

WILLIAM H. MUMLER.

Improvement in Electric Signalling Apparatus for Fire Engines.

No. 123,355.

Patented Feb. 6, 1872.

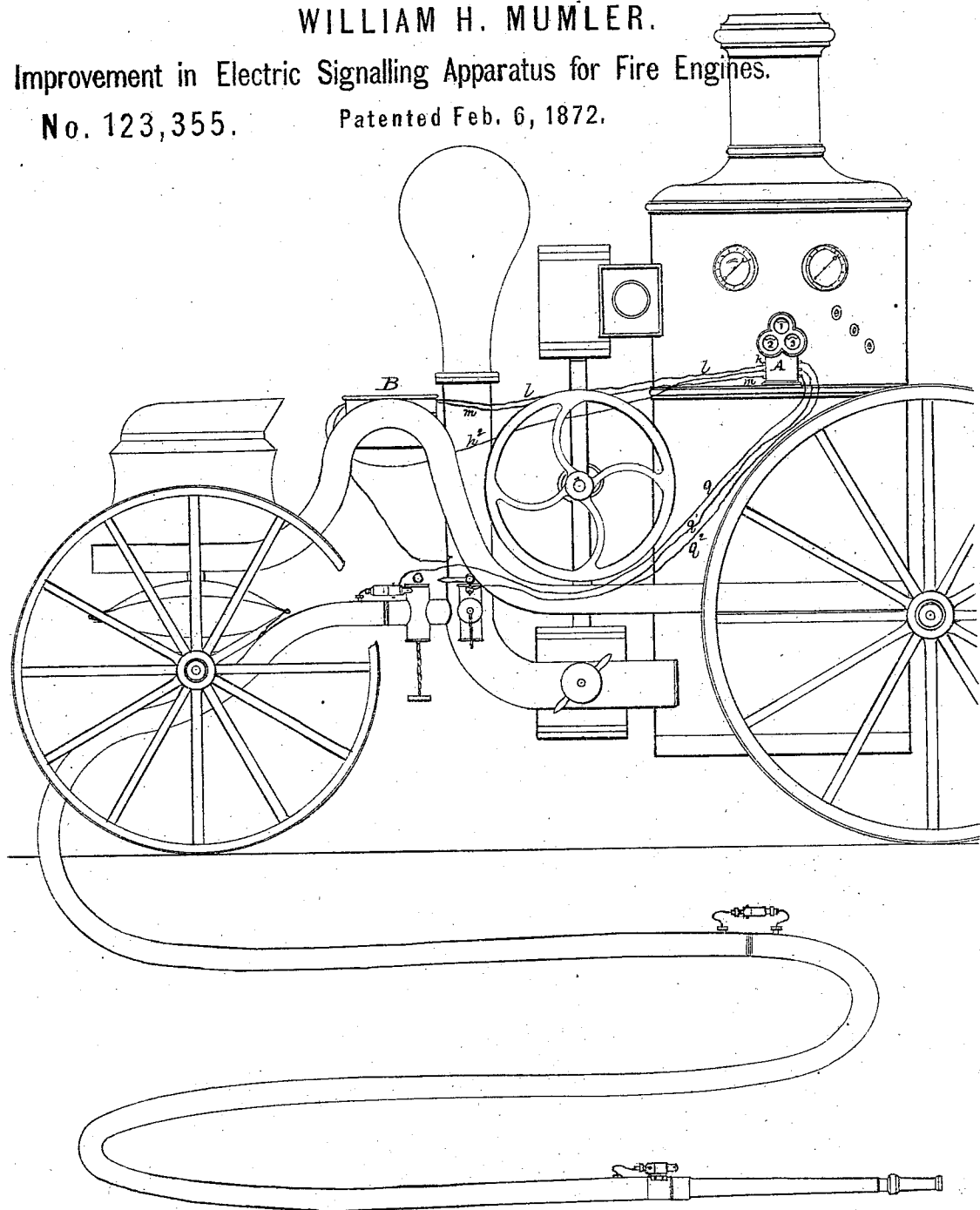
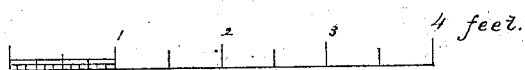


FIG. 1.



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Scale for fig. 1.

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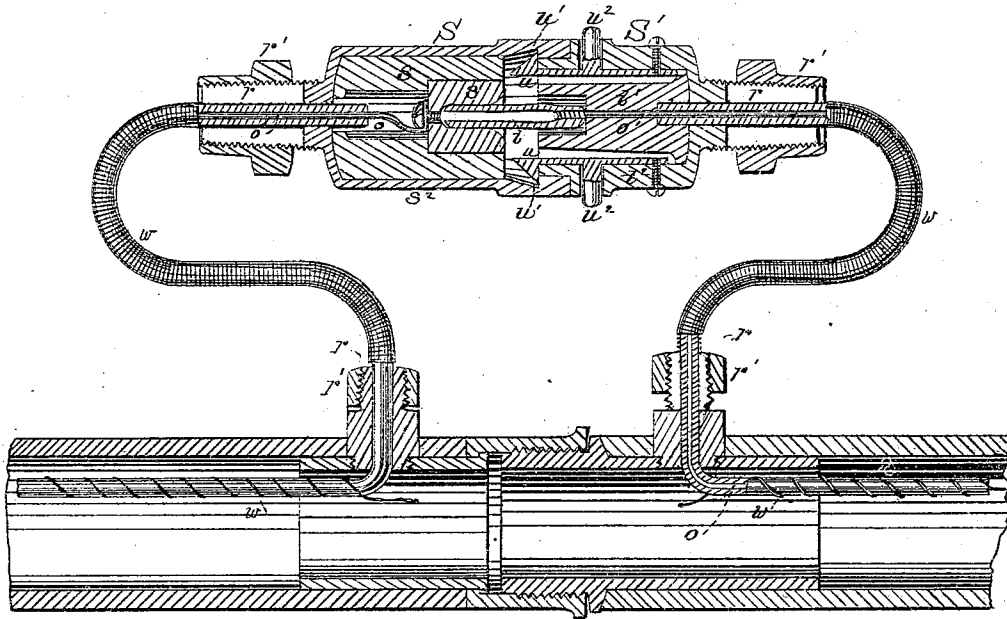


FIG. 2.

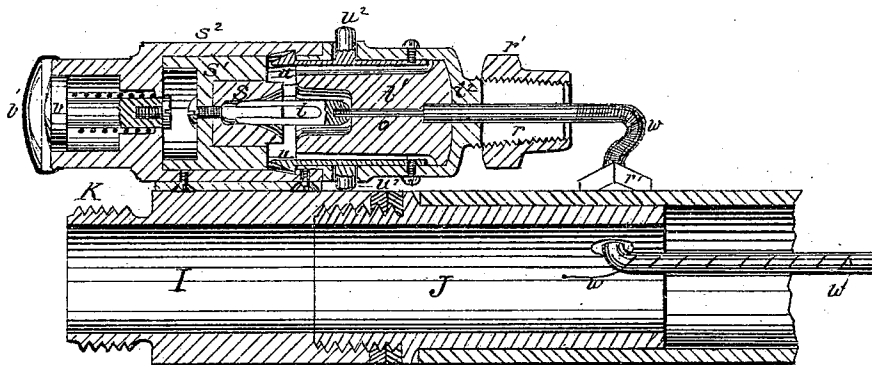


FIG. 3.

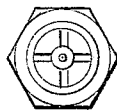


FIG. 4.

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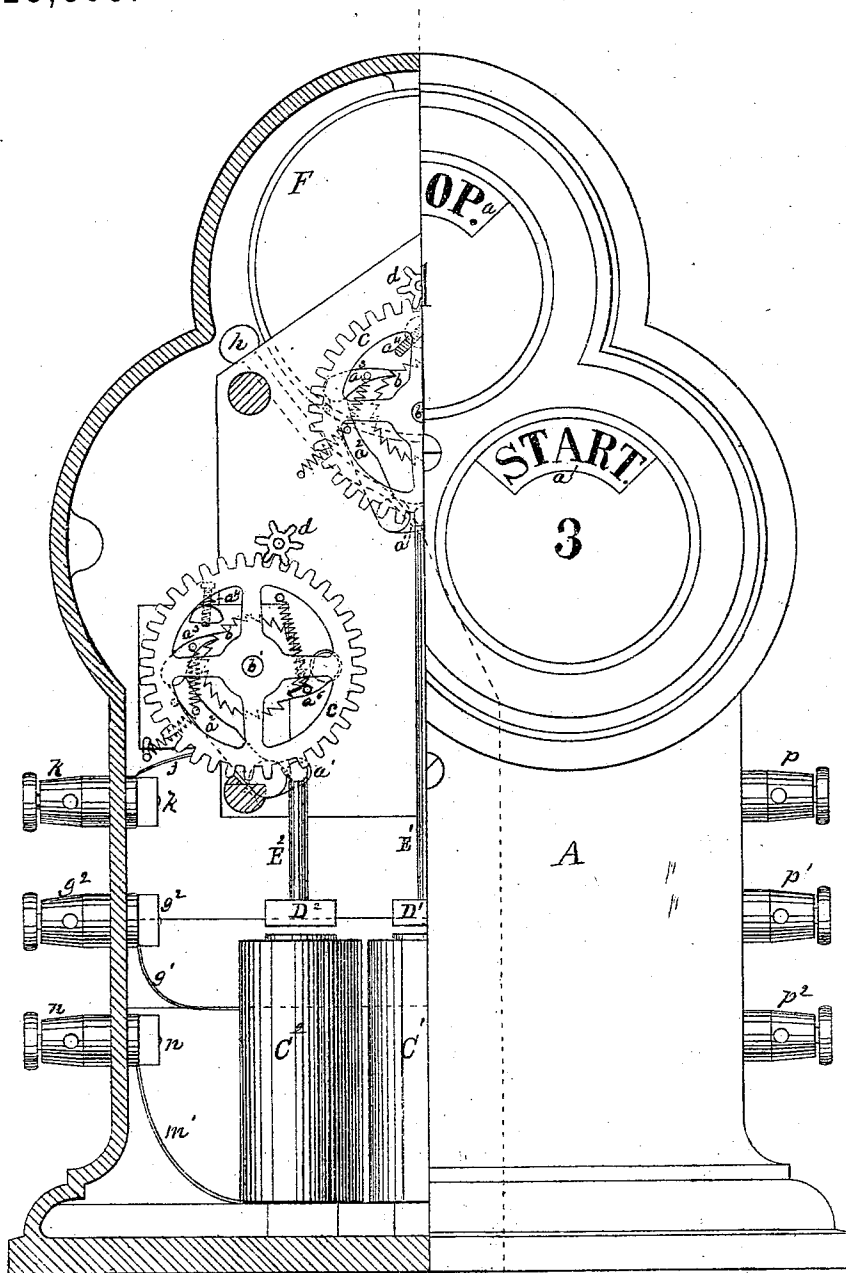


FIG. 5.

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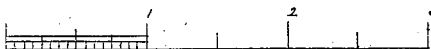
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3 inches.



Scale for figures 2, 3, 4, 5, 6 & 7.

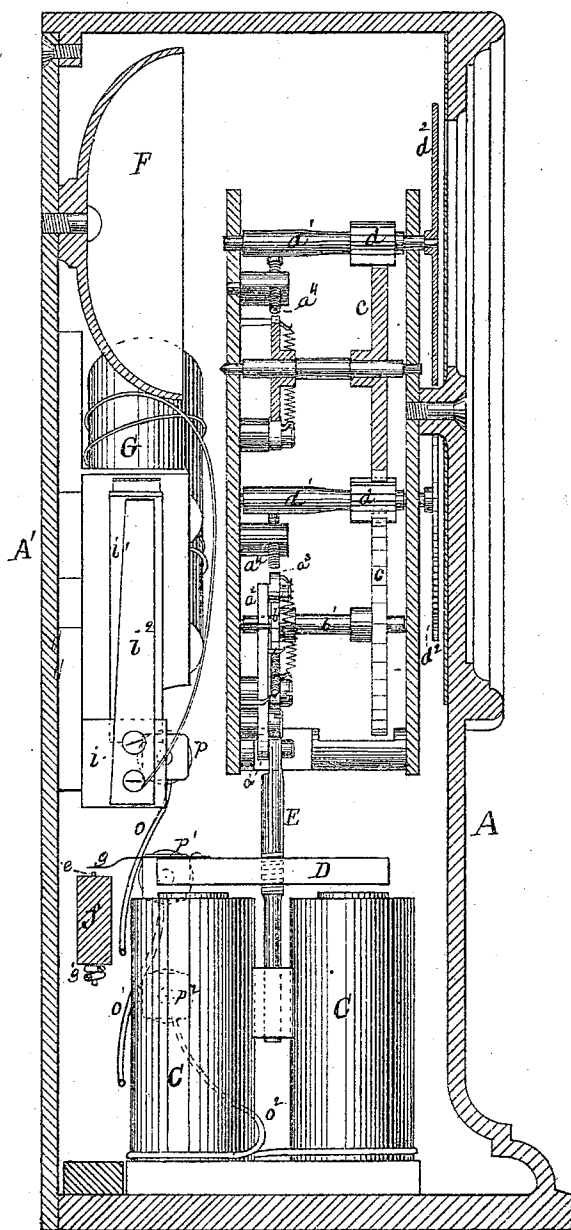


FIG. 6

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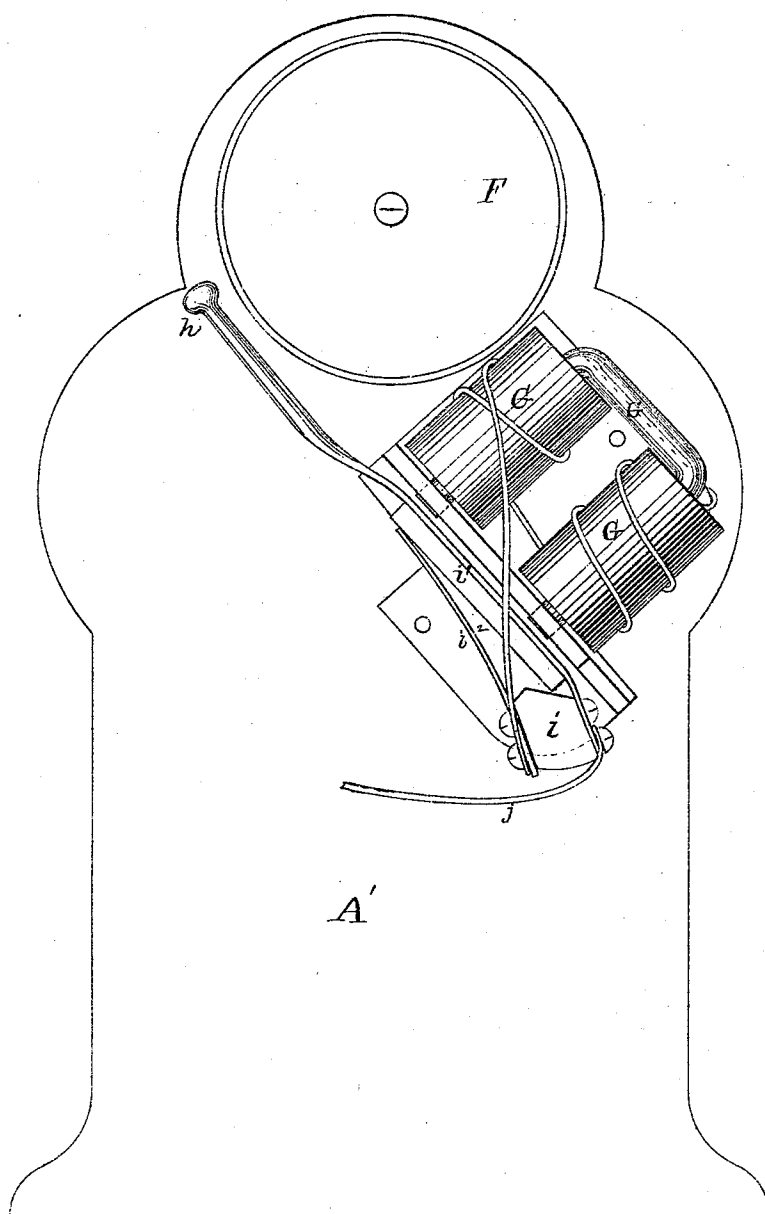


FIG. 7.

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UNITED STATES PATENT OFFICE.

WILLIAM H. MUMLER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO LUCIUS A. BIGELOW, TRUSTEE, OF SAME PLACE.

IMPROVEMENT IN ELECTRIC SIGNALING APPARATUS FOR FIRE-ENGINES.

Specification forming part of Letters Patent No. 123,355, dated February 6, 1872.

Specification of a new and useful Signaling Apparatus for Fire-Engines, invented by WILLIAM H. MUMLER, of Boston, in the county of Suffolk and State of Massachusetts.

The object of my invention is to provide a cheap and effective means of transmitting signals from the leading hoseman in charge of the pipe or butt to the engineer or foreman in charge of a fire-engine while playing at a fire, so that the word of command may be instantly transmitted from the hoseman to the engine without the trouble and delay occasioned by the sending of a messenger and the liability of mistakes occurring on account of the noise and confusion always attending a fire, and thereby preventing the great loss and damage which often occurs at fires from an excess of water being thrown when it is not needed owing to the difficulty of signaling the engine; and it consists, first, in the employment, in combination with a fire-engine and the leading-hose thereof, of an electro-galvanic signaling device, so arranged that the hoseman in charge of the butt or discharge-pipe, by touching a key provided for the purpose, shall close the circuit and thereby cause a bell to be rung on the engine, and, at the same time, the appropriate signal "stop" or "start" is brought to view on a dial in sight of the engineer or foreman. It consists, further, in the combination, with each length of leading-hose of a fire-engine, of a cable, consisting of two or more wires inclosed in "gutta-percha" or other suitable insulating material, or of one wire inclosed and insulated as described and a second wire wound or coiled around the outside of the insulating covering for the purpose of making a ground circuit, said cables being provided at either end with suitable male and female couplings for uniting the different lengths of cable, and insuring a connection from one to the other. It also consists in the employment of a coupling for uniting the several lengths of the cable, made to slip together by pressure without being rotated, and provided with spring-hooks, by which the two parts are securely held in position, one-half of said coupling containing a cup or socket and the other half a pin to fit said cup or socket, to each of which one end of a length of wire is connected, said cup and pin and the wire in the center of the cable being insulated from

the metal of said coupling by being inclosed in hard rubber and the "gutta-percha" covering of the cable. It also consists in the use of a clamping device for securing said coupling to the cable and the cable to the hose-coupling, consisting of a socket inclosing the cable, said socket being made tapering on the outside, and having a screw-thread cut thereon and longitudinal slits made through the same, dividing it into two or more parts, and provided with a nut, the thread of which is tapering to correspond with the socket, so that when said nut is screwed onto the socket the several prongs or parts into which it is cut by the slits shall be forced inward and made to gripe the cable firmly, and thus relieve the central wire from a large part of the strain to which it would otherwise be subjected. It also consists in the employment, in combination with the leading-hose of a fire-engine, and wires leading to the engine and connecting with a signal-box, and battery thereon, of a circuit-closer, arranged upon or near to the "butt" or pipe in such a manner as to be completely under the control of the hoseman. It further consists in the combination, with a fire-engine, of a signal-box, containing one or more electro-magnets, so arranged that the movement of either of the armatures consequent upon the closing of the circuit shall cause a bell to be rung and a dial, upon the face of which are painted or otherwise made to appear certain words or signs, to revolve, so as to cause the appropriate word or sign to appear through an opening in a fixed dial, thus signaling to the ear and the eye by one and the same operation.

In the drawing, Figure 1 represents a portion of a steam fire-engine with my signaling apparatus attached. Fig. 2 is a longitudinal section through the center of a hose-coupling and a short piece of the hose on either side thereof, showing the wire cable attached to the clamping device for securing the cable to the hose-coupling, and a coupling for uniting the contiguous ends of the lengths of the cable. Fig. 3 is a longitudinal section of the circuit-closing key, its case, and coupling for the same, with the hose-coupling next to the butt or pipe. Fig. 4 is a transverse section through the clamp for cable. Fig. 5 is a view of the signal-box, one-half of which is in elevation and the other

half in vertical section on line xx on Fig. 6. Fig. 6 is a vertical section on line zz on Fig. 5; and Fig. 7 is an elevation of the inside of the back plate, showing the bell-striking apparatus.

A is the signal-box, secured to the boiler or some other prominent part of the engine, and provided with three circular faces or dials, numbered 1, 2, and 3, through which are cut curved openings a concentric with their centers. C, C¹, and C² are three electro-magnets, immediately above which are the armatures D, D¹, and D², secured by their middles to the rods E, E¹, and E². Each of the rods E, E¹, and E² are suspended from the end of the short arm a^1 of an elbow-lever, the long arm a^2 of which carries the pawl a^3 , arranged to engage with the ratchet-wheel b mounted on the shaft b^1 , which also carries the gear-wheel c , arranged to operate the pinion d on the shaft d^1 , which also carries the disk d^2 , arranged just in the rear of the fixed dial 1, 2, or 3, and having the words "start" and "stop" painted or otherwise affixed on its outer face in such manner that when said disk is rotated the said words will be alternately brought to view through the openings a . a^4 is an adjustable stop-screw to limit the motion of the pawl a^3 , and a^5 is a retaining-pawl to prevent the dial being turned back by the backward motion of the pawl a^3 . The armatures D, D¹, and D² each have secured to their upper sides a thin spring-plate of metal, g , which, by the downward movement of the armatures, is brought in contact with the pin e set in the bar f , and to which the wire g is connected, the other end of which is connected to the screw-cup g^2 , to which is also connected the wire h^2 , leading to the positive pole of the battery B. The bell F is secured to the back-plate A¹ of the case and rung by the hammer h , the spring-handle of which is attached to the block of hard rubber i , and has secured thereon the armature i^1 . G is an electro-magnet, also secured to the back-plate A¹, the wire from one side of which connects with the spring-stop i^2 , and the wire from the other side connects with the back-plate A¹, which, with the other metallic portions of the mechanism and the case, serve as conductors to transmit the current from said magnet to the spring-plate g , the circuit being completed by the wire j , one end of which is secured to the spring-handle of the hammer h , and the other to the screw-cup k , to which the wire l from the negative pole of the battery is attached, thus forming a circuit for striking the bell; the closing of the circuit being accomplished by the downward movement of either of the armatures D, D¹, and D², which causes the spring-plate g to come in contact with the pins e . Another wire, m , from the negative pole of the battery connects with the screw-cup h , to which the wire m^1 , leading to and connecting with each of the magnets C, C¹, and C², is also connected. The wires o , o^1 , and o^2 , from the opposite sides of the magnets C, C¹, and C², connect with the screw-cups p , p^1 , and p^2 , from which the wires

q , q^1 , and q^2 lead to the three lines of leading-hose, only one of which, H, is shown in the drawing. These wires are inclosed in a gutta-percha covering, and are placed inside the hose for a great part of the distance, passing into and out of the same through the side of the hose-coupling, where it is firmly secured by means of the slotted sockets r and the tapering nuts r^1 . These wires may be secured upon the outside of the hose instead of being placed inside thereof, and should be made somewhat longer than the length of the hose, to allow for coupling and uncoupling the cable; and have secured to one end thereof the cup or socket s and to the other end the forked spring-pin t , both of which are inclosed in the hard-rubber casings s^1 and t^1 , which are also inclosed in the metallic casings s^2 and t^2 , the whole constituting the male and female couplings S and S¹, respectively, each of which is provided with the tapering split socket r and nut r^1 for clasping the cable. The casing t^2 on one length of wire fits into the casing s^2 on the next length of wire, and the two parts of the coupling S and S¹ are held together by the spring-hooks u u , which hook into the notch u^1 inside of the casing s^2 , and are operated by the knobs u^2 , which project through the casing t^2 . I is an extra section of metallic tube, fitted with a female screw at one end, by which it is secured to the hose-coupling, and a male screw at the other end, to which the butt or pipe is secured in the usual manner. K is a stand secured to the periphery of the section L, in the forward end of the upper portion of which is mounted a key, v , having a spring around the same for the purpose of breaking the circuit when the finger is removed from the key, said key being protected from accidental operation by the cover v^1 . The rear portion of said stand K contains the cup or socket s , inclosed in the rubber s^1 and metallic casing s^2 , and fitted to the coupling on the end of the cable or insulated wire attached to the length of hose next in the rear thereof, or toward the engine. Upon the outside of the gutta-percha covering to the wire q is coiled the wire w , connecting at either end with the hose-couplings and to the positive pole of the battery, and forming a ground circuit in a well-known manner.

The operation of my invention is as follows: When the engine has arrived at the fire the hose is placed in position, the cable coupled, and the leading hoseman is ready for water. He touches the key v , which, by coming in contact with the metallic socket s , closes the circuit, and causes the magnet C to attract the armature D, which, by its downward motion, brings the spring-plate g in contact with the pin e , thus closing the bell-circuit and causing the bell to be rung as long as the finger remains on the key v . The downward motion of the armature D also pulls down upon the rod E and the short arm a^1 of the pawl-lever, and causes the ratchet-wheel b to revolve a certain distance by the action of the pawl thereon, and, through the gear c and the pinion d , causes

the disk d^2 to revolve and bring the word "start," painted thereon, in front of the opening a , so as to be seen by the engineer or foreman. When the water begins to discharge from the butt the hoseman removes his finger from the key v and closes the cover v^1 , when the bell will cease to ring, and the disk d^2 remains in the position just described until another signal is given by the hoseman placing his finger on the key again, when the disk d^2 will be rotated sufficiently to bring the word "stop" to view through the opening a . Precisely the same results will be obtained if the hoseman in charge of the other lines of hose (not shown in the drawing) should touch the key—a different magnet, however, being brought into operation, and acting upon a different train of mechanism to move the appropriate dial; or all three of the magnets may operate and cause the three dials to revolve at the same time.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is as follows:

1. The within-described process of signaling from the hoseman to the engineer or foreman of a fire-engine by means of electro-magnetism, substantially as described.

2. The combination, with a fire-engine and the leading-hose thereof, of a battery and signal mechanism located on the engine and conducting-wires leading from said battery and signal mechanism to the leading hoseman, and a suitable circuit-closer at or near the "butt" or discharge-pipe, for the purpose of transmitting signals from the hoseman to the engineer or foreman, substantially as described.

3. In combination with each length of the leading-hose, I claim a cable consisting of one or more insulated wires attached thereto, either inside or outside of the hose, and provided with suitable male and female couplings for

uniting two contiguous lengths and insuring a connection between the same, substantially as described.

4. The male coupling S and the female coupling S^1 secured together by the spring-hooks u u , substantially as described.

5. In an electro-magnetic apparatus for signaling from the hoseman to the engineer or foreman of a fire-engine, I claim the circuit-closing key v placed upon or near to the discharge-pipe so as to be under the control of the hoseman, substantially as described.

6. In combination with an electric wire or cable attached to engine-hose, I claim the slotted sockets r and tapering nuts r^1 , for the purpose of clamping the cable, substantially as described.

7. In an apparatus for signaling from the hoseman to the engineer or foreman by electro-magnetism, I claim a signal-box, containing one or more electro-magnets and one or more trains of mechanism, so arranged that the movement of either of the armatures when attracted by its magnet shall cause a disk to rotate upon which the suitable signals are painted in such a manner that the desired signal shall appear through an opening in the face of the box, substantially as described.

8. In an apparatus for signaling from the hoseman to the engineer or foreman of a fire-engine, I claim the combination of the dial-moving mechanism and the bell-ringing apparatus, when so arranged that the closing of the circuit by the hoseman shall cause the bell to ring and the dial to revolve so as to bring the appropriate signal into view, substantially as described.

Executed at Boston this 30th day of December, 1871.

WILLIAM H. MUMLER.

Witnesses:

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