TALL OFFICE BUILDING MODEL FOR THE WORLD'S FAIR.

The many-storied office building, with its skeleton of steel and paneling of brick, stone and glass, is essentially an American production. It is pretty generally admitted that the composite building originated in this country, and whether it did or not, it is certain that its structural possibilities, as exemplified in the towering structures at the lower end of Manhattan Island, have been developed and demonstrated almost exclusively on this side of the Atlantic. The construction of the very remarkable model, which forms the subject of our illustration, is due to the desire of the Western Society of Civil Engineers to adequately represent the branches of engineering which are concerned in tall office building erection, at the Paris Exposition. At the request of the society, Mr. Corydon T. Purdy, of this city, undertook the work of getting up a suitable exhibit, and to this end selected the Broadway Chambers office building, as being one of the very latest structures of the kind to be erected, and as being thoroughly representative of the best class of construction. The plans of the building were furnished to Mr. H. C. Hinchcliff, of this city, who undertook to construct a model on the scale of half an inch to the foot, or one-twenty-fourth of the real size for the sum of $5,000.

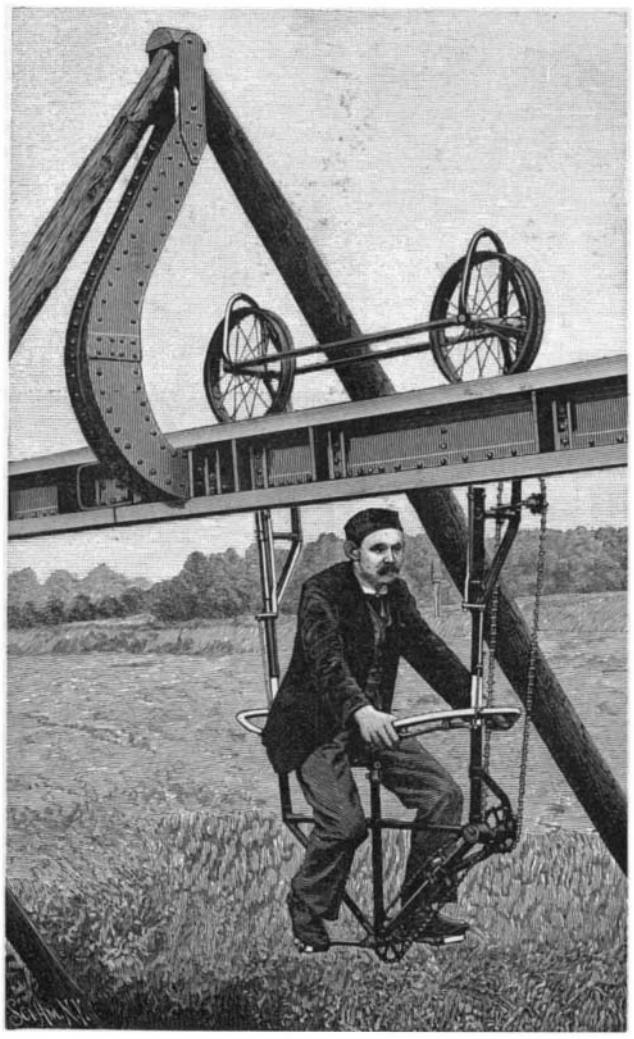
The model stands about 12 feet high, and weighs altogether about 2,300 pounds. 1,500 pounds being the weight of the base and 800 pounds representing the weight of the brass out of which the whole of the I-beams and columns have been constructed. The model contains altogether 30,000 separate pieces, the extraordinarily large number being explained by the fact that not only does the model represent each column, I-beam and girder in the structure, but each of these members is built up of as many separate pieces of sheet brass as there are separate pieces of steel in the completed building. Thus, for instance, where a main column is built up of say two web plates, two cover plates, and a certain number of angles, the model faithfully represents both in shape, thickness and number, the separate pieces. The joints of the main columns are located in exactly the same positions as they occur in the building itself, and every gusset, stringer, and floor beam is found in the model. Indeed, the only pieces that are wanting are the bolts and rivets which, for obvious reasons, could not be reproduced except at a great increase in the cost. The foundations, as will be seen from the detail view of the model, are faithfully represented, and visitors to the Fair will receive an interesting object lesson in the methods adopted by our engineers to distribute the enormous concentrated loads inseparable from these buildings. The elevator system, without which the tall building would have been impossible, is shown in the model by four beautifully constructed models of the Otis elevator, which are in exact proportion and are capable of being operated. To the right of the elevator is seen the system for supplying water throughout the building, which, in the case of the Broadway structure, is forced up to the various stories by compressed air.

Around the model will be arranged various exhibits, some of them on a full-sized scale, of the different industries which are represented in the construction of a tall office building. One of these exhibits will be a plaster-of-paris model of the structure as completed. Another will be a model of a single office room, showing the fire-proof construction of the floor and partitions, and the general finish and fittings. There will also be models of the electric lighting plant, showing the dynamo-engine, system of electric wiring, and various fixtures. Another exhibit will present the sanitary and plumbing arrangements; another the steam heating; while Carnegie & Company will exhibit some full-sized sections of the steel frame work. After it has served its purpose as an exhibit in Paris, the model is to be used as a selling sample, providing in this respect a better representation of the work than is afforded by a wash drawing and a set of blue prints.

THE Western Locomotive Works is building two locomotive of armor plate steel. The working pressure is to be 225 pounds to the square inch.

THE MONO-RAIL TRACK VELOCIPEDE.

The ordinary track velocipede as used on our standard railways is a familiar object and withal a most useful aid to railway superintendents, road masters and maintenance-of-the-way engineers in the performance of their duties. The ordinary velocipede is a four or three-wheeled affair propelled, in the older forms, by a regulating shaft, operating through levers on the cranks, and in the later forms by regular bicycle chain-and-sprocket driving gear. In the course of the development of the Langen single-rail railway, illustrations of which were given in our last issue, it was realized that a velocipede would prove a particularly convenient means of inspecting the line and moving from one part of the work to another. As it was evident that all the advantages claimed for suspended cars would apply very well to the suspended velocipede, the unique machine shown in the accompanying illustration was constructed, and subsequently proved to be thoroughly practicable.



THE MONO-RAIL TRACK VELOCIPEDE.

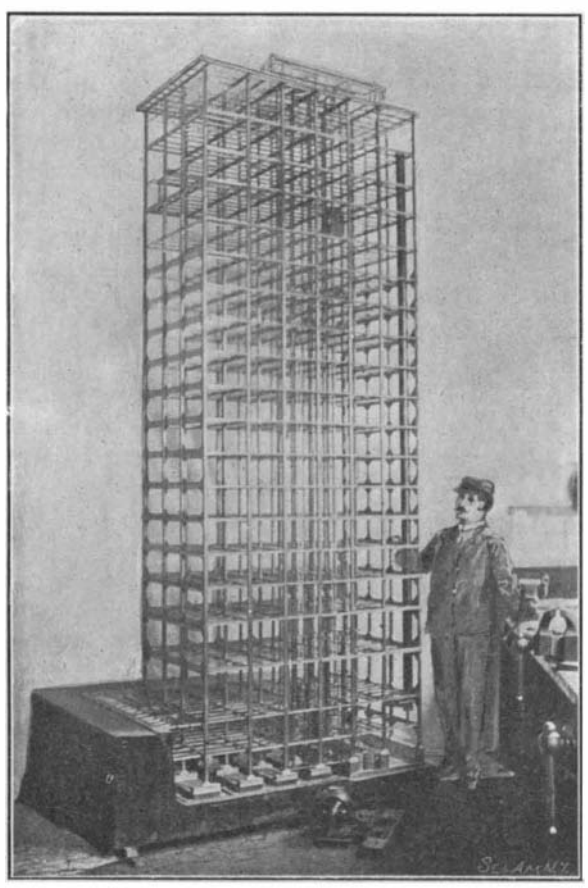
The suspended railway upon which it is traveling differs considerably from the form adopted on the line through the Wupper Valley. It will be seen that the elevated girder is suspended by means of hook-shaped plate steel supports from the apex of a couple of inclined poles, the hanger resting upon the tops of the poles by means of a pair of plate straps riveted to the hanger and to the saddle. The rail in this case is a continuous built-up I-beam, the upper flange of which forms the track.

The velocipede is suspended from and forms part of a two-wheeled truck, the forward wheel of which carries on its axle the sprocket which is engaged by the chain drive. The suspended frame is built of bicycle tubing, and its construction is so clearly shown in the engraving as to need no detail description. To enable the machine to be run in either direction, it is provided with two handle-bars, one on each vertical member of the frame, the saddle being reversible in the seat post. Each handle-bar is provided with a brake lever which, by means of sliding rods attached to the vertical members of the frame, enables the rider to press a brake shoe against the under flange of the suspended railway.

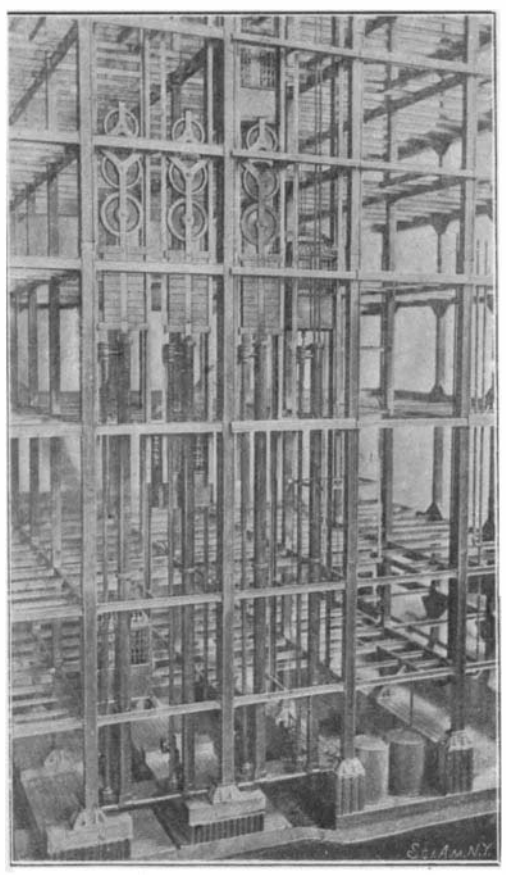
Bromide Paper for Amateur's Use.

It is generally believed that the preparation of bromide paper involves great difficulties, and in consequence is practically impossible for the amateur. However, these difficulties are not insurmountable, and with careful and clean operation successful results may be obtained. Besides, the paper thus prepared presents certain advantages over the paper of commerce, for by modifying the composition of the emulsion, the final tone may be varied, and shades from red to sepia and black may be obtained without varying the development. As the same emulsion may be used to give these different tones, one may prepare as much of each color as is necessary. When, for instance, the required amount of paper of black tone has been prepared, the same emulsion may be utilized to obtain other shades by the simple addition of certain chemicals. Mr. Thorne Baker gives the following process, which he has used with success: 2 grammes of Nelson's gelatine No. 1 are swelled in 28 c.c. water; it is more convenient to do this in a graduated measure placed in a cylindrical vessel of larger dimensions. When the gelatine has absolved all the water, it is melted by slightly heating the water in the outer vessel, which is filled to three-quarters the height of the graduate. When the gelatine is melted, 1·2 grammes bromide of ammonium are added, and the mixture introduced into a flask previously rinsed with distilled water, then a solution of 1·7 grammes in 28 c.c. water is added, this latter operation being carried out in the dark-room. The mixture should be well agitated. The emulsion is then heated to 65° C. for ten minutes, then filtered through four layers of fine muslin; it is thus filtered three or four times and then cooled. When completely cool, the emulsion is cut into small pieces and placed upon canvas, the four corners of which are then brought together and the emulsion forced through the canvas. After this operation it should be carefully washed with distilled water, preferably in a funnel suitably arranged for the purpose. The emulsion is then remelted in a porcelain dish placed in a larger vessel containing hot water. To sensitize the paper, it is floated for three minutes upon the emulsion, drained, and dried flat upon blotting paper. The paper thus prepared gives black tones. To obtain brown tones, only 1 gramme of bromide of ammonium is taken, to which is added 0·2 gramme iodide of potassium. The sensitiveness of the paper varies according to the quantity of haloid salts present. For development a dilute bath of hydrochinon, alone or in combination with metal, may be used.

ACCORDING to The Daily Graphic the backwardness of the authorities in London in adopting the mechanical inventions of the century is most extraordinary. In London the men who clean the street are provided with shovels, pick-axes, antiquated carts and inefficient brooms which have little effect upon an inch or so of melted snow. A short time ago a rude snowplow made of boards, weighed down by a tree-trunk, was to be seen in Battersea Park and a few open places. In Paris the heaviest fall of snow is gotten rid of in very short order with the aid of tools, squeegees and revolving brushes which sweep the slush down splendid drains.



MODEL OF TALL OFFICE BUILDING FOR THE WORLD'S FAIR.
Cost, $5,000. Number of pieces, 30,000.



DETAILS OF FOUNDATIONS, SIDEWALK, AND ELEVATORS.