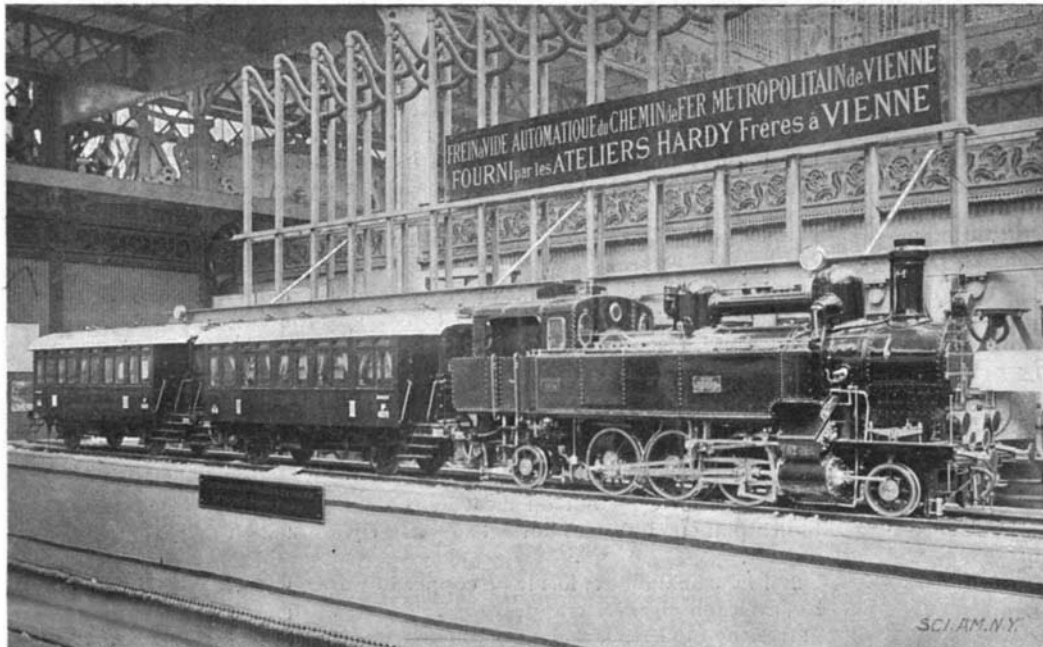


MODELS IN AUSTRIAN SECTION OF THE PARIS EXPOSITION.

In the civil engineering section of the Paris Exposition are to be seen a number of models showing the public works which have been carried out in different countries of Europe. The Austrian exhibit contains two models of this kind, which illustrate a series of improvements lately inaugurated in Vienna. The first of these is the Metropolitan Railway system, which is now practically finished. For several years the need of a rapid transit system was felt in that city, and a number of projects were studied. The Emperor Francis Joseph, in his annual discourse of 1891, expressed the wish that the affair might be carried out in the near future. This led, in fact, to active preparations on the part of the government. The idea of the Metropolitan was not only that of transportation with-

in the city limits, but also to make connection with the suburbs, even those at some distance; it was to be used for freight transportation and to supply the city with provisions. With this in view, the work was carried out on a large scale. The line is double track throughout, with an extensive signal system. Two large main stations have been erected; the first of these is at Heiligstadt, on the Francis-Joseph line, and the second at Hütteldorf-Hacking, on the West line. The system includes four different sections, which have a total of about 16 miles. The first is a suburban line which passes from Heiligstadt to the western part of the city and thence to the suburbs. The Belt line, the second, runs parallel to the first as far as Nüssdorf, then skirts the city to Gumpendorf, joining the lines of the Vienna valley and that of Vienna-Trieste. The third section, that of the Vienna valley, leaves from Hütteldorf and follows the river to the Custom House, with a junction to the Praterstem Place; it makes connection with the Vienna-Warsaw and other main lines. The last section is that of the Danube Canal, starting from the Custom House station; it follows the canal to Heiligstadt, with a branch line to the Belt railroad. The first three of these lines are now completed and the fourth is to be finished next year. The construction was carried out with great difficulty and expense, owing to the nature of the ground to be passed over and the necessity of satisfying the different conflicting interests, but the work of the first three lines was finished in the beginning of 1897. According to the configuration of the ground to be passed over, the line is in some places elevated, and in others it runs in a tunnel or cut. The elevated portions are generally supported upon a viaduct, and it is only in a few places in the outlying districts where it runs on an embankment. Over certain wide streets metal bridges have been constructed; these are ballasted to deaden the sound.

In the illustration will be seen a well-executed model of the locomotive and train used on the Metropolitan. The road has been

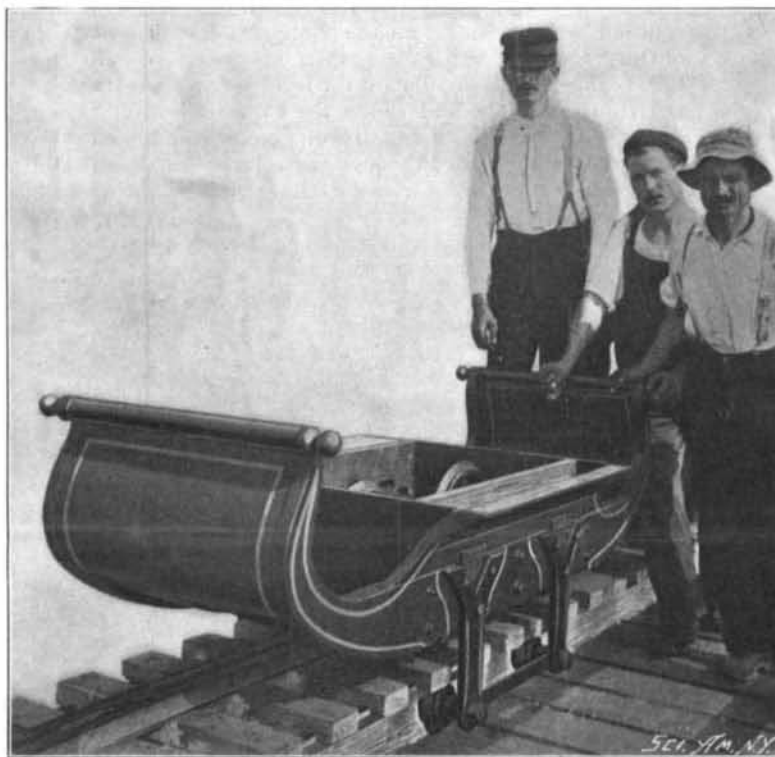


MODEL OF LOCOMOTIVE USED ON VIENNA METROPOLITAN ROAD.

laid out under conditions which differ considerably from those of a main line; the grades reach two percent and the stations are very near together. It is necessary to provide heavy locomotives, having great trac-

first-class cars being suppressed. A system of vacuum brakes, manufactured by Hardy Brothers, of Vienna, is used. The trains run from 5:00 A. M. to 11:00 P. M., and when the system is entirely finished, the interval between trains will be from 3 to 6 minutes, with 12 minutes on the Belt line.

The erection of the various stations of the road was carried out in consultation with one of the leading architects of Vienna, M. Otto Wagner. Besides the two main depots of Hütteldorf and Heiligstadt and that of the Custom House, are those of Gersthof, Hernalis and Ottakring, for passengers, and that of Michelbeuern for market products. There are numerous way-stations upon all the lines. At the main stations five or six platforms are provided, one for each line; they are joined by underground passages in most cases. For the lines below the level, the superstructure is relatively light, and contains only the different offices; for the overhead lines a structure of much larger size is erected.



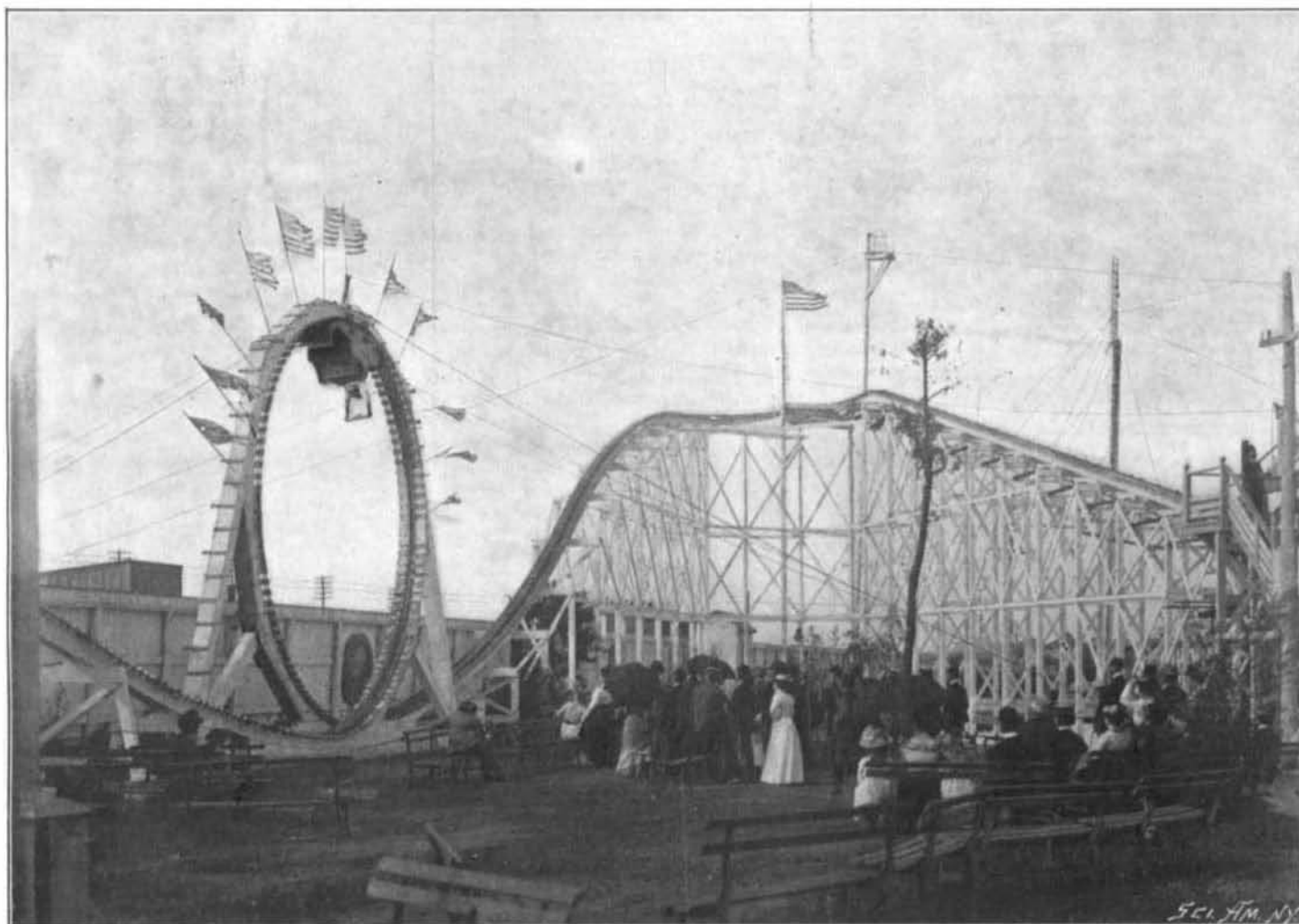
A VIEW OF THE CAR.

CONEY ISLAND'S CENTRIFUGAL RAILWAY.

That discoveries and inventions of great scientific importance are often applied to the purpose of contributing to the pleasure of the amusement-seeking public is proved clearly enough by the mechanical toys and scientific curiosities sold in the shops of our large cities. One of the most remarkable of such applications of scientific methods, remarkable chiefly for the size of the apparatus employed and for the curious phenom-

enon presented, is to be found in the Boyton centrifugal railway, which has been added to the attractions of Coney Island. It can be safely said that those who have ridden in one of the cars of this odd road of Boyton's have been very strongly impressed with the meaning of the term "centrifugal force."

The railway consists of an elevated track curving upward and downward near its middle to form an oval loop, the vertical or major axis of which is 24 feet long and the horizontal or minor axis 20 feet long. The cars used are 6 feet long by 3 feet



THE BOYTON CENTRIFUGAL RAILWAY, SHOWING THE CAR AT THE HIGHEST POINT OF THE LOOP.