

THE WORLD'S FAIR BUILDINGS AT CHICAGO.

The designs for the various buildings of the Columbian World's Fair are being rapidly approved by the committee. We publish the accepted designs of the Electrical Display Building, the Fisheries Building, and the Transportation Building.

We are indebted to our enterprising contemporary the Chicago Graphic for the engravings.

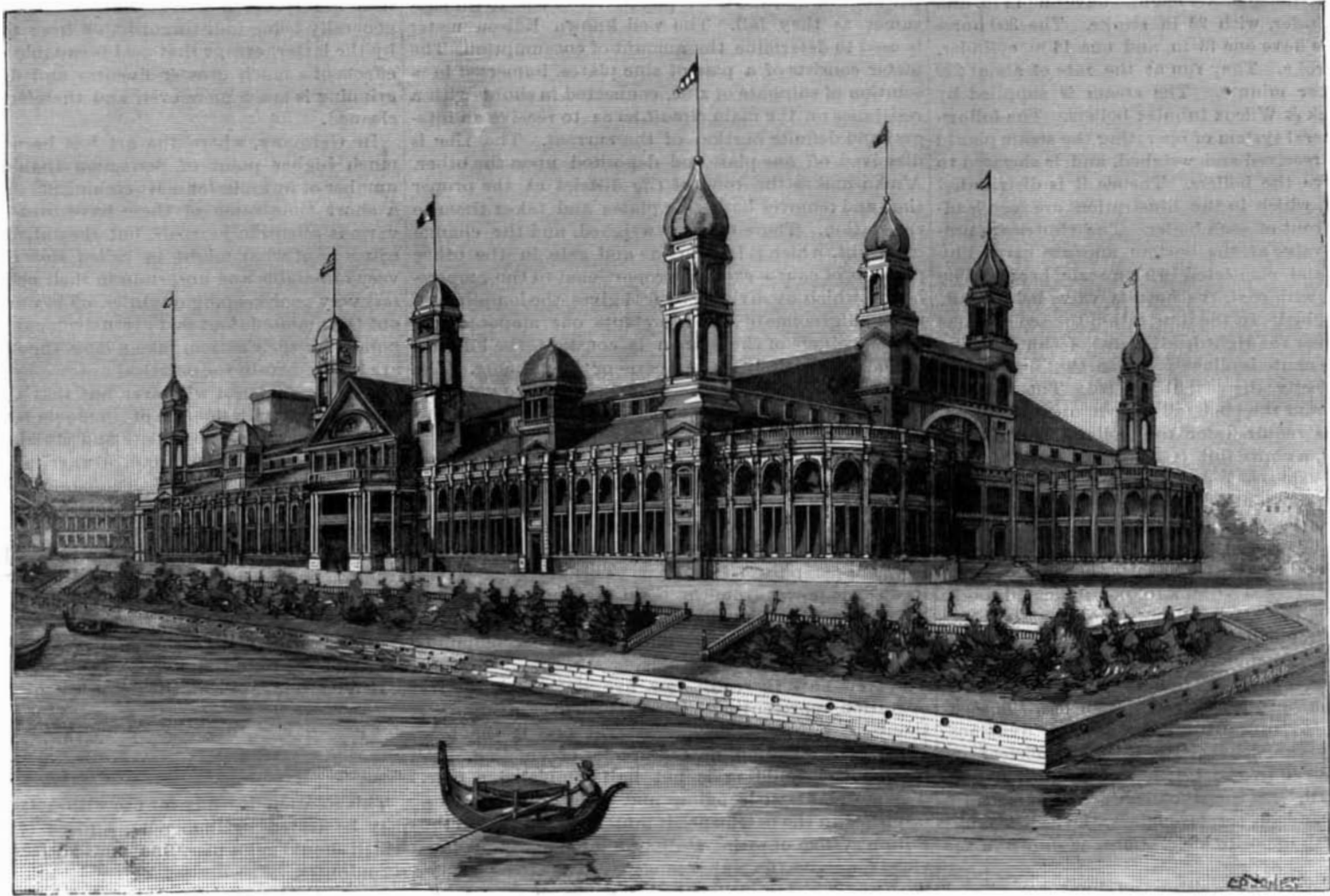
The Whitehead Torpedo.

The success of the small Chilean gun boats in sinking the large war ship of the rebels, the Blanco Encalada,

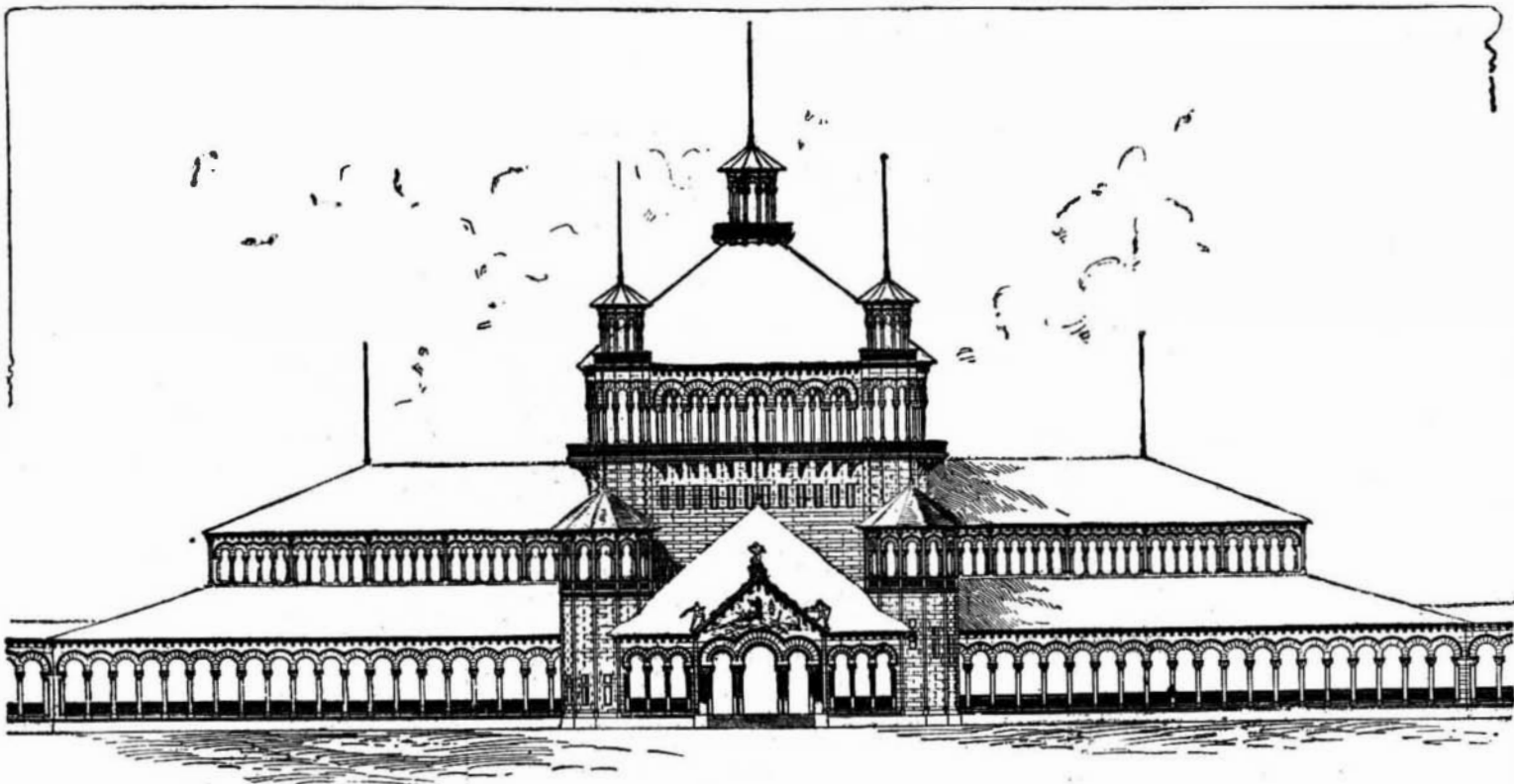
by which the torpedoes are arrested or caused to explode harmlessly at a sufficient distance from the structure to prevent damage, makes it desirable to have net cutters. But nothing efficient has yet been produced. There is unquestionably a great field for the invention of new improvements in respect not only



TRANSPORTATION BUILDING.



ELECTRICAL DISPLAY BUILDING.



FISHERIES BUILDING.

ACCEPTED DESIGNS OF BUILDINGS FOR THE COLUMBIAN EXPOSITION.

Ground has been broken and the work on the exhibition has been actually begun, and will be pushed with energy and vigor. The designs for some of the buildings are very beautiful, and the lagoon, the bridges, the boats, and the columns surmounted by statues of Victory and Liberty that will line the approach to the exhibition from the lake will be novel and very imposing.

by means of Whitehead torpedoes has given renewed interest in that class of missiles. At the naval exhibition now in progress in London, the latest improved specimens are shown, among them an 18 in. torpedo which, with a speed of $28\frac{1}{2}$ knots for 600 yards (a rate of over 33 miles per hour), carries nearly 200 lb. of explosive. The adoption of nets projected from the side of a ship,

of torpedoes but naval appliances of all kinds. A remarkable feature about it is the bluntness of the head, showing the advance of ideas in this respect. In the nose of the torpedo is a long striker with a needle point, which causes ignition of the explosive on coming violently in contact with any hard substance, such as the bottom of a ship.

A Remarkable Woman.

Mrs. Deborah Powers, head of the banking firm of D. Powers & Sons and of the great oilcloth manufacturing firm of the same name, died at her home in Lansingburg, N. Y., on May 28, at the age of 101 years. She had resided in Lansingburg for seventy-five years. She left an estate valued at two millions of dollars. She retained her mental faculties unimpaired almost to the very last.

Mrs. Powers was born in Hebron, N. H., on August 5, 1790. For eight years prior to her marriage earned her livelihood by tailoring and spinning. On February 22, 1816, she married William Powers, whom she had known from childhood, and who was a school teacher in Lansingburg.

Soon after their arrival in Lansingburg, Mr. Powers had his attention attracted by a piece of floor cloth in the bottom of a carriage, and, having some knowledge of the manufacture of table oilcloths, determined to attempt the manufacture of the article. His experiments were attended with so much success that he soon abandoned school teaching. Mrs. Powers was her husband's only assistant for some time, but the business increased so rapidly that more room and additional help were necessary. In 1829 the building of a large factory was begun.

In that year Mr. Powers was burned to death while making varnish, and Mrs. Powers was badly injured while trying to save him. Left with two small children and an unfinished factory on which a large sum was due, Mrs. Powers did not despair. She bent all her energies to the continuance of the business, with such success that in 1842 she had a fine business, a large factory free from debt, and a large sum of money. Mrs. Powers spent hours every day in the office and factory until about twenty years ago, when she surrendered the personal control of the business to her son. In 1877 Mrs. Powers organized the private bank of D. Powers & Sons, and its patronage was soon large and lucrative, everybody having confidence in Mrs. Powers' ability. It is now one of the most popular banks in that part of the State, and Henry L. Lamb, at one time superintendent of banks, is the cashier.

Grub Fungus.

We lately received from a correspondent in Bolivia a specimen of the above, also another specimen of the same character from a correspondent in Vermont. We submitted both specimens to Dr. C. V. Riley, of the Entomological Bureau at Washington, who writes us as follows concerning them :

"I have received from your office a letter from Myron E. Sprague, Plymouth Union, Vt., also a translation of a communication from Marco D. Paredes, La Paz, Bolivia, both accompanied by specimens of a fungus growing from the larva of a Lamellicorn beetle. Mr. Sprague's specimen was the common white grub fungus which I have figured and described in the *American Entomologist*, vol. iii. (June, 1880), pages 137 to 140. This fungus was formerly known by the name of *Torrubia militaris*, but is now placed in the genus *Cordyceps* and the specific name now given to it is *Ravenelii*. It infests a number of different insects. The Bolivian form is very similar; the larva is closely allied to the white grub, belonging to the same series of earth-inhabiting Scarabæids. The fungus cannot be specifically determined, as it is entirely sterile, but it is without doubt a species of *Cordyceps* and closely allied to our North American species."

Watch Glasses.

It is interesting to know something of the details and labor connected with the production of these handy adjuncts to the laboratory. The glass is blown into a sphere about a meter in diameter, sufficient metal being taken to give the required thickness, as the case may be. Disks are then cut out from this sphere with the aid of a pair of compasses having a diamond at the extremity of one leg. There is a knack in detaching the disk after it has been cut. A good workman will cut 6,000 glasses in a day.

THE TRAIN STAFF BLOCK SYSTEM.

Although single track railways are rapidly becoming a thing of the past, there are still many such roads in the country, some of which will be changed to double or quadruple track roads in obedience to the exigen-

without some very perfect block system, which will prevent the entrance upon a given section of trains from opposite directions, and also limit and control the number and movements of trains passing in either direction. This has been accomplished in various ways by means of electrical devices, mechanically operated semaphores, etc., but a simpler and more effective system is in use upon the Shore Line Division of the New York, New Haven and Hartford Railroad, where the train runs over several miles of single track. The system is as simple as it is effective. It was brought from Europe some time ago by Mr. Charles P. Clark, president of the road, and it has been in successful operation ever since. For our information we are indebted to Mr. Wm. A. Waterbury, superintendent.

At each end of the single track section, in the house of the switchman, is placed a box containing tickets, which are red at one end of the section and white at the opposite end. The box is provided with a lock which can be opened only by a key carried in the end of a staff upon which is mounted a plate bearing the words "Niantic and New London." The key is movably mounted in the staff so that it may be slid out for use, or drawn in for protection. Only one staff is furnished for the section.

The mode of operation is as follows: The engineer of a train approaching the single track section—provided he is not followed by another train—upon entering the red ticket end of the section takes from the switchman the train staff, and retains it until he reaches the end of the section, when he delivers it up to the switchman at the opposite or white ticket end. So long as the staff is retained by the switchman no train can follow the out-going train, as the switchman who gave up the train staff has no means

of opening the box, and cannot, therefore, authorize a train to follow the first train, either by giving a ticket to the engineer, or handing him the staff. If, however, other trains are to follow the first one entering the single track section from the same direction, the switchman gives to the engineer of the first train a red train staff ticket from the box in the switch house; at the same time he shows the engineer the train staff, thus indicating his authority to dispatch the train and to send the second train upon its arrival. If but two trains are to pass over the section in the same direction, the switchman gives to the engineer of the second train the train staff, and it is carried to the opposite end of the section and there delivered to the switchman, as in the first case. A red ticket will allow a train to pass in one direction only, a white ticket being required to allow a train to pass in the opposite direction.

It will thus be seen that until the train staff reaches the switchman at the white ticket end of the section he cannot admit a train to the section from that end without giving the engineer a white train staff ticket, or the staff itself, a thing which he cannot do until he receives the staff by the hand of the engineer from the red ticket end of the section.

Two trains moving in opposite directions cannot occupy the same section at the same time where this system is rigidly carried out. In this case the engineers and the switchmen are made directly responsible for the safe passage of the trains.

This system has been long in use in Europe on short lines, bridges, etc. It was used on the Tay bridge, and has been quite extensively adopted in Australia.

Poisonous Dry Goods.

The British consul at Christiania, in Norway, about four months ago forwarded a letter calling the attention of the Foreign Office to the fact that, owing to the English printed fabrics containing arsenic, there had been a great decline in the quantity of such goods imported into Norway, and the British printed cloths were getting a bad reputation in consequence of their containing such a large excess of arsenic. This letter was forwarded to the Manchester Chamber of Commerce, which procured samples of the goods in question, and they were handed over to Mr. Ivan Levinstein, who had the samples examined, and they were found to contain arsenic in large quantities.

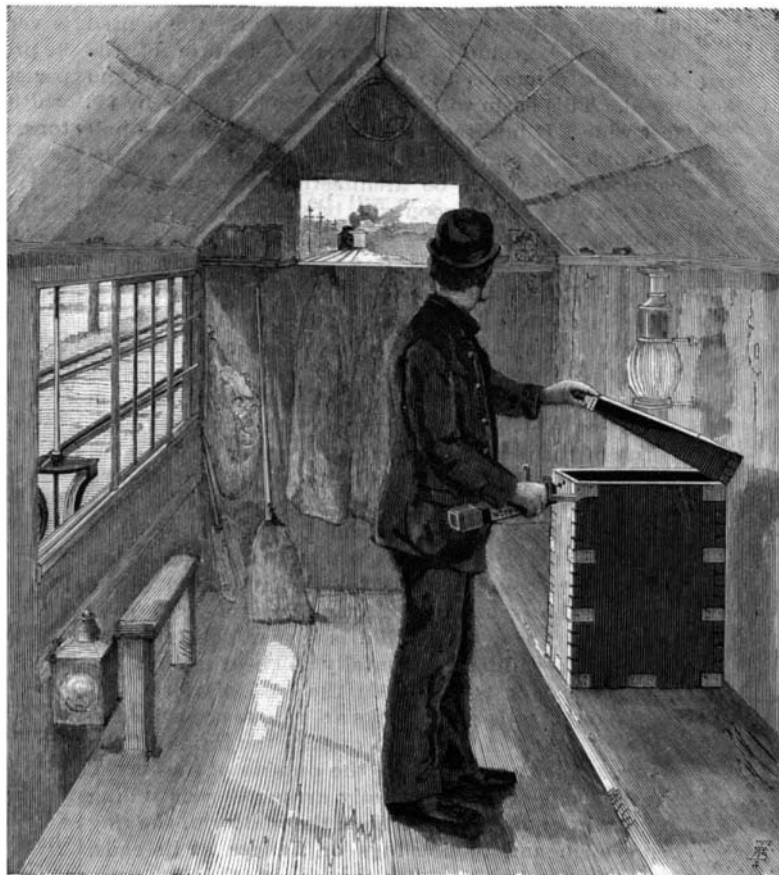


Fig. 2.—SWITCHMAN SECURING A TICKET FOR THE FIRST TRAIN OF A SERIES.

cies of traffic, while others will forever remain in their present condition. Some roads are furnished with a double track throughout, with the exception of a few



Fig. 3.—THE TRAIN STAFF.

sections or unimportant branches, which are of necessity continued on a single track system.

In proportion to the traffic, more accidents occur upon single track roads and upon single track sections than upon a double track, and this is to be expected

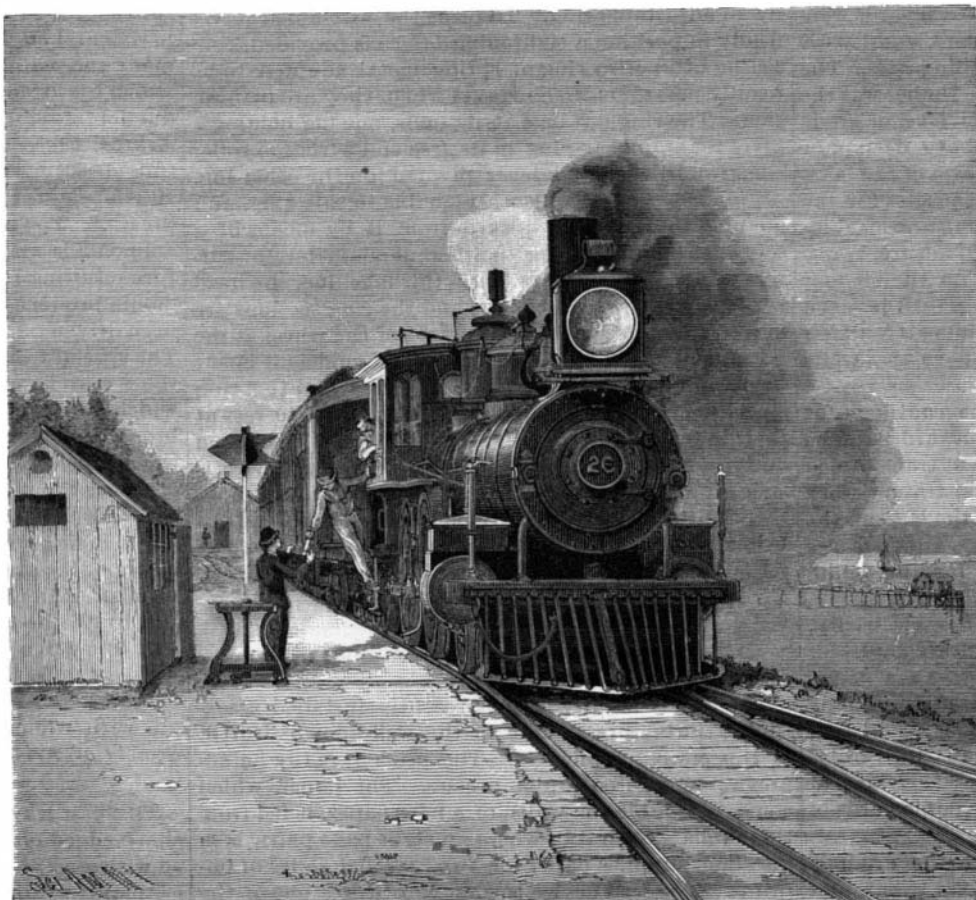


Fig. 1.—OPERATOR RECEIVING THE TRAIN STAFF.