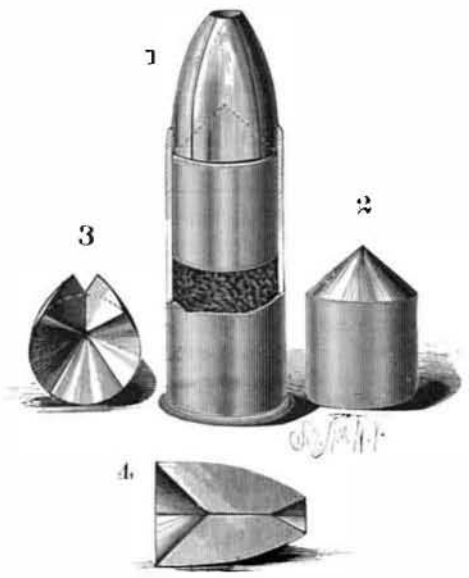
NEW PROJECTILE.

The annexed engraving shows a sectional projectile recently patented by Mr. I. L. G. Rice, of Cambridge, Mass. It consists of a main bullet having a conical end, and placed wholly within the cartridge shell, with its conical end pointing outward, and a sectional bullet composed of several parts, held in place by the cartridge shell. The sectional portion has a conical cavity adapted to the conical end of the main bullet, and there is a conical aperture in the outer end of the sectional bullet to allow the air to act upon the sections to separate them after they are discharged from the firearm.



RICE'S IMPROVED PROJECTILE.

The complete projectile is shown partly in section in Fig. 1, the main bullet is shown in Fig. 2, and the sectional part is shown in Figs. 3 and 4.

A New Photo-Printing Process.

M. Leon Vidal, in a letter to the *Photographic News*, says: Since I have had occasion to mention the name—a name never to be forgotten—of Poitevin, I should like to say a word on that gentleman's special process depending on the action of light on a layer of gelatine made insoluble by the following solution:

Water	100 cub. cents.
Iron perchloride	3 grammes.
Tartaric acid	1 gramme.

Gelatine, with which this solution is incorporated, is insoluble, but ceases to be so in those parts where light is able to act by reducing to its natural state the iron compound. I have not myself been able to make experiments on the very interesting reaction here indicated; but as it has been published by a man whose assertion on such a point it would be impossible to doubt, I can at once see very important results that follow from it. I can foresee here a means of producing carbon papers for special purposes; these could be sensitized from the very first, for all that is requisite is to have insoluble pellicles of pigmented gelatine, stored in a dry and dark place, where they could be kept for a long time without deteriorating. With this inverse method of working—I call it "inverse" because the action of light produces an effect quite opposite to that which it has when the gelatine has been sensitized by bichromate—we ought to be able to arrive at results of quite an opposite kind to those of the ordinary processes. Adopting this method in the Woodburytype process, as pointed out by M. Boivin, we might leave the film of gelatine in contact with the glass plate over which it had been flowed, and expose this upper surface against the negative The gelatine, which is at first insoluble, would become soluble to a depth corresponding to the greater or less transparency of the negative. Opposite a very transparent part a depression would be formed much deeper than in a place opposite a comparatively opaque part. The transparency produced would be positive; a moulding taken from it would be negative, and this, in its turn, would give the ordinary metallic plate of the Woodburytype. With a positive transparency a print could be taken serviceable for the first moulding

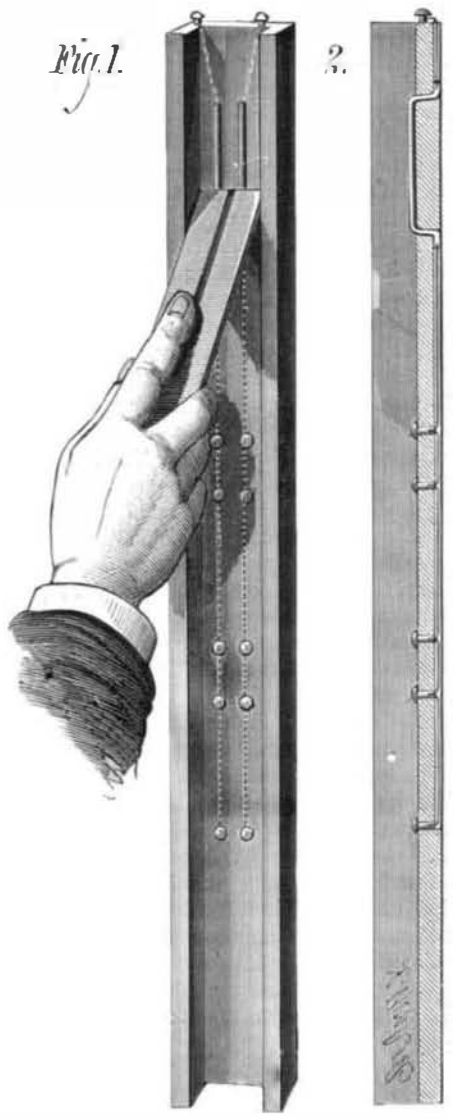
When applied to special kinds of carbon printing, or for the reproduction of line drawings, the layer of gelatine must be very thin, and not highly colored, and then the following action takes place: if it be exposed beneath a positive—for instance, a pen and ink drawing on thin paper—the light acts through all the translucent parts, but not on the parts beneath the lines. When sufficiently printed, it is only necessary to place it in hot water, and the lines alone will remain visible; the whole of the ground, which has been acted on by the light through the white paper, has become soluble, and has been washed away by the hot water. Hence we have the means of obtaining as a direct positive the reproduction of a drawing in black lines on a white ground. This application of the process appears to me to be of great importance, and to have a successful future in prospect. I believe, moreover, that in this country it will soon be worked on a larger and commercial scale. The experiments that it is my intention to make will, I hope, have practical results, which may be of great service to those endeavoring to work out such applications, and I shall be glad, so soon as I have completed them, to lay those results frankly before my readers. I have already discovered another means of applying this action to the production of the negative copy of a line drawing on a sheet permeable only in the parts corresponding to the drawing, and rendering by pressnre the exact reproduction of the original drawing. The conclusion to which we are led by the arguments of this letter is: all honor to those who lay down the great principles! The discovery of the practical applications to which those principles can be put is merely a question of time. All honor to such men as Van Monckhoven and Poitevin!

A Railway up the Volcano of Vesuvius.

The railway for the ascent of Vesuvius is now finished It is 900 meters in length, and will enable tourists to ascend by it to the edge of the crater. The line has been constructed with great care upon a solid pavement, and it is believed to be perfectly secure from all incursions of lava. The mode of traction, says the *Engineer*, is by two steel ropes put in movement by a steam engine at the foot of the cone The wheels of the carriages are so made as to be free from any danger of leaving the rails, besides which each carriage is furnished with an exceedingly powerful automatic brake, which, should the rope by any chance break, will stop the train almost instantaneously. One of the chief difficulties of the undertaking was the water supply, but that has been obviated by the formation of two very large reservoirs, one at the station, the other near the observatory.

ELECTRICAL SIGNALING INSTRUMENT.

In electric signaling apparatus, as usually made, some sort of clockwork is considered necessary to give uniformity to the movement of the interrupter. In the signaling instrument shown in the engraving no gearing or springs are required, and although it is of the simplest character it is found in practice to work equally as well as the more expensive instruments, and is much less liable to derangement. It is the invention of Mr William Hadden, of 145 Broadway, New York, and it consists in a plain grooved strip of wood or other non-conductor of electricity, containing contact points arranged in pairs and placed so as to represent any desired signal. These contact points are in electrical communication with the line wires or with a ground and the line, so that when any two of the adjacent points are simultaneously touched by an electrical conductor the circuit will be completed through the points and the conductor, and a signal will be received at a distant point. To facilitate the



HADDEN'S SIGNALING INSTRUMENT.

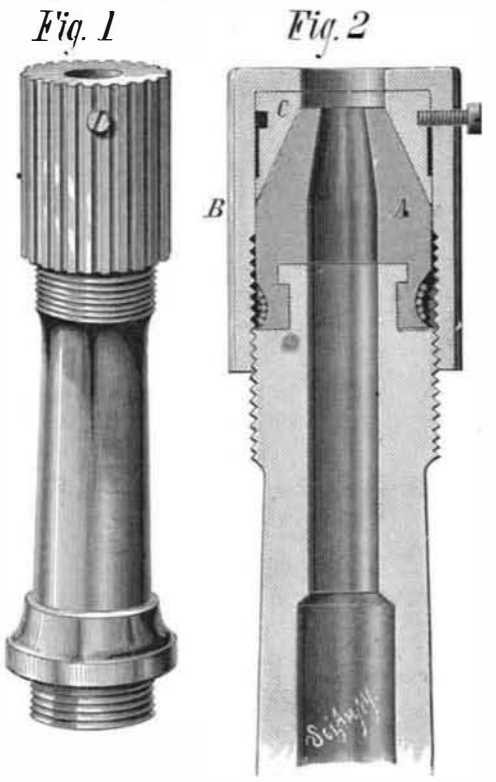
operation of sending the signal and to insure the contact of the metallic conductor, the latter is made of spring metal and split. The signal is given by drawing the spring circuit closer over the contact points from one end of the apparatus to the other. The movement of the hand is sufficiently uniform without making a special effort.

This device is adapted to fire alarm telegraphs, district telegraphs, bell signals, etc.

IMPROVED HOSE NOZZLE.

The accompanying engraving shows in perspective and in section a new hose nozzle recently patented by Mr. George C Palmer, of Rochester, N. H. It may be adjusted to deliver a uniform stream of any desired size by turning the nozzle cap one way or the other.

A short elastic rubber tube, A, is secured to the end of the tube forming the main body of the nozzle, and is sur



NOVEL HOSE NOZZLE.

rounded at its outer end by a conical washer, C, contained by the cap, B, which screws over the end of the body of the nozzle.

The inside diameter of the rubber tube in its normal condition is the same as that of the body of the nozzle. When it is desired to diminish the stream the rubber tube is contracted by forcing down the conical washer, C, by means of the screw cap.

Developing Gelatine Plates in Daylight.

The one drawback—and beyond question a serious one—attendant upon the use of highly sensitive gelatine plates, has been found in the fact that they could not be developed—or, in fact, uncovered for any purpose—in the ordinary dark room, illuminated with sufficient yellow light to permit of comfort in working. Extreme sensitiveness to feeble radiations has inevitably brought with it the risk of fog or abnormal action of light on the surface of the plate, if light possessing any actinic power whatever should come in contact therewith. The special claim of these plates is their sensitiveness to weak light, and that they are not wholly insensible to yellow light. Hence it should not be matter of surprise or impatience that they fog if opened or developed in the light of the ordinary dark room. To secure safety, it has been found necessary not only to reduce the area through which light could pass, but also to glaze that with deep ruby glass, two thicknesses being better and safer than one. With patience and practice it is not difficult to succeed with this small amount of light. But beginners often fail in the necessary precautions, and often, in consequence, blame the plates or the process altogether, and so fail to secure for themselves one of the greatest boons the art has ever placed within their power.

Mr. Werge has changed all this, and made development of the most sensitive plates easy in an ordinary sitting-room, or, at any rate, in a well lighted dark room. Among the many ingenious appliances exhibited at the recent South London technical meeting, none excited greater interest than the developing tray of Mr. Werge, in which he developed in the full gaslight of the room a gelatine plate which had been exposed in the morning, and exhibited to the meeting the result in a clean transparency, without fog or any trace of the abnormal action of light. The matter is, of course, very simple. The plate is developed in a covered tray, and is so protected from light. The arrangement consists of an ebonite tray, fitted in a casing of tin, grooved to allow a plate of ruby glass to slide in and cover the top of the dish or tray There is also an aperture for a funnel, through which is poured the developing solution, etc. What arrangement exists for watching the progress of development we do not know, as we have had no opportunity of examining the apparatus. This and some other matters are doubtless provided for. We can here simply record the fact, interesting to many, that the demonstration before the South London meeting was a perfect success.—*Photographic News.*

New Fashion.—Foot Jewels.

The bracelet slipper has been introduced in Paris. The shoe is cut very low in front and high up on the instep, it is fastened with a finely chiseled real gold bracelet instead of the usual strap. Another expensive novelty in the same line is the Andalusian boot, made of black satin, with lace ruffles down the front seam, and fastened with real jewel buttons.