

R. MANY.
HOSE CONSTRUCTION.
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1,179,374.

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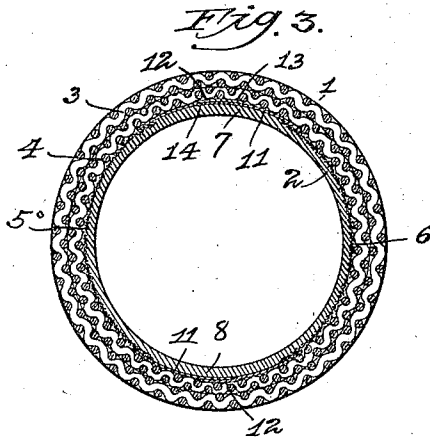
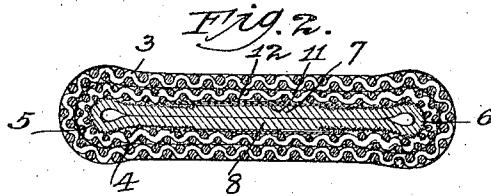
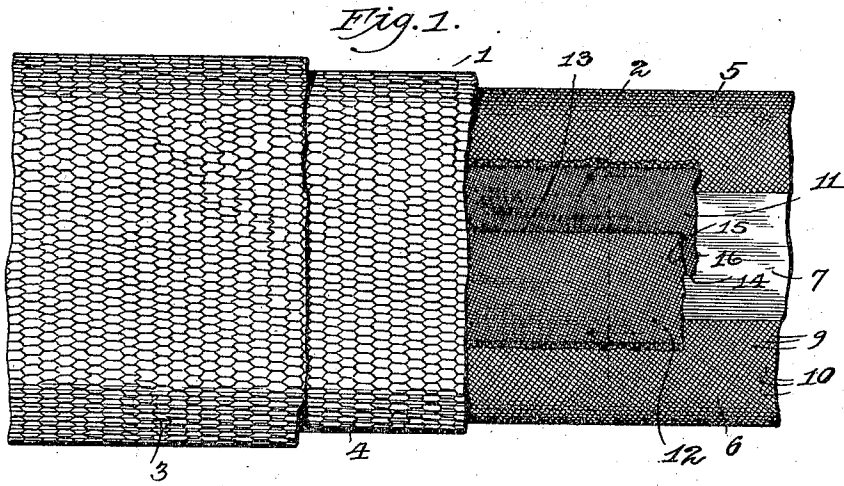


Fig. 4.

Witness, 5
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UNITED STATES PATENT OFFICE.

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HOSE CONSTRUCTION.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROBERT MANY, a citizen of the United States, residing in the village of Oak Park, in the County of Cook and State of Illinois, have invented certain new and useful Improvements in Hose Constructions, of which the following is a specification.

This invention relates to improvements in hose constructions and more particularly to an improved hose of the type in which the fluid containing tube is expansible and is surrounded by and preferably detachably inclosed within an outer or incasing jacket.

Among the salient objects of the invention are to provide an improved reinforced elastic fluid conveying tube which can be detachably employed with an incasing jacket; to provide a construction in which the reinforcement for the fluid conveying tube protects those portions of the tube which form the bent edges when the hose is in flattened condition, my invention being primarily adapted for fire or mill hose of the larger type which are adapted to be rolled or folded in flattened position when not in use, though in its broader aspects, the invention is not limited to such use; to provide freely expansible central portions extending longitudinally of the tube and positioned intermediate the reinforced edge portions thereof; to provide a protective means for preventing the freely expansible central portions of the tube rubbing against the rough inner surface of the inclosing jacket or casing; to provide a construction in which the protective means comprises a flap having one side fixedly secured to the outer wall of the inner tube and an unsecured side extending over the freely expansible portion thereof, there being preferably two or more of these flaps overlapping a distance greater than the amount of expansion of the flexible portion which they overlie; to provide a construction in which the reinforcing fabrics which are fixedly secured to the edge portions of the inner tube are formed of material cut on the bias, which arrangement together with the free movement between the overlapping flaps allow the necessary longitudinal and lateral expansion; to provide a construction in which the inner fluid conveying tube can be easily slipped into the casing and is unattached thereto through substantially its entire length, and in which danger of tearing

the expansible portions of the inner tube when drawing it into the jacket is avoided; to provide an improved construction of inner tube which can be inserted in previously formed jackets so as to permit of the repair or renewal of fire hose without the necessity of purchasing new incasing jackets; to provide a construction in which the fabrics that are fixedly secured to the inner fluid conveying tube and the flaps which overlap the freely expansible portions of the tube are saturated with a bituminous or other waterproofing compound, preferably the so-called air-blown asphalts of commerce; to utilize the waterproofing characteristics of the reinforcing fabrics and flaps in protecting the general structure of the fluid conveying tube; and in general to provide an improved and simplified construction which can be economically manufactured, and in which the inner and outer casings readily attached and detached.

The invention further resides in various details of construction and combination of parts hereinafter set forth.

In the drawings: Figure 1 is a top plan view of a hose construction embodying my invention. Fig. 2 is a cross section through the hose in flattened position. Fig. 3 is a cross section through the hose in inflated position. Fig. 4 is an enlarged fragmentary cross section taken on the dotted line shown in Fig. 1.

Describing in detail the particular construction shown in the drawings, which illustrates a fire hose embodying my invention, 1 designates as an entity the incasing or protective jacket and 2 the inner fluid conveying tube. The jacket comprises two independent sections 3 and 4 telescopically engaging with each other, the inner one of which in turn telescopically receives the fluid conveying tube. In the use of hose of this type it is usual to store the assembled tubes and casing in flattened position either by folding the hose back upon itself or winding it up on a reel, and to facilitate the folding or winding of the hose the larger sizes are generally constructed to normally return to a collapsed or flattened position when not in use. Extreme difficulty, however, has been encountered in preventing the weakening of the inner tube near the lines of the bends of the edge portions. In the present construction this objection is overcome by the employment of reinforcing fab-

rics 5 and 6 which are fixedly secured to and extend around the edge portions of the inner tube. These reinforcing fabrics run lengthwise of the hose and serve to hold the edge portions thereof out of engagement with the rough interior surface of the outer casing. They also protect the edge portions of the hose by preventing any appreciable expansion strain thereof, substantially the entire expansion strain coming upon the freely expandible portions 7 and 8, shown in Fig. 2 at the top and bottom respectively. However, some expansion both in a lateral and longitudinal direction of the portions of the hose to which the fabrics 5 and 6 are secured is permitted by having the material which forms these fabrics cut on the bias, that is, with its threads 9 and 10 extending in an oblique or diagonal direction relative to the axis of the hose.

The construction so far described gives adequate protection to the edge portions of the tube but the present invention further contemplates protection of the central expandible portions 7 and 8 in the following manner: Secured to the respective fabrics 5 and 6 is a pair of longitudinally extending flaps or fabrics 11 and 12, the width of each of which is such that the free sides 13 and 14 have overlapping portions 15 and 16. The flaps 11 and 12 are secured at one side only as shown in detail in Fig. 4 and the amount of overlap is such that when the hose is inflated by the passing of fluid through it there still remains overlapping portions of the flaps or fabrics 11 and 12. Thus at all times the expandible portions 7 and 8 are held out of engagement with the inner wall of the incasing jacket, the flaps being free to relatively adjust themselves to the expansion and contraction of the inner tube.

The use of the fixedly secured fabrics 5 and 6 in combination with the overlapping flaps 11 and 12 allows for the necessary expansion and also avoids the crinkling which would take place if a single flap extended from the fabric 5 to the fabric 6 and had its opposite sides fixedly secured to the respective fabrics. It is obvious that if a single fabric fixed at both sides were employed it would in the inflated position be necessarily of greater width than that required when the hose is flattened or collapsed. Therefore, in the latter position, such fabric would necessarily be creased or wrinkled, which objection is overcome in a simple and efficient manner by the present novel construction. This manner of protecting the freely expandible portions forms an important feature of my invention and is not necessarily limited to the particular means disclosed for accomplishing this result.

The fabrics 5 and 6 and the flap fabrics 11 and 12 are each saturated with a bitumi-

nous composition. The exact nature of this bituminous composition will vary somewhat with conditions. Preferably I use an asphaltic saturated compound, the base of which is made from blown-oil petroleum residuum, the asphaltic products having a much higher percentage of asphaltene and a much less percentage of petroleum than the residuum from which it is made. Such a product has the characteristics desired in a saturating compound used for the purpose specified. The saturations not only protects the fabrics and makes them waterproof but it is also substantially acid-proof and in addition will more effectively protect the inclosed rubber lining.

From the above description it is obvious that the various objects of the invention will be effectively accomplished by a construction which can be economically manufactured and readily inserted and withdrawn from the outer casing as an entity.

While I have shown and described the construction as adapted for use with fire and mill hose of the larger type which normally return to flattened position I do not desire to limit the invention to the particular type of hose shown and described nor in any manner except as specified in the appended claims.

I claim as my invention:

1. In hose construction, the combination with an incasing jacket, an inner fluid conveying tube detachably positioned within said casing, a reinforcing fabric secured to the outer surface of the tube leaving an intermediate longitudinal portion which is freely expandible, and a protective member for said expandible portion comprising a fabric extending longitudinally along the expandible portion and having one edge secured to the tube.

2. In hose construction, the combination with an incasing jacket, an inner fluid conveying tube detachably positioned within said casing, a reinforcing fabric secured to the outer surface of the tube leaving an intermediate longitudinal portion which is freely expandible, and a protective member for said expandible portion comprising a pair of reinforcing fabrics each having one side secured to the tube and a free side in overlapping engagement with the other of said pair.

3. In hose construction, the combination with an incasing jacket, an inner fluid conveying tube detachably positioned within said casing, a reinforced fabric secured to the outer surface of the tube leaving an intermediate longitudinal portion which is freely expandible, and a protective member for said expandible portion comprising a pair of reinforcing fabrics each having one side secured to the tube and a free side in overlapping engagement with the other of

said pair, the overlap being greater than the amount of expansion of the portion of the tube which is protected by the overlapping fabrics.

5 4. In hose construction, the combination with an incasing jacket adapted to lie flat when not inflated, of an inner fluid conveying tube detachably positioned within said casing and unattached thereto throughout
10 the major portion of its length, said inner tube having fixedly secured to diametrically opposite surfaces thereof adjacent to its line of fold reinforcing fabric strips and having

relatively adjustable overlapping flaps extending over the remaining portions thereof. 15

5. In hose construction, the combination with an incasing jacket, adapted to lie flat when not in use, of an inner fluid conveying tube positioned within said casing and a pair of spaced reinforcing fabrics secured
20 to the portions of the tubes which comprise the bent edges when the jacket and tube are in their flattened position, said fabrics being saturated with a hydrocarbon water-proofing.

ROBERT MANY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."