

SPECIAL CONSULAR REPORTS.

VEHICLE INDUSTRY IN EUROPE.

VOL. XXI—PART II.

REPORTS FROM CONSULAR OFFICERS IN ANSWER TO A CIRCULAR
FROM THE DEPARTMENT OF STATE

Issued from the Bureau of Foreign Commerce,
Department of State.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1900.

PUBLICATIONS OF THE BUREAU OF FOREIGN COMMERCE.¹

The publications of the Bureau of Foreign Commerce, Department of State, are:

I.—**COMMERCIAL RELATIONS**, being the annual reports of consular officers on the commerce, industries, navigation, etc., of their districts.

II.—**CONSULAR REPORTS**, issued monthly, and containing miscellaneous reports from diplomatic and consular officers.

III.—**ADVANCE SHEETS, CONSULAR REPORTS**, issued daily except Sundays and legal holidays, for the convenience of the newspaper press, commercial and manufacturing organizations, etc.

IV.—**EXPORTS DECLARED FOR THE UNITED STATES**, issued quarterly, and containing the declared values of exports from the various consular districts to the United States for the preceding three months.

V.—**SPECIAL CONSULAR REPORTS**, containing series of reports from consular officers on particular subjects, made in pursuance to instructions from the Department.

Following are the special publications issued by the Bureau prior to 1890:

Labor in Europe, 1878, one volume; Labor in Foreign Countries, 1884, three volumes; Commerce of the World and the Share of the United States Therein, 1879; Commerce of the World and the Share of the United States Therein, 1880–81; Declared Exports for the United States, First and Second Quarters, 1883; Declared Exports for the United States, Third and Fourth Quarters, 1883; Cholera in Europe in 1884, 1885; Trade Guilds of Europe, 1885; The Licorice Plant, 1885; Forestry in Europe, 1887; Emigration and Immigration, 1885–86 (a portion of this work was published as **CONSULAR REPORTS** No. 76, for the month of April, 1887); Rice Pounding in Europe, 1887; Sugar of milk, 1887; Wool Scouring in Belgium, 1887; Cattle and Dairy Farming in Foreign Countries, 1888 (issued first in one volume, afterwards in two volumes); Technical Education in Europe, 1888; Tariffs of Central America and the British West Indies, 1890.

The editions of all these publications, except Tariffs in Central America, etc., are exhausted and the Department is therefore unable to supply copies.

In 1890 the Department decided to publish reports on special subjects in separate form, to be entitled **SPECIAL CONSULAR REPORTS**. There are now the following **SPECIAL CONSULAR REPORTS**:

Vol. 1 (1890).—Cotton Textiles in Foreign Countries, Flax in Spanish America, Carpet Manufacture in Foreign Countries, Malt and Beer in Spanish America, and Fruit Culture in Foreign Countries.

Vol. 2 (1890 and 1891).—Refrigerators and Food Preservation in Foreign Countries, European Emigration, Olive Culture in the Alps Maritimes, and Beet-Sugar Industry and Flax Cultivation in Foreign Countries.

Vol. 3 (1891).—Streets and Highways in Foreign Countries.

Vol. 4 (1891).—Port Regulations in Foreign Countries.

Vol. 5 (1891).—Canals and Irrigation in Foreign Countries.

Vol. 6 (1891 and 1892).—Coal and Coal Consumption in Spanish America, Gas in Foreign Countries, and India Rubber.

Vol. 7 (1892).—The Slave Trade in Foreign Countries and Tariffs of Foreign Countries.

Vol. 8 (1892).—Fire and Building Regulations in Foreign Countries.

Vol. 9 (1892 and 1893).—Australasian Sheep and Wool and Vagrancy and Public Charities in Foreign Countries.

Vol. 10 (1894).—Lead and Zinc Mining in Foreign Countries and Extension of Markets for American Flour.

Vol. 11 (1894).—American Lumber in Foreign Markets.

Vol. 12 (1895).—Highways of Commerce.

Vol. 13 (1896 and 1897).—Money and Prices in Foreign Countries.

Vol. 14 (1898).—The Drug Trade in Foreign Countries.

Vol. 15 (1898).—Soap Trade in Foreign Countries; Screws, Nuts, and Bolts in Foreign Countries; Argols in Europe; Rabbits and Rabbit Furs in Europe; Cultivation of Ramie in Foreign Countries.

Vol. 16 (1899).—Tariffs of Foreign Countries: Part I. Europe; Part II. America; Part III. Asia, Africa, Australasia, and Polynesia.

Vol. 17 (1899).—Disposal of Sewage and Garbage in Foreign Countries; Foreign Trade in Coal Tar and By-products.

Vol. 18 (1900).—Merchant Marine of Foreign Countries.

Vol. 19 (1900).—Paper Trade in Foreign Countries; Uses of Wood Pulp.

Vol. 20 (1900).—Part I. Book Cloth in Foreign Countries; Market for Ready-Made Clothing in Latin America; Foreign Imports of American Tobacco; Cigar and Cigarette Industry in Latin America. Part II. School Gardens in Europe. Part III. Slave Trade in Foreign Countries.

Vol. 21 (1900).—Part I. Foreign Markets for American Coal. Part II. Vehicle Industry in Europe. Part III. Foreign Trusts and Trade Combinations.

¹ Formerly Bureau of Statistics. Name changed to Bureau of Foreign Commerce by order of the Secretary of State July 1, 1897.

Of these SPECIAL CONSULAR REPORTS, Australian Sheep and Wool, Cotton Textiles in Foreign Countries, Files in Spanish America, Fire and Building Regulations, Gas in Foreign Countries, Lead and Zinc Mining, Malt and Beer in Spanish America, Port Regulations, Refrigerators and Food Preservation, Vagrancy, etc., are exhausted, and no copies can be supplied by the Department. There was also published in 1899, Proclamations and Decrees during the War with Spain, comprising neutrality circulars issued by foreign countries, proclamations by the President, orders of the War and Navy Departments, and war decrees of Spain.

Of the monthly CONSULAR REPORTS, many numbers are exhausted or so reduced that the Department is unable to accede to requests for copies. Of the publications of the Bureau available for distribution, copies are mailed to applicants without charge. In view of the scarcity of certain numbers, the Bureau will be grateful for the return of any copies of the monthly or special reports which recipients do not care to retain. Upon notification of willingness to return such copies, the Department will forward franking labels to be used in lieu of postage in the United States, Canada, the Hawaiian Islands, and Mexico.

Persons receiving CONSULAR REPORTS regularly who change their addresses should give the old as well as the new address in notifying the Bureau of the fact.

In order to prevent confusion with other Department bureaus, all communications relating to CONSULAR REPORTS, including COMMERCIAL RELATIONS, should be carefully addressed, "Chief, Bureau of Foreign Commerce, Department of State, Washington, U. S. A."

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DEPARTMENT CIRCULAR.

DEPARTMENT OF STATE,

Washington, March 5, 1900.

To certain consular officers of the United States:

This Department has been requested by one of the large firms in the United States engaged in manufacturing vehicles to procure certain statistical information in regard to the vehicle industry in Europe. It is desired that your report shall cover the following points:

1. The particular localities in the territory within the supervisory jurisdiction of your office where the manufacture of vehicles is an industry of importance.
2. The total number and general styles manufactured per annum.
3. Capital represented.
4. Capacity and earnings of employees.
5. Names and addresses of leading manufacturers.

The firm mentioned wishes to ascertain by these inquiries the condition of the vehicle industry in 1800, in 1850, and on January 1, 1900. You are also requested to give general statistics and information in regard to the automobile, showing, if possible, the number manufactured and names and addresses of leading manufacturers, the number in use, and any general information regarding the popularity of the vehicle and the common-opinion as to its future.

In asking you to make the report above outlined the Department does not expect you to go into the historical part of the subject exhaustively. It is thought that it would be of much greater interest to the business public if you would deal largely with present conditions, showing the actual extent of American competition in the markets of Europe.

I am, sir, your obedient servant,

THOS. W. CRIDLER,
Third Assistant Secretary.

VEHICLE INDUSTRY IN EUROPE.

AUSTRIA-HUNGARY.

AUSTRIA.

VEHICLE INDUSTRY.

Condition of the industry in 1800.—At the close of the eighteenth century, carriage building in Austria may be said to have been in its most flourishing condition. Vienna was then, as now, on the highway to the principal European countries, and it was there that the nobility bought their carriages, and the great state kept by the Austrian emperor and court created an ever-increasing demand for gala coaches. The coach builders belonged to a guild, and as early as 1770 laws were passed regulating the number of apprentices and conditions of employment. The time fixed was three years apprenticeship, and four if the master provided clothing for his apprentice. The journeyman, before settling down in Vienna as a master, must have traveled about for three years after completing his apprenticeship, and, after the “Wanderjahre,” have served two years under a Vienna master and be so perfect in his work as to satisfy his examiners. The final trial pieces were a three-wheeled wagon upon which 40 casks of wine could be drawn, a miller’s wagon capable of drawing 2 quarters of wheat, and an axle wagon and a wheelbarrow, including wheels.

The following sorts of carriages were made: Flies, balloon flies, trussed flies, cabriolets, phaëtons, two and four seat landaus, two and four seat floating coaches, Chinese coaches, and for heavy goods, rack wagons, open vans, builders’ carts, small carts of all kinds, sledges, munition and heavy wagons for the army, carriage blocks for cannons and gun carriages. Early in the nineteenth century the vehicle trade made great strides; there were 48 master coach builders and 27 assistants or managers who had over 200 journeymen under them, and, of course, a larger number of apprentices. The chief masters were Hahn, Echtler, Semler, Eder, Graf, Kautzner, Kiener, and Eberle. In Austrian Poland, in Moravia and Bohemia, not to mention Hungary and Transylvania, large quantities of carts, peasants’ vans, and sledges were made, and the better work was made in such towns where German saddlers were to be found; and one man, Herr Fink, of Bregenz, was distinguished for the excellent coaches, chaises, and landaus which he

made, and especially for the fact that the bodies were made of a smaller quantity of wood than used by other firms. Peasant carts were not put on the market for the fact that they were manufactured according to individual taste, and in the towns or villages where they were required. The prices were about the following: For an ordinary frame and wheels, without fittings or body, \$28; the frame of a calash (called by the coach-maker a weak frame), from \$16 to \$20; the best four-seat frames from \$32 to \$36; an ordinary calash body, unfitted, from \$16 to \$18; floating shape, \$32 to \$36; a four-seat body, \$36 to \$40; a wheelbarrow cart, \$4, and a van, including ladder, \$28. No prices are given of ordinary vehicles, for they were generally put together by the blacksmith, who either received the parts from his customer who may have bought or made them, or bought the parts separately of the makers.

The trimmer acted the part of supplier in most cases, even for the better class of vehicles. He employed the coach builder, who supplied the frame, wheels, and body; the blacksmith, the locksmith, and all other necessary persons who never in any way came in contact with one another. The trimmer paid the wages and received price of carriages from his customers. The chief sorts of vehicles supplied in Austria by the trimmer were the so-called Styrian coaches, of which there were three kinds, ordinary, cushioned, covered or uncovered, for mountainous districts; covered vans, small and large hunting vehicles, "society" carriages with double seats, barouches, a kind of Chinese cart driven by the owner, all of which were for the towns; calashes for town and country, or for journeying, and a special kind of Turkish calash with high roof and wood carving covered with gold and ornamented with bronzes and painted figures. The "Pritschken" or ordinary traveling coach was the favorite, because not only were passengers safe in them, but they were also more convenient for packing, and besides the traveler could lie down at full length; then there were landaus, state carriages, carriages answering to our modern brakes for from six to twelve persons, and diligences. So from this it will be seen that the chief trade lay in the hands of the trimmers.

A prosperous trade was done with Russia, Balkans, Germany, and other countries where Vienna-made coaches were much in favor.

The industry in 1850.—By 1850 the home manufacture of private carriages had become a very prosperous one, but the manufacturers complained that a large quantity of the necessary materials came from other countries—axles, leather, silk, cloths, and all materials for trimming the carriages. All kinds of vehicles continued to be exported from Austria to Russia, the Orient, and the principalities of the Danube. The chief trade was still in the hands of the trimmers who alone came in contact with their customers. The chief firms were Brandmeyer, Engel, Koller, Lechner, Laurenzi, in Vienna, and Kubal, in Prague. The chief coach builders were Armbruster, Carl and Franz

Brandmeyer, Joh. B. Engel, F. Huber, Jacob Lohner, C. Marius, Jos. Moser, and Ferdinand Ott, all in Vienna, and in addition to those trimmers already mentioned there were between 160 and 170 less important ones. The total annual production, including traveling and private carriages, was 2,000, and their worth \$400,000. The post vans numbered somewhat over 200, their worth being \$63,200. In addition to these a number of omnibuses were manufactured by J. Spiering, Vienna, and J. Rohrbacher; in Ober-St-Veit, near Vienna.

Present condition of the industry.—For some years a depression in the vehicle industry in Austria has existed. There has been a large falling off in the exports from Vienna. The Hungarians, who previously were her largest customers, now buy almost entirely from their own manufacturers. Formerly all the nobility and aristocracy of Hungary, Bohemia, and Moravia bought their private and gala carriages here, but this is not now the case. Carriages made in the provinces are inferior to those manufactured in Vienna, but are much cheaper, and have found their way, to some extent, into foreign markets. Even in the fifties these inferior goods began to make their way into the Levant and especially to Constantinople. In consequence of their poor quality, for they were put together as quickly and as cheaply as possible, these goods were soon brought into bad repute, and the Viennese manufacturers lost much trade with Constantinople, and only lately have the Turks again begun to buy.

Till the customs war in July, 1886, Russia and particularly Roumania were customers for Austrian vehicles. Since then trade with the latter country has dwindled, and owing to the continual increase of Russian duty on vehicles the export thither is becoming smaller. The failure of the export to Roumania touches Austria the most, for Roumania was one of her largest customers, and this is a loss that will never be regained, for Roumania revenged herself for the customs war which lasted so long by inviting trimmers and work people to settle in her land and set up their own manufactories. Vehicles are still exported to Egypt, British India, Java, and even to North Germany and Sweden, as well as to Australia, Chile, South Africa, and Argentina. Such export trade is owing to the individual efforts of a few manufacturers, although the Vienna carriage is celebrated for its good quality and fine workmanship. There is, therefore, ground for the complaint that the vehicle industry in Austria, as far as the export trade is concerned, is on the decrease. The inland trade also suffers from competition, particularly owing to the preference for French-made carriages. Although the Austrian vehicles are inexpensive, profits are low, and notwithstanding the cost of materials used in manufacture is continually rising, the prices for manufactured goods are, in consequence of the competition, stationary. The introduction of rubber tires for carriages and vehicles of all kinds has also caused a loss to the manufacturers

and their journeymen. Many of these tires are imported from France, though a continually increasing quantity is being manufactured here. A general evil, too, is the long credit which must be given, and this, of course, falls most heavily on the smaller manufacturers.

The worst blow to the manufacturers of vehicles here was, perhaps, the establishment of a factory under Government contract in Klosterneuberg, near Vienna, for the production of military wagons, ambulances, and vehicles required for the army. This trade was previously in the hands of the coach builders here, but since the seventies the Government has manufactured on its own account. In Hungary the production of army transports and vehicles is entirely in the hands of the private manufacturers. In spite of all these difficulties, a few firms have increased their premises and by dint of great exertion and personal pecuniary loss have brought the vehicle trade to a higher level, and they hope that in a short time it will be thoroughly restored.

As far as vans, carts, and country vehicles are concerned, they are still made by the local wagon maker as they were a hundred years ago.

VEHICLE MANUFACTURES.

Vehicles are made in Prague and Pilsen in Bohemia, and Brunn and Nesseldorf in Moravia, but the chief manufacturers are in Vienna—namely, S. Armbruster, J. Lohner & Co., A. Weiser & Son, Karl Marius, Schwanzer, Johann Weitzer, Lehmann & Leyres, the Maschinen und Waggon-Baufabrik-Aktiengesellschaft, and Schuster & Co. The Nesseldorfer-Wagenbau-Gesellschaft is in Nesseldorf, Moravia, Rudolf Fuchs in Brunn, Moravia; P. Klubel & Co. and Jacob Raubitschek (basket carriages) in Prague, Bohemia; W. Brozik & Son in Pilsen, Bohemia. The following are purveyors to the Imperial Court of Austria: J. Lohner & Co., S. Armbruster, Peter Klubal, and W. Brozik & Son, while A. Weiser & Son are purveyors to the Shah of Persia.

VEHICLES MANUFACTURED.

The following fine carriages are made: Parisian, Stanhope gigs, tilburys, roofed and unroofed dogcarts, phaetons, basket phaetons, Derby carts, T-carts, hunting carts, phaetons with basket-work panels, hunting phaetons, sand runners, char-à-bancs, mail phaetons, spider with and without tops, ladies' driving phaetons, pony basket phaetons, hunting wagons, American char-à-bancs, victorias, cabriolets with and without tops, full-sweep victorias, spring victorias with rumbles, basket sociables for four persons, barouches, sociables with tops, sociable double tops, spring barouches, spring landaus, miniature landaus, full-sweep landaus, landaulets, four-wheel cabs, rockaways, broughams, single broughams, chariots, spring broughams, coupés, clarence coaches, wagonettes, breaks for six, seven, nine, and twelve persons, light and heavy drags, four-in-hand breaks, stable breaks,

small and large; omnibuses for four and six persons, and Russian and Albany sledges.

The following business vehicles for hand and horse: Handcarts for delivery of food and goods, such as sewing machines, bicycles, and the like; double-roofed handcarts without springs for taking away refuse for hospitals; the same with portable doors; covered handcarts with springs to open at the top or side; the same with galleries, length 4 feet 8 inches, height 2 feet 4 inches; advertisement handcarts with revolving wheels for the inscription; two-wheeled vans, with place for two persons and cupboard for goods; these are made in various sizes; transport vans for flowers, open one-horse vans with or without wooden galleries, beer vans with doors at the side and back and place for two persons, two-horse baggage wagons to open at the top and behind, also for beer (capable of holding about 700 bottles); hotel omnibuses, ice wagons for 48 blocks and with three double doors, ice wagons for 70 and 80 blocks, two-horse ice carts for 5,280 pounds of natural ice, parcel carts, family omnibuses, plateau wagons for two and four horses, hotel breaks, milk carts for bottles and cans, goods wagons of all kinds, furniture vans for street and railway, street omnibuses, tram cars and fiacres.

PRODUCTION AND WAGES.

It is impossible to give annual production, for no statistics are to be had and the manufacturers refuse to give them. They are not even entered at the chamber of commerce. Exact statistics as to capital invested are practically impossible to obtain. The manufacturers refuse to give particulars.

There is a singular fear existent that a knowledge of statistics will cause either competition or depression in the respective trades, and those who make the inquiries are looked upon askance. Those firms who very kindly gave some details will be here mentioned.

S. Armbruster, Vienna, IX Porzellangasse. Business commenced in 1841. Premises enlarged and new buildings added in 1888-89. Yearly production, about 300 vehicles. Export to India, North and South America, Brazil, Egypt, Cape Town, and Australia. He obtained first prize at Paris, 1867; Vienna, 1873; Philadelphia, 1876; Paris, 1878; Vienna, 1880; Melbourne, 1881; Trieste, 1882; Adelaide, 1887; Melbourne, 1888; Sydney, 1888; Budweis, 1889; Vienna, 1890; Chicago, 1893, and Vienna, 1892, 1894, and 1898. Here, there has been no strike since 1872. Wages average from \$3.60 to \$10 weekly. Working hours, ten; workmen paid per day or by piece. There is a pension fund for aged work people.

Jacob Lohner & Co., imperial purveyors, Vienna, IX Porzellangasse. This firm commenced operations in 1821. The factory is now in Floridsdorf, near Vienna. At first the firm only manufactured articles of luxury, but now every kind of vehicle is produced. Here, nearly all the

ambulance vans for inland and export trade are manufactured. Medals: Vienna, 1845; London, 1851; Munich, 1854; Paris, 1855; Stettin, 1865; Paris, 1867; Moscow, 1872; jury, Vienna, 1873; Brussels, 1876; Philadelphia, 1876; Paris, 1878; Melbourne, 1880; Vienna, 1880; jury, Trieste, 1882; Berlin, 1883; Scheveningen, 1892; Chicago, 1893; and Rome, 1893.

W. Brozik & Son, Pilsen, Bohemia, imperial purveyors. Business commenced in 1867. Manufacture all kinds of equipages, electric carriages for the streets, and electric tram cars. Export to Russia, Germany, France, and the Orient. Amount unknown.

Peter Klubal & Co., Prague. Established 1876. Production between 100-150 yearly. Number of employees, about 60.

Nesseldorfer Wagen-Bau-Fabrik Gesellschaft, Nesseldorf, Moravia, manufacturers for the imperial house by letters patent. This company has a workmen's colony. The dwellings vary in rent from \$12 to \$24 per year. Wages of laborers average from 32 to 36 cents a day; journeymen earn from 60 cents to \$1.20 daily. Sixteen hundred work people are employed, and about 600 carriages are manufactured yearly. This manufactory was carried on from 1850 under the name of Schustala & Co. till some five years ago, when the above company was formed.

RAW MATERIALS.

Although Austria is dependent on other countries for many of her raw materials, she buys nothing but a small quantity of leather and a moderate amount of hickory wood from the United States. And even with regard to these two items there are no statistics. These might be obtained only from the different manufacturers, who, for obvious reasons, refuse to give them.

AUTOMOBILES.

The automobile trade, although still in its infancy, is developing rapidly. Two years ago automobiles were little known here, but since that time they have been manufactured in Austria. In 1870 Herr Siegfried Marcus, of Vienna, drove a benzine motor car. By far the best known amateurs are Count Wilczek, jr., and Count Siegfried Wimpffen, who together brought a steam carriage propelled by coke to Vienna. Franz Ritter von Liebig, of Reichenberg, and Herr Häuser, of Garning, were the first to have benzine automobiles, and an engineer, Professor Czischek, of Klagenfurt, in 1886, built a steam tricycle with petroleum to drive it.

Thanks to the former prime minister, Count Badeni, who was convinced of the value of automobiles by Mr. J. Lohner, the way was made easy for them as far as the police and magistrates were concerned. In twenty-four hours after the matter was laid before him, the necessary permission for their use in the streets of Vienna was given. This

was some four years ago, and now they are allowed everywhere, even in the Prater, the great park of Vienna. The press has come to the help of the automobiles, giving a separate column to them, and the second automobile race was held in Vienna in May. There is, however, one great hindrance to the use of the automobile in the provinces, for benzine is not much used, as in France, and, besides, the sale of it is in control of the police, who are very strict in regard to it, so it can rarely be bought in sufficient quantities except at high retail prices. But efforts are being made, and will be successful, to enable purchases of benzine to be made at convenient places and at moderate cost.

There is now an automobile club in Vienna of which Count Gustav Potting-Persing is the president. This was started in 1899 and has many members. There are also two papers in Vienna devoted to automobiles, *Mittheilungen des Oesterreichischen Touring Clubs und Automobil Clubs* and *Allgemeine Automobile Zeitung*.

Automobiles are made in Vienna, and Baden near Vienna, in Moravia, at Nesseldorf, and in Bohemia, at Prague, and Pilsen. The various firms are herewith mentioned:

Accumulatoren-Manufacturen-Actien-Gesellschaft, Vienna, factory at Hirschwang, Lower Austria, business commenced 1898; no particulars obtainable as to capital or output. System is Tudor for traction purposes.

Armbruster, k. u. k. Hof-Wagenfabrik, Vienna, commenced manufacture of automobiles in 1898. All kinds of carriages for automobiles made.

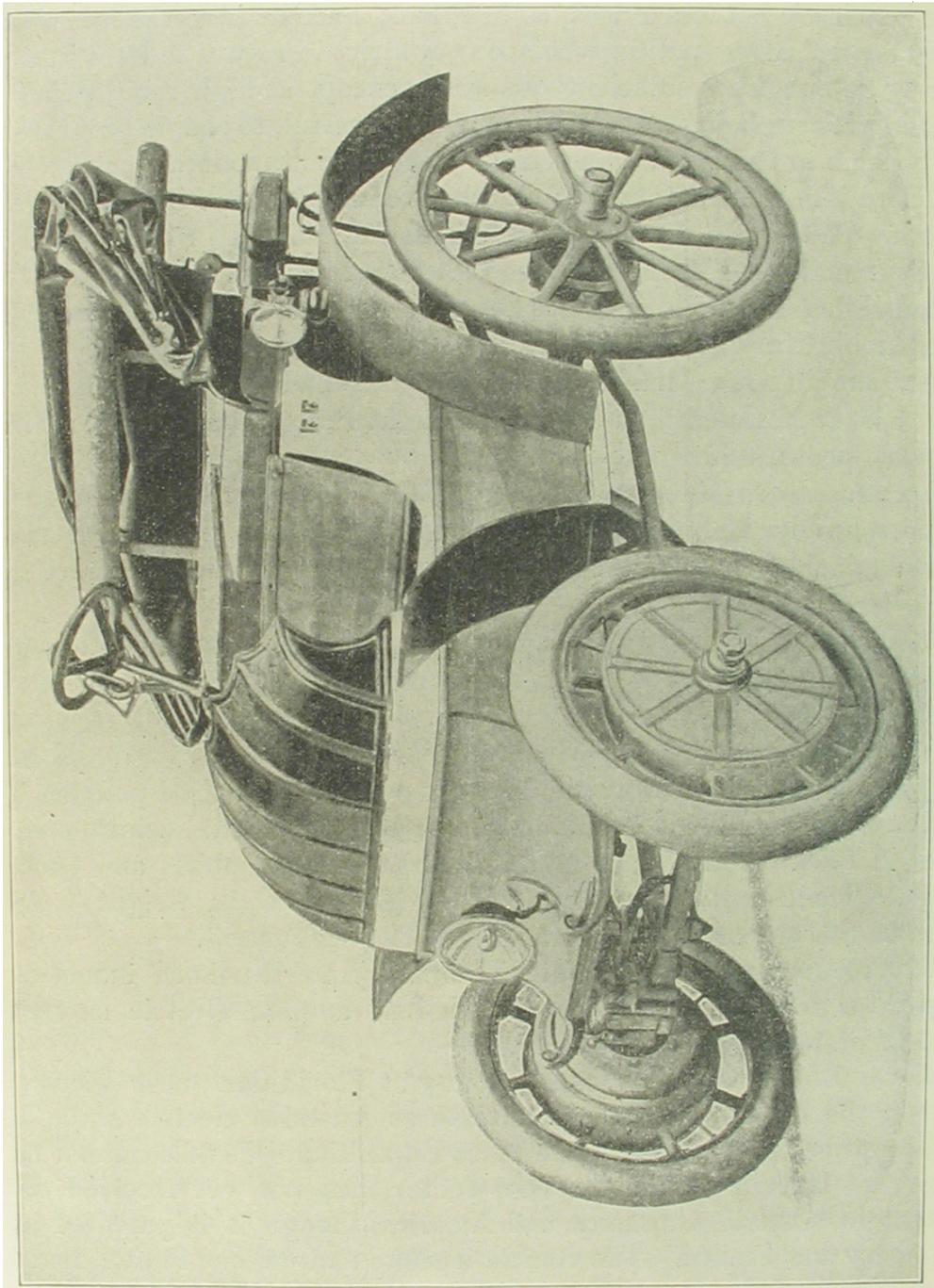
August Braun & Co., Vienna, business started in 1897. Make "Favorite" victoria voiturette, $2\frac{1}{2}$ horsepower, weight 264 pounds.

Franz Heimel, Titan-Accumulatoren-Fabrik, Vienna, business commenced 1898. Make Titan accumulators for automobiles and tramways. Their normal carriage battery has 44 cells, weight 1,100 pounds, 230 ampere hours at 25 ampere electric current.

F. Kröttlinger, electrotechnic, Vienna. New Rumkorff induction apparatus for automobiles, with one-half ampere electric current instead of $1\frac{1}{2}$ ampere as formerly.

Jacob Lohner & Co., Vienna, factory at Floridsdorf, near Vienna. This is the only firm which manufactures Austrian electric automobiles now being exhibited at the Paris Exposition. Details can not be given as Herr Porsche, the constructor, has not yet received his patent in Austria, Germany, and America, though it is patented in Hungary and France. The vehicle has two motors, one in each front wheel; each of these has 2.5 normal horsepower, which can be raised to 3.5 horsepower and even as high as 7, but not for any length of time without danger of overheating. This equals an 8 horsepower benzine motor car. These cars do not slip in wet weather as the vehicle is drawn and not pushed. The weight is 2,046 pounds, of which

the battery, containing 44 cells, weighs 902 pounds, and each complete motor wheel 242 pounds. The normal rate of traveling is 18.6 miles an hour, but at 80 volts a speed is attained of from 36 to 37 miles an hour. One filling of the battery lasts for 62 miles, but the

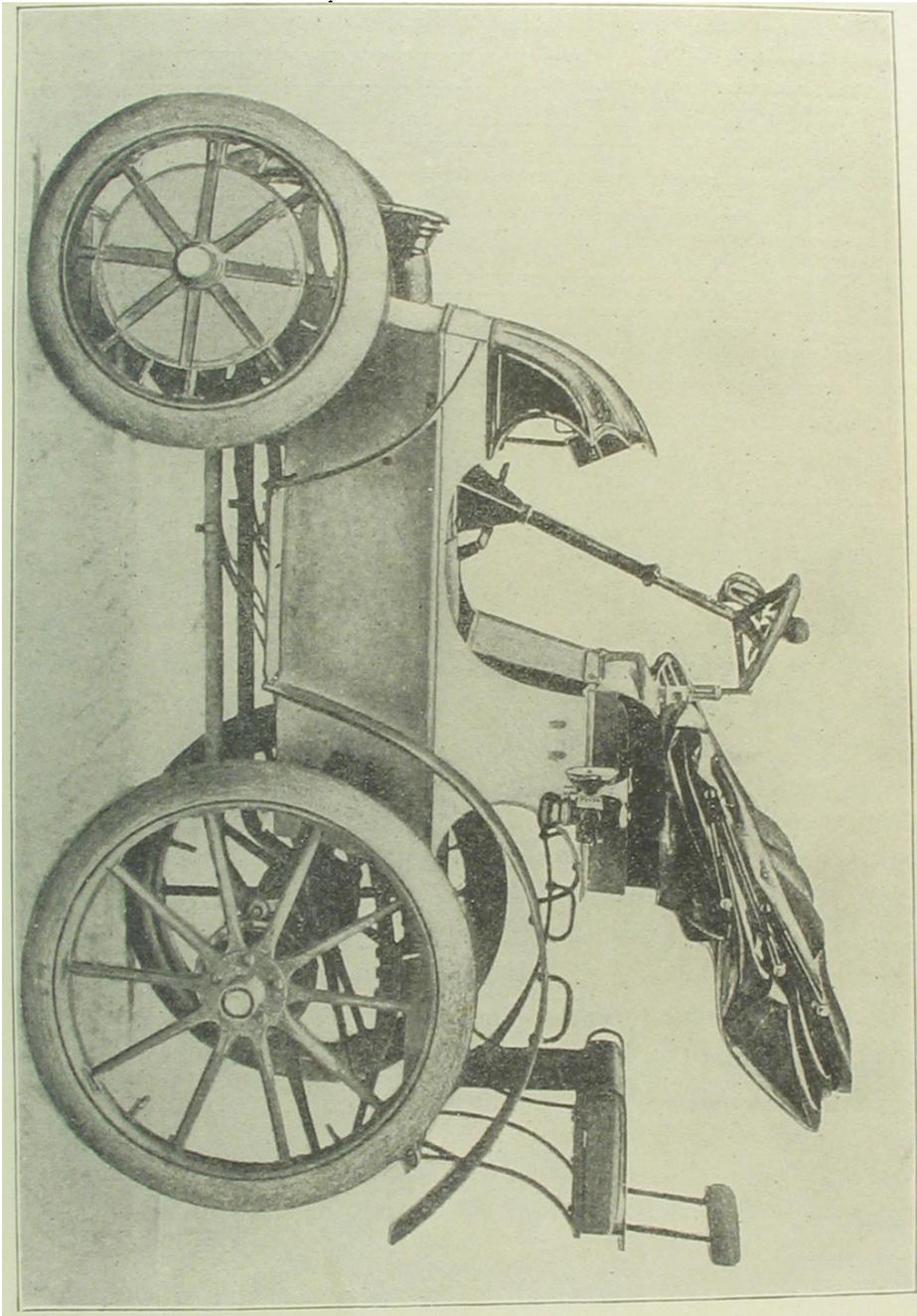


Front view.

inventor intends that the vehicle shall carry its own loading station so that during the journey a new electric current can be started which will enable it to travel 93 miles at a stretch.

Accompanying are drawings of J. Lohner's electro-mobile Lohner-Porsche, model No. 27, a three-seated phaeton; price, without top, \$1,500.

Side view.



Price list of Lohner-Porsche electromobiles.

CARRIAGES WITH TWO MOTORS AT 2.5-HORSEPOWER NORMAL CAPACITY.

[Each capable of surcharge to 7 horsepower.]

No. of model.	Description.	Value.
27	Three-seat phaeton without roof	\$1,500
	Four-seat phaeton without roof:	
2	Battery slipped in	1,540
26	Battery hung up	1,540
23	Mylord, battery hung up (Mylord body exchangeable for coupé body No. 34)	1,600
34	Coupé, battery hung up (coupé body exchangeable for Mylord body No. 33)	1,700
33, 34	Combined carriage with Mylord and coupé body	1,860
35	Mylord, battery slipped in (Mylord body exchangeable for coupé body No. 36)	1,600
36	Coupé, battery slipped in (coupé body exchangeable for Mylord body No. 35)	1,700
35, 36	Combined carriage with Mylord and coupé body	1,860
20	Landau	1,880
10	Six-seat break without roof	1,660
11	Six to eight seat omnibus	2,000
25	Ambulance for two litters with slip arrangement "Dietrich-Lohner"	1,940
13	Merchandise and advertising wagon with cabriolet	1,840

CARRIAGES WITH TWO MOTORS AT 5-HORSEPOWER NORMAL CAPACITY.

[Each capable of surcharge to 15 horsepower.]

30	Fifteen-seat break with roof	\$2,880
20	Twenty-seat omnibus	3,120
16	Heavy van carrying 5,500 pounds	2,360
31	Heavy van carrying 11,000 pounds	2,500

The Nesselndorfer Wagen-Bau-Fabrik Gesellschaft, Nesselndorf, Moravia, from 1897 to 1899 built four-seated benzine cars. They produce 125 automobiles yearly. Price of 7 horsepower, \$1,600; of 9 horsepower, \$1,800. Inclusive of the carriage works there are 1,600 employees, who live in the Nesselndorf colony, paying rent for their dwellings of from \$12 to \$24 a year.

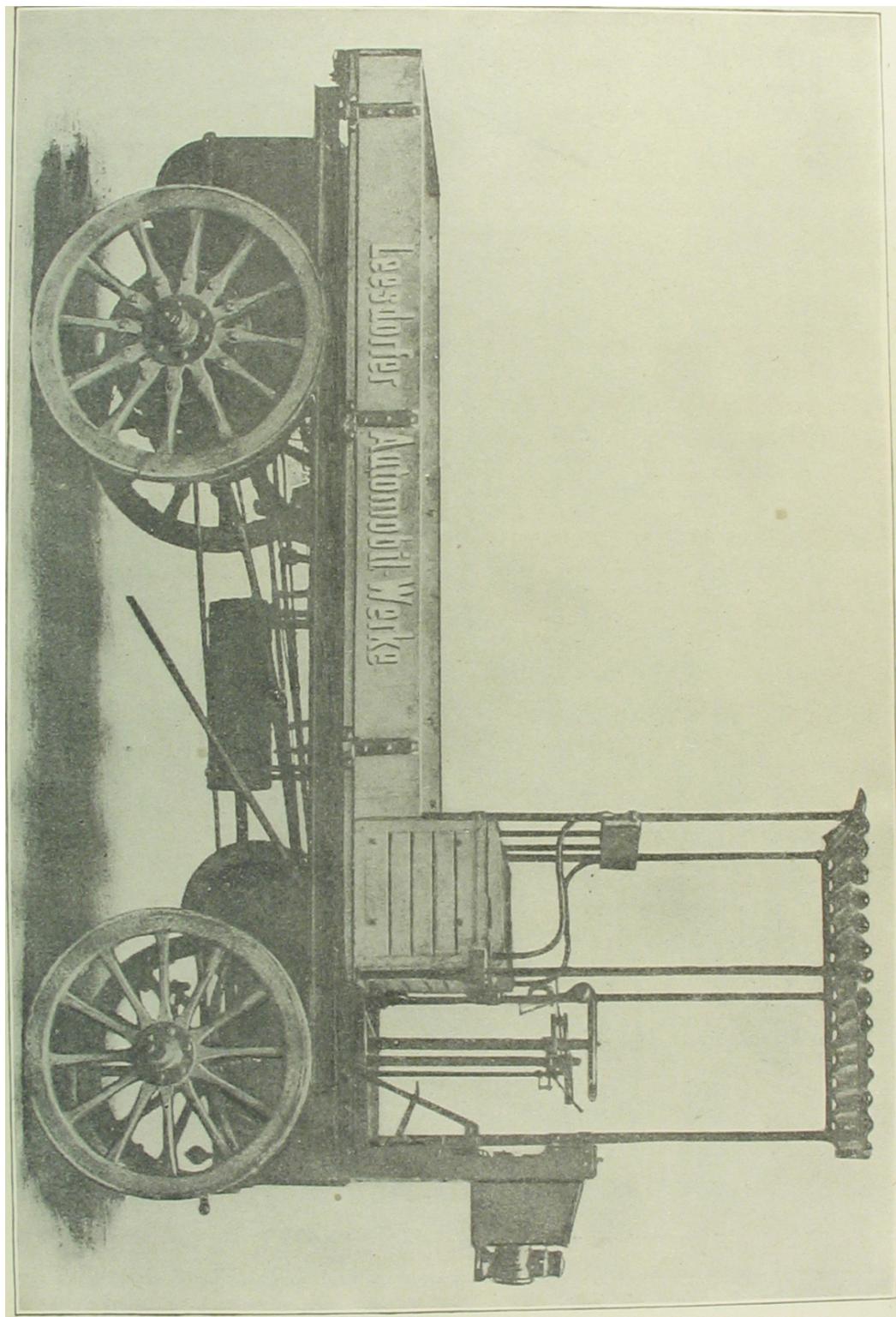
Leesdorfer Automobilfabrik Actien Gesellschaft, capital \$280,000, fully paid up. The factory is at Baden, near Vienna, and occupies a space of some 18,000 square feet. Can manufacture 150 automobiles per year. The company makes only large vehicles of from 6 to 9 horsepower. All kinds are turned out, from equipages and omnibuses to heavy wagons. This factory was opened on January 1 of the present year.

Illustrations of two types from these works are given herewith.

The price list of the Leesdorfer Company is as follows:

Description.	6-horse-power motor.	9-horse-power motor.
Open hauling wagon	\$1,640	\$2,000
Covered hauling wagon	1,840	2,240
Racing wagon		4,000
Petit Duc	2,100	2,500
Duc Tonneau	2,200	2,600
Phaeton	2,100	2,500
Five-seated hunting wagon	2,200	2,600
Omnibus		3,200
Break		2,600

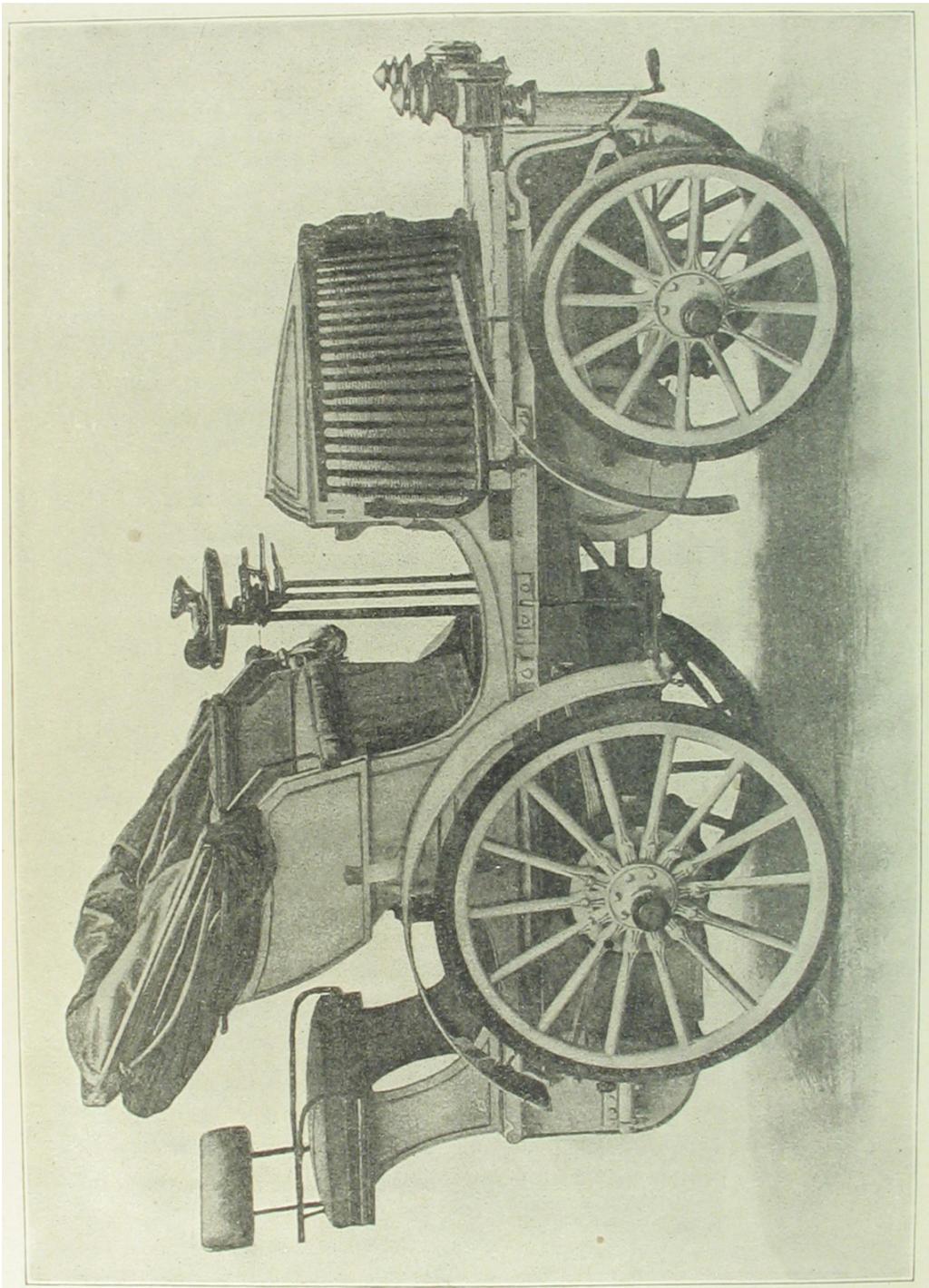
Bierenz, Fischer & Co., Oesterreichische Daimler-Motoren-Commandit Gesellschaft, Vienna, capital \$140,000, Porser-Daimler's patent.



Open hauling wagon. Patent Amedée Bollée. Price, with 6-horsepower benzine motor, \$1,640; with 9-horsepower motor, \$2,000.

The factory is at Wiener Neustadt, in Lower Austria, one and one-fourth hours from Vienna. The works occupy a space of many

thousand square feet. The water power is equal to 35 horsepower, the steam engines to 60 horsepower. The factory was opened this spring and can turn out 100 automobiles per year.



"Petit Duc." Patent Amadée Bollée. Price, with 6-horsepower benzine motor, \$2,100; with 9-horsepower, \$2,500.

Goebel, Knoller & Co., Commandit Gesellschaft Automobilfabrik, Vienna. The first automobile was built at this factory in the spring of the present year. It was for four persons and driven by petroleum.

AMERICAN AUTOMOBILES IN AUSTRIA.

These are the principal manufactories in Austria. The automobiles are chiefly French in design, but Lohner and the Leedorfer factory have their own special ones. There is a growing desire on the part of the public for automobiles as a mode of conveyance, and it is expected that the next two or three years will bring a large increase in the manufacture. The only obstacle to the general adoption of the automobile is the high price. People of small means are awaiting the advent of an inexpensive machine. American automobiles have not been on the market in Austria until recently, when there was established in Vienna an agency of a United States automobile manufactory, and it is hoped that this variety and others from the United States will exercise an appreciable part in the trade in automobiles in Austria—a trade that promises to be of great dimensions.

IMPORTS OF VEHICLES.

The latest statistics as to import and export of vehicles of all kinds are here quoted:

Imports and exports of vehicles.

IMPORTS.

Whence imported.	Number.	Value.
<i>Heavy vans.</i>		
England	18	.....
German Empire	71	.....
Italy	50	.....
Roumania	61	.....
Russia	17	.....
Servia	4	.....
Switzerland	13	.....
1899	234	\$31,232.00
1898	216	26,816.00
1897	288	36,976.00
1896	294	37,536.00
1895	233	33,615.00
<i>Heavy sleighs.</i>		
German Empire	17	.....
Russia	1	.....
1899	18	144.00
1898	16	93.60
1897	9	57.60
1896	14	64.80
1895	23	172.80
<i>Passenger vehicles without leather or upholstery.</i>		
United States	60	.....
Belgium	1	.....
England	3	.....
France	37	.....
German Empire	67	.....
Italy	32	.....
Roumania	2	.....
Russia	2	.....
Switzerland	7	.....
1899	211	15,023.20
1898	116	8,259.20
1897	205	14,596.00
1896	145	10,324.00
1895	208	8,401.60

VEHICLE INDUSTRY IN EUROPE.

Imports and exports of vehicles—Continued.

IMPORTS—Continued.

Whence imported.	Number.	Value.
<i>Passenger sleighs without leather or upholstery.</i>		
German Empire	6	.....
Roumania	1	.....
Russia	1	.....
1899	8	\$416. 00
1898	15	780. 00
1897	20	1,040. 00
1896	18	936. 00
1895	21	1,092. 00
<i>Passenger sleighs with leather or upholstery.</i>		
United States	13	.....
England	3	.....
France	16	.....
German Empire	37	.....
Italy	18	.....
Roumania	1	.....
Russia	3	.....
Switzerland	5	.....
Other countries	10	.....
1899	106	40,066. 00
1898	47	17,776. 00
1897	61	23,058. 00
1896	50	18,900. 00
1895	52	19,656. 00

EXPORTS.

Whither exported.	Number.	Value.
<i>Heavy vans.</i>		
Africa	5	.....
Belgium	21	.....
Egypt	16	.....
German Empire	45	.....
Italy	39	.....
Levant	17	.....
Roumania	82	.....
Russia	3	.....
Servia	16	.....
Switzerland	1	.....
1899	245	\$24,552. 00
1898	361	22,060. 80
1897	260	22,881. 60
1896	214	13,996. 80
1895	597	28,584. 00
<i>Heavy sleighs.</i>		
German Empire	10	.....
Italy	1	.....
1899	11	216. 00
1898	5	72. 00
1897	15	201. 60
1896	13	311. 20
1895	17	288. 00
<i>Passenger vehicles without leather or upholstery.</i>		
German Empire	269	.....
Italy	6	.....
Roumania	6	.....
Russia	5	.....
Servia	17	.....
Switzerland	3	.....
Other countries	20	.....
1899	328	42,890. 00
1898	410	55,800. 00
1897	405	56,700. 00
1896	350	56,000. 00
1895	363	68,840. 00

Imports and exports of vehicles—Continued.

EXPORTS—Continued.

Whither exported.	Number.	Value.
<i>Passenger sleighs without leather or upholstery.</i>		
German Empire	31	.....
Switzerland.....	1	.....
1899	32	\$1,792.00
1898	30	1,680.00
1897	32	4,592.00
1896	37	2,072.00
1895	75	4,200.00
<i>Passenger vehicles with leather or upholstery.</i>		
Belgium	2	.....
Bulgaria	12	.....
England	5	.....
France	5	.....
German Empire	116	.....
Greece	4	.....
Holland	4	.....
Italy	16	.....
Roumania	25	.....
Russia	95	.....
Servia	37	.....
Spain	1	.....
Switzerland.....	28	.....
Turkey.....	12	.....
Other countries	15	.....
1899	377	79,170.00
1898	298	62,580.00
1897	259	62,160.00
1896	307	73,680.00
1895	369	88,560.00
<i>Passenger sleighs with leather or upholstery.</i>		
German Empire.....	12	.....
Roumania	1	.....
Russia	2	.....
Switzerland.....	5	.....
1899	20	1,920.00
1898	15	3,150.00
1897	22	2,880.00
1896	14	8,640.00
1895	10	960.00

CARL BAILEY HURST,
Consul-General.

VIENNA, May 25, 1900.

HUNGARY.

VEHICLE MANUFACTURERS.

The leading manufacturers of vehicles in Hungary are Kölber Brothers, Joseph Bogdan, Charles Zsigmondy's successors, J. Bihari & Bro., Michael Nusura, Budapest; Stephen Reitter, Vác; A. Marschall, John Hruska, Pozsony; Henry Riesz, Debreczen; B. Hegedüs, Nuskolcz.

PRESENT CONDITION OF INDUSTRY.

There are no comparative statistics of the vehicle industry in Hungary for 1800, 1850, and 1900. The census of 1890, however, showed the following conditions:

Of 1,215 individuals engaged in vehicle manufacture, 221 were employers and 950 were employees. Of the 221 employers, 7 were engaged on a large scale, each employing more than 20 employees, and all together 374 men.

AUTOMOBILES IN HUNGARY.

So far as I know there are no manufacturers of automobiles in Hungary, but there is no doubt that Budapest is bound to import a larger quantity from year to year, and representatives of American firms should endeavor to land their machines directly on the market, exporting from New York via the New York and Mediterranean Steamship Company to the port of Fiume instead of via North German ports. In this line, as well as in other machine trades, no local agents can be pronounced reliable, and direct representation by an American employee who speaks German has always proved the most successful. Local dealers are either Germans or Jews. The former seek only to get the good points of the American articles and then reproduce them in their own way; the latter are not always financially sound and only work for high commission.

FRANK DYER CHESTER, *Consul.*

BUDAPEST, *April 10, 1900.*

CARRIAGE AND WAGON WHEELS IN AUSTRIA-HUNGARY.¹

I have the honor to report, in compliance with the Department's inquiry as to the quantity and value of carriage and wagon wheels and the material therefor imported into Austria-Hungary, that there have been in the last two or three years inconsiderable shipments from the United States of hickory carriage wheels. This importation was due to a fashion which sprang up, to all appearances, spontaneously, and which has now practically gone out of vogue. At present the wheels for trotting sulkies are the only species which can boast of a regular import from the United States, and they come by way of Germany; it is therefore impossible to ascertain the correct figures as to the extent of the trade.

The following kinds of woods are used in Austria-Hungary for the manufacture of wheels: Ash for spokes and fellies, elm and ash for hubs, and beech for fellies of ordinary vehicles.

¹ Republished from Consular Reports for May, 1898, No. 212.

Carriage wheels can not be suggested as an article for import into Austria-Hungary, because this Monarchy has an extensive supply of the woods needed for their manufacture.

Machinery used in the production of carriage and wagon wheels, if not made in Austria, is imported from Germany, and is much cheaper than ours; but, above all, the low wages make the home product cheaper at the present time than any foreign manufacture.

The wagons and vans in this country are of such different types, and their various shapes are so dear to their respective owners—either being the product of their own inventive genius or having their origin in many local and provincial customs—that they can only be built “on the spot” and at varying prices.

CARL BAILEY HURST,
Consul-General.

VIENNA, *December 4, 1897.*

BELGIUM.

VEHICLE INDUSTRY.

For a long time the manufacture of vehicles of every sort has enjoyed in this country a remarkable vitality and flourishing conditions of trade. Like every other industry, of course it has had its ups and downs and although at the present time it is considered to be in a very prosperous condition, still foreign competition has already begun to make considerable impression even in quarters where in the past the native industry commanded the market entirely. That it is true that foreign competition has already made rapid advances is shown by the fact that in the year 1898, pleasure carriages were imported into Belgium of a value amounting to \$192,537, whereas the exportations of carriages of the same description amounted to only \$196,912.

The Belgian carriage manufacturers have always been well satisfied with the success of their interests in the past, particularly with the impressions made upon foreign markets.

In 1804, on passing through Brussels, Napoleon I ordered at one time twelve loop-hung coaches, showing that even then this city enjoyed a great reputation for this style of vehicle; and that this reputation has not suffered to any extent in latter years is shown by the success obtained by her builders in the way of premiums awarded at the different world's exhibitions.

The points that are especially found worthy of commendation in the construction of the Belgian carriages are the elegance of form united to solidity of construction, due in a large measure to the fine quality of the material used as well as to the skill with which the same is handled by the workmen employed.

The statistics asked for as to the condition of the industry in 1800

and 1850 have been found impossible to obtain. There are no official publications to my knowledge from which such information can be gleaned. In the first place Belgium, as a separate Kingdom, did not exist prior to 1830 and all efforts made by me to find anything in the way of a publication treating upon the industry mentioned as it existed fifty years ago have proved fruitless.

KINDS OF VEHICLES MANUFACTURED.

As to the styles of carriages manufactured, I would state that the leading ones are breaks, cabs, cabriolets, coupes, landaus, victorias, broughams, wagonettes, tillburys, traps, dog carts, and phaetons.

CAPITAL INVESTED.

In regard to the capital represented I would say that this industry, as is the case with many others of like nature, is as a rule perpetuated in the same family, and few associations and companies of recent origin exist. For this reason, if for no other, it is difficult to obtain any information as to the amount of capital invested, as would be the case were joint stock companies or incorporations engaged, the statistics regarding which would be published in official form.

Here allow me to state that no commercial agencies of any importance exist in this country which publish books of reference concerning capital invested in business, ratings of business men, etc. There is only one agency in Belgium of any standing whatever which acts as a correspondent of Bradstreet & Co., and pretends to furnish something like the information obtainable in our country from such sources. People here would resent the asking of the questions pertaining to their private affairs which are propounded to our business men for the sake of obtaining commercial rating. For the same reason, manufacturers or merchants here refuse to disclose to any questioner the amount of their capital invested, earnings on same, wages paid employees, etc. From the foregoing it will be seen how difficult it is to furnish a satisfactory reply to the fourth question propounded, as to the capacity and earnings of employees.

LABOR AND WAGES.

That the capacity of a great part of the workmen must be good is shown from the character of the work turned out, and the reputation of the same enjoyed not only at home but abroad.

Naturally workmen are paid according to their capacity in this as in every other industry, and the conditions in that respect are no different in this country from those in our own. Taking the whole range of the industry into consideration, blacksmiths and wheelwrights earn on the average from 7 to 8 cents; wood workers on bodies, from 8 to 15 cents; painters and trimmers, from $14\frac{1}{2}$ to $19\frac{3}{10}$ cents; and workmen on carts and wagons, 8 to 12 cents per hour.

MANUFACTURERS.

The following list gives the names and addresses of the leading manufacturers of the Kingdom:

Coach makers.—G. Vandenplas, Rue Van Brée, Felix Verwilt, Rue Quellin, Antwerp; L. Claeys, Rue St. Jacques, J. Dobbelaere, Rue Tonneliers, Bruges; H. De Bruyne fils, Rue du Dannier, De Ruytter-Demessine, Bd. de la Senne, D'Ieteren frères, Ch. Charleroi, A. Laureys fils, Rue De Joncker, Joseph Mettervie, Rue de France, P. J. Schürmann, Rue d'Orleans, Snutsel et fils, Rue de l'Activité, V. et J. Snutsel fils, Bd. de Waterloo, A. Van Roosbroeck, Rue Willems, Brussels; J. Delbeke, Courtrai; Ch. De Pann, Rue Charles Quint, C. Deruyter, Rue de Poire, Ghent; Gametté, Lambt. le Beque, L. Lilien, Rue Variy, H. Vogt, Rue G. Orbay, Liege; L. Antonis, Verwilt, frères, Lierre; G. Malcorps, Rue Neuve, Louvain; L. Muey, Rue des Juifs, Mons; J. Michotte-Carlier, Bd. Canchy, Noel, vve., Rue de Collège, Wilmet-Melchior fils, Rue de Bruxelles, Namur; F. Piron, Spa; Barbier frères, Sivevezele; Dedonder, Termonde; H. Boosmeier, Verviers.

Carts and drays.—J. B. Coeckx, Rue Comtesse de Flandre, E. P. de Ridder, Quai aux Brigues, J. Goes, Chaussée d'Anvers, E. Hannouille fils, Chaussée de Mons, J. Plas, Rue de la Banque, J. B. Van Gend, Rue Van Belmont, Brussels; Société anonyme de Construction de Morlanwelz, Morlanwelz, Hainaut; Mathieu, Thiun, Hainaut.

The express wagons and such as are used at home by butchers and grocery men, milk dealers, and bakers, etc., are not in general use here. Delivery of merchandise of the character above mentioned is ordinarily made by the use of push carts and with small wagons often drawn by the assistance of dogs.

Wagons for heavy drayage are all built very low, long, and extremely heavy. Both running gear and body are constructed very much heavier than we are accustomed to, although the tendency is toward a lighter form of building.

The following is a list of the best-known cartwrights in the country:

J. Delhaye, Willen (Namur); A. Beauvils, Assenois (Luxemburg); A. et D. Faynard, Ath (Hainaut); J. Devos, Marché Vendredi, Bruges; J. B. Buys-Berard, Rue Linnée, J. B. Cockx, Rue Comtesse de Flandres, Brussels; A. Beternier, Chapelles a Witinnes, J. B. Omez, Courelles, Province of Hainaut; J. B. Morel, Dinant, Namur; E. Ranson, Dixmude, C. Dieroux, J. Schorre, Dottigines, West Flanders; J. et J. Geoffin, Eeckeren, Antwerp; J. Compain, Dassy, Erguelmnes, Hainaut; J. J. Garrand, Etalle, Luxemburg; L. et J. Lefebvre, Falmagne, Namur; E. Depann, Rue St. Georges, Ghent; F. Colson, Jupille, Liege; A. et F. Van Guyenbroeck, Lokeren, East Flanders; Brisoy-Barntry, Morlannelz, J. Nevez, Paturayes, H. Mayeyr, Quevancanyes, A. Mandoux, Rance, Hainaut; Sabbe Maschis, Roulers, West Flanders;

Monsen, Roux, Hainaut; C. Bricont, St. Aubon, Namur; A. Gilmot, St. Vaast, Hainaut; J. Mathot, Saiveniere, Namur; J. Dodemont, G. Bayob, W. Bayob, Vise, Liege.

AUTOMOBILES.

Here, as is the case pretty much everywhere, the automobile has already been introduced and is rapidly becoming popular, although its comparatively high cost renders it at present rather an object of luxury than of general use.

It is estimated that in Brussels alone there are owned about 300 machines of different makes, and already one or two large retail establishments have auto delivery wagons running. Already there are quite a number of establishments engaged in the manufacture of this style of vehicle and there seems to be a growing tendency to found new ones, which tends to show that a demand is expected.

The prices of course vary very greatly, depending upon the style of carriage as well as the character of the motor employed.

The largest manufacturing establishment in this country engaged in this branch of industry, according to the best information obtainable, is the Fabrique Nationale d'Armes de Guerre, at Herstal, near Liege, which has successively added to the object for which the company was formed (the manufacture of firearms), that of bicycles and lately that of automobiles. It is stated that this firm alone on the 1st of April had orders for the building of 100 carriages of different sorts.

Following will be found a list of the more prominent automobile manufacturers throughout the country.

Ch. Belot, Rue du Poinçan, 24; J. A. Boisselot, Rue de Fiennes, 66; Electricité Mécanique, Automobiles, Digne du Canal de Charleroi, 4; Fabrique Nationale d'armes de Guerre, de Herstal, Rue de l'Ecuyer, 31; Dechamps, Rue Frère Orban, 31; Ad. Larand, Rue aux Champs, 21; La Compagnie Belge de Construction d'Automobiles, Place Louise, 4; La Société Général Belge des Automobiles, Rue d'Arlon, 58; Vivinue & Cie., Rue du Progrès, 244; Wallegghem & Sovghen, Rue de la Concorde, Brussels; La Compagnie Belge des Automobiles (Société Anonyme) Rue Vander Kelen, Antwerp; Les Etablissements Pieper (Société Anonyme), Liege; La Société Anonyme de Construction Liégeoise, d'Automobiles, Rue Lairesse, Liege; N. Vincke, Rue Leopold, Malines; La Société Anonyme des Usines Delin, Louvain; La Société Anonyme des Ateliers Germain, Monceau-sur-Sambre L. Linon, Ensival.

GEO. F. LINCOLN,
Consul-General.

ANTWERP, *April 19, 1900.*

DENMARK.

VEHICLE INDUSTRY.

The carriage industry proper is of small consequence, and Copenhagen is its center. The number of pleasure vehicles of all descriptions turned out annually does not exceed 300. They are of all the usual styles, except buggies, and are built to "cut under" on account of the narrowness of the Copenhagen streets.

The condition of the vehicle industry of Denmark at the present time presents no very striking contrast with its condition either fifty or one hundred years ago. The bicycle has come into general use, of course, and the automobile is not absolutely unknown, but the latter will have to become as good and nearly as cheap relatively as the bicycle before it attains much popularity. Horses will, of course, pass to their rest and even Danish wagons will wear out, and in this lies the hope of the manufacturer of good and cheap self-propelling vehicles. But the dawn of that day has not as yet appeared.

The historical aspect of this question is hardly worth going into, with the possible exception of the Copenhagen cab.

In the olden time, communication between the towns was by stage-coach or by boat; the saddle horse was also used.

MANUFACTURERS.

In Copenhagen the principal makers of carriages are F. C. Shultz, 40 Nørregade, who enjoys the title of carriage maker to the Danish court; F. L. Gloy, 61 Nørrefarimagsgade; L. Andersen, 13 Studiestraede, and V. Torbensen, 48 Gothersgade.

The N. Larsens Vognfabrik, Limited, with a capital of 4,000,000 kroner (\$1,072,000), is a concern which makes not only carriages, but tram cars, omnibuses, etc., and this company has been experimenting with compressed air as a motive power, but so far without gratifying results.

All carriage builders make wagons and hand carts, but figures concerning them are unavailable.

WAGES.

The average daily wage paid is \$1.34. The number of employees is by no means constant, but varies with the season and the orders on hand. Statistics for the whole of Denmark are not to be obtained.

CLASS OF VEHICLES MANUFACTURED.

The wagons are virtually all alike—somewhat in the style of a regular Studebaker or Jackson wagon—but the sides flare a little. They are heavy and strong, never covered, and require two horses. One-

horse wagons are almost unknown. And just here is where the hand carts come in, and their name is legion. They are used for any purpose that does not require 2 horsepower. A man in harness is cheaper than horse and driver, and a boy is cheaper than a man, and thus it happens that most of the hand carts in this city are pulled by youths or boys.

J. C. INGERSOLL, *Consul.*

COPENHAGEN, *May 22, 1900.*

CARRIAGE AND WAGON WHEELS IN DENMARK.¹

The Danish statistics, with few exceptions, include the imports of all articles made of wood under the general term "manufactures of wood." Figures, therefore, dealing with the imports of wheels and material therefor can only be approximated by men familiar with the trade.

No ready-made wheels are imported into Denmark. For work wagons, trucks, drays, and heavy vehicles, the material used for wheels is oak, supplied principally by Denmark itself, the balance coming from Sweden. Such wheels must, according to law, measure at least 4 inches across the tire; this rule applies both to country and city.

For carriages, buggies, road carts, and light vehicles, the wheels are made of American hickory, obtained exclusively from importing houses in Hamburg. It is safe to say that the wheels of all the cabs in this city are made of hickory.

I have consulted Mr. Larsen, of the firm of N. Larsen & Co., No. 11 Smallegade, the largest manufacturers of wagons and carriages in the Kingdom. He estimates that there is imported annually 20,000 hickory spokes and 500 rims (fellies). The manufacture is only for domestic consumption, and Mr. Larsen thinks the supply about equals the demand. This firm itself consumes about one-half of the annual import of hickory. He is also of opinion that during the present year (1897) there have been imported about 3,500 rough hubs. The orders for this market being so small, dealers find it more convenient to buy from Hamburg, especially as the American exporter is averse to making such small shipments. The population of the Kingdom is about 2,200,000, and, although the quantity of material imported may seem insignificant from an American standpoint, if it meets the demand, as Mr. Larsen says—and he is a competent judge—it is difficult to see how it can be increased, unless an export trade in wheelwright supplies is developed, and there does not appear to be any prospect of this.

¹ Republished from Consular Reports for May, 1898, No. 212.

I have also been in consultation with Messrs. Sally Meyer & Co., No. 11 Laderstrade, dealers in carriage and wagon supplies, and quote their letter to me in full as follows, in translation:

In reply to your letter, we must remark that ready-made wheels are not imported into Denmark. Although the duty on ready-made wheels is 6½ öre (1.7 cents) per Danish pound (1.102 American), we do not doubt that the Danish carriage builders would find it to their advantage to import them from America; but our manufacturers are, in this respect, very conservative, and for a middleman it would be very difficult and risky to carry a stock which must necessarily consist of many sizes. If a capable firm would send a sample or consignment lot here, it would undoubtedly lead to business. When the wheels have been introduced and found to be good, they could be imported for our own account. This applies, however, only to wheels for light vehicles. Wheels for working trucks can not, in our opinion, be imported. The duty on such heavy articles amounts to too much, and our forests furnish so much ash and oak, of which the wheels are made, that foreign competition is excluded.

On the other hand, we import via Hamburg a good deal of American hickory rims and spokes. We have many times tried this import from the United States direct, but always with unsatisfactory results. We have always ordered the very best goods, and they have always sent us goods very much inferior to those (American goods) we buy from Hamburg merchants. The reason probably is that Hamburg imports more in a week than the whole of Denmark would import in a year; but the principal reason why we can buy the rims cheaper through Hamburg may be found in the fact that Hamburg imports the wood in its natural form and works it into rims, while we must import the rims already shaped, in which condition they take up more space, and freight is higher. These rims are used exclusively for light-draft vehicles, and we believe the yearly import amounts to about 300 four-wheel sets. The duty on these is only 31 öre (8.3 cents) per 100 pounds Danish.

It would seem from the foregoing that there is no market here at the present time for heavy wheels from the United States, that we already control the market, through Hamburg, in wheel material for light-draft vehicles, and that there is an opening for the ready-made wheels for the latter. These could be stored in the "free port" duty free and exhibited in the city through samples, or a trial shipment could be consigned direct to a dealer in Copenhagen, at the risk and account of the American exporter. The Danish merchant wants the privilege of seeing and handling the goods before investing his money, and, in my opinion, this is the only way in which American-made wheels can be introduced. The three principal dealers in Copenhagen are: H. E. Bonner, Vestergade 28; Sally Meyer & Co., Laderstrade 11; Nienstadt & Co., Vester Boulevard 20.

ROBERT J. KIRK, *Consul.*

COPENHAGEN, *September 18, 1897.*

FRANCE.

Vehicles for the district of Paris are principally made in the Department of the Seine. The manufacture of vehicles is to be divided into two principal groups: First, private carriages; second, vehicles for commerce and agriculture.

PRIVATE CARRIAGES.

There are only about ten manufacturers of private carriages of any importance in this district, and I quote the firms in order of their importance: Binder (first grand prize at Paris Exposition of 1899), 170 Boulevard Haussmann; Henry Binder, 31 Rue du Colisée; Mulbacher, 63 Avenue des Champs Elysées; Bail junior, 67 Avenue Malakoff; Ehrler, 51 Rue de Ponthieu; Kellner, 125 Avenue Malakoff; Labourdette, 183 Rue de la Pompe; Million, Guiet & Co., 124 bis, Avenue de Villiers; Grummer & Co., 26 Rue Cambacères; Bail Ainé, 98 Avenue Kléber; Carrosserie Industrielle, 228 Faubourg St. Martin.

There are no statistics giving the number of carriages manufactured per annum.

The styles manufactured are very numerous. Makers manufacture the following types: Coupé, two seats, very light; coupé, three-fourths circular front; coupé, three-fourths square front; "Duc" (a kind of Victoria with seat behind for footman). There are several designs of this carriage. The "Duc" cab with straight seat is the latest style. "Mylord" (Victoria), dogcarts, landeau, buggies, morning cart, cab cart, rally cart, Derby cart, etc. The inclosed charts of the Carrosserie Industrielle will show the various styles in general use.

The capital represented by the above-mentioned firms is estimated at \$20,000,000, but there is no way to ascertain the exact amount.

The number of employees is given between 2,000 and 3,000, but it varies according to the season. The wages paid are from 7 francs (\$1.35) to 14 francs (\$2.70) per day of ten hours' work. There are a few smaller manufacturers with capital aggregating about \$5,000,000, employing perhaps 1,000 employees, paid as above.

It is considered that the private-carriage industry has increased but very slightly since 1850. The reason given is that under the empire the court caused an influx of "fashionable" people who kept carriages. In 1800 the manufacture of fine carriages was limited to a certain heavy type called "Carrosse."

COMMERCIAL VEHICLES.

The most important houses are, in order of importance, as follows: Carrosserie Industrielle, 228 Faubourg St. Martin; Marcou, 73 Rue Riquet; René Breteau, 162 Rue Championnet; Larochette, 120 Avenue Daumesnil.

The capital represented by these firms is about \$3,000,000. They

employ about 2,000 hands, which are paid: Blacksmith, from 8 francs (\$1.54) to 12 francs (\$2.31) per day; wheelwright, from 7 francs (\$1.35) to 8 francs (\$1.54) per day; riveters and carpenters from 7 francs (\$1.35) to 8 francs (\$1.54) per day; painters from 6 francs (\$1.15) to 10 francs (\$1.93); upholsterers from 7 francs (\$1.35) to 8 francs (\$1.54).

This industry has increased enormously since 1850. It is about three times more important to-day than it was fifty years ago.

AUTOMOBILES.

This branch of the industry is increasing enormously. It is estimated that 30,000 are in circulation at the present time in the Paris consular district.

Electrical automobiles would be preferred, but for the difficulty of recharging the accumulators outside of Paris. If depots for the purpose of recharging or exchanging the accumulators were established every 20 or 30 miles, the sales of electrical automobiles would be very much larger.

The most popular are petroleum automobiles because fuel can be obtained everywhere. The "Voiturettes," a very light automobile with two or four seats, sold at from \$400 to \$1,000, are at present most in use.

The following are the principal firms doing business in automobiles, together with the estimated capital: Belvallette frères, 24 Avenue des Champs Elysées; works at 64 Rue Pergolèse; \$200,000; employees, 400. A. Clement, Levallois-Perret, Seine; \$4,000,000; employees, 2,500. Delahaye & Cie., 10 Rue du Banquier; works at Tours; \$600,000; employees, about 700. Dion, Bouton & Co., 46 Avenue de la Grande Armée; works at Puteaux, Seine; \$5,000,000; employees, 2,000. Ernst & Cie., 241 Boulevard Périère; \$300,000; employees, 400. Hurtu, 10 Rue Hélevy; works at 54 Rue St. Maur; \$400,000. Liberator, Pantin, Seine; \$200,000; employees, 250. La Minerve, 30 Rue du Point du Jour, Billancourt, Seine; Soc. Anonyme d'Electricité et Automobiles, 48 Rue du Théâtre; \$2,000,000; employees, 1,200. Panhard & Levassor, 19 Avenue d'Ivry; \$4,000,000; employees, 2,000. Georges Richard, 23 Avenue de la Grande Armée; \$600,000; employees, 700. Peugeot, 83 Boulevard Gouvion St. Cyr; \$3,000,000; employees, 2,000.

The salaries are as follows: Fitter, 7 francs (\$1.35) per day of ten hours; mechanic, 10 francs (\$1.93) per day of ten hours; turner (lathe), 12 francs (\$2.31).

It may be said that most of these firms not only manufacture automobiles, but also bicycles, as in the case of Peugeot, Hurtu, Georges Richard, etc.; motors, as Dion, Bouton, etc., Panhard & Levassor.

JOHN K. GOWDY, *Consul-General.*

PARIS, August 3, 1900.

GERMANY.¹

VEHICLE INDUSTRY.

The wagon and carriage manufacture is one of the oldest and most widely extended of German industries. There are in this country 1,020 manufacturers of vehicles sufficiently important to be included in the Industrial Directory of the Empire. Many of these are firms or companies of large facilities, which manufacture vehicles for both home and export trade. There are in Berlin three illustrated periodicals devoted solely to the wheelwright's handicraft and trade. There are in and about Berlin seventy makers of wagons and carriages of various classes, including everything from a royal barouche or landau to a handcart or dog wagon. Of these, the most notable builders of fine carriages for public and private use are: The Ruhlstein Carriage Company, Ernst & Co., Hermann Ganschwindt, W. Erdmann, jr., Jos. Neuss, E. Zimmermann, J. Frauenknecht, C. Klient, Wilhelm König, Max Leuschner, August Farber, George Morigen, and W. Steinmetz. Among other notable builders located elsewhere in Germany may be mentioned the following:

Dick & Kirchsten, Offenbach on Main; A. Krüger, Erfurt; Fr. Reutter, H. Wimpf & Son, Stuttgart; Engelmann & Co., Warnsdorf in Baden; Paul Axthelm, Weimar; Gastell Bros., Monbach-Mainz; Georg Wiener, Oels, Silesia; De Dietrich & Cie, Niederbronn, Alsace.

In fact, it may be said that every large town or city in Germany has local makers of carriages and wagons capable of fulfilling all requirements. It will be noticed in the wheelwrights' journals that no advertiser announces finished articles, but all advertise materials and fixtures for the use of carriage and wagon builders. Thus Messrs. Menne & Kasspoht, of Hanover, are large dealers in American carriage timber, especially spokes, hubs, and felloes. The Troy Bending Company, of Troy, Ohio, is ably represented. Several Parisian factories advertise carriage lamps and other fixtures, but axles, joints, and upholstering materials are mainly of German manufacture. Workmen are abundant and skillful, and earn from one-third to one-half the wages that are paid for similar labor in the United States.

AMERICAN VEHICLES HANDICAPPED IN THE GERMAN MARKET.

Since the American vehicle industry was restricted and depressed by the advent of the bicycle several years ago, repeated efforts have been made to establish an export trade in wagons and carriages to

¹ In addition to the reports from Germany herewith, the consuls at Bavaria, Munich, and Solingen have reported that vehicle industries, outside of those for merely local demands, do not exist in their districts.

Germany, but, so far as can be observed or ascertained, without success, and for the following, among other, reasons:

1. Upholstered vehicles of all kinds are subject to a high duty when imported to this country, whereas materials of every kind used in the wheelwright's trade are either free or bear only a nominal duty. For instance, a common runabout open buggy which costs, crated, at New York \$126, must pay 150 marks (\$35.70) duty on entry to Germany. Add to this sea freight for space occupied by so bulky an article, and the net cost on arrival is raised quite above the price of similar vehicles of home manufacture. Rubber tires are, for some reason, far cheaper here than in America.

2. The forms and classes of carriages used here differ essentially from those most generally employed in the United States. There the owner of a vehicle of the buggy class generally drives it himself, and when he alights fastens his horse to a ring in the pavement or to a hitching post. Here the hitching post is unknown, and the carriage is, in most cases, driven by a coachman, or, if temporarily driven by the owner, the driver is taken along to take charge of the team when the master lays down the reins. There is no place in the social system of this country for the American buggy or single-seated phaeton, and when the German farmer takes his family for a Sunday drive it is usually with a horse and wagon that have done service for more serious hauling during the week.

3. All kinds of carriages here are far more heavy and substantially built than in the United States. In this the Germans are undoubtedly foggyish and far behind the American standard, but they think they are right, and consider most American buggies and carriages too light to stand heavy use and be permanently durable. For the same reason, axles, spindles, and other parts made here are larger, and will fit nothing that is made in the United States. The first objection the German customer will make to an American-built vehicle is that if it breaks or any part wears out, it can be only with great difficulty repaired in this country. American bolts and screws of nearly all kinds are cut with a thread so different that German-made nuts will not fit, and this fact blocked the introduction of American bicycles until our leading makers supplied their agents here with parts and tools, and even workmen sufficient to set up American repair shops in all principal towns.

3. The number of private carriages used here is small in proportion to the wealth and population of German cities. The bicycle is of almost universal use among the middle and working classes, and, except for the wealthy and exclusive minority, cabs are the mainstay of transportation for everyday life. In cities where a cab is ready at every street corner from morning until after midnight to carry one, two, or three persons 2 miles for 20 or 25 cents, there is small temptation to undertake the costly luxury of a private equipage, especially since

electric tramways, omnibuses, and motor carriages have made the driving of a spirited horse or pair dangerous and unpleasant.

4. If there is one untried opportunity left in Germany for American carriage builders, it would seem to be in the direction of cabs, or "droschken," as they are called here, for public use. These are of several forms—the coupe, with glass front, a seat for two persons, and "strapontin," or adjustable narrow front seat, for a third, which costs here new about \$350; the Victoria, with deep front and buggy top, which costs \$250 to \$300, and the double seated one-horse landau or "caleche," with top that divides in the middle and lowers forward and back. This costs when new \$350 to \$400. It is possible that these models, constructed by American makers and imported in the rough to be set up, painted, trimmed, and finished by German workmen in this country, might come within the line of profitable competition. But the experiment would be at best doubtful.

AUTOMOBILES.

It was stated in the report of this series describing the International Motor Carriage Exposition held at Berlin in September of last year (Consular Reports, No. 231, December, 1899¹), that although nearly all hydrocarbon motors, including the Daimler machine and all variations of the Otto gas engine, are substantially German inventions, automobilism and the manufacture of motor vehicles has developed much more slowly in this country than in France, Belgium, or even England. It was not until the exposition of last year was organized that the motor carriage appeared on the streets of Berlin, and even now there are only twenty-four registered for use by private individuals. Besides these, however, there are as many more driven for advertising purposes by agents of motor-carriage makers located here and in other cities. There are twenty electrical omnibuses in service, and more are being built as rapidly as possible, and perhaps a hundred electrical and hydrocarbon motor drays, delivery wagons, and business vehicles of various types.

There were represented at the exposition of 1899 thirty-two makers of motor vehicles in Germany, nearly all of whom, except the Daimler Company, at Cannstadt, and the Benz Motor Wagon Company, of Mannheim, had been previously manufacturers of bicycles, wagons and carriages, or electrical machinery. All of these makers, so far as can be ascertained, are actively occupied, with their output usually sold in advance of completion, so that it is still difficult to obtain a motor vehicle of native manufacture without waiting for it to be completed. This is especially true of omnibuses and wagons of various types for business purposes, which seem to have been adopted in this country more readily than carriages for travel, pleasure riding, or

¹Also in Advance Sheets, No. 561, October 24.

racing purposes. There will be no important automobile races in Germany this year, for the reason that the best makers and drivers are occupied with the exhibition and contests pertaining to the International Exposition at Paris.

Of American motor carriages, there are in use at Berlin several of the Columbia type from Hartford, Conn., which are used as models under a business arrangement between the Pope Manufacturing Company and the Motorfahrzeug Fabrik at Marienfelde, near Berlin. These are electrical carriages, and, although expensive, they are greatly admired for their fine workmanship, elegance of form and finish, and their smooth, noiseless action. Besides these, there is an agency at No. 74 Unter den Linden for an American steam carriage, which is sold in the United States for \$650, but for which 5,000 marks (\$1,190) is asked in Berlin, a price that is here considered excessive.

PERMANENT AUTOMOBILE EXHIBITION.

But the fact of most importance to American manufacturers is that there has been organized here and will be opened in June a permanent exhibition of automobiles, which will offer exceptional facilities for the motor-vehicle builders of all countries to bring their products before the people of Germany under highly advantageous conditions and at minimum expense.

The association includes among its founders several prominent capitalists and business men of Berlin, its officers are men of the highest character and social position, and its purpose is not to make money, but to provide a permanent, legitimate basis of encouragement to the motor-vehicle industry in Germany, and to automobilism as an adjunct of sport, business, and recreation. The managers of this enterprise realize fully that German manufacturers are as yet in some important respects behind those of France and the United States; they appreciate the advantages that will result from bringing the leading motor vehicles of all countries into practical, side-by-side competition, and they therefore offer to foreigners and their machines precisely the same privileges and conditions that are vouchsafed to those of their own country.

The association is a limited stock company, entitled "Die Automobil Ausstellung," with offices at No. 6 Dorotheen Strasse, and exhibition grounds and driving school on Georgen Strasse, Berlin. The space for permanent exhibits includes 1,200 square meters (12,902 square feet), with offices, restaurant, and all the features of a well-arranged exposition. Floor space will be rented to exhibitors at a uniform half-yearly rate of 200 marks (\$47.60) per square meter, with 60 marks (\$14.28) per meter for wall space to be used for advertising purposes. This will be the only expense involved, no commission or other charge being made for vehicles sold when on exhibition or from samples there displayed. The space rates above stated will be

reduced proportionately when the term exceeds six months. Vehicles and other articles on exhibition will be guarded by agents of the company, which will, when requested, effect fire insurance on exhibits at the expense of the owner.

It should be understood that the association is not commercial, and can not accept the business of selling, on commission or otherwise, the motor carriages or materials exhibited by any manufacturer, native or alien, but it will, when requested, recommend to foreign makers firms or individuals of good standing as agents in Germany, and its recommendation in this respect will be a high testimonial to the character and responsibility of the party recommended.

An illustrated catalogue of all exhibits will be issued and corrected from time to time so as to include new articles received for display. The public will be admitted gratis to all parts of the exhibition, which will thus become a permanent, open, international business display of motor vehicles and parts and materials pertaining thereto, classified as follows: (*a*) Motor cars of every description for conveying passengers. (*b*) Motor vehicles for the transport of goods. (*c*) Motor cycles and tenders for use with the same. (*d*) Accessories for motor-driven vehicles, fittings, tools, etc. (*e*) Books on the subject, drawings, models, etc. (*f*) Articles connected with the manufacturing, etc., of motor cars, etc.

That this permanent exhibition will meet an obvious want and exert an important influence in the development of automobilism in Germany is beyond any reasonable doubt. There are to-day in Berlin and its outlying suburbs scores of persons—physicians, lawyers, and other professional and business men—who are ready and anxious to purchase an automobile, but not being mechanics or thoroughly informed on the subject, they distrust their own judgment and hesitate to buy lest they may find with experience that they have chosen unwisely and paid a high price for an inferior machine.

The permanent exhibition will give intending purchasers an opportunity to examine and compare side by side motor vehicles of all classes and nationalities, propelled by steam, hydrocarbon, and electrical motors, to see them tested in competition with each other, and when a machine is chosen the buyer will be taught by an expert to understand and manage it. Numerous applications for space have already been received from French and Belgian makers, so that the exhibition will assume from the first an international character.

DUTY ON AUTOMOBILES.

For the information of American manufacturers who may wish to avail themselves of this opportunity, it may be stated that thus far motor vehicles are classified under the German tariff law as machinery

and bear an import duty of 10 marks (\$2.38) per 100 kilograms, or \$23.80 per metric ton of 2,204 pounds.¹ This rate is likely to remain unchanged until the new German tariff now under discussion shall take effect in January, 1903, at which time it is probable that the duty on most manufactured articles will be raised more or less above the present rates.

It is highly desirable that the publishers of all American periodicals devoted to automobilism should, in the interest of their advertisers and the general cause, send their publications regularly to the reading rooms which will form an attractive feature of this exposition. Automobilism in Germany is in much the same stage of development as the manufacture and use of bicycles in 1894-95. The American bicycle came and not only set new and higher standards of construction, finish, and general excellence, but secured a place in the German market which it holds to-day. Will our makers of motor carriages, who have entered upon the new industry with such valiant spirit, be equally enterprising and achieve an equally creditable and profitable result?

FRANK H. MASON,
Consul-General.

BERLIN, *April 30, 1900.*

¹ According to the German tariff, the following duties are charged on machines and carriages entering the Empire, per 220.46 pounds:

Machines:

- | | |
|--|---------|
| 1. Locomotives and portable engines | \$1.904 |
| 2. Other machines, according to the preponderating material: | |
| α. Of wood | .714 |
| β. Of cast iron | .714 |
| γ. Of wrought iron | 1.19 |
| δ. Of other common metals | 1.904 |

Tare to No. 15 b 2 δ: B. and C. 13; Bs. 6; Bl. 4.

Note to b 1 and 2: Marine engines and boilers..... Free.

Note to b 2 β and γ (applicable to treaty countries):
Machinery for flour mills, electric machinery, cotton-spinning machinery, weaving machinery, steam engines, steam boilers, machinery for the manufacture of wood and paper pulp, machine tools, turbines, gearing, machines for working wool, pumps, ventilators, blowing machines, sets of rollers, steam hammers, shears and punches, cranes, hoisting machinery. When any of the above-mentioned machines, chiefly composed of cast or wrought iron, are imported in detached parts from a treaty country, all the detached parts being cleared at the same time, such parts shall be dutiable according to the preponderating material of the complete machine.

Carriages and sleighs:

- | | |
|---|-----------------|
| 1. Railway carriages— | |
| α. Neither upholstered nor with leather work.....ad valorem.. | 6 p. c. |
| β. Other | do.... 10 p. c. |
| 2. Other carriages and sleighs, upholstered or lined with leather..each.. | 35.70 |

AIX LA CHAPELLE.

There are no manufactories of any importance in this city; the largest, which has a reputation for fine carriages, employs less than twenty men. This city has a number of carriage and wagon shops, each containing three to five mechanics. The prices charged, upon order, average 2,000 marks (\$476) for landaus, cabriolets, barouches, and very finest four wheel, leather top, upholstered in best cloth. In fact, I am surprised at the low cost of vehicles. Shops work on orders.

Historically, I feel quite safe in saying that the four-wheeled landau and the two-wheeled cart, for draying purposes, have been the regulation vehicles for the last hundred years. The character of this city seems to call for just such vehicles. They are very heavy; the carts weigh from 1 to 1½ tons and one horse pulls from 2 to 3 tons.

Automobiles are getting to be very plentiful on the streets; they are manufactured in Germany and France. This city has now in corporation two or three automobile manufactories, but at present there is but one in operation, Cudell & Co., who placed over \$100,000 worth of American machinery in action about two years ago. They only make what is called a tricycle, a French patent. The company is now undergoing some sort of a transformation, and hence brief mention is sufficient at present.

FRANK M. BRUNDAGE, *Consul*.

AIX LA CHAPELLE, *March 22, 1900.*

COBURG.

There is only one factory of vehicles of any importance in this consular district, that of Mr. N. Trutz, Coburg.

Mr. Trutz is a thorough expert at his trade. He had for a number of years a factory at Paris. On being expelled from France in 1870, at the outbreak of the Franco-Prussian war, he established himself at Coburg, bringing a few of his best workmen with him from France. He started business on a small scale, having only about 10 assistants. His business has become of considerable importance during the last thirty years, he employing now from 50 to 60 skillful hands, of which the best are receiving wages of from 150 to 200 marks (\$35.70 to \$47.60) a month.

He manufactures vehicles of all styles used in Germany and usually keeps a pretty large stock on hand, including landaus, chaises, omnibuses, and sporting wagons and wagonettes of every sort and description. In the spring and autumn, at the change of seasons, his stock is often completely exhausted. His goods are well known as being first-class; very durable and of elegant style and finish.

The yearly output amounts to about 300 vehicles, ranging in price from 1,000 to 3,000 marks (\$238 to \$714).

There are no automobile cars either running or manufactured in this district, and on account of the country being very hilly and the roads in a rather bad state it is very unlikely that the automobile will ever become of importance here.

OLIVER J. D. HUGHES, *Consul*.

COBURG, *March 19, 1900.*

DRESDEN.

VEHICLE INDUSTRY.

There are but two manufacturers of carriages within the limits of this consular district that are of any importance, and but two that have facilities for completing a vehicle, the rest being small jobbing concerns, each making a specialty of the woodwork, the ironwork, the upholstering, or the painting of wagons and carriages.

The concerns referred to keep a limited stock on hand—say, 10 to 12 carriages—not exceeding in value 40,000 to 60,000 marks (\$9,520 to \$14,280), and for their trade depend mainly on orders.

The two leading manufacturers are Dresdner Luxuswagen-Fabrik Robert Lieber, Dresden N., Königsbrücker-Strasse 56, and Heinrich Gläser, Dresden A., Rampische Strasse 6, who practically supply the demand, the latter being the concern patronized by the Royal Saxon Court. These two firms have a capital scarcely exceeding \$100,000 each and have good reputations for doing excellent work.

A 2-horse landauer, upholstered and painted in good style, accommodating 4 people, would cost from 1,800 to 2,800 marks (\$424.40 to \$662.40), a victoria would cost from 1,200 to 1,400 marks (\$285.60 to \$333.20), a cab (3 and 4 persons) would cost from 1,000 to 1,100 marks (\$238 to \$261.80), a buggy ("American") would cost 800 marks (\$190.40). Rubber tires cost 500 to 600 marks (\$119 to \$142.80) extra (set for 4 wheels).

WAGES.

Woodworkers are paid from 28 to 38 marks (\$6.66 to \$9.04) per week, saddlers and upholsterers from 20 to 24 marks (\$4.76 to 5.71) per week, blacksmiths about 25 marks (\$5.95) per week, painters about 20 to 25 marks (\$4.76 to \$5.95) per week—twelve hours of labor per day.

The usual time required to complete one carriage is about seven weeks; three carriages can be completed in two months, and six in three months.

The wood used is mainly oak, beech, maple, and hickory.

DRESDEN VEHICLE REGULATIONS.

The city regulations governing the width of tire and the gauge of vehicles, which must be strictly observed by the carriage builders, are as follows:

Carriages and light vehicles of all kinds must have a width of tire of at least $2\frac{1}{2}$ inches. Teams for heavy loads, such as brick, coal, earth, stone, etc., must have a width of tire of at least 4 inches. All vehicles must have a flat and not rounded surface of tire. Wagons or vehicles with nails or other fastening parts protruding from their tires are prohibited.

The greatest pressure of the wheel on the road or street must not exceed 2,500 kilos (about 5,100 pounds) in summer and 3,000 kilos (6,614 pounds) in winter, excepting loads that can not be divided, such as steam boilers, trunks of trees, etc.

The gauge must not exceed 1.38 meters (4.43 feet) and the gauge of the front wheels must be the same as that of the hind wheels. The average gauge of a "landauer" is from 1.34 to 1.38 meters (4.35 to 4.43 feet) and that of a cab 1.25 meters (4 feet).

Very few, if any, American-built carriages are used in Dresden, but I should think vehicles made in accordance with the legal restrictions would meet with favor.

AUTOMOBILES.

The original invention of the automobile or motor vehicle is claimed for Germany by the firm of Carl Benz & Co., Rheinische Gasmotorenfabrik Aktiengesellschaft, in the city of Mannheim.

The first experiments were made by this firm in 1884-85, and in the latter year the first vehicle propelled by a benzine motor was placed on the market, and created a general sensation at the industrial mechanical exposition of 1888 in Munich. The first patent on motor vehicles was granted this firm on January 29, 1886.

The industry has since then made rapid progress, and while a number of other firms have placed vehicles of similar construction on the market, the "Benz" motor carriage has always taken the lead and is preferred to all the other systems.

Up to October 1, 1899, the Benz company built 2,000 motor vehicles, which are in use in many foreign countries, as well as in Germany.

The Benz carriage runs well on all roads, even when frozen or covered with snow, and can attain a speed of 30 kilometers (18.64 miles) per hour on a level. It mounts grades up to 18 per cent, which means on 6 yards of road 1 yard ascent. One supply of benzine will do for 50 to 80 miles of running distance.

Other automobile manufacturers of importance in Germany are: Daimler & Co., in Cannstatt, Wurttemberg Dürkopp & Co.; Cycle

Works, at Bielefeld; Adam Opel, Rüsselsheim am Rhein, and Gudell & Co., Aix-la-Chapelle (motor tricycles).

In this consular district there are practically no manufacturers of automobiles. Two firms have been experimenting for some time with a view of solving the problem of inventing an automobile propelled by electricity, and the Sächsische Akkumulatoren-Werke, Aktiengesellschaft, in Dresden, have just completed a motor wagon for heavy loads, propelled by electricity, with electric steering gear and electric brake; it has many new improvements, the propeller being located over and driving the front wheels. The storage battery is in the bottom of the wagon, and one charge will run it about 60 miles. The electric steering gear is so constructed that it will turn the carriage in a circle on its hind wheels without describing the least radius—an advantage which the inventor claims no other automobile can offer.

The other concern in Dresden that has taken up the automobile is the Gasmotoren-Fabrik Moritz Hille, Dresden-Löbtau. So far, this concern has only been experimenting and has not yet placed a vehicle on the market. It sent a pretty fair exhibit to the German automobile exposition, held in Berlin, in the fall of 1899.

There are only six or seven automobiles of different types, mainly Benz motors, running in Dresden, averaging in price about 4,000 marks (\$952) each.

That the automobile is not very popular in this part of Germany (I understand it has gained a better foothold in Berlin) is certainly evident from the small number in use in this city, and I learn from the largest dealer in bicycles, tricycles, etc., that he made every effort—by exhibit, advertising, or otherwise—to bring the automobile to the attention of the people, but without apparent success. He says, and this is also the general opinion, that the automobile has without a doubt a good future, but that there would be little chance for an increase of sales until certain defects have been remedied and an automobile offered which does not continually get out of order—as is more or less the case with vehicles propelled with benzine. He thinks that as soon as a satisfactory automobile propelled by electricity is produced, that can run about 50 miles with one charge, success would be insured.

Motor tricycles are even less in favor than the automobiles, and the only manufacturers who have had a fairly good sale are Messrs. Dion & Bouton, in Paris, whose motor cycles are considered the best yet invented. The motor tricycle will hardly have any practical value and will remain a sporting vehicle, because it does not run smoothly enough and because it can not be used for moving or pulling loads, as it is too weak to mount grades. Gardell & Co., in Aix-la-Chapelle, are considered the best manufacturers of motor tricycles in Germany.

CHAS. L. COLE,

Consul-General.

DRESDEN, *April 11, 1900.*

FRANKFORT-ON-THE-MAIN.

VEHICLE INDUSTRY.

Vehicles are manufactured in the Frankfort consular district by a number of small concerns. Two only, one in the city of Frankfort and one at Offenbach, are of importance.

I have been trying in every way to obtain from these two latter firms the information asked for, but in spite of promises to do so they have not furnished it.

The reason for this unwillingness of German manufacturers and business men to furnish data to United States consuls is due to the fact that leading commercial and other newspapers are continually cautioning German manufacturers against giving information to Americans.

The German Museum of Commerce, a bimonthly journal published at Berlin, in its number of May 1, 1900, contains a long article under the caption of "American consuls," in which they—the consuls—are accused of using every device to injure the German manufacturer; and calls upon the German authorities, as well as upon Germans generally, to be most reticent in their intercourse with American consuls, so that they will not be enabled to injure German national and local interests.

I can not find any indication of American competition in vehicles except in those used by railways. Germany, last year, imported from the United States 152 of these.

Under the heading "Wagons and sleighs," I find that Germany in 1899 imported from Belgium 21; France, 91; Austria-Hungary, 85; no other countries mentioned.

The different commercial reports for the year 1899 speak of the business of manufacturing vehicles as having been good, owing to the general revival of business and prosperity, so that every branch of the industry was fully employed. For vehicles de luxe, especially, the demand was strong. It is also stated that foreign orders which formerly went to France were filled in Germany, and that it is the endeavor of German manufacturers to equal those of France with reference to tasty workmanship. Vehicles for transportation have been exported to the German colonies in Africa as well as to Russia, Holland, and Switzerland.

As the import duty on finished wagons and sleighs, irrespective of value, is \$35.70 each, it would not be an easy task, in my opinion, to successfully compete with at least the cheaper grades of ordinary vehicles in this market. The prices at which carriages, such as landaus, barouches, etc., are sold in Germany seem cheap from an American standpoint.

AUTOMOBILES.

Judging from the constantly growing automobile industry in Germany within the last few years, it must be admitted that automobiles are gaining in favor. There are quite a number in use in this city, mostly tricycles for one, two, or more persons. The motive power is either electricity or benzine; but owing to the heavy weight of the accumulators electric motors are only feasible on very good roads, and as this motor is dependent on charging stations, the benzine-driven automobile has the preference, although the mechanism of the former is more simple and there is no noise nor offensive odor. The use of compressed and liquid air as the motive power, or of a combination of benzine or electricity with steam, has not met with favor. The battle for supremacy seems to be between electricity and benzine. American manufacturers of first-class automobiles should have good chances in this country.

No automobiles are manufactured in this consular district.

RICHARD GUENTHER,
Consul-General.

FRANKFORT-ON-THE-MAIN, *May 4, 1900.*

KEHL.

AUTOMOBILES.

The only firm in this district that I can learn of as doing a business of any importance is De Dietrich & Cie, of Niederbronn, who have lately undertaken the manufacture of automobiles, in addition to their other work, under the patents of Amédée Bolleé, and are making quite a large variety of automobiles. I understand they have now all the work on hand that they can attend to. What their output is, however, I am unable to say.

AMERICAN VEHICLES.

As to the competition of American wagons, I doubt greatly if one is to be found in Alsace-Lorraine. There are, however, I understand, a few in use in Baden-Baden.

A. WOOD, *Consul.*

KEHL, *May 17, 1900.*

MAINZ.

GERMAN VS. AMERICAN VEHICLES.

All vehicles manufactured in Germany are much heavier and clumsier looking than American vehicles, owing to the fact that hickory does not grow in the country. German manufacturers are, therefore,

obliged to use, in the construction of their carriages and wagons, wood which has not nearly the strength of hickory, and must be much thicker, especially for wheels.

The type of vehicle known as buggy in the United States I have never yet seen in this country, and in and about Mainz it is entirely unknown. One of our light piano-box buggies would cause a sensation in this city; people would expect to see it break down at any moment. The broughams and carriages look respectable, but still can not compare with American carriages of like type. The victorias are rather old fashioned, and remind one of the victorias used in the United States twenty to twenty-five years ago.

TRUCKS AND CARTS.

The trucks used in this part of Germany are entirely different from those used in the United States. The body of the truck is very low, quite long, and longitudinally level, whereas the cross section is curved, which causes all articles thereon to slide or roll toward the middle, and prevents the goods from falling off; this is necessary, as there are no sides to the truck.

The four wheels are almost of equal size, and are entirely beneath the body of the truck. There is no driver's seat, the driver either walking along the side of the truck or sitting on the side of the platform with his feet dangling over. Every truck, carriage, and cart is supplied with brakes. The two-wheeled dirt carts are also very clumsy affairs.

American competition is wholly unknown in these parts, and I think there is an excellent opening for an enterprising American firm who will take the trouble to send a representative over here to study carefully the conditions and requirements.

The import duty on wagons in the rough, not painted, varnished, or upholstered is 3 marks per 100 kilograms (71.4 cents per 220.46 pounds); on wagons painted or varnished, but not upholstered, 10 marks per 100 kilograms (\$2.38). The duty on iron or steel axles is charged separately, and amounts to 10 marks per 100 kilograms. The import duty on finished upholstered carriages is 150 marks (\$35.70) each, irrespective of value.

AUTOMOBILES.

In this part of the country the automobile is not gaining favor very rapidly. There are only two or three machines of this type in Mainz. The board of aldermen of this city recently refused to grant permission to a large company to run automobile cabs and carriages as public conveyances in this city.

WALTER SCHUMANN, *Consul.*

MAINZ, *March 27, 1900.*

MANNHEIM.

CARRIAGES.

The few carriages in use here are clumsy affairs as compared with modern American carriages. Single buggies, phaetons, surreys, fancy traps, etc., are not in use. An occasional two-wheel conveyance of American or English design is seen here, but it generally belongs to a temporary resident. The number of modern carriages of the brougham and Berlin coach type in use here is very small. There is no factory in this district devoted to the manufacture of what may be regarded as modern carriages, chiefly because there seems to be small demand for them in this locality.

As is well known, hitching posts are not permitted in German cities and all carriages must provide for a driver. He is generally provided with a seat in the front part of the carriage, though occasionally the seat is in the rear. Physicians in Mannheim use a carriage the rear part of which is much like an American round-top phaeton, with seat in front for driver.

While German public roads are ideal for driving, it can not be said that the German in this locality cares for driving or that he is a horseman. One very rarely sees a carriage of any kind in the country, and as the cities are compactly built and suburban residences scarcely known, the keeping of driving horses is much less common than in the United States. Many American villages of 2,000 or 3,000 people have more good driving horses and carriages than this city of 150,000 people.

The German here is quite content as a rule to go to a funeral, or to the theater, or the annual races with his family, in a heavy cab hired for the occasion and drawn by one horse of poor quality. He is not a horseman in any sense, and until he radically changes in this regard modern pleasure carriages will not be in demand in this consular district. It is safe to say that any vehicle designed for this market would have to be built with special reference to strength and durability. It is no commendation to the German that a tool or a carriage is low priced, if it will not last well.

WAGONS.

The wagon industry in this district is backward. Many of the delivery wagons are handsome and well finished. The wagons used for hauling purposes are generally heavy and clumsy looking. The trim two-horse farm wagon of the United States is unknown here. The wagons in use by the peasants are of the simplest type, clumsy, and heavy in construction, and by careful use and housing do service for two or three generations. A tongue or pole, and not shafts, is generally used in wagons drawn by one horse.

HANDCARTS.

Hundreds of handcarts are used in this, as in other German cities. These are generally heavier than the American handcart, the wheels and axles being much like those of our two-horse wagons in the United States. These and heavy hand wagons are much used in delivering goods from stores, by mechanics in moving building materials, by milkmen, etc. Deliveries of meats are made from the city slaughterhouse on carts, not infrequently the carcasses of two heaves being hauled on one cart by men assisted by dogs.

BICYCLES.

The bicycle industry in this consular district is very large, being represented by six or seven factories of varying output and by several agencies of wheels manufactured elsewhere.

The Lozier Manufacturing Company is the only American company which can be said to be pushing our bicycles in this consular district. Their wheels are on sale in the district, and they have a catalogue and other matter handsomely printed in German.

The prices paid for the German wheel here are much higher than for wheels of the same grade in the United States. The better wheels retail here at from 250 marks (\$59.50) up to 400 marks (\$95.20). It is doubtful whether these wheels are as good as the wheels retailing at from \$40 to \$60 in the United States. They are at least a fifth heavier and are not so handsome or well finished. One only of the local factories uses wooden rims. It is claimed here that wooden rims have shown a tendency to warp and twist out of shape, and they are not in favor in the factories. I am of the opinion that our manufacturers of wooden rims might secure business here by judicious methods and by proper guaranties of their wares. Bicycles are much in use throughout this district. Nearly 10,500 are licensed in the city of Mannheim alone.

Three-wheeled machines are widely used by bakers and other merchants in delivering their wares, and, to some extent, by the post-office department in collecting mails from the city boxes.

AUTOMOBILES.

The automobile industry in this consular district is an important one. Many automobiles are in use in Mannheim. A paper called the "Automobilist," devoted wholly to automobile matters, is issued weekly here, in connection with the "Radtourist," devoted to bicycle matters. An automobile club, known as the "Rheinischer Automobile Club of Mannheim," has a large membership, and by races and other means keeps up an interest in the machine. On May 13 of this year, automobile races over a route 170 kilometers (104 miles), starting from Mannheim, were participated in by twenty-four different riders with machines from the various factories of southern Germany. On

the day preceding the races an exhibition of automobiles and automobile appliances was given in this city and visited by many people.

The principal automobile factory in this district is that of Benz & Co., of Mannheim, who employ 800 men and have a capacity of three finished automobiles per day. They are just now making extensive additions to their plant.

The Benz company use only hydrocarbon (gasoline and benzine) motors on their carriages. They claim to be the pioneers in building this form of carriage, and exhibit at their factory what they term the "first spirit-motor carriage in the world," patented in Germany under date of January 29, 1886. This carriage, with five handsomely finished carriages of their late models, form the company's exhibit at the Paris Exposition. The company exhibited at Chicago in 1893, and have taken an active part in the continental expositions, including the exhibit in Berlin in September, 1899, and in the races which formed a part of that exhibit.

In the Mannheim races of May, above referred to, the company had carriages in three of the four classes competing, and received first prize in each class.

Mr. Charles Benz, the inventor and patentee of the first spirit-motor carriage, is at the head of the mechanical department of the present company. He and his associates claim that their machines excel in simplicity of construction, in speed, in durability, and ease of management. They are adapted for the use of gasoline or benzine.

The cost of running the lighter vehicles over average roads is about one-half cent per mile. The ordinary carriage is equipped for a distance of from 50 to 80 miles without additional fuel. The company devotes itself especially to the building of general-purpose carriages for from two to six persons and of from 3 to 8 horsepower. Their later carriages are fitted with rubber tires, either solid or pneumatic, and have every appearance of excellence of finish. About 2,500 of their carriages have been sold. The market is principally in Germany, although their machines have been exported to some extent. A small number have gone to the United States. The machines retail at from \$600 upward.

A new factory for the manufacture of automobiles has recently been started at Ludwigshafen and is said to be backed with abundant capital. The concern employs about 75 men and is only fairly started. The machine shop is in a high, well-ventilated building, and is equipped for the most part with American machinery. This factory will build hydrocarbon-motor machines. Only a few machines have been completed.

The Kayser Bicycle Company, a large concern at Kaiserslautern, in this consular district, has begun the building of motor tricycles

designed for one or two persons only. The business is an experiment, with uncertain promise of success.

CAPITAL INVESTED.

It is impossible to obtain much information as to the capital invested in the vehicle industry in this district. There are no factories building wagons or carriages on an extensive scale. If there were they would be slow about giving information on this point. Benz & Co. is a corporation capitalized at 3,000,000 marks, or approximately \$750,000. The Luxische Industrierwerke, of Ludwigshafen, is a corporation the amount of whose capital I am not able to state.

WORKMEN AND WAGES.

It is difficult to give definite information on this topic. German machinists and other mechanics are not as a rule as skillful and fine in their workmanship as American workmen in the same line. They do not have as good tools to work with and they do not work with the precision and accuracy that is considered essential in the United States. A gentleman just now putting in place a large amount of machinery from the United States in a factory in this district, tells me that it is almost impossible to get local mechanics who will compare with ours in the handling and adjustment of machinery. He says they are much slower and have much less regard for accuracy and precision than our own workmen. The wages paid are much lower than in the United States, though how much less or what the average wages paid machinists and other skilled mechanics is I am unable to learn.

OUTLOOK FOR AMERICAN VEHICLES

It is doubtful whether our carriage manufacturers will find this locality a market for the light vehicles so common in the United States. If the manufacturer would get a footing here, it must be with wagons and carriages that conform to the German idea of durability and, in the case of carriages, that provide for a driver's seat. The German here, however well to do he may be, is not a horseman and cares nothing about holding the lines.

The automobile industry in Germany is comparatively new, as it is in the United States. The German inventor and manufacturer has taken hold of the business with a splendid show of enthusiasm. Large factories are springing up all over the Empire. Several papers are devoted to the subject. At least one quite large book on the subject has been on the market for several months. Automobile races, automobile exhibits, and automobile clubs are attracting much attention throughout the Empire, and it will be strange if the German automobile does not enter the field as a vigorous competitor.

H. W. HARRIS, *Consul.*

MANNHEIM, *July 4, 1900.*

NUREMBERG.

Nearly all the carriages seen here are manufactured in other German cities, like Stuttgart, Coburg, and Frankfort-on-the-Main. The few vehicles built here are chiefly of the heavier kind for local trade and some mail carts for the royal post-office.

As to the automobile industry, I would say that some of the cycle factories in and around Nuremberg have taken up the making of automobiles, but so far have produced nothing but samples. The few automobiles seen here, about six, are either from Benz, in Mannheim, or Daimler, in Stuttgart.

GUSTAV C. E. WEBER, *Consul*.

NUREMBERG, *March 23, 1900.*

WEIMAR.

There are three cities in the Weimar consular district where the vehicle industry is at present carried on, i. e., Weimar, Gotha, and Eisenach. In the two former cities this industry consists of the manufacture of railway passenger and freight cars, and in the latter city of automobiles.

Only the Weimar Waggon-Fabrik would consent to furnish this consulate with statistics as to the output, etc. This company manufactures 250 railway passenger and freight cars per annum. The capital is not stated.

The number of employees is between 360 and 400 men, who earn about \$83,000 per annum.

The names and addresses of the vehicle manufacturers in the Weimar consular district are: Waggon-Fabrik, A. G., at Weimar; Waggon-Fabrik, Gotha, and Fahrzeugfabrik, Eisenach.

In regard to the historical aspect of this subject, there is nothing to be said, these factories having only been established within the last few years.

The automobile is not yet much in use in this district. There are none in the city of Weimar. No American automobile is in use in this section, so far as careful inquiry reveals.

THOS. EWING MOORE, *Consul*.

WEIMAR, *April 11, 1900.*

CARRIAGE AND WAGON WHEELS IN GERMANY.¹

The demand of Germany on the United States for the material of which wagon wheels are made is yet comparatively small in proportion to the material used by the home wagon makers, and is confined

¹ Republished from *Consular Reports for May, 1898, No. 212.*

mostly to hickory spokes, moderate quantities of rock-elm hubs, and some wood for fellies, as well as some bent fellies. All these articles come into the country at the nominal import tariff of 30 pfennigs (7½ cents) for 100 kilograms (220.46 pounds), which rate pays but little, if any, more than the handling through the custom-house, it being one of the policies of the Government to admit any raw or crudely manufactured material used in German manufactures either free or at as low a tariff as can possibly be afforded. It is quite impossible to ascertain, even approximately, the amount of imports of these articles, either in general or from the United States, separately, because in the records they are classed with other wooden ware coming from turning shops and with the crude, which pay the same tariff rate. It is safe to say, however, that the imports are mostly from the United States. Of home woods and those brought from neighboring countries, German oak, elm, ash, and locust are mostly used, oak having the preference for heavy trucks and wagons.

In the manufacture of wagons or other vehicles for export Germany takes no prominent place, supplying some of the neighboring countries only to a moderate extent. Having the most excellent forestry laws, the supply of home woods of the more valuable class is kept up to the extent possible in a country so thickly populated; so it seems likely that the imports of wagon material will not vary much from year to year, and that the demand for hickory spokes will be entirely filled from the United States. There have been dealings by the larger traders and manufacturers with that country for years.

In ready-made wheels, on which, unpainted, the import tariff is 3 marks (72 cents) per 100 kilograms, the trade thus far is exceedingly light. Here a peculiar spirit opposes innovations. It may be called the spirit of guild (*Zunftwesen*), not known exactly in that way in the United States, yet resembling the different mechanics' labor unions. These guilds have an excessively conservative influence in the management of all affairs pertaining to industries, and are jealously watching to keep the balance of power in their favor.

Thus, the blacksmith union opposes as much as possible, by all legitimate means, the introduction of such wheels as the "Warner" and the "Star," and so far the wood-hub wheel appears to be the one legitimately trusted in Germany.

Some few bolder dealers and manufacturers, who are willing to take the chance of a possible silent boycotting by the wagon makers, are beginning to experiment with importing these wheels, some of which have become known here by whole carriages having been imported. The naïve objection to them by the blacksmiths is that "they hardly ever need repairs."

Should these wheels assert their superiority in the long run, as they already have in England, the demand for them will come. So far, however, the wood-hub wheel is the wheel in Germany.

As to selling or disposing of wheels or wheel material here, it should be remembered that Berlin is becoming every year more and more the manufacturing, mercantile, and distributing center of Germany, and that if any American exporter wants to do a safe and paying business in Germany a simple agency in Hamburg will not do it. A good, bright man, thoroughly familiar with the article which is to be sold and the handling of it, understanding the German language—unless he can bear the expense of a good interpreter—should come to Berlin and sell the goods himself; or, what is still better, establish a branch house here.

Whether the trade in wagon wheels and the material used for them can be made large enough to pay for such a branch house I can not with safety assert; but I believe that such a house would not only get the trade for the manufacturer establishing it, but would also, by the facility of seeing exactly what is wanted here, create new business for his American factory.

Berlin manufacturers and dealers, I understand, are supplied with American wagon-makers' material by factories located in New Jersey, Indiana, Pennsylvania, and by one large concern in Buffalo, which shows that they are quite familiar with American goods in this line.

JULIUS GOLDSCHMIDT,
Consul-General.

BERLIN, *October 23, 1897.*

GREECE.

VEHICLE INDUSTRY.

In the beginning of this century, Greece had but very few manufactories in existence, and there was not a vehicle manufactory within its boundaries. In 1850 Greece had enjoyed her new-born freedom nearly a score of years, and many of her long-slumbering industries were awakening and commencing new life, among which was the manufacture of vehicles. A number of small establishments were annually turning out a few of the rough, strong, and heavy two-wheeled carts used by the peasants, but it was more than a decade later that a first attempt was made to manufacture carriages and other nicely finished four-wheeled vehicles.

In 1861, the first carriage manufactory known in modern Greece was established in Athens by the Rossi Brothers, by whom it is still conducted, who have made it a successful enterprise that is a credit to themselves and the city. From that date to this, the manufacture of fine carriages and a variety of other well-finished vehicles has been

a fixed industry in Athens, and it has steadily increased in importance until it has grown to be one of the leading industries of the city. But outside of Athens there are no carriage manufactories in the Kingdom, and only small establishments in a few of the leading towns which make and repair the common heavy carts.

The Rossi Brothers, besides being the pioneers in the carriage-manufacturing industry, are still the leading firm in that line in the Kingdom, both as regards the extent of the plant, the number of employees, and the annual output of first-class carriages. They employ 50 to 60 hands and manufacture 25 to 30 vehicles, nearly all finely finished carriages, annually.

The manufactory of Lorenzo Manos occupies second place as regards size of plant, number of employees, and annual output, and third as to date of establishment. His plant was established in 1874, employs 35 to 40 hands, and manufactures 40 to 50 vehicles of various styles yearly, mostly of the well-finished light omnibus, delivery wagon, and "susta" patterns. A "susta" is a light but strong two-wheeled vehicle on springs, sometimes fitted with a top, and is used by peasants and country merchants for carrying passengers, produce, and goods to and from the larger towns and cities.

The third in size of the vehicle manufactories of Athens is owned and operated by Sebastore Versace. It was established in 1870, employs 25 to 30 hands, and its annual output is 20 to 30 vehicles, mostly of the surrey, light omnibus, and "susta" patterns.

Besides the three firms above named, there are a number of smaller establishments in Athens for the manufacture of vehicles, among whom we may name Michael Scordara, Manouil Pedoura, Pietro Metztes, and David Augustine.

The leading firms are prepared to manufacture almost any style of well-finished carriage to order, but they seldom keep any finished carriages in stock. While the carriages built in Athens have not as fine a finish as those manufactured in the United States, they show skillful and creditable workmanship.

WAGES.

The employees of the vehicle manufactories of Greece are not, as a rule, very skillful workmen, but many of them become very skillful experts in their trade. Their wages range from 3 to 10 drachmas¹ (36 cents to \$1.20) per day.

¹The consul estimates the drachma at 12 cents.

VEHICLES MANUFACTURED.

The following is a list of the vehicles manufactured in Greece, with their prices expressed in paper drachmas, \$1 equaling 8.30 drachmas at the present rate of exchange:

Description.	Prices.	
	Drachmas.	United States equivalent.
Coupe de Gala	12,000-14,000	\$1,440-1,680
Berlin de Gala	15,000-20,000	1,800-2,400
Coupes	4,000-5,100	480-612
Vis-a-vis	2,500-4,000	300-480
Landaus	5,000-6,800	600-816
Omnibuses	2,500-3,300	300-396
Cabs	3,000-4,000	360-480
Dorsays	5,000-6,000	600-720
Victorias	3,500-5,300	420-636
Tilburys	1,200-1,500	144-180
Pony carts	1,200-1,500	144-180
Dog carts	1,500-2,000	180-240
Chariots	1,100-1,500	132-180
Phaetons	1,800-2,700	216-324
Wagonettes	1,800-2,300	216-276
Surreys	1,200-2,000	144-240
Traps	1,000-2,500	120-300
Sustas, with tops	750-1,200	90-144
Sustas, without tops	600-850	72-102
Heavy carts	450-700	54-84

There are no published statistics of this industry in Greece, and figures relating to it are more guesswork than anything else. The number of vehicles now manufactured annually in the Kingdom is estimated at from 60 to 100 first-class carriages, and from 180 to 300 sustas, strong surreys, wagonettes, light omnibuses, traps, etc., and a much larger number of common heavy carts. The amount of capital now invested in this industry in Greece is variously stated at from 1,700,000 to 2,500,000 drachmas (\$208,000 to \$300,000).

OPENING FOR AMERICAN MATERIALS.

The necessary materials for the manufacture of vehicles are not produced in Greece. Most of the iron and steel for this work comes from France and Germany, the greater portion of the wood from Austria, France, and Italy, and nearly all of the leather from France and England. The Greek manufacturers of vehicles are very anxious to procure their materials from the United States, believing that they can obtain materials of a better quality there, and, on certain conditions, as low in price as those they now use. The principal condition to insure low prices on the American materials is that a direct line or lines of steamships connecting Greece with ports in the United States be established, so as to save the expense of the middleman and transshipment.

The local prices for such materials are very high in most cases, and in some are seemingly exorbitant. If American exporters will see to it that a direct line of steamships is established between Greek and

United States ports, they will find a good market here for a great many American products, and it will then be a matter of but a few years' time until the United States supplies Greece with the larger part of its imports. The Greeks are beginning to understand that American machinery, tools, and various other products are far superior to those produced in Europe, and they are desirous of procuring them, if their cost delivered here is not too much in excess of European prices.

The machinery and tools used in the vehicle manufactories of Greece are nearly all imported from France, and it does not require the eye of an expert to see that they are inferior to those produced in the United States for such purposes, both as to make and finish, and the Greek manufacturers are becoming aware of this fact. As they take pride in turning out good work, the Greek vehicle makers desire to procure the best machinery and tools possible, and exporters of the United States should see to it that they are supplied.

TARIFF ON VEHICLES.

The vehicle manufactories of Greece are protected by a high tariff on all manufactured vehicles imported, which insures a steady and healthy growth of the industry in the Kingdom.

The duties on manufactured vehicles imported into the Kingdom, as given in the latest tariff publication¹ of the Greek Government, per 100 okes (284 pounds):

Description.	Duty.	
	Drachmas.	United States equivalent.
Two-wheeled carriages	132.25	25.57
Four-wheeled carriages	396.75	76.72
Handcarts and bicycles	13.28	2.55
Two-wheeled freight carts	26.45	5.11
Four-wheeled freight carts	52.90	10.21
Delivery wagons	39.68	7.66
Railway and tramway freight cars	(a)	(a)
Railway and tramway passenger cars	(a)	(a)
Handcarts for merchandise	(b)	(b)

a Ten per cent ad valorem.

b Twenty per cent ad valorem.

AUTOMOBILES.

No automobiles are manufactured in Greece, and thus far but two have been imported, both into Athens; but it is said that many Athenians wish to purchase such vehicles, and it is expected that quite a number will be imported in the near future.

DANIEL E. MCGINLEY, *Consul.*

ATHENS, *June 8, 1900.*

¹ According to the Greek tariff the duties are payable in metallic money; hence the reductions are made on a gold basis—19.3 cents per drachma.

ITALY.

VEHICLE INDUSTRY.

The vehicle industry is not anywhere in Italy of very great importance. A large number of vehicles of all categories are manufactured, more especially cheap one-horse carriages, for the public service in the cities.

There are many small factories scattered all over the country, employing, on an average, from 7 to 15 workmen.

Some of the principal works are devoted to the construction of railway and tram cars, the largest of which are located in Milan. The following are the provinces where the carriage industry has a certain local importance:

Alessandria.—Four small factories in the commune of Asti, employing 15 men in all, and one in the commune of Moncalvo, employing 7 workmen.

Ancona.—Eight small cart and carriage factories, with 33 workmen.

Aquila.—Four shops for the manufacture of vehicles of various sorts, one of which is especially devoted to the construction of carriages.

Ascoli Piceno.—Two factories, principally of carriages, one with 30 and the other with 27 workmen.

Avellino.—In the capital commune there are two shops, with 9 workmen.

Bari.—In the whole province there are 15 cart and carriage factories, with 44 workmen.

Belluno.—One carriage factory, with 8 workmen.

Bergamo.—This province possesses the most important factory of the kind founded at the beginning of the century; it employs 19 workmen. Eight other minor factories employ in all 52 workmen.

Bologna.—Ten carriage factories, situated in the capital city, the most important of which employs 36 men. In all the ten factories are employed 103 adults and 28 boys. Fourteen other small factories scattered over 9 communes of the province employ in all 41 workmen.

Brescia.—Fifteen factories and 125 workmen.

Caserta.—In 7 communes of the province they manufacture and repair carts, carriages, and vehicles in general for good roads; there are employed in this industry 92 workmen.

Catania.—Six carriage factories.

Catanzaro.—One factory of carts and carriages, employing 3 men.

Chieti.—One cart and two carriage factories, with 14 workmen in all.

Varese.—Four very important factories, of carts and carriages, with 145 men.

Lecco.—One carriage and four cart factories, with 16 workmen, and five minor ones, with 16 workmen in all.

Cosenza.—Three small factories for carts and other vehicles for the road, employing in all 6 workmen. Other three, with 7 men, at Corigliano Calabro, and one with 2 men in the commune of San Marco Argentano.

Cuneo.—One shop in Savigliano produces railway cars; besides there are 21 factories for the production of carts and carriages, with 105 workmen in all. Only two of these factories are furnished with hydraulic motors.

Cremona.—Three factories, with 29 workmen.

Ferrara.—Three shops, two in Ferrara and one in Cento turn out rough-finished carriages, employing 17 workmen.

Florence.—Twenty-nine factories, large and small, four of the most important of which make use of mechanical motors; all employ about 90 workmen; in the whole province there are engaged in this industry 263 men.

Forlì.—Seven carriage factories, with 26 men.

Lecce.—Eleven factories of carts, carriages, and other vehicles, with 43 workmen.

Mantova.—Two factories in the commune of Bozzolo, with 20 workmen, producing each year 75,000 lire (\$9,000) worth of carriages. They manufacture also vehicles of every sort, and they are highly esteemed for their double qualities of beauty and strength.

Milan.—Nine factories are engaged in the manufacture of bicycles, employing 60 men; further, there are nineteen factories with 300 workmen, seven in Milan and the rest in the province, for the manufacture of carriages.

Modena.—One carriage factory, steam motor, employing 11 workmen.

Naples.—Seventeen carriage factories are found in the capital commune; the most important factory employs 62 workmen and is operated by an engine of 4 horsepower. The rest are worked by hand and employ in all 175 workmen. In the commune of Ottaviano there are ten factories for carts and road vehicles, employing in all 48 men, and using hard wood, such as oak and mulberry, brought from the province of Avellino.

Castellammare.—In this commune there are five shops, with 26 workmen, making carriages from hard wood, such as walnut and poplar woods from the neighborhoods.

Padua.—One important factory for the manufacture of carriages and railway carts, employing 28 workmen; in other small works of the province there are employed 60 workmen.

Parma.—Three factories, employing in all 27 workmen; one of these is exclusively devoted to the manufacture of carriages and employs 13 men; one other, with 10 workmen, to the manufacture of carts.

Ravenna.—One factory for the manufacture of bicycles, and nine for the construction of carriages; four factories in Faenza, one in the city of Ravenna, and four in Bagnacavallo, employing in all 52 workmen.

Siena.—One carriage factory, with an annual output of 20 vehicles; seven other small cart factories at Rappolano, employing 9 workmen.

Treviso.—One important factory at the capital commune, and nine others in six communes of the province for the constructing and repairing of carts and other road vehicles, employing in all 63 workmen; at Rocande there is a shop for constructing and repairing bicycles with 8 workmen.

Udine.—One carriage factory at Palmanove, employing 11 workmen, and a number of others scattered about the province, employing some 150 men in all.

Verona.—Eight carriage and cart factories, employing in all 46 men.

Vicenza.—Some small factories, employing about 60 workmen in all.

In Rome there are about ten factories (one of which is more important than the balance put together), employing altogether some 200 men.

The leading manufacturers of carriages, vehicles, in Italy, are the following: Belli Cesare & Son, Varese; Francesco Belloni, Milano; Vincenzo Benvenuti, Sangiovanni A. Teduccio, Naples; Borelli & Schenome (bicycles), Turin; Bottazzi Raimondo, Rome; Ferretti Carlo, Rome; Ernesto Breda & Co. (rail and tram cars), Milan; Costruzioni meccaniche, Saronno, Milan; Cappelli & Ci., Brescia; Diatto Brothers, Turin; Eugenio Ferrari, Milan; Fusi & Co., Milan; Grandona Comi & Co., Milan; Macchi Brothers, at Varese; Miani Sivestri, Milan; Nardi, H., Bozzolo; Henry Orsaniga, Milan; Pavesi & Crispi, Milan; Pieresca Brothers, Treviso; Ponsini Leopoldo, Milan; Prinetti Stucchi & Co. (very important, moto-cars and bicycles); Cesare Sala, Milan; Societa Nazionale delle Officine di Savigliano, Torino; Riccardo Stipel & Waimann, Milan; Trinci and Figlio, at Pistoia.

EXPORTS.

The total exports of vehicles from Italy during the year 1897 amounted to about \$120,000, representing some 1,214 pieces, of which 1,036 were bicycles and the rest vehicles of various characters.

In 1898, the exports amounted to about \$170,000; in 1899, \$180,000. This last year shows a decrease of about \$40,000 in the exportation of bicycles, and an increase of about \$50,000 in the exports of other vehicles.

There are no statistics to be obtained as far back as the year 1800, but it can be safely said that the carriage industry has largely decreased in the last forty years, owing to the introduction of new means of transportation, such as railways, tramways, and especially the increasing use of bicycles.

WAGES.

Foremen receive from 6 to 7 lire (72 to 84 cents) per day; woodworkers from 2 to 4 lire (24 to 48 cents), according to their ability; ordinary workmen from 2.50 to 3 lire (30 to 36 cents); blacksmiths from 2.50 to 5 lire (30 to 60 cents); apprentices from 0.55 centimes to 1.50 lire (7 to 18 cents; painters from 2 to 3.50 lire (24 to 42 cents); upholsterers from 2 to 3.75 lire (24 to 45 cents); all per day. The foremen of each of these various departments receive on an average 1 lire (12 cents) more than the highest pay of the workmen. These prices are, as a rule, for ten hours day labor. The workmen are paid every week.

AUTOMOBILES.

The moto-car industry is still in its infancy. Two concerns of importance have started works in Milan, viz, Prinetti Stucchi, having a very large plant in connection with their carriage and bicycle works, and C. Bianchi. There is also one establishment for automobiles in Rome, but it is of recent creation and has not reached any importance. A certain number of automobiles of foreign make have been introduced into this country and have met with public favor, which should be encouraging for the future development of that industry in Italy.

HECTOR DE CASTRO, *Consul-General.*

ROME, *June 13, 1900.*

CARRIAGE AND WAGON WHEELS IN ITALY.¹

Owing to the fact that the Italian customs does not keep a separate entry for wagon and carriage wheels, they being classed with "wagons and vehicles with two or more wheels," it is impossible to gather any information from that quarter.

The imports into Italy in 1896 were: Wagons, \$7,500; bicycles, \$166,000, of which \$39,000 worth was from the United States; cabs and carriages, \$49,000, of which \$5,000 worth was from the United States.

Personal inquiries from carriage manufacturers have generally remained unanswered; but one manufacturer here in Rome, who is considered to be the best in Italy for high-grade vehicles, informs me that he imports all the wood, timber, and varnishes he requires for his trade from the United States; the springs, upholstering, and trimmings from France, and the iron and other material necessary for other parts of carriages from Sweden.

The ordinary carriage trade is very extensive in Italy, but nearly all the material used is of domestic production and manufacture.

HECTOR DE CASTRO, *Consul-General.*

ROME, *October 7, 1897.*

¹ Republished from Consular Reports for May, 1898, No. 212.

NETHERLANDS.

VEHICLE INDUSTRY.

Statistics regarding the industry do not exist in the Netherlands, nor are there any publications containing information on the subject. For estimates and general information I have applied to some 40 of the principal manufacturers and dealers in carriages, but the majority declined to furnish me with any particulars, while the data received from some hardly covered a part of the subject. By some manufacturers I was informed that the information wanted did not concern the American export trade. All this shows that parties interested in the vehicle industry seem to fear American competition to such an extent that they are afraid of divulging anything relative to the importance of the industry.

It will, under the circumstances, be understood that the information which follows here, and which was principally obtained from a gentleman who, though not interested in the industry, has dealings with vehicle manufacturers, is only based on estimates and personal observation, and may therefore not be entirely accurate.

The vehicle industry is of importance in Amsterdam and Haarlem, province of North Holland; in Utrecht, province of Utrecht; Groningen, province of Groningen; The Hague, province of South Holland, and S'Hertogenbosch and Dongen, province of North Brabant.

There are about 50 vehicle factories in the Netherlands. The total number of vehicles manufactured by them per annum is estimated to be from 3,000 to 4,000. This includes broughams, landaus, victorias, cabs, carts, berlines, tilburies, drays, wagons, and automobiles. About 300 carriages, of which 100 are fancy carriages, are manufactured per year. The capital invested in the industry is supposed to be about \$2,000,000.

WAGES.

I have not been able to obtain an estimate of the number of employees engaged in the vehicle industry. It is stated that in the various vehicle factories 1,500 men are employed in the manufacture of wagons. The earnings of employees in the vehicle factories are from \$4 to \$7.20 a week, with the exception of enamelers, who earn from \$6 to \$8 a week.

VEHICLE MANUFACTURERS.

Besides the manufacturers, there is at least one wagon maker in every town and village. There are said to be about 10,000 of them in the Netherlands.

Three of the principal vehicle manufacturers work with a capital of from \$200,000 to \$400,000 each.

Messrs. Spyker Brothers, of Amsterdam, very prominent vehicle manufacturers, are said to have visited the United States to study American methods, which they have introduced in their factories. This firm, in reply to my request for information on the vehicle industry, wrote me as follows:

Carriages and other vehicles are, with a few exceptions, mostly made by hand in small shops. We think we can safely say that business in this line is very unsatisfactory and decreasing from year to year, owing to a general lack of prosperity among those that keep horses and carriages as a luxury, and also to the poor condition of the farmers, and the improved means of communication in this country by means of street cars, railroads, etc. Freight wagons are not generally used, as we have our transportation by water. Farmers' wagons are not wanted to any extent, as our farmers are engaged principally in cattle breeding and dairying.

HISTORY OF VEHICLE MANUFACTURE.

In 1800 there was no vehicle industry whatever. In 1850 most vehicles were imported from Belgium. At the present time sufficient capital and labor is employed to supply the local demand, and some of the larger manufacturers even export.

AMERICAN VS. FRENCH BUGGIES.

It is estimated that about 50 vehicles are imported in the Netherlands per annum, principally buggies from France, which are claimed to be more strongly built than the American buggy.

PRICES.

Two or three of the large manufacturers have catalogues and price lists, but, although I have made application for them, I have failed to obtain them. From the proprietor of one of the large livery stables here I learned that the livery stables very seldom purchase carriages from the manufacturers. When they are in need of a carriage they contract with a wagon maker for the woodwork, with a saddler for the leather, and with a painter for the enameling. Carriages obtained this way will cost as follows: Victorias, from \$300 to \$400; landaus and cabs, from \$350 to \$800. The livery man stated further that if he had to purchase at the factories, his carriages would cost him considerably more.

VEHICLES IN DEMAND.

The vehicle mostly used by the farmers for driving purposes is the so-called tilbury, a very clumsy kind of buggy with rather heavy wheels. There are about 3,000 of these in use, and they are generally made by the local wagon makers, as are also the wagons, of which there are about 25,000 in use, excluding drays, dump carts, etc. Tilburies are sold at about \$200, and wagons at from \$100 to \$300, according to size and finish. For tilburies and wagons each province has its own model.

In the southern part of this country much stronger vehicles are in demand than in the northern part, on account of the roads, which are gravel in the north and basalt stone in the southern part.

Vehicles are mostly made of oak and ash wood, but the wheels of fancy carriages of American hickory.

MANUFACTURERS.

The largest factory in the Netherlands where carriages are manufactured is the "Royal Factory for Carriages and Railroad Cars, J. J. Beynes," at Haarlem. This concern is also the principal one which manufactures railroad and street cars, for use here and in the Dutch colonies. I could, however, not obtain any information from this company, not even in regard to the material used.

Names and addresses of leading manufacturers in the Netherlands are as follows: Gebroeders Spyker, Amsterdam; H. J. Overmeyer & Son, Amsterdam and Hilversum; N. H. van Lient, Amsterdam; Joh. M. Langeman, Amsterdam; J. H. van der Meulen, L. C. zn., Amsterdam; M. L. Hermans & Co., The Hague; W. Goljaard, The Hague; B. F. van Ryswyk & Son, The Hague; J. J. van den Berg & Dolman, The Hague; Ned. Maatschappij van rollend materiaal, formerly Peunsch & Co., The Hague; J. L. Mackenzie, Rotterdam; J. C. Dolk, Rotterdam; B. Veth, jr., Arnhem; Clarys Frères, Breda; Biltsche Rytuigfabriek, De Bilt, Province Utrecht; Weterman & Van Brakel, Deventer; G. J. Donderwinkel, Doesburg; F. Oostwoud, Franeker; C. A. Teurlings, 'sHertogenbosch; F. H. Lathouwers, 'sHertogenbosch; Royal Factory for Carriages and Railroad Cars, J. J. Beynes, Haarlem; Gebroeders Kimman, Haarlem; P. de Hoo Fzn., Leeuwarden; Kleine Hermans, Maasbracht; Th. Egbers, Nymegen; Plaum & Drevers, Nymegen; G. J. W. de Bouter, Utrecht; H. B. Gielen, Utrecht; R. van der Monde, Utrecht; A. van der Poel, Utrecht; Buitenweg & Co., Velp; A. Nieboer, Winschoten; H. Cezar, Winschoten; G. Uitman, Zeist; Firma G. ten Cate, Zutphen; M. Boezeman, Zwolle.

AUTOMOBILES.

The leading manufacturers of automobiles in the Netherlands are: Gebroeders Spyker, Amsterdam; Maatschappij Gelria, Arnhem; M. W. Aertnys, Nymegen; Groningen Motor Rytuigen Exploitatie, Groningen.

Thus far, about 80 automobiles have been manufactured in the Netherlands, and the capital invested in that industry is estimated by Mr. M. Adler, a dealer of Amsterdam, at not more than \$800,000. He thinks that about 150 employees are engaged therein.

There are at present about 180 automobiles in use in the Netherlands, 100 of which are imported. The total number of automobiles and motor cars imported during the last three years from France and Germany was about 175.

Automobiles have thus far not been very popular in the Netherlands, and will probably not become so until the prices at which they are sold (\$600 to \$1,200) have gone down considerably. With the smooth level roads of this country there would probably be a very good field for them here if the cost were less.

OPENING FOR AMERICAN VEHICLES.

In conclusion I beg to say, in regard to American vehicles, that I think there would be a good opening for them here. The difficulty has thus far been that there has not been sufficient American stock in the country. Some years ago two very energetic young men, who had been in the United States, started the importation of American buggies, etc., but as they did not have sufficient capital to pay for what they wanted, they could never have many styles to show to consumers here. The consequence was lack of sales and subsequent failure.

If American manufacturers would, after sending some one over to study the needs of this country, intrust some reliable man understanding the trade with show and stock rooms here, I have no doubt but that the American vehicle, if built somewhat after the Dutch pattern, would eventually find a market; but the sending of catalogues to dealers, as has thus far been done, will not effect any sales, and no merchant will import a variety of styles of American vehicles if he has to pay for the same on delivery.

If a large stock room were established in the Netherlands, at The Hague or Rotterdam, local carriage dealers could from there be supplied with American vehicles for their showrooms, and I have no doubt that such an arrangement would give satisfactory results to the American manufacturer and exporter.

In this country all the manufacturers subscribe to a Paris monthly, edited by Louis Dupont, 78 Rue Bousiere, who with each number issues pictures of carriages which are copied by Dutch manufacturers.

S. LISTOE, *Consul.*

ROTTERDAM, *June 26, 1900.*

PORTUGAL.

VEHICLE INDUSTRY.

In no part of this country is the manufacture of vehicles an industry of importance, and Lisbon is the only town where it is carried on to any extent.

The principal firm in Lisbon engaged in carriage building estimates that not more than 40 carriages of all descriptions are produced in Portugal per annum, victorias predominating, the remainder being landaus and coupés.

WAGES.

The earnings of employes in carriage building are as follows, per diem: Smiths, skilled, 2 milreis¹ (\$1.48); carpenters, coach bodies, 1.8 milreis (\$1.33); upholsterers, skilled, 1.6 milreis (\$1.18); laborers, lowest wage, one-half milreis, (37 cents).

VEHICLES IN DEMAND.

Outside of Lisbon, carts and wagons are drawn by oxen, and the vehicles are of the rudest and most primitive character—the wheels, for instance, with one crossbar instead of spokes, and revolving axles.

MANUFACTURERS.

The following are the principal manufacturers of vehicles in Lisbon: Almeida Navarro, 256 Rua da Palma; A. C. Costa & Co., 27 Rua das Parreiras; Ant. Joag. Dunas da Silva, Rua da Rosa; Fernando Augusto Pereira & Tomãos, No. 8 Rua do Marquez Sá da Bandeira.

The duty on all vehicles is extremely high.

AUTOMOBILES.

I understand there are only two small automobiles in Portugal, and these are of French make.

As the towns of Lisbon and Oporto are very hilly, neither automobiles nor bicycles are likely to be very much in demand.

J. H. THIÉRIOT, *Consul.*

LISBON, *June 27, 1900.*

RUSSIA.

VEHICLE INDUSTRY.

There are no official statistics, past or present, to be had relating to this industry. I am indebted to the firm of Theodore Meise for the following facts concerning the trade in St. Petersburg, where between 1,500 and 2,000 vehicles of various styles are manufactured annually, largely “droschkies”—the Russian cab—small, heavy victorias, landaus, and coupés. A capital of \$3,000,000 is employed, and the greater part of the work is done by hand. The raw material, principally hickory, as well as the varnish, is imported from the United States. The annual product, including repairs, amounts to \$2,000,000.

¹ The consul estimates the milreis at 74 cents.

MANUFACTURERS.

The principal manufacturers are: J. J. Braeutigam, Zaharievskaia, 8; P. D. Jaccovleff, Nadejdinskaia, 1-96; T. Meise, Basseinaia, 14; Fraese & Co., Ertelev, 10; J. B. Schober, Sergievskaja, 43; C. J. Krummel, Kovenski, 5; P. Paliatchek, Nevski, 106.

About 1,500 workmen are employed by the foregoing.

WAGES.

The following is the scale of wages paid skilled workmen per month:

Upholsterers	\$20. 00
Leather workers	17. 50
Painters	\$20. 00 to 25. 00
Blacksmiths	35. 00
Woodworkers	30. 00 to 35. 00
Spring makers	25. 00
Laborers	7. 00 to 10. 00

OUTLOOK FOR AMERICAN GOODS.

The tariff is almost prohibitory, and as a consequence there is very little trade in foreign vehicles. A few sulkies and trotting wagons are imported, and those from the United States are preferred. It is claimed that American carriages are too light to stand the rough roads found in Russia.

AUTOMOBILES.

Automobile tricycles are manufactured by the Anonymous Velocipede Company, of St. Petersburg, and are beginning to attract attention, but it is conceded that the roads in Russia are too rough to warrant their general use in the near future.

The Russian minister of war is anxious to secure a motor that will draw army wagons, to be run by petroleum or storage battery.

W. R. HOLLOWAY,
Consul-General.

ST. PETERSBURG, *April 21, 1900.*

CARRIAGE AND WAGON WHEELS IN RUSSIA.¹

In reply to Department instructions, I submit the following tabular statement showing the imports into Russia in 1895 and 1896 of carriages, carts, and detached pieces thereof, together with the duties to which they are subjected under the Russian tariff:

¹ Republished from Consular Reports for May, 1898, No. 212.

Description.	1896.		1895.		From Jan. 1 to May 1, 1897.		Rate of duty.
	Pieces.	Value.	Pieces.	Value.	Pieces.	Value.	
Carriages:	No.		No.		No.		
Large, such as coaches, calashes for four persons, landaus, diligences, and omnibuses.	55	\$25,186	44	\$16,962	10	\$4,112	\$101.90 each.
Light, such as calashes for two persons, phaetons, droskies, cabriolets, cabs, etc.	130	30,326	108	21,588	186	6,168	\$69.48 each.
Vans and carts	22	2,570	34	3,598	42	8,738	\$30.88 each.
Carts, common, for farmers, and other similar carts for conveyance of freight or passengers.	93	2,056	.....	.....	10	514	\$9.26 each.
Total	300	60,138	186	42,148	248	19,532	
Detached parts of carriages, such as bodies, wheels, lamps, etc., with the exception of springs, axles, and other accessories.	Tons.		Tons.		Tons.		
	54	69,904	72½	79,156	52	38,036	1 \$6.17 per pood.

1 pood = 36.112 pounds.

NOTE.—Carriages upholstered, completely finished, pay 20 per cent in addition to the duties stated.

Carriages of all sorts, heavy and light, are imported chiefly from Germany and Austria-Hungary, while vans and carts, as given in the table, are imported from Austria, Germany, Great Britain, and Holland. Detached parts of carriages (wheels, bodies, lamps, etc.) come from Germany and England.

Hickory wood, which is used in this country for wheels, comes from the United States indirectly, through firms in Germany and England.

The principal firms using carriage and wagon material in St. Petersburg are: M. F. Beyer, Nevski, No. 8; I. Brautigam, Zaharievskaja, No. 8; Th. Wainoff, Liteinaia, No. 15; E. Wienel, Peski, Fourth street, No. 42; Th. Hartley, Zastavskaja, No. 5; T. Meise, Basseinaia, No. 14; I. Chaubert, Serguievskaja, No. 43; P. Jakovlev, Nevski, No. 96.

JOHN KAREL,
Consul-General.

ST. PETERSBURG, September 16, 1897.

SPAIN.

VEHICLE INDUSTRY.

After careful investigation, I find that this industry is almost confined to Madrid and Barcelona. In these chief cities of Spain the leading manufacturers have established their works, although in every town and village there may be found one or more small workshops capable of turning out a vehicle for local use.

There are in Barcelona five or six large vehicle manufactories, with a capital of about \$200,000 and employing, together with the smaller

shops, about 500 workmen. These large firms make on an average about 30 vehicles each per annum, the largest turning out as many as 50.

Madrid, from the fact of its being the capital and the residence of a larger proportion of wealthy people, gives more scope to this industry, and some \$300,000 are said to be there invested in it.

It was only about fifty years ago that the manufacture of carriages was properly established in this country, but it has steadily grown in importance until it is now able to supply most of the vehicles required. The axles and other fittings are, however, all imported from England and France. I find that French and English journals connected with this industry are received by the manufacturers here, and most of the carriages made are built according to plans and drawings published in such periodicals. In conversation with some of the leading carriage builders here, I was informed that a few American carts were brought over some time back, but were found too lightly built for the rough roads and pavements of this city.

It appears to me that it would be well for some of our home journals to be circulated among the Spanish manufacturers. Illustrated advertisements of tools and fittings related to the industry might with great advantage be brought to their notice.

WAGES.

Of skilled employees there are not many. Their earnings average about \$1.50 per day of ten hours work. Ordinary employees earn from 40 cents to 90 cents per day.

MANUFACTURERS.

I subjoin a list of the carriage manufacturers of Barcelona, those marked with an * being the most important:

Julio Agost, Marqués del Duero, 6; Francisco Amat, Riera San Miguel, 58, Rafael Aranda, Luis Antuñez, 18, Gracia; * Federico Badal, Consejo de Ciento, 341; Juan Balagué, Paseo San Juan, 277; Baquial Batlle y Forn, Lope de Vega, San Martin; Jaime Barceló, Comercio, 14; * Betlla Hermanos, Caspe, 66; Antonio Binefa, Travesera, 143, Gracia; Canas y Riera, Freixuras, 4; Juan Capel, Ribas, 13; Francisco Capella, Consejo Ciento, 263; Tirso Capuz, Aragón, 290; Compañía de Tranvías de Barcelona á Sans, Carretera, 99, Sans; José Estrada, San Vicente, 8; José Farré, Ronda San Antonio, 54; Francisco Figueras, Carretera de Mataró, 250, San Martin; * Forcada y Compañía Gerona, 154; Gatell Gatell, Casanovas, 6; Jerónimo Gausach, Vergara, 18; Jaime Jornet, Sagrera, 127, San Martin; Esteban Labrandero, Vilá y Vilá, 123; J. Marqués é hijo, Berenguer el Viejo, 10; Antonio Meler, Comercio, 42; Fayos Miralles, Avellana, 3; Juan

Molist, Aribau, 13, Gracia; Juan Nadal, Guardia, 15; Francisco Niella, Carretera Mataró, 262, San Martín; Francisco Paret, Mayor, 110; Antonio Pedros, Torrente Olla, 156, Gracia; Rafael Pich Mansó, 39; José Quinto, Plaza Cementario, 4, San Martín; * Juan Reynés, Consejo Ciento, 463; Francisco Riera, Sepúlveda, 168; Vicente Sorrivias, Aragón, 439.

AUTOMOBILES.

The automobile may be said to have been introduced only within the past two years. The firm of E. de la Cuadra, floated as a share company with ample means, has been formed to push the sale in Spain. This is, however, believed to be connected with a German firm of manufacturers. No automobiles are made in Spain as yet, but I am of the opinion that they are likely to be popular. I should further surmise from the jealousy with which I was refused all information regarding the development of the importation of automobiles into Spain, that their sale is increasing.

JULIUS G. LAY, *Consul-General.*

BARCELONA, *April 19, 1900.*

CARRIAGE AND WAGON WHEELS IN SPAIN.¹

Owing to the fact that no satisfactory returns of the imports into Spain are published, it is very difficult to give statistics that would prove of any real value to exporters to this country. According to the official Madrid Gazette, there were imported during 1896:

Description.	Quantity.	Value.
	<i>Tons.</i>	
Tires for carriage and wagon wheels.....	550	\$21,483
Wheels, without tires.....	37	2,344
Axletrees.....	45	1,764
Wrought-iron hoops and wheels, weighing 220½ pounds and over.....	3,467	14,506
Wrought-iron wheels, weighing under 220½ pounds.....	211	2,718
Total.....	4,310	42,815

In order to obtain more definite information, I called on the leading carriage and wagon builders in Spain—the Sociedad Material para ferrocarriles y construcciones—who furnished me with the following particulars:

During 1896 we built only 23 carriages; this year we have orders for 700 carriages and wagons, so that one year's statistics are no guide to what our imports from abroad are. Wheels are imported from Germany and Belgium; but, with the exception of

¹Republished from Consular Reports for May, 1898, No. 212.

the springs, buffers and couplings, and grease boxes, all the accessories required in carriage building are now made in Spain. In 1896 we imported—

From Germany, 40 sets of wheels.....	\$1,400.00
From Belgium:	
28 sets of wheels	1,340.80
168 bearing springs.....	345.80
160 bearing-spring brackets	208.00
80 guard plates.....	108.00
72 guide fasteners	25.10
40 buffers and couplings	416.00
140 spiral springs.....	50.00
80 safety chains.....	68.00
112 grease boxes	521.40
From France, 1 vacuum brake	100.00

This year, of course, our imports of wheels will be much larger; but, owing to the high rate of exchange on foreign countries, we are obtaining almost all our other supplies at home.

The railroad companies in Spain also import large quantities of wheels for their own shops, chiefly from Germany, on account of their cheaper cost as compared with those made in Great Britain.

This meager information is all I have been able to collect on the subject.

H. HENDERSON RIDER,
Vice and Deputy Consul-General.

BARCELONA, *September 22, 1897.*

SWEDEN.

VEHICLE INDUSTRY.

The manufacture of wagons and vehicles has not achieved any prominent place in Sweden. A large factory does not exist, and all work may be called hand work. The wagons in use are strong, with small wheels, and, as a rule, the load is drawn by the shaft. Where a team is employed, a pair of shafts are used.

The latest statistics show only 753 men engaged in the vehicle industry, and out of this number 340 are also employers. In this total 274 are engaged in the cities, 13 in the villages, and 466 in the country. There are many large entailed estates in Sweden that are managed according to the customs prevalent a century ago. On all these holdings there is a wagon smith, and during the year round he turns out and keeps in repair the vehicles that are required and that need mending.

An idea of the smallness of the industry in Sweden may be obtained from the report of the assessor, who returns the taxable property in the Kingdom employed in the vehicle industry at only \$35,000. I may say that Stockholm turns out the best goods.

The wages paid range from 75 cents to \$1 per day of ten hours' labor.

Sweden imports very little in the way of vehicles. The total value for last year was only about \$30,000. Denmark supplies one-half the import and the remainder comes from Germany and England.

The exports are insignificant.

AUTOMOBILES.

The manufacture of automobiles has not begun, and I do not believe there are more than fifteen in the Kingdom. As soon as a cheap and practical machine comes on the market, they will be popular. There is no American competition to speak of.

EDWARD D. WINSLOW,
Consul-General.

STOCKHOLM, *March 24, 1900.*

CARRIAGE AND WAGON WHEELS IN SWEDEN.¹

The value of carriage and wagon material imported into this Kingdom for the last fiscal year amounted to \$19,173, of which about one-half comes from Denmark and the balance equally from Germany and England.

The wheel most needed must have heavy spokes, with strong hubs. The roads are good, but the country is hilly, and consequently the carriage wheel must have all the elements of strength and yet not be clumsy. In the cities cobblestones constitute the majority of the pavements, and heavy tires are used to keep the wood secure. The iron hub used extensively in the United States I have not seen here.

The conveyances used in the hilly districts are small, and the diameter of wheels correspond. The United States does not seem to be represented in this trade, and samples of the work of American manufacturers would have to be placed with merchants here in order to test the prospect of making sales.

EDWARD D. WINSLOW,
Consul.

STOCKHOLM, *October 5, 1897.*

¹ Republished from Consular Reports for May, 1898, No. 212.

SWITZERLAND.

VEHICLE INDUSTRY.

The vehicle manufacturing industry of Switzerland is not of much importance. It is a question whether there were many more wagons of all sorts manufactured in this country during 1899 than were manufactured in 1879. The street car, the railway, the bicycle, and the automobile have made the slower systems of transportation and locomotion unpopular, and to a considerable extent unnecessary. At the beginning of the nineteenth century the awkward French stagecoach, the clumsy farm wagon, the heavy dray cart, and now and then a private coach of the French pattern, were the only vehicles ever seen in Switzerland. The back of the horse, the ox, the cow, and the peasant accomplished the principal part of the local transportation of produce and wares of different kinds. This condition of things was not very much improved up to the middle of the nineteenth century. After that the modern improvements in transportation began to be felt, and while this has resulted in giving to Switzerland more miles of railroad, according to area, than any other country, it can not be said that the vehicle industry has advanced in any very marked degree.

For instance, there are, as Consul Ridgely states in his report, only ten manufacturers of vehicles in Geneva, and all of them together do not produce more than 50 vehicles a year. As will be seen from the report of Consul Gifford, Basel is the most important vehicle manufacturing center of Switzerland. About 250 coupes, landaus, victorias, and dogcarts are constructed in that neighborhood every year, and in their manufacture some American hickory is used. American hickory made its mark at the Paris Exposition in 1878. At that time there was a fine display of this excellent wheel material, and all wood workers and wagon builders who saw it were very much interested in its strength and solid qualities, and from that time there has been a lively demand for hickory. The only difficulty standing in the way of its importation in large quantities is the cost.

AUTOMOBILES.

The tariff is 4 francs per quintal (77.2 cents per 220.46 pounds).

There are probably not more than 200 automobiles and motor cycles now owned in this country, and these are mostly in French Switzerland, and are very largely of French manufacture, although now and then one sees the "Daimler," which is well known, and is manufactured principally in Cannstadt, Germany. There are no real automobile factories in Switzerland, as we understand the term "factory." Some are made by Martini at Wetzikon, Glotoni at Lugano, Saurer

at Arbon, Egli at Zurich, and at the Velofabrik at Liestal. It is doubtful whether more than 25 automobiles have been manufactured in Switzerland, for this industry is just beginning, and it is a question whether they will ever become popular in the northern and eastern parts of the country, owing to the grades and to the sharp edges of the broken stone which are being continually placed on the public highways, and which are very injurious to the rubber tires. I have been informed that there are two American automobiles in Switzerland, but that they are of earlier make and not very attractive. Every intelligent Swiss vehicle manufacturer, if asked the question, "From what country will the successful automobile come?" would probably answer, "We are looking to the United States for the best results."

WAGES.

The capacity of the workmen is fair. They are sturdy and industrious, but can not be compared to our workmen in cleverness and ability to turn out fine work, and do it rapidly.

As to wages, Consul Gifford reports that skilled blacksmiths get about \$2.50 per day, skilled painters \$2, skilled saddlers \$2, and common workmen in all departments from 80 cents to \$1.20 per day. There may be exceptional cases where a very skillful blacksmith gets \$2.50 per day and a very fine painter \$2, but the blacksmith and painter of ordinary ability does not receive more than from \$1.25 to \$1.50 per diem for ten hours of work. Even this wage is a large increase on the wages of ten years ago, when the blacksmith received on an average only \$5.40 for sixty-five hours of labor, and the painter only \$3.96.

The names and addresses of the leading manufacturers will be found in the accompanying reports of Consuls Ridgely and Gifford

AMERICAN VEHICLES IN SWITZERLAND.

In conclusion I may add that at present the actual extent of the American competition in the markets of Switzerland, so far as the vehicle trade is concerned, is quite in proportion to the number of registered American commercial travelers who visited this country last year to sell goods, as compared to the number of registered German and French commercial travelers who came here during the same period. Last year Germany sent nearly 4,000, France 1,700, the United States 1.

JAMES T. DU BOIS,
Consul-General.

ST. GALL, *April 10, 1900.*

VEHICLE IMPORTS AND EXPORTS OF SWITZERLAND.

Switzerland's trade in wagons and parts of wagons, rolling chairs, automobiles, etc., in 1899.

From and to—	Quantities.	Value.	
		Francs.	United States equivalent.
IMPORTS.			
Germany	<i>Quintals</i> , ¹ 186	82,620	\$15,945.66
Austria	175	29,750	5,741.75
France	517	87,890	16,962.77
Italy	197	33,490	6,463.57
Great Britain	30	5,100	984.30
United States	4	680	131.24
Total	1,409	239,530	46,229.29
Total, 1898	1,304	208,640	40,267.52
Increase	105	30,890	5,961.77
EXPORTS.			
Germany	115	57,877	11,170.26
Austria	22	14,040	2,709.72
France	281	77,653	14,987.03
Italy	37	5,900	1,138.70
Belgium	2	3,000	38.60
Danube principalities		200	
Total	458	158,670	30,623.31
Total, 1898	401	88,564	17,092.85
Increase	57	70,106	13,530.46

¹ Quintal = 220.46 pounds.

ADOLPH L. FRANKENTHAL,

Consul.

BERNE, *April 6, 1900.*

BASLE.

VEHICLE INDUSTRY.

Since 1850, the local carriage industry has undergone a complete transformation, or rather it has been created. Up to forty years ago nearly everything except the peasants' carts were imported, generally from France. Finally one Kaufmann, a Frenchman, established himself in the neighboring Alsacian village of St. Louis and began to manufacture vehicles for the Swiss market, especially devoting his attention to fine private carriages of all kinds. After the annexation of Alsace to Germany he removed to Basle, where he continued and enlarged his business.

VEHICLES MANUFACTURED.

There are no statistics in regard to the number of vehicles manufactured in this part of Switzerland, but a well-informed gentleman connected with the business estimates that about 250 fine carriages are turned out yearly in this city alone.

These carriages—coupés, landaus, victorias, dogcarts—are thought to be as well and elegantly made as the finest products of the French industry, and accordingly there are now perhaps less than half a dozen imported vehicles in Basle. The exceptionally high tariff, amounting

to 20 francs (\$3.86) per centner (220.46 pounds) weight on vehicles used for the transportation of persons, and 6 francs (\$1.16) per centner on other carts and carriages, when added to the freight charges, increases the price too much, unless some decided advantage is to be obtained from purchasing abroad.

The fine private carriages of the regulation styles are built here by two principal houses, that manufacture not only for the local market but for other parts of the country, and to some extent for the neighboring German territory.

The owners of livery stables in this city have the concession for the cab service also. They buy many of their better vehicles at second hand from the owners of private equipages, while they make the greater number of the common hackney coaches in their own repair shops.

Farm and milk wagons, which still constitute the most important part of the industry in Switzerland, are manufactured by a large number of small establishments scattered everywhere over the country. There are no extensive factories on the American plan producing articles of a standard type in large numbers, so that missing or defective parts can not at once be supplied in any desired quantity.

In recent years, the type of the milk wagon which formerly had so great an importance in this country has undergone a change. It is now a four-wheeled vehicle, that may be changed at will into a cart for the transportation of other products, or, with the addition of a second seat, into a pleasure wagon. Milk is still brought to market in these carts, but since narrow-gauge and electric roads penetrate the country in all directions, a great deal of it is brought to cities and towns every night and morning by rail. The formation and wonderful success of the so-called "Consumvereins," or cooperative societies for the purchase and distribution of provisions, has also contributed much to limit the peddling out of milk and farm products by individual farmers, and consequently to reduce the demand for milk carts.

CAPITAL INVESTED.

The capital invested in the vehicle business in this city is estimated at about 1,000,000 francs (\$193,000).

WAGES.

The following are the average wages of the principal employees and workmen in the carriage shops of this city, per day:

	Francs.	United States equivalent.
Skilled blacksmiths.....	14	\$2.70
Skilled painters.....	10	1.93
Skilled saddlers.....	10	1.93
Common workmen in all departments.....	4-6	.77-1.116

MANUFACTURERS.

The names and addresses of leading manufacturers are as follows, all of Basle: D. Dischler, 9 Baumleingasse; R. Finiger-Krug, 16 Holbeinstrasse; Charles Heimburger, 24-26 Spitalstrasse; Imhoff-Schetty, 3 Rappoltshof; Reinbolt & Christie, 59 Elsässerstrasse; Spleis-Hohler, 7 Maltgasse.

Only two of these houses are of more than local importance, namely, Reinbolt & Christie, reputed to be the most extensive carriage manufactory in Switzerland, and Charles Heimburger, who holds, perhaps, the third rank, Griesberger, of Zurich, being second in importance.

EMPLOYMENT OF AMERICAN WOOD.

An interesting experiment, begun a few years ago by Basle manufacturers, is the employment of American hickory for carriage wheels. The trial was recommended by a Swiss who had lived many years in the United States. Although it is affirmed that the native acacia is equally valuable for this purpose, the fact that the importation and use of the American wood continue seems to be a proof of the contrary.

AUTOMOBILES.

It may be said that up to this time no automobiles have been manufactured in this district; but the corporation named the "Velofabrik Diestal," of Diestal, the principal town of the Canton of Baselland, is just now on the point of placing such a vehicle on the market. It is not understood that the new machine possesses any very novel features; and it is impossible to say whether it will obtain more favor with the public than the French and German articles that occupy the field at present. Of these latter, manufactured by Benz, of Mannheim, and by Pagrot in France, not more than half a dozen seem to be in use by private persons in this consular district. These may possibly give satisfaction to their owners, but it is certain that they possess no attraction for the public in general. So that it may be predicted with confidence that until an automobile has been invented which has considerable advantages over those now introduced, in respect to lightness, elegance, and especially odor, there will never be a great demand for such vehicles in this region.

The field then is quite clear for the American machine that shall fulfill the above conditions. There is no prejudice to overcome such as exists in regard to American vehicles in general, on account of their alleged lack of strength and stability. On the contrary, it seems to be confidently expected that America will solve the problem and furnish Europe with the automobile, as it has already furnished it with the most successful bicycles. The watchword with amateurs at present is, "Wait till America sends us a successful electric motor."

This confidence in what our countrymen can and will do in the way of mechanical invention is born of long experience and has often been signally justified; but it is nevertheless an interesting phenomenon just at this time, when the commercial policy and political action of the United States do not enjoy the advantage of always exciting enthusiasm "in foreign parts."

GEORGE GIFFORD.

BASLE, *April 5, 1900.*

BERNE.

VEHICLE INDUSTRY.

The vehicle trade of this consular district is insignificant. There are no regular factories as we understand that word, and every village blacksmith is also a wheelwright, who can build and repair the clumsily constructed vehicles that are used in his locality. In the larger cities of this district, dealers in saddlery articles also handle wagons. The so-called manufacturing consists of assembling and putting together the different parts which are imported in the rough, mostly from France, Germany, and Italy. The finishing, painting, and upholstering are done here.

Statistics show that the whole import of vehicles and parts is below \$50,000, and the export figures contain again the parts imported rough, but finished and reexported across the boundaries to the near-by countries. I can not tell the total number of vehicles manufactured, but the styles could be divided into three classes, namely, pleasure carriages, common wagons, and country wagons.

SWISS V. AMERICAN VEHICLES.

There are but few good pleasure carriages and these are mostly of the French or German type, with small front wheels, heavy fancy iron works, curved bodies, generally hanging low, and the front wheels placed in front of the body and not under it. The wheels are heavy, with 2½-inch iron tires.

The attempt has been made to introduce American buggies, but without results. One dealer said to me, "Your wagons look as if a wind would blow them over. They are not heavy enough for our taste, and as for a side bar, I would not risk riding in one. You need too much room for turning round and the wagons are dangerous, for you are liable to get tipped out."

SWISS HORSE DRIVING.

I succeeded in finding out the reason why a side-bar wagon could not be used. The peculiarity of the Swiss in driving horses is that they appear not to know the ability of a horse to back as well as to

draw. The harness here is without breeching, and consequently a brake is necessary, and every vehicle is supplied with one. The crank of this brake looks like the handle of a coffee mill and is put in the most inaccessible places, generally between the legs of the driver near the bottom of the seat or low down on the outside of the place where the driver puts his feet. Every time the slightest incline is descended this crank is wound up, and it is a comical sight to see the driver bending down, winding up the brake crank with one hand and with the other trying to prevent the horse from going any faster, all the while looking like a man who was afraid of a horse and seeking something in the bottom of the wagon to throw at it without ever being able to find it. The screw rod of the brake extends downward through the body and ends in an iron shoe, acting against the tire of the hind wheel.

COMMON WAGONS.

Under the second heading of common wagons would come every class of vehicle used for transportation. One sentence would describe them. The heavier and clumsier they are made the better they are liked. I shall try and give a description of a dump cart: Four heavy wheels; hubs 6 and tires 4 inches across; front wheels two-thirds size of hind wheels; immense heavy front and back rockers of wood, but not protected with iron plates; across these two parallel beams 12 feet long and from 6 to 8 inches in diameter, sometimes being tree trunks rudely planed off, and in the center and firmly bolted down, a box with movable sides with a capacity of 1 cubic meter (35.316 cubic feet). There is also a wagon tongue that could serve as the mast of a small yacht, heavily ironed, and a brake of wood, large, heavy, and clumsy, which acts on the front wheels, the crank which operates it being located directly in front of one of the wheels. Two horses are required to pull this apparatus, and the location of the brake crank causes many accidents, for the driver, when he wants to wind it up, has to get down and do so while walking backward. It is easy thus to stumble and fall under the wheels. This is also the plan of most of the common wagons, with perhaps a few alterations and variations.

The country or farm wagons are anything and everything capable of running on wheels, but not one of them would be complete, or rather incomplete, without the inevitable brake.

The industry amounts to so little that it is impossible to procure statistics regarding the capital employed, nor can I give the earnings of the employees. There are no leading manufacturers of carriages here.

AUTOMOBILES.

There are a few agents for French automobiles in my district, but the sale is limited. In Berne and vicinity there are four or five gasoline machines.

ADOLPH L. FRANKENTHAL,

Consul.

BERNE, *April 6, 1900.*

GENEVA.

VEHICLE INDUSTRY.

Vehicles are manufactured in this district on a very small scale and although there has been a decided increase in population since January, 1850, there are fewer vehicles manufactured in French Switzerland than at that epoch. This is due to the fact that railways, street cars, steam and electric tramways, bicycles, and automobiles have steadily grown in use and popularity.

There are 10 manufacturers of vehicles in the large city of Geneva, and all of them together do not manufacture more than 50 vehicles a year. Very little capital is invested and few vehicles are kept in stock. The manufacturers generally make to order upon designs furnished by their clients. An order to construct a fine landau or coupé in Geneva would be regarded by the most prosperous manufacturer with respect and awe. Yet, none the less, Monsieur A. Oertig, a manufacturer at No. 40 Rue du Môle, has just turned out at his shop both a coupé and landau which he is sending to be displayed at the Paris Exposition. The coupé is a very fine and graceful vehicle, with rubber tires, and has an electric battery under the coachman's seat which furnishes lights for its two fine lamps. These lights may be turned on by the coachman himself or by the occupant of the coupé. The manufacturer told me that he had never seen a vehicle thus equipped in Europe and appeared to look upon me with suspicion when I informed him that electric lights for carriages would not be regarded as a novelty in the United States. The price fixed for this fine exposition coupé is \$1,200. The price of an ordinary Geneva-made coupé would be \$600 to \$900.

RUBBER TIRES.

Rubber tires are just beginning to come into use, but up to this time there are not twenty-five vehicles in the entire city equipped with them. It costs here about \$100 to equip an ordinary four-wheel vehicle with rubber tires. A leading manufacturer said to me that some eight or ten years ago several American vehicles were imported and offered for sale in Geneva, but they were so badly finished and so poorly put

together that the people who bought them considered themselves humbugged—they had but one merit, their lightness. This same manufacturer also said that it had become the fashion nowadays for people to keep on having their old traps done over and over until they were in the end like a popular Italian ruin—that is to say, with none of the original left. He intimated, indeed, that people were becoming quite hardened in this particular and were entirely losing their self-respect.

OPENING FOR AMERICAN VEHICLES.

If cheap American dogcarts, two-seated phaetons, and open surreys could be sent here in charge of competent agents, I have no doubt they would meet with a fair sale at tolerable prices, in spite of the pessimistic views of the manufacturer and dealer above quoted.

WAGES.

Skilled workmen are paid in the carriage shops from 10 to 15 cents an hour. It would be difficult to even estimate their capacity.

MANUFACTURERS.

The following are the leading manufacturers and dealers in Geneva and Lausanne, which are the two principal cities of this district, the more important houses being marked with an asterisk:

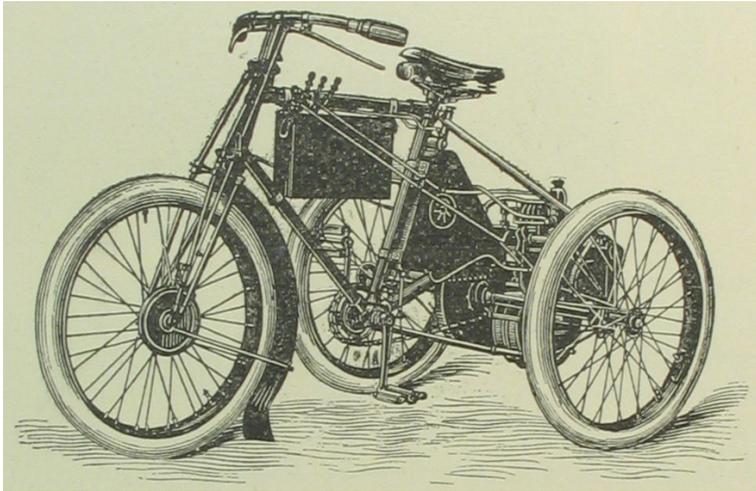
Geneva.—Jean Burkin, No. 8 Rue Rothschild; A. G. Girardin, No. 8–10 Rue Versonnax; Hirt & Mossaz, No. 588 Rue des Pierres à Niton; Aug. Hoffmann, No. 7 Rue G. Leschot; *Jaccard & Alary, No. 4 Rue Pradier; *A. Oertig, No. 40 Rue de Môle; *Vachat & Co., No. 51–55 Terrassière; D. Vasselin, No. 33 Boulevard de la Cluse; *Marc Weber fils, No. 5 Terrassière; H. Weber & Matzinger, No. 3 Chemin des Buis.

Lausanne.—W. Assal, No. 6 Maupas; J. Egli, aux Mousquines; W. Haaser, Derrière l'Ancienne Douane; Edouard Janzi, Maupas, Petit Rocher; Charles Lindenfelser, No. 14 Rue du Bugnion; J. Maurer & fils, No. 46 Rue Martheray; Jean Zaugg, 9 Caroline.

AUTOMOBILES.

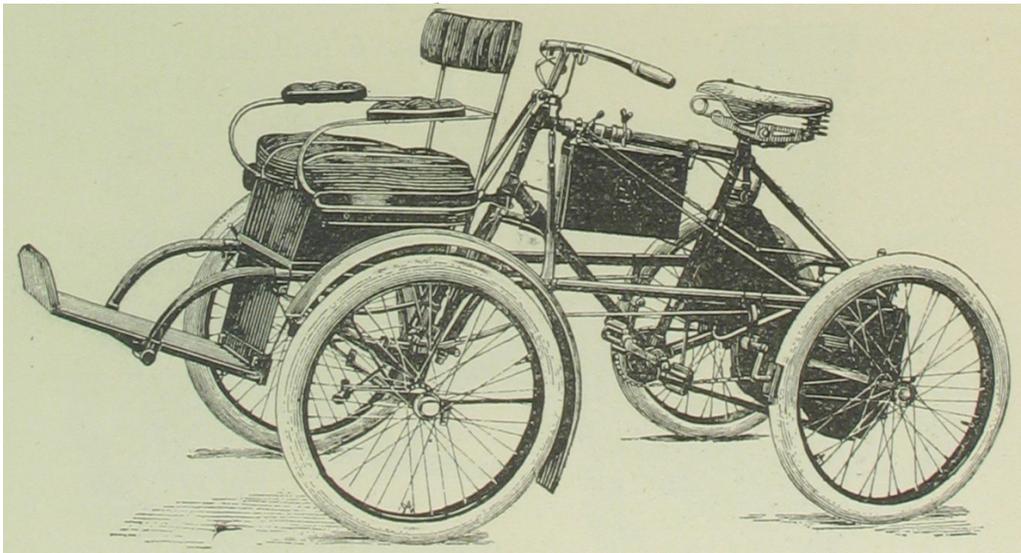
If the carriage trade is not over active, it must be admitted that this does not apply to automobiles, for in this line there is a spirited boom. No automobiles are manufactured in French Switzerland, however, although at Bienne, in the Canton of Berne, Messrs. Baehe & Co., who own the rights of the Henriod petroleum motor, have installed a plant, and are about to begin construction on a small scale. The latest unpublished statistics of the Swiss Touring Club indicate that in all Switzerland about 175 automobiles (including motor-cycles) are in use at present. Of these two-thirds are in French

Switzerland, principally at Geneva. The automobiles sold here at present are almost exclusively of French manufacture, although until recently the "Daimler," manufactured by the Daimler Company, at Cannstadt, Germany, had the lead. This is still true in so far as machines above 4 horsepower are concerned, but the lighter machines are chiefly from the French manufactory of De Dion, Bouton & Co. The best selling automobiles at present are the motorcycles. This is because they are cheaper to buy and less expensive to operate. Following are the two designs most in use. They have each a force of 2½ horsepower:



Tricycle of De Dion, Bouton & Co. Price, £320.

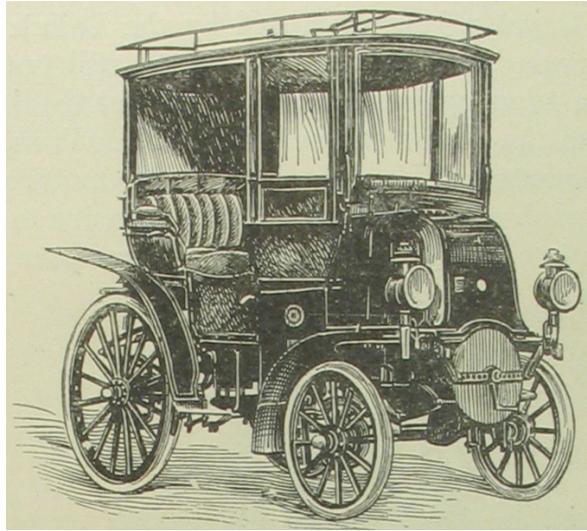
Either of the foregoing machines will mount a grade of from 12 to 13 per cent with occasional assistance from the pedals. They easily



Quadricycle of De Dion, Bouton & Co. Price, \$435.
(Can be transformed into a tricycle when desired.)

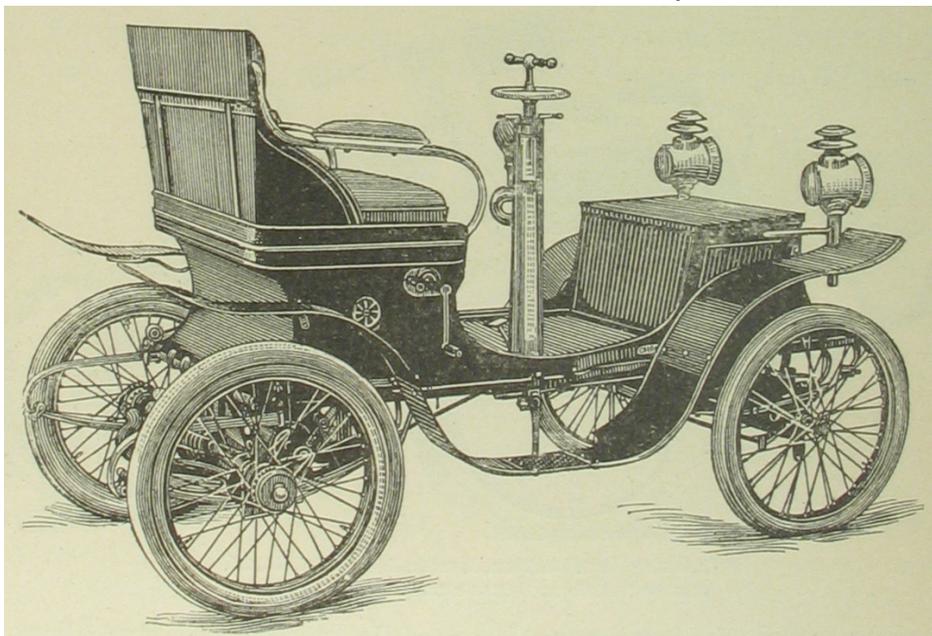
attain a speed of 20 miles an hour on flat roads, and burn about 5 liters of gasoline for each 100 kilometers (62½ miles).

Following is a drawing of the popular four-seated 5-horsepower Daimler:



Vulture Daimler. Price, from \$1,600 to \$1,850.

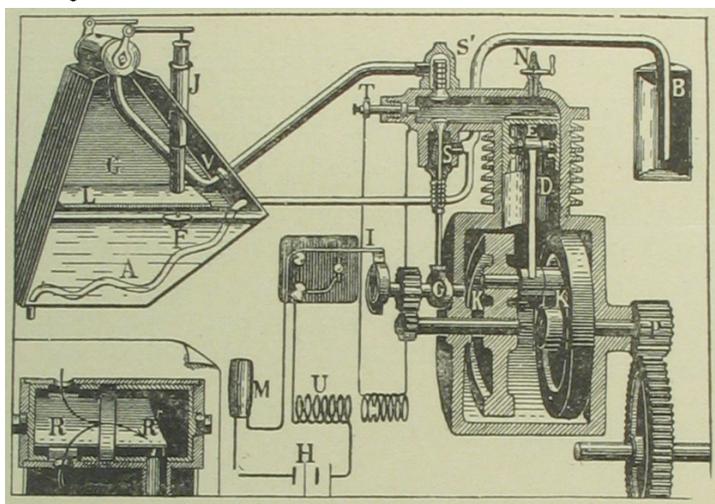
The above-described machine will easily mount a grade of 16 per cent. It has a speed of from 2 to 19 miles an hour on flat roads, and is regarded here as among the best and surest of automobiles. The Daimler motor system is too well known in the United States to require any detailed description here. The Daimler rights have been sold in France, and the famous Panhard automobile is but a French edition of this sturdy German machine. The greatest success in Geneva at present is the new three-seated 3-horsepower automobile of De Dion, Bouton & Co., of which the following is a drawing:



Threeseated 3-horsepower. Price, \$808.50; with top, \$920.

The foregoing automobile is really a graceful and fine little machine.

It can be run at any speed from 1 to 30 kilometers¹ an hour on flat roads, and will mount a grade of 15 per cent at a speed of from 6 to 8 miles an hour. It weighs 616 pounds and burns 8 liters of gasoline (cost, 9 cents per liter) for every 100 kilometers (62½ miles). The system is the same as that of the De Dion motor cycle, above described. Only one cylinder is used (the Daimler motor uses two) with the cold-water circulation system. The following diagram explains the motor tolerably well:



A, pipe coil for the hot gases intended to heat the essence; B, dead box for the escapement of the gases; C, carburetor, where the air is mixed with hydrocarburit; D, cylinder; E, piston; F, float; G, cam acting upon the exhaust valve; H, dry battery; I, trembler for electric-lighting device; J, air-admission pipe of the carburetor; K, fly wheels; L, plate of sheet metal recovering the essence; M, handle with contact device for the starting; N, compression cork; P, pinion fixed on the main driving shaft and gearing with the gear wheel of the driving-wheel axle; R, regulating cock for the air and gas mixture; R', regulating cock for the admission of the explosive mixture into the cylinder; S, exhaust valve; S', inlet valve; T, lighting device; U, induction coil; V, safety box.

The above-described 3-horsepower automobile is, as I have stated, the success of the moment in Geneva. Its relative cheapness, reliability, and simplicity are the combined merits which make it sell. The local agents have orders now for twenty-five of these machines, none of which can be delivered before June or July. In other words, the demand is far beyond the supply, as it also is for the "Daimler."

The "Peugeot" automobile, so popular in France, has found no great favor in Geneva, but the "Richard," a small three-seated 3-horsepower French machine, has been actively pushed by the local agent and is popular. Its price is \$675.

The "Brierre," another 3-horsepower three-seated French automobile, is promised shortly for Geneva, and great things are expected of it, as it is the gasoline and cold-water circulation system of motor which De Dion has made so successful, and its reduced price of \$675 is attractive.

The most important automobile agency in Geneva is that of the "Société Générale de Voitures Automobiles." This concern is the

¹ One kilometer = 0.62 mile.

exclusive agent for the Daimler, as well as for De Dion, Bouton & Co., and has also accepted the Brierre agency. The president of the company said to me to-day: "We are anxiously looking to the Americans for something fine and cheap in the way of automobiles. We expect to see them do in automobiles what they did in bicycles. What we want in particular is an electric automobile, and we expect to see it come from the other side of the Atlantic. We stand ready to accept the agency for any reliable American electric automobile, and we can sell it fast if it is not too dear."

The other automobile agents of Geneva are: L. Ansermier, 6 Rue de Lausanne; Comptoir General de Voitures Automobiles, 4 Boulevard du Théâtre; E. Duckert, 14 Rue de Fribourg; Eugène Excoffier, 40 Rue du Môle; *F. Panchaud, 2 Quai Pierre-Fatio; G. Picard, 15 Rue Buttini; A. Ryniker, 61 Boulevard du Pont d'Arve; M. Sandoz, 2 Boulevard des Philosophes; M. Picker, 7 Rue du Roveray; Vassali & Grillet, 2 Rue Gevray; Marc Weber Fils, 5 Rue de la Vinaigrerie; *Bruel Frères, 10 Boulevard de Plampolais. The * indicates the more important houses.

BENJ. H. RIDGELY, *Consul.*

GENEVA, *April 5, 1900.*

ZURICH.

VEHICLE INDUSTRY.

Zurich can only boast of one firm which can really be called a manufactory in the American sense, and that firm is Geisberger & Co., Wiesenstrasse, 10. They have been established for fifty years, and sell their goods not only in Zurich, but all over Switzerland. Their annual output is 300 vehicles, and their capital invested 1,500,000 francs (\$289,500). They employ, on the average, 300 men, and the wage ranges from 4 to 10 francs (77.2 cents to \$1.93) per day. There are no statistics that I can find giving the total number of vehicles manufactured in this city or Canton.

The firm mentioned furnishes or makes about half of all the vehicles that are made here. As these people are slow and conservative, it is reasonable to believe that many, if not the majority, of vehicles in use in Switzerland are built to order.

There are quite a number of vehicles imported from Germany and Austria. All imaginable vehicles are built here—street cars, omnibuses, stage coaches, fine carriages, heavy and light wagons, road carts, delivery wagons for all branches of business. Efforts have been made to sell American-built wagons, but without success. Several Studebaker wagons are here now, but can not be sold—too light for these hard roads and the wheels not wide or broad enough. A strong running gear is required on these paved streets and hard roads.

In addition to the wagon firm above named there are the following firms who do a smaller business: Heinrich Eckert, Mühlebachstrasse, 12-20; H. Germann, Albisstrasse, 62; Kasper Isler, Zeltweg, 111; Jakob Ochsner, Müllerstrasse, 54-56.

The firm of Geisberger & Co. have American machinery in their factory and are satisfied with it. It is claimed that ordinary or plain vehicles can be built in the United States at less cost than here, but that high-grade and finely finished work, where skilled labor is an important item, can be done more cheaply here. There are a good many small wagon and blacksmith shops all over the city and in villages, doing repairing and building ordinary wagons to order. If our American manufacturers intend to compete in this market, they must furnish strong, well-made vehicles, with wide tires, strong brakes, etc.

AUTOMOBILES.

There are a very few automobiles in use here. The firm of Escher, Wyss & Co. has built a few, but it seems that people do not take kindly to them.

ADAM LIEBERKNECHT, *Consul.*

ZURICH, *June 23, 1900.*

CARRIAGE AND WAGON WHEELS IN SWITZERLAND.¹

It is impossible to state the quantity and value of wagon wheels imported into Switzerland, for the reason, first, that no statistics covering importation of wheels are available, and second, that comparatively few finished wheels are imported at all. As regards the United States, hubs and spokes in the rough, the former of oak and the latter of hickory, are being imported in a small way and finished here. The houses of Geisberger & Co., Zurich & Kaufmann, at Basel, large concerns, buy American wood in the rough and manufacture all the parts themselves. These houses are equipped with American tools and wood-working machines. For fine work, as, for instance, wheels for buggies and carriages, American wood is mostly used; but for ordinary vehicles, hubs made from domestic walnut, oak, or acacia are used. I am informed that, in general, the styles, diameter, and sizes of wheels are the same as in the United States, except that in Switzerland all the parts are heavier. The smaller wheel-making concerns use both domestic and American woods, some getting the article finished in the rough and others cutting the timber themselves and manufacturing by hand. In the case of wheels manufactured in Basel, the following items may be found of use:

Size of wheels.—From 75 to 125 centimeters (29½ to 49½ inches) in diameter.

¹Republished from Consular Reports for May, 1898, No. 212.

Size of hubs.—Length, 20 to 24 and 25 centimeters ($7\frac{3}{4}$ to $9\frac{1}{4}$ and $9\frac{3}{4}$ inches); diameter, 150, 165, and 185 millimeters ($5\frac{9}{16}$, $6\frac{1}{2}$, and $7\frac{1}{4}$ inches).

Size of spokes.—Thickness, 38 millimeters ($1\frac{1}{2}$ inches) at the hub and 32 millimeters ($1\frac{1}{4}$ inches) at the rim; length, 35 to 80 centimeters ($13\frac{3}{4}$ to $31\frac{1}{2}$ inches).

Size of feliies.—Square, 43 to 52 millimeters and 40 to 55 millimeters ($1\frac{3}{8}$ to $2\frac{1}{8}$ inches and $1\frac{1}{8}$ to $2\frac{3}{8}$ inches).

Material.—The principal Basel manufacturer imports from the United States, through an agent in Hamburg and another in Havre, elm hubs, mostly in a finished state, and others only perforated. He also imports spokes of acacia and feliies of hickory, both in an unfinished condition.

It does not appear that any finished carriage wheels are imported.

IRVING B. RICHMAN,
Consul-General.

ST. GALL, *September 21, 1897.*

TURKEY.

VEHICLE INDUSTRY.

The manufacture of vehicles does not figure in the industries of this country. There are a few small shops in this city, and also a few in the other seaport cities of Turkey, where common farm wagons of clumsy and primitive pattern are made, and also the common Turkish "araba," with a seat for the driver and two seats fronting each other behind him. There are many Victorias and a few landaus used in this city, Salonica, Smyrna, Beirut, Damascus, and Jerusalem; most of these are manufactured in Vienna and are clumsy but substantial vehicles.

The roads in and about Constantinople are rough, and during the rainy season in terrible condition. The ruts and stones are a severe strain upon wagons of every kind, and the average driver seems to have a genius for running into difficult and dangerous places.

OPENING FOR AMERICAN VEHICLES.

At Salonica, Smyrna, and the cities farther down the coast the streets are well paved, and there are excellent roads in the interior. Assuming that American manufacturers can compete in price, I believe that there is an excellent opening in this country for wagons of all kinds. Our American carriages are lighter and more graceful in design than anything I have seen in the Turkish markets. They ought

also to be more durable, as the best material, thoroughly seasoned, is used in the manufacture of our wagons, while thoroughly seasoned wood in this country is almost unknown.

I have answered some inquiries upon this subject from the Studebaker Brothers Manufacturing Company, of South Bend, Ind., and have suggested that they confer or correspond with W. S. Bigelow & Co., 52 Broadway, New York. This firm represents the United States end of the combination of American manufacturers and exporters, who have recently opened, under my direction,—an American exposition in this city. Mr. Hough, of that firm, has been here to organize and start the business, and is somewhat familiar with the general local conditions.

AUTOMOBILES.

The automobile has not yet found its way into this part of the East.

CHAS. M. DICKINSON,

Consul-General.

CONSTANTINOPLE *March 23, 1900.*

THE UNITED KINGDOM.

VEHICLE INDUSTRY.

Cabs were originally introduced into England from Paris at the beginning of the nineteenth century. In 1805, Messrs. Bradshaw and Rotch obtained licenses for a few of these vehicles. They were built to hold two persons, exclusive of the driver, and ran on two wheels, similar to the present "hansom." Owing to much opposition their number was at first very limited, but in 1832 there were sixty-five of them plying for hire in London. The cab introduced from Paris gradually displaced the older hackney coach, but was itself succeeded by a cab of a larger style, brougham type, from which the present "four wheeler" now in use was designed.

The hansom patent safety cab, invented by a Birmingham architect, was introduced in 1834, and marked a new era in street locomotion. Since that time many advances have been made in the hansom, and to-day it is the principal vehicle in use in London streets for rapid transit. In 1898 the number of licensed public carriages in London was as follows:

Hansoms	7, 800
Clarences	3, 648
Omnibuses	3, 423
Tram cars	1, 205
Total	10, 205

In the same year there were licensed:

Hackney drivers	13,475
Stage drivers.....	7,498
Conductors	8,753
Total	29,726

Carriage, a term applied to any vehicle for general use in conveying passengers, is a structure of which there is a multitude of shapes and designs, to wit, road carriages, having two or four wheels, such as the gig, the Tilbury, dogcart, T-cart, Irish car, and hansom cab, all these being built with two wheels. They require very strong and rigid shafts in consequence of the weight having to be divided between the horse's back and the wheels of the vehicle. In four-wheeled vehicles, on the other hand, the horse has no weight to bear, having only to drag. Open four-wheel carriages are the phaëton, wagonette, and the brake and char-a-banc. Other four-wheel vehicles are the omnibus, coach, brougham, landau, and drag.

The manufacture of carriages and omnibuses ranks, it is said, in the highest class of skilled labor. The best materials and workmanship are needed, as, in view of the hard wear to which the vehicles are subjected, cheap and light building would be ruinous. From an authoritative source I quote the following:

Many kinds of wood are employed in the construction. The body of the carriage is made by one set of workmen, the under framing by another, the former partaking more than the latter of the nature of cabinetwork. The steel spring making is delicate work, owing to the necessity for combining strength with lightness and elasticity. * * * The covering of the upper part of the body of a carriage with leather is one of the most difficult parts of the manufacture; one single hide is employed, the leather being worked round the corners by repeated currying while wet. * * * The best coaches receive as many as twenty to thirty coats of oil paint, and the polishing processes are numerous and carefully conducted.

Carts used for the conveyance of merchandise and goods, as distinguished from passengers, are usually two-wheeled vehicles, four-wheeled being termed, generally, wagons. All carts in Great Britain are required under the law to bear the name and address of their owner.

Railway carriages.—In the United Kingdom there were in 1891 87,000 carriages used on the railways for the conveyance of passengers and 526,000 wagons for goods traffic, drawn by something over 16,000 locomotives. The cost of a passenger express locomotive is between £2,500 to £3,500 (\$12,166 to \$17,033), while more powerful engines cost anywhere from £4,000 to £5,000 (\$19,466 to \$24,333). Both engines and carriages are usually made by the railway companies themselves. A first-class carriage costs from £600 to £700 (\$2,920 to \$3,406) to build, a second class £450 to £600 (\$2,100 to \$2,920), and a

third-class £300 to £450 (\$1,460 to \$2,190). A coal wagon capable of carrying 8 tons costs £70 (\$341), and a 10-ton wagon £70 to £90 (\$341 to \$438).

MANUFACTURERS.

There is not within this consular district any particular locality where the manufacture of vehicles may be said to be the staple industry. There are in the London district alone over 220 coach builders, over 15 cab builders, 65 wagon builders, over 250 cab proprietors, several of whom make their own vehicles—not only cabs but carriages of all sorts—and over 150 job masters who let out cabs and carriages, either for a specific journey or by the hour or day, or who contract to let out a cab or carriage for any purpose, according to arrangement. As before stated, the number of licensed public carriages in 1898 was 16,265 vehicles in London alone.

The number manufactured per annum, however, it is not possible to state, or indeed to estimate with any degree of accuracy, as it is evident that in a city of over 6,000,000 inhabitants the number of private vehicles must necessarily be very large. The general styles of private vehicles include the brougham, landau, gig, dogcart, barouche, wagonette, coach, and private cab.

CAPITAL INVESTED.

The capital represented by the vehicle industry must be enormous, even if the term "vehicle" be applied solely to cabs, carriages, and the "mercantile" wagons. But as the firms engaged in the business are not, as a rule, joint stock concerns, there is no available means of discovering, even approximately, the amount of such capital.

WAGES.

As regards the capacity and earnings of employees, I am informed by Messrs. Thomas Tilling, Limited, a large company of omnibus and cab proprietors and builders, having offices and branches around London, that—

A journeyman coach builder here earns, on an average, about £2 (\$9.73) per week, but a foreman who does piecework—that is to say, pays the men himself and makes a fixed charge for the work—will earn as much as £8 (\$38.93) per week.

They add:

We do not manufacture a great many carriages ourselves, and what we do make are principally landaus, broughams, and victorias, which altogether, including omnibuses, number 1,600. Our net increase for the past year was about 200.

From the London General Omnibus Company, Limited, I have received the following details:

This company turns out on an average 140 new ordinary garden-seat omnibuses per year; * * * also repairs and renovates about 1,450 omnibuses and maintains the same in working order; * * * also builds provender, manure, and other service vans and vehicles used in the company's business. The following are employed on the work:

Occupation.	Wages.	
	English currency.	United States equivalent.
	£. s. d.	£. s. d.
Coach builders.....per hour..	0 0 7½-0 0 8½	\$0.15-\$0.17
Smiths.....do.....	0 0 7-0 0 9	.14- .18
Smiths' mates.....do.....	0 0 5½-0 0 6	.11- .12
Iron turners.....do.....	0 0 8	.16
Wood machinists.....do.....	0 0 8-0 0 9	.16- .18
Viceman.....do.....	0 0 7-0 0 7½	.14- .15
Painters.....do.....	0 0 5½-0 0 7	.11- .14
Ornamental writers.....per week..	2 0 0-4 0 0	9.78-19.46
Foreman.....do.....	2 12 6-8 5 0	12.77-15.82
Clerks.....do.....	1 12 0-2 7 0	7.78-11.43
General laborers.....per hour..	0 0 5-0 0 6	.10- .12

All the above are day workers, except the ornamental writers, who are piece workers.

MANUFACTURERS.

Among the principal manufacturers may be mentioned the following firms, all in London:

Thomas Rouke, 15, 34, and 36 Iron Gate road, Paddington, whose specialty is hansom cabs; Hy. McMullen & Sons, 216 Long Acre; James Kempster, 39, 113, and 114 Long Acre; Holland & Holland, 479, 483 Oxford street; Patrick Hearne, Rodney street, Pentonville; Forder & Co., Limited, 7, 8, and 9 Upper street, Martins lane; Cook & Holdway, Halkin place, Belgrave square; A. Isaac & Co., 14 High road, Knightsbridge; Alford & Alder, 53 and 57 Newington Butts; Anglo-American Carriage and Cycle Company, 24 Middlesex street, Aldgate; C. S. Windover & Co., 20, 31, and 33 Long Acre; Henry Whittock, Limited, 10, 12, and 14 Earls Court road; Turrill & Sons, 23 Long Acre; Todd & Wright, 34 Craven road, Westbourne terrace; William Cole & Sons, 13 Young street, Kensington; Burlington Carriage Company, Limited, 315 and 317 Oxford street; Morgan & Co., 127-130 Long Acre; Bayleys, Limited, 42 Newington causeway; Bonallack & Sons, St. Georges Van Works, Cable street; Glover Brothers, 28 Cleveland place (London, W.); E. & H. Hora, Shenley Works, Peckham road, Camberwell; Webb & Sons, 42 and 44 Holland street (London, SE.); C. R. Whitmore, 279 and 281 York road, Battersea, (London, SW.); Taylor Brothers, 280 Hackney road.

It may here be pointed out that most four-wheeled vehicles are built

with the front wheels "swiveled" so as to turn at right angles, thus assisting in turning the vehicle in a small space.

AMERICAN VEHICLES IN ENGLAND.

The actual extent of American competition in England, in vehicles, is but small, the reason being that the vehicles in use here are necessarily of a more rigid make and style than those in vogue in the United States. It is very seldom that an American-made vehicle is to be seen in London.

The lighter patterns and makes do not, it would seem, inspire confidence as to their strength. The vehicles here are decidedly of a heavier build and their appearance much more clumsy than is the case with American vehicles. The best method of introducing, with success, the American article would be for a large firm (or for several firms together) to send over here good representative men to thoroughly study the particular styles, patterns, and builds of the various vehicles in use, and to notify their firm or firms in the United States exactly what class of build would likely prove most popular. One point may be mentioned, and that is that many of the roads in this country are narrow and the turnings abrupt, necessitating a greater freedom for the shafts by undercutting, in order that the vehicle can safely negotiate a corner.

There would appear to be a chance for the lighter class of American vehicle, in the introduction of well-built tram cars, more especially as it is the intention, at an early date, to inaugurate electric tram-car traction in London. I append herewith an article from a recent issue of the Daily Mail. Prompt action might result in the American vehicle manufactories securing large orders for cars suitable for the proposed new departure in this particular department of rapid transit. And no effort should be missed to provide satisfactory cars, in order that the foothold once obtained should be safely held against competition.

THE DOOMED TRAM HORSE—LONDON'S COMING REVOLUTION IN STREET RAILWAYS— ELECTRIC TRACTION IN EVERY DIRECTION.

Ten years hence, in an odd corner of the new South Kensington Museum, there will be exhibited among the curiosities of bygone ages a specimen of the present London tram car.

Teachers will take their classes and show it as a proof of the little value placed on time by men of the nineteenth century. People in 1900, they will say, were content to sit in such cars an hour to get from Holborn to Hampstead. The boys of 1910, who go from Charing Cross to St. Albans in twenty minutes, will pity the slow, old fossils of to-day.

The tram car of 1900 is doomed, and before long the tram horse will have disappeared from our streets.

London is on the eve of the greatest revolution in local transit since the introduction of railways. Within the next few weeks the United Tramways Company, which owns the lines from Hammersmith to Uxbridge and Hampton, will inaugurate the most magnificent system of electric cars in Europe. Its present carriages will be sold for what they can fetch, and an array of palace cars, costing £1,000 pounds apiece, will carry the lucky Westerners with the swiftness of racehorses.

County council follows suit.—As soon as possible the London County Council, which is obtaining the ownership of all the lines in its boundaries, will follow suit. An experimental line will first be built from Westminster to Tooting, and then there will be a general transformation. Fresh lines will be run out in all directions. One will go down Farringdon street, New Bridge street, and across Blackfriars to South London. Another will come along the Embankment from Putney into the very heart of the city. A third is proposed from Piccadilly circus to Grays Inn. In every suburb the steel tentacles will reach out, gripping all London in one great system.

The ugly and dark, ill-ventilated, uncomfortable, and crawling cars of to-day are to give way to a host of palaces on wheels, furnished in princely fashion, lit like the halls of the sun, gliding swiftly through the streets with a quick, easy motion. With great plate glass windows, free from disfiguring advertisements, with brilliant lights ahead and astern, splendidly upholstered, these cars will be dreams of luxury. To travel in them will be rest and recreation.

Each tram will accommodate nearly twice as many as the present ones, and if more cars are wanted it will be easy to run them on.

Where workmen will benefit.—The change is going to revolutionize London. Months ago the Prince of Wales, with singular prescience, declared that the one way to solve the great slum problem was to make it easy and cheap for the poor to reach the suburbs. When the workman can get from Finsbury Park to Piccadilly in twenty minutes for a penny, he will no longer box himself in a fetid city slum.

Statistics prove that out of every shilling now paid in fares the horse tram car costs about 10 pence. The electric car of the proper pattern will only cost about 6 pence. In other words, the new tram cars will yield London nearly a million a year profit.

AUTOMOBILES.

Owing in a great measure to the laws in force prior to the passing of the regulations supplementary to the "locomotives on highways act," which became law for six months from November 9, 1896, and have since remained in force, the motor-vehicle industry in Great Britain was greatly retarded, and the consequence is that to-day this country is far behind other countries in the practical adoption and use of these vehicles; and although the business is now assuming more importance year by year, it may be said to be still in its infancy. Some large firms have adopted motor wagons in place of the horse-drawn vehicles, but either because of the natural conservatism of the English character or the fear of mishaps and breakdowns, coupled with the high cost, the adoption of motor vehicles does not assume the popularity that, it is safe to say, will in a few years be extended thereto. I give a summary of the regulations now in force.

REGULATIONS FOR MOTOR CARS.

APPLICABLE TO ENGLAND AND WALES.

The following is a summary of the regulations issued by the local government board supplementary to the locomotives on highways act:

A light locomotive means a vehicle propelled by mechanical power, under 3 tons in weight unladen; only used for the purpose of drawing one vehicle, such vehicle and its locomotive together not exceeding in weight unladen 4 tons; not emitting any smoke or visible vapor, except from any temporary or accidental cause.

In calculating the weight of a vehicle unladen, the weight of any water, fuel, or accumulators used for the purpose of propulsion shall not be included.

It must be capable of being worked either forward or backward. The tire of each wheel must be smooth, with a breadth varying, according to the weight of the vehicle, from 4 inches to 2½ inches. There must be two independent brakes, each capable of preventing two wheels on the same axle from revolving. If a vehicle is drawn by the locomotive it, too, must have an efficient brake, controlled by a competent person, or else the brakes on the locomotive must be able to control the vehicle. The width of a locomotive must not exceed 6½ feet. A lamp is to be carried during the period between one hour after sunset and one hour before sunrise, exhibiting a white light forward and a red light in the reverse direction. If drawing another vehicle, it must have the name of its owner and his address conspicuously painted on it, together with its weight on the right or off side in letters white on black or black on white, not less than 1 inch in height. The weight must also be painted on every locomotive weighing unladen 1½ tons and upward.

Greatest possible speed is fixed at 12 miles an hour. If the weight be 1½ and does not exceed 2 tons, the speed shall be not more than 8 miles an hour. If the weight exceeds 2 tons, the speed shall be not more than 5 miles an hour. Whatever the weight, if used to draw any vehicle the speed shall not exceed 6 miles an hour.

This regulation has effect for six months, from November 9, 1896, and thereafter until the local government board shall direct otherwise.

General regulations.—The police are to regulate speed and stoppages for the convenience of the general traffic. A bell or other instrument shall give warning of the approach or position of the light locomotive. The ordinary rules of the road shall be observed. The name of owner shall be given whenever demanded by a constable or on the reasonable request of any other person.

A breach of any regulation may, on summary conviction, be punished by a fine not exceeding £10.

SCOTTISH REGULATIONS.

The limit of speed is fixed at 10 miles an hour if the locomotive be under 1½ tons unladen; if over this but under 2 tons, the limit is 8 miles, and from 2 tons onward the maximum is fixed at 5 miles an hour. Whatever the weight, if used to draw any vehicle the maximum speed must not exceed 6 miles an hour.

I am informed by one of the motorear manufacturing companies that "business is increasing by leaps and bounds, and there seems every reason to believe that there will be a great future for the automobile industry. We have secured some very large orders for steam vans, omnibuses, wagons, and lorries, which we are shipping out to some of the colonies."

Another company, which does not claim to have done very much toward building complete steam cars, states that it has given its attention more particularly to improvements in the various parts required

in connection with steam vehicles, and adds that it has recently sold patents therefor to the Locomobile Company of America, New York.

From a price list of certain electric vehicles recently offered for sale, it appears that the initial cost or charge ranged from £330 (\$1,616), for a brake to carry 4 passengers and driver, to £375 (\$1,824.94) for a Victoria.

A very interesting experiment was recently tried with motor vehicles of various grades and motive power, some being driven by electricity and others by petroleum and steam. A tour of 1,000 miles, extending from London to Bristol, thence to Birmingham, Manchester, Carlisle, Glasgow, Edinburgh, Newcastle, and return to London, was arranged, and the result was deemed very satisfactory. Many severe hill-climbing tests were included in the experiment, and in the course of the trial defects were noted, to which attention could be given with a view to, if possible, entirely eliminating such drawbacks in the manufacture of subsequent vehicles.

In my opinion, there is a good opening for the introduction of American motor vehicles, both for passenger locomotion and the carriage of goods. Both in the United States and France motor cars have been longer adopted and built than in Great Britain, with the result that the faults in construction to which the British manufacturer is now giving attention, have been in many cases either entirely overcome or lessened. In addition, the number of vehicles manufactured here is very small compared with the number turned out in the two countries named.

It is superfluous, almost, to add that many French vehicles (either French built or built here under French patent rights) are in use here, and there is no reason why the American manufacturer should not open up a good trade in England in this industry.

WM. M. OSBORNE,
Consul-General.

LONDON, *June 27, 1900.*

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