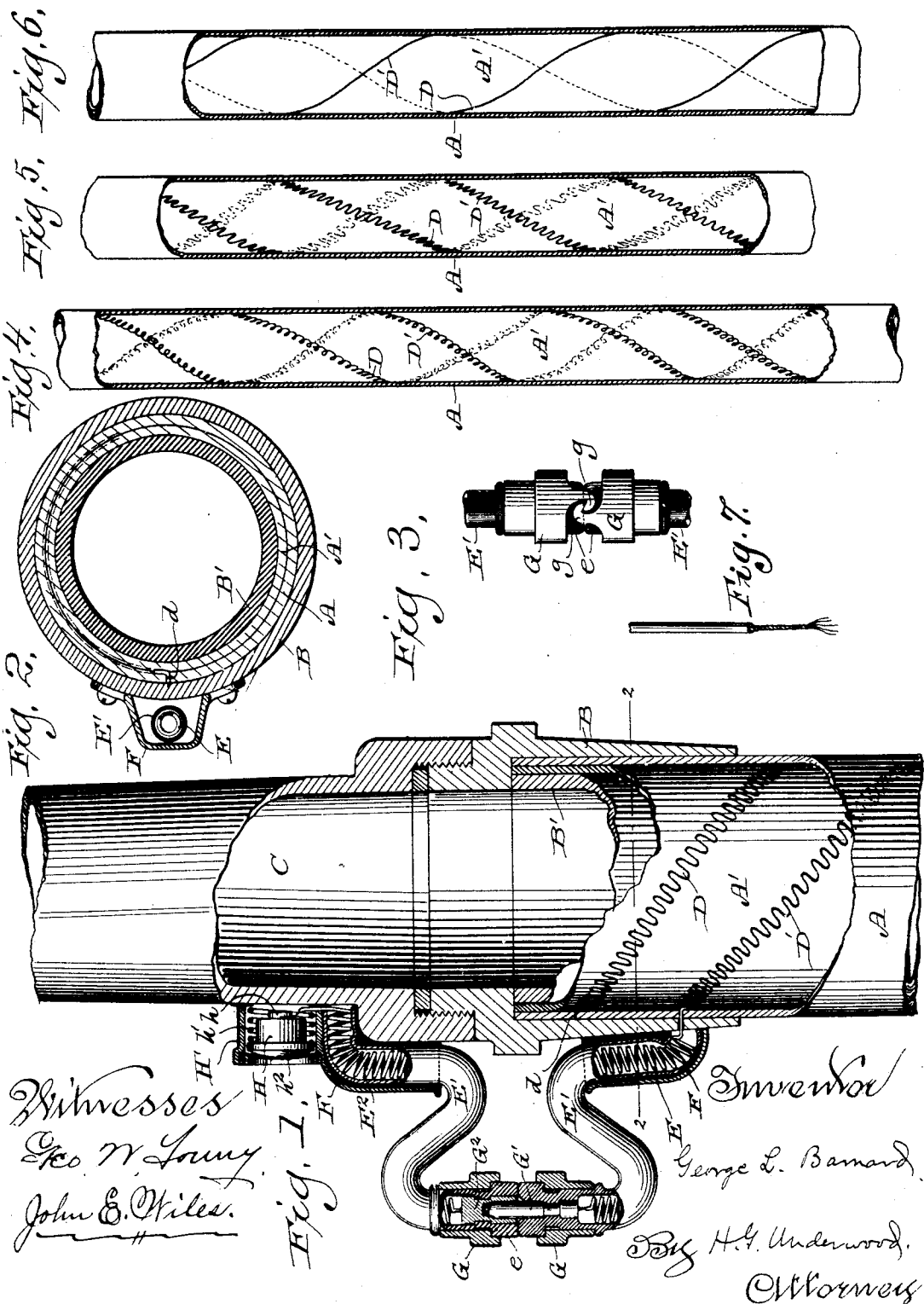


(No Model.)

G. L. BARNARD.
ELECTRIC SIGNALING DEVICE FOR HOSE.

No. 511,188.

Patented Dec. 19, 1893.



Witnesses
Geo. W. Lamy
John E. Chiles.

Inventor
George L. Barnard.
By H. G. Underwood,
Attorney

UNITED STATES PATENT OFFICE.

GEORGE L. BARNARD, OF MILWAUKEE, WISCONSIN.

ELECTRIC SIGNALING DEVICE FOR HOSE.

SPECIFICATION forming part of Letters Patent No. 511,188, dated December 19, 1893.

Application filed August 22, 1892. Serial No. 443,706. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. BARNARD, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Electric Signaling Devices for Hose; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to improvements in electric signaling devices for hose, for enabling a pipeman in charge of a line of hose connected with a fire engine or other source of supply of water under pressure, to communicate with a person at the engine or other source of water supply.

It is often necessary in case of fire, for a pipeman having charge of a line of hose, to communicate with the engineer or other person at the supply end of the line of hose, to turn the water on or off, to deliver the water under a greater or less pressure, or to send an extra nozzle or tools for his use at the discharge end of the hose, and it has been customary heretofore, to send such communications by messengers, or by means of a speaking trumpet. Devices of this nature have been constructed heretofore, with electric conducting wires arranged upon the inside or outside of the hose, or arranged straight within the wall of the hose, but in the former construction, where the wires are not embedded in the hose, they are liable to become detached or disarranged so as to be inoperative, and in the latter form, the stretch of the hose due to the pressure of the water, frequently breaks the wires and hence renders the signaling apparatus inoperative.

In the accompanying drawings illustrating my invention: Figure 1 is a view partly in section, of a portion of a fire hose constructed in accordance with my invention, and illustrates the manner of forming the connection between the nozzle and the hose, and between the wires in the hose and a push button on the nozzle. Fig. 2 is a transverse sectional view taken on line 2-2 of Fig. 1. Fig. 3 is a separate view in elevation of the device for electrically connecting the ends of the signal wires. Fig. 4 is a view of a piece of fire hose constructed according to my invention, and illustrates a part of the outer layer of

the hose as broken away to show the arrangement of the wires. Fig. 5 is a similar view illustrating a somewhat different arrangement of the wires. Fig. 6 is another similar view illustrating still another arrangement of said wires, and Fig. 7 a detail view of the wire.

In said drawings: A represents the outer and A' the inner layer of the hose fabric.

B represents one member of a hose coupling, and C the nozzle secured thereto in the usual manner.

Electric conducting wires D and D' are arranged spirally within the fiber of the hose preferably between the outer and inner layers thereof, as shown, the opposite ends of one of said wires, as D, being electrically connected with the metallic coupling members B, at opposite ends of the sections of hose, said wires being conveniently arranged to project through the outer layer A of the hose fabric and joined onto said metallic parts, as shown at *d* in Figs. 1 and 2. The ends of the other wire D' in each section of the hose, are carried to the outside of the metallic coupling members, being insulated therefrom, and provided with suitable couplings as will be presently described in detail.

I prefer to form the conductors from lengths of composite, wire formed from several strands braided or twisted together and covered with a suitable insulation as shown in Fig. 7. In the particular construction illustrated in Figs. 1 and 5, these conducting wires D and D' are repeatedly corrugated or bent back and forth in addition to being arranged spirally within the wall of the hose, while in the form shown in Fig. 4 the wires are each arranged in the form of a continuous series of small loops.

In the particular form of construction shown in Fig. 6 the wires are arranged in the form of plain spirals between the outer and inner layers of hose fabric.

I arrange the outer ends of the conducting wires D' D' in the form of spirals E E, which are provided with suitable tubular protective coverings E' E' as shown in Fig. 1, a similar wire E² being arranged in like manner upon the rear end of the nozzle, but insulated therefrom in the manner before described.

Suitable protective housings F F are secured to the metallic couplings and are ar-

ranged to inclose the inner ends of said wires. These protective coverings E' E' for said spiral wires, are preferably formed from rubber tubing or analogous material, and are provided at their outer ends with enlargements *ee* as shown. Short sleeves G G, are revolvably engaged with the tubings E' E' and are provided with hooks *gg* preferably on opposite sides thereof and adapted for engagement with each other, as shown more particularly in Fig. 3, when the ends of said tubings are brought together, and the enlargements *ee* on said tubes E' E' are of sufficient length to necessitate a considerable compression of said enlargements before the hooks *gg* can be brought into engagement. The faces of the said hooks *gg*, are slightly beveled, as shown in Fig. 3 so that when they are in engagement with each other, the expansive pressure of the compressed extensions *ee* of the tubes E' E' serve to prevent accidental disengagement of said hooks from each other.

Within the enlarged ends of the tubes E' E', are arranged suitable male and female coupling members G' and G² respectively adapted to be brought into engagement with each other when the ends of said tubes are abutted together, and these latter coupling members are electrically connected with the spirally arranged wires in their respective tubings as shown in Fig. 1 more particularly. It follows from this construction that when two sections of hose provided with my improved conducting wires and the flexible connections therefor, are brought into engagement in the manner described, the wires D D in said sections of hose will be electrically connected with each other through the medium of the metallic hose coupling members, and when the flexible couplings at the ends of the wires D' D' are brought into engagement, the said wires D' D' will be electrically connected with each other.

The wires D and D' lead to opposite poles of a suitable battery or other source of current adjacent to the supply end of the hose, and any desired device, such as a bell, for audible signaling is included in the circuit.

In order for the pipeman at the discharge end of the hose to signal the person at the other end of the line of hose, it is only necessary to make electric connection between the wire E² and the metallic nozzle C, when the circuit will be completed from the battery through the wires D and D' and the signaling device in an obvious manner, and for the purpose of thus connecting said wire and nozzle, I provide upon the outside of the nozzle, a suitable push button H carrying a suitable contact *h* electrically connected with the wire E², but normally held out of contact with the nozzle C by means of a spring *h'*. If now the push button H be pushed inwardly so as to bring the contact *h* against the metallic nozzle the circuit will be completed in an obvious manner.

In order to insure the push button and its connections against short circuiting by reason of moisture, I inclose said push button in a suitable housing H' secured to the outside of the nozzle and cover the button with a suitable elastic diaphragm *h*² which entirely closes the opening in the housing H', so as to effectually exclude water or moisture from said housing.

A great advantage gained by my improved construction is that, by the spiral arrangement of the wires within the wall of the hose, the hose is permitted to stretch under the pressure of the water without breaking the circuit wires. A still further advantage is gained by the construction shown in Figs. 1, 4 and 5, in which the wires in addition to being arranged spirally, are bent, corrugated or looped, from the fact that by such an arrangement of the wires, the hose will be permitted to expand diametrically, as well as to stretch lengthwise without damage to the wires, and any tendency of the spirals of said wires to contract diametrically under lengthwise stretch of the hose, would be entirely obviated.

By the construction of the couplings for the circuit wires D' D' shown and described, the enlargements *ee* when they are in engagement with each other, serve not only to hold the hooks *gg* in engagement, but to exclude all moisture from the male and female coupling members G' and G² and insure perfect insulation thereof at all times.

By the employment of the composite wires as shown in Fig. 7 greater flexibility of the conducting wires is insured than if single wires were employed.

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

1. The combination with a hose, of electric circuit wires corrugated or repeatedly bent and arranged spirally within the wall of the hose, extending throughout the length of the hose, and suitable means for making electrical connections with the ends of said wires, substantially as set forth.

2. The combination with two or more lengths of hose, of electric circuit wires embedded in the wall of said hose and arranged spirally therein throughout said lengths of hose, said wires being carried to the outside of the hose adjacent to opposite ends of said sections and terminating in spirals tubular protective coverings for the spiral ends of said wires and suitable male and female coupling members carried by said tubular coverings and adapted to form electrical connections between said wires, substantially as set forth.

3. The combination with two or more lengths of hose, of circuit wires embedded in the wall thereof and extending spirally throughout said lengths said wires being arranged to extend to the outside of the lengths of hose, adjacent to opposite ends thereof, suitable tubular coverings around the ends of

said wires, carrying metallic contact pieces
connected with said wires and adapted to form
electrical connections between said wires,
hooks for holding the ends of said tubular
5 coverings in engagement with each other, and
elastic cushions upon the ends of said tubings,
substantially as set forth.

In testimony that I claim the foregoing I

have hereunto set my hand, at Milwaukee, in
the county of Milwaukee and State of Wis- 10
consin, in the presence of two witnesses.

GEORGE L. BARNARD.

Witnesses:

JOHN E. WILES,
H. G. UNDERWOOD.