.3

(Taken from: Wl. WOYTINSKY: "The World in Figures", Book 4, page 21.)

³ For figures up to 1923-24 see *Die Volkswirtschaft der U. d. S.S.R. in Zahlen*, published by the Central Statistical Office, Moscow, 1925 (Russian) (taken from Wl. WOYTINSKY: "The World in Figures", page 221). The figures for 1924-25 are taken from *Die Volkswirtschaft der U. d. S.S.R.*, fifth year, 1926, No. 14, page 37. According to this source, a total of 609 locomotives was built in 1913, but in 1923-24 the number was 179 (not 151, as given by the former source).

Production of Certain Kinds of Machinery (number of machines).

Year or economic year	Loco-motives	Ploughs	Harrows	Seed drills	Harvesters	Threshers	Winnowers
1918	200	—	—	—	—	—	—
1919	74	22,902	892	—	1,117	158	853
1920	90	88,838	1,336	1,068	2,319	1,731	3,638
1921	78	106,562	6,218	509	5,432	1,725	2,047
1921-22	115	116,500	13,900	4,400	10,000	6,900	2,800
1922-23	93	206,500	26,800	10,700	11,700	25,350	11,600
1923-24	151 (179)	122,172	78,936	9,576	14,012	10,770	9,098
1924-25	186	542,599	174,935	28,928	45,703	32,915	45,377

Ad No. 4.

NUMBER OF MEN EMPLOYED; NUMBER OF MEN UNEMPLOYED.

A. Number of Men employed.

1. UNITED STATES.

The census held in the United States every two years since the war¹ records, in addition to the output of the different branches of industry, the total number of persons in industry and the number of wage-earners. In the publication at our disposal, however (Statistical Abstract of the United States) only the number of wage-earners is given. According to another American publication² the proportion of wage-earners to the total number of persons in the engineering industry is approximately 81 to 84 per cent³.

If, in order to include as far as possible only the mechanical engineering industry proper, we consider the same census items as in calculating the value of output⁴, we obtain the following figures:

Number of Wage-earners in the American Engineering Industry.

	1909	1914	1919	1921	1923
<i>Total</i>	642,677	518,050	812,825	517,656	703,741
Classified by branches of production:					
Foundries and machine-shops	531,011	362,471	482,767	321,363	449,040
Agricultural machinery and implements	50,551	48,459	54,368	30,359	30,962
Locomotives	14,909	17,391	26,715	16,583	30,672
Motors	—	29,657	77,617	35,567	48,495
Machine-tools	—	—	53,111	21,307	33,373
Textile machinery and parts thereof	—	—	31,823	31,025	35,672
Office appliances	17,043	20,047	32,213	23,167	29,934
Sewing appliances	19,296	18,007	19,230	12,569	13,435
Pumps	2,136	8,322	16,072	12,186	14,550

The *female* wage-earners only amount to a very small proportion of the total number employed, e.g.⁵.

¹ Cf. Ad No. 3 of this Annex.

² "A Graphic Analysis of the Census of Manufactures, 1849-1919", published by the National Industrial Conference Board, New York.

³ The exact percentages for 1919 (we have no particulars for other years) were: for agricultural implements 80.9 per cent; for foundries and machine-shops 83.9 per cent ("A Graphic Analysis", page 29).

⁴ The 14 headings considered and other remarks regarding the methods employed will be found in the observations in Ad No. 3 of this Annex.

⁵ See "A Graphic Analysis", page 41.

Branch	1911	1919
Agricultural implements	1 %	1.8%
Foundries and machine-shops	1.2%	3.2%

If we compare the total value of output and the total number of workers in the American engineering industry we obtain the following figures for the output per head:

1909	1914	1919	1921	1923
\$	\$	\$	\$	\$
2,342	2,491	4,831	4,836	5,188

2. GREAT BRITAIN.

(a) Sources and Method of Compilation.

As regards the number of employed in the British engineering industry we have ¹:

- (1) The results of the industrial census of June 1921;
- (2) The estimates of the number of persons insured against unemployment in July 1923, 1924 and 1925.

The occupation figures of the census of 1921 referred to England, Wales and Scotland, and the estimates of the number of persons insured to Northern Ireland as well. The census included all employed persons aged 10 years or over, and the estimates only included manual workers and non-manual workers earning not more than £250 (Unemployment Insurance Act of 1920). The classification of insured persons according to branches of industry ² has roughly been brought into line since 1923 with the classification adopted in the industrial census of 1921. The group "General engineering" does not include electrical engineering, vehicle construction, iron construction and shipbuilding, but the figures for insured persons also include the hands employed in the foundries (General Engineering and Founding), who, in the census of 1921, were included in two special items in another branch of industry ("General iron foundries" and "Steel foundries"). Marine engineering, on the other hand, is included under shipbuilding and repairing in the census of 1921, but has a special heading in the insurance figures.

(b) Results.

1. Number of persons employed in the British engineering industry ³, June 1921 ⁴:

Branch of industry	Number of persons employed
Stationary engines and power transmission plant	26,114
Steam locomotives, road and rail, and railway plant	97,242
Agricultural engineering	37,810
Textile machinery and accessories	79,743
Heating and ventilating engineering	11,330
Machine tools	21,063
Other.	347,821
Total	624,123

¹ Cf. Committee on Industry and Trade: "Survey of Industrial Relations", London 1926, pages 220 *et seq.* and 403 *et seq.*

² Each legally insured person receives an "unemployment book" which states to what branch of industry his employer for the time being or last employer belongs.

³ "Engineering (not marine or electrical)".

⁴ "Survey of Industrial Relations", page 406.

The above figures include a number of branches of industry which do not belong to the engineering industry proper, e.g. workshops for railway plant, and heating and ventilating engineering. On the other hand, they do not include marine engineering or the item "Scales and weighing machines", which employed 8,996 persons. Taken all round, however, the number of employed in the engineering industry proper in 1921 cannot be very far from the total given above (621,123) ¹.

2. Estimated number of persons insured against unemployment in the engineering industry of Great Britain and Northern Ireland ²:

Period	General engineering and founding			Marine engineering		
	Males	Females	Total	Males	Females	Total
July 1923	635,260	39,660	674,920	65,760	1,110	66,870
July 1924	588,500	38,880	627,380	64,860	1,250	66,110
July 1925	583,590	43,690	627,280	60,760	1,050	61,720

These figures include insured persons who became unemployed during the months in question. To obtain the number of persons actually employed it is therefore necessary to deduct the number of unemployed ³.

3. GERMANY.

(a) Sources and Methods of Compilation.

With regard to the number of employed in the German engineering industry we have the following sources:

- (1) Results of the industrial census, June 12th, 1907 ⁴;
- (2) Figures of the German factory inspectors ⁵;
- (3) Estimates of the "Verein Deutscher Maschinenbau-Anstalten (V.D.M.A.)";
- (4) Figures regarding the composition of the personnel of the firms belonging to the V.D.M.A.

These different statistics cannot be compared with one another, as they present considerable differences in the methods of compilation and particularly in the definition given to the mechanical engineering industry. While the industrial census of 1907 included all the employees of all engineering works, the factory inspectors only counted the *wage-earners* in the enterprises under their supervision (enterprises with ten or more wage-earners or with mechanical power), and the engineering industry is grouped together with ironworks, ship-building, vehicle-building, motor vehicles and bicycle construction, electrical engineering, precision-machine work, manufacture of musical instruments, etc. in a single figure. The estimates of the V.D.M.A. refer to all the employees of the engineering industry proper, but can only be regarded as an approximation ⁶. Lastly, the member firms of the V.D.M.A.

¹ In addition, "General iron foundries" employed 80,216 persons, and "Steel foundries" 7,799 persons.

² "Survey of Industrial Relations", page 226. For July 1925, from *The Ministry of Labour Gazette* 1926, No. 1, pages 22-23.

³ Published monthly in the *Ministry of Labour Gazette*.

⁴ See *Statistik des Deutschen Reiches*, Vol. 220-221, pages 5*-7*.

⁵ See the *Jahresberichten der Gewerbe-Aufsichtsbeamten und Bergbehörden* (cf. also *Wirtschaft und Statistik*, 1926, page 171).

⁶ They were based on particulars supplied by about 700 firms belonging to the V.D.M.A. with regard to their degree of employment (percentage ratio of persons actually employed to the number

provide figures regarding the composition of their personnel with the help of which it is possible to calculate with considerable accuracy the number of *workmen* in the German engineering industry as a whole, since the conditions obtaining among the member firms, which embrace about three-quarters of the workmen employed in the entire engineering industry may be regarded as typical.

(b) *Results.*

1. Persons employed in the German Machinery and Apparatus Construction Industry according to the industrial census of June 12th, 1907¹.

Branch of Industry	Number of persons employed
Steam engines (including locomotives)	69,513
Internal-combustion and internal-explosion engines	4,493
Agricultural machinery and implements	41,514
Textile machinery	31,072
Sewing machines (and parts)	20,038
Printing machines	7,318
Brewing and distilling machines	7,224
Machines and apparatus for gas- and water-works	9,254
Machines and apparatus for laundries	1,590
Lifts and elevators.	3,180
Pumps, cranes, ventilators and hydraulic plant.	7,997
Fire extinguishers and fire-engines.	1,693
Mill construction.	5,405
Other machines and apparatus	266,161
Total	476,457

2. Number of workmen employed in Germany in the construction of machinery, apparatus, instruments, etc. according to the statistics of the factory inspectors.

Year	Number of workmen	Increase (1913 = 100)
1907	886,361	76
1913	1,173,481	100
1919	1,313,484	102
1920	1,419,677	121
1921	1,462,282	125
1922	1,654,346	141
1923	^a	—
1924	1,411,150	120

employed at full capacity and on an estimate of the number employed by the whole engineering industry when working at full pressure.

¹ Of the branches of manufacture included in group B 40 under No. VIa. 1-18 ("Machinery and apparatus") the following have been omitted as not belonging to the engineering industry proper:

- VIa. 7. Iron constructions;
- VIa. 8. Central heating appliances;
- VIa. 9. Automatic machines;
- VIa. 11. Boilers and boiler plates.

On the other hand, No. B 41 (mill construction) has been added.

² Owing to the occupation of the Ruhr, the figures for 1923 are incomplete.

3. Number of persons employed in the engineering industry proper according to the estimates of the V.D.M.A.

Period		Number of persons employed
1913		500,000-600,000
1922		700,000-750,000
First quarter	1924	556,000
Second quarter	1924	540,000
Third "	1924	535,000
Fourth "	1924	541,000
First quarter	1925	563,000
Second "	1925	578,000
Third "	1925	565,000
Fourth "	1925	510,000
First quarter	1926	455,000
Second "	1926	441,000

From these figures we find that the annual average for 1924 was 543,000 persons employed and for 1925 554,000.

4. Composition of the personnel employed in the German engineering industry (according to data compiled by the " Verein Deutscher Maschinenbau-Anstalten ").

	Number of		Per thousand workmen						
	Clerical staff	Workmen	Skilled artisans	Semi-skilled workmen	Unskilled labourers	Apprentices	Young labourers	Female workers	Other workers
	Per thousand person employed								
July 1914	163	837	509	202	148	115	26	—	—
" 1920	155	845	444	187	171	135	30	34	—
" 1921	166	834	449	194	167	135	25	33	—
" 1922	171	829	457	191	176	123	27	26	—
" 1923	177	823	466	191	169	129	23	22	—
" 1924	186	814	484	192	140	150	15	19	—
" 1925	185	815	494	191	134	145	16	20	—
" 1926 ¹	208	792	494	183	107	170	15	14	17

4. FRANCE.

According to the census of 1906 (more recent data not available) there were, in the branch " iron foundries, machine-shops, shipbuilding and repairing, boilers, bicycles and motor vehicles " (but excluding electrical engineering), 19,857 establishments, employing 282,656 persons. (Source: " Resultats statistiques du Recensement général ", 1906, I, 2, page 224.)

The number of persons employed in the engineering industry proper is probably considerably smaller.

¹ The disproportionately small number of workmen in July 1926 (79.2 per cent) is due to numerous dismissals since the fourth quarter of 1925, which affected officials to a much lesser extent.

5. SWITZERLAND.

Number of Workers employed by the Members of the Union of Swiss Engineering Firms.
(According to their annual reports.)

End of 1913	41,987
„ „ 1921	41,217
„ „ 1922	39,756
„ „ 1923	40,403
„ „ 1924	45,088
„ „ 1925	45,689

These figures cannot be taken as representing the number of workers employed in the Swiss engineering industry, as, on the one hand, there are firms belonging to the above-named Union which produce electrical goods, instruments, tools, boilers, etc., while, on the other hand, this Union does not include all the firms which belong to the mechanical engineering industry proper.

6. SWEDEN.

Persons employed by the "Mekaniska Verkstäder ej. s. n."¹
(Source: "Sveriges officiella Statistik Industri".)

	1913	1920	1921	1922	1923	1924
Number of employees. . .	4,602	8,458	6,659	5,551	5,825	6,205
Number of workmen . . .	39,661	48,193	33,933	27,783	33,081	36,585

7. CANADA.

Number of Wage-earners in the Canadian Engineering Industry.
(Results of the Official Census.)²

Branch of Production	1910	1915	1921	1922
Agricultural implements	8,834	6,737	7,154	4,873
Foundry and machine-shop products.	24,367	19,985	10,131	9,294
Boilers and engines	5,300	4,155	1,768	1,307
Elevators.	473	690	255	} 4,028
Industrial machinery.	—	—	4,057	
Gas apparatus.	369	136	—	—
Scales.	224	303	257	—
Sewing machines.	714	—	—	—
Pumps and windmills	540	551	153	—
Cream separators	216	—	226	—
Washing machines and wringers.	156	110	219	—
Office and household machines	—	—	—	1,637
Typewriters.	—	—	44	47
Calculating machines.	—	—	202	—
Total.	41,193	32,667	24,466	21,186

¹ Excluding the electro-technical, instrument-making and watch-making industries and ship-building, but including boiler-making and vehicle construction, which, if eliminated, would give much lower figures for the number of employed.

² For source and method of compilation see "3. Germany" above.

8. THE NETHERLANDS.

*Number of Employed in Machinery and Boiler Workshops, and Workshops for Conduit Pipes, Plate-welding and for Rolling-stock*¹.

(These figures do not include: electrical engineering, bicycle industry, building yards and ironware manufacturing, shipbuilding and repairing, iron and steel foundries, etc.)

Total personnel (including employees) on September 15th.				
1920	1921	1922	1923	1924
23,555	19,688	16,605	15,915	17,949

9. BELGIUM.

The census of December 31st, 1910, established the number of employed in the Belgian engineering industry as 36,377².

This figure, however, includes:

Manufacture of boilers and steam containers	8,517 workmen.
Electrical engineering industry	5,670 workmen.

Exclusive of these two branches, we have a total of 22,190 for the engineering industry at the end of 1910. This figure may be subdivided as follows:

Construction of engines, machine tools, looms, industrial machinery.	19,859
Construction of machines for the manufacture of clothing	501
Agricultural machinery	1,655
Fire engines, etc.	175
Total	22,190

10. CZECHOSLOVAKIA.

No particulars are available regarding the number of employed in the engineering industry.

11. AUSTRIA.

Number of Workmen in the Austrian Engineering Industry.

(According to the statistics of the metal workers' union.)

Source: *Wirtschafts-Statistisches Jahrbuch*, 1925, Vienna, p. 291.

Branch of Industry	1924	1925
General engineering	10,777	9,341
Locomotive and wagon factories	6,708	6,057
Mill construction	430	89
Machine-tools.	1,105	596
Agricultural machinery	2,717	3,588
Sewing machines, typewriters and calculating machines	413	615
Scales and balances.	478	311
Total	22,628	20,593

¹ Only factories with 25 or more workmen. (Source: *Maandschrift van het Centraal Bureau voor de Statistiek*, 21st year, Vol. 5, dated May 31st, 1926, pages 586 and 702 et seq.)

² Cf. "Die Hauptindustrien Belgiens", Part II, Munich 1919, page 40.

Number of Workers on June 30th, 1925, in Engineering Undertakings subject to Compulsory Accident Insurance.

Source: *Wirtschafts-Statistisches Jahrbuch*, 1925, Vienna, pages 285-286. (Data compiled by the Chamber of Labour with the help of the accident insurance offices.)

Branch of Industry	Number of insured workers		
	Male	Female	Total
Iron construction.	2,263	14	2,277
General engineering	12,468	373	12,841
Agricultural machinery.	2,410	29	2,439
Heating and water conduit appliances	4,104	30	4,134
Metal fittings and apparatus	1,546	71	1,617
Total.	22,791	517	23,308
Employed in Vienna.	12,026	301	12,327

These figures do not include electrical engineering, foundries, the small iron industry, other metal industries, and the vehicle industry. The locomotive construction included in the latter item employed 2,445 insured workers, of whom 2,414 were males and 31 females.

12. ITALY.

According to the census of 1911, the branch "Construction of Machinery for Agriculture, Industry and Transport" employed:

156,530 males
2,871 females

Total 159,401.

(Source: *Annuario Statistico Italiano*, 1917-18, page 32.)

These figures include, *inter alia*, the entire motor-vehicle industry, boiler-making and apparently also wagon construction, so that they cannot be taken to represent the number of persons employed in the mechanical engineering industry proper.

13. DENMARK.

Number of Workmen in Iron Foundries, Machine Factories, etc.

(Source: The Danish "Statistisk Aarbog")

June 12th, 1906	9,587 (10,980 employed)
May 26th, 1914	13,487 (16,233 »)
1919	13,435
1920	13,645
1921	8,100
1922	8,707
1923	9,763

¹ Yernstoberier, Maskinfabrikker m.v.

14. HUNGARY.

Number of Workmen in the Engineering Industry.

(From *Die weltwirtschaftliche Lage Ende 1925*, published by the Konjunktur Institut of the Statistical Department of the Reich.)

	1913 New frontiers	1922	1923
	44,595	40,859	41,848

These figures are undoubtedly much too high, as is shown, for example, by a comparison with the number of members of the Hungarian Metal-Workers Union ¹.

15. JAPAN.

(Source: "The Statistics of Agriculture Industries and Commerce" 1923, Section of Statistics, Department of Agriculture and Commerce, March 1925, Tokyo.)

In the group "Manufacture of machines, tools, implements, instruments" there were in 1923:

3,744 factories employing 260,394 persons,
of whom 229,475 were factory hands.

These figures also include:

Electrical engineering, with . . . 343 enterprises employing 29,788 persons
The vehicle industry, with . . . 682 enterprises employing 42,442 "
Shipbuilding, etc., with . . . 278 enterprises employing 106,059 "

For the mechanical engineering industry proper we therefore have the following figures of employed for 1923.

	Total number employed	Number of factory hands
Engines, water-wheels, condensers, steam regulators, etc.	7,192	6,121
Machinery for agriculture, building and civil engineering .	2,308	2,028
Machinery for the mining and oil industries	1,263	1,033
Machinery for the textile industries	9,242	7,965
Metal and wood-working machinery, etc.	4,498	3,962
Other machinery	7,834	6,850
Cranes, conveyors and elevators	1,031	855
Pumps, compressors, blowers, ventilators, etc.	2,840	2,454
Machinery for the munition industry	17,909	15,715
Total	54,117	46,983
Locomotives, cars, tanks, refrigerators	34,473	28,321

16. POLAND.

No particulars available.

¹ Cf. Section B of this chapter.

17. NORWAY.

Number of insured in enterprises subject to accident insurance inspection in the industry of "machines, apparatus, etc."

(Source: *Statistik Årbok for Kongeriket Norge* 1912, page 76.)

1913 (workmen and clerical staff)	19,913
1918 (workmen and clerical staff)	23,267
1921 (workmen only).	16,446

These figures comprise the whole engineering industry including shipbuilding, which is a branch of considerable importance.

18. FINLAND.

No employment figures available.

19. AUSTRALIA.

*Number of Employed in the Mechanical Engineering Industry*¹.

Calendar or economic year	Agricultural machinery and implements	Ironworks and engineering ⁴
1908	3,134	17,699
1909	4,081	17,882
1910	4,868	20,109
1911	5,156	22,539
1912	4,733	25,151
1913	4,444	26,014
1919-20	3,116 ²	31,050 ³
1920-21	4,299 ²	33,914 ³
1921-22	4,696	30,628
1922-23	4,674	31,872
1923-24	5,584	33,052

20. NEW ZEALAND.

*Number of Employed in the Mechanical Engineering Industry*⁵.

Economic year	Engineering works ⁶	Agricultural and dairy-ing machinery and implement-making
1910-11	2,442	—
1918-19	2,731	830
1919-20	3,030	930
1920-21	3,388	1,080
1921-22	2,835	900
1922-23	2,993	939

¹ Source: *Official Year-Book of the Commonwealth of Australia*, No. 8, 1915, pages 474-475, and No. 18, 1925, pages 845-846.

² Excluding three factories in Western Australia.

³ Including three factories engaged in the manufacture of agricultural machinery and implements in Western Australia.

⁴ "Engineering, ironworks and foundries". — This item includes for the most part branches of production which do not belong to the mechanical engineering industry proper (*cf. supra*, Ad No. 3 of this Annex).

⁵ Source: *New Zealand Official Year-Book* 1925, pages 506 *et seq.*

⁶ Excluding foundries, automobile construction, shipbuilding (*cf. supra*, Ad No. 3 of this Annex.)

21. RUSSIA.

Number of Workmen employed in the Mechanical Engineering Industry in Russia.

Calendar or economic year	Agricultural machinery and implements	General engineering	Total
1913	—	99,000 ¹	—
1922-23 ²	4,850	64,008	68,858
1923-24 ²	7,004	77,011	84,015
1924-25 ³	25,090	73,751	98,841

B. Number of Men Unemployed (and Degree of Employment).

1. UNITED STATES.

Index Numbers of the Degree of Employment in the Foundries and Machine-Shops of the United States.

Source: United States Department of Commerce: *Commerce Year-Book*, 1925, page 370. (From the Statistics of the National Industrial Conference Board.)

Basis: June 1920 = 100.

One week in month of	1920	1921	1922	1923	1924	1925
January	—	76.4	54.2	87.8	81.4	75.2
February	—	72.9	56.5	88.4	82.2	74.9
March	—	67.5	59.1	91.4	82.1	75.6
April	—	61.0	62.3	91.7	81.3	75.2
May	—	57.2	65.7	92.4	80.0	74.1
June	100.0	55.2	68.8	92.7	76.4	73.6
July	100.6	51.2	72.1	91.9	73.3	74.1
August	100.7	49.7	73.6	91.2	70.5	72.9
September	100.7	49.7	75.8	90.5	70.9	73.6
October	98.3	51.0	79.4	90.6	73.3	74.0
November	93.2	53.5	82.5	86.4	72.6	74.9
December	86.2	55.1	85.3	85.0	73.4	76.1
Average for year	(97.1)	58.4	69.6	90.0	76.45	74.5

¹ From *Die Volkswirtschaft der U.d.S.S.R.*, 4th year, No. 1, January 1925, page 20.

² *Ibidem*, pages 80 *et seq.*

³ Results of the industrial census of 1924-25. (From *Die Volkswirtschaft der U.d.S.S.R.*, 5th year, 1926, No. 7, page 72.)

2. GREAT BRITAIN.

Percentage of Unemployed among Trade-Union Members in the Mechanical Engineering and Shipbuilding Industries.

Source: "Enquête sur la Production" (published by the International Labour Office), Vol. IV, 2, pages 419-420; from July 1924 onwards, *Wirtschaft und Statistik*, published by the Statistical Department of the Reich.

(a) Monthly Average		Unemployment %	
1911		4.0	
1912		3.9	
1913		3.1	
1919		3.5	
1920		3.5	
1921		23.0	
1922		28.8	
1923		22.1	
1924		14.7	
1925		14.5	

(b) Monthly Average	1920 %	1921 %	1922 %	1923 %	1924 %	1925 %	1926 %
First quarter . .	4.1	11.2	28.7	23.8	16.5	13.7	15.2
Second quarter . .	1.8	27.6	31.5	21.7	14.7	13.8	
Third quarter . .	2.6	26.5	27.8	22.4	13.4	15.1	
Fourth quarter . .	5.5	26.5	27.3	20.7	14.2	15.4	

Percentage of Unemployed among Insured Persons at the End of Each Month in the General Engineering and Founding Industries.

Source: *Labour Gazette*. — See "Survey of Industrial Relations", page 227, and "Report on the Present Condition and Future Prospects of the Engineering Industry", pages 64-65.

Month	1923	1924	1925
January	—	19.1	14.0
February	—	17.3	13.3
March	—	16.1	12.9
April	—	15.8	13.1
May	—	14.6	12.3
June	20.9	14.0	12.3
July	—	13.5	12.4
August	20.2	14.1	12.6
September	20.2	15.0	12.4
October	20.5	15.3	12.0
November	—	14.7	12.0
December	18.3	13.7	11.7
Average for year	(20.0)	(15.3)	(12.6)

3. GERMANY.

Degree of Employment in the German Engineering Industry.

(Percentage Proportion of Persons actually employed to Number employed at Full Capacity.)

Data collected by the V.D.M.A. from about 700 of its member firms.

	Workmen %	Employees %	Total number of employed %
1921 First quarter	86.4	98.9	88.0
Second "	92.1	96.6	92.8
Third "	89.5	97.4	90.7
Fourth "	90.5	98.1	91.7
1922 First "	88.9	98.1	90.3
Second "	90.6	98.9	91.9
Third "	91.2	99.2	92.5
Fourth "	89.5	98.6	90.9
1923 First "	87.2	98.1	89.0
Second "	85.4	97.3	87.3
Third "	83.1	96.0	85.3
Fourth "	71.0	91.1	74.2
1924 First "	71.5	87.6	74.1
Second "	71.0	85.6	73.4
Third "	69.3	81.8	71.4
Fourth "	70.1	83.1	72.2
1925 First "	73.0	85.1	75.0
Second "	75.2	86.8	77.1
Third "	73.8	83.4	75.4
Fourth "	65.2	81.5	67.9
1926 First "	57.4	77.5	60.6
Second "	54.8	73.7	57.9

Unemployment and Short-time in the German Metallurgical Industry.

(In Percentage of Trade-Union Members.)

Source: *Wirtschaft und Statistik*, published by the Statistical Department of the Reich.

End of month	1923		1924		1925		1926 †	
	Entirely un- employed	On short time	Entirely un- employed	On short time	Entirely un- employed	On short time	Entirely un- employed	On short time
January			24.4	39.2	7.7	6.2	18.8	32.9
February			27.5	32.9	6.3	6.3	19.6	29.8
March			20.5	19.0	5.2	5.8	22.6	34.5
April			17.0	11.1	5.1	5.4	18.9	25.2
May			14.1	16.7	3.6	6.1	19.8	24.9
June	4.44	19.66	16.5	31.4	3.2	6.4	20.5	26.4
July	3.85	16.	20.2	49.4	3.7	8.0	20.6	25.6
August	7.06	22	20.5	52.1	4.5	10.7	19.8	23.6
September	10.45	50	18.2	33.4	5.1	16.8	18.6	21.0
October	18.92	62	13.5	23.2	7.3	24.5		
November	24	57	9.3	11.7	8.4	24.9		
December	26	46	7.2	9.0	17.3	31.4		

† Including copper-smiths since April.

4. FRANCE.

No figures available.

5. SWITZERLAND.

Unemployment in the Metallurgical Industry.
(Number of Employed).

Source: "Le Marché suisse du Travail", (published by the Office Federal du Travail, Berne), 1920-26.

1920		1921	
January	—	January	3,574
February 24th	572	February 28th	4,581
March 29th	437	March 24th	4,827
April 26th	459	April 28th	5,579
May 31st	432	May 23rd	6,359
June 28th	353	June 20th	6,349
July 26th	350	July 18th	6,597
August 30th	488	August 31st	8,061
September 27th	570	September 30th	8,624
October 25th	793	October 31st	9,148
November 29th	1,334	November 30th	10,210
December 20th	1,713	December 31st	11,809

Month	1922	1923	1924	1925	1926
January	12,814	6,793	3,159	1,172	1,805
February	12,952	6,378	3,108	1,098	1,669
March	12,146	5,390	2,146	943	1,209
April	11,162	4,427	1,548	885	1,134
May	9,958	3,673	1,173	760	1,062
June	8,825	3,170	1,010	723	
July	7,605	2,635	1,121	723	
August	7,062	2,641	969	808	
September	6,216	2,283	872	806	
October	6,148	2,531	981	967	
November	6,806	3,031	1,086	1,392	
December	7,192	3,078	1,112	1,619	

6. SWEDEN.

Unemployment in the Metallurgical Industry.

(Percentage of Unemployed among Members of Trade Unions.)

Source: Sociala Meddelanden, Stockholm, 1911-1924. (See "Enquête sur la Production", Vol. IV, 2, pages 421-422.)

Year	Monthly average
1911	3.82
1912	3.18
1913	2.56
1920	4.94
1921	29.76
1922	30.47
1923	15.73
1924	8.87
1925	6.2 ¹

7. CANADA.

Unemployment in the Metallurgical, Engineering and Transport Industries.

(Percentage of Unemployed among Members of Trade Unions.)

Source: *Labour Gazette*. (See "Enquête sur la Production", Vol. IV, 2, page 447.)

Month	1919	1920	1921
January	3.21	4.11	21.84
February	5.54	3.38	23.28
March	5.51	2.29	27.75
April	4.26	3.54	27.47
May	7.27	4.46	29.59
June	4.69	2.00	25.23
July	4.84	2.09	18.65
August	5.39	1.74	24.24
September	4.6	5.3	22.32
October	4.6	4.67	
November	5.73	13.46	
December	3.72	17.98	

¹ The figures for 1925 are taken from the periodical *Wirtschaft und Statistik*, published by the Statistical Department of the Reich.

8 NETHERLANDS.

Unemployment in the Metal Industry.

(Percentage of Unemployed among Persons insured against Unemployment.)

Source: *Wirtschaft und Statistik*, published by the Statistical Department of the Reich.

Year	Monthly average
1922	14.5
1923	20.5
1924	12.1
1925	8.5

Unemployment in the Metallurgical Industry.

(Percentage of Unemployed among Members of Trade Unions.)

Source: *Maandschrift van het Centraal Bureau voor de Statistiek*, 1911-1924. (See "Enquête sur la Production", Vol. IV, 2, pages 435-436, and Vol. V, 2, page 876.)

Year	1911	1912	1913	1920	1921	1922	1923
Monthly average .	1.00	0.50	0.51	1.85	7.42	14.38	20.50

9. BELGIUM.

Unemployment in the Metallurgical Industry.

(Percentage of Unemployed among Members of Trade Unions.)

Source: "Enquête sur la Production", Vol. IV, 2, page 409. (See *Recue du Travail*.)

Year	Monthly average
1921	9.0
1922	4.0
1923	0.7
1924	0.6 ¹

10. CZECHOSLOVAKIA.

No figures available.

¹ This figure is from "Enquête sur la Production", Vol. V, 2, page 672.

11. AUSTRIA.

Unemployed in Receipt of Unemployment Allowances in the Vienna Metallurgical Industry.

(The numbers refer to more than half of all unemployed in receipt of any kind of allowances in the Austrian metallurgical industry.)

Source: *Wirtschafts-Statistisches Jahrbuch*, 1925, issued by the Vienna Chamber of Workmen and Employees, pages 110-111.

Year	Monthly average
1922	8,745
1923	15,893
1924	7,418
1925	15,543

12. ITALY.

No figures available.

13. DENMARK.

Unemployment among Smiths and Engineers.

(Percentage of Unemployed among Members of Trade Unions.)

Source: "Statistiske Efterretninger" and "Statistisk Aarbog". (See "Enquête sur la production", Vol. IV, 2, page 432.)

Monthly average for:			
1920	1921	1922	1923
4.56	26.41	27.84	19.86

14. HUNGARY.

Unemployment in the Metallurgical Industry.

(Number of Members and of Unemployed in the Fédération nationale des Ouvriers métallurgistes¹.)

Source: "Enquête sur la Production", Vol. IV, 2, page 386.

Date	Members	Unemployed	Percentage of unemployed
Fourth quarter 1913	29,653	2,933	= 9.9%
Fourth quarter 1919	49,182	8,528	= 17.3%
Fourth quarter 1920	48,268	5,172	= 10.7%
Second quarter 1921	47,156 ²	12,872 ²	= 27.2%

¹ Figures published by the Employment Bureau of the union and referring only to Budapest and neighbourhood.

² The figure for April 30th refers to the whole of Hungary and therefore includes all the unemployed members of trade unions in the Hungarian iron and metallurgical industry.

15. JAPAN.

No statistics of unemployment.

16. POLAND.

No data available for unemployment.

17. NORWAY.

Unemployment in the Metallurgical Industry.

(Percentage of Unemployed among Members of Trade Unions.)

Source: " Sociale Meddelelser, Statistisk Aarbog for Kongeriket ", Norway, 1913.

Year	Monthly average
1911	1.32
1912	1.41
1913	1.47
1920	1.92
1921	18.8
1922	19.3
1923	10.6
1924 ¹	6.8
1925	11.0

18. FINLAND.

No data available for unemployment.

19. AUSTRALIA.

Unemployment in the Engineering and Metallurgical Industries.

Source: Commonwealth Bureau of Census and Statistics, Labour and Industrial Branch, "Prices, Purchasing Power of Money, Wages, Trade Unions. Unemployment and General Industrial Conditions", 1913-1921, and *Quarterly Summary of Australian Statistics, 1922-1923*. (See "Enquête sur la Production", Vol. IV, 2, page 452).

	1913	1919	1920	1921	1922
End of first quarter	6.5	6.5	5.3	5.4	17.7
„ „ second „	6.9	7.6	5.7	10.2	14.1
„ „ third „	7.1	5.4	3.6	9.0	17.2
„ „ fourth „	8.2	5.6	4.3	14.4	15.6

The figures refer to persons remaining without work for three days or more and include trade unions which give no unemployment pay. They also comprise unemployment due to illness, accidents and other causes.

¹ Monthly average in last quarter.

20. NEW ZEALAND

21. RUSSIA

No particulars available relating to unemployment in either of these two countries.

Ad. No. 5.

HOURS OF WORK; OUTPUT PER HEAD.

I. UNITED STATES.

Average Number of Wage-Earners distributed according to the Prevailing Hours of Labour per Week in Individual Industries.

Source: *Statistical Abstract of the United States, 1924, pages 760 et seq.*

	1914	1921	1923
I. Agricultural Implements:			
Total wage-earners.	48,459	30,359	30,962
Wage-earners in establishments where the prevailing hours of labour per week were:			
44 and under	—	1,249	1,096
Between 44 and 48	—	2,330	331
48 ¹	4,461	1,707	318
Between 48 and 54	2,632	18,902	19,786
54	4,559	2,539	2,120
Between 54 and 60	25,258	3,279	6,530
60 and over.	11,549	353	781
II. Engines:			
Total wage-earners, etc.	29,657	35,567	48,495
Wage-earners in establishments where the prevailing hours of labour per week were:			
44 and under	—	5,131	5,159
Between 44 and 48	—	5,415	2,701
48 ¹	1,962	11,795	12,746
Between 48 and 54	1,075	7,607	13,679
54	8,862	2,031	2,234
Between 54 and 60	14,789	3,367	11,746
60 and over.	2,949	221	230
III. Foundry and Machine-Shop Products²			
Total wage-earners.	362,471	321,363	448,777
Wage-earners in establishments where the prevailing hours of labour per week were:			
44 and under	—	46,192	28,652
Between 44 and 48	—	21,178	11,393
48 ¹	25,699	83,675	113,392
Between 48 and 54	45,433	76,067	139,000
54	110,782	40,604	63,651
Between 54 and 60	129,822	44,059	77,371
60 and over.	50,735	9,588	15,318

¹ Includes 48 and under for 1914.

² Textile machinery included in 1914.

— 100 $\frac{2}{5}$ —

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Between 54 and 60	129,822	44,059	77,371
60 and over.	50,735	9,588	15,318

¹ Includes 48 and under for 1914.

² Textile machinery included in 1914.

	1914	1921	1923
<i>IV. Locomotives:</i>			
Total wage-earners.	17,391	16,583	30,672
Wage-earners in establishments where the prevailing hours of labour per week were:			
44 and under	—	350	—
Between 44 and 48	—	1,462	—
48 ¹	189	—	267
Between 48 and 54	5,594	6,260	12,650
54	1,285	—	468
Between 54 and 60	10,323	8,508	17,287
60 and over.	—	3	—
<i>V. Textile Machinery:</i>			
Total wage-earners.	— ²	31,025	35,672
Wage-earners in establishments where the prevailing hours of labour per week were:			
44 and under	—	1,018	864
Between 44 and 48	—	537	50
48 ¹	—	7,492	8,536
Between 48 and 54	—	18,548	22,723
54	—	1,074	1,232
Between 54 and 60	—	2,204	2,145
60 and over.	—	152	102

	1914	1921	1923
<i>I-V. Mechanical Engineering Industry as a Whole³:</i>			
Total wage-earners	457,978	434,897	594,578
Wage-earners in establishments where the prevailing hours of labour per week were:			
44 and under.	—	53,940 (12.4%)	35,791 (6.0%)
Between 44 and 48	—	30,922 (7.1%)	14,475 (2.4%)
48 ¹	32,331 (7.0%)	104,669 (24.1%)	135,259 (22.8%)
Between 48 and 54	54,734 (11.9%)	127,384 (29.3%)	207,838 (35.0%)
54.	125,488 (27.4%)	46,248 (10.6%)	69,705 (11.7%)
Between 54 and 60	180,192 (39.3%)	61 417 (14.1%)	115,079 (19.4%)
60 and over	65,233 (14.4%)	10,317 (2.4%)	16,431 (2.7%)

The average hours of labour per week for *all* wage-earners in the mechanical engineering industry (weighted average) according to these figures were:

In 1914 approximately 55½ hours
 „ 1921 „ 50½ „
 „ 1923 „ 52 „

¹ Includes 48 and under for 1914.

² Included in item No. III, " Foundry and machine-shop products ", in 1914.

³ This does not include a number of branches of engineering such as machine-tools (included in the item " Foundry and machine-shop products " in 1914), office appliances and sewing machines, pumps, etc., which in 1914 accounted for nearly 12 per cent, and in 1921 and 1923 to about 16 per cent, of the total number of workers in the mechanical engineering industry (*Cf. Ad No. 3 A of this Annex*).

2. GREAT BRITAIN.

Before the war, working-hours in England amounted as a rule to from 52 to 56 hours a week and in the engineering industry generally 53 or 54 hours. In 1919 and 1920 reductions in the hours of labour were made in nearly all industries. In the engineering and shipbuilding industries, negotiations between the employers' organisations and the trade unions resulted in an agreement to reduce the normal working week to 47 hours as from January 1st, 1919, without any reduction in the weekly wages of time-workers. This arrangement was still in operation in June 1925.

As regards overtime, in the British engineering industry before the war a general agreement provided that no workmen should be required to work more than 32 hours overtime in any four weeks (except in cases of emergency). In June 1925, the amount of overtime which could be worked was only 30 hours (allowance being made for time lost through sickness, absence with leave, etc.). It was agreed in 1922 that the employers should have the right to decide when overtime is necessary.

(See "Survey of Industrial Relations", pages 128 *et seq.*)

3. GERMANY.

For the year 1913 statistics only exist with regard to the minimum hours of labour in the metallurgical industry as fixed by agreement.

(Source: Die Tarifverträge im deutschen Reiche am Ende des Jahres 1913 — Supplement to the *Labour Gazette* of the Reich.)

According to these statistics the hours of work of those employed in this industry (excluding salesmen) were as follows:

Less than 48 hours	1,832 (= 1 %)
48-50 hours	3,258 (= 1.8 %)
More than 50, up to 52 hours	7,203 (= 4 %)
" 52 " 54 "	88,799 (= 48.7 %)
" 54 " 56 "	46,010 (= 25.2 %)
" 56 " 58 "	25,925 (= 14.2 %)
" 58 " 60 "	9,197 (= 5.1 %)
" 60 " 62 "	16 (= 0.0 %)
Over 62 hours	35 (= 0.0 %)
	182,275 (= 100%)

The weighted average on the basis of these figures was about 54 hours.

For the post-war period the monthly figures of the V.D.M.A. have been taken as a basis for the following tables:

Hours of Labour in the Engineering Industry.
(From the monthly figures of the V.D.M.A.)

Period	Average working hours in the engineering industry ¹	
	Workmen: Hours per week	Employees: Hours per week
1924		
April		53.3
May		51.3
June		49.7
July		49.5
August		48.3
September		48.3
October	50.0	48.3
November	51.4	48.2
December	52.5	48.3

¹ Calculated by classifying the firms sending in reports according to the individual weekly hours of labour announced, which in some cases differ considerably.

Hours of Labour in the Engineering Industry. (Continued.)

Period	Average working hours in the engineering industry	
	Workmen: Hours per week	Employees: Hours per week
1925		
January	52.4	48.6
February	52.3	48.2
March	52.7	48.3
April	52.8	48.4
May	52.4	48.4
June	52.7	48.5
July	52.8	48.6
August	52.5	48.5
September	50.5	48.0
October	49.0	48.2
November	48.5	48.2
December	47.9	48.2
1926		
January	44.4	47.9
February	45.7	47.9
March	44.1	48.1
April	43.9	} No longer calculated, as variations from 48 become insignificant
May	45.8	
June	45.2	
July	45.2	
August	46.0	
September	46.4	
October	47.4	

The annual average for 1925 is as follows:

For workmen	51.4 hours
For employees	48.3 hours.

4. FRANCE.

According to an enquiry undertaken¹ before the war, the working-day of 51,810 undertakings in the metallurgical industry (*métaux ordinaires*) in 1912 was as follows:

8 hours or less	18	} = 1.7%
8-9 hours	22	
9 hours	422	
9-10 hours	410	} = 69.2%
10 hours	35,843	
10-11 hours	2,523	= 4.9%
11 hours	5,728	= 11.0%
11-12 hours	2,134	= 4.1%
12 hours	4,042	= 7.8%
Unknown	668	= 1.3%
Total	51,810	= 100 %

The average therefore was somewhat over 10 hours a day. By a Law of April 23rd, 1919, the

¹ Ministère du Travail et de la prévoyance sociale: "Rapport sur l'application des lois réglementant le travail en 1912"; Paris, 1914, Chapitre III: "Durée du travail horaire".

eight-hour day and the forty-eight-hour week were generally introduced. This law was amended by numerous administrative regulations¹.

As regards the *actual* hours of work in the post-war years, statistical data are lacking.

5. SWITZERLAND.

In the Swiss mechanical engineering industry the actual weekly hours of labour in 1911² were as follows:

	Percentage of workmen
Less than 54 hours	2.7
54 hours	9.7
56½-57 hours	9.7
59-60 hours	73.1
61½-62½ hours	3.2
64-65 hours	1.6
	100

Before the war and up to December 15th, 1917, the maximum working week was fixed by law at 64 hours, and up to January 1st, 1921, at 59 hours. Nevertheless, from 1919 onwards the 48-hour week was introduced by a large number of firms. On January 1st, 1921, the Federal Law of January 27th, 1919, relating to hours of labour in factories, which makes the 48-hour week compulsory, came into force.

In the first quarter of 1925, the actual weekly hours of work³ in 250 enterprises in the metallurgical and engineering industries were as follows:

Less than 48 hours	16 (= 6.4%)
48 hours	154 (= 61.6%)
More than 48 hours	80 (= 32.0%)
Total	250 (=100%)

6. SWEDEN.

Particulars regarding the actual hours of labour in the Swedish engineering industry are not available here.

7. CANADA.

Particulars are lacking.

8. NETHERLANDS.

The hours of labour of male workers in the metallurgical and engineering industries were not limited by law before the war. The actual working hours are shown in the following table:

Hours of Labour per Diem in 1913 in Workshops for the Construction of Steam Engines and Other Apparatus, etc., subject to the Law on Accident Insurance.

Source: Centraal Verslag der Arbeidsinspectie in het Koninkrijk der Nederlanden over 1913, pages 536-537. (See: "Enquête sur la Production", Vol. IV, 2, pages 496-497.)

Of the total number of male and female workers of all ages in 1913, there worked:

For 9 hours or less	1,586	(= 4.4%)
„ 9½ „	7,480	(= 21.1%)
„ 10 „	11,149	(= 31.5%)
„ 10½ „	5,707	(= 16.1%)
„ 11 „	4,781	(= 13.5%)
„ 11½ „	3,602	(= 10.2%)
„ 12 „	634	} (= 3.2%)
„ 12½ „	301	
„ 13 „	197	
„ 13½ „	1	
„ 14 or more	3	
	35,441	(= 100%)

¹ See "Survey of Industrial Relations", page 145-146.

² See "Enquête sur la production", Vol. IV, 2, pages 499 *et seq.*

³ See *Sozialstatistische Mitteilungen*, published by the Federal Labour Department, No. 4, May 1925, page 134.

The average hours of labour before the war according to these figures were about $10\frac{1}{4}$ hours. The Labour Act of November 1st, 1919, which came into force on October 24th, 1920, fixed a maximum working-day of 8 hours and a maximum working-week of 45 hours for all workers employed in factories and workshops; with effect as from June 1922 these maxima were raised to $8\frac{1}{2}$ hours and to 48 hours respectively. Numerous exceptions to the maximum hours were authorised¹.

According to the returns made to the "Standardisation Bureau of Engineering Employers", the hours worked during the first half of 1924¹ in the metallurgical and engineering industries were:

	Percentage of workers
Less than 48 hours a week.	7%
48 hours a week.	72%
More than 48 hours a week	21%

9. BELGIUM.

The working-hours per day of metal-workers in Belgium varied in 1914, according to the "Commission syndicale de Belgique", between 10 and 12 hours ("Enquête sur la Production", Vol. IV, 2, page 475.)

A Law dated June 14th, 1921 (which entered into force in October 1921) made the 8-hour day and the 48-hour week compulsory, but these hours were already in operation in certain industries in consequence of collective agreements.

As regards the distribution of the hours of work over the week, exceptions were allowed, but the 48-hour week may not be exceeded without authorisation ("Survey of Industrial Relations", page 141).

10. CZECHOSLOVAKIA.

The eight-hour day was introduced by a Law dated December 19th, 1918. The Washington Convention was ratified on August 24th, 1921.

No particulars are available regarding the *actual* hours worked in the engineering industry.

11. AUSTRIA.

The 56 collective agreements concluded in the metallurgical and engineering industries in 1914 fixed the hours of work on the first five days of the week as follows²:

Hours worked per diem	Number of workmen
Less than 9 hours	212 (= 1.8%)
9 and $9\frac{1}{4}$ hours	1,331 (= 11.3%)
$9\frac{1}{2}$ and $9\frac{3}{4}$ hours	9,940 (= 84.2%)
10 and $10\frac{1}{4}$ hours	315 (= 2.7%)
	11,798 (=100%)

The eight-hour day was introduced in Austria by the Law of December 18th, 1918, and was regulated in greater detail by the Law of December 1919.

In regard to *actual* hours worked in the engineering industry since the war, no particulars are available here.

¹ See: "Survey of Industrial Relations", pages 153-154.

² See: *Osterreichisches Statistisches Handbuch*, 1915.

12. ITALY.

The hours of work in Italian industry before the war averaged about 10½ hours per day. 81.45 per cent of the workers worked for 10 or more hours per diem¹. No particulars are available regarding the engineering industry individually.

Hours of work since the war have been regulated on the basis of the 48-hour week. In pursuance of a Royal Decree which came into force in August 1923, the normal length of a working day must not exceed 8 hours of actual work or 48 hours a week. Certain exemptions were allowed for individual industries².

In 1925 a detailed enquiry was undertaken into working hours and wages in all the chief branches of industry in Italy, and the period selected was the first half of May in order that all branches should be working at full capacity. In the engineering industry (automobile industry, railway construction and repairs, general engineering, motor construction and repairs, electrical engineering, and other engineering industries) the hours worked by the 150,313 workers covered by the enquiry were as follows³:

Less than 8 hours a day	12 (= 0.0%)
8 hours a day	147,233 (= 97.9%)
More than 8 hours a day	3,068 (= 2.1%)
	150,313 (=100%)

In May 1925, the eight-hour day was therefore predominant, but a recent Law dated June 30th, 1926, has empowered agricultural, industrial and commercial undertakings to increase the working day of all manual and brain-workers by one hour without prejudice to the exemptions already in force.

13. DENMARK.

Particulars regarding the actual working hours in the Danish mechanical engineering industry are not available here. In pursuance of collective agreements between employers and trade unions, the eight-hour day has been applied in all industrial undertakings since January 1st, 1920⁴. We do not know, however, whether this agreement is still in force.

14. HUNGARY.

Weekly Hours of Labour in the Iron and Mechanical Engineering Industries.

(Source: "Enquête sur la production", Vol. IV, 2, page 463. — Statistics of the Hungarian National Union of Foundries and Machine-shops.)

Taking an average of all the undertakings situated in the territory of present-day Hungary, the hours of labour were:

In 1913	60 hours a week.
„ 1919	57 „ „ „
„ 1920	52 „ „ „
„ 1921	48 „ „ „

¹ See "Enquête sur la Production", Vol. IV, 2, page 478.

² See "Survey of Industrial Relations", page 151.

³ See *Wirtschaft und Statistik* 1926, pages 587 and 588 (No. 17).

⁴ See "Enquête sur la production", Vol. IV, 2, pages 492 and 493.

15. JAPAN.

For Japan we have the results of an official enquiry undertaken at the end of 1921. (See *The Japan Year-Book*, 1926, page 230.) According to this enquiry, the actual hours of work in the engineering and tool industry were:

Less than	8 hours,	13.3 per cent of the factories
„	„ 9 „	29.3 „ „
„	„ 10 „	44 „ „
„	„ 12 „	10.8 „ „
More	„ 12 „	1.6 „ „

16. POLAND.

Before the war the maximum working hours in industry were fixed by a Russian law at 11 ½ hours (Saturdays 10 hours), but in many branches of industry they were reduced by agreement to 10 or 9 hours.

The eight-hour day was introduced by a Decree of November 23rd, 1918, which was later replaced by a Law (December 18th, 1919). This law prescribed a working-day of 8 hours and a week of 46 hours, which could be prolonged by special authorisation.

The principle of the eight-hour day has often been broken by permanent or temporary decrees. Very numerous special authorisations have been granted to individual undertakings in order to enable them to fulfil urgent orders. These authorisations allow the working day to be increased by four hours on condition that the extra hours do not exceed 120 during the whole year. Most of these authorisations refer to the metallurgical industry, agricultural machinery, milling machinery, locomotives, textile industry, milling industry, sawmills and cigarette factories.

(See: "Enquête sur la Production", Vol. IV, 2, pages 464-466, and "Survey of Industrial Relations", page 155).

17. NORWAY.

Classification of the Workers in the Iron and Metallurgical Industries according to Net Working Hours per Week in 1913.

Source: "Norges Officielle Statistik", Vol. IV, 3, and "Arbejdstiden i Industrien", September 1913, pages 8* and 9*. Christiania, 1914. (See "Enquête sur la Production", Vol. IV, 2, pages 490-491.)

Hours of labour	Number of workmen	Percentage of total
Under 48 hours.	318	2.3
48-51 „	25	0.2
51 ½-53 ½ „	1,089	7.9
54 „	824	5.9
54 ½-55 „	894	6.5
55 ½ „	8,065	58.2
56-56 ½ „	816	5.9
57 „	657	4.7
57 ½-59 ½ „	1,044	7.5
60 „	125	0.9
Total	13,857	100.0

Since January 1st, 1920, the maximum working day has been fixed in Norway at 8 ½ hours and the week at 48 hours ("Survey of Industrial Relations", page 154).

18. FINLAND.

Actual Hours of Work per Week in the Metallurgical Industry.

Source: "Enquête sur la Production", Vol. IV, 2, page 467.

	1910	1920
Particulars supplied by employers	56.8 hours	44.8 hours
Particulars supplied by workmen	56.8 hours	42.9 hours

19. AUSTRALIA.

Weighted Average of the Hours of Work per Week in the Machine Factories, Iron and Steel Works, etc., of the Six Chief Towns of Australia.

Source: "Enquête sur la Production", Vol. IV, 2, page 510. (Particulars supplied by the Australian Government).

	April 30th, 1914. Hours	September 30th, 1920. Hours
Sydney	48	47 $\frac{3}{4}$
Melbourne	48	48
Brisbane	45.9	44
Adelaide	48	48
Perth	48	47 $\frac{1}{2}$
Hobart	48	48
General average	47.8	47 $\frac{3}{4}$

Since 1920 the hours of labour in the Australian industry have, in some cases, been still further reduced. (See "Survey of Industrial Relations", pages 160-161.)

20. NEW ZEALAND.

Average Hours of Work in the Metallurgical Industry.

Source: "Statistical Report on Prices, Wages, and Hours of Labour, etc. for the Year 1924".

Year (on March 31st)	Hours of labour per week
1914	46 $\frac{1}{4}$
1921	45
1922	45
1923	45
1924	45
1925	45

21. RUSSIA

No particulars are available regarding the hours of work in the engineering industry of Russia.

Ad No. 6.

WAGES.

1. UNITED STATES.

(a) *Average Weekly Earnings in the Foundries and Engineering Shops.*

Source: "Wages and Hours in American Industry", New York, 1925, published by the National Industrial Conference Board (association of American employers).

Month	1920		1921		1922		1923		1924		1925	
	Average weekly earnings											
	Un- skilled workers \$	Skilled workers \$	Un- skilled workers \$	Skilled workers \$	Un- skilled workers \$	Skilled workers \$	Un- skilled workers \$	Skilled workers \$	Un- skilled workers \$	Skilled workers \$	Un- skilled workers \$	Skilled workers \$
July 1914	10.89	14.85					10.89	14.85				
January			23.01	29.97			22.11	28.83	24.00	31.13	25.35	30.71
February			21.39	28.54			22.09	29.20	24.25	31.24	24.36	31.23
March			20.75	27.04			22.47	29.85	24.35	31.16	24.55	31.38
April			20.24	25.54			23.69	31.01	24.39	31.25	24.16	31.15
May			20.05	25.95			24.35	31.83	23.70	30.57	23.79	31.37
June	28.53	34.10	19.89	25.29			24.37	31.73	23.08	30.44	23.65	30.73
July	28.18	34.12	18.31	24.67	20.27	25.93	24.23	31.43	22.58	29.71	23.50	30.43
August	28.61	34.42	18.63	24.89	20.36	26.73	24.33	31.69	22.68	29.06	23.85	30.17
Septem.	28.81	34.36	18.86	24.16	21.08	27.27	24.69	31.09	23.44	29.73	24.44	30.79
October	28.06	34.33	19.30	24.83	22.04	28.37	24.34	32.06	23.36	30.47	—	—
Novem.	26.56	33.12	19.41	24.72	22.06	28.36	23.78	31.85	23.54	30.37	—	—
Decem.	28.85	32.81	19.76	25.47	22.54	29.02	23.53	31.42	23.21	31.30	—	—

(b) *Calculation of Average Wage in the Mechanical Engineering Industry according to the Results of the Census.*

	1909	1914	1919	1921	1923
Total number of employed ¹ . . .	642,677	518,050	812,825	517,656	703,741
Total wages earned ² (in thousands of dollars)	387,430	349,685	1,041,097	659,012	1,000,372
Percentage of wages to total value of production	= 25.7%	= 27.1%	= 26.5%	= 26.3%	= 27.4%
Average annual wage per worker (in dollars)	602.8	675.0	1,280.8	1,273.07	1,421.5

¹ Cf. *supra*, Ad No. 4A of this Annex.

² The same items have been considered here as for the calculation of output and degree of employment.

2. GREAT BRITAIN.

Average Weekly Wage¹ (Time Wage) for Male Workers in Sixteen Centres of the British Engineering Industry.

Source: *Statistisches Jahrbuch für das Deutsche Reich, 1924-1925 and 1926.*

Date	Jobbers and turners	Iron- moulders	Pattern- makers	Unskilled assistants
	s. d.	s. d.	s. d.	s. d.
August 4th, 1914	38 11	41 8	42 1	22 10
February 29th, 1920 . .	82 5	85 6	86 8	63 11
December 31st, 1920 . .	89 6	92 10	94 3	70 9
February 28th, 1922 . .	73 6	76 3	77 10	55 11
September 30th, 1922 . .	57 6	59 9	61 4	40 5
March 31st, 1923	56 6	59 2	60 9	40 3
September 30th, 1923 . .	56 5	59 1	60 10	40 3
December 31st, 1924 . .	56 6	60 0	60 11	40 2
June 30th, 1925	56 6	60 0	60 11	40 2
September 30th, 1925 . .	56 6	60 0	60 11	40 2

3. GERMANY.

Regulation Weekly Wages for Male Workers in Twenty Centres of the German Metallurgical Industry².

Source: Publications of the Statistical Department of the Reich.

Month	1924		1925		1926	
	Skilled M.	Unskilled M.	Skilled M.	Unskilled M.	Skilled M.	Unskilled M.
Middle of 1924	36.92	23.55				
January	28.54	21.81	39.14	26.15	46.24	31.16
February	28.68	21.04	39.66	26.52	46.24	31.16
March	29.77	21.04	40.83	27.09	46.24	31.16
April	32.27	21.04	42.22	27.76	46.24	31.16
May	34.15	22.55	42.65	28.13	46.24	31.16
June	35.86	23.26	42.93	28.35	46.06	31.11
July	37.09	24.14	44.72	29.39	46.06	31.11
August	37.13	24.16	45.66	30.31	46.08	31.12
September	37.11	24.09	45.86	30.46	46.08	31.12
October	37.82	24.68	46.15	30.60		
November	38.30	25.24	46.24	31.16		
December	38.71	25.70	46.24	31.16		

¹ Unweighted averages — the figures apply to the regulation weekly working hours (53 and 54 hours in 1914 and 47 hours since the war).

² Weighted averages of the regulation wage rates during the months in question for full-time workers in the highest age category, including allowances for wife and two children, if they were paid in the place to which the report refers. The rates apply to the regulation periods of work. For skilled workers we have given piece-work wages according to the tariff for an average output, or time wages including piece-work allowance, and for unskilled workers only the time wages; for 1914, however, the average earnings are given (time and piece-rates for skilled workers and time rates for unskilled workers).

4. FRANCE.

Average¹ Earnings per Hour in the Paris Metallurgical Industry.
(Compiled by the Employers' Association of the Paris Metallurgical Industry.)

Source: *Wirtschaft und Statistik*, 1925, page 644.

Nature of work	February 1923		February 1924		February 1925	
	Time wage Fr.	Piece wage Fr.	Time wage Fr.	Piece wage Fr.	Time wage Fr.	Piece wage Fr.
Locksmiths	3.15	3.46	3.37	3.68	3.66	3.95
Machine-tool fitters	3.35	3.56	3.66	3.85	3.81	4.12
Smiths	3.14	3.67	3.65	4.00	3.80	4.19
Millers	3.32	3.54	3.45	3.75	3.77	4.00
Pattern-makers	3.93	4.34	4.11	4.62	4.50	4.73
Drillers	3.17	3.46	3.38	3.79	3.51	4.08
Dressers	3.29	3.49	3.45	3.63	3.76	4.19
Turners	3.23	3.50	3.53	3.83	3.83	4.12
Male assistants (unskilled) . . .	2.01	2.21	2.35	2.46	2.49	2.62
Female assistants (unskilled) . .	1.39	1.51	1.48	1.83	1.70	2.01
„ „ (semi-skilled)	1.49	1.73	1.83	1.98	2.01	2.31

Ordinary Earnings per Hour² in the Paris Machine-Shops.
January-February 1926.

Source: *Wirtschaft und Statistik*, 1926, No. 15, page 497. Published by the Employers' Association of the Metallurgical Industry of Paris and the Neighbourhood.

In addition to the ordinary hourly wages of the bulk of the workers in this industry (70 per cent) the earnings of the 15 per cent who earn more than this average and of the 15 per cent earn less are shown separately.

Nature of work	Time wages			Piece-work wages		
	15 %	70 %	15 %	15 %	70 %	15 %
	of the workers under consideration			of the workers under consideration		
	Fr.	Fr.	Fr.	Fr.	Fr.	Fr.
<i>Skilled workers:</i>						
Hand-moulders	3.63	4.18	4.71	3.74	4.94	6.61
Moulders for copper-smelting . . .	3.81	4.32	5.30	3.82	5.02	5.88
Tool-turners	3.74	4.39	4.86	3.86	4.67	5.27
Hammersmiths	3.39	4.16	4.87	3.63	4.51	5.37
Coppersmiths	3.71	4.33	4.94	—	—	—
Ironsmiths	3.28	3.89	4.46	3.60	4.39	4.84
<i>Semi-skilled:</i>						
Machine-moulders	3.02	3.49	4.11	3.27	4.35	6.05
Turners	3.15	3.64	4.15	3.18	3.99	4.53
Drillers	2.99	3.30	3.88	3.14	3.78	4.40
Stokers	2.83	3.29	3.74	—	—	—
Mechanics	2.68	3.29	3.84	—	—	—
<i>Unskilled:</i>						
Labourers (male)	2.48	2.74	3.14	2.47	2.88	3.54

¹ Including premiums and other working allowances but excluding family allowances.

² Including premiums and working allowances but excluding family allowances.

5. SWITZERLAND.

Average Wages per Hour and per Day in the Metallurgical and Engineering Industries.

Source: *Statistisches Jahrbuch für das Deutsche Reich, 1924-1925 and 1926.*

Year	Earnings per hour in centimes		Earnings per day in francs	
	Skilled and semi-skilled workers	Unskilled workers	Skilled and semi-skilled workers	Unskilled workers
1913	65.0	48.9	6.36	4.88
1918	110.3	89.0	10.48	8.29
1919	137.7	112.0	11.77	9.28
1920	159.9	131.0	12.93	10.72
1921	165.6	134.5	13.10	10.78
1922	146.1	116.2	12.61	9.93
1923	138.3	111.2	11.98	9.10
1924	140.8	106.2	12.20	9.35

6. SWEDEN.

Average Earnings per Hour¹ of Adult Male Workers in the Machine-Shops.

Source: *Statistisches Jahrbuch für das Deutsche Reich, 1924-25 and 1926.*

Year	1913	1921	1922	1923	1924
In crowns	0.46	1.67	1.26	1.12	1.16

7. CANADA.

Agreed Wages per Hour in the Iron and Metallurgical Industry (in 13 Chief Towns).

Source: *Statistisches Jahrbuch für das Deutsche Reich, 1926.*

Nature of work	1913 \$	1922 \$	1923 \$	1924 \$	1925 \$
Smiths	0.352	0.643	0.647	0.649	0.646
Mechanics	0.370	0.646	0.649	0.647	0.639
Iron-moulders	0.363	0.653	0.652	0.656	0.649
Tin-workers	0.425	0.710	0.723	0.734	0.732

¹ Including overtime, allowance in kind, etc.

8. HOLLAND.

*Average Wages per Hour and per Week of Adult Male Metal-workers*¹.

Source: *Statistisches Jahrbuch für das Deutsche Reich, 1924-25 and 1926.*

Period	Earnings per hour Dutch florins	Earnings per hour Dutch florins
1910	0.21	13.30
1920 1. Half-year	0.66	31.86
2. »	0.74	35.51
1921 1. »	0.77	36.97
2. »	0.77	36.79
1922 1. »	0.69	32.98
2. »	0.66	31.86
1923 1. »	0.62	29.86
2. »	0.60	28.67
1924 1. »	0.57	27.31
2. »	0.56	27.10
1925 1. »	0.57	27.22
2. »	0.59	28.19

9. BELGIUM.

Agreed Wages per Hour in the Brussels Engineering Industry.

Source: *Statistisches Jahrbuch für das Deutsche Reich, 1924-25 and 1926.*

Nature of work	July 1st 1924	Oct. 1st 1924	Jan. 1st 1925	April 1st 1925	July 1st 1925	Oct. 1st 1925
	Fr.	Fr.	Fr.	Fr.	Fr.	Fr.
Fitters	3.20	3.02	3.02	3.08	3.02	3.15
Iron-moulders	3.18	3.32	—	3.29	3.29	3.30
Pattern-makers	4.61	3.75	3.75	3.75	3.75	3.77
Turners	3.27	3.50	3.30	3.30	3.30	3.32
Unskilled labourers	2.35	2.29	2.29	2.29	2.21	2.30

10. CZECHOSLOVAKIA.

Agreed Wages per Hour in the Prague Engineering Industry.

Source: *Statistisches Jahrbuch für das Deutsche Reich, 1924-25 and 1926.*

Nature of work	1924		1925		
	July 1st August 1st Sept. 1st	October 1st Nov. 1st Dec. 1st	January 1st	April 1st	July 1st October 1st Nov. 1st Dec. 1st
	Kč.	Kč.	Kč.	Kč.	Kč.
Fitters	5.41	5.41	5.42	5.42	5.53
Iron-moulders	5.52	5.52	5.52	5.52	5.53
Pattern-makers	6.35	6.46	6.46	6.46	6.67
Turners	5.10	5.10	5.10	5.00	5.00
Unskilled labourers	3.33	3.33	3.33	3.13	3.23

¹ Skilled, semi-skilled and unskilled workers, whose average earnings for the first half-year of 1925 were made up as follows:

	Earnings per hour	Earnings per week
Skilled	0.62	29.83
Semi-skilled	0.56	26.75
Unskilled	0.47	22.46

11. AUSTRIA.

(a) *Agreed Wages per Week in the Vienna Metallurgical Industry.*

Source: *Statistisches Jahrbuch für das Deutsche Reich, 1924-25 and 1926.*

Period	Skilled and unskilled workers Schillings	Unskilled assistants Schillings
January 1914	40.32	30.24
End of first quarter 1925	40.80	34.00
» » second » »	40.80	34.08
» » third » »	40.80	34.08
» » fourth » »	40.80	34.08
» » first » 1926	40.80	34.08
» » second » »	40.80	34.08

The figures of the time rates regulated by agreement do not include the higher piece-work earnings, as is shown by the following table:

(b) *Average Weekly Earnings in the Metallurgical Industry (Heavy Industry) of Vienna.*

Compiled by the Vienna Chamber of Labour in conjunction with the Austrian Metal-workers Union. (See *Wirtschaft und Statistik, 1925, page 645.*)

Branch of work	End of January 1925			End of June 1925		
	Piece-work wage Sch.	Time wage Sch.	Average Sch.	Piece-work wage Sch.	Time wage Sch.	Average Sch.
Turners	56.71	47.92	52.76	57.50	48.40	53.30
Locksmiths.	57.77	45.09	49.93	58.35	45.50	50.43
Smiths.	58.56	46.87	54.50	59.15	47.50	55.05
Tinsmiths	59.27	49.30	54.56	59.86	50.00	55.10
Tool-makers	56.52	49.43	51.13	57.09	49.93	51.64
Other skilled workers	56.90	46.93	51.31	57.60	47.40	51.80
Semi-skilled workers.	43.67	41.52	41.68	44.11	41.54	42.00
Unskilled females	29.65	22.46	26.30	29.95	22.67	27.00

12. ITALY.

Agreed Wages per Hour in the Mechanical Engineering Industry at Rome and Milan, 1924 and 1925.

Source: *Statistisches Jahrbuch für das Deutsche Reich, 1924-25 and 1926.*

Branch of work	1924			
	July 1st		October 1st	
	Rome Lire	Milan Lire	Rome Lire	Milan Lire
Fitters	3.0	2.83—3.15	3.20	2.76
Iron-moulders	3.00—3.50	2.98—3.45	3.20	2.99
Turners	3.00—3.30	2.76—3.19	3.20	3.02
Unskilled labourers	2.20—2.56	2.26—2.42	2.20	2.12

Nature of work	1925							
	January 1st		April 1st		July 1st		October 1st	
	Rome Lire	Milan Lire	Rome Lire	Milan Lire	Rome Lire	Milan Lire	Rome Lire	Milan Lire
Fitters	3.20	2.76	3.60	3.04	3.60	3.24	3.40	3.24
Iron-moulders	3.20	2.99	3.60	3.27	3.60	3.47	4.80	3.47
Turners	3.20	3.02	3.50	3.30	3.50	3.50	3.40	3.50
Unskilled labourers .	2.00	2.12	2.30	2.40	2.40	2.60	2.70	2.60

13. DENMARK.

Average Earnings per Hour of Smiths, Engineers and Engineer Labourers in the Metallurgical Industry of Copenhagen and the Provinces.

Source: *Statistisches Jahrbuch für das Deutsche Reich, 1924-25 and 1926.*

Period	Smiths and engineers		Labourers	
	Copenhagen Cr.	Provinces Cr.	Copenhagen Cr.	Provinces Cr.
1914.	0.62	0.55	0.49	0.46
First quarter 1920 . .	2.31	2.00	—	—
Second " "	2.40	2.08	—	—
Third " "	2.56	2.22	—	—
Fourth " "	2.68	2.32	—	—
First quarter 1921 . .	2.62	2.24	2.10	1.86
Second " "	2.33	2.01	1.89	1.67
Third " "	2.30	1.93	1.76	1.55
Fourth " "	2.29	1.92	1.73	1.54
First quarter 1922 . .	—	—	—	—
Second " "	1.89	1.59	1.47	1.29
Third " "	1.92	1.60	1.46	1.30
Fourth " "	1.93	1.59	1.45	1.29
First quarter 1923 . .	1.80	1.50	1.39	1.24
Second " "	1.81	1.49	1.39	1.24
Third " "	1.81	1.50	1.40	1.24
Fourth " "	1.85	1.54	1.43	1.27
First quarter 1924 . .	1.89	1.56	1.47	1.30
Second " "	—	—	—	—
Third " "	1.90	1.59	1.48	1.31
Fourth " "	1.95	1.62	1.51	1.34
First quarter 1925 . .	1.97	1.64	1.51	1.34
Second " "	—	—	—	—
Third " "	1.98	1.65	1.54	1.37
Fourth " "	2.01	1.68	1.54	1.37

14. HUNGARY.

Average Wages per Hour in the Metallurgical and Engineering Industries of Hungary.

Source: *Statistisches Jahrbuch für das Deutsche Reich, 1924-25 and 1926.*

Period	Skilled workers	Unskilled workers
	Cr.	Cr.
First half-year 1914	0.71	0.37
December 1919	4.60	2.72
» 1920	12.43	8.31
» 1921	23.27	15.13
» 1922	122.60	71.23
» 1923	2,293	1,236
January 1924	2,506	1,317
April 1924	7,147	3,685
June 1924	9,363	4,862
September 1924	9,505	5,077
January 1925	9,877	5,271

15. JAPAN.

Average Wage per Day of Metal-workers.

Source: *Statistisches Jahrbuch für das Deutsche Reich, 1924-25.*

Nature of work	1924	Second half of 1925
	Yen	Yen
Turners	2.31	2.29
Fitters	2.33	2.36
Founders	2.21	2.20
Smiths	2.18	2.20
Wood-patternmakers	2.34	2.36

16. POLAND.

Agreed Wages per Hour in the Warsaw Engineering Industry.

Source: *Statistisches Jahrbuch für das Deutsche Reich, 1924-25.*

Nature of work	1925			
	January 1st Zloty	April 1st Zloty	July 1st Zloty	October 1st Zloty
Fitters	0.75	0.75	0.76	0.77
Iron-moulders	0.75	0.75	0.76	0.77
Pattern-makers	0.75	0.75	0.76	0.77
Turners	0.75	0.75	0.76	0.77
Unskilled labourers	0.47	0.47	0.47	0.50

17. NORWAY.

(a) *Average Wages per Hour (including wages regulated by agreement) in the Chief Centres of the Norwegian Iron and Metallurgical Industries.*

Source: *Wirtschaft und Statistik*, 1925, page 307, and *Statistisches Jahrbuch für das Deutsche Reich*, 1924-25, page 109.

Nature of work	November 1921	November 1922	November 1923	November 1924
	Cr.	Cr.	Cr.	Cr.
Skilled workers	2.43	1.78	1.73	1.94
Labourers	1.95	1.52	1.64	1.58

(b) *Wages per Day in the Norwegian Engineering Industry.*

Source: *Arbeidsgiveren, organ for norsk arbeidsgiverforening*, No. 9, of August 28th, 1922. (From "Enquête sur la Production", Vol. IV, 1, page 705.)

Year	Crowns	Index No.
1914	5.25	100
November 1920	20.08	382.4
" 1921	17.86	340.1

(c) *Agreed Wages per Hour in the Oslo Engineering Industry.*

Source: *Statistisches Jahrbuch für das Deutsche Reich*, 1924-25 and 1926.

Nature of work	1924		1925	
	July 1st, August 1st, September 1st, Crowns	October 1st, November 1st, December 1st, Crowns	January 1st Crowns	April 1st, July 1st, Oct. 1st and Dec. 1st Crowns
Fitters	1.50	1.59	1.59	1.75
Iron-moulders	1.50	1.59	1.59	1.75
Pattern-makers	1.50	1.59	1.59	1.75
Turners	1.50	1.59	1.59	1.75
Unskilled labourers	1.40	1.33	1.33	1.49

18. FINLAND.

Average Earnings per Hour of Metal-workers in Finland.

Source: *Statistisches Jahrbuch für das Deutsche Reich*, 1924-25.

Nature of work	July 1913	July 1923	July 1924
	Finn. M.	Finn. M.	Finn. M.
Smiths	0.504	5.760	6.231
Founders	0.478	6.417	7.463
Filers	0.502	5.844	6.500
Turners	0.524	6.134	6.861

19. AUSTRALIA.

Minimum Weekly Wages in the Sydney and Melbourne Engineering Industry
(Unweighted average for both cities).

Source: *Statistisches Jahrbuch für das Deutsche Reich, 1924-25.*

Nature of work	1914	1921	1922		1923		1924	
	July	Dec. 31st	June 30th	Dec. 31st	June 30th	Dec. 31st	June 30th	Dec. 31st
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Coppersmiths	69 0	124 7	104 11	106 9	106 0	114 3	109 9	108 6
Pattern-makers	73 0	134 0	111 10	112 9	112 0	120 3	115 9	117 6
Fitters	68 0	124 7	104 11	106 9	106 0	114 3	109 9	108 6
Turners	68 0	124 7	104 11	106 9	106 0	114 3	109 9	108 6
Labourers	47 3	85 6	84 6	82 6	81 6	86 0	87 3	85 2

20. NEW ZEALAND.

Average Minimum Weekly Wages in the Mechanical Engineering Industry.

Source: *New Zealand Official Year-Book, 1925, page 728.*

On March 31st	Fitters	Motor mechanics
	s. d.	s. d.
1911	61 5½	64 11½
1912	64 7½	64 11½
1913	64 7½	64 11¾
1920	84 2½	88 1½
1921	102 5¼	101 ¾
1922	100 10	101 9
1923	94 5	94 5
1924	94 5	94 5

21. RUSSIA.

Average Monthly Earnings of Metallurgical Industry Workers in Moscow.

Source: *Statistisches Jahrbuch für das Deutsche Reich, 1924-25 and 1926.*

Month	Earnings in chervonetz roubles
1913	33.4 (gold roubles)
1924 January	61.22
April	58.13
July	69.82
October	79.10
1925 January	74.45
April	74.28
July	85.45
October	85.84

Ad No. 8.

CUSTOMS TARIFFS, AND IMPORT AND EXPORT PROHIBITIONS AND LICENCES

FOREWORD.

In the following tables and observations with regard to Chapter 8, an outline is given of the duties on machinery and of the main features of the commercial policy of 25 countries importing machinery. For lack of space it has only been possible as a rule to include in the tables the most important machinery items of the different Customs tariffs; thus throughout we have given the duties in force in 1913 and in the autumn of 1926 for six groups of machinery (machine tools, textile and agricultural machinery, power engines and printing machinery, together with the products falling under the heading of "machinery not specified" in the various tariffs); at the same time it has not always been possible to give the individual duties (particularly in the case of graduated duties) even within these groups.

1. UNITED STATES.

Tariff number	Goods	Customs duty	
		1913	1926
372	<i>Machine tools</i>	15% <i>ad val.</i>	30% <i>ad val.</i>
372	<i>Textile machinery</i>	25% <i>ad val.</i>	35% <i>ad val.</i>
1504	<i>Agricultural machinery</i>	free	free
	Cream separators valued at more than \$50 . .	—	25% <i>ad val.</i>
372	<i>Engines:</i>		
	Steam engines	15% <i>ad val.</i>	15% <i>ad val.</i>
	Internal-combustion engines	20% <i>ad val.</i>	30% <i>ad val.</i>
372	<i>Printing machinery</i>	15% <i>ad val.</i>	30% <i>ad val.</i>
372	<i>Machinery not specified</i>	20% <i>ad val.</i>	30% <i>ad val.</i>

There are not at the present time nor were there before the war any tariff discriminations in America between the imported goods of particular countries or import prohibitions for products of the mechanical engineering industry.

1. GREAT BRITAIN.

Machinery of all kinds and from all countries are *duty free*.
There are no import prohibitions or restrictions.

3. GERMANY.

Tariff number	Goods	Duty in Reichsmarks per 100 kilog.			
		1913		1926	
		General	Con-ventional	General	Con-ventional
904	<i>Machine tools weighing:</i>				
	(1) 250 kgs. or less	20	12	20	—
	(2) over 250 kgs. up to 1,000 kgs.	12	8	12	—
	(3) » 1,000 » » » 3,000 »	8	6	8	—
	(4) » 3,000 » » » 100,000 »	6	5	6	—
	(5) » 100,000 kgs.	4	—	4	—
	<i>Textile machinery:</i>				
Ex 899	Machines for spinning and twisting. .	6	4	12	—
900	Looms:				
	(a) ribbon looms.	5	4.50	7	—
	(b) other	5	4.50	7.50	—
	<i>Agricultural machinery:</i>				
905	(a) Ploughs and other agricultural implements to be driven by mechanical motive power without their motive machinery	4	—	4	—
	Reaping machinery	4	—	8	—
906C.	(b) Cream separators weighing:				
	50 kilogrammes or less	12 or 15	10	25	20
	more than 50 kgs.	3 to 12	3 to 10	20	14
894	<i>Motive machinery (except electric motors) weighing:</i>				
	(1) 40 kgs. or less.	100	75	100	—
	(2) over 40 kgs. up to 100 kgs.	60	—	60	—
	(3) » 100 » » » 200 »	38	—	38	—
	(4) » 200 » » » 500 »	25	—	25	—
	(5) » 500 » » » 1,000 »	18	11	18	—
	(6) » 1,000 » » » 2,500 »	13	7.50	13	—
	(7) » 2,500 » » » 5,000 »	10	6	10	—
	(8) » 5,000 » » » 50,000 »	7	5	7	—
	(9) » 50,000 » » » 100,000 »	5.50	4.50	5.50	—
906D.	(10) » 100,000 »	3.50	—	3.50	—
	<i>Other machinery not specially mentioned¹ weighing:</i>				
	(1) 40 kgs. or less	15	10	15	—
	(2) over 40 kgs. up to 100 kgs.	12	10	12	—
	(3) » 100 » » » 200 »	10	7	10	—
	(4) » 200 » » » 400 »	9	6	9	—
	(5) » 400 » » » 1,000 »	7	5	7	—
	(6) » 1,000 » » » 5,000 »	5.50	4	5.50	—
	(7) » 5,000 » » » 10,000 »	4.50	4	4.50	—
	(8) » 10,000 »	3	3	3	—

¹ Including agricultural machinery and printing machines not mentioned above.

4. FRANCE.

Tariff number	Goods	Duty in gold francs ¹ per 100 kilogrammes				
		1913		1926		
		General tariff	Minimum tariff	General tariff	Minimum tariff	For Germany
525	<i>Machine tools weighing:</i>					
	More than 25,000 kgs.	15	10	39.2	9.8	39.3
	5,000 to 25,000 »	18	12	47.2	11.8	11.8
	1,000 » 5,000 »	24	16	62.8	15.7	28.3
	250 » 1,000 »	36	24	94	23.5	37
	250 kgs. and less	75	50	196	49.0	19.6
	<i>Textile machinery:</i>					
517	Throstles for spinning or twisting	18	12	71.6	17.9	71.6
517	Other spinning machines.	15	9	53.6	13.4	53.6
518	Looms.	12	8	47.6	11.9	47.6
	<i>Agricultural machinery:</i>					
522	Cream separators	23	15	60 % <i>ad val.</i>	15 % <i>ad val.</i>	15 % <i>ad val.</i>
	Parts of same.	23	15	60 % <i>ad val.</i>	15 % <i>ad val.</i>	60 % <i>ad val.</i>
	Mowers, reapers, combined reapers and binders	15	12	28.60	7.15	8.75
	Other:					
	Weighing 400 kgs. or above					
	Not specially mentioned	15	12	53.80	13.45	16.5
	Chopping machines, spring harrows, cultivators and ploughs.					13.45
	Seed drills					22.70
	Weighing less than 400 kgs.					
	Not specially mentioned	23	15	67.40	16.85	20.65
	Chopping machines, spring harrows, cultivators and ploughs over 150 kgs.					16.80
	Seed drills					28.30
	<i>Engines and motors of all kinds, with piston, weighing:</i>					
510	over 100,000 kgs.	18	12	43.80	10.95	13.45
	50,000 to 100,000 »	21	14	51	12.75	15.7
	1,000 » 50,000 »	24	16	58.4	14.6	18.—
	250 » 1,000 »	27	18	65.6	16.4	20.20
	100 » 250 »	39	26	94.8	23.7	29.20
	50 » 100 »	54	36	131.2	32.8	40.5
	less than 50 »	60	40	146.—	36.5	45.—
	The tariffs given in the last columns do not apply to semi-Diesel and similar motors, for which the duties are 77.5 per cent higher.					
521	<i>Presses and machines for printing, weighing:</i>					
	10,000 kgs. and above	14	9	32.20	8.5	32.20
	less than 10,000 kgs.	18	12	42.80	10.70	20.50
525 f	<i>Machines and apparatus not elsewhere mentioned.</i>	15	10	37.80	9.45	37.80

Before the war the United States, Great Britain and Germany were granted the minimum rates. As regards textile machinery only, the United States were subject to a surtax of 50 per cent above the minimum tariff. At the present time Great Britain and the United States, but not Germany, enjoy the minimum tariff, while, as before the war, American textile machinery is subject to a surtax of 50 per cent.

¹ The 1926 duties fixed in paper francs have been converted into gold francs at the rate of November 16th, 1926 (100 paper francs = 17.5 gold francs).

5. SWITZERLAND.

Tariff number	Goods	Duty in Swiss francs per 100 kilog.			
		1913		1926	Provisional general tariff ¹ of 5.XI.25
		General	Conventional	Tariff in use for 1921	
	<i>Machine tools:</i> The machines specified below under Statistical No. M. 6: M. 6. Machine tools for working metal, wood, stone, etc. weighing, per piece:				
894 c	50,000 kgs. and over	8	5	15	20
894 d	10,000 to 50,000 kgs.	8	6	15	20
895 b	2,500 » 10,000 »	10	7	20	30
896 b	500 » 2,500 »	12	8	20	40
897 b	100 » 500 »	16	12	30	50
898 b	less than 100 kgs.	20	16	35	60
	<i>Textile machinery:</i>				
884	Spinning machinery, including machinery for the preparation and transport of materials for spinning: twisting machines, including doubling and reeling machines, gassing and glazing machines, winding machines	8	4	15	25
885	Looms	8	4	15	25
	<i>Agricultural machinery:</i>				
Ex 893 a	Pulverisers, winnowing and sorting machines for grain and seeds; centrifugal skimming machines	8	4	15	—
893 b	Other agricultural machinery such as seed drills, reaping machines, threshing machines, etc.	8	7	20	30
	<i>Motors:</i> The machines specified below under M. 3, M. 4 and M. 5: ex M. 3. Hydraulic and wind motors ex M. 4. Non-portable steam engines; steam locomobiles; steam turbines; also in combination with motors. ex M. 5. Motors driven by gas, petrol, benzine, hot air, compressed air and all other motors. Duties according to tariff items 894c to 898b for machine tools (cf. under "Machine tools").				
	<i>Printing machines:</i> Machines for typographic printing and other graphic processes; bookbinding machines:				
890 a	Printing presses	6	2	20	30
890 b	Other	6	2	10	30

¹ The provisional general tariff of November 5th, 1926, is not yet in force.

5. SWITZERLAND (continued).

Tariff number	Goods	Duty in Swiss francs per 100 kilog.			
		1913		1926	Provisional general tariff ¹ of 5.XI.25
		General	Conventional	Tariff in use for 1921	
	<p><i>Machines not specially mentioned:</i> Machines specified below under Statistical No. M. 9. M. 9. Machinery and machine tools of all kinds not elsewhere specified in the general tariff. Duties according to tariff items 894c to 898 b for machine-tools (cf. under "Machine tools").</p>				

Before the war the lowest duties (cf. column 1913, conventional) were applied to imports from all countries exporting machinery. In 1926 the duties of the tariff in use for 1921 were raised all round. No discrimination is made.

The last import prohibitions imposed in the post-war period lapsed on December 31st, 1925.

6. SWEDEN.

Tariff number	Goods	Duty in Swedish crowns per 100 kilog.	
		1913	1926
1005	<p><i>Machine tools:</i> Machines for drilling metals provided they do not exceed 500 kgs. net weight each</p>	7	7
	<p>Drilling machines, weighing more than 500 kgs. net each, and lathes; milling, planing, worming and polishing machines for metal work; other machines for cutting metals but not clipping machines; also mandrils (spindle, pinol and support mandrils) and supports; exchange boxes and dividing apparatus, weighing each:</p>		
1006	Not more than 250 kgs.	20	20
1007	More than 250 kgs. but not more than 1,000	16	16
1008	» » 1,000 » » » » 2,000	14	14
1009	» » 2,000 » » » » 5,000	10	10
1010	» » 5,000 » » » » 10,000	7.50	7.50
1011	» » 10,000 »	5	5
	<p>Lathes and milling, planing, sawing, drilling and chiselling machines intended for woodworking; also all other woodworking machines not specially mentioned and all kinds of machines for working cork, weighing each:</p>		
1014	Not more than 250 kgs.	25	25
1015	More than 250 kgs. but not more than 5,000.	12	12
1016	Not more than 5,000 kgs.	8	8
	<p><i>Textile machinery:</i> Textile machines of all kinds except sewing and knitting machines .</p>	10%	10%
Ex 1034		<i>ad val.</i>	<i>ad val.</i>

¹ The provisional general tariff of November 5th, 1926, is not yet in force.

Tariff number	Goods	Duty in Swedish crowns per 100 kilogs.	
		1913	1926
	<i>Agricultural machinery :</i>		
1025	Ploughs, including also steam ploughs, double-mould-board ploughs and subsoil ploughs; harrows and other agricultural appliances similar to harrows; reaping and harvesting machines; horse rakes, hay tedders, weeders, horse hoes and other appliances not specially mentioned for sowing or reaping; screening and winnowing machines, etc., seed sorters and other appliances not specially mentioned for sorting, purifying and cleaning seeds, grains, etc.; potato and peat grinding machines; root cutters; rotary crushers (also seed and oilcake crushers) and mashing mills; chaff-cutting machines and other machines for cutting up cattle food; also sheaf elevators and other stacking machines	6	6
1027	Threshing machinery, straw and hay presses and seed drills.	7	7
1028	Fertiliser sprinklers.	6	6
	Milk-skimming machines of all makes, also milk separators, milk centrifuges and radiators; also emulsors, centrifugal butyrometers and yeast and mud centrifuges:		
1029	To be worked by mechanical power	15	15
1030	To be worked by hand or foot power even if provided with a belt pulley	25	25
	Bowls for separators and centrifugal butyrometers, weighing per article:		
1031	Not more than 10 kgs.; also complete parts of such bowls of all kinds.	150	150
1032	Of greater weight	100	100
	<i>Motors :</i>		
	Gas, photogen, benzine and other combustion and explosion motors; also hot-air motors, weighing each:		
992	Not more than 500 kgs.	10% <i>ad valorem</i>	
993	More than 500 kgs. but not more than 1,500 kgs.	20	20
994	" " 1,500 " " " " 5,000 "	12	12
995	" " 5,000 " " " " 25,000 "	9	9
996	" " 25,000 "	6	6
	<i>Printing machines :</i>		
1017	Mechanical presses, also double-movement and rotary presses, accessories, and all kinds of lithographic presses, including phototypic presses; also type-casting and composing machines and matrices intended for such machines	free	free
1018	Platen presses, including also hand presses (not lithographic) and proof presses	12	12
<i>Ex</i> 1034 ¹	Mechanical presses of other kinds than those mentioned under Tariff Nos. 1017 and 1018.	10% <i>ad val.</i>	free
	<i>Machines not specially mentioned</i>		
1034	Machines of all kinds not mentioned elsewhere in the tariff	10% <i>ad val.</i>	10% <i>ad val.</i>

The Swedish Customs tariff is a uniform one. No duties other than those mentioned above have been or are charged in Sweden.

There are no import prohibitions or restrictions.

¹ According to the Commercial Treaty between Germany and Sweden in force since August 1st, 1926, printing presses *ex* Tariff No. 1034 are admitted free of duty into Sweden. In virtue of the most-favoured-nation clause, this privilege is also granted to similar products of all the chief machinery-exporting countries.

7. CANADA.

Tariff number	Goods	Duty of general tariff ¹	
		1913	1926
453	<i>Machine tools</i>	27 ½% <i>ad val.</i>	27 ½% <i>ad val.</i>
468	<i>Textile machinery:</i> (With the exception of sewing machines and textile machinery produced by the home country ²)	10% <i>ad val.</i>	10% <i>ad val.</i>
	<i>Agricultural machinery:</i>		
446 <i>b</i>	(a) Ploughs	25% <i>ad val.</i>	10% <i>ad val.</i>
447 <i>b</i>	(b) Threshing machines	20% <i>ad val.</i>	10% <i>ad val.</i>
445	(c) Harvesters	17 ½% <i>ad val.</i>	6% <i>ad val.</i>
446	(d) Cultivators and seed drills	20% <i>ad val.</i>	7 ½% <i>ad val.</i>
446	(e) Harrows, horse-rakes, etc.	25% <i>ad val.</i>	7 ½% <i>ad val.</i>
447	(f) Locomobiles and other traction engines	20% <i>ad val.</i>	17 ½% <i>ad val.</i> ³
448	(g) Other agricultural machinery	25% <i>ad val.</i>	10% <i>ad val.</i>
453	<i>Motors</i>	27 ½% <i>ad val.</i>	27 ½% <i>ad val.</i>
	<i>Printing machines:</i>		
442	(a) Printing presses, bookbinding machines and machines for treating paper	10% <i>ad val.</i>	10% <i>ad val.</i>
	(b) Newspaper-printing presses; type-casting and composing machines	free	free
453	<i>Machines not specially mentioned</i>	27 ½% <i>ad val.</i>	27 ½% <i>ad val.</i>

8. NETHERLANDS.

By far the greater number of machines and apparatus may be imported duty-free into Holland, as before the war. No discrimination is made between products from countries with which treaties have been concluded and those with which no treaties exist. There are no import prohibitions or restrictions.

¹The duties on machinery in the general tariff are applied to all countries except Great Britain and are therefore also applicable for example to the United States and Germany. A few European countries, however (such as France, Sweden, Norway and Switzerland), enjoy concessions and reductions on the Canadian mean tariff with regard to individual items, e.g. they pay an *ad valorem* duty of 22 ½ per cent on machines not specially mentioned. Great Britain enjoys highly preferential treatment on nearly all items.

²Textile machines produced by the home country (with the exception of sewing machines) are subject to the duties of Tariff No. 453 (machines not specially mentioned).

³Gas and gasolene tractors are duty-free.

9. BELGIUM.

Tarif number	Goods	Duty in gold francs ¹ per 100 kgs.		
		1913	1926	
			Minimum tariff	Maxim. tariff
	<i>Machine tools:</i>			
1040	Machine tools weighing:			
	25,000 or more.	2-4	9.3	27.9
	10,000 to 25,000 kgs.	2-4	11.6	34.8
	5,000 to 10,000 kgs.	2-4	13.9	41.7
	1,000 to 5,000 kgs.	2-4	16.2	48.6
	250 to 1,000 kgs.	2-4	23.2	69.6
	Less than 250 kgs.	2-4	46.4	139.2
	<i>Textile machinery:</i>			
1046	Throstle frames, complete, for spinning and twisting.	2-4	10.2	30.6
1047	Other spinning machinery, winding-machines, etc., complete.	2-4	8.1	24.3
1048	Looms	2-4	8.1	24.3
	<i>Agricultural machinery:</i>			
1057	Agricultural machines (not including motors) and detached parts thereof:			
	(a) Cream separators.	2-4	18.1	54.4
	(b) Threshing machines and sorters and other machines chiefly of wood.	10% ad val.	10.9	32.7
	(c) Ploughs, cultivators, extirpators, potato ploughs, etc.; mechanical reaping machines, seed drills, hay-tedding machines, and other agricultural machines not specially mentioned:			
	1. Harvesters (ordinary reapers, reapers and binders of all kinds), bone crushers, automatic fodder cases, hay unloaders, tedders and tedding rakes, mowers, pasturisers and milk refrigerators. . .	2	1.8	5.4
	2. Other.	2	5.8	17.4
	<i>Motors:</i>			
1025	Fixed steam engines without their boilers; steam pumps and other mechanically-worked pumps, compressors for air and gas of various kinds, gas engines, oil engines, alcohol engines, hot-air engines, compressed-air engines and engines worked by any other gaseous or explosive mixture and all other engines not specially mentioned:			
	(a) With piston, weighing:			
	50,000 kgs. or more	2-4	8.1	24.3
	10,000 and up to 50,000 kgs.	2-4	10.9	32.7
	2,500 " " " 10,000 "	2-4	13	39
	1,000 " " " 2,500 "	2-4	16.3	48.9
	500 " " " 1,000 "	2-4	19.5	58.5
	250 " " " 500 "	2-4	27.1	81.3
	100 " " " 250 "	2-4	32.6	97.8
	50 " " " 100 "	2-4	43.5	130.5

¹ The 1926 duties fixed in paper francs have been converted into gold francs on the basis of the "belga" (rate of November 1926).

Tariff number	Goods	Duty in gold francs per 100 kgs.		
		1913	1926	
			Minimum tariff	Maxim. tariff
E.r 1064	Less than 500 kgs.	2-4	54.4	163.2
	(b) Without piston, weighing:			
	50,000 kgs. or more	2-4	20.3	60.9
	5,000 and up to 50,000 kgs.	2-4	24.4	73.2
	500 and up to 5,000 kgs.	2-4	30.5	91.5
	Less than 500 kgs.	2-4	45.6	136.8
	<i>Printing machines:</i>			
	Machines not specially mentioned in the tariff:			
	(b) Of cast iron, wrought iron or steel, weighing:			
	10,000 and up to 50,000 kgs.	2-4	6	18
	2,500 » » » 10,000 »	2-4	9.3	27.9
	1,000 » » » 2,500 »	2-4	10.5	31.5
500 » » » 1,000 »	2-4	13.9	41.7	
250 » » » 500 »	2-4	18.5	55.5	
100 » » » 250 »	2-4	23.3	69.9	
50 » » » 100 »	2-4	29	87	
Less than 50 kgs.	2-4	34.8	104.4	
1064	Machines, engines and apparatus not specially mentioned in the tariff:			
(a) Of aluminium or containing not less than 10 per cent of aluminium, weighing:				
250 kgs. or more.	40	46.4	139.2	
Less than 250 kgs.	40	58	174	
(b) Of cast iron, wrought iron or steel, weighing:				
50,000 kgs. or more	2-4	5.8	17.4	
10,000 and up to 50,000 kgs.	2-4	6	18	
2,500 » » » 10,000 »	2-4	9.3	27.9	
1,000 » » » 2,500 »	2-4	10.5	31.5	
500 » » » 1,000 »	2-4	13.9	41.7	
250 » » » 500 »	2-4	18.5	55.5	
100 » » » 250 »	2-4	23.3	69.9	
50 » » » 100 »	2-4	29	87	
Less than 50 kgs.	2-4	34.8	104.4	
(c) Of copper or containing more than 50 per cent of copper, weighing:				
250 kgs. or more.	12	40.6	121.8	
Less than 250 kgs.	12	58	174	
(d) Containing not less than 10 per cent but not more than 50 per cent of copper, weighing:				
250 kgs. or more.	12	23.3	69.9	
Less than 250 kgs.	12	29	87	
(e) Of wood	10%	10%	30%	
	<i>ad valor.</i>	<i>ad valor.</i>	<i>ad valor.</i>	
(f) Of any other material	12	10%	30%	
	<i>ad valor.</i>	<i>ad valor.</i>	<i>ad valor.</i>	

The *lowest* duties given above have been or are applied to the mechanical engineering products of all the chief machinery-exporting countries. The maximum tariff given for 1926 is not applied to any country.

There are no import prohibitions or restrictions.

NOTE. Machines and the like were taxed before the war according to the material of which they were made, viz:

Machines of cast iron at the rate of	Belgian francs	2 per 100 kgs.
„ „ wrought iron at the rate of	4 „	100 „
„ „ aluminium at the rate of	40 „	100 „
„ „ copper and other materials at the rate of	12 „	100 „
„ „ wood	10%	<i>ad val.</i>

10. CZECHOSLOVAKIA.

Tariff number	Goods	Duty in Austrian gold crowns ¹ per 100 kgs.			
		1913		1926	
		General	Conventional	General	Conventional
538	<i>Machine tools:</i>				
	Metal-working machines weighing each:				
	(a) 200 kgs. or less	30	26	109.50	65.70
	(b) 200 to 1,000 kgs.	28	24	102.50	61.40
	(c) over 1,000 kgs.	24	16-21	87.60	52.60
529	<i>Wood-working machines:</i>				
	Saw frames	24	13.50-18	87.60	39.50
	Other			87.60	52.60
531/33	<i>Textile machinery:</i>				
	Spinning machines	15	5	6.60	
	Looms	15	14	6.60	
530	<i>Agricultural machinery:</i>				
	(a) Steam ploughs.	10		36.50	
	(b) Threshing machines	18	17	47.30	26.30
	(c) Other (of iron)	24	20 ²	63.—	28.—
	(d) Centrifugal cream separators	24		105.30	52.60
528	<i>Motors weighing:</i>				
	(a) 200 kgs. or less	40		146.—	58.50 ³
	(b) 200 to 2,500 kgs.	32		117.—	46.75 ³
	(c) 2,500 to 10,000 kgs.	26	22	95.—	38.— ³
	(d) 10,000 to 100,000 kgs.	22	19-21	80.50	32.20 ³
	(e) over 100,000 kgs.	20	18	73.—	29.20 ³
538	<i>Printing machines weighing:</i>				
	(a) 200 kgs. or less	30	24	13.20	
	(b) 200 to 1,000 kgs.	28	22	12.30	
	(c) over 1,000 kgs.	24	16-20	10.50	
538	<i>Machines not specially mentioned, weighing:</i>				
	(a) 200 kgs. or less	30	24	109.50	45.60-86.—
	(b) 200 to 1,000 kgs.	28	22	102.50	40.3-66.5
	(c) over 1,000 kgs.	24	16-20	87.60	43.8-57.—

In 1913 the United States, Great Britain and Germany had most-favoured-nation rights in Austria, and they now enjoy the same rights in Czechoslovakia.

At the present time, import licences are still necessary in Czechoslovakia. Of the machines mentioned above, the following are exempt from this obligation: wood-working, textile, agricultural, shoe-making and tanning machinery.

¹ The 1926 duties fixed in Czechoslovak crowns have been converted into gold crowns at the rate of November 16th, 1926 (100 Czechoslovak crowns = 14.6 gold crowns).

² With the exception of reaping machines.

³ These conventional duties are only applicable to explosion and internal-combustion engines.

AUSTRIA.

Tariff number	Goods	Duty in gold crowns per 100 kgs.			
		1913		1926	
		General	Conventional	General	Conventional
441 c.	<i>Machine tools:</i>				
	Metal-working machines weighing:				
	(1) 10,000 kgs. or more.	24	16	32	24
	(2) 10,000 kgs. to 1,000 kgs. . . .	24	18-21	45	28
	(3) 1,000 to 200 kgs.	28	24	58	33
	(4) Under 200 kgs.	30	26	70	38
	Wood-working machines weighing:				
	(1) 10,000 kgs. or more.	} 24	13.50	32	22
	(2) 10,000 to 2,000 kgs.		18	45	25
	2,000 to 1,000 kgs.		18	45	28
(3) 1,000 to 200 kgs.	18		58	33	
(4) Under 200 kgs.	18		70	35	
Textile machinery:					
440 c.	Spinning machines	15	5	free	free
400 b.	Looms:				
	For cotton and linen	15	14	20	16
	For cloth	15	14	20	
	All other.	15	14	20	13
439	<i>Agricultural machinery:</i>				
	(a) Steam ploughs	10		10	
	(b) Threshing machines	18	17	25	15
	(c) Milk separators	24		40	35
	(d) Other (of iron)	24	20 ¹	24	18
438	<i>Engines weighing:</i>				
	(a) 100,000 kgs. or more	20	18		
	Steam engines			28	18
	Combustion motors			28	20
	(b) 100,000 to 10,000 kgs.	22	19-21		
	Steam engines			35	24
	Combustion motors			35	25
	(c) 10,000 to 2,500 kgs.	26	22		
	Steam engines			40	26
	Combustion motors			40	30
	(d) 2,500 to 1,000 kgs.	32			
	Steam engines			45	
Combustion motors			45	38	
(e) 1,000 to 200 kgs.	32				
Steam engines			60		
Combustion motors			60	38	
(f) Under 200 kgs.	40		65		
441 c.	<i>Printing machines weighing:</i>				
	(1) 10,000 kgs. or more.	24	16		
	Mechanical presses, rotary machines and flat printing rotary machines.			32	22
	Other			32	
	(2) 10,000 to 1,000 kgs.	24	18-20		
	Hand and mechanical presses, rotary machines.			45	35

¹ With the exception of reaping machines.

Tariff number	Goods	Duty in gold crowns per 100 kgs.			
		1913		1926	
		General	Con-ventional	General	Con-ventional
441 c.	<i>Printing machines weighing (continued):</i>				
	Flat printing machines over 7,000 kgs.			45	30
	Other			45	
	(3) 1,000 to 200 kgs.	28	22		
	Hand and mechanical presses, rotary machines			58	40
	Other			58	
	(4) Weighing under 200 kgs.	30	24	70	
	<i>Machines not specially mentioned weighing</i>				
	(1) 10,000 kgs. or more	24	16	32	20-26
	(2) 10,000 to 1,000 kgs.	24	18-20	45	25-35
(3) 1,000 to 200 kgs.	28	22	58	30-40	
(4) Less than 200 kgs.	30	24	70	32-45	

Germany, United States and Great Britain now, as in 1913, enjoy most-favoured-nation treatment, i.e. duties at the conventional rates.

12. ITALY.

Tariff number	Goods	Duty in gold lire per 100 kgs.			
		1913		1926	
		General	Con-ventional	General	Con-ventional
403	<i>Machine tools:</i>				
	(a) Not automatic, weighing:				
	(1) Over 10,000 kgs.	9	—	28.80	25.60
	(2) From 5,000 to 10,000 kgs.			34.20	28.80
	(3) From 1,000 to 5,000 kgs.			48	38.40
	(4) From 100 to 1,000 kgs.			64	51.20
	(5) Up to 100 kgs.			90	72
(b) Automatic, weighing:					
(1) More than 5,000 kgs.	9	—	15% surtax	10% surtax	
(2) From 1,000 to 5,000 kgs.			25% "		
(3) Up to 1,000 kgs.			50% "		
414	<i>Spinning machinery:</i>				
	(a) For preparing	10	6	15	15
	(b) Other, weighing				
	(1) Other 3,000 kgs.			28	
(2) From 1,000 to 3,000 kgs.	32				
415	(3) Up to 1,000 kgs.			36	
	<i>Weaving machinery:</i>				
	(a) Frames with an automatic movement	10	6	15	15
	(b) Other, weighing:				
(1) Other 3,000 kgs.	28				
(2) Over 1,000 and up to 3,000 kgs.	32				
(3) Up to 1,000 kgs.			36		

Tariff number	Goods	Duty in gold lire per 100 kgs.			
		1913		1926	
		General	Conventional	General	Conventional
407	<i>Agricultural machinery</i> ¹ :				
	(a) Ploughs and other machines for preparing the soil, weighing:				
	(1) Over 3,000 kgs.	9	—	21	—
	(2) From 1,000 to 2,000 kgs. . .			24	
	(3) Up to 1,000 kgs.			27	
	(b) Threshing machines:				
	(1) Over 3,000 kgs.	9	—	21	14
	(2) Over 1,000 and up to 3,000 kgs.			24	20.8
	(3) Up to 1,000 kgs.			27	23.4
	(c) 1. Reaping machines	4	—	free	free
	2. Parts of same, weighing:				
	(a) Over 3,000 kgs.	11	10	16.80	10
	(b) From 1,000 to 3,000 kgs.			19.20	
	(c) Up to 1,000 kgs.			21.60	
396	<i>Engines:</i>				
	(a) With pistons:				
	I. Steam engines:				
	(1) Over 20,000 kgs.	12	—	27	18
	(2) Over 10,000 and up to 20,000 kgs.			28.8	19.2
	(3) Over 5,000 and up to 10,000 kgs.			30.6	20.4
	(4) 2,500 to 5,000 kgs.			32.4	21.6
	(5) 1,000 to 2,500 kgs.			36	24
	(6) 500 to 1,000 kgs.			41.4	27.6
	(7) 300 to 500 kgs.			54	54
	(8) 150 to 300 kgs.			72	72
	(9) Up to 150 kgs.			90	90
	II. Internal-combustion engines ² :				
	(1) More than 100,000 kgs.	12	—	32.4	23.4
	(2) " " 50,000 up to 100,000 kgs.			36	26
	(3) " " 20,000 up to 50,000 kgs.			41.4	29.9
	(4) " " 10,000 up to 20,000 kgs.			45	32.5
	(5) " " 5,000 up to 10,000 kgs.			54	36
	(6) " " 2,500 up to 5,000 kgs.			63	42
	(7) " " 1,000 up to 2,500 kgs.			81	49.5
	(8) " " 500 up to 1,000 kgs.			108	66
	(9) " " 300 up to 500 kgs.			126	70
	(10) " " 150 up to 300 kgs.			162	90
	(11) Up to 150 kgs.			180	100

¹ For the sake of simplicity, only a few of the more important agricultural machines have been considered; the present Italian tariff is subdivided to a very great extent as regards agricultural machinery, although formerly the only divisions were " Reaping machines " and " Other ".

² The duties on hydraulic and rotary engines and their subdivision into categories have also enormously increased as compared to 1913.

Tariff number	Goods	Duty in gold lire per 100 kgs.			
		1913		1926	
		General	Conventional	General	Conventional
412	<i>Printing machines :</i>				
	(a) Rotary machines	10	—	18	15
	(b) Other:				
	(1) Over 5,000 kgs.	10	}	32.4	27
	(2) Over 2,000 and up to 5,000 kgs.			36	30
	(3) Over 1,000 and up to 2,000 kgs.			43.2	31.2
(4) Over 500 and up to 1,000 kgs.	50.4			36.4	
(5) Up to 500 kgs.	57.6			57.6	
460	<i>Machinery not specially mentioned, of cast-iron, iron or steel¹ :</i>				
	(1) Over 10,000 kgs.	10	}	48	}
	(2) Over 5,000 and up to 10,000 kgs.			54	
	(3) Over 1,000 and up to 5,000 kgs.			72	
	(4) Over 100 and up to 1,000 kgs.			92	
	(5) Up to 100 kgs.			116	

Germany, Great Britain and the United States have enjoyed and the two last still enjoy most-favoured-nation treatment in Italy. There are no import prohibitions, but there is a strong tendency to diminish imports, which, among other things, has led to the Italian Protective Decree of January 7th, 1926.

13. DENMARK.

Tariff number	Goods	Duty	
		1913	1926
224	<i>All kinds of machinery with the exception of reaping machinery</i>	5% <i>ad val.</i>	5% <i>ad val.</i>
223	<i>Reaping machinery</i>	5% <i>ad val.</i>	free

These duties apply to every country.

¹ Same duties for other machines (not of iron).

14. HUNGARY.

Tariff number	Goods	Duty in gold crowns per 100 kgs.			
		1913		1926	
		General	Con-ventional	General	Con-ventional
826	<i>Metal-working machines</i> according to class and weight	24-30	16-26	28-400	
827	<i>Wood-working machines</i> according to weight	24	13.50-18	40-80	
830	<i>Textile machines</i> (with the exception of sewing machines)	15	5-14	free	
	<i>Agricultural machinery:</i>				
814 a	Steam ploughs	10		60	
814 b	Seed drills and artificial manuring machines	24	20	33	
814 c	Ploughs, harrows and other agricultural machines	24	20	30	
815 a	Reapers	24		14	
815 b	Grass mowers, hay-rakes, etc.	24	20	30	
817	Threshing machines	18	17	50	
819	Other agricultural machinery	24	20	30-50	
	<i>Engines:</i>				
Ex 807	Steam engines weighing:				
	More than 10,000 kgs.	20-22	18-21	50	
	10,000 to 500 kgs.	26-32	22 ¹	75	
	Less than 500 kgs.	32-40		320	
Ex 807	<i>High-speed explosion and combustion motors</i> (except Diesel engines) weighing:				
	More than 400 kgs.	20-32	18-22	130	
	400 to 200 kgs.	32		200	
	200 to 50 kgs.	40		270	
	50 kgs. and less	40		400	
809	Steam and gas turbines weighing:				
	(a) More than 5,000 kgs.	20-26	18-26	100	
	(b) 5,000 kgs. and less	26-40	26	130	
	<i>Printing machines:</i>				
833	Printing machines (except composing machines) weighing:				
	More than 10,000 kgs.	24	16	50	40
	10,000 to 500 kgs.	24-28	18-22	70	50
	500 kgs. and less	28-30	22-24	95	75
	<i>Machines not specially mentioned:</i>				
Ex 836	(b) Of iron, weighing:				
	(1) More than 20 kgs.	24-30	16-24	50	50 ²
	(2) 20 to 5 kgs.			100	70
	(3) 5 kgs. and less			150	120

¹ Only for weights between 2,000 and 10,000 kgs.

² Only for a few types of machinery.

15. JAPAN.

Tariff number	Goods	Customs duty	
		1913	1926
		1 yen = approx. 2 marks 1 kin = 0.60 kgs.	
596	<i>Machine tools:</i> Metal- or wood-working machinery:		
	(1) Up to 25 kgs.	} 15% ad val.	84.40 yen per 100 kin
	(2) » » 100 »		52.60 » »
	(3) » » 500 »		30.50 » »
	(4) » » 1,000 »		24.20 » »
	(5) » » 2,500 »		23.50 » »
	(6) » » 5,000 »		18.50 » »
	(7) » » 20,000 »		16.0 » »
	(8) » » 50,000 »		9.0 » »
	(9) Other		8.0 » »
597	<i>Spinning-machines, etc.</i>	15% ad val.	6.90 » »
598	<i>Looms:</i>		
	(a) Of metal	} 15% ad val.	5.85 » »
	(b) Other		15% ad val.
576	<i>Engines:</i> Steam engines:		
	(1) Up to 250 kgs.	} 15% ad val.	23.10 yen per 100 kin
	(2) » » 1,000 »		13.10 » »
	(3) » » 5,000 »		11.30 » »
	(4) » » 50,000 »		8.20 » »
	(5) Other		15% ad val.
577	<i>Gas and petroleum engines:</i>		
	(1) Up to 100 kgs.	} 15% ad val.	30.— yen per 100 kin
	(2) » » 250 »		20.— » »
	(3) » » 1,000 »		17.70 » »
	(4) » » 2,500 »		17.— » »
	(5) » » 10,000 »		14.70 » »
	(6) » » 50,000 »		13.70 » »
	(7) Other		20% ad val.
603	<i>Printing machines:</i>		
	(1) Up to 250 kgs.	} 5% ad val.	20% ad val.
	(2) Other		16.50 yen per 100 kin
604 ¹	<i>Machines not specially mentioned.</i>	15% ad val.	20% ad val.

¹ This item also includes agricultural machinery.

16. POLAND.

Tariff number	Goods	Russian Customs duty for 1913 in gold roubles per 100 kgs. *		Polish Customs duty for 1926 in gold zlotys per 100 kgs. **			
		General	Conventional	General	Conventional		
	<i>Machine tools:</i>						
167 18	Metal-working machines weighing:						
	(a) 300 kgs. and less			48.25			
	(b) 300 to 750 kgs.			37.50			
	(c) 750 to 2,000 »	34.15	25.70	32.20			
	(d) 2,000 to 4,000 »			19.30			
	(e) 4,000 to 10,000 »			16.10			
	(f) Over 10,000 »			12.85			
167 17c	Wood-working machines			26.80	19.50	20.20	16.10
	<i>Textile machinery:</i>						
167 23	Spinning machines			27.80			
167 20	Looms:						
	(b) hand looms	18.65	12.80	15.40	9.25		
	(c) power looms			18.20	10.95		
	<i>Agricultural machinery:</i>						
167 43	Centrifugal milk separators.	free	free	5.35	3.75		
167 44	Reapers	free	free	2.15			
167 45	Seed drills	7.60	4.60	7.30			
167 46	Ploughs, harrows, cultivators	7.60	4.60	9.—			
	Threshing machines	free	free	9.—			
167 47	Horse rakes	free	free	10.95	7.65		
	Dairy machines	7.60	4.60	10.95	7.65		
	<i>Engines:</i>						
167 9	Steam engines, wind motors, combustion motors up to 3,000 kgs., weighing:						
	(a) 120 kgs. or less			45.—			
	(b) 120 to 300 kgs.			36.40			
	(c) 300 to 750 »	26.80	19.50	28.85			
	(d) 750 to 1,500 »			22.50			
	(e) 1,500 to 3,000 »			19.30			
	(f) 3,000 to 5,000 »			17.15			
	(g) Over 5,000 kgs.			15.—			
167 10	Combustion motors over 3,000 kgs.					11.80	
167 1	<i>Printing machines weighing:</i>						
	(a) 5 kgs. or less			34.25			
	(b) 5 to 25 kgs.	26.80	19.50	27.80			
	(c) 25 to 100 »			21.40			
	(d) 100 to 300 »			16.10			
	(e) Over 300 kgs.			11.80			
167 1	<i>Machines not specially mentioned weighing:</i>						
	(a) 5 kgs. or less			34.25			
	(b) 5 to 25 »	18.65	12.80	27.80			
	(c) 25 to 100 »			21.40			
	(d) 100 to 300 »			16.10			
	(e) Over 300 kgs.			11.80			

* The pre-war Customs duties fixed in Russia in gold roubles for 100 pouds (= 1,638 kgs.) have been converted into gold roubles per 100 kgs.

** The Polish Customs duties fixed in paper zloty per 100 kgs. have been converted into gold zloty at the rate of November 16th, 1926.

The United States, Great Britain and Germany enjoyed the conventioned duties in Russia in 1913. In 1926, on the other hand, the conventional duties in Poland were only applied to the United States and Great Britain, but not to Germany.

Import prohibitions exist for the following products: locomotives and tenders, sewing-machines, transmitter parts with the exception of ball bearings and rollers, typewriters and calculating machines, scales and balances.

Importation may be allowed by special licence.

17. NORWAY.

Tariff number	Goods	Duty	
		1913	1926
424	Machines of all kinds	10% <i>ad val.</i>	10% <i>ad val.</i> ¹

In virtue of Governmental decrees, certain kinds of machinery are, however, admitted free of duty for specific periods; this, for example, is at present the case with regard to wool-weaving looms.

18. AUSTRALIA.

Tariff number	Goods	General tariff	
		1913	1926
174 or 176 <i>f</i>	<i>Machine tools</i>	25% <i>ad val.</i>	10% <i>ad val.</i> ²
176 <i>f</i>	. . . . .		60% <i>ad val.</i> ³
160-165	<i>Textile machinery</i>	25% <i>ad val.</i>	60% <i>ad val.</i> ³
178	<i>Agricultural machinery</i> , according to class. . .	15-25% <i>ad val.</i>	10-35% <i>ad val.</i> ⁴
169	<i>Engines</i>	20% <i>ad val.</i>	60% <i>ad val.</i> ³
	<i>Printing machines</i>	free	10% <i>ad val.</i> ²

¹ Owing to surtaxes, the duties in most cases now amount to 15 per cent of the value.

² Great Britain: free.

³ Great Britain: 45 per cent.

⁴ Great Britain: free up to 22½ per cent *ad valorem*.

19. INDIA.

Tariff number	Goods	Duty	
		1913	1926
87	<i>Machine tools</i>	free	2½% <i>ad val.</i>
87	<i>Textile machinery</i>	free	2½% <i>ad val.</i>
69	<i>Agricultural machinery</i>	free	free
87 ²	<i>Engines</i>	free	2½% <i>ad val.</i>
87 ²	<i>Printing machines</i>	free	2½% <i>ad val.</i>
87 ²	<i>Machines not specially mentioned</i>	free	2½% <i>ad val.</i>

20. ARGENTINE.

Tariff number	Goods	Duty	
		1913	1924
1452-54	<i>Machine tools:</i> Hand-saws, pit-saws, circular-saws, band or blade	5% <i>ad val.</i>	32% <i>ad val.</i>
1247-49	<i>Other machine tools</i>	5% <i>ad val.</i>	free
1247-49	<i>Textile machinery</i>	5% <i>ad val.</i>	free
	<i>Agricultural machinery:</i>		
29	Mowers, harvesters and binders	free	free
33	Threshers	free	free
1273	<i>Fodder-pressing machines</i>	5% <i>ad val.</i>	free
37	Butter-making machines	free	free
819-21	<i>Ploughs</i>	5% <i>ad val.</i>	5% <i>ad val.</i>
1267	<i>Lawn mowers</i>	5% <i>ad val.</i>	5% <i>ad val.</i>
1274-5	<i>Seed drills</i>	5% <i>ad val.</i>	5% <i>ad val.</i>
1413&1416	<i>Harrows</i>	5% <i>ad val.</i>	5% <i>ad val.</i>
1247-49	<i>Agricultural machines not specially mentioned</i>	5% <i>ad val.</i>	free
1247-49	<i>Engines</i>	5% <i>ad val.</i>	free
1247-49	<i>Printing machines</i>	5% <i>ad val.</i>	free
1247-49	<i>Machines not specially mentioned</i>	5% <i>ad val.</i>	free

No discrimination is made between the products of different countries in Argentine, nor was there any such discrimination before the war.

21. BRAZIL

Tariff number	Goods	Duty <i>ad valorem</i> or in reis per kg.	
		1913	1926
1009	<i>Machine tools:</i>		
	Not specially mentioned, weighing:		
	10 kgs. or less		250
	10 » to 50 kgs.		220
	50 » » 100 »		200
	100 » » 250 »		180
	250 » » 500 »		160
	500 » » 1,000 »	} 8% <i>ad val.</i>	140
	1,000 » » 5,000 »		120
	5,000 » » 10,000 »		100
Over 10,000 »	80		
1015	Presses		8% <i>ad val.</i>
1021	Lathes—power-driven		8% <i>ad val.</i>
	Other	300	300
1009	<i>Textile machinery:</i>		
	Not specially mentioned, weighing:		
	10 kgs. or less		250
	10 » to 50 kgs.		220
	50 » » 100 »		200
	100 » » 250 »		180
	250 » » 500 »	} 8% <i>ad val.</i>	160
	500 » » 1,000 »		140
	1,000 » » 5,000 »		120
	5,000 » » 10,000 »		100
	Over 10,000 »		80
	Machines for the preparation of yarn		free
	<i>Agricultural machinery</i>	8% <i>ad val.</i>	free
1008	<i>Engines:</i>		
	A. Steam engines, fixed, weighing:		
	1,000 kgs. or less		200
	1,000 » to 5,000 »		150
	5,000 » » 20,000 »	} 8% <i>ad val.</i>	120
	20,000 » » 100,000 »		100
	Over 100,000 »		90
	C. Combustion and explosion motors weighing:		
	500 kgs. or less		300
	500 kgs. to 1,000 kgs.	} 8% <i>ad val.</i>	220
over 1,000 kgs.	180		
1014	<i>Printing machines</i>	15% <i>ad val.</i>	15% <i>ad val.</i>
1009	<i>Machines not specially mentioned, weighing:</i>		
	10 kgs. or less		250
	10 to 50 kgs.		220
	50 to 100 kgs.		200
	100 to 250 kgs.		180
	250 to 500 kgs.	} 8% <i>ad val.</i>	160
	500 to 1,000 kgs.		140
	1,000 to 5,000 kgs.		120
	5,000 to 10,000 kgs.		100
	over 10,000 kgs.		80

No discrimination is made in Brazil between the products of different countries, nor was any such discrimination made before the war.

22. CHINA

Goods	Duty	
	1913	1926
All machinery	5% <i>ad val.</i>	5% <i>ad val.</i>

23. UNION OF SOUTH AFRICA

Tariff number	Goods	Duty of the general tariff ¹	
		1913	1926
	<i>Machine tools:</i>		
118 <i>b</i>	(a) Fixed, for factory plant	3% <i>ad val.</i>	free
118 <i>d</i>	(b) Other	3% <i>ad val.</i>	3% <i>ad val.</i>
	<i>Textile machinery:</i>		
118 <i>b</i>	(a) Fixed, for factory plant	3% <i>ad val.</i>	free
118 <i>d</i>	(b) Other, for industrial purposes	3% <i>ad val.</i>	3% <i>ad val.</i>
140	(c) Sewing and knitting machines for household use	20% <i>ad val.</i>	15% <i>ad val.</i>
	<i>Agricultural machinery:</i>		
101	(a) Dairy machinery	3% <i>ad val.</i>	free
135	(b) Wool, hay, straw, wine and other similar presses	3% <i>ad val.</i>	free
118 <i>a</i>	(c) All other agricultural machines	3% <i>ad val.</i>	free
	<i>Engines:</i>		
118 <i>b</i>	(a) Fixed, for factory plant	3% <i>ad val.</i>	free
118 <i>d</i>	(b) Other, for industrial purposes	3% <i>ad val.</i>	3% <i>ad val.</i>
103	(c) Ships' engines	3% <i>ad val.</i>	free
118 <i>c</i>	(d) For mining purposes	3% <i>ad val.</i>	free
118	<i>Printing machines.</i>	3% <i>ad val.</i>	3% <i>ad val.</i>
	<i>Machines not specially mentioned.</i>		
118 <i>b</i>	(a) Fixed, for factory plant	3% <i>ad val.</i>	free
118 <i>d</i>	(b) Other, for industrial purposes	3% <i>ad val.</i>	3% <i>ad val.</i>
118 <i>c</i>	(c) For mining purposes	3% <i>ad val.</i>	free

¹ The duties on machinery of the general (maximum) tariff apply to all countries. Great Britain alone in the present year (1926) enjoys preferential treatment on the basis of the minimum tariff, but it is only in respect of machines for industrial purposes (Tariff No. 118a), machines for mining purposes (Tariff No. 118c) and electrical and gas machines (Tariff No. 119) that she has an advantage over other countries through exemption from duty.

24. SPAIN.

Tariff number	Goods	Duty in gold pesetas per 100 kgs.					
		1913			1926		
		1st tariff	2nd tariff	Conventional tariff	1st tariff	2nd tariff	Conventional tariff
	<i>Machine tools:</i>						
	(a) For metal:						
534	Up to 500 kgs. . .	25	25	—	195	95	—
535	501 to 1,000 kgs. . .				225	90	—
536	1,001 » 4,000 »				210	70	—
537	4,001 » 10,000 »	20	20	—	150	50	40
538	Over 10,000 to 20,000 kgs. . .				90	30	27
	(b) For wood:						
539	Up to 250 kgs. . .	25	25	—	275	110	—
540	250 to 500 kgs. . .	25	25	—	255	85	—
541	500 » 1,500 » . .				180	60	—
542	Over 1,500 kgs. . .	20	20	—	150	50	—
554	<i>Textile machinery of all kinds (except knitting and embroidering machines)</i>	20	20	18.50	195	65	—
	<i>Agricultural machinery:</i>						
566	Ploughs				65	25	—
567	Seed drills				130	50	—
568	Machinery for motor cultivation.				50	25	—
569	Mechanical mowers, reapers and harvesters	10	10	—	40	20	—
570	Threshing machines, etc.				50	25	—
572	Chaff-cutters, etc. . .				40	20	—
573	Dairy machinery, etc.				50	25	—
	<i>Engines:</i>						
	Internal-combustion engines:						
493	Up to 1,000 kgs. . .				130	65	—
494	Over 1,000 kgs. . .				120	60	—
	Driven by gasoline, alcohol, etc:						
495	Up to 1,000 kgs. . .			35	220	110	88
496	Over 1,000 » . . .	35	35		120	60	—
	With more than two cylinders:						
497	Up to 1,000 kgs. . .				440	220	176
498	Over 1,000 » . . .				160	80	—
	Burning heavy oil:						
499	Up to 10,000 kgs. . .				60	20	—
500	10,000 to 50,000 kgs.			20-30	45	15	—
501	Over 50,000 kgs. . .				30	10	—

24. SPAIN (continued).

Tariff number	Goods	Duty in gold pesetas per 100 kgs.					
		1913			1926		
		1st tariff	2nd tariff	Conventional tariff	1st tariff	2nd tariff	Conventional tariff
	Steam engines, land and marine:						
503	Up to 500 kgs. . . .				330	132	—
<i>Ex</i> 503	Locomotives				330	132	105.6
504	500 to 2,000 kgs. . .	35	35	35	339	113	100
<i>Ex</i> 504	Locomotives				339	113	90.4
505	2,000 to 10,000 kgs..				246	82	75
<i>Ex</i> 505	Locomotives				246	82	66
506	10,000 to 50,000 kgs.	20-30		20-30	207	69	62
<i>Ex</i> 506	Locomotives				207	69	56
507	Over 50,000 kgs. . .				120	40	32
	<i>Printing machines:</i>						
578	Up to 100 kgs. . . .	22	22	—	100	40	—
579	100 to 1,000 kgs. . .				105	35	—
580	Over 1,000 kgs. . . .				90	30	—
	<i>Machines not specially mentioned:</i>						
590	Up to 50 kgs. . . .	22	22	18.50 ¹	268	105	90
591	50 to 500 kgs. . . .				250	95	80
592	500 to 1,500 kgs. . .				240	85	70
593	Over 1,500 kgs. . . .				180	60	50

There are no import restrictions. Before the war, Germany, Great Britain and the United States enjoyed full most-favoured-nation treatment. At present Spain only grants most-favoured-nation treatment according to list. Since July 1926, a 20 per cent surtax has been imposed on most of the import items in pursuance of the Spanish Protective Decree of July 9th, 1926.

25. KINGDOM OF THE SERBS, CROATS AND SLOVENES.

Tariff number	Goods	Duty in dinars per 100 kgs.			
		1913		1926	
		Maxim. tariff	Minim. tariff	Maxim. tariff	Minim. tariff
651	<i>Machine tools:</i>				
	Machine tools for the working of:				
	(1) Wood and carving materials. . . .	6	free	40	30
	(2) Metals, stone and other materials . .	6	free	40	30
<i>Ex</i> 657	<i>Textile machinery:</i>				
	Textile machines:				
	(1) Looms	8	free	25	free
	(2) Spinning machinery	8	free	25	free

¹ For milling, paper and ice machines.

25. KINGDOM OF THE SERBS, CROATS AND SLOVENES. (Continued.)

Tariff number	Goods	Duty in dinars per 100 kgs.			
		1913		1926	
		Maxim. tariff	Minim. tariff	Maxim. tariff	Minim. tariff
<i>Ex</i> 653	<i>Agricultural machinery:</i> Agricultural machines: (1) Threshing machines: (a) weighing over 1,000 kgs. each (b) weighing 100 kgs. or less each (2) Harvesters, chopping machines, reapers, seed drills and sorting machines (3) Separators	8 8 10 10	free free free free	25 40 40 40	15 15 20 20
<i>Ex</i> 650	<i>Engines:</i> Steam turbines, steam engines not mentioned elsewhere and all combustion engines burning crude oil, petroleum, benzine, gasoline, generator gas, etc. .	12	free	25	15
651	Hydraulic motors and hydraulic turbines: (1) Hydraulic motors. (2) Hydraulic turbines: (a) with diameter of outer rotor wheel over 1.80 metres (b) Other	12 12 12 12	free free free free	20 40 40	15 25 30
<i>Ex</i> 658	<i>Printing machines:</i> Industrial machines not specified and parts thereof for book-printing. . . .	20	6	25	20
662	<i>Machinery not specially mentioned:</i> Machinery and appliances not elsewhere mentioned	20	6	40	30

The products of all the chief machinery-exporting countries have enjoyed or enjoy the rates of the minimum tariff in the Kingdom of the Serbs, Croats and Slovenes in virtue of the most-favoured-nation treatment accorded to them.

There are no import prohibitions or restrictions.

Ad No. 9.

EXPORTS AND IMPORTS.

FOREWORD.

The statistical data with reference to Chapter 9, as will be seen in detail from the list given below, comprise the following schedules referring as a rule to the years 1908-13 and 1920-25:

Tables 1*a* and 2*a* first of all reproduce the values of the total imports or exports of machinery of those countries which have a considerable import or export trade in engineering products. By means of the annual average rates of the table of conversion into marks (Table 3)¹, these figures have been converted from foreign currencies into a uniform currency (German Reichsmarks) and have then been reproduced in the two main schedules (Tables 1*b* and 2*b*). The subsequent Tables 4-15 then give the export figures for a few of the main categories of machinery in twelve of the principal machinery-exporting countries; and, lastly, Tables 16*a* to 18*c* give for the three chief producing countries the distribution of machinery exports among the purchasing countries in the last year before the war and in 1924 (in the case of Germany also in 1925).

In Tables 1-3 and 16-18 the countries have been arranged so that the twenty-one producing countries come first, in the same order as they are dealt with in the other sections of the statistical annex, and then (in Tables 1*a* and *b*, 3 and 16-18) come the other machinery-importing countries in the order of the volume of their total imports of machinery (value in Reichsmarks) in 1924.

LIST OF THE FOREIGN TRADE TABLES REFERRING TO CHAPTER 9.

1. Total machinery imports of 50 countries, 1908-13 and 1920-25:
 - (a) In the national currency;
 - (b) Converted into Reichsmarks (first main schedule).
2. Total machinery exports of 19 countries, 1908-13 and 1920-25:
 - (a) In the national currency;
 - (b) Converted into Reichsmarks (second main schedule).
3. Table of conversion into marks (showing the annual average rates employed in the two main schedules for the conversion of foreign currencies into German Reichsmarks).
4. United States — exports of the chief categories of machinery (values) in the financial years 1908-9 to 1913-14 and the calendar years 1920-1925.
5. Great Britain — exports of the chief categories of machinery (quantities and values) in the years 1908-13 and 1920-25.
6. Germany — exports of machinery classified according to the groups of specialised associations of the VDMA (quantities and values):
 - (a) In the years 1908-13;
 - (b) In the years 1920-25.

¹ The rates of this table have also been used in the present memorandum for the conversion of the figures of output, etc. into German currency.

7. France — exports of the chief categories of machinery (quantities and values) in the years 1908-13 and 1920-25.
8. Switzerland — exports of the chief categories of machinery (quantities and values) in the years 1908-13 and 1920-25.
9. Sweden — exports of the chief categories of machinery (quantities and values) in the years 1908-13 and 1920-25.
10. Canada — exports of the chief categories of machinery (values) in the financial years 1908-9 to 1913-14 and 1920-21 to 1925-26.
11. Netherlands — exports of the chief categories of machinery (quantities and values) in the years 1920-25
12. Belgium — exports of the chief categories of machinery (quantities and values) in the year 1925.
13. Czechoslovakia — exports of the chief categories of machinery (quantities and values) in the years 1920-25.
14. Austria — exports of the chief categories of machinery (quantities and values) in the years 1923-25.
15. Italy — exports of the chief categories of machinery (quantities and values) in the years 1908-13 and 1922-25.
16. Markets of the United States for the chief categories of machinery (values):
 - (a) In the financial year 1912-13;
 - (b) In the calendar year 1924.
17. Markets of Great Britain for the chief categories of machinery (quantities and values);
 - (a) In the year 1913;
 - (b) In the year 1924.
18. Markets of Germany for machinery (quantities and values):
 - (a) In the year 1913;
 - (b) In the year 1914;
 - (c) In the year 1925.

Table 1a.
TOTAL MACHINERY IMPORTS OF FIFTY COUNTRIES.

Source: Statistics of the country in question.

No.	Country	Currency	Values in thousands of the national currency											
			1908	1909	1910	1911	1912	1913	1920	1921	1922	1923	1924	1925
1	United States of America ¹	\$	4,259	10,232	9,396	7,384	7,520	6,738	14,245	12,447	12,634	15,338	12,009	13,958
2	Great Britain	£	3,965	3,897	3,884	4,712	5,663	5,913	19,607	10,533	7,048	8,407	—	9,730
3	Germany	RM	82,829	77,230	77,254	88,099	99,112	101,235	—	—	—	—	—	38,598
4	France	Frs.	188,540	184,090	210,600	241,350	256,000	275,860	2,335,007	1,493,811	829,554	807,218	964,760	1,058,867
5	Switzerland	Frs.	33,200	33,930	37,910	38,780	47,170	42,200	97,789	51,691	33,449	36,805	50,110	63,840
6	Sweden	Kr.	20,756	17,304	18,496	20,379	17,245	21,739	89,691	49,372	23,633	32,201	34,017	37,142
7	Canada ²	Fl.	14,264	20,030	30,639	37,881	49,460	37,268	78,998	36,114	38,952	47,984	38,988	57,976
8	Netherlands	ƒ	27,360	24,410	26,895	32,129	40,166	49,580	161,052	107,175	75,470	61,090	69,140	74,200
9	Belgium (-Luxemburg)	Frs.	64,836	60,493	70,583	70,791	99,463	108,718	538,124	510,742	568,302	537,325	687,203	478,664
10	Czechoslovakia	Kc.	—	—	—	—	—	—	625,151	642,547	419,279	244,192	354,472	562,603
11	Austria (Austria-Hungary)	G. Kr.	107,300	97,600	112,800	127,200	161,800	132,200	32,885	—	39,085	36,620	77,870 ³	56,870 ³
12	Italy	Lire	219,890	162,450	136,520	138,530	130,900	125,050	751,311	459,037	340,226	387,778	514,980	917,070
13	Denmark	Kr.	—	18,452	12,350	12,950	17,310	19,090	74,312	40,233	25,571	36,699	41,821	—
14	Hungary	G. Kr.	—	—	—	—	—	—	—	—	—	—	—	—
15	Japan	Yen	30,817	17,470	12,910	20,252	23,838	31,316	98,085	101,117	95,216	88,434	33,522	31,042
16	Poland	Zl.	—	—	—	—	—	—	—	—	44,576	59,187	102,991	70,559
17	Norway	Kr.	15,450	14,560	16,920	20,870	25,130	27,720	83,620	49,787	37,440	31,580	89,023	93,617
18	Finland	Fmk.	19,248	14,723	15,396	17,035	19,460	23,177	177,152	165,039	108,021	175,263	210,610	210,350
19	Australia ³	£	2,719	2,696	3,053	4,265	4,265	4,306	8,174	6,291	6,286	7,579	7,617	—
20	New Zealand	£	629	544	615	631	803	—	—	—	1,689	1,560	1,835	2,319
21	Russia	Rbl.	77,540	92,570	109,060	140,620	142,960	158,030	—	21,389	46,515	14,717	21,106	72,075
22	British India ⁴	Rup.	6,314 ⁵	4,731 ⁶	4,146 ⁶	3,890 ⁶	4,561 ⁶	6,823 ⁶	255,226	362,748	251,644	209,211	146,253	147,508
23	Argentina	G. Pes.	16,105	18,675	23,413	20,445	23,263	22,376	16,983	20,841	19,026	23,965	39,141	37,176
24	Brazil	G. Mlr.	20,536	22,292	26,998	36,313	46,660	44,449	8,083 ⁷	6,508 ⁷	3,431 ⁷	3,368 ⁷	5,624 ⁷	—
25	China	Hk-Tael	10,932	10,593	12,572	9,542	5,752	6,645	28,221	67,739	57,055	30,084	25,905	16,980
26	Union of South Africa	£	1,410	2,120	3,519	2,955	2,936	3,133	6,670	7,494	3,070	3,604	4,596	4,902
27	Mexico	Pes.	21,482	16,527	21,982	23,468	19,560	23,690	47,194	59,388	—	35,297	36,009	39,920
28	Spain	Pes.	51,006	52,462	54,163	62,921	74,437	92,490	102,590	197,180	131,450	151,540	134,830	108,190
29	Cuba	Pes.	4,057	5,307	7,968	7,899	9,881	12,071	—	—	—	—	—	—
30	Dutch Indies	Fl.	17,105	13,402	16,814	21,367	28,546	34,884	72,812	104,608	41,692	27,949	36,217	—
31	Chile	G. Pes.	31,516	19,144	16,237	28,685	25,694	22,978	25,251	27,110	17,455	29,683	—	—
32	Peru	Per. £	256	137	—	—	—	—	868	498	831	1,131	1,570	2,048
33	Egypt	£ E.	744	495	480	705	794	883	1,922	2,292	1,053	1,094	1,384	1,957
34	Irish Free State	£	—	—	—	—	—	—	—	—	—	—	1,143	1,162
35	Roumania	Lei	29,800	29,680	34,280	50,040	53,900	42,410	209,438	276,294	421,500	775,157	860,698	1,277,824
36	Columbia	Pes.	—	—	—	—	—	—	—	—	2,506	3,995	—	—
37	Algeria	Frs.	15,431	15,186	16,479	23,978	—	—	—	—	—	—	—	—
38	Latvia	Lat.	—	—	—	—	—	—	—	—	—	—	—	—
39	Kingdom of the Serbs, Croats and Slovenes	Din.	4,794	3,256	4,798	7,162	8,430	—	58,335	190,187	321,406	318,616	268,580	368,209
40	Portugal	Esc.	1,908 ⁹	2,007 ⁹	1,949 ⁹	2,006 ⁹	—	3,022	17,746	45,890	53,065	85,157	103,695	—
41	Greece	Drachm.	2,582	1,915	2,277	2,221	2,461	2,021	46,700	32,344	36,530	59,435	169,750	—
42	Bulgaria	Leva	8,760	13,500	14,205	17,830	21,660	18,050	52,000	149,600	270,100	334,400	378,000	—
43	Turkey	—	—	—	—	—	—	—	—	—	—	—	—	—
44	Uruguay	Pes.	433	535	624	—	—	—	—	—	—	—	—	—
45	Morocco	Frs.	—	374	353	445	795	1,894	22,858	33,722	24,470	18,058	31,168	—
46	Bolivia	Bol.	—	—	—	—	—	2,777	3,298	4,242	6,540	3,778	—	—
47	Slam	Tikal	1,202	1,253	1,083	898	1,846	2,039	4,241	2,666	2,075	2,568	2,996	—
48	Estonia	E. Mk.	—	—	—	—	—	—	—	—	—	803,163	495,680	474,084
49	Lithuania	Lits	—	—	—	—	—	—	—	—	—	9,254	12,104	9,737
50	Tunisia	—	—	—	—	—	—	—	8,322 ¹⁰	41,388 ¹⁰	1,276	—	—	—

¹ United States: 1908-1913, financial years beginning on July 1st; 1920-1925, calendar years.

² Australia: 1908-1913, calendar years; 1920-1925, financial years beginning on July 1st.

³ Schillings. ⁴ £'s sterling. ⁵ £'s sterling. ⁶ £'s sterling. ⁷ £'s sterling. ⁸ Latvian roubles. ⁹ Milreis.

² Canada: financial years beginning on April 1st.

⁴ India: financial years beginning on April 1st.

¹⁰ Lithuanian auksinas.

Table 1b. (First main Schedule.)
TOTAL MACHINERY IMPORTS OF FIFTY COUNTRIES.
 (Converted into Reichsmarks from the national currency — Table 1a.)

No.	Country	Values in thousands of Reichsmarks											
		1908	1909	1910	1911	1912	1913	1920	1921	1922	1923	1924	1925
1	United States of America ¹	17,888	42,974	39,463	31,013	31,584	28,300	59,829	52,378	53,063	64,420	50,438	57,624
2	Great Britain	80,886	79,499	79,234	96,125	115,525	120,797	301,262	170,203	131,022	161,423	179,227	221,316
3	Germany	82,829	77,230	77,254	88,099	99,112	101,235	(17,000)	(23,000)	(33,000)	(19,000)	38,598	98,942
4	France	152,717	149,113	170,586	195,494	207,360	223,447	693,497	467,563	285,367	205,841	213,115	212,303
5	Switzerland	26,892	27,483	30,707	31,412	38,208	34,182	69,430	37,631	26,759	27,898	38,439	51,819
6	Sweden	23,351	19,467	20,808	22,926	19,401	24,456	77,134	46,755	25,973	35,904	37,953	41,881
7	Canada ²	69,880	84,086	128,623	159,024	207,633	156,451	331,634	151,607	163,520	201,437	162,190	243,499
8	Netherlands	46,512	41,497	45,722	54,619	68,282	83,641	232,539	151,331	121,884	100,249	111,315	125,205
9	Belgium (-Luxemburg)	52,517	48,999	57,172	57,341	80,565	88,062	166,280	159,862	182,993	117,674	134,486	95,781
10	Czechoslovakia	—	—	—	—	—	—	41,885	34,055	42,766	30,280	44,203	70,100
11	Austria (Austria-Hungary)	91,205	82,960	95,880	108,120	137,530	112,370	27,985	(30,000)	33,261	31,164	45,584	33,650
12	Italy	178,111	131,585	110,581	112,209	106,029	101,291	156,273	82,627	68,045	74,841	94,756	153,334
13	Denmark	(21,000)	20,759	13,894	14,569	19,474	21,476	49,120	30,054	22,477	28,295	29,459	(31,000)
14	Hungary	—	—	—	—	—	—	(28,000)	(15,000)	(26,000)	(22,000)	28,514	26,404
15	Japan	64,469	36,347	27,007	42,367	49,869	65,513	207,548	206,705	191,003	180,317	178,174	121,361
16	Poland	—	—	—	—	—	—	(25,000)	(30,000)	36,107	47,941	71,388	69,220
17	Norway	17,381	16,380	19,035	23,479	28,271	31,185	58,032	34,316	20,144	22,085	48,503	22,632
18	Finland	15,388	11,778	12,317	13,628	15,568	18,773	28,876	15,019	9,830	19,805	22,219	22,255
19	Australia ³	55,468	54,998	62,281	73,318	87,006	87,967	125,594	101,656	116,857	145,524	140,305	(145,000)
20	New Zealand	42,832	41,098	42,546	42,872	46,381	(18,000)	(32,000)	(30,000)	31,399	29,954	33,801	46,908
21	Russia	167,486	199,951	235,570	303,739	308,794	341,347	(5,800)	46,200	100,472	31,789	44,808	156,075
22	British India ⁴	128,806	96,512	84,578	79,350	93,044	139,189	393,048	411,356	311,208	273,439	195,979	225,392
23	Argentina	65,225	75,634	94,823	82,802	94,215	90,623	64,162	63,940	65,411	78,797	128,382	142,756
24	Brazil	47,089	51,116	61,906	83,266	106,991	101,922	124,195	105,163	63,782	64,669	103,594	—
25	China	29,954	28,177	34,699	26,241	17,946	20,467	146,919	216,087	198,780	101,022	88,077	54,166
26	Union of South Africa	28,764	43,248	71,788	60,282	59,894	64,004	102,485	121,096	57,071	69,200	84,658	99,413
27	Mexico	44,940	34,574	45,986	49,095	40,920	49,559	98,730	122,339	(90,000)	70,947	78,860	87,824
28	Spain	40,805	41,970	43,330	50,337	59,550	74,917	68,633	111,998	85,443	91,833	75,424	87,634
29	Cuba	17,031	22,279	33,450	33,160	41,480	50,674	—	—	—	—	(63,000)	—
30	Dutch Indies	28,856	22,609	28,365	36,046	48,157	58,849	105,141	147,706	67,333	45,864	58,309	—
31	Chile	48,283	29,329	24,875	43,945	35,202	35,202	29,089	32,854	24,332	42,744	(40,000)	—
32	Peru	5,230	2,799	—	—	—	(10,000)	—	17,633	7,866	13,622	19,671	27,145
33	Egypt	15,438	10,271	9,960	14,629	16,476	18,322	(30,700)	(39,000)	19,961	21,556	26,407	40,745
34	Irish Free State	—	—	—	—	—	—	—	—	—	—	21,054	23,565
35	Roumania	24,138	24,041	27,767	40,532	43,659	34,352	17,383	14,367	12,224	16,278	18,161	25,940
36	Colombia	—	—	—	—	—	(7,000)	—	—	9,605	15,804	(18,000)	—
37	Algeria	12,499	12,301	13,348	19,422	—	(23,000)	—	—	—	—	(17,000)	—
38	Latvia	—	—	—	—	—	—	—	—	(13,000)	16,406	14,902	15,506
39	Kingdom of the Serbs, Croats and Slovenes	3,883	2,637	3,886	5,801	6,828	(6,000)	9,275	18,829	18,320	14,338	14,718	26,364
40	Portugal	8,662	9,112	8,848	9,107	(12,000)	13,708	13,861	18,526	14,683	15,260	14,331	(15,000)
41	Greece	2,091	1,551	1,844	1,799	1,993	1,637	21,902	7,924	5,078	4,279	12,739	(10,000)
42	Bulgaria	7,096	10,935	11,506	14,442	17,545	14,621	3,536	6,433	7,833	12,373	11,680	(15,000)
43	Turkey	—	—	—	—	—	—	—	—	—	—	(11,000)	—
44	Uruguay	1,879	2,322	2,708	—	—	(8,000)	—	—	—	—	(9,000)	—
45	Morocco	(300)	303	286	360	644	1,534	6,789	10,555	8,418	4,605	(6,000)	—
46	Bolivia	—	—	—	—	—	4,538	—	—	4,787	—	(6,000)	—
47	Siam	1,890	1,970	1,702	1,412	2,902	3,205	—	—	4,109	5,026	5,620	—
48	Est'onia	—	—	—	—	—	—	—	—	(5,000)	12,047	5,254	5,310
49	Lithuania	—	—	—	—	—	—	—	—	536	3,799	5,085	4,032
50	Tunisia	—	—	—	—	—	—	—	—	—	(4,000)	—	—

All figures in brackets are estimated.

¹ United States: 1908-1913, financial years beginning on July 1st; 1920-1925, calendar years.

³ Australia: 1908-1913, calendar years; 1920-1925, financial years beginning on July 1st.

² Canada: financial years beginning on April 1st.

⁴ India: financial years beginning on April 1st.

Table 2a.

TOTAL MACHINERY EXPORTS OF NINETEEN COUNTRIES.

Source: Statistics of the country in question.

No.	Country	Values in thousands of the national currency.												
		Currency	1908	1909	1910	1911	1912	1913	1920	1921	1922	1923	1924	1925
1	United States of America ²	\$	106,316	87,210	102,810	133,539	143,590	162,038	496,784	319,329	182,219	222,198	241,227	304,704
2	Great Britain	£	30,706	26,891	27,400	28,987	31,066	35,306	70,674	81,817	57,027	45,028	41,450	44,288
3	Germany	RM	449,363	419,482	500,735	592,832	684,389	738,441	—	—	—	497,195	517,857	734,901
4	France	Frs.	74,582	71,134	75,767	85,748	90,225	94,679	513,188	477,239	353,585	578,592	764,348	844,886
5	Switzerland	Frs.	56,511 ¹	49,942 ¹	56,038 ¹	63,635 ¹	73,165	76,853	234,951	184,691	142,027	126,450	137,350	154,309
6	Sweden	Kr.	21,640	23,769	28,929	35,369	39,625	43,472	123,906	83,132	91,855	73,345	94,295	80,007
7	Canada ³	\$	4,700	5,695	7,359	7,006	7,413	8,785	21,488	9,115	9,960	13,814	15,099	18,253
8	Netherlands	Fl.	18,151	15,144	15,213	21,543	25,764	22,099	39,509	41,436	26,474	24,643	28,805	34,907
9	Belgium (-Luxemburg)	Frs.	58,336	50,356	61,605	70,608	94,627	77,265	231,336	259,260	251,114	296,267	367,357	292,876
10	Czechoslovakia,	Kč.	—	—	—	—	—	—	504,553	872,316	272,393	171,305	426,280	—
11	Austria (Austria-Hungary)	G. Kr.	23,481	24,598	31,623	34,014	38,063	32,396	52,005	—	58,582	40,658	66,540 ⁵	71,541 ⁵
12	Italy	Lire	9,655	8,443	10,978	14,779	19,731	22,359	114,543	102,927	91,679	121,316	136,507	157,014
13	Denmark	Kr.	—	11,723	7,672	8,989	10,740	11,222	44,108	29,840	22,427	25,670	32,342	—
14	Hungary	G. Kr.	—	—	—	—	—	—	—	—	—	15,572	14,315	—
15	Japan	Yen	1,861	1,420	1,069	1,263	2,489	2,004	10,514	9,087	10,360	6,841	7,634	7,024
16	Poland	Zloty	—	—	—	—	—	—	—	—	6,490	4,984	6,344	12,005
17	Norway	Kr.	859	1,281	2,114	2,486	2,543	1,675	12,338	4,024	2,848	3,720	4,818	—
18	Finland	Fmk.	455	785	1,004	1,677	4,424	2,571	3,474	10,187	8,365	7,198	11,645	27,541
19	Australia ⁴	£	145	146	157	174	191	283	243	399	478	175	299	281

¹ Switzerland: 1908-1911 including electric locomotives.² United States: 1908-1913, financial years ending on June 30th; 1920-1925, calendar years.³ Canada: financial years beginning on April 1st.⁴ Australia: 1908-1913, calendar years; 1920-1925, financial years ending on June 30th.⁵ Austria: 1924-1925, schillings.

Table 2b. (Second Main Schedule.)

TOTAL MACHINERY EXPORTS OF NINETEEN COUNTRIES.

(Converted into Reichsmarks from the national currency of the period — Table 2a.)

No.	Country	Values in thousands of Reichsmarks											
		1908	1909	1910	1911	1912	1913	1920	1921	1922	1923	1924	1925
1	United States of America ²	446,527	366,282	431,802	560,864	603,078	680,560	2,086,493	1,341,182	765,320	933,232	1,013,153	1,279,757
2	Great Britain	626,402	548,576	558,960	591,335	633,746	721,266	1,085,906	1,322,081	1,060,132	864,583	763,509	898,161
3	Germany	449,363	419,482	500,735	592,832	684,389	738,441	.	.	.	497,195	517,857	734,901
4	France	60,411	57,619	61,371	69,456	73,082	76,690	152,417	149,376	121,633	147,541	169,609	169,400
5	Switzerland	45,774 ¹	40,453 ¹	45,391 ¹	51,544 ¹	59,264	62,251	166,815	134,455	113,622	95,849	105,361	125,253
6	Sweden	24,345	26,740	32,545	39,790	44,578	48,906	106,559	78,726	100,949	81,746	105,205	90,216
7	Canada ³	19,740	23,919	30,908	29,425	31,135	36,897	90,250	38,283	41,832	58,019	62,812	76,663
8	Netherlands	30,857	25,745	25,862	36,623	43,799	37,281	57,051	58,508	42,756	40,439	46,376	58,902
9	Belgium (-Luxemburg) .	47,252	40,788	49,900	57,192	76,648	62,585	71,483	81,148	80,859	64,882	71,892	58,604
10	Czechoslovakia	—	—	—	—	—	—	33,805	46,233	27,784	21,242	53,157	(44,000)
11	Austria (Austria-Hung.)	19,959	20,908	26,880	28,912	32,354	27,537	44,256	(52,700)	49,853	34,600	39,818	42,331
12	Italy	7,821	6,839	8,892	11,971	15,982	18,111	23,825	18,527	18,336	23,414	25,117	26,253
13	Denmark . . . . .	.	13,188	8,631	10,113	12,083	12,625	29,155	22,290	19,713	19,792	22,782	(25,000)
14	Hungary	—	—	—	—	—	—	(4,000)	(11,000)	(25,000)	(12,600)	13,246	12,176
15	Japan	3,893	2,971	2,236	2,642	5,207	4,192	22,248	18,565	20,785	13,949	13,207	12,081
16	Poland	—	—	—	—	—	—	(5,000)	(5,000)	5,257	4,037	5,087	8,876
17	Norway	966	1,441	2,378	2,795	2,861	1,884	8,563	2,531	2,090	2,604	2,823	(4,000)
18	Finland	369	636	813	1,358	3,553	2,083	566	927	761	813	1,229	2,914
19	Australia ⁴	2,958	2,978	3,203	3,550	3,896	5,781	3,734	6,447	8,886	3,360	5,508	5,699

The figures in brackets are estimated.

¹ Switzerland: 1908-1911, including electric locomotives.

² United States: 1908-1913, financial years ending on June 30th; 1920-1925, calendar years.

³ Canada: financial years beginning on April 1st.

⁴ Australia: 1908-1913, calendar years; 1920-1925, financial years ending on June 30th.

Table 3.

TABLE OF CONVERSION INTO MARKS.
Showing the annual average rates employed in the two main schedules for the conversion of foreign currencies into German Reichsmarks.

No.	Country	Currency	1908	1909	1910	1911	1912	1913	1920	1921	1922	1923	1924	1925	Remarks
1	United States of America	1 Dollar	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	
2	Great Britain	1 £	20.40	20.40	20.40	20.40	20.40	20.429	15.365	16.159	18.590	19.201	18.42	20.28	
3	Germany	100 M. - RM.	100.00	100.00	100.00	100.00	100.00	100.00	—	—	—	100.00	100.00	100.00	
4	France	100 Frs.	81.00	81.00	81.00	81.00	81.00	81.00	29.70	31.30	34.40	25.50	22.09	20.05	
5	Switzerland	100 Frs.	81.00	81.00	81.00	81.00	81.00	81.00	71.00	72.80	80.00	75.80	76.71	81.17	
6	Sweden	100 Kr.	112.50	112.50	112.50	112.50	112.50	112.50	86.00	94.70	109.90	111.50	111.57	112.76	
7	Canada	1 Dollar	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.16	4.20	
8	Netherlands	100 Fl.	170.00	170.00	170.00	170.00	170.00	168.70	144.40	141.20	161.50	164.10	161.00	168.74	
9	Belgium	100 Frs.	81.00	81.00	81.00	81.00	81.00	81.00	30.90	31.30	32.20	21.90	19.57	20.01	
10	Czechoslovakia	100 KČ.	—	—	—	—	—	—	6.70	5.30	10.20	12.40	12.47	12.46	
11	Austria (Hungary)	100 Gold Kr.	85.00	85.00	85.00	85.00	85.00	85.00	85.10	85.10	85.10	85.10	59.84 ¹	59.17 ¹	1 100 schillings.
12	Italy	100 Lire	81.00	81.00	81.00	81.00	81.00	81.00	20.80	18.00	20.00	19.30	18.40	16.72	
13	Denmark	100 Kr.	112.50	112.50	112.50	112.50	112.50	112.50	66.10	74.70	87.90	77.10	70.44	88.80	
14	Hungary	100 Gold Kr.	—	—	—	—	—	—	85.06	85.06	85.06	85.06	85.06	85.06	
15	Japan	1 Yen	2.092	2.092	2.092	2.092	2.092	2.092	2.116	2.043	2.006	2.039	1.73	1.72	
16	Poland	100 Zloty	—	—	—	—	—	—	—	—	—	81.00	81.00	80.19	
17	Norway	100 Kr.	112.50	112.50	112.50	112.50	112.50	112.50	69.40	62.90	73.40	70.00	58.59	75.09	
18	Finland	100 Fmk.	80.00	80.00	80.00	80.00	80.00	81.00	16.30	9.10	9.10	11.30	10.55	10.58	
19	Australia	1 £	20.40	20.40	20.40	20.40	20.40	20.429	15.365	16.159	18.590	19.201	18.42	20.28	Same as Great Britain
20	New Zealand	1 £	20.40	20.40	20.40	20.40	20.40	20.429	15.365	16.159	18.590	19.201	18.42	20.28	Ditto
21	Russia	1 Chervonetz	21.601	21.601	21.601	21.601	21.601	21.601	21.601	21.601	21.601	21.601	21.601	21.601	1 10 roubles.
22	British India	100 Rup.	20.401	20.401	20.401	20.401	20.401	20.429 ¹	154.00	113.40	123.67	132.60	134.00	152.80	1 £ sterling
23	Argentina	1 Gold peso	4.05	4.05	4.05	4.05	4.05	4.05	3.778	3.068	3.438	3.288	3.28	3.84	
24	Brazil	10 Gold mlr.	22.93	22.93	22.93	22.93	22.93	22.93	15.365 ¹	16.159 ¹	18.590 ¹	19.201 ¹	18.42 ¹	20.28 ¹	1 £ sterling.
25	China	1 H. tael	2.74	2.76	2.76	2.75	3.12	3.08	5.206	3.190	3.484	3.358	3.40	3.19	
26	Union of South Africa	1 £	20.40	20.40	20.40	20.40	20.40	20.429	15.365	16.159	18.590	19.201	18.42	20.28	Same as Great Britain
27	Mexico	1 Peso	2.092	2.092	2.092	2.092	2.092	2.092	2.092	2.060	2.054	2.010	2.19	2.20	
28	Spain	100 Peseta	80.00	80.00	80.00	80.00	80.00	81.00	66.90	56.80	65.00	60.60	55.94	81.00 ¹	1 100 gold pesetas.
29	Cuba	1 Peso	4.20	4.20	4.20	4.20	4.20	4.198	—	—	—	—	—	—	
30	Dutch Indies	100 Fl.	170.00	170.00	170.00	170.00	170.00	168.70	144.40	141.20	161.50	164.10	161.00	168.74	Same as Netherlands
31	Chile	1 Gold peso	1.532	1.532	1.532	1.532	1.532	1.532	1.152	1.212	1.394	1.440	1.391	—	
32	Peru	1 Per. £	20.40	20.40	20.40	20.40	20.40	20.429	20.315	15.796	16.392	17.393	17.29	17.12	
33	Egypt	1 £ E.	20.75	20.75	20.75	20.75	20.75	20.751	—	—	—	—	19.703	20.82	
34	Irish Free State	1 £	—	—	—	—	—	—	—	—	—	—	18.42	20.28	
35	Roumania	100 Lei	81.00	81.00	81.00	81.00	81.00	81.00	8.30	5.20	2.90	2.10	2.11	2.03	
36	Columbia	1 Peso	—	—	—	—	—	—	—	—	—	3.833	3.956	—	
37	Algeria	100 Frs.	81.00	81.00	81.00	81.00	81.00	81.00	29.70	31.30	34.40	25.50	22.09	20.05	Same as France
38	Latvia	100 Lat.	—	—	—	—	—	—	—	—	—	—	82.12	80.66	
39	Kingdom of the Serbs, Croats and Slovenes	100 Dinar	81.00	81.00	81.00	81.00	81.00	81.00	15.90	9.90	5.70	4.50	5.48	7.16	
40	Portugal	100 Escudos	4.54 ¹	4.54 ¹	4.54 ¹	4.54 ¹	4.54 ¹	4.53	453.60	78.11	40.37	27.67	17.92	13.82	1 1 Escudo.
41	Greece	100 Drachma	81.00	81.00	81.00	81.00	81.00	81.00	46.90	24.50	13.90	7.20	7.54	6.60	
42	Bulgaria	100 Leva	81.00	81.00	81.00	81.00	81.00	81.00	6.80	4.30	2.90	3.70	3.09	3.05	
43	Turkey	—	—	—	—	—	—	—	—	—	—	—	—	—	
44	Uruguay	1 Peso	4.34	4.34	4.34	—	—	4.34	—	—	—	—	—	—	
45	Morocco	100 Frs.	81.00	81.00	81.00	81.00	81.00	81.00	29.70	31.30	34.40	25.50	22.09	20.05	Same as France.
46	Bolivia	1 Boliviano	—	—	—	—	—	—	—	—	—	1.267	1.291	1.333	
47	Siam	100 Tical	157.20	157.20	157.20	157.20	157.20	157.20	—	—	198.00	195.70	187.60	186.97	
48	Estonia	100 Est m.	—	—	—	—	—	—	—	1.30	1.50	1.50	1.06	1.12	
49	Lithuania	100 Lits.	—	—	—	—	—	—	—	—	—	—	41.05	42.01	41.41
50	Tunisia	100 Frs.	81.00	81.00	81.00	81.00	81.00	81.00	29.70	31.30	34.40	25.50	22.09	20.05	Same as France.

Table 4.

UNITED STATES.

Exports of the Chief Categories of Machinery.(Values in thousands of dollars ¹.)

Category of machinery	Financial years ending June 30th						Calendar years					
	1908-9	1908-10	1910-11	1911-12	1912-13	1913-14	1920	1921	1922	1923	1924	1925
Locomotives	3,498	2,405	3,954	3,298	6,443	3,692	53,630	33,696	8,664	4,422	5,649	7,022
Motors	6,627	9,174	12,095	15,448	19,090	12,927	77,940	28,884	18,321	21,596	21,340	35,003
Agricultural machinery . . .	26,891	29,609	37,904	37,516	43,086	34,765	50,763	40,350	24,219	46,512	56,639	73,411
Metal-working machinery . .	3,640	5,976	9,627	12,152	16,097	14,011	44,312	19,636	12,209	13,105	14,589	22,037
Textile machinery	2	2	2	2	1,968	1,611	20,920	19,928	13,726	9,044	8,752	11,489
Sewing machines	5,904	7,514	9,040	9,947	11,574	11,495	15,582	7,306	9,136	10,905	10,515	10,634
Machinery for the sugar industry	2	2	2,591	1,783	2,889	2,548	22,787	15,628	3,799	6,023	8,305	8,270
Mining machinery	4,016	5,400	7,017	6,870	10,041	9,557	15,220	18,870	10,802	16,763	16,477	20,811
Office appliances	9,529	11,160	13,849	15,938	17,094	17,081	17,934	17,934	17,386	21,728	26,425	33,859
Printing machinery	2	2	2	2	4,216	4,535	14,212	11,543	7,983	8,493	10,111	9,900

¹ Quantitative figures are only available for certain items of the foreign trade statistics.² Included in the item "All other machinery".

Table 5.
GREAT BRITAIN.
Exports of the Chief Categories of Machinery.
 (Quantities and values.)

Category of machinery		Quantities in tons or units											
		1908	1909	1910	1911	1912	1913	1920	1921	1922	1923	1924	1925
Locomotives (and tenders)	Tons	47,327	43,540	35,447	47,422	39,298	47,121	43,296	47,379	32,208	94,656	23,563	29,326
	Units	—	—	—	—	—	—	837	931	586	669	482	—
Parts	—	—	—	—	—	—	—	—	—	—	—	—	—
Engines	Tons	76,175	66,434	75,363	80,434	81,935	94,564	30,311	30,060	29,060	41,812	50,695	56,847
Agricultural machinery and implements (includ. dairy machinery) .	Tons	59,412	60,399	71,458	77,902	76,211	73,498	10,712	5,315	8,107	13,221	17,971	21,958
Machine tools (metal-, wood-, stone-working)	Tons	8,183	15,164	13,329	12,749	16,817	16,537	24,242	19,969	12,011	14,113	11,995	14,289
Textile machinery	Tons	190,560	174,991	161,362	144,319	150,456	178,074	63,314	157,044	154,396	138,658	103,618	123,107
Sewing machines	Units	34,364	61,191	65,445	69,129	129,891	86,440	90,877	57,737	57,373	90,837	91,032	72,167
	Tons	1,156	2,174	2,157	2,180	3,835	2,540	2,556	1,735	1,728	2,841	2,759	1,981
Parts	Tons	24,026	25,695	24,743	25,457	31,345	30,719	20,787	7,556	18,095	16,589	18,952	26,932
Typewriters . .	Units	1,057	811	1,947	2,754	3,440	4,386	3,720	2,591	1,501	2,911	3,275	2,139
	Tons	7	—	12	21	17	22	26	24	3	21	17	13
Parts	Tons	4	2	6	12	7	8	34	20	32	43	48	64
Ships' engines .	Tons	—	—	—	—	—	—	279	333	181	135	167	—
Printing and similar machines	Tons	—	—	—	—	—	—	2,079	3,341	5,572	3,717	4,254	—

Category of machinery	Values in thousands of pounds sterling											
	1908	1909	1910	1911	1912	1913	1920	1921	1922	1923	1924	1925
Locomotives (and tenders)	2,730.0	2,381.1	1,707.7	2,307.6	2,137.2	2,781.9	5,987.3	7,938.5	5,074.9	2,893.6	1,851.5	2,558.9
Parts	—	—	—	—	—	—	1,066.5	1,614.1	1,379.1	1,134.2	644.6	601.9
Engines	3,504.0	3,068.2	3,545.7	3,844.9	4,334.6	5,210.1	4,122.4	4,866.3	4,089.5	4,180.4	4,724.7	5,428.4
Agricultural machinery and implements (including dairy machinery)	2,311.6	2,271.8	2,687.3	2,739.9	2,905.4	2,989.2	1,025.8	589.8	712.4	1,021.3	1,368.7	1,707.2
Machine tools (metal-, wood-, stone-working)	416.4	768.5	714.6	759.5	934.9	1,012.8	3,436.0	2,920.6	1,516.1	1,505.5	1,361.9	1,560.9
Textile machinery . .	8,829.0	8,240.0	7,614.2	6,779.2	7,043.5	8,281.8	9,158.9	25,113.1	21,449.0	15,734.3	10,831.4	12,157.9
Sewing machines . .	90.6	151.7	155.1	167.0	301.1	209.5	481.3	384.1	311.2	415.8	351.6	262.6
Parts	1,475.5	1,674.1	1,575.5	1,604.5	2,083.7	2,158.3	3,456.0	1,397.7	2,635.2	2,151.9	2,077.5	2,693.8
Typewriters	13.4	8.7	15.6	20.9	27.4	31.8	68.7	47.1	23.8	39.5	41.8	26.0
Parts	4.7	2.9	3.8	5.3	5.0	6.5	64.9	33.5	48.8	52.1	47.6	60.7
Ships' engines	2,595.3	1,819.6	1,209.1	1,632.4	1,750.4	2,336.5	4,896.1	6,182.5	6,507.2	2,421.3	1,355.3	—
Printing and similar machines	—	—	—	—	—	—	437.5	972.0	738.8	868.4	1,027.0	—

Table 6a.

GERMANY.

Exports of Machinery, 1908-13, classified according to the Specialised Groups of Associations of the V.D.M.A.¹

(Quantities in tons and values in thousands of marks).

Groups of the V.D.M.A.		1908		1909		1910		1911		1912		1913	
No.	Goods	Tons	1,000 M.	Tons	1,000 M.	Tons	1,000 M.	Tons	1,000 M.	Tons	1,000 M.	Tons	1,000 M.
I	Machine tools	58,523	77,616	48,033	63,019	59,115	76,227	64,851	67,602	77,283	84,012	90,279	98,272
II	Textile machines and parts thereof . .	61,946	83,439	62,442	83,317	75,624	98,758	77,562	109,287	82,201	117,840	79,867	116,521
III	Agricultural machinery and implements	44,297	27,018	49,860	30,711	61,064	36,565	65,239	44,123	80,787	55,890	80,820	56,544
IV	Locomotives	50,098	62,284	37,522	41,854	36,144	37,430	51,680	49,216	36,780	37,152	54,445	55,224
V	Engines	51,840	54,520	47,468	55,044	60,009	72,666	78,304	105,943	93,924	127,195	100,262	117,655
VI	Driving machinery*	10,815	13,526	10,434	12,452	12,993	15,720	13,976	17,879	19,446	24,591	22,683	29,723
VIII	Mechanical conveyors, and scales and balances	21,705	16,677	18,410	14,681	25,815	19,864	27,746	23,915	32,390	26,333	39,601	32,682
IX	Machines for the paper and graphic industries	24,896	32,270	19,747	29,169	23,327	34,900	25,599	37,870	30,094	42,050	29,098	42,810
X	Machines for the foodstuffs and kindred industries and for the chemical industry	26,921	28,391	30,488	31,388	37,610	36,367	40,362	38,370	41,782	41,517	40,501	39,357
XI	Machines for the treatment of coal, ores, stone and soils	22,406	17,952	22,287	17,686	25,317	19,700	22,685	17,342	23,688	18,057	32,614	24,039
XII	Other machines and parts thereof, mis- cellaneous	28,981	35,670	31,735	40,160	39,266	52,538	64,689	81,265	86,693	109,752	56,279	125,614
I to XII	Total	402,428	449,363	378,426	419,482	456,285	500,735	532,694	592,832	605,068	684,389	666,449	738,441

¹ For Group VII (smelting, steel and rolling works and machinery), export figures cannot be ascertained, as these products are included in the German foreign trade statistics partly under machine tools (Group I) and partly with various other non-mechanical products.

* Industrial machinery permanently combined with steam motors (steam dredgers, steam hammers, steam cranes, steam pumps, steam fire engines and the like). (Tr.)

Table 6b.

GERMANY.

Exports of Machinery, 1920-25, classified according to the Specialised Groups of Associations of the V.D.M.A.¹

(Quantities in tons and values in thousands of marks).

Groups of the V.D.M.A.		1920		1921 ²		1922		1923		1924		1925	
No.	Goods	Tons	1,000 M.	Tons	1,000 M.	Tons	1,000 M.	Tons	1,000 M.	Tons	1,000 M.	Tons	1,000 M.
I	Machine tools	94,921		66,654		78,167		49,762	64,101	45,041	68,307	58,155	95,751
II	Textile machines and parts thereof. .	51,448		36,960		47,856		49,689	101,262	49,147	114,693	58,258	144,432
III	Agricultural machinery and appliances .	41,454		63,136		60,465		44,312	33,912	40,155	33,448	73,380	61,227
IV	Locomotives	17,091		50,031		101,250		17,163	26,863	17,177	20,106	22,573	27,174
V	Engines	30,890		36,047		62,759		46,586	51,722	31,456	49,036	49,954	86,436
VI	Driving machinery	11,041		11,533		16,315		12,669	22,992	12,639	24,820	17,193	36,536
VIII	Hoisting machines, and scales and balances	26,860	Values not ascertainable	18,161	Values not ascertainable	28,500	Values not ascertainable	18,733	17,348	16,865	20,370	20,234	24,229
IX	Machines for the paper and graphic industries.	27,578		18,096		23,435		21,113	37,388	19,277	41,871	25,769	60,118
X	Machines for the foodstuffs and chemical industries	21,636		23,061		24,947		15,108	19,081	12,865	18,265	17,314	25,502
XI	Machines for the treatment of coal, ores, stone and soils	11,909		9,715		12,641		8,817	7,998	8,590	8,456	11,486	11,703
XII	Other machines and parts thereof, miscellaneous	85,273		83,252		82,823		60,566	114,528	55,900	118,485	82,128	161,796
I to XII	Total	420,101		416,646		539,158		344,518	497,195	309,202	517,857	436,444	734,901

¹ For Group VII (smelting, steel and rolling works and machinery), export figures cannot be ascertained, as these products are included in the German foreign trade statistics partly under machine tools (Group I) and partly with various other non-mechanical products.

² Figures for 1921 estimated by the returns for the months May to December.

Table 7.
FRANCE.

Exports of the Chief Categories of Machinery. (Quantities and values.)

Category of machinery	Quantities, in tons											
	1908	1909	1910	1911	1912	1913	1920	1921	1922	1923	1924	1925
Locomotives (locomotives, steam traction engines and locomotive tenders)	3,243	2,272	1,843	2,953	1,679	1,335	4,674	5,412 ¹	4,428 ¹	8,874 ²	5,515 ²	6,707 ²
Engines (stationary and ships' engines, steam locomobiles, hydraulic power engines, pumps and ventilators)	2,746	2,159	2,888	3,515	3,478	4,562	4,457 ¹	3,851 ³	3,598 ³	1 3	1 3	1 3
Agricultural machinery	6,913	6,750	7,365	9,376	10,823	12,311	5,836	5,764	4,433	8,490	13,663	14,431
Machine tools	4,071	4,126	4,998	5,102	4,748	4,583	7,345	5,787	3,770	6,204	8,651	11,171
Textile machinery	3,285	3,358	3,283	2,600	2,528	1,973	3,386	6,154	9,412	12,378	10,702	12,456
Sewing machines	260	290	443	379	306	391	183	169	120	199	265	311
Machinery for the paper industry	45	54	29	8	31	79	30	59	46	57	190	111
Office appliances (typewriters and calculating machines, etc.)	—	—	45 ⁴	87 ⁴	91 ⁴	92 ⁴	209	106	106	200	191	154
Printing machines (presses and printing machines, including accessories)	854 ⁵	702 ⁵	704	945	755	811	744	632	480	667	732	767
	Values, in thousands of francs											
Locomotives (locomotives, steam traction engines and locomotive tenders)	5,479	5,750	3,114	4,738	2,811	2,210	37,427	37,115	22,548	47,367 ²	29,425 ²	39,101 ²
Engines (stationary and ships' engines, steam locomobiles, hydraulic power engines, pumps and ventilators)	3,412	2,657	3,615	4,351	4,280	5,947	30,096	21,956	19,988	39,065	49,513	65,638
Agricultural machinery	7,950	8,100	8,838	11,252	12,988	14,773	27,721	25,939	19,949	35,018	52,739	59,452
Machine tools	8,346	8,459	10,245	10,458	9,734	9,396	69,780	43,405	22,621	35,638	56,479	80,352
Textile machinery	3,797	4,370	3,910	3,060	2,832	2,259	21,823	42,483	64,246	84,788	78,451	81,972
Sewing machines	792	884	1,350	1,156	933	1,191	1,460	1,354	903	1,909	3,056	4,058
Machinery for the paper industry	79	94	51	14	54	139	165	313	231	306	1,026	601
Office appliances (typewriters and calculating machines, etc.)	—	—	1135 ⁴	2185 ⁴	2,265 ⁴	2,303 ⁴	20,502	8,284	6,572	7,976	7,181	7,213
Printing machines (presses and printing machines, including accessories)	1793 ⁵	1475 ⁵	1,501	1,989	1,632	1,731	8,209	5,961	3,858	6,045	7,677	8,606

¹ Including petroleum-driven traction engines. ² Including steam rollers. ³ Including boilers. ⁴ Including cash registers and accessories. ⁵ Printing machines (not specified).

Table 8.
SWITZERLAND.

Exports of the Chief Categories of Machinery. (Quantities and values.)

Category of machinery	Quantities, in tons											
	1908	1909	1910	1911	1912	1913	1920	1921	1922	1923	1924	1925
Locomotives and tenders	701 ¹	982 ¹	741 ¹	1,440 ¹	895	979	1,176	1,074	642	388	2,527	3,184
Engines ²	12,749	9,987	11,004	13,004	16,125	16,905	14,654	14,196	12,127	13,007	14,626	17,505
Agricultural machinery ³	341	501	560	628	598	671	553	311	255	252	498	604
Machine tools	528	539	596	857	995	979	8,136	2,696	2,423	2,369	2,853	2,899
Textile machinery.	10,884	8,879	10,696	9,860	10,770	10,241	14,180	10,562	9,994	9,400	9,903	12,535
Sewing machines and parts thereof	108	27	42	65	96	96	80	78	115	109	149	188
Machines for the production and treatment of foodstuffs, refrigerators, cooling apparatus	1,594	1,488	1,645	1,773	2,240	2,411	4,731	2,714	2,497	2,315	2,272	3,137
Milling machines, porcelain cylinders	5,819	5,232	5,970	6,377	7,441	6,970	5,893	3,595	2,965	3,718	4,297	3,810
Office appliances ⁴ .	53	52	67	70	83	100	135	86	93	134	136	110
Book-printing and book - binding machines	263	315	278	391	469	423	613	464	989	974	1,104	1,406
	Values, in thousands of francs											
Locomotives and tenders	1,301 ¹	1,898 ¹	1,032 ¹	2,117 ¹	1,201	1,463	4,459	3,692	1,476	1,454	1,055	1,931
Engines ²	22,767	18,338	19,564	24,116	28,661	30,920	67,047	69,154	53,645	44,142	44,955	52,437
Agricultural machinery ³	366	547	679	631	625	642	2,065	1,217	574	715	1,346	1,342
Machine tools	1,316	1,290	1,650	2,267	2,625	2,439	36,081	12,663	9,159	7,881	11,823	12,119
Textile machinery.	14,031	11,610	14,045	13,592	14,620	14,632	54,173	46,545	41,510	35,198	37,145	43,148
Sewing machines and parts thereof	542	141	243	341	465	460	559	463	618	628	763	974
Machines for the production and treatment of foodstuffs, refrigerators, cooling apparatus	2,440	2,593	2,954	3,139	4,166	4,131	19,381	12,456	7,935	7,152	7,588	9,553
Milling machines, porcelain cylinders	6,050	5,481	6,454	6,909	8,389	8,254	17,942	11,829	6,657	7,803	8,474	7,629
Office appliances ⁴ .	963	997	1,240	1,328	1,701	2,010	5,901	3,949	3,285	4,634	4,669	3,969
Book-printing and book - binding machines	562	665	737	1,037	1,028	997	4,091	2,534	3,566	4,544	4,716	5,239

¹ Including electric locomotives, which are not placed in a separate category.

² Including steam ploughs, steam pumps, and threshing and reaping machines, which are not placed in a separate category.

³ Including agricultural implements with the exception of steam ploughs, threshers and reapers.

⁴ Cash registers, calculating machines and gas meters.

Table 9.

SWEDEN.

Exports of the Chief Categories of Machinery. (Quantities and values.)

Category of machinery	Quantities, in tons											
	1908	1909	1910	1911	1912	1913	1920	1921	1922	1923	1924	1925
Locomotives and tenders	—	—	—	—	7	85	384	3,633	17,804	11,343	18,211	292
Engines (steam engines, locomobiles, combustion motors, etc.)	1,605	2,577	4,517	5,927	6,570	6,648	7,540	4,474	2,933	4,537	6,389	6,420
Agricultural machinery and implements (including dairy machines)	11,034	9,764	12,393	14,172	16,390	18,090	12,773	8,718	3,919	7,201	11,533	17,924
Machine-tools (metal and wood-working machines)	1,481	1,289	2,102	2,614	2,659	2,597	5,027	1,534	1,460	2,428	2,710	3,583
Textile machinery	188	144	93	119	45	48	178	357	72	174	131	202
Sewing machines	118	67	61	52	57	70	156	50	129	199	198	270
Office appliances (typewriters, calculating machines, cash registers)	2.1	0.4	0.3	0.7	0.4	0.4	7	7	6	10	16	21
	Values, in thousands of crowns											
Locomotives and tenders	338	—	—	—	10	93	1,218	11,553	56,401	26,949	32,468	662
Engines (steam engines, locomobiles, combustion motors, etc.)	2,294	3,956	6,334	7,599	9,795	10,690	33,768	19,135	8,716	10,412	15,293	14,659
Agricultural machinery and implements (including dairy machines)	14,623	15,774	16,256	18,937	19,844	22,344	40,193	26,293	12,282	16,725	25,475	38,078
Machine-tools (metal and wood-working machines)	1,569	1,481	2,261	2,769	2,819	2,662	16,268	5,345	3,387	5,209	4,846	6,181
Textile machinery	216	160	108	128	74	83	708	273	227	397	646	958
Sewing machines	174	112	89	81	96	118	643	236	410	665	625	818
Office appliances (typewriters, calculating machines, cash registers)	29	7	5	9	5	5	389	285	157	440	754	982

Table 10.

CANADA.

Exports of the Chief Categories of Machinery. (Values in thousands of dollars ¹.)

Category of machinery	Financial years, ending on March 31st											
	1908-	1909-	1910-	1911-	1912-	1913-	1920-	1921-	1922-	1923-	1924-	1925-
Locomotives and spare parts	—	—	—	—	—	—	3,473	1,207	1,700	1,023	21	14
Engines	—	—	—	—	—	88	263	273	79	121	82	288
Agricultural machinery	3,612	4,321	5,914	5,793	6,366	7,949	11,979	5,054	5,720	8,864	10,930	13,207
Machine tools	—	—	—	—	—	—	—	150	163	190	241	381
Sewing machines	117	160	239	163	250	99	897	716	877	1,515	2,149	3,022
Office appliances	204	303	371	312	262	205	730	328	258	260	379	207
Printing machines	136	21	37	8	1	11	20	19	5	4	5	1

¹ No figures of weight are given in Canada's foreign trade statistics, and the number of units is only given for certain items.

Table 11.

NETHERLANDS.

*Exports of the Chief Categories of Machinery*¹. (Quantities and values.)

Category of machinery	Statistical number	Quantities, in tons						Values, in Dutch florins (000's)					
		1920	1921	1922	1923	1924	1925	1920	1921	1922	1923	1924	1925
Locomotives (and tenders) and parts thereof	1205-06	1,296	1,306	1,509	411	781	1,343	2,864	2,645	2,835	426	658	1,051
Motors and parts thereof	1052 1553-55 1063-68	3,156	2,606	2,354	3,021	3,746	4,841	4,925	4,307	3,296	3,238	4,161	5,436
Agric. machinery and implements	1207 1069-71	663	549	353	297	364	304	628	511	231	191	218	190
Driving engines	1056-57	6,686	4,938	4,994	4,672	5,276	5,940	8,637	6,937	6,171	5,713	6,810	7,544
Textile machinery (including sewing machines)	1060-61	554	546	539	684	805	1,050	882	858	664	838	1,086	1,307
Machinery and appliances for the sugar industry	1058	7,381	12,989	5,890	8,258	9,520	11,831	6,752	13,180	4,725	4,806	4,609	5,258
Mechanical conveyors	1214-16	3,552	4,192	3,150	3,470	5,538	6,382	4,519	5,878	3,210	2,742	3,642	4,147
Office appliances ²	1087	33	51	33	29	27	31	212	289	247	146	184	166

¹ Holland's export of machinery can only be divided according to categories for the post-war period. Before the war all the exports of machinery were included in a single item.

² Including copying machines and other office requisites.

Table 12.

BELGIUM.

Exports of the Chief Categories of Machinery in 1925¹. (Quantities and values.)

	Quantities, in tons	Values, in thousands of francs
Locomotives (and tenders)	11,469	47,135
Engines	2,976	16,887
Agricultural machinery (including dairy machinery) . .	7,744	31,658
Machine tools	3,139	19,099
Textile machinery	1,097	12,530
Sewing and embroidering machines.	26	755
Office appliances	28	1,512

¹ The Belgian exports of machinery can only be divided into categories for the year 1925. In previous years the machinery exports were simply subdivided according to the substance of which the machines were made.

Table 13.

CZECHOSLOVAKIA.

Exports of Chief Categories of Machinery. (Quantities and values.)

	Quantities, in tons						Values, in thousands of Cz. crowns					
	1920	1921	1922	1923	1924	1925	1920	1921	1922	1923	1924	1925
Locomotives (and tenders)	254	474	280	25	8,987	3,983	5,670	16,039	5,303	58	108,805	48,222
Engines	2,901	3,218	1,486	1,782	2,328	1,966	76,554	56,636	17,673	16,118	28,777	30,991
Agricultural machinery and implements (including dairy machines) . .	14,215	15,759	5,623	4,848	8,101	13,661	115,675	352,334	28,286	25,968	42,593	88,753
Machine-tools	1,898	1,948	830	1,083	1,610	1,079	29,807	45,902	13,663	8,291	13,430	8,620
Textile machinery	6,137	8,013	6,380	6,255	6,687	3,694	75,807	91,434	66,231	30,084	28,492	20,358
Sewing engines	58	113	108	68	67	—	1,306	4,885	3,975	956	1,593	—
Driving engines	664	520	480	272	473	763	15,917	11,297	4,858	3,402	5,241	5,623
Office appliances	27	42	2	6	6	—	905	3,495	573	1,445	1,058	—
Printing machines	43	95	76	66	31	—	374	1,694	1,189	379	398	—
Milling machines	195	572	564	306	891	—	3,664	10,145	6,183	2,498	7,461	—

Table 14.

AUSTRIA.

Exports of Chief Categories of Machines. (Quantities and values ¹.)

	Quantities, in tons			Values		
				in gold crowns (000's)		in sch. (000's)
	1923	1924	1925	1923	1924	1925
Locomotives (and tenders) . . .	6,058.5	4,578.1	619.8	6,765	6,523	1,008
Engines	6,657.2	5,612.3	6,374.4	9,733	9,458	15,536
Agricultural machinery and im- plements (including dairy ma- chinery)	4,786.6	7,714.8	8,032.2	3,686	5,670	15,738
Machine tools	2,695.5	3,737.9	3,390.9	4,529	6,744	5,858
Textile machinery	913.8	799.2	630.7	2,282	2,106	2,077
Sewing machines	259.6	365.6	369.8	673	981	1,605
Office appliances	13.6	22.3	14.8	208	301	416
Printing machines	532.0	443.5	951.9	811	827	2,901
Milling machines	388.5	568.9	408.9	422	639	1,047
Machines for the chemical industry	319.1	351.4	349.4	524	616	748

¹ For the years 1920-22 it is not possible to divide the exports of machinery into categories.

Table 15.

ITALY.

Exports of Chief Categories of Machinery. (Quantities and values.)

Category of machinery	Quantities, in tons									
	1908	1909	1910	1911	1912	1913	1922	1923	1924	1925
Locomotives (and tenders) . .	—	—	9	33	323	489	177	1,462	2,271	127
Engines	1,779	805	1,339	1,504	2,718	3,833	1,450	1,500	1,611	2,342
Agricultural machinery and im- plements (including dairy ma- chinery)	208	260	375	463	431	410	296	269	367	461
Machine tools	28	43	57	84	171	147	450	644	880	536
Textile machinery	49	140	164	232	354	487	566	706	781	610
Sewing machines ¹	10	12	17	12	22	317 ²	20	11	46	23
Printing machines	18	16	158	355	392	196	133	256	352	412

Category of machinery	Values, in thousands of lire									
	1908	1909	1910	1911	1912	1913	1922	1923	1924	1925
Locomotives (and tenders) . .	—	—	14	50	568	880	2,604	10,109	12,616	103
Engines	2,328	1,042	1,880	1,965	3,755	5,503	11,836	11,677	13,920	16,551
Agricultural machinery and im- plements (including dairy ma- chinery)	270	336	487	579	538	491	3,324	2,328	2,462	3,109
Machine tools	27	44	58	91	190	181	3,436	5,172	6,029	4,576
Textile machinery	66	207	243	315	508	682	4,950	6,484	6,750	5,560
Sewing machines ¹	22	26	43	24	53	1,102 ³	388	307	607	579
Printing machines	26	24	237	533	667	332	1,093	1,755	3,352	4,814

¹ 1922-25 including embroidering and similar machines.

² Including parts thereof: 296 tons.

³ Including parts thereof: 1,050 tons.

Table 16 a.

Export Markets of the UNITED STATES for the Chief Categories of Machinery in the Financial Year 1912-13.

(Values in thousands of dollars.)

Market	Locomotives	Engines	Agri-cultural machinery	Metal-working machinery	Textile machinery	Sewing machines	Machinery for sugar industry	Mining machinery	Office appliances	Printing machines
Great Britain . . .	—	1,375	1,053	3,210	520	3,016	—	550	3,213	523
Germany	—	722	3,768	3,175	118	758	—	—	2,745	244
France	—	197	3,412	1,937	67	100	—	535	1,396	338
Switzerland	—	—	—	—	—	—	—	—	266	—
Sweden	—	84	—	—	—	—	—	—	—	—
Canada	1,183	9,887	7,366	2,326	859	528	—	2,224	1,411	1,315
Netherlands	—	113	418	—	—	201	—	—	208	—
Belgium	—	45	—	787	—	—	—	—	363	—
Austria-Hungary . .	—	—	1,569	601	61	—	—	—	723	—
Italy	—	50	478	—	—	—	—	109	525	—
Denmark	—	60	692	—	—	—	—	—	—	—
Japan	1,302	163	—	—	—	306	—	384	—	—
Norway	—	92	—	—	—	—	—	—	168	—
Commonwealth of Australia	—	684	922	—	—	373	—	396	604	445
New Zealand	—	142	—	—	—	—	—	—	—	—
Russia (European) .	—	522	8,682	1,089	—	766	—	431	1,140	—
British India	—	—	—	—	—	—	—	280	224	—
Argentina	—	955	6,983	—	—	880	—	127	657	236
Brazil	2,311	524	349	—	—	1,677	154	285	743	252
China	—	28	—	—	—	163	—	—	—	—
South Africa	—	151	1,439	—	—	—	—	672	160	—
Mexico	—	630	653	—	—	713	148	1,672	398	145
Spain	—	—	—	—	—	—	—	116	226	—
Cuba	382	704	313	—	—	399	1,383	—	215	—
Dutch East Indies .	—	—	—	—	—	—	—	287	—	—
Chile	203	62	457	—	—	—	—	182	141	—
Peru	—	—	—	—	—	—	—	259	—	—
Roumania	—	—	424	—	—	—	—	223	—	—
Colombia	—	—	—	—	93	202	—	—	—	—
Uruguay	—	40	520	—	—	161	—	—	—	—
Philippine Islands .	468	206	—	—	—	227	183	—	142	—
Venezuela	—	—	—	—	—	113	—	—	—	—
Other Exports	594	1,654	3,588	2,972	250	991	1,021	1,309	1,426	718
Total	6,443	19,090	43,086	16,097	1,968	11,574	2,889	10,041	17,094	4,216

Table 16 b.

Export Markets of the UNITED STATES for the Chief Categories of Machinery in the Calendar Year 1924.
(Values in thousands of dollars.)

Market	Loco- motives	Engines	Agri- cultural ma- chinery	Metal- work- ing ma- chinery	Textile ma- chinery	Sewing ma- chines	Machi- nery for sugar industry	Mining machi- nery	Office appli- ances	Print- ing ma- chines
Great Britain and Ireland	—	484	1,879	3,128	2,318	1,987	—	959	4,748	1,838
Germany	—	54	509	545	249	1,062	4	21	2,476	187
France	637	637	7,135	2,059	473	279	13	385	2,653	601
Switzerland	—	1	33	43	30	2	—	—	545	62
Sweden	—	41	1,276	155	41	8	—	12	665	150
Canada	357	7,296	6,981	1,752	1,715	660	18	1,286	1,363	2,050
Netherlands	—	132	283	202	4	59	—	65	621	213
Belgium	7	193	928	192	92	19	—	97	560	109
Czechoslovakia	—	—	35	56	1	4	—	12	520	110
Austria	—	1	—	6	1	39	—	—	683	4
Italy	—	66	1,360	304	629	33	14	134	1,104	176
Denmark	—	95	1,603	30	22	12	—	—	269	56
Hungary	—	—	—	—	1	7	—	—	120	—
Japan	96	2,087	240	1,981	576	1,196	12	562	547	701
Poland and Danzig	—	5	210	5	29	9	—	190	304	—
Norway	—	16	30	23	24	1	—	128	150	7
Finland	—	—	—	11	—	—	—	11	185	2
Commonwealth of Australia	—	569	4,573	640	129	454	16	474	1,181	1,373
New Zealand	10	139	819	107	7	42	2	94	200	199
Russia	—	135	1,295	236	11	31	—	200	152	—
British India and Ceylon	385	159	206	337	319	137	5	899	406	117
Argentine	247	2,132	15,628	215	493	445	98	525	1,173	370
Brazil	740	774	786	187	487	400	772	64	824	507
China	16	215	96	51	307	45	99	99	—	366
South Africa	29	187	1,907	223	1	3	65	1,278	286	176
Mexico	1,811	958	1,504	352	212	1,036	529	2,387	603	143
Spain	30	132	565	324	202	10	3	458	698	165
Cuba	591	1,317	1,395	346	28	693	4,271	81	507	200
Dutch East Indies	—	109	82	48	—	7	14	762	153	4
Chile	210	351	513	213	59	72	29	937	312	60
Peru	138	320	424	120	32	237	153	775	178	4
Egypt	—	5	77	17	—	—	—	47	91	3
Roumania	—	49	—	15	—	—	—	165	—	—
Colombia	142	306	170	77	—	222	127	467	302	31
Algeria and Tunisia	—	32	917	—	—	—	—	60	—	—
Portugal	—	—	—	14	13	—	1	—	—	—
Bulgaria	—	—	—	8	—	—	—	—	—	—
Uruguay	—	24	535	17	22	101	1	63	128	23
Bolivia	—	—	21	15	—	42	—	451	43	—
Dominican Republic	34	248	—	15	888	—	888	—	—	—
Ecuador	22	—	—	25	—	—	56	76	—	7
Venezuela	25	147	183	67	28	106	70	864	—	—
Philippine Islands	98	529	166	74	21	558	902	141	—	48
Hong-Kong	—	—	—	20	47	—	—	—	—	—
Kwantung	317	108	—	—	—	—	—	—	—	—
Straits Settlements	—	—	—	35	1	2	—	363	57	38
Portuguese E. Africa	168	—	—	—	—	—	—	—	—	—
Other Exports	176	1,287	—	—	14	—	19	985	—	7
Total	5,649	21,340	56,685	14,590	8,752	10,514	8,304	16,477	26,425	10,110

Table 17a.

Export Markets of GREAT BRITAIN for the Chief Categories of Machinery in 1913.
(Quantities and values.)

Market	Locomotives		Engines		Textile machinery		Machine tools		Agricultural machinery		Sewing machines (complete)			Parts of sewing machines		Ships' engines	
	Tons	£ (000's omitted)	Tons	£ (000's omitted)	Tons	£ (000's omitted)	Tons	£ (000's omitted)	Tons	£ (000's omitted)	Unit	Tons	£ (000's omitted)	Tons	£ (000's omitted)	Tons	£ (000's omitted)
United States of America	—	—	9	0.7	3,939	250.8	—	—	—	—	—	—	—	—	—	—	27.4
Germany	—	—	1,877	99.0	13,917	783.9	434	46.0	7,817	297.4	—	—	932	91.4	—	—	126.0
France	7	1.2	7,202	327.1	12,630	735.9	1,753	142.1	4,138	158.2	1,440	47	5.1	4,759	213.2	—	101.7
Switzerland	—	—	—	—	668	54.3	—	—	—	—	—	—	—	238	22.5	—	—
Sweden	—	—	—	—	2,028	99.2	—	—	—	—	—	—	—	952	74.5	—	66.2
Canada	—	—	1,953	103.3	4,527	176.3	546	24.8	191	14.0	—	—	60	6.8	—	—	45.0
Netherlands	1,144	62.2	2,362	118.8	12,172	412.5	280	17.9	1,608	60.3	—	—	502	24.6	—	—	302.8
Belgium	—	—	2,011	95.8	10,314	490.7	491	32.1	1,109	41.9	—	—	836	42.0	—	—	14.8
Austria-Hungary	—	—	3,761	169.6	1,045	65.4	122	10.6	—	—	—	—	—	1,182	75.3	—	100.4
Italy	—	—	1,579	97.7	2,399	150.1	1,465	68.5	2,729	116.1	—	—	—	2,376	157.8	—	10.3
Denmark	—	—	244	15.5	541	21.6	—	—	672	26.0	—	—	—	320	15.6	—	0.3
Japan	139	7.0	4,770	411.7	19,688	802.6	2,164	118.1	—	—	358	7	0.9	—	—	—	101.1
Norway	—	—	794	27.7	—	—	—	—	—	—	—	—	—	310	18.8	—	231.4
Finland	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Commonw. of Australia	6,020	269.9	7,962	492.8	1,417	64.0	2,098	115.8	2,356	85.2	3,246	147	16.0	306	32.2	—	251.8
New Zealand	—	—	1,815	128.9	318	15.3	244	13.7	782	32.7	1,070	73	8.1	—	—	—	63.7
Russia	—	—	5,210	332.1	15,308	995.3	1,315	85.0	26,729	1,103.3	53	3	1.0	11,337	839.9	—	189.9
British India	14,811	838.5	12,285	576.2	50,287	1,992.6	1,419	89.2	2,515	97.8	—	—	—	1,297	127.3	—	75.8
Argentina	11,571	695.6	4,445	230.6	205	13.0	488	30.6	5,196	219.3	2,402	86	5.5	—	—	—	76.5
Brazil	1,279	78.8	3,413	100.9	11,863	480.2	1,141	57.7	663	23.4	9,214	394	23.9	—	—	—	55.6
China	175	10.3	615	39.4	3,321	134.6	—	—	—	—	9,605	383	22.5	—	—	—	—
South Africa	3,243	192.8	2,753	140.0	—	—	299	22.8	2,381	94.2	656	4	1.9	359	39.8	—	0.1
Mexico	85	3.4	400	18.8	3,002	131.7	—	—	399	21.4	2,673	44	5.1	1,420	103.6	—	18.4
Spain	526	29.7	3,209	306.4	3,166	161.7	357	20.6	—	—	24,883	555	41.8	—	—	—	110.2
Dutch East Indies	25	3.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chile	1,179	73.6	2,247	107.8	—	—	342	17.1	2,390	95.6	9,340	327	25.8	—	—	—	13.1
Peru	76	5.6	—	—	211	11.4	—	—	112	5.1	1,028	31	2.7	—	—	—	0.3
Egypt	224	14.5	4,922	207.3	305	16.0	—	—	2,228	91.8	—	—	—	215	12.6	—	47.8
Roumania	—	—	166	8.7	—	—	—	—	441	16.3	—	—	—	520	51.3	—	25.3
Colombia	—	—	—	—	—	—	—	—	—	—	987	22	2.2	—	—	—	—
Algeria	—	—	—	—	—	—	—	—	2,490	101.0	—	—	—	—	—	—	—
Portugal	—	—	1,560	62.4	1,254	57.6	—	—	713	31.2	—	—	—	693	31.0	—	—
Greece	—	—	—	—	448	20.5	—	—	—	—	—	—	—	305	18.3	—	81.5
Bulgaria	—	—	—	—	—	—	—	—	—	—	—	—	—	52	3.4	—	—
Turkey	48	3.6	1,116	57.7	1,118	42.8	—	—	—	—	334	11	1.0	768	82.9	—	3.7
Uruguay	379	24.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bolivia	—	—	—	—	—	—	—	—	—	—	431	8	1.0	—	—	—	—
Siam	184	13.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Philippine Islands	52	3.2	315	16.1	—	—	—	—	—	—	210	4	0.5	—	—	—	—
Hong Kong	—	—	580	37.0	—	—	—	—	—	—	52	3	0.3	—	—	—	—
Ceylon	1,694	107.1	1,327	62.8	—	—	—	—	—	—	—	—	—	—	—	—	—
Straits Settlements	81	6.1	1,378	70.9	—	—	—	—	—	—	3,927	102	7.0	—	—	—	0.3
Portuguese India	681	48.5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Portuguese East Africa	—	—	323	16.7	—	—	—	—	—	—	—	—	—	—	—	—	—
British West Africa	—	—	843	46.1	—	—	—	—	—	—	2,838	53	6.9	—	—	—	36.9
Other British Colonies	3,254	218.0	3,540	196.6	471	27.5	303	17.5	1,075	47.2	2,840	59	7.6	215	18.7	—	93.3
Other Countries	973	73.6	7,578	396.5	1,513	74.4	1,276	82.6	4,764	209.7	8,253	227	23.3	765	54.9	—	53.7
Total	47,121	2,781.9	94,564	5,210.1	178,074	8,281.8	16,537	1,012.8	73,498	2,989.2	86,440	2,540	209.5	30,719	2,158.3	—	2,336.5

Quantities not given

Table 18 a.

Export Markets of GERMANY for Machinery in 1913.
(Quantities and values.)

Market	Machine tools		Textile machinery		Agricultural machinery		Steam locomotives		Other machinery		Boilers, parts and accessories of machines		Total	
	Metric tons	1,000 RM	Metric tons	1,000 RM	Metric tons	1,000 RM	Metric tons	1,000 RM	Metric tons	1,000 RM	Metric tons	1,000 RM	Metric tons	1,000 RM
United States of America.	1,277	1,743	4,409	5,688	51	95	127	139	2,888	3,504	1,944	5,142	10,696	16,311
Great Britain	5,987	6,509	2,422	4,616	472	488	19	19	12,549	15,638	26,104	12,626	47,552	39,896
France	12,745	13,727	12,500	16,717	2,102	2,233	2,372	2,606	23,501	25,603	14,772	13,706	67,993	74,592
Switzerland	3,210	3,711	3,550	5,074	1,274	858	60	63	7,403	8,959	9,045	6,934	24,543	25,599
Sweden	2,008	2,315	1,507	1,851	502	413	188	184	3,945	5,061	1,539	1,619	9,688	11,443
Canada	79	91	105	173	13	23	—	—	1,748	1,631	180	135	2,124	2,053
Netherlands	4,775	4,638	3,053	3,711	2,507	1,717	1,038	1,082	14,328	14,816	15,271	9,081	40,073	35,045
Belgium	7,736	7,459	3,975	5,020	1,069	876	249	226	15,683	15,730	9,482	7,804	38,494	37,115
Austria-Hungary	13,864	15,407	8,439	11,370	4,173	5,240	2,740	2,751	27,375	35,756	13,074	13,907	69,665	84,431
Italy	7,630	7,676	4,833	7,389	2,768	1,852	1,056	1,190	12,120	14,671	6,530	6,392	34,936	39,170
Denmark	1,201	1,190	864	1,303	1,844	1,181	1,218	1,248	4,719	5,414	3,401	2,237	13,247	12,320
Japan	1,380	1,148	1,946	2,011	3	3	1,485	1,523	6,917	6,495	1,088	790	12,818	11,970
Norway	997	1,191	949	1,164	396	201	115	134	3,861	4,615	2,153	1,423	8,470	8,728
Finland	419	452	666	975	157	167	5	5	2,484	2,929	772	766	4,502	5,294
Commonw. of Australia	338	400	692	1,145	79	134	19	23	1,536	1,880	651	436	3,314	4,018
Russia	16,257	18,765	12,904	20,299	18,359	14,061	1,774	1,872	58,494	66,883	13,249	14,627	121,035	136,507
British India	158	160	693	1,352	283	377	631	614	2,295	2,490	457	438	4,517	5,431
Argentina	1,828	2,086	1,115	1,842	797	736	5,978	6,310	7,831	9,136	2,268	2,140	19,816	22,250
Brazil	2,582	3,006	2,958	4,944	493	595	2,855	2,709	9,978	11,780	1,693	1,791	20,558	24,825
China	259	273	260	541	42	51	779	606	1,923	2,220	432	339	3,694	4,030
South Africa	55	70	173	427	146	215	23	25	2,566	3,301	2,638	1,500	5,600	5,538
Mexico	70	104	704	789	37	53	116	191	2,193	2,440	1,244	625	4,416	4,202
Spain	1,792	2,122	1,096	2,113	295	262	11,072	11,011	6,848	8,038	2,209	2,419	23,312	25,965
Cuba	20	22	85	115	4	5	387	394	2,905	1,973	433	237	3,833	2,746
Dutch East Indies	539	593	359	918	83	97	1,508	1,753	5,682	5,081	3,203	2,070	11,374	10,512
Chile	332	383	421	733	472	431	2,021	2,329	3,542	3,939	1,575	1,372	8,363	9,187
Peru	44	50	35	54	15	19	129	132	1,964	1,473	209	170	2,396	1,898
Egypt	84	77	91	186	3	4	953	980	2,512	2,655	476	384	4,119	4,286
Roumania	833	836	658	866	1,198	1,318	5,705	5,320	8,184	8,243	1,581	1,541	18,160	18,124
Colombia	13	18	26	61	8	4	126	141	295	360	71	84	539	668
Kingdom of the Serbs, Croats and Slovenes	43	45	311	285	24	36	1,096	1,242	715	823	473	455	2,662	2,886
Portugal	387	485	589	869	41	41	1,799	2,107	1,842	1,887	427	389	5,085	5,778
Greece	90	109	114	249	55	64	—	—	1,175	1,139	597	657	2,030	2,209
Bulgaria	140	149	102	186	126	99	4,230	3,767	3,372	3,342	506	660	8,476	8,203
Turkey	192	227	185	427	35	39	1,393	1,389	1,889	1,834	543	535	4,242	4,451
Uruguay	232	252	152	220	60	43	141	145	1,258	1,273	134	152	1,977	2,085
Bolivia	29	28	24	58	6	6	140	133	936	864	539	371	1,676	1,467
Ecuador	10	9	47	14	17	14	—	5	124	144	9	9	181	222
Guatemala	25	31	10	24	12	16	—	4	142	137	33	55	222	263
British East Africa	5	7	19	39	3	3	—	18	401	321	65	40	510	431
Other Countries	614	717	787	1,744	683	913	830	828	7,585	7,914	3,800	7,494	14,299	14,613
Total	90,279	98,272	73,795	107,592	40,708	34,983	54,445	55,224	277,705	312,089	144,866	118,602	681,798	726,762

Table 18 b.

Export Markets of GERMANY for Machinery in 1924. (Quantities and values.)

Market	Machine tools		Textile machinery		Agricultural machinery		Steam locomotives		Other machines		Boilers, parts and accessories of machines		Total	
	Metric tons	1,000 RM	Metric tons	1,000 RM	Metric tons	1,000 RM	Metric tons	1,000 RM	Metric tons	1,000 RM	Metric tons	1,000 RM	Metric tons	1,000 RM
United States of America.	1,086	1,732	1,988	5,980	86	212	10	9	2,102	3,830	480	1,131	5,752	12,894
Great Britain	1,783	3,106	1,108	3,711	188	312	—	—	4,579	9,447	2,176	2,582	9,834	19,158
France	1,475	2,258	1,675	4,049	81	109	31	38	3,184	5,799	677	1,840	7,123	14,093
Alsace-Lorraine	123	169	102	214	304	212	—	—	610	134	307	970	1,512	2,413
Switzerland	2,700	4,409	1,875	5,083	1,099	929	20	17	4,102	8,094	3,646	4,881	13,442	23,413
Sweden	2,994	4,292	1,331	2,695	415	499	23	19	4,294	7,194	2,021	3,198	11,108	17,897
Canada	5	7	24	67	—	—	—	—	101	164	2	11	132	249
Netherlands	2,535	3,634	2,062	4,683	2,309	1,711	410	451	10,135	16,284	6,975	8,150	24,426	34,913
Belgium	1,138	1,561	1,463	2,852	508	405	49	38	2,825	5,004	906	1,441	6,889	11,301
Luxemburg	44	63	17	59	282	198	—	—	717	879	264	318	1,324	1,517
Czechoslovakia	1,886	3,891	3,889	8,896	252	422	210	228	2,781	6,906	1,662	4,478	10,650	24,821
Austria	3,567	5,587	2,690	6,391	700	746	61	62	5,562	11,055	3,681	5,693	16,262	29,534
Italy	2,873	4,241	4,527	10,273	2,933	2,430	113	124	5,952	9,647	2,747	4,862	19,145	31,277
Denmark	800	1,053	844	1,944	1,705	1,124	660	667	3,753	4,549	2,354	2,922	10,116	12,259
Hungary	542	897	2,532	4,341	236	276	38	49	1,394	3,027	574	1,140	5,316	9,730
Japan	826	1,621	2,589	4,624	18	27	—	—	2,846	5,991	310	671	6,589	12,934
Poland	1,947	3,294	2,826	6,936	1,231	1,668	2,045	2,220	7,532	12,676	3,570	6,209	19,151	33,003
Norway	271	359	401	947	152	140	16	23	1,805	2,315	861	1,154	3,506	4,938
Finland	376	562	779	1,485	397	368	935	—	2,137	3,391	1,471	1,803	6,095	8,807
Commonw. of Australia	162	225	190	731	6	9	—	—	350	709	19	72	727	1,746
Russia	743	1,562	296	980	1,586	1,594	12	13	2,600	6,182	398	1,569	5,635	11,900
British India	184	324	453	1,522	144	196	26	35	1,632	3,026	323	365	2,762	5,468
Argentine	2,477	3,243	2,103	4,817	572	541	249	382	4,833	8,025	1,895	2,808	12,129	19,816
Brazil	3,599	4,652	2,247	5,546	160	218	1,947	2,889	5,671	9,133	712	1,458	14,336	23,896
China	1,816	2,503	441	1,032	33	43	91	112	1,925	3,312	474	732	4,780	7,734
South Africa	215	369	80	253	310	315	5	6	484	1,011	395	405	1,489	2,359
Mexico	246	413	216	488	48	60	57	64	1,388	2,348	527	718	2,482	4,091
Spain	865	1,550	976	3,067	485	369	93	169	4,549	7,406	1,007	1,913	7,975	14,474
Dutch East Indies	349	490	47	114	216	251	972	1,298	1,818	2,755	1,962	2,026	5,364	6,934
Chile	339	586	250	662	185	225	381	557	1,735	2,749	804	1,443	3,694	6,222
Peru	96	156	46	86	15	27	132	167	570	870	146	124	1,005	1,430
Egypt	113	169	63	160	23	29	48	35	1,751	2,076	412	582	2,410	3,051
Roumania	993	1,219	631	1,157	410	332	2,124	1,473	3,243	4,453	1,333	2,381	8,734	11,015
Colombia	43	71	27	69	14	15	134	198	437	880	79	168	734	1,401
Latvia	754	991	882	1,663	913	803	107	154	2,144	2,697	494	705	5,294	7,013
Kingdom of the Serbs, Croats and Slovenes	416	640	681	1,420	157	160	450	623	1,985	3,218	502	1,060	4,191	7,121
Portugal	378	537	209	497	209	189	1,755	2,727	1,744	2,262	326	455	4,139	6,149
Greece	461	725	257	710	126	172	64	77	1,803	2,806	384	681	3,095	5,171
Bulgaria	370	549	851	2,123	197	205	21	13	1,774	2,364	267	515	3,480	5,769
Turkey	350	727	339	727	315	362	2,025	1,988	1,137	1,444	333	473	4,499	5,781
Bolivia	27	35	6	22	5	5	—	—	119	164	179	229	336	455
Estonia	214	332	255	610	435	406	36	35	794	1,088	222	401	1,956	2,872
Lithuania	87	126	423	425	425	362	71	108	1,059	1,338	191	289	2,058	2,646
Danzig	277	460	395	902	718	1,172	122	81	1,787	2,923	849	1,128	4,148	6,666
Saar Basin	1,593	1,525	146	406	119	111	779	745	921	1,484	801	1,065	4,359	5,336
Territory of Memel	73	106	43	91	128	126	—	—	188	267	159	168	591	758
Ecuador	45	70	70	105	27	38	25	34	159	234	15	37	341	518
Guatemala	15	25	4	8	9	12	—	—	628	806	21	37	677	888
Other Countries	770	1,194	611	1,906	223	359	830	985	4,005	6,340	986	1,596	7,422	12,380
Total	45,041	68,310	45,762	107,567	12,109	20,194	17,177	20,111	118,860	200,714	50,726	78,394	298,676	495,290

Table 18c

Export Markets of GERMANY for Machinery in 1925. (Quantities and values.)

Market	Machine tools		Textile machinery		Agricultural machinery		Steam locomotives		Other machinery		Boilers, parts and accessories of machines		Total	
	Metric tons	1,000 RM	Metric tons	1,000 RM	Metric tons	1,000 RM	Metric tons	1,000 RM	Metric tons	1,000 RM	Metric tons	1,000 RM	Metric tons	1,000 RM
United States of America.	2,218	3,288	3,158	9,409	75	182	—	—	1,740	4,092	962	2,019	8,153	18,990
Great Britain	3,441	6,265	1,311	5,188	208	311	59	69	6,301	14,068	9,939	7,425	21,259	33,326
France	2,099	3,755	1,520	4,737	522	674	152	147	3,335	7,706	1,462	3,322	9,090	20,341
Alsace-Lorraine	131	207	129	259	229	159	43	39	372	773	203	556	1,107	1,993
Switzerland	3,264	5,535	1,772	5,018	1,120	963	21	33	5,748	11,425	4,977	6,371	16,902	29,345
Sweden	1,241	2,163	1,014	2,263	608	590	15	8	5,457	9,909	3,599	4,096	11,934	19,029
Canada	8	20	42	112	8	13	—	—	174	612	10	53	243	810
Netherlands	3,344	5,190	3,612	7,859	3,455	2,684	305	280	11,490	19,273	12,898	12,807	35,104	48,093
Belgium	1,993	2,507	2,100	4,812	581	418	12	14	3,904	7,639	2,236	3,342	10,831	18,732
Luxemburg	475	210	19	54	323	244	—	—	246	381	794	658	1,557	1,538
Czechoslovakia	3,164	6,154	3,857	10,570	398	718	66	71	4,980	11,556	2,354	5,642	14,819	34,711
Austria	1,985	3,491	2,243	5,176	739	739	201	227	4,595	10,592	3,984	5,840	13,747	26,083
Italy	7,853	11,427	9,088	17,897	4,995	3,450	138	139	12,146	18,480	6,121	8,530	40,341	59,923
Denmark	838	1,186	583	1,750	2,361	1,747	290	327	2,985	5,418	2,769	3,394	9,826	13,822
Hungary	513	953	2,429	4,950	249	274	26	20	1,183	3,249	522	1,302	4,922	10,748
Japan	419	1,007	1,650	3,141	44	64	496	629	3,760	7,103	511	1,002	6,881	12,946
Poland	2,233	4,153	2,007	6,145	2,121	2,652	732	755	8,043	15,011	2,560	5,498	17,696	34,214
Norway	299	518	303	945	227	200	20	30	2,361	4,304	1,729	2,127	4,939	8,124
Finland	312	527	257	713	368	351	13	15	1,793	2,878	865	1,325	3,607	5,809
Commonw. of Australia	245	404	179	622	13	32	—	—	634	1,425	77	170	1,148	2,653
Russia	1,827	4,225	575	2,424	12,631	10,494	—	—	4,644	18,704	1,920	3,921	21,597	39,858
British India	350	560	632	2,105	211	302	912	1,208	2,085	4,038	2,908	3,312	7,096	11,525
Argentina	3,151	4,663	1,716	4,882	823	832	378	461	8,981	13,987	3,680	4,777	18,729	29,602
Brazil	4,496	6,439	3,326	7,538	343	449	8,608	11,631	9,292	15,609	1,261	2,260	27,326	43,926
China	1,215	2,298	349	640	37	55	193	213	2,189	3,864	1,296	1,383	5,279	8,453
South Africa	327	552	132	446	408	538	1,995	2,631	719	1,271	887	940	4,468	6,378
Mexico	298	541	351	774	61	83	12	14	2,370	4,225	588	646	3,680	6,283
Spain	2,235	3,517	1,306	4,612	1,071	843	942	911	8,601	14,585	2,868	4,197	17,023	28,665
Dutch East Indies	326	548	44	158	215	277	750	845	4,693	5,728	4,044	4,055	10,072	11,611
Chile	249	468	249	672	210	386	634	726	2,509	4,372	1,396	919	4,770	7,920
Peru	67	119	241	471	16	25	104	149	716	1,326	311	527	1,455	2,617
Egypt	256	388	108	275	72	86	72	72	3,357	4,675	830	939	4,695	6,435
Irish Free State	30	52	15	29	53	120	64	83	52	119	28	48	242	451
Roumania	1,285	1,981	973	2,134	340	330	205	189	4,116	6,096	2,067	3,095	8,986	13,825
Colombia	81	139	62	165	20	32	156	206	564	1,274	99	214	982	2,030
Latvia	418	701	315	873	508	483	102	138	1,346	2,010	454	651	3,143	4,856
Kingdom of the Serbs, Croats and Slovenes	1,084	1,579	1,109	2,605	282	284	42	49	2,810	4,548	626	1,100	5,953	10,255
Portugal	569	1,004	191	564	175	177	810	1,427	1,065	1,927	253	492	3,083	5,291
Greece	878	1,665	354	1,105	131	190	210	230	4,669	6,582	1,076	1,571	7,119	11,343
Bulgaria	289	391	910	2,614	602	723	77	79	1,683	2,330	386	731	3,947	6,868
Turkey	615	1,090	268	697	526	405	1,184	1,023	2,785	4,259	519	926	5,897	8,400
Bolivia	28	47	15	118	8	8	163	350	137	279	158	238	509	1,042
Estonia	132	220	151	536	193	250	51	55	260	447	230	358	1,017	1,866
Lithuania	122	158	149	315	345	246	489	406	700	919	191	331	1,996	2,375
Danzig	260	412	285	728	474	764	19	15	1,956	3,357	1,172	1,602	4,166	6,878
Saar Basin	714	1,108	150	413	67	80	1,350	1,090	1,466	1,732	879	1,231	4,206	5,654
Territory of Memel	34	41	18	33	140	175	—	—	190	312	96	136	478	697
Ecuador	44	112	43	104	10	21	51	49	193	337	35	60	376	693
Guatemala	25	35	14	45	7	11	—	—	273	429	86	128	405	648
Other Countries	970	1,738	2,228	4,062	665	748	412	408	6,967	11,677	2,355	3,242	13,597	21,875
Total	58,155	95,761	53,552	133,748	39,288	35,802	22,574	27,171	162,015	297,002	90,704	120,076	426,378	709,550

Ad No. 10.

TOTAL CONSUMPTION AND CONSUMPTION PER HEAD IN EACH COUNTRY.

TOTAL QUANTITY OF MACHINERY CONSUMED AND QUANTITY CONSUMED PER HEAD OF THE POPULATION IN FORTY-THREE COUNTRIES.

(a) BEFORE THE WAR.

Number	Country	Year	Consumption (in millions of RM.)	Calculation ¹ (in millions of RM.)	Population (in millions)	Consumption per head (RM.) ²
1	United States of America	1914	4767	P 5420 + I 28 — E 681	96.5	49.4
2	Great Britain	1913	1002	P 1602 + I 121 — E 721	45.2	22.2
3	Germany	1913	2163	P 2800 + I 101 — E 738	67.0	32.3
4	France	1913	389-430	P 243 (284) + I 223 — E 77	39.6	9.8-10.8
5	Switzerland	1913	92-152	P 120 (180) + I 34 — E 62	3.9	23.6-39.0
6	Sweden	1913	97	P 122 + I 24 — E 49	5.7	17.0
7	Canada	1910	399-439	P 300 (340) + I 129 — E 30	7.5	53.2-58.5
8	Netherlands	1913	132	P 85 + I 84 — E 37	6.7	19.7
9	Belgium	1913	171-187	P 146 (162) + I 88 — E 63	7.5	22.8-24.9
10	Austria-Hungary	1912	566	P 460 + I 138 — E 32	51.5	11.0
11	Italy	1913	233-283	P 150 (200) + I 101 — E 18	34.7	6.7- 8.2
12	Denmark	1913	40	P 32 + I 21 — E 13	2.9	13.8
13	Japan	1913	104-114	P 42 (52) + I 66 — E 4	53.4	1.9- 2.1
14	Norway	1913	39-43	P 10 (14) + I 31 — E 2	2.5	15.6-17.2
15	Finland	1913	23-25	P 6 (8) + I 19 — E 2	3.3	7.0- 7.6
16	Australia	1913	142-162	P 60 (80) + I 88 — E 6	4.6	30.9-35.2
17	New Zealand	1913	23-24	P 5 (6) + I 18	1.0	23.0-24.0
18	Russia	1913	791-841	P 450 (500) + I 341	167.0	4.7- 5.0
19	British India	1913	139	I 139	319.0	0.4
20	Argentina	1913	91	I 91	7.9	11.5
21	Brazil	1913	102	I 102	30.0	3.4
22	China	1913	20	I 20	350.0	0.06
23	Union of South Africa	1913	64	I 64	6.1	10.5
24	Mexico	1913	50	I 50	15.5	3.2
25	Spain	1913	75	I 75	20.0	3.8
26	Cuba	1913	51	I 51	2.7	18.9
27	Dutch East Indies	1913	59	I 59	44.0	1.3
28	Chile	1913	35	I 35	3.8	9.2
29	Peru	1913	10	I 10	4.5	2.2
30	Egypt	1913	18	I 18	12.5	1.4
31	Roumania	1912	44	I 44	7.2	6.1
32	Colombia	1913	7	I 7	5.1	1.4
33	Algeria	1913	23	I 23	5.6	4.1
34	Kingdom of the Serbs, Croats and Slovenes	1912	7	I 7	3.0	2.3
35	Portugal	1913	14	I 14	6.0	2.3
36	Greece	1913	2	I 2	4.8	0.4
37	Bulgaria	1912	18	I 18	4.4	4.1
38	Turkey	1913	13	I 13	8.0	1.6
39	Uruguay	1913	8	I 8	1.4	5.7
40	Morocco	1913	2	I 2	5.0	0.4
41	Bolivia	1913	5	I 5	2.8	1.8
42	Siam	1913	3	I 3	8.4	0.4
43	Tunisia	1913	2	I 2	2.0	1.0

¹ P = Production; I = Imports; E = Exports.

TOTAL QUANTITY OF MACHINERY CONSUMED AND QUANTITY CONSUMED PER HEAD OF THE POPULATION IN FIFTY COUNTRIES. (Continued.)

(b) POST-WAR PERIOD.

Number	Country	Year	Con- sumption (in mil- lions of R.M.)	Calculation ¹ (in millions of R.M.)	Popu- lation (in millions)	Con- sumption per head. (R.M.)
1	United States of America	1923	14,465	P 15,334 + I 64 — E 933	112.1	129.0
2	Great Britain	1924	2,351	P 2,936 + I 179 — E 764	44.0	53.4
3	Germany	1925	2,264	P 2,900 + I 99 — E 735	62.5	36.2
4	France	1925	529-610	P 486 (567) + I 212 — E 169	39.2	13.5-15.5
5	Switzerland	1925	177-247	P 250 (320) + I 52 — E 125	4.0	44.0-61.7
6	Sweden	1925	122	P 170 + I 42 — E 90	6.0	20.3
7	Canada	1925	836-916	P 670 (750) + I 243 — E 77	8.9	93.9-102.9
8	Netherlands	1924	168	P 103 + I 111 — E 46	7.0	24.0
9	Belgium (Luxemburg)	1925	199	P 162 + I 96 — E 59	7.9	25.2
10	Czechoslovakia	1925	176-206	P 150 (180) + I 70 — E 44	13.8	12.7-15.0
11	Austria	1925	92-112	P 100 (120) + I 34 — E 42	6.6	13.9-17.0
12	Italy	1925	367-407	P 240 (280) + I 153 — E 26	39.0	9.4-10.4
13	Denmark	1924	59	P 53 + I 29 — E 23	3.4	17.3
14	Hungary	1925	69-74	P 55 (60) + I 26 — E 12	8.0	8.6-9.3
15	Japan	1923	346-416	P 180 (250) + I 180 — E 14	59.7	5.8-7.0
16	Poland	1925	110-120	P 50 (60) + I 69 — E 9	27.3	4.0-4.4
17	Norway	1925	36-41	P 15 (20) + I 25 — E 4	2.7	13.3-15.2
18	Finland	1925	29-34	P 10 (15) + I 22 — E 3	3.4	8.5-10.0
19	Australia	1923-24	259-299	P 120 (160) + I 145 — E 6	6.0	43.2-49.9
20	New Zealand	1923-24	46-47	P 12 (13) + I 34	1.4	32.8-33.6
21	Russia	1924-25	536-586	P 380 (430) + I 156	130.0	4.1-4.5
22	British India	1925-26	225	I 225	330.0	0.7
23	Argentina	1925	143	I 143	8.8	16.3
24	Brazil	1924	104	I 104	32.0	3.3
25	China	1924	88	I 88	450.0	0.2
26	Union of South Africa	1925	99	I 99	7.0	14.1
27	Mexico	1925	88	I 88	14.0	6.3
28	Spain	1925	90	I 88 (+ P 2)	21.0	4.3
29	Cuba	1924	63	I 63	3.0	21.0
30	Dutch East Indies	1924	58	I 58	50.0	1.2
31	Chile	1923	43	I 43	4.0	10.7
32	Peru	1925	35	I 35	5.0	7.0
33	Egypt	1925	41	I 41	13.0	3.2
34	Irish Free State	1925	24	I 24	3.2	7.5
35	Roumania	1925	28	I 26 (+ P 2)	17.5	1.6
36	Colombia	1924	18	I 18	6.3	2.9
37	Algeria	1924	17	I 17	5.8	2.9
38	Latvia	1925	15.5	I 15.5	1.8	8.6
39	Kingdom of the Serbs, Croats and Slovenes	1925	26	I 26	12.2	2.1
40	Portugal	1925	15	I 15	6.0	2.5
41	Greece	1924	13	I 13	5.6	2.3
42	Bulgaria	1924	12	I 12	5.0	2.4
43	Turkey	1924	11	I 11	10.0	1.1
44	Uruguay	1924	9	I 9	1.5	6.0
45	Morocco	1924	7	I 7	5.5	1.3
46	Bolivia	1924	6	I 6	3.0	2.0
47	Siam	1924	6	I 6	9.4	0.6
48	Estonia	1925	6	I 5,3 (+ P 0.7)	1.1	5.5
49	Lithuania	1924	5	I 5	2.0	2.5
50	Tunisia	1924	4	I 4	2.1	1.9

¹ P = Production; I = Imports; E = Exports.

Ad No. 11.

PRICES.

1. UNITED STATES.

PRICES OF AGRICULTURAL MACHINERY.

(a) Average Price per Unit (Local Prices) according to Quarterly Reports.

Source: United States Department of Agriculture: *Agriculture Year-Book* 1923, p. 1152.

Category of machinery	15. 1. 23. \$	15. 4. 23. \$	15. 7. 23. \$	15. 10. 23. \$	15. 1. 24. \$
Centrifugal hand cream separator, 250-quart capacity.	79.10	80.61	81.91	84.06	85.31
Engines, gasoline, 3 horse-power . .	97.44	100.48	103.45	103.00	103.99
Grain binders, 7-foot	201.61	206.95	217.97	217.19	222.81
Harrows, disc, 7-foot single	53.36	54.51	55.25	53.00	57.74
Hay-rakes, 2-horse, sulky	40.67	39.88	43.75	43.34	44.91
Mower, 5-foot.	74.39	76.92	81.39	81.00	81.22
Plow, 2-horse, walking.	18.24	18.83	18.94	19.83	19.92
Plow, riding, horse-drawn, 2 bottoms	85.10	89.54	91.79	89.47	95.00

(b) Prices Per Unit according to Reports of Dealers in the Middle of December of Each Year.

Source: United States Department of Agriculture: *Agriculture Year-Book* 1923, p. 1150-51.

Category of machinery	1909 £	1914 £	1918 £	1919 £	1920 £	1921 £	1922 £
Cream separators	63.10	59.30	87.00	95.00	102.00	90.00	88.88
Harrows	—	—	—	—	30.00	25.50	24.90
Mowers	44.30	46.50	79.20	84.00	88.00	78.00	77.24
Plows, turning.	11.50	12.10	20.00	21.00	23.00	20.00	22.35
Tedders.	39.00	39.50	69.40	74.00	78.50	69.00	70.33
Walking cultivators	—	—	32.90	35.20	40.00	34.00	30.05

2. GREAT BRITAIN.

No particulars are available regarding the prices of machinery.

3. GERMANY.

*Index Figures of Prices*¹ *of Machinery in Germany (July 1914 = 100).*

Source: *Wirtschaft und Statistik* for 1925.

Month	All machinery	Agricultural machinery	Metal-working machines	Wood-working machines	Combustion motors	Type-writers
1924:						
January	141.6	—	—	—	—	—
February	131.7	134.0	131.0	129.0	127.0	111.0
March	130.5	—	—	—	—	—
April	136.4	130.0	139.0	141.0	128.0	111.0
Mai	141.1	144.0	142.0	144.0	141.0	111.0
June	142.2	144.0	142.0	153.0	140.5	100.0
July	137.7	138.0	137.0	141.0	118.5	100.0
August	135.0	131.0	135.0	129.0	118.5	100.0
September	136.2	131.0	134.1	128.6	118.5	100.0
October	134.3	127.0	132.3	128.6	118.5	100.0
November	133.5	127.0	130.6	128.6	118.5	100.0
December	133.4	121.7	130.6	128.6	125.5	100.0
1925:						
January	135.2	122.9	132.9	131.9	119.0	100.0
February	138.7	125.8	137.8	133.2	121.0	100.0
March	139.1	126.7	140.0	133.2	121.0	100.0
April	140.2	128.1	141.3	133.2	121.0	100.0
May	143.9	128.2	145.6	133.2	121.0	100.0
June	146.1	129.9	146.9	136.7	124.5	99.5
July	146.5	129.9	146.9	136.7	122.5	99.5
August	147.1	130.1	146.9	140.5	122.5	99.5
September	147.9	131.8	146.2	143.0	122.5	99.5
October	147.6	131.8	145.4	142.3	122.5	99.5
November	148.1	131.8	146.7	142.3	122.5	99.5
December	148.1	131.4	146.7	139.0	127.5	99.5
1926:						
January	147.5	131.9	148.6	136.2	118.5	99.5
February	147.1	132.2	146.7	136.2	118.5	99.5
March	147.0	131.4	146.7	136.2	118.5	99.5
April	145.8	131.9	144.4	135.6	118.5	99.5
May	145.3	131.9	144.4	135.6	118.5	99.5
June	145.0	131.4	144.3	135.2	118.5	99.5
July	144.6	127.6	144.3	135.2	118.5	99.5
August	143.9	127.6	143.0	134.8	118.5	99.5
September	143.9	127.2	143.0	134.8	118.5	99.5
October	143.9	127.2	143.0	134.8	118.5	99.5

¹ Calculated on the basis of the prices at the factory on dealers' prices.

OBSERVATIONS

submitted by

BRITISH, FRENCH AND ITALIAN ASSOCIATIONS

on the

**Memorandum on the World's Mechanical
Engineering Industry**

2.

OBSERVATIONS

on the

MEMORANDUM ON THE WORLD'S MECHANICAL ENGINEERING INDUSTRY

Submitted by the **BRITISH ENGINEERING ASSOCIATION.**

Communicated by Sir ARTHUR BALFOUR.

At the beginning of the Memorandum, its authors state that, in respect of statistics for foreign countries, they have had to use the material which was available in Germany. The particulars given in respect of foreign countries for production, exports, etc., have been taken as far as possible from the official publications of those countries; but where this information is lacking, recourse has been had to various private sources.

Admission of considerable deficiencies in the statistical material applying to foreign countries was made in the preliminary draft of the Memorandum (see page 29), and is repeated on page 58 of the revised text¹.

The general survey of world engineering production and foreign trade is summarised in Section 1 of the Memorandum. On page 10 is printed Table 1, which is a summary of the engineering production and productive capacity in 1913 and 1925 of the United States, Great Britain, Germany and "Other Countries" taken together. Further, the production and capacity figures for 1925 are re-valued on the basis of pre-war prices so as to give a measure of comparative volume between 1913 and 1925.

The range of engineering products for the purposes of Table 1, in the case of Great Britain (and presumably other countries as well), comprises the following items: "Machinery" as per our own British foreign trade returns (group III G.) *minus* boilers and boiler-house plant and electrical machinery, *plus* locomotives (complete and parts), tractors and ships' machinery.

As to the source of these statistics, the data for Great Britain, according to the statement on page 65 of the Memorandum, are either taken from or based upon an article which appeared in *World Power* for April 1925, page 182. This article was entitled "British Engineering Production; the Position in 1913 and 1924", and was

¹ The references to the pages of the German Memorandum are adjusted to the pagination of the present volume.

written by "Economist". In this article an attempt is made to estimate the volume of British engineering production in 1913 and 1924, based essentially on a sample census taken in the latter year by the Engineering and Allied National Employers' Federation, which, for the sake of brevity, will be hereinafter referred to as the E.E.F. census. This census showed, amongst other things, that, in the years 1923 and 1924, the average proportions of home and export trade were 73.5 per cent and 26.5 per cent respectively, as compared with 46.65 per cent and 63.35 per cent as shown by the 1907 census of production.

The writer of the *World Power* article commences by taking certain statistics of engineering production from the report of the census of production for 1907, and comparing with these the export statistics (from the Trade Returns) for the identical products in that year. The range of products in question comprises all machinery *other than electrical*, together with locomotives (including agricultural locomotives or tractors), and pumping and winding and other steam engines. The average per ton of the output of these commodities and of the tonnage exported is calculated; and also the percentage of the amount exported to the total amount produced, which works out at 44.8 per cent on value and 32.3 per cent on tonnage. The next step is to assume that these export quotas and the respective production and export values per ton *were identical in 1913 and 1907* and, on that basis, from the export figures of 1913, statistics of production in that year are calculated; but for this year the range of products taken is altered to all machinery *including* electrical, plus electrical goods and apparatus, but *excluding* locomotives, tractors, etc.

The next step is to take the export statistics for 1923 and 1924 for these products, and then, from the above-mentioned E.E.F. census ratio, to calculate the total output figures for these years. But it is to be noticed that *the average value per ton of electrical goods and apparatus in each year is taken to be identical with the average value per ton of machinery, and in each year the amazing assumption is made that the average value per ton at the works and the average export value per ton are identical*. It will be noticed that, throughout these calculations, various daring assumptions are made which the author freely admits, and "hopes that the margin of error introduced is not great enough seriously to affect the validity of the conclusions".

Up to this point the authors of the German Memorandum accept the statistics of value of British production as given by the writer of the above article for 1913 and 1924 (see page 65-66 of the Memorandum), and also the export quotas as given for 1913, 1923 and 1924, viz., 45 per cent, 28 per cent, and 26 per cent respectively. These are then applied to the value of British exports according to the definition given in the fourth paragraph of these notes, viz., machinery *less* boilers and electrical machinery, *plus* locomotives, tractors and ships' machinery (see pages 65-66 and 148 of the Memorandum). Consequently, the total production value of British machinery industry for the years 1913, 1923 and 1924 is given as 78.4, 125.1 and 159.4 million pounds respectively, which are converted into German Reichsmarks at the current rates of exchange. *And so we arrive at the production value statistics given for Britain for these years in Table 1 of the Memorandum*. A critical analysis of these estimates is made in the Appendix attached.

It is even more interesting to observe the method by which the *capacity* figures are arrived at. It should be stated in the first place that the production for 1925 is calculated from the production of 1924, according to the ratio 87.4 to 84.7, that is, the percentage of average employment of insured workers in "general engineering" (which excludes electrical, marine, and constructional engineering, and takes no account of short time working) in 1925 to the corresponding figure in 1924. Capacity for 1925 is estimated in the following manner: If the production figure for 1925 was obtained from 87.4 per cent of the insured workers, then capacity must be the amount which would be obtained from 100 per cent of the insured workers. This is a sufficiently doubtful assumption to necessitate no further comment, since it obviously does not follow that the full strength of the workers insured in the industry at the present time corresponds to the full output capacity of the industry as it has existed since the war. As to the pre-war capacity, it was originally assumed, in the preliminary draft of the Memorandum, that all countries in 1913 were working at 95 per cent of capacity; therefore, capacity was to production as 100 to 95, but, in the revised text, this assumption has been dropped and it is stated there that the productions of countries in 1913 was *identical as near as may be* with their individual capacities.

A further danger lies in the uniform re-valuation of post-war values to pre-war values by the application throughout (except for Germany itself) of the index number 150 for 1925 (1913 equals 100) — which is stated to be based on the British Board of Trade Index Number of Wholesale Prices. Apart from the incidental dangers of this wholesale method of re-valuation (in that it takes no account of the changed nature of products which constitute the trade, or of such differences between country and country, or of the increase in direct labour costs), the actual index number for 1925 was something in excess of 150 for all commodities, while the average value of engineering products in 1925, as evidenced in export prices, was almost double that of 1913.

With regard to the summary of world export engineering trade contained in the table on page 14 of the Memorandum, the respective percentage shares given there for the United States, Great Britain, Germany and other countries tend on the whole to confirm the corresponding figures which we ourselves published in Table 33 of our Monograph, when allowance is made for two facts: (1) that the estimates are not made on an exactly identical basis; and (2) that our calculation is that of percentage shares taken by Britain, Germany, France and the U. S. A. of *their own total combined trade*, whereas the percentage shares quoted in the German Memorandum are those of *total world export trade*.

With regard to engineering export trade, the German Memorandum concludes that such trade between the engineering manufacturing countries themselves remains more important than trade to countries which have not developed engineering industry, but the fact remains, for Britain at any rate, that 73.8 per cent of her exports of machinery goes to countries where manufacturing is either non-existent or of quite minor importance.

The following shows the actual value of engineering exports in 1913 and 1924 (in strict accordance with the German definition) and the consequent estimates

of total output value, obtained by the use of the calculated export quotas :

	Value (£000)	Tons	Value (£000)	Tons
		1913		1924
Machinery	33,602	689,389	44,783	463,447
<i>Less.</i> Boilers, etc.	1,773	68,520	2,632	55,398
Electrical	2,269	26,860	5,353	31,429
	<u>4,042</u>	<u>95,380</u>	<u>7,985</u>	<u>86,827</u>
	29,560	594,009	36,798	376,620
Locos.	2,782	47,121	2,496	31,500
<i>Plus.</i> Tractors	628	9,755	724	8,452
Ships' Machinery	2,297	(?)45,000	1,360	(?)12,000
	<u>35,267</u>	<u>(?)695,885</u>	<u>41,378</u>	<u>(?)428,572</u>
∴ Total output on basis of Export Quota				
at 45 % =	£78,400,000 ¹	1,575,000		
at 26 % =			£159,400,000 ¹	1,650,000

It will be seen that the output values have been estimated entirely on export prices. It is almost certain that in 1913, as in 1907 (according to the Census of Production of that year), the average home output value per ton was appreciably lower than the export value. For instance, in the case of textile machinery in 1907 the average value at works was £33 per ton, while the average value per ton of exports was £44 per ton *f.o.b.* Further, the export quota taken above for 1913 as 45 per cent is based on a calculation in respect of a certain range of products (not identical with the above) for the year 1907. The export quota for all engineering products in 1907 was 53.35 per cent. For the range of products embraced by the German definition, it was approximately 59.9 per cent and in all probability for the year 1913 the corresponding export quota would be not less than 50 per cent. Having regard to these considerations, the total output value in 1913 was probably in the neighbourhood of £70,000,000, or even less, rather than £80,000,000.

Since it is commonly accepted that our export trade in finished metal manufactures at the present time, as in pre-war, is generally of a more highly finished character and therefore of a higher average value than our general production (even if for no other reason than that export values are *f. o. b.* and therefore include the cost of putting the products on board ship), it is thus probable that the German estimate of output value for 1924, being in this case also based entirely on export prices, is on the high side; although in post-war years the margin between home and export prices may not be so pronounced as pre-war. It will be noticed that in the table above, in addition

¹ Confirming the estimates as given by the Germans.

to stating the export values, an attempt has been made to give an estimate as closely as possible of the tonnage of the exports as per the German definition. From these, as has been done in the case of values, an estimate of the total output in tonnage is calculated by the application of the export quotas. From these figures it will be seen that the average export values per ton in 1913 and 1924 were just over £50, and just under £100, per ton respectively. Having regard to what has been said above as regards the relation of output and export values, it is probable that the correct output values per ton in these years were approximately £45 and £90 per ton. On the tonnage figures as calculated above this would give output values in these years of £70,000,000 and £148,500,000 respectively.

It is very possible that even those estimates are still on the high side, because, apart from the fact that the 45 per cent and 26 per cent quotas are not calculated on an identical basis (the latter in fact being the result of the E.E.F. Sample Census, which, contrary to the German range, included electrical machinery and other items), there is reason to think that these quotas are too low; if so, the output values calculated by their means would be too high. It has been shown above that the 45 per cent for 1913 should in all probability not be less than 50 per cent; whereas as regards the 26 per cent, in addition to what has been said above, there is reason to think, as was pointed out in a previous memorandum, that this figure may be too low on account of sub-contractors returning as for home consumption manufacture which has actually been for export.

It is very likely, therefore, that the output values for 1913 and 1924 as put forward above, namely, £70,000,000 and £148,500,000 respectively, represent the maximum estimate for each year, in respect of those products which fall within the scope of the German Survey.

3.

FRENCH OBSERVATIONS

on the
MEMORANDUM ON THE WORLD'S MECHANICAL ENGINEERING INDUSTRY

Communicated by M. DE PEYERIMHOFF DE FONTENELLE.

I. OBSERVATIONS SUBMITTED BY "LA CHAMBRE SYNDICALE DE FABRICANTS ET DE CONSTRUCTEURS DE MATÉRIEL POUR CHEMINS DE FER ET TRAMWAYS".

Generally speaking, the information given with regard to the construction of railway material is correct; for instance, in the matter of locomotives, the figure given for French production (page 68) — 650 to 700 units per annum — is exact for the pre-war period. The average value of these units in 1913 does indeed give a total of 40 millions. But it should be pointed out that, at the present time, the output capacity of the French locomotive industry is twice as great. Moreover, no mention is made of the truck and passenger-carriage building industry, which nevertheless forms part of mechanical engineering. This industry, which is specialised, is at present capable of building 1,500 tenders, 2,000 passenger carriages of the most modern type and 30,000 goods trucks of the latest improved type, per annum. This output capacity in the matter of railway material, including locomotives, would mean about 40,000 workmen and employees actually employed.

The authors of the Memorandum seem to have been handicapped, particularly in the case of France, by the lack of statistics.

Although, from the point of view of the *relative value* of the volume of output, the Memorandum is on the whole fairly accurate, from the point of view of the *absolute value* of this volume, the tonnage attributed to France seems to understate the truth.

In addition to the weight and volume of output, the value of the latter should also be taken into account. In this connection the position of France with regard to Russia before the war is instructive. The German Memorandum gives pre-war Russia a more important place than that accorded to France in the matter of mechanical construction. At that time, however, at any rate as regards railway material, France was well ahead of Russia and exported railway material to that country. It is evidently the enormous mass of the Russian population which has lent such great importance to Russian mechanical construction. But it may be asked whether it is right to compare *in weight* the result of the work of a multitude of small workshops, not all highly

organised, with that of a few powerful companies provided with modern improvements. It does seem that, from a scientific and technical point of view, France was, and still is, with the United States of America, Great Britain, Germany and Belgium, one of the leading industrial nations producing railway material. The statistical figures of the German Memorandum should therefore, we think, be corrected on the basis of a certain "psychological coefficient".

II. OBSERVATIONS SUBMITTED BY THE FÉDÉRATION DES SYNDICATS DE LA CONSTRUCTION MÉCANIQUE, ÉLECTRIQUE ET MÉTALLIQUE DE FRANCE.

The information given in the document regarding the mechanical construction industry in France seems to differ appreciably from that which is generally admitted as accurate.

Among the *sources consulted* for the information regarding French mechanical construction, we note the "General Report on French Industry" published by the Ministry of Commerce and Industry in 1919. For various reasons — one being the havoc wrought by the German armies in the northern departments — most of the data contained in this document are not sufficiently accurate to allow of their utilisation, even for approximate calculations.

Since the above date, the syndical and federal organisation has conducted enquiries, the results of which have been utilised for the compilation of these notes.

The basic documentation regarding our industries is mainly that concerning persons actually employed. The statistical results of the general census of the population taken on March 6th, 1921, by the French General Statistical Office (published for each of the departments) have made it possible to establish the data which we have the honour to submit at the end of this note.

It may be admitted that, in the mechanical engineering industries, *production* is in the main proportionate to the number of persons employed. As regards the industrial sub-group "mechanics", production has steadily increased since 1921 and, leaving the present situation out of consideration, it is probably not less than 6,000,000,000 francs, or 1,000,000,000 Reichsmarks, *i.e.*, twice the amount shown for France on page 30 of the German document.

The number of persons actually employed referred to on page 33 is also an underestimate. The data on this subject are given in the annexed note.

The number of persons employed cannot give an adequate idea of the output capacity of French mechanical construction. For instance, owing to special circumstances, *locomotive construction* workshops only employ a very small number of workmen in comparison with the number they could employ as a result of their post-war development.

In view of these considerations, the information and graphs given in chapters 1, 2 and 10 should be rectified.

Output Capacity.

The output capacity, reckoned on the basis of the existing plant, may be given as follows:

Agricultural machinery	700,000,000	frances
Machine tools	500,000,000	»
General machinery	5,000,000,000	»
Textile machinery	500,000,000	»
Locomotives	750,000,000	»
	<hr/>	
Total	7,450,000,000	»
Or approximately	1,250,000,000	Reichsmarks.

Working Population, by Industrial Sub-Groups.

(According to the statistical results of the general census of the population taken on March 6th, 1921, by the French General Statistical Office.)

Sub-Group	1921	Working Population	1906
Engineering (machinery) Industry. . .		456,538	152,258
Deduct from this:			
Motor-car Industry, about		150,000	21,670
		<hr/>	<hr/>
About		306,538	130,588

III. OBSERVATIONS SUBMITTED BY L'UNION DES INDUSTRIES MÉTALLIQUES ET MINIÈRES.

(a) *Wages.*

On page 112 the Memorandum gives statistics regarding the average earnings per hour of workers in engineering industries in the Paris area. These statistics, which have been taken from the German Review *Wirtschaft und Statistik*, originate from the Group of Metal, Mechanical and Allied Industries of the Paris Area. As the first table refers only to wages paid in February 1923, 1924 and 1925, I think that it may be desirable to transmit to you herewith data, taken from the same source, for February 1926. I regret that I am unable to give any information referring to a more recent period, but the Group of Industries of the Paris Area only draws up these statistics once annually in February.

Average Wages in the Paris Area, February 1926.
(*Metal Industries.*)

	Time (per hour)	Piece work
Fitter	3.98	4.38
Tool Fitter	4.23	4.49
Smith	4.16	4.51
Miller	4.13	4.43
Pattern-maker	5.03	5.28
Mortiser-Planer	3.86	4.42
Adjuster	4.16	4.58
Turner	4.17	4.52
Ordinary Workers: men	2.74	2.88
women	1.93	2.26
Specialist Workers, women	2.22	2.48

(b) *Trade Organisation of the Mechanical Engineering Industries.*

Most of the syndical organisations in the engineering industries form part of the Metallurgical and Mining Industries Union, which has made a special study of labour, social and fiscal questions. I think I cannot do better, as regards the Union, than forward you its Year-Book for 1926-1927, in which you will find, on pages 17 *et seq.*, a list of 119 groups which are members of the Union.

Economic questions (Customs questions, problems of supply, etc.) are watched by the primary syndical organisations, as for instance, the Syndical Chamber of Ship and Marine Engine Builders or the Syndical Chamber of Manufacturers and Constructors of Railway and Tramway Material. A large number of syndical chambers of mechanical, metal and electrical construction have, however, established, for the study of these economic questions, the Federation of Syndicates of Mechanical, Electrical and Metal Construction, called, for short, the Mechanical Engineering Federation; it includes, at the present time, 65 syndicates of the transforming industries.

OBSERVATIONS
on the
MEMORANDUM ON THE WORLD'S MECHANICAL ENGINEERING INDUSTRY

Submitted by the **ASSOCIAZIONE NAZIONALE INDUSTRIALI MECANICI ITALIANI.**

Communicated by M. GUARNERI.

1. **OUTPUT AND NUMBER OF WORKERS EMPLOYED.**

The interesting Memorandum prepared by the Verein deutscher Maschinenbau-Anstalten deals only with the branches of engineering affiliated to that Union, so that the memorandum does not cover other important branches; some of these, however, like the automobile and electro-technical industries, have made considerable progress in Italy. This has had the twofold effect, on the one hand, of limiting the value of the conclusions derived from the Union's report, at all events as regards Italy, and, on the other, of rendering comparison between the different countries difficult and in some cases uncertain.

On the basis of the data to be found on page 30 concerning the value of the output and on page 33 concerning the number of workers employed, we have established the following table, showing the value of the output per worker employed:

Output in gold marks per worker employed.

	Year 1913 at 1913 prices	Year 1925 at 1925 prices	Year 1925 at 1913 prices
	Marks	Marks	Marks
1. <i>America:</i>			
United States	10,927	21,816	14,544
Canada	8,000	17,750	11,825
2. <i>Europe:</i>			
Great Britain	4,854	6,020	4,014
Germany	6,086	6,415	4,276
Russia	3,653	4,132	2,755
Austria, Hungary	5,750	5,030	3,348
France	5,844	6,117	4,082
Italy	5,833	7,428	4,942
Belgium	6,416	6,480	4,320
Switzerland	3,571	6,333	4,222
Sweden	4,880	8,500	5,650
Other countries	4,533	6,025	4,025
3. <i>Australia and Asia:</i>			
Australia and New Zealand	5,066	7,600	5,050
Japan	2,350	4,574	3,042
General average	7,168	10,734	7,155

Since the degree of industrial organisation and hence the extent to which labour is utilised varies in the different countries, the value of the output in relation to the labour employed must necessarily also vary. We think, however, that certain differences to be noted as regards the values given in the above table should be attributed to the fact that the data concerning the value of the output and those concerning the number of workers employed are not sufficiently accurate. As regards Italy, we have reason to believe that neither the value of the output nor the number of workers employed is in accordance with the actual facts.

On page 89 of the Memorandum, it is stated that, according to the Italian census for 1911, the total number of workers engaged in the construction of machinery for agriculture, industry and transport was 159,401, and that this number included all the workers engaged in the automobile industry, workers engaged in boiler-making and probably workers employed in the construction of rolling-stock. There is no justification, however, for the arbitrary conclusion that in 1911 the number of workers employed in the branches of the engineering industry dealt with in the German Memorandum did not exceed 30,000.

The following table, which covers a large proportion of the branches considered in the Memorandum, is taken from Volume IV of the "Census of Works and Industrial Undertakings on June 10th, 1911":

	Workers
Mechanical engineering in general and heavy agricultural and industrial machinery.	58,087
Various branches of mechanical engineering.	8,385
Typewriters, calculating machines, clocks and watches (a negligible quantity of small watches).	2,548
Other machinery and metal manufactures	15,080
	<hr/>
Total	84,100

While it must be admitted that the first category includes certain specialities which should not be taken into account, it is essential, on the other hand, to add the workers engaged in certain other special manufactures included by the census in branches not dealt with in the above table (automobiles, shipbuilding, locomotives and rolling-stock). The total of 84,000 should be reduced, but at the same time the number of workers employed in 1911 in the engineering branches dealt with in the Memorandum cannot be much below 60,000.

For the year 1925 we can obtain approximate indications from the summary of the returns of the Inspectors of Industry and Labour concerning wages and hours of work in industry (May – August 1925). These returns refer only to the principal branches of the mechanical engineering industry and do not include average-sized or minor establishments, of which there are many, at all events in Italy.

The number of workers taken into account by these inspectors may be seen from the following table, in which we have also included branches not dealt with in the German Memorandum in order to show their importance in our country.

Branches of Industry	Workers' employed Units	Per cent
<i>Foundries (second smelting):</i>		
Foundries for cast iron, aluminium, bronze, brass, zinc, nickel.	24,978	11.40
<i>Shipbuilding industry:</i>		
Shipbuilding yards, yards for the fitting, repairing, dismantling and breaking-up of vessels (excluding yards for the build- ing of wooden boats or vessels)	24,435	12.70
<i>Works specialising in the construction of machinery in general:</i>		
Engineering works specialising in the con- struction and repairing of machinery and apparatus for the generation and trans- mission of power, the construction and repairing of operating machinery (heavy engineering), the construction of agricul- tural machinery	28,056	13.00
<i>Works for the construction and repairing of electrical engines and material</i>	11,356	5.20
<i>Automobile and motor-cycle works:</i>		
Automobile and motor-cycle works, engineer- ing works for the repairing of autom- obiles and motor-cycles (excluding coach- building for motor-cars)	27,231	12.70
<i>Works for railway material construction and repairs:</i>		
Engineering works specialising in the con- struction of locomotives, passenger and goods coaches for railways and tramways; works for the construction of railway vehicles; constructions of wood and iron combined.	32,651	15.00
<i>Other engineering industries:</i>		
Industries for special mechanical construc- tions, for the working of ordinary metals, the manufacture of machine parts and metal articles (excluding works for the manufacture of precision instruments or of articles composed of precious metals, and also industries included within the last four groups of industries).	65,679	30.00
Total	217,395	100.00

Foundries (second smelting) have been classified apart in order to obtain homogeneous data concerning wages and hours of work; in most cases, however — at all events in Italy — such foundries form part of engineering establishments. Owing to the way in which the workers have been divided up into categories, shipbuilding yards appear to include engineering works which construct engines and auxiliary apparatus for vessels. Further, taking into account the fact that average-sized and minor works were deliberately omitted, one arrives at the conclusion that in 1925 there were not less than 100,000 to 120,000 workers engaged in the branches of engineering dealt with in the German Memorandum.

The method adopted by the latter in reckoning output — namely, by deducing it from the export figures — is quite unreliable, at all events as regards Italy.

Despite its continual development, the Italian engineering industry, except in the case of certain special branches, is not yet in a position to engage in exportation to an extent which would justify exportation being taken as an index of its total output. While the automobile industry in 1925 exported almost 75 per cent of its total output, the other branches of the engineering industry, with very few exceptions, export only a negligible proportion of their output and are not yet in a position to supply home requirements, especially when the latter assume unusual proportions; this happened, for example, in 1925 when a number of undertakings were increasing their plant and equipment.

In Italy, at all events, a safer method would be to deduce the value of the output from the number of workers employed.

The table to be found on page 185 would appear to show that for Italy the output per worker employed was higher in 1913 than for Great Britain, Switzerland or Sweden, while in 1925 it was higher than for Great Britain, Germany, the Successor States of Austria-Hungary, Belgium or Switzerland.

However great the Italian workman's reputation for industry may be, we hardly think that his output can be higher than that of workers in the above-mentioned countries, as mass production is not practised on a large scale in Italy, and lack of capital prevents us from improving our mechanical equipment.

As already stated, the data concerning the value of the output and the number of workers employed do not appear to us to correspond to actual facts. We cannot be far wrong in assessing the value of the average annual output per worker for 1913 at approximately 4,000 marks. Thus, assuming that the number of workers engaged in engineering was 60,000, the value of the output in 1913 would be about 240 millions of marks.

In 1925 the engineering industry adopted the eight-hour instead of the ten-hour day, which had been in force before the war. Since, however, in the meantime, all the engineering works have improved their equipment and 1925 was a very busy year, there is reason to think that the work done by a worker in 1925 was more or less equal to that of a worker in 1913, and that the value of the output in 1925 was thus equal to what it was in 1913, namely: 4,000 marks (or approximately 6,000 marks, taking into account the depreciation of gold).

In this case, assuming that the number of workers employed was from 100,000 to

120,000, the total value of the output in 1925 may be assessed at 400 to 480 millions of marks, instead of 173 millions as indicated in the table to be found in the Memorandum of the V.D.M.A.

The above data would appear to indicate that the Italian output is almost double what it was during the pre-war period.

This conclusion seems quite sound and corresponds to the general impression concerning the development of the Italian engineering industry.

This development has been even more marked in the case of certain special branches, as may be seen from the data concerning them.

The following examples may be given :

(a) *Hydraulic Motors.*

The development of hydro-electric installations in Italy in recent years is a matter of common knowledge. In 1915, existing plant represented a potential energy of about a million kilowatts; in 1925, this figure had risen to about 2,370,000 kilowatts. In addition, there were under construction at the end of 1925, 79 hydro-electric installations capable of producing in all 1,000,000 horse-power. It is to be noted that the hydraulic motors required for these installations were all constructed in Italy; imports of hydraulic motors are very small and are counterbalanced by exports. The total horse-power of hydraulic motors constructed in Italy for the home market in recent years is as follows:

	Horse-power		Horse-power
1913.	143,000	1920	442,000
1914.	86,000	1921	238,000
1915.	71,500	1922	186,000
1916.	100,000	1923	485,000
1917.	172,000	1924	445,000
1918.	200,000	1925	500,000
1919.	170,000		

Taking as a basis period for comparison the three years 1923-25, the production of hydraulic motors has more than trebled as compared with 1913; and as in every succeeding year technical conditions become more complex, it may be estimated that the value of these articles has also more than trebled.

(b) *Steam and Internal-Combustion Marine Engines.*

Marine engines and auxiliary engines employed in marine engineering are entered separately in import statistics. Imports of these articles were, however, in 1913, as well as in 1925, insignificant; this means that the numerous and varied mechanical appliances required in the construction of vessels (engines for propulsion, auxiliary motors, pumps, ventilators, compressors, capstans, refrigerating apparatus, laundry appliances, etc.) were constructed in Italian engineering works both for merchant vessels and warships. The output of such machinery is in all probability proportionate

to the tonnage launched, and since in 1925 three times as much tonnage was launched as in 1913, the engineering output must also have trebled. The following table shows the number of steel merchant vessels (steamers and oil-driven vessels) launched from 1913 to 1923:

Year	Total	No.	Gross tonnage displacement	Oil-driven vessels	
				No.	Gross tonnage displacement
1913	16	44,496	?	?
1918	11	59,391	?	?
1922	22	96,336	3	9,500
1923	15	67,674	2	6,888
1924	14	79,507	4	27,368
1925	27	141,066	15	101,299

The development of the construction of oil-driven vessels in Italy in 1925 is worthy of note.

Many of the necessary motors were built in newly established works.

(c) *Other Branches of Mechanical Engineering.*

Equally clear and reliable data are not available with regard to the output in other branches of engineering, but it may truthfully be said that progress — and sometimes remarkable progress — has been made in this direction also.

There has, for instance, been a great increase in the amount of machinery used for improving the land: the pumps for raising water and their motors were constructed in Italy. The construction of many roads, particularly in Southern Italy, and special roads for motor traffic in Northern Italy, and the erection of many public buildings have led to a remarkable demand for machinery for working the material employed in constructing public buildings. Considerable progress has also been made in the construction of textile machinery — to quote a type of machinery which Italy still largely imports from abroad — and successful efforts have been made to produce machinery which before the war was always imported.

2. IMPORT DUTIES.

The German Memorandum contains two tables showing the variations per cent which occurred between 1913 and the autumn of 1926 in the import duties of twenty-two countries (Table A), and the incidence of the duties in force in September 1926 on the value of certain products of the engineering industry (Table B).

As regards the first of these tables, it should be noted that the adoption of this method, whereby only the extreme variations are taken into account, must necessarily lead to false conclusions, since the fact that a certain item in the tariff has been the object of a considerable increase does not mean that the whole series of items to

which it belongs has undergone similar variations; nor does the fact that the duties on a certain item in the tariff have been reduced justify the conclusion that the tariff duties as a whole have been reduced. Further, there can be no question of drawing conclusions from the mean between the two extremes.

Going on to consider Table B, we find that the figures for the incidence per cent of Italian import duties on the various products of the engineering industry under consideration are nearly all incorrect. We give in the following table the duties actually in force in September 1926 and the proportion per cent resulting as compared with the value taken as a basis in the Memorandum:

Description of products	Weight upon which the duty is levied (Kgs.)	Price converted into gold marks	Tariff number	Conventional duties		Per cent <i>ad valorem</i>
				Gold lire	Gold marks	
Locomotives	8,800	124	528/b/2	64.80	52.50	42.2
Reciprocating steam engines	70,000	129	396/a/1	18	14.6	11.35
Pumps (mechanical)	1,900	109	431/a/1/d	22.40	18.2	16.6
Diesel engines	17,500	127	396/a/2/d	23.40	19	14.9
Lathes (not automatic).	28,000	88	403/a	25.60	20.8	23.6
Machinery for the manufacture of paper.	94,000	114	409	15	12.2	10.70
Weaving frames.	2,000	125	415/b	15	12.2	9.8
Cranes	6,000	76	446/a	26	21.2	29.4
Machines for mercerising	12,500	200	425/a	35	28.5	14.2
Steam threshers.	5,000	95	407/b	14	11.4	12

We might mention that the table of import duties in force in Italy to be found in the annex does not quote the Italian duties (conventional tariff) for the following articles:

I. *Ploughs and other machines for preparing the soil:*

	Lire per quintal
1. Brabant ploughs	10
2. Ploughs with wooden beams and single share	12
3. Other ploughs weighing over 2 but not more than 10 quintals	21.60
4. Other machinery for preparing the soil, weighing:	
(a) Over 30 quintals	18.20
(b) Over 10 but less than 30 quintals	20.80

II. *Machinery not specified:*

(a) Made of cast iron, wrought iron or steel:

1. Beet-washing and -cutting machines; machines for rasping and slicing beets; oscillatory conveyors; sugar granulators and pulp presses, weighing:	
(i) Over 100 quintals	31.20
(ii) Over 50 but less than 100 quintals	35.10
(iii) Over 10 but less than 50 quintals	46.80
2. Machines for beating and brushing sacks; vertical millstones; sets of millstones (<i>palmenti</i>) and mixing machines; sausage-meat mincing and sausage-stuffing machines; moulding machines for use in foundries; street cleaners drawn by animals; pile-drivers (without the engine); presses (except hydraulic presses and fruit and oil presses and filter presses), weighing:	
(i) Over 100 quintals	31.20
(ii) Over 50 but less than 100 quintals	35.10
(iii) Over 10 but less than 50 quintals	46.80
(iv) Over 1 but less than 10 quintals	59.80
(v) Up to 1 quintal	75.40

(b) Other machinery:

1. Beet-washing and -cutting machines; machines for rasping and slicing beets; oscillatory conveyors; sugar granulators and pulp presses, weighing:	
(i) Over 100 quintals	39.00
(ii) Over 50 but less than 100 quintals	45.50
(iii) Over 10 but less than 50 quintals	57.20
2. Machines for beating eggs, whipping cream and the like; machines for crushing almonds and the like, for rasping and cutting almonds, for husking almonds; and machines for shaping biscuits	40.00
3. Machines for beating and brushing sacks; vertical millstones; sets of millstones and mixing machines; sausage-meat mincing and sausage-stuffing machines; moulding machines for use in foundries; street cleaners drawn by animals; pile-drivers (without the engine); presses (excluding hydraulic presses, presses for fruit, and oil and filter presses) of other materials, weighing:	
(i) Over 100 quintals	39.00
(ii) Over 50 but less than 100 quintals	45.50
(iii) Over 10 but less than 50 quintals	57.20
(iv) Over 1 but less than 10 quintals	71.50
(v) Up to 1 quintal	91.00

III. WAGES.

The wages shown in the Memorandum were probably taken from the statistical bulletins of the cities of Milan and Rome. The data given in these bulletins are not the result of direct or systematic investigation, nor are they absolutely reliable. We would point out that the information furnished by the Inspectors of Industry and Labour reported in the *Labour Bulletin* for May and June 1925 is more reliable. We give the average wages paid in the class "general mechanical engineering", which probably includes the branches of industry which the German Union has in view.

Average Earnings during the First Fifteen Days of May 1925.

ENGINEERING INDUSTRY, GENERAL MECHANICAL ENGINEERING.

Total for the Kingdom — Classification by Categories of Workers.

Categories or divisions	Average earnings		
	Without overtime		With overtime
	Per hour	Per diem	Per diem
Tool-setters	3.30	26.41	31.48
Smiths	2.73	21.86	23.90
Mechanics	2.97	23.79	26.83
Fitters	2.99	23.96	26.62
Assemblers	3.13	25.10	27.94
Adjusters	3.28	26.29	28.85
Labourers	2.50	20.—	23.08
Apprentices	1.21	9.71	10.41
Other categories	2.90	23.23	26.37

The average weekly wages (six working days) of the above classes of workmen vary apparently from 143.50 lire (smiths) to 188.90 lire (tool-setters). At the rate of 5.86 on Berlin (average for May 1925), this would give 24.50 and 32.10 marks respectively.

The wages of unskilled labourers, taking as our basis the wages of manual labourers (138 lire), would be 23.80 marks a week.