A PHOTOGRAPH OF THE SOLAR ECLIPSE.

In our last issue we described some of the eclipse stations, and briefly outlined the results obtained on the occasion of the total eclipse of the sun on May 28. We now present an engraving made from a photograph taken at Wadesboro, N. C., by Paul A. Draper, who was one of the party on duty during the period of the eclipse, at the Smithsonian Institution observatory. The installation included three large cameras for photographing the eclipse; they were placed upon an equatorial axis, and Mr. Draper's instrument was placed on this axis, next to one of the largest instruments. The exposure was 82 seconds, the lens being a Bausch & Lomb symmetrical lens, 5 × 7, rear combination; focus, 13½ inches; stop, F—11. The plate used was of the double-coated, non-halation variety made by Seed. The cap was removed 5 seconds after totality began and was replaced about 5 seconds before it ended. The entire duration of totality at this station was 90 seconds. The photograph was submitted at a meeting of the Smithsonian party held at Washington, D. C., and was pronounced to be an excellent representation of the eclipse. The composite picture which will be prepared by the scientific parties will not be finished for several months.

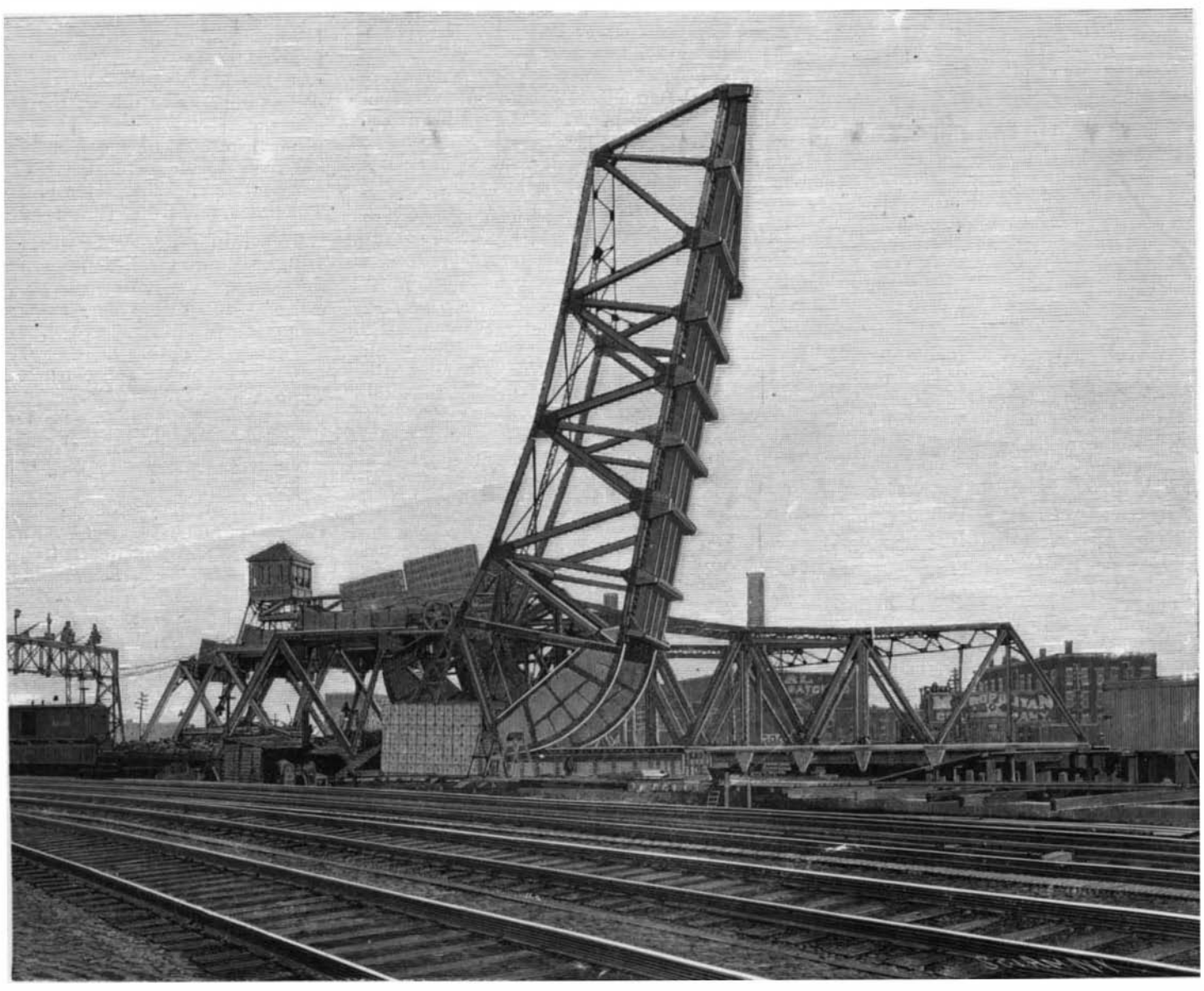
While the corona was a beautiful sight, it was considered by some observers not to be equal to its predecessors. It is said to be fainter than that of 1878 and dimmer than usual; the prominent white places were entirely missing, and the streamers were not quite as active as formerly. This, however, is vigorously denied by other observers.

Photograph taken by a Smithsonian observer at Wadesboro, N. C. Exposure, 82 seconds.

TOTAL SOLAR ECLIPSE OF MAY 28.

ROLLING-LIFT BRIDGE OVER FORT POINT CHANNEL, BOSTON.

The rolling-lift bridge shown in the illustration forms part of the extensive works which have been necessary in connection with the approaches of the various roads which enter the great South Terminal Station at Boston. It serves to connect the Plymouth Division of the New York, New Haven and Hartford Railroad with the terminal yard tracks, several of which are seen in the foreground of the picture. The Plymouth Division tracks cross the channel at an angle of forty-two degrees, and the crossing is made up of three separate lifting trusses, placed side by side with a distance of 29 feet 6 inches from center to center, the total width of the triple bridge as thus arranged being a trifle over 88 feet. Each bridge is raised and lowered independently by a 60 horse power electric motor, the movement of all three bridges being controlled from the operating tower, which will be noticed in the engraving at the rear of the bridges. One of the spans is shown in the fully raised position, while the other two are down. The bridge is of the standard lattice truss type, with inclined posts and vertical hangers. Owing to the fact that the bridge is on the skew, each span contains one long and one short truss, which are respectively 113 feet 10 inches and 83 feet 8 inches long.



ROLLING-LIFT BRIDGE OVER THE FORT POINT CHANNEL, BOSTON.

The counter-weighting of the bridge is accomplished by providing two counter-weight frames, one for each truss, and loading each frame, 99 weights being placed in each frame, those for the heavier truss weighing 1,800 pounds apiece, and those for the lighter truss 1,300 pounds. The total weight in the one case is 644,050 pounds, and in the other 499,300 pounds; while the total weight of the three lifts is 1,143,350 pounds.

The segmental bearings on which the span revolves are struck to a radius of 26 feet and cover a circular arc of 80°. Their faces are provided with segmental cast-steel tracks with rectangular pockets formed in them, into which mesh the teeth of a heavy rack which is carried on the horizontal tracks. The purpose of the rack is to prevent any slipping motion during the opening or closing of the span. The counter-weighting is so adjusted with reference to the center of gravity that the span will open or close by gravity through the first 40° of its travel, leaving the operating machinery to complete the closure or opening. Thus, if the locking mechanism is released when the span is closed, the latter will rise through 40° and then come to a rest. Similarly, if the locking devices are released when the span is in a raised position, as shown in our engeaving, the span will fall through 40°, leaving the other 40° of travel to be operated by the closure mechanism.

The opening and closing is accomplished by means of a trussed operating-strut, provided on its under side with a rack which is engaged by a cast-steel pinion driven by the 60 horse power electric motor above referred to. Two speeds are provided, the faster allowing the bridge to be opened in calm weather in thirty seconds, while the slow speed, which is thrown in during the prevalence of high winds, will close or open the bridge in ninety seconds.

SIGNOR MARCONI has arrived in New York. He comes on a short business trip.

An Automatic Coherer.

An automatic coherer has been devised by M. Tommasina, which will, no doubt, render great service in wireless telegraphy. The experimenter, who has been working for some time in this direction, described his method at a recent meeting of the Académie des Sciences, his idea being to devise a coherer in which the agglomeration of the particles ceases immediately after the action of the electric wave, without any outside action, even that of breaking the current. He commenced his experiments by using powdered carbon, which was placed between two carbon cylinders of 5 millimeters in diameter, passing by friction in a glass tube. After a few trials he obtained an automatic decohering action, but this was somewhat irregular, and he found that the inertia of the relay interfered with the action. When this was removed and simply a battery and telephone was contained in the circuit of the coherer, a much better result was obtained, but in some cases the carbon refused to return to the normal condition instantaneously, this requiring sometimes as much as several seconds.

The form of coherer which was finally arrived at seems to work very well, and the decohering action is instantaneous. It is small enough to be contained in an ordinary telephone receiver, and is made by cutting out of a strip of ebonite 2½ millimeters thick a rectangle 12 × 15 millimeters; this is pierced with a hole 2 millimeters in diameter, and a groove is filed in each face of the piece. A German-silver wire, silk-covered, is passed through the hole and along the grooves, and twisted together on the outside, forming a loop, and a second wire is similarly disposed opposite to this, the two wires being face to face in the opening, and the silk covering is here removed. The hole is closed on one side by a sheet of mica fastened to the block and the opening is filled with powdered carbon; a second plate covers this, forming a coherer whose electrodes are constituted by the two wires, these being about a millimeter apart. The cover of a telephone receiver is unscrewed, the circuit of the coil is cut and the coherer inserted, placing it so as not to touch the diaphragm.

On trial, this arrangement works well with a single dry pile in the circuit of the telephone and coherer, and its sensitiveness is equal to that of a coherer made with metal filings. A shock is heard in the telephone upon the passage of each spark of the oscillator, no matter how rapidly these follow each other; the action is entirely automatic, suppressing the striking device necessary with the usual form of coherer, and the use of carbon gives it increased stability. The experimenter hopes to succeed in adapting the coherer directly to a Morse registering receiver, and considers that this will solve the problem of rapid transmission in aerial telegraphy.

IN Brooklyn, New York, a modified pile driver is used to break up the asphalt pavement of Bedford Avenue. This pavement was put down many years ago, and was in such bad condition that an entirely new pavement had to be substituted. The pile driver is mounted on a heavy cart which can be moved about easily. A hoisting engine raises the hammer, which weighs about 15 hundredweight and has a 14-inch chisel edge. The action of the hammer is to break up the pavement into square blocks, and water and gas pipes frequently suffer if they are near the surface. There is little question that this contrivance is a great time saver.