

AN ELECTRO-PHOTO-DETECTIVE THIEF CATCHER.

Photography has been employed in many ways in identifying and capturing criminals, but the incident which we illustrate is the first of the kind in which the thieves are made to set in operation the apparatus which is the means of their identification and capture.

Mr. Triquet, of Toledo, Ohio, had for some time missed cigars, which were taken from his show case by some clever thief, and detectives who had watched the place for several days failed to detect the thieves or to discover their mode of operation. As a last resort, the proprietor applied to Mr. W. H. Harbeck, the patentee of the flash light photographic apparatus, which we illustrate, with the hope of securing photographs which would lead to the identification of the perpetrators of the thefts.

The apparatus was set up and arranged in working order, and left to do its work. Early one morning two boys entered the place, opened the show case, and in so doing set in operation the apparatus, which made a permanent record of their deed and furnished the evidence which sent them to prison. The two lads, in the act of opening the case, closed an electric circuit, which released the camera shutter and at the same instant operated the flash light apparatus, which photographed the boys in the act of removing cigars from the case.

Fig. 1 is a correct reproduction of this photograph; in Fig. 2 the sides and end of the camera and the covering of the apparatus are removed to admit of showing the working parts more clearly. The camera is placed in a box, which is provided with a shutter operated by the spring seen at the front of the box. The shutter is furnished with an escapement which is let off by an electro-magnet. On the top of the box is arranged another electro-magnet, a vertical spindle carrying at the top a roughened disk, the electro-magnet being connected with a detent which engages an arm on the vertical spindle. In a spring-pressed holder is placed a match, which rests against the roughened disk, and above the disk is supported a flash light. Wires lead to the shutter case, and a switch is provided so that as the show case door is opened they close the circuit. The shutter of the camera is first opened by the action of the magnet connected with the escapement, and simultaneously with the operation of this magnet the detent magnet at the top of the box is operated, releasing the detent and allowing the vertical spindle to revolve, the power for this purpose being stored in a volute spring connected with the spindle. The match is ignited, and as the disk completes its revolution the match projects through the aperture and ignites the flash light powder. All this occurs in a small fraction of a second, and as soon as the circuit is opened the shutter is opened and closed and the image formed on the sensitive plate is prevented from being further acted upon. To secure the closing of the shutter, the current which lets off the igniting mechanism is taken through a fusible wire or strip of thin fusible foil located in the flash light chamber. When the flash light powder burns, the wire or foil is melted, the electric circuit is broken, and the shutter is released so as to close automatically. The effectiveness of the apparatus is clearly proved by the work it has done. It would seem that such apparatus might be concealed in banks, jewelry stores, and in other places where valuables are kept, and used as an auxiliary to the other means employed for the safety of valuable property.

Ice in the Treatment of Asthma.

Dr. B. O. Kinnear regards asthma as a purely nervous disease and recommends the application of bags of ice to the spine for relief. He does not particularize the *technique* of the treatment, but, from the reports of his cases, one gleans that the applications are made from the lower cervical or upper dorsal vertebrae downward to the upper lumbar. The bags are to be kept *in situ* for periods of an hour or so at a time, and repeated three or four times daily in suitable cases. This treatment serves to equalize the general circulation, and to do away with the sufferings arising from other visceral neuroses which asthmatic patients are very apt to have. The first application, says the *N. Y. Medical Journal*, frequently gives great relief to the paroxysm.

Magazine Guns.

At a recent meeting of the Royal United Service Institution Captain Walter H. James read a paper on "Magazine Guns; their latest developments and effects." In opening his address, Captain James reminded his hearers that he delivered a lecture on a similar subject five years ago at the institute, when the nations of Europe

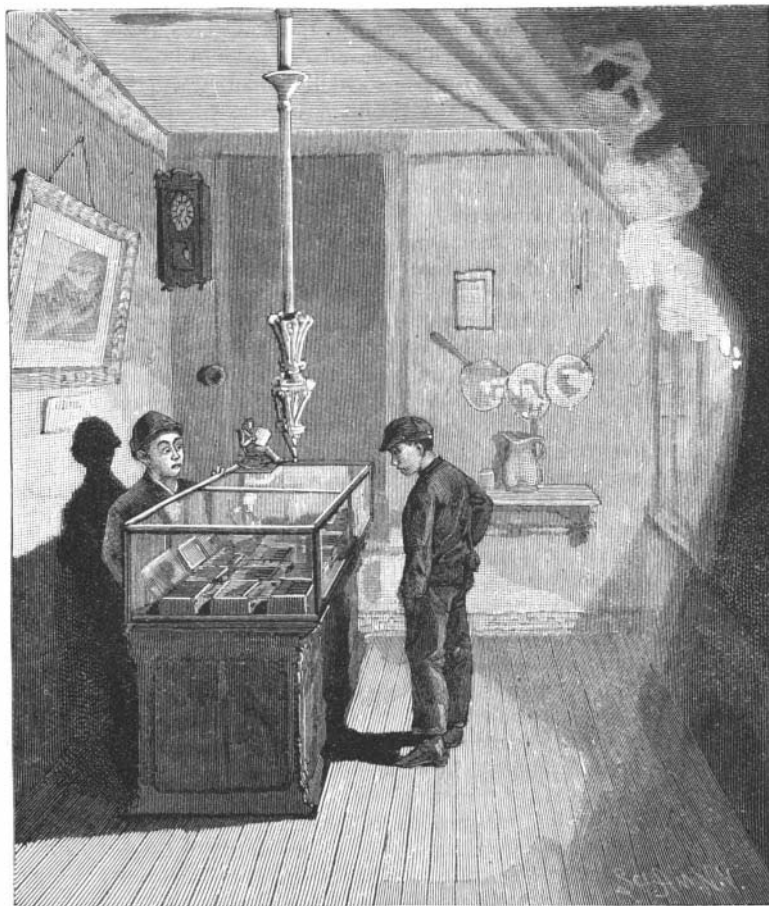


Fig. 1.—THE PHOTO-DETECTIVE.

were only on their way toward adopting a magazine rifle armament for their armies. At the present time every Continental army had adopted them, or was in course of doing so. In some, as a tentative measure, the old rifles had been adapted to magazine fire, but among all the great powers a small-bore rifle had been or was now being introduced. Germany had discarded the Mauser for a new weapon. Austria had gone over to the small-bore Mannlicher, France had the Lebel, Italy had adapted her old-fashioned Vet-

the cartridges should be contained in a frame, or filler, so that they can be readily loaded into the magazine; the cartridges should be easily taken from the holder for use in the weapon as a single loader; there should be a cut-off, which should be so arranged as to facilitate the use of the weapon as a single loader; and the bore should be sufficiently small to enable a long bullet to be driven at a high velocity, so that at medium ranges—i. e., within 800 yards—one sight would suffice for military purposes.

Engineering Enterprise in Japan.

A large and important government engineering enterprise was recently completed in Japan. Lake Biwa, having an area of 500 square miles, is situated about seven miles from the city of Tokio, and at an elevation of about 140 feet. A navigable canal has been cut from this lake to Tokio, involving two miles of tunneling and an aqueduct of considerable length. At the eastern extremity of the city, to which point the canal has been brought, there is a sharp decline of 118 feet, from the base of which the canal is continued to the sea. This difference of level is overcome by inclined plane ways, 2,100 feet in length, on which boats are raised or lowered from one canal to the other. These ways are operated by electric power furnished from a Pelton water wheel, connected with a Sprague motor. The fall above named affords also a very valuable water power, a part of which has already been utilized for various mechanical purposes by means of electric transmission. The power station is located at the foot of the incline, and consists of three 8 feet and two 6 feet Pelton wheels, aggregating about 600 horse power, which are supplied with water from the high level canal by three lines of 36 inch pipe, 1,300 feet in length, delivering water to the wheels under a head of about 100 feet.

These wheels are at present operating three Edison dynamos of 80 kilowatts each, the power from which is distributed about the city within a radius of two miles, running rice mills, spinning mills, a watch factory, and various other machinery. One Thomson-Houston alternating current dynamo of 2,000 volts supplies the city with 1,300 incandescent lights, as well as many arc lights. The above works, involving an expenditure of about \$1,250,000, were planned by and executed under the direct supervision of Mr. S. Tanabe, an eminent Japanese engineer, and they are said to be entirely successful, both from a scientific and commercial standpoint.

Uses of Resin.

There are many useful purposes, says *Engineering*, to which resin can be applied outside of those of general practice. As a non-conductor of heat it is used in the protection of water pipes, particularly in crossing bridges where the pipe is laid in the middle of a long box and the whole filled with melted resin. Resin is also used in supporting basement floors in machine shops, which may be laid over some dry material, as spent moulding sand, which is carefully leveled off, and the planking laid upon temporary supports separating it about 2 inches above the sand. Numerous holes, about 2 inches diameter, being bored through these planks, melted resin is forced through them by means of funnels until the whole space is solidly filled, and then the upper flooring is laid upon these planks. In case the floor is subjected to shocks sufficient to break the resin, it rapidly joins together again in much the same manner as the regelation of ice. Resin is also used to form waterproof paper for use in butchers' shops, fish markets and also for building purposes, and strange to say, this improvement reduces the cost of the paper. All methods of applying resin in solution after the paper is finished add heavily to its cost and also render it very brittle; but if the resin is dissolved in potash and mixed with the pulp in the beating engine and this alkali afterward treated with

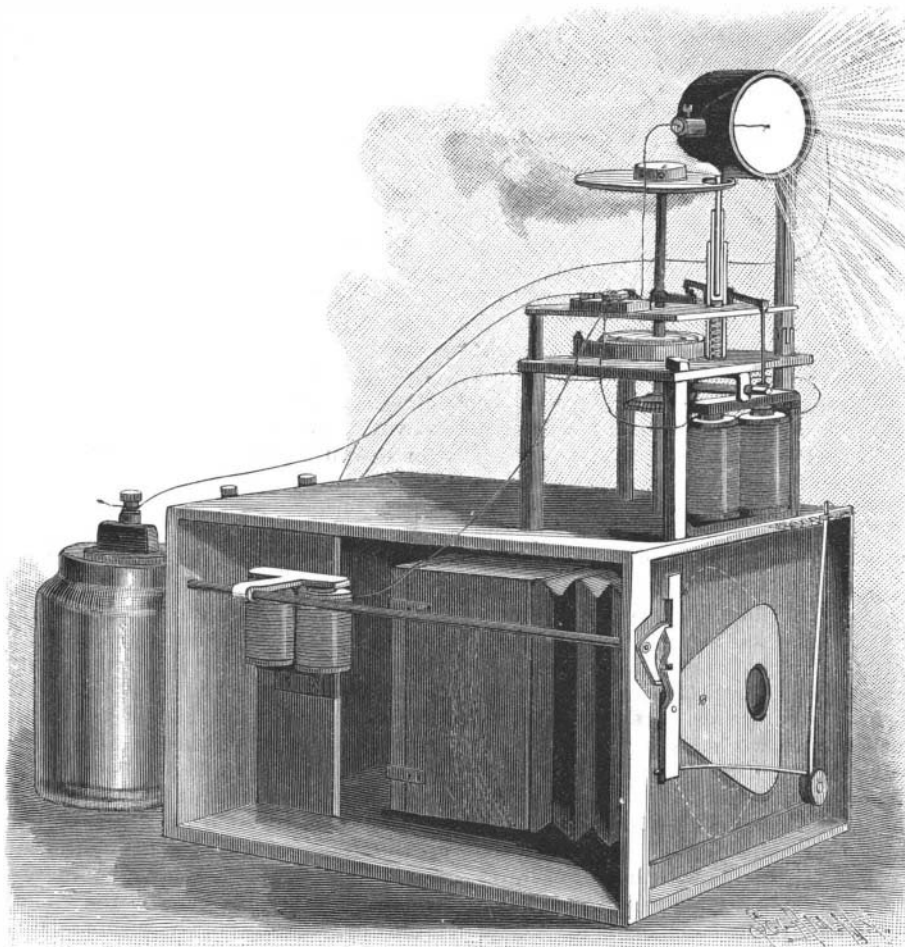


Fig. 2.—DETAILS OF THE PHOTO-DETECTIVE APPARATUS.

alum, it becomes neutralized and washed away, leaving the finely diffused resin throughout the whole mass. It is also used for protecting the coarser manufactured products, such as agricultural implements, against rust by mixing it in a solution with benzine. This is applied as varnish, and the benzine rapidly dries away, leaving a coat which protects the material until it goes to the severe service of actual use.