### Crude Attempts at Telegraphy.

About seventy years ago, perhaps before the present mode of telegraphy had been thought of, an attempt in that direction was made by a Mr. Porter, a man of inventive faculties, who afterward became originator, proprietor, and conductor of The American Mechanic, the pioneer publication in that direction, and the predecessor of the present SCIENTIFIC AMERICAN.

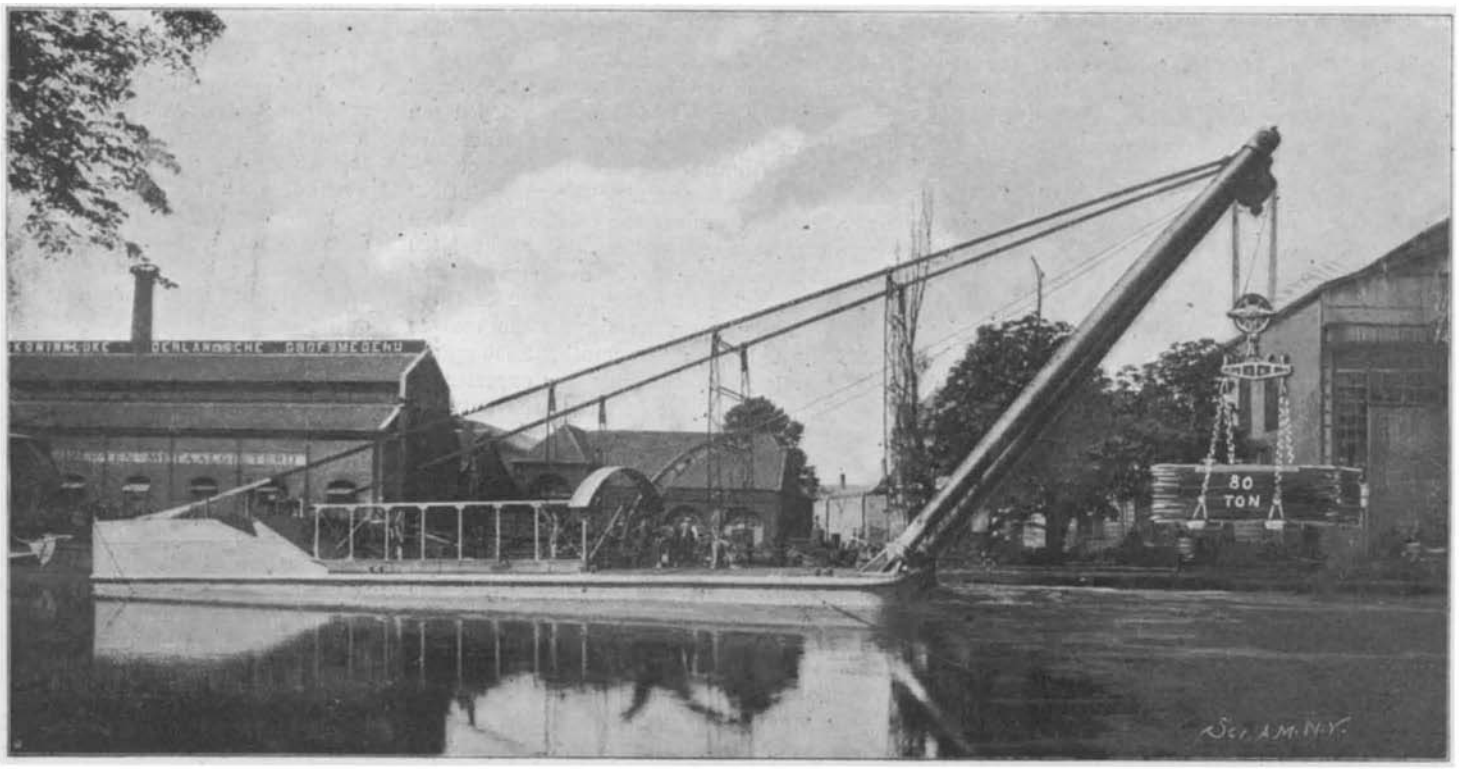
The southern and ocean terminus was on Rhode Island on Rocky Farm, and the place of its location has since been known as Telegraph Hill. It was constructed wholly of wood, was in part a species of wireless telegraphy. It consisted of a series of upright posts, with a number of arms secured to the post at one end by pivots, permitting the arm to be moved in any direction desired, at the liberated part, up or down, and the information was derived from the relative position of these arms. The signals were placed on the summits of the highest hills, at desired intervals, an operator being required at each signal post to convey the signals to the next station.

To reach Boston, as was intended, would require a large number of signal stations and operators, and the execution would have been necessarily slow and expensive. Of course, no approach could have been made toward the present manner and matter of telegraphy, at best being confined to the briefest expression of important information, to carry which to Boston, for instance, would have required a comparatively long time. It was put in operation, if the writer mistakes not, and for a sufficient length of time to test its availability, but not its practical value, and it was early abandoned. It is only within a few years that the southernmost signal post disappeared from Telegraph Hill.—Newport News.

### EIGHTY-TON FLOATING CRANE FOR THE SANTOS HARBOR WORKS.

We present an illustration of an 80-ton floating crane which has been built by the Royal Dutch Forge Company at Leyden, Holland, for the Santos Harbor Works. Its principal dimensions are: Length of vessel, 100 feet; beam, 35 feet; depth, 7 feet 3 inches; outward overhang of shearlegs, 35 feet 3 inches; height of top of shearlegs above water level, 50 feet. The power needed is supplied by a vertical high-pressure engine, with two cylinders, each 12 inches in diameter by 15-inch stroke, and taking steam at an initial pressure of 120 pounds per square inch. The general appearance of the craft is shown by the accompanying engraving. The hoisting gear consists of two sets of wormwheel gearing and two sets of spur-wheels. The worms, of forged steel, are driven from the steam engine. The wormwheels are fitted on intermediate shafts, on which, on the other end, are fixed cast-steel pinions, driving the cast-steel spur-wheels, and bolted to the drums. Each drum, of cast iron, has a diameter of 3 feet 7 inches by a length of 3 feet 7 inches between the flanges, and weighs about 4 tons. All shafts are of forged steel; the bearings have large surfaces, and are lined with white metal.

The shearlegs are constructed of mild steel plates, the diameter in the middle being 2 feet 8 inches. The upper ends of the shearlegs are provided with cast-steel top pieces to take the upper shaft, which is of forged steel, 12 inches in diameter. The water-ballast tank, having a capacity of 130 tons, is divided into four compartments. Each compartment can be filled separately, and also all compartments together, by a duplex ballast pump, placed in the engine room. The hull of the vessel is built of mild steel, and special attention has been paid to the longitudinal stiffness of the vessel. The crane has been tested on the works with full load by a commission of engineers, and proved satisfactory in all respects.

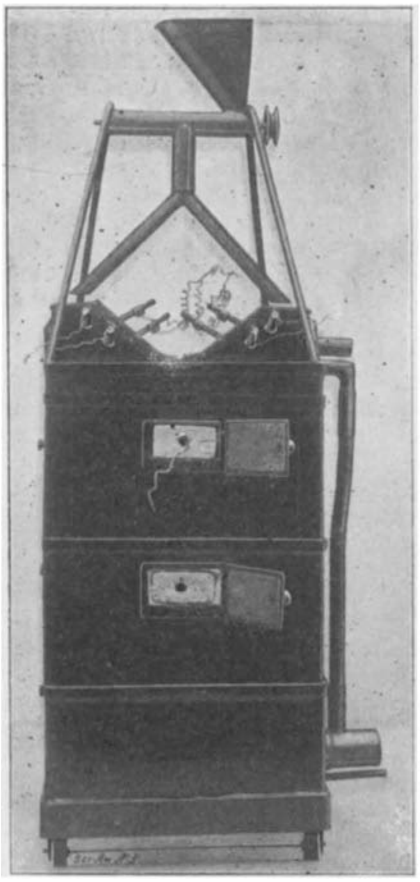



EIGHTY TON FLOATING CRANE FOR THE SANTOS HARBOR WORKS.

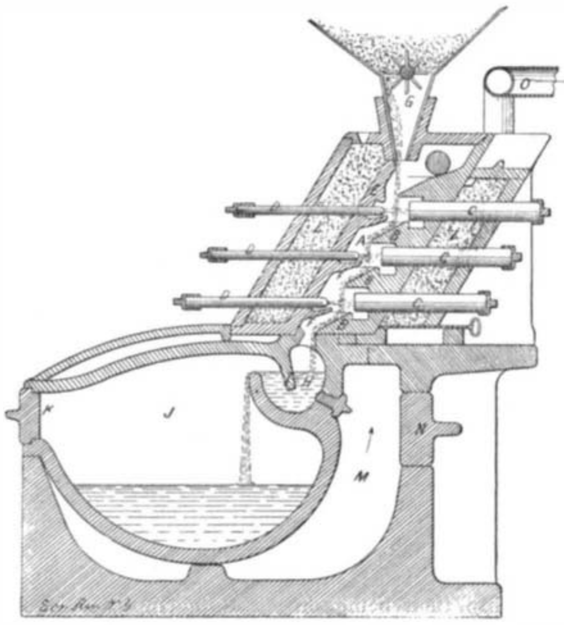
A mixture of two parts olive oil and one part turpentine gives an excellent furniture polish. It at once removes all finger marks, etc., from the furniture.

### AN ELECTRICAL GLASS-FURNACE.

Most varieties of glass are largely composed of silica, often mingled with oxides of sodium and calcium. The glass from which ordinary tumblers, for example, are made is composed essentially of white sand (silica), soda (sodium carbonate) and lime (calcium carbonate). The raw materials are pulverized, intimately mixed, and subjected for 20 to 30 hours to an intense heat either in clay crucibles (glass-pots) or in large basins (tubs). However economical the most improved forms of glass-furnaces may be in the consumption of fuel, and however small the percentage of loss in glass, the fact still remains that the amount of fuel required and the quantity of heat radiated without any effect on the contents of the furnace are enormous. Moreover, the installation of a glass-furnace is exceedingly costly; valuable space is taken up both below and above ground; the health of the workmen is endangered by the fierce heat radiated by the furnace; and the plant must be worked continuously, so that the loss in heat may be reduced to a minimum.



AN ELECTRIC GLASS-MAKING FURNACE.



VERTICAL SECTION OF ELECTRIC GLASS-MAKING FURNACE.

A new type of glass-furnace recently attracted our attention, which seemed to mark a great onward step in the manufacture of glass and which seemed to be singularly free from the defects enumerated. Through the courtesy of Dr. Voelker of the Société Anonyme, L'Industrie Verrière et ses Derivés, Brussels and Cologne, we are enabled to present to our readers a clear account of this departure in one of the most important industries.

The invention is an electric furnace which can be made in various forms, and one type of which is pictured in our sectional view. The silica and other ingredients are finely pulverized, intimately mingled, and introduced into a hopper, in the discharge-opening of which a feed-wheel is mounted. If the hopper be long and the discharge-opening located at one end, a screw-conveyor is used. From the hopper the material to be fused is fed to an inclined melting-chamber, *A*, which is formed by the wall, *E*, and by a continuous series of hearths, *B*, so situated that one is placed above and slightly to one side of the one immediately below. The surfaces of the hearths are inclined to permit the fused material to flow off; and the edges of the hearths are made as sharp as possible to permit the escape of the bubbles of carbon dioxide gas. Through perforations in the wall, *E*, and in the hearth-wall, carbons, *D* and *C*, are respectively passed. Beneath the carbons, *D*, the wall, *E*, is formed, with pan-like projections, *F*, which receive the ashes and unconsumed portions of the carbons. The carbons, *C*, are mounted immediately above the corresponding hearths, *B*. Direct current generated by a 360-ampère dynamo with a voltage of 120 is passed through the carbons. The intense heat of the first arc melts the raw material fed from the hopper. The molten glass trickles down the first hearth; drops upon the second hearth; is there subjected to the heat of the second arc; falls upon the third hearth; and finally reaches the collecting cup, *H*, as an exceedingly liquid glass, free from all gases and impurities. Since it is of the utmost importance that no air be allowed to enter the melting-chamber, *A*, during the operation of fusing the silica, a compartment, *L*, is provided at the side of each wall, which compartment is filled with refractory material, packed so closely around the electrodes that no air can possibly enter. The gases which bubble from the molten glass are led through several passageways into the air space, *M*, surrounding the pot, *J*. In the air space, *M*, the gases are mixed with hot or cold air and burnt, the heat thus generated serving to warm the walls of the pot. The products of combustion pass through suitable channels to the out-take, *O*.

It is claimed for this electrical method of fusing silica that 60 per cent of the fuel formerly required is saved. But, even if this figure be possibly modified when accurate data are obtained, it cannot be denied that the remarkable compactness of the furnace, the unprecedented rapidity with which the materials are fused (bottles can be blown within half an hour after the hopper is charged), and the very small amount of heat lost by radiation are sufficient to predict a bright future for the electrical system. The pots, besides being small, and cheap in cost, last longer than has ever been the case in glass-making. The workmen are subjected to no