PRESSED STEEL CARS.

Most revolutionizing inventions are practically developments, and though one man may finally succeed in giving to it a useful existence, the germ of the idea dates back many years. This is the case with the new pressed steel car, which is producing remarkable changes in American railroading. Although it has only succeeded in attracting general attention in the last year or two, it is not exactly a new invention. It is an evolution of the old wooden freight car through the structural steel car to the modern product, which is made of large sheets pressed into shape by machinery.

It was some thirty years ago that the first steel car was built in France, and that first clumsy attempt of 1869 is in a good state of preservation to-day. It is cited often by authorities to show that the life of the steel car is much greater than that of the old wooden structure. The modern steel cars made in this country are all of such recent manufacture that they cannot be quoted as samples of longevity. The known life of a wooden freight car is fifteen years, and half a century of use in this country has demonstrated that sufficiently to make it a positive fact. Although the first French steel freight car is in good condition to-day, it may not necessarily follow that the modern pressed steel cars used on American roads will have an equally long average life; but there is good reason to suppose that they will far exceed the useful lifetime of wooden cars. Painting often and thoroughly to prevent rusting will be an important factor in determining the life of a steel car, and a great deal will depend upon the amount of attention given to its rolling stock by a railroad in settling the much mooted question.

The modern pressed steel car, more generally known as the Schoen car after the inventor, Charles T. Schoen, is now in general use and demand on most of the railroads. In 1897 there were not more than a few hundred in existence, but to-day the Baltimore and Ohio road has over 6,000 in use, the Pennsylvania some 4,500, the Pittsburg, Bessemer and Lake Erie 2,000, the Philadelphia and Reading, the Lehigh Valley and Chicago and Alton, Great Northern, Lake Shore, Erie, Union Pacific, Pittsburg and Western, and Chicago and Eastern Illinois about 1,000 each. Nearly all of the other prominent roads, East and West, have placed orders for the new type of cars, and it is only a question of time when most of the old wooden freight cars will be replaced by the pressed steel cars. Fifteen to twenty small coal roads and private ore companies operate from fifty to five hundred of the cars. Many of the coal and ore mining companies find them far more serviceable than the ordinary type.

The Fox Pressed Steel Equipment Company was the first pressed steel concern established in the country, and a fine plant was in operation at Joliet, Illinois, before the Schoen pressed steel car had been invented. In 1897 the Schoen Pressed Steel Company was organized for the manufacture of the pressed steel cars, and a plant established in Pittsburg. In 1899, January 12, these two companies operating in pressed steel products were consolidated as the Pressed Steel Car Company, with a capitalization of $25,000,000. The consolidated company owns one large plant at Pittsburg, where pressed steel cars are made exclusively, another where steel specialties, such as truck frames, bolsters, counter planes, and general miscellaneous car parts are manufactured, and the Joliet plant for similar car specialties. The capacity of the car plant when running to its utmost limit is 100 cars a day, and this daily number has frequently been turned out during the past year to meet the demand.

The new type of cars are constructed entirely of steel, all the parts except the sheets that make up the sides, ends and flooring being forced into shape directly from the uniform sheets of steel by hydraulic presses of great power. The structural steel cars by virtue of their shape and riveting weigh about 10 per cent more than the pressed steel cars. The former had already sounded the doom of the old wooden freight cars, and on all the roads handling heavy freights the steel cars were rapidly displacing the old wooden types. The saving in weight by pressing single sheets of steel into shape to make the cars is not the only advantage obtained in the modern article. The sheets of steel can be made heavier at certain points where the strain is the greatest without increasing the general thickness of the sides throughout. Thus at the corners and at various other points the thickness of the pressed steel cars is quite double that at other places. There is a direct economy of material in this work which proves an important item in the manufacture. Of course there is more or less riveting required, but there is about 60 per cent advantage in the number of rivets used and their consequent cost and weight over the structural steel cars.

In recent years the low transportation rates that have of necessity prevailed on most of our railroads have worked havoc with the profits of even some of the best-equipped roads, and many of the weaker ones have been forced into bankruptcy. The effort to economize in every possible way seemed a hopeless task. Some roads were making their profits on passenger traffic and conducting their freight department for the love of it until better times returned. But it is not likely that freight rates will ever advance to their former figures. Everything points to a gradual lowering of transportation rates both on land and water. There was consequently an imperative demand for some freight car that would have a carrying capacity sufficient to enable the roads to earn dividends in handling bulk freight. The modern steel cars were the outcome of this universal demand.

The standard wooden car of about 30 tons costs today about $725, which is in excess of a steel car of the latest pattern. The standard wooden car, with a carrying capacity of 30 tons, weighs 30,000 pounds, and when loaded the ratio of the load or paying freight to the total weight of car and cargo is 66·67 per cent. The pressed steel cars, with a carrying capacity of 50 tons, weigh only 34,000 pounds, and when loaded the ratio of the load to the total weight of car and cargo is 74·60 per cent. In the larger steel cars, those of 55 tons for instance, the ratio of the load or paying freight to the weight of car and cargo is a trifle over 75 per cent.

The whole question of profit or loss is often decided by this ratio of paying load to the total weight of loaded car, and the matter of figuring out a profit on lines where the freight charges must of necessity be the lowest is one of securing the right cars. Roads equipped with the latest freight cars have made higher mileage profits at as low rate charges as other roads equipped with the old-style cars. Freight profits differ widely on different roads. There is the question of competition, long and short hauls, and character of the freight to be considered; but there should be some average struck to show the relative superiority of one car over another. The Pittsburg, Bessemer and Lake Erie holds the record for the highest train-mile earnings in this country, and with 50-ton pressed steel cars, 30 cars to the train, it earned $5.38 to the mile in hauling iron from Lake Erie to Pittsburg and coal back to the lakes. This heavy earning capacity must not be attributed entirely to the use of the new style of freight cars; but other important roads, equipped with old wooden cars, were making at the same time earnings that varied only from $1.47 to $2.73 to the mile. These latter roads were widely distributed over the East and West and were engaged in hauling a great variety of freight. Thus the New York Central's train-mile earnings for the same year were $1.84, the Great Northern $2.73, the Northern Pacific $2.70, the Erie $1.47, and the Chesapeake and Ohio $1.38.

Figures of course speak on a railroad's balance sheets more plainly than words, and when the year's comparisons of the different road earnings are presented, there is always an investigation to discover the reason for one road's superior earning capacity over that of another. One road may thus lead in innovations for a time, but the others are sure soon to follow. With the clear demonstrations of the superior earning capacity of steel cars over the wooden structures, it is only a matter of a short time before the wooden cars will be relegated to the past. They are just as surely doomed as the old horse cars of our city. Meanwhile improvements in the steel cars may still further revolutionize the freight traffic of the country.

FRENCH CONGO REGION.

The bulletin of the French-African Committee gives an analysis of the report recently published by the government of the French Congo as to the situation of that region in 1898. A notable increase in the commercial movement is marked; during the year the total figure for the imports and exports reaches $2,108,000, which is an increase of $338,000 over the preceding year; the greater part of this commerce is with foreign countries, especially England. Of the products exported by the country, that of caoutchouc will be the most considerable, as soon as measures have been taken to stop the depredations made by the natives upon the rubber-producing plants, and the industry will be greatly increased when proper facilities for transportation have been provided. Experiments have been made on the cultivation of the cocoanut, coffee, tobacco, clove, vanilla, and other plants, which have proved quite successful. The report gives interesting details as to the postal service in the region and the meteorological conditions. The primary schools are conducted by the various missions; there are 52 schools, counting 2,654 pupils.

ANTI-ALCOHOL SERUM IN FRANCE.

Drs. Sapelier, Thebault and Broca have advised the French Academy of Medicine that they have discovered an anti-alcohol serum. They stated that their experiments proved that a horse fed for a certain time on doses of alcohol and food mixed with alcohol furnished a serum antiethyline which, injected into victims of the alcohol habit, gave them an absolute distaste for the liquor. Dr. Sapelier has sent a second communication to the Academy stating his methods and results obtained. He cited fifty-seven cases of drunkards treated by antiethyline; thirty-two cases were successful, or sixty per cent: fifteen per cent had their condition improved, and the failures amounted to twenty-five per cent which was caused by irregularity in following the treatment, or from physical defects considered as unfavorable. It has been stated that the success obtained by the injection of anti-alcohol serum is due to imagination or auto-suggestion, but this is refuted by Dr. Sapelier, who states that the hysterical and impressionable patients figure among the failures, or those who were merely improved in condition. The three doctors have deduced an ingenious theory from their system. They say that the action of anti-alcohol serum awakens reflex acts which, as a whole, constitute originally the instinctive distaste of man for alcohol, thus re-establishing a natural habit in place of the induced habit.

PARIS EXPOSITION NOTES.

Among the interesting exhibits in the American section at Vincennes is that of the McCormick Harvesting Machine Company, who have built a special pavilion near the Machinery Building; it is of tasteful construction, and contains a number of agricultural implements, many of which are shown in operation. A small model of the company's works at Chicago is to be seen; it is represented in motion, with the small boats moving along the Chicago River, railroad trains, etc. Another model is that of a farm, with different agricultural machines in operation. The pavilion was recently inaugurated by a ceremony at which Mr. McCormick, Mr. Peck, and a number of American representatives were present.

The United States section in the department of textile fabrics has recently been opened; the exhibits give a good idea of the American industry in the lines of textiles, furs, boots and shoes, hats, and like manufactures. A number of fine sets of furs are to be seen. An interesting feature is a series of shoe machines which are in actual operation, showing the American method of manufacture. The exhibit of silks and other fabrics is also of interest, as well as that of clothing, hats, etc. A moving staircase, or inclined way, of American make, conducts the visitors to the gallery above. It differs from the platforms of French make in that it is made up of a series of steps, the latter being constructed on the endless belt system; of these there are a number in different parts of the Exposition.

The first illumination of the Electric Palace and Fountain took place on the evening of May 27. An immense crowd had gathered to witness the sight, and at 9 o'clock the circulation became difficult in this part of the Exposition. The public were not disappointed, for not only was the front of the Electrical Palace lighted up with a succession of colors, but also the fountain of the Château d'Eau was illuminated for the first time. The appearance of the fountains when viewed during the day is pleasing; the jets of water in the various basins are projected to a considerable height, and a number of sprays are sent into the basins from different sculptural groups around the border. At night, when the light is sent up from below into the jets, a strikingly brilliant effect is obtained, and the cascades appear blue, green, purple, or golden, as the different colored lights are used in succession; the fountain is thus visible from all parts of the grounds. The rich carvings and reliefs of the great central arch reflect the light of different colors, and are thus seen under a new aspect.

A number of handsome pavilions have been erected on the upper floor of the Electrical Palace; some of these represent different governments, and others have been built by private firms. Among the latter the Allgemeine Electric Company, of Berlin, is the largest and most attractive; it comes next to the United States Pavilion. It is built of white staff, of square form, surmounted by a dome. The sides and dome are ornamented by a vine and leaf design in iron and repoussé metal of handsome construction; it contains incandescent lamps at intervals, and a number of lamps are placed around the pavilion; the reliefs in staff, of a somewhat grotesque character, are very pleasing. The interior is frescoed in different designs, some of which show the interiors of different electrical shops. A number of interesting electrical exhibits are to be seen, both in the interior and exterior. The pavilion is to be lighted in the interior by Nernst lamps, and small dynamos, motors, measuring instruments, Roentgen tubes, etc., are to be seen. The same company has erected another structure in the gallery at the end of the main dynamo room; it is built of repoussé copper in various designs, with stained glass, and is surmounted by a dome. The interior contains exhibits of various cables for telegraph and telephone; for high tension, etc., as well as a fine display of insulating material. The attention of the public is attracted by the noise of a large spark which is passed across a sheet of mica from a high-tension transformer. A system of wireless telegraphy is to be established, which will make communication between the two pavilions, and show the recent German types of this apparatus. It may be remarked that the exhibits of German dynamos and electrical apparatus are among the finest in the electrical section and have received many favorable comments.