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Despaquis' Photo-Engraving Process.

M. Despaquis has observed, like all who have occupied themselves with this branch of study, that in an engraving it is necessary to have a grain inside the cavities, while the surface should be of a polished character in those portions destined to reproduce the whites of the image. He therefore set about to discover how such a result could be brought about. He applied to the metallic plate two films of gelatin, the first a thick one containing the grain, and the second thinner and absolutely free from grain. It is due to this second film that M. Despaquis is enabled to produceall the delicacy of half tone. His method of operation is as follows: In one thousand cubic centimetres of water are dissolved two hundred grammes of gelatin; to this are added twenty grammes of liquid Indian ink and four grammes of powdered pumice, the latter being finely ground and sifted through fine linen. Next, upon a plate of glass which has been waxed, he spreads a sheet of moistened paper, taking care to prevent the formation of air bubbles. The solution of gelatin, previously filtered and maintained at a slightly warmed temperature sufficient to keep it liquid, is then poured upon this sheet of paper. In this way a sheet is secured, covered with a thick film of gelatin having a very fine grain, uniformly spread throughout its body. When it is desired to make use of this prepared paper the second film is applied, and the sheet sensitized at the same time; to do this, it is immersed (prepared side uppermost) in a solution composed of:

Water.....	500 cub. cents.
Gelatin.............. ....1 to	15 grammes.
Bichromate of ammonia.......	15 "

After remaining in this liquid for some seconds the sheet is taken out, and by two of its corners (still prepared side uppermost) it is drawn over a gelatined plate, previously prepared with ox-gall, so that later the paper may be easily detached. The sheet, dried in a locality where it is screened from daylight, is cut a little larger than the cliché, and placed underneath the latter. The exposure of the prepared sheet to the light should be a third that necessary to give a carbon print. As in this latter process, as soon as the printing is finished, the impression is plunged into cold water, so as to transport the print, not to albumenized paper, but a plate of polished steel or copper; it is afterward put under pressure, and allowed to dry, and finally the image developed, as in the carbon process, with warm water. It is, indeed, treated as if it were a carbon print, rather more care being taken, however, because there is less adhesion between the gelatin and the polished steel. When the matrix plate has been secured in this way, a mould is made, either in the hydraulic press, as in the Woodburytype process, or in a rolling mill, covering the plate with a double sheet of very stout lead. The mill must be worked two or three times, so that every detail of the image is reproduced in the lead. Finally, you produce by the aid of the electrotype process a countermould, which is the plate from which the printed copies are produced.

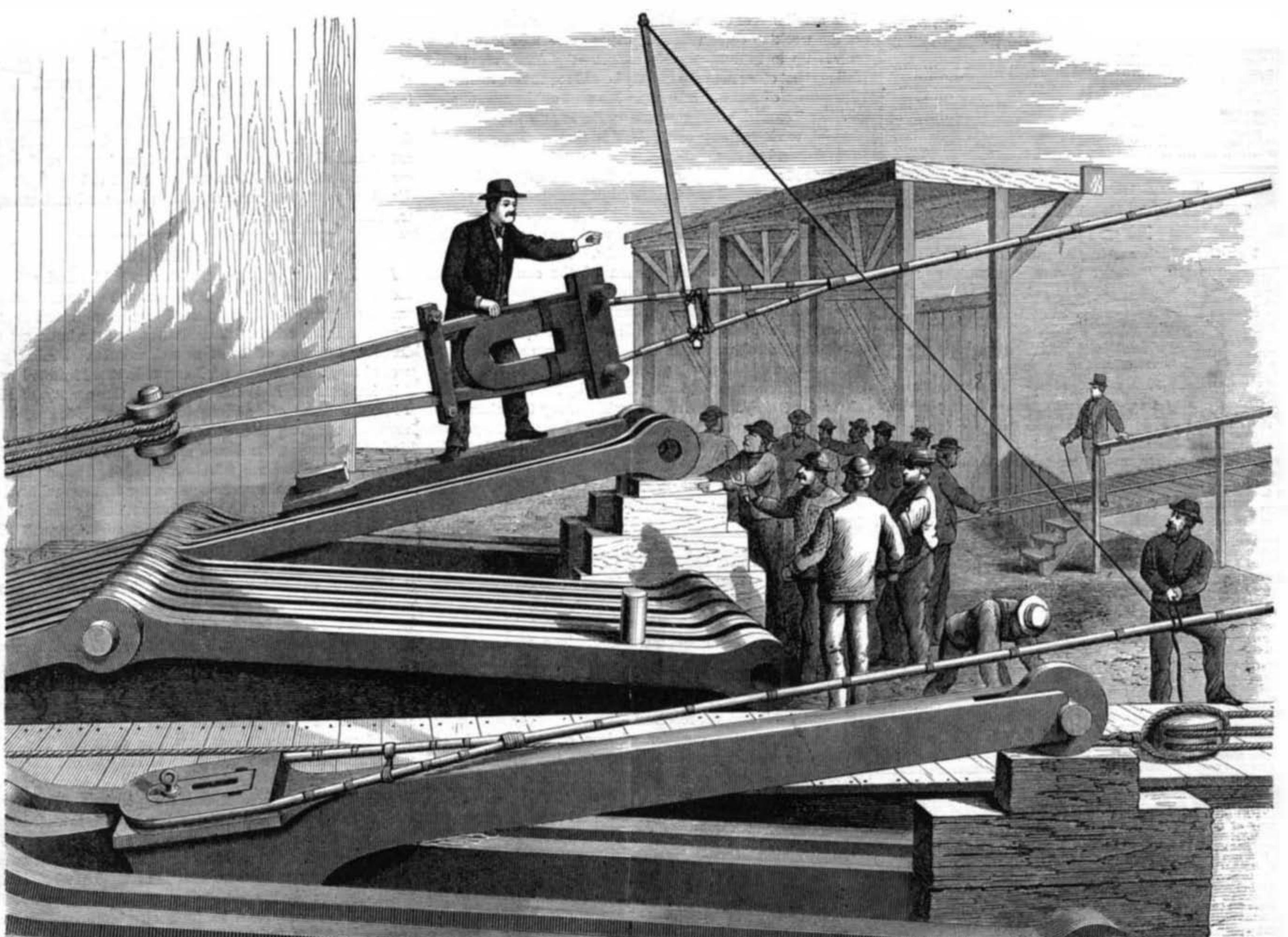
An Illuminating Cannon Shot.

One of the most simple and ingenious contrivances, for the purpose of investing a fleet with a zone of light through which no enemy could pass without being observed, has been devised by M. Ferdinand Silas, of Vienna, whose experiments with lifebuoys at Portsmouth have been reported in these columns. M. Silas' inextinguishable lightning shell is similar to a common shell, can be made to fit any gun, and can, accordingly, be projected to any distance. The projectile consists of three parts, one within the other. Within the shell proper is a lining of wet sponge, and within this is a glass bottle, which fills the whole cavity; the bottom of the shell unscrewing to admit of its entrance. This bottle is filled with various charges of phosphide, none of which, however, is to be less than ten pounds. A small channel is bored through the sharp point of the shell in order to allow the air to mix freely with the wet sponge, and there are a couple of apertures in the head which are plugged with wooden stoppers covered with leather. Through the movable bottom of the shell a steel striker is inserted, which is fitted with a spring, and communicates with the glass bottle within. When the light shell is fired, the spring striker is driven forward by the explosion like a gas check and so breaks the bottle; the water contained in the jacket of sponge then penetrates through the broken glass and saturates the phosphide; phosphuretted hydrogen is immediately generated in large quantities, by the pressure of which the stoppers are forced out and two streams of illuminating matter are poured upon the sea. The light burns with great brilliancy for a considerable time, and is claimed to be inextinguishable.—*London Times.*

CABLE FASTENINGS OF THE EAST RIVER BRIDGE.

In an article last week we followed the progress of making one of the strands that is to form the massive cables designed to support the roadway of the East River Bridge. These strands are a little over three inches in diameter, and the diameter of the cable when completed will be about fifteen and a half inches. We have seen the strand in place and resting in its permanent seat, the saddle, on top of the tower. We will now detail the manner in which the ends of these strands are secured and held in place at the anchorage at each end of the bridge. In the engraving, Fig. 1, which is taken from the Brooklyn anchorage, is shown the manner in which the wires are wrapped around the iron shoe as they are received at the anchorage. In the front of the engraving will be observed a massive iron bar, to one end of which this shoe, similar in form to a horseshoe magnet with armature in place, is attached. In folding the wires around it, as received from the carriers, the shoe lays horizontally, and the bight

[Continued on page 82.]



THE GREAT SUSPENSION BRIDGE BETWEEN NEW YORK AND BROOKLYN.—THE CABLE FASTENINGS.