(No Model.) 2 Sheets—Sheet 1.

J. SCHENCK & B. L. STOWE.

SEAMLESS MULTIPLY FABRIC HOSE.

No. 299,017. Patented May 20, 1884.

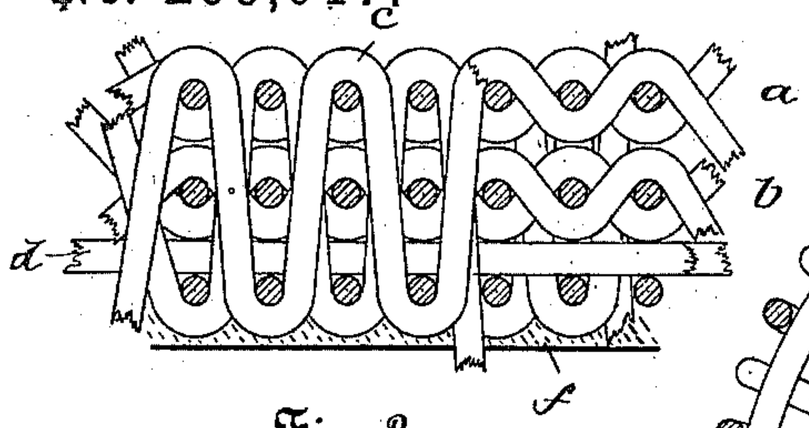

Fig. 2.

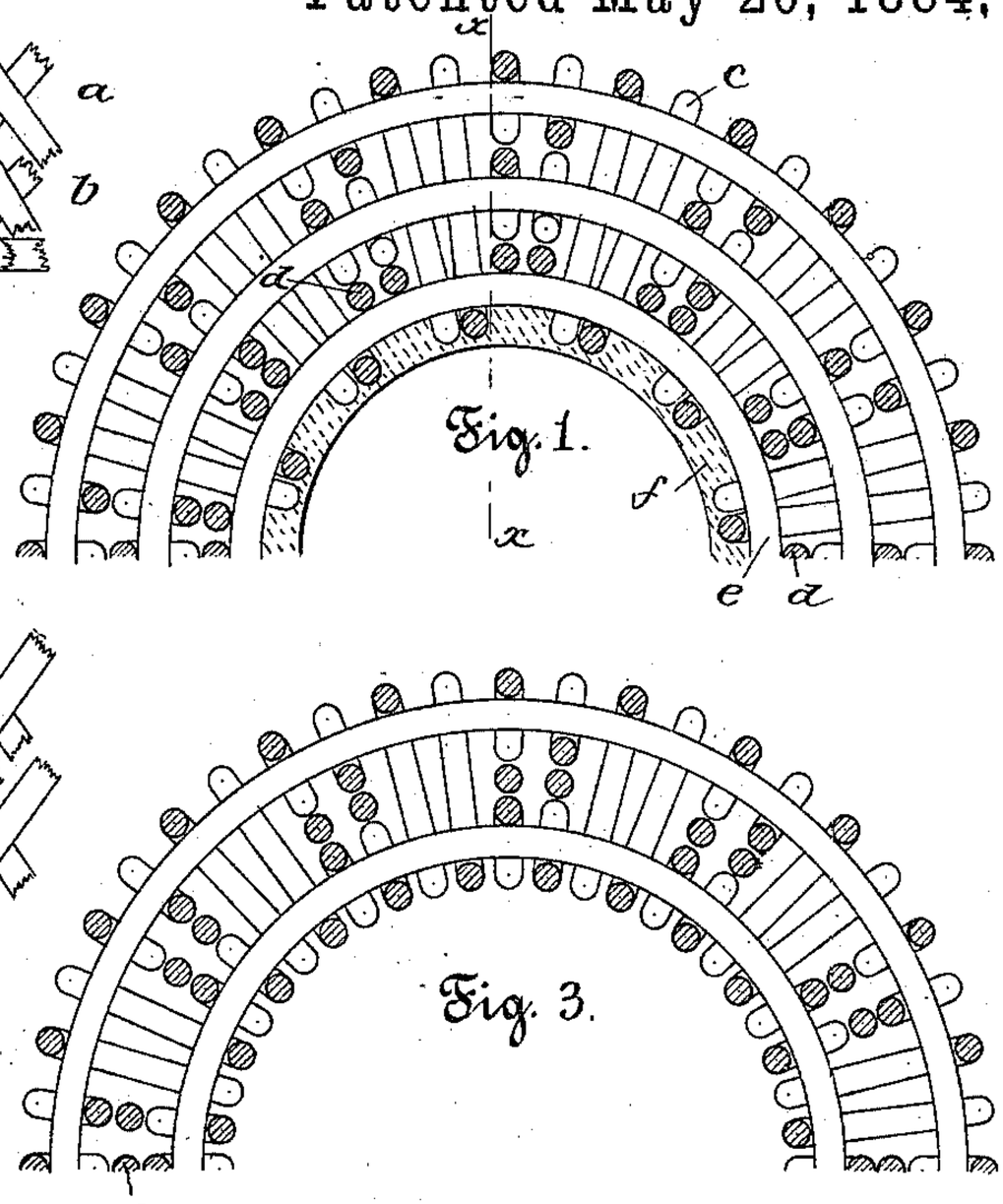

Fig. 1.

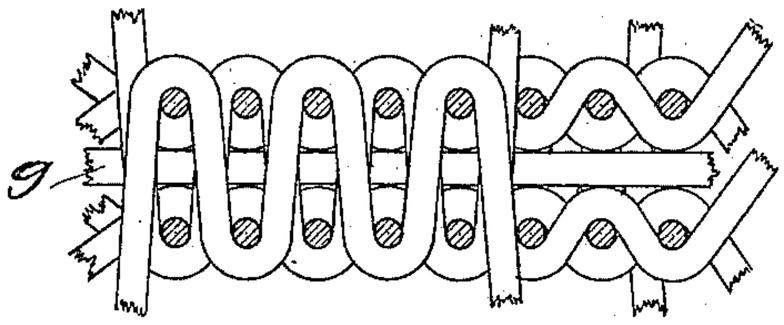

Fig. 4.

Fig. 3.

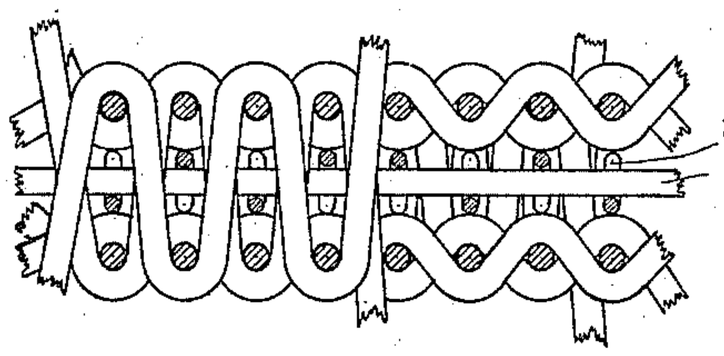

Fig. 6.

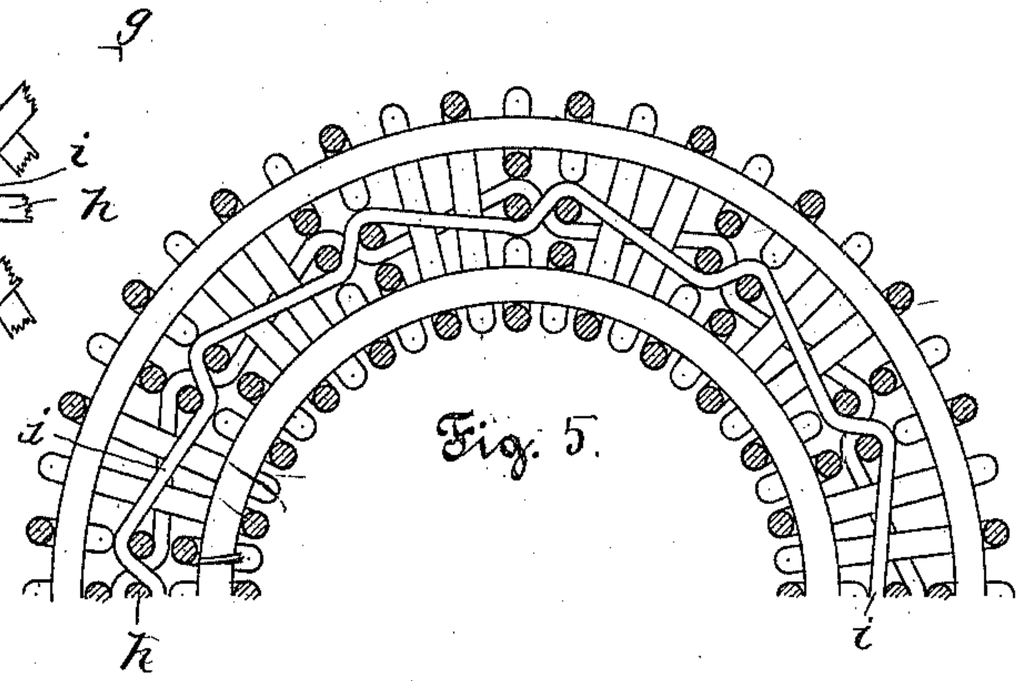

Fig. 5.

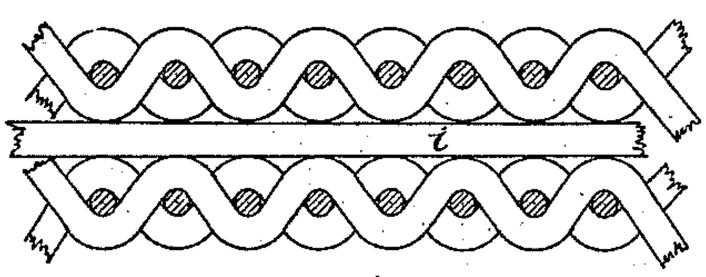

Fig. 8.

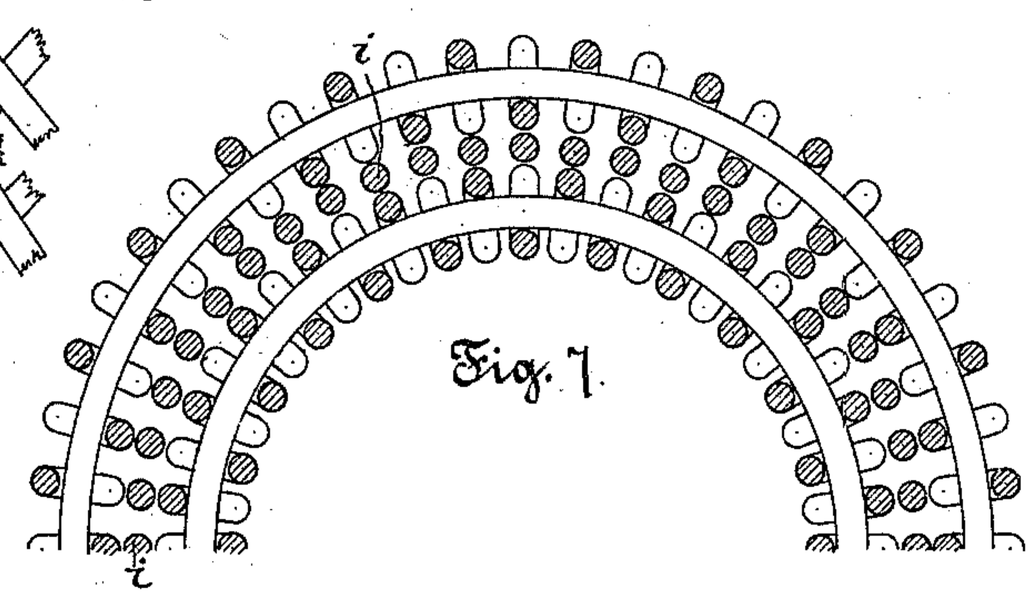

Fig. 7.

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(No Model.) 2 Sheets—Sheet 2.

J. SCHENCK & B. L. STOWE.

SEAMLESS MULTIPLY FABRIC HOSE.

No. 299,017. Patented May 20. 1884.

Fig. 9.

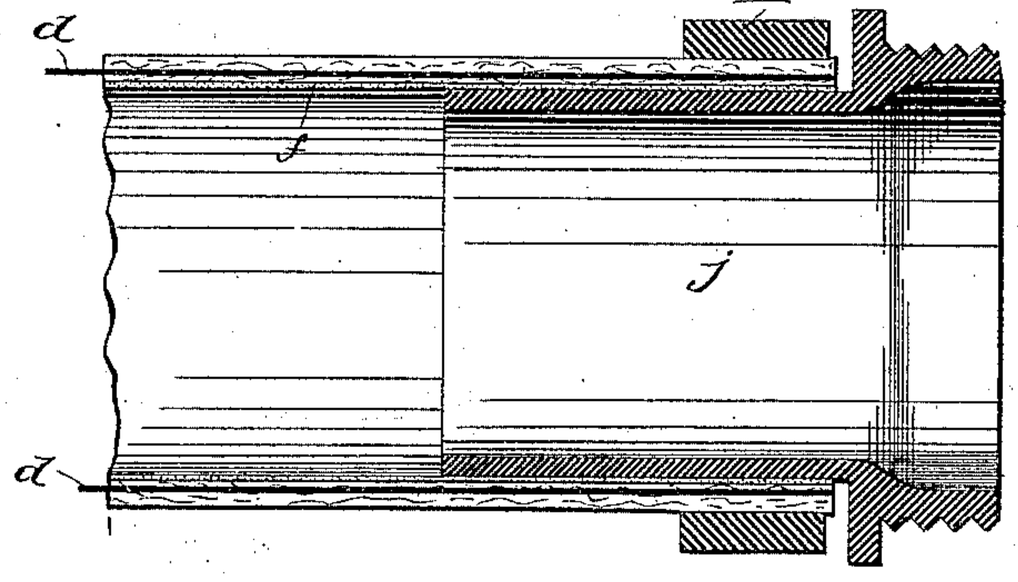
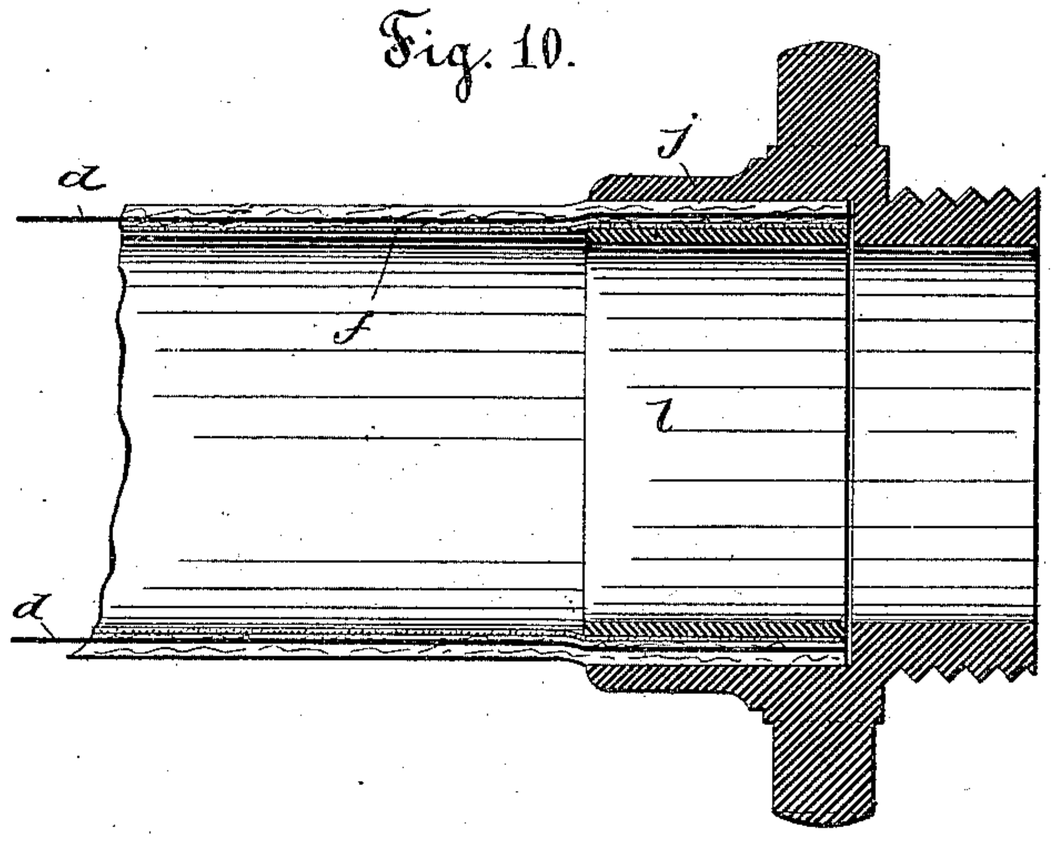


Fig. 10.



Witnesses.
J. Walter Blandford.
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Benjamin L. Stowe
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Attorney

UNITED STATES PATENT OFFICE.

JUNIUS SCHENCK AND BENJAMIN L. STOWE, OF BROOKLYN, ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO THE EUREKA FIRE HOSE COMPANY, OF NEW YORK, N. Y.

SEAMLESS MULTIPLY-FABRIC HOSE.

SPECIFICATION forming part of Letters Patent No. 299,017, dated May 20, 1884.

Application filed October 17, 1883. (No model.)

To all whom it may concern:

Be it known that we, JUNIUS SCHENCK and BENJAMIN L. STOWE, of Brooklyn, Kings county, New York State, have invented a certain new and useful Improvement in Seamless Multiply-Fabric Hose for Fire, Hydraulic, and other Purposes, of which the following is a specification.

Our improvement in seamless multiply-fabric hose consists in incorporating with the hose longitudinal or warp strands which are laid and held in the web or fabric straight or without corrugation, for the purpose of overcoming the longitudinal extensibility of the hose, and of preventing it from elongating—as it now does—when under heavy internal pressure. This result can be obtained in a variety of ways. A portion of the plies can be woven in the usual manner—as, for instance, in the manner set forth in Reissued Letters Patent No. 7,442, dated December 19, 1876—while upon the warps belonging to a certain other one of the plies we put a strong tension, and then either omit entirely the weft pertaining to that particular ply, or put a very light tension on the weft, or use a very fine weft, or manipulate the warp and weft in such other manner as shall accomplish the result desired, as will be readily understood by those skilled in the art to which the invention relates. This result—viz., the placing in the fabric of certain longitudinal cords in a straight or nearly straight manner, so as to overcome longitudinal elasticity or extensibility which the hose otherwise possesses—can be arrived at in a variety of ways, some of which are illustrated in the accompanying drawings. We do not intend, however, to restrict ourselves to the special forms shown in illustration of our invention, for any equivalent arrangement by which there is produced a multiply tube having straight longitudinal cords or strands incorporated with it may be adopted.

In the drawings, Figures 1 and 2 represent in cross-section and longitudinal section one form of multiply tubular fabric hose embodying our improvement. The cross-section is of one-half the tube only, and the longitudinal section is on line *x x*, Fig. 1. The strands or cords are represented on a much enlarged scale, and as widely separated from one another, in order to allow the structure of the fabrics to be more clearly seen. Figs. 3 and 4, 5 and 6, and 7 and 8 are corresponding sectional views of modified forms of the fabric. Figs. 9 and 10 are longitudinal central sections of hose and hose-couplings, to be hereinafter referred to.

The hose illustrated in Figs. 1 and 2 is a multiply woven hose of the type set forth in Reissued Letters Patent No. 7,442. It is in the present case a three-ply hose. The warps and wefts of two of the plies, *a* and *b*, and the tying-strands *c* are manipulated in the manner described in said Reissued Letters Patent; but the warps *d*, pertaining to the other ply—in this case the inner ply—are so manipulated (as will readily be understood by one skilled in the art to which our improvement relates) as to always lie straight between the second ply, *b*, and the inner weft, *e*, which latter is held in its position by the tying-strands *c*, the rubber lining *f*, when put into the hose, also materially assisting, by its adhesion, in fixing and holding the fabric. The strands or warps *d*, inasmuch as they lie straight and without corrugation, effectually prevent the elongation or stretching of the hose.

We here remark that we have made the special form of hose in Figs. 1 and 2 subject of a separate application for Letters Patent of even date herewith.

The hose in Figs. 3 and 4 is made in the same manner as described in Reissued Letters Patent No. 7,442, save that the weft pertaining to the middle ply is omitted, and a heavy tension is put upon the warp of that ply during the weaving operation, with the result of laying this warp (lettered *g*) straight and without corrugation between the outer and inner plies.

In Figs. 5 and 6 the hose is also of the type described in Reissued Letters Patent No. 7,442. In this hose, however, a very heavy tension—during the making of the hose—is put on the warp *h* of the middle ply, and a very light tension on the weft *i* of that ply, the weft thus used being also comparatively

fine. The result is, that these particular warp-strands *h* lie in the hose straight and substantially without corrugation, just as though no weft were used.

In the multiply hose illustrated in Figs. 7 and 8 no tying-strands are used, and the weft of the middle ply is omitted, the result being that certain strands, *i*, are laid longitudinally and straight between two plies of the hose, where they will be held firmly by the couplings that go upon the ends of the hose.

In putting couplings upon hose, the hose is either firmly bound upon the shank of the coupling *j* by bands or clamps *k*, or their equivalents, as in Fig. 9, or else rings *l* are expanded within the hose, which in this case is placed inside of the shank of the coupling, as in Fig. 10. In either case, however, hose is necessarily tightly pinched or compressed between the ring and the shank, and this compression will hold the ends of the straight warp-strands sufficiently to prevent them from drawing back into the fabric when the hose is under pressure.

Our improvement, manifestly, can be applied to and used to advantage in braided hose, or other multiply-fabric hose, by placing between the plies thereof the straight cords or strands for preventing elongation of the hose.

What we claim as new and of our invention is as follows:

1. In a seamless multiply-fabric hose, the combination, with the plies, of warp or longitudinal strands placed in and incorporated with the fabric so as to lie therein substantially straight and without corrugation or abrupt bend, substantially as and for the purposes hereinbefore set forth.

2. Seamless multiply-fabric hose containing straight longitudinal strands or cords for preventing elongation of the hose, in combination with coupling and clamps, whereby the ends of the said straight cords or strands are prevented from drawing back into the fabric when the hose is under pressure, substantially as hereinbefore set forth.

In testimony whereof we have hereunto set our hands this 1st day of September, A. D. 1883.

JUNIUS SCHENCK.
BENJAMIN L. STOWE.

Witnesses:
F. ASHMUN STOWE,
RICHARD J. HARRIGAN.