

AMERICAN IDEAS IN EUROPEAN MACHINERY.*

BY ELMER P. HOWE.

GROUP XIII.—MACHINERY.

The first impression of an American, entering the Machinery hall at the Exposition, was one of disappointment. Outside the American department, there was a conspicuous lack of novelty in the exhibited objects. In the small space allotted to the United States, there was more to attract the thoughtful, or the casual visitor, than in all the long hall beyond. The reason for this is not hard to find. For, laying aside certain tools which are adapted for the use of some particular country, there was no machinery but such as was well known in the United States, and such valuable improvements of late date as appeared, were generally of American invention, or have been adopted and to some extent developed in American practice.

It will not, I trust, savor of a boastful spirit to briefly examine the prominent mechanical exhibits with the view of discovering to what extent ideas from this country have been employed. In this attempt, as it will be almost impossible to

* While to Europeans the American department of the Machinery hall was by far the most interesting, from the great number of novel and labor-saving inventions it contained, the rest of the long building, was equally striking to the American visitor, from the lack of original machinery. The peculiar ability of the American mind in the matter of invention, is, for the first time, fully realized, in passing through the foreign departments. Coupled with this poverty of inventions of their own, the visitor from this country was struck with the frequency with which he came across well-known American ideas and machines among the exhibits of the different European nations. So common was this that the commission thought it worth while to suggest an examination of the Exhibition, with a view of presenting a brief catalogue of American inventions which have within a few years been adopted in Europe. This has been done partly with a view of showing how grand a field the Old World would become for our inventors, could some reasonable patent protection be had in Europe. From this examination the following article arose.—EDITOR.

state with accuracy the locality of every invention discussed, it will be assumed that the credit of an invention is due to the country where it is first made practical, rather than to the one where it is designed and patented.

Thus, the band-saw, one of the most useful of modern wood-working tools, was patented in England in 1808, in essentially its present form, but its use did not become general until it was introduced by the French, forty years later. The band-saw is, therefore, justly credited to the French.

Commencing with English machinery, among the steam-engines there was to be seen a small machine with a Corliss bed and ordinary slide-valves. It is known, however, that the Corliss engine is regularly built in England by at least two leading firms, and has become an accepted type in their steam engineering. In machine tools, Sharp, Stewart & Co., the rivals of Whitworth, exhibited an iron planer with Sellers' worm-gear and belt-shifting mechanism. The standard wood-working tools take advantage of our Daniels and Woodworth patents. Among the special machines, the Armstrong dove-tailer and Richards mortiser were prominent. The sewing and knitting machines were but variations of those made by our well-known firms. In general machinery and small fittings, quite a list of American inventions were noticeable; Pickering, Huntoon and Porter governors, Ashcroft safety-valves and gauges, Berryman feed water heater, Blake stone-crusher, Dudgeon hydraulic jacks and punches, differential pulley blocks, Stephens' vise, Peet valves, Cameron special pumps, Cope and Maxwell valveless steam-pumps, Dows soda water apparatus, twist drills, ratchet drills, self-centering chucks, etc. A late English invention exhibited was a complete copy of the idea of the Merrill atmospheric hammer, except that the cylinder instead of the piston was the moving part.

American iron working machinery has been copied very little in France, Belgium and Switzerland, apparently because they have not yet advanced so far as to perceive the need of our new ideas. There were Swiss imitations of twist drills and American chucks, but, as far as could be learned, they have not yet affected the exportation of the genuine American

productions. In the Swedish department were two lathes, almost exactly reproduced from those of the Putnam Machine Co., Fitchburg. The imitation extended to the form of the name-plate and table of gears. A firm from Berlin exhibited a lathe made from the designs of Pratt, Whitney & Co., Hartford, and a universal milling machine after Brown & Sharpe, Providence. The best manufacturers, it is fair to say, condemn this undisguised piracy. A German company, among many imitations of English tools, had a Sellers planer, of the same design as the one spoken of in the English department.

The large establishment of Heilmann Du Commen, in Alsace, acknowledge their indebtedness to the United States in many points of detail. The products of this firm illustrate the value of international expositions. Since the Paris exposition they have changed the design of many of their best tools, and have introduced improvements obtained there. This made their collection one of the most valuable in the German section. They are really French, however, as they have not been under German rule long enough to acquire the language. The Shaw & Justice spring-hammer, Burleigh rock-drill and air-compressor, Cameron and the Earle direct-acting steam-pump, were shown by German firms. The Danks furnace was shown in model by a German manufacturing firm.

Among the best steam-engine builders, the Corliss was the favorite model. Although there were but eight exhibited, six were in operation. Of these, three were almost exact copies from Mr. Corliss' pattern; the others were changed, whether advantageously or not is not to be decided here. Two were from Switzerland, one from Belgium, three from Austria, and two from Germany. Quite a number of other engines were fitted with automatic variable cut-off of one kind or another; in whatever form used, undoubtedly an American invention. There were several others with Corliss beds. Three engines (two in the Austrian department and one in the German) were fitted with the Rider expansion-valve.

The locomotives and railway appliances were most widely at variance with our practice. One Austrian builder had a locomotive with four large drivers and a four-wheeled bogie.

A large business is done at Buda-Pest, Hungary, in chilled cast-iron car-wheels. The trade has increased from 16 in 1853, to over 26,000 in 1868. They are most used on Saxon, Austrian and Russian roads. Ordinary American cars, with six-wheeled trucks, are employed in Würtemberg and on a few Austrian lines, generally for second and third class passengers. A system for warming cars by circulation of hot water, very similar to that in use here, was shown by a Geneva builder.

In wood-working machinery English models have been very closely adhered to on the continent. In the Swedish department, however, there were two poor imitations of the moulding machines made by R. Ball & Co., Worcester, and a planing machine, with fixed cutters, on a plan which has been condemned here. A Hungarian house exhibited a continuous rotary planer for surfacing short boards. The design is American and worthless.

The application of machinery to the manufacture of boots and shoes is peculiar to our country; consequently the exhibits in this industry were but inferior copies of well-known machines. An exception might be made in favor of Lemerrier, in the French department, who displayed an original machine for fastening on soles and heels by brass screws, and a lasting machine which was rather a hindrance than a help.

Sewing machines were exhibited by a great number of continental firms, as well as English, and their manufacture has become a standard business. It is, however, flattering testimony to the skill of our mechanics, that the American-made machines are sold in very large numbers in the European markets, at much higher prices than those of domestic make.

American breech-loading guns were shown in great numbers (the manufacture of European government shops), but it is needless to say not so well made, and apparently not so cheaply as our work.

Another prominent manufacture, founded on American invention, was that of Rubber in its various forms.

Of Agricultural implements, some are made according to the traditions of the country; some are copied from the

English. The mowers, rakes, harvesters and lawn-mowers, are American.

Such are some of the American ideas which would attract the attention of the ordinary visitor in passing down the Machinery Hall of the Exposition. Doubtless the specialist in almost any department would find others, but these, numerous and prominent in themselves, are the more striking, because they do not appear to be matched by corresponding invention on the part of the various nations which have adopted them.

Undoubtedly our superiority is due to two causes: our higher grade of education and our patent system. In education they are rapidly improving. In special technical education they are to-day our superiors; and they can adopt our patent system.

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