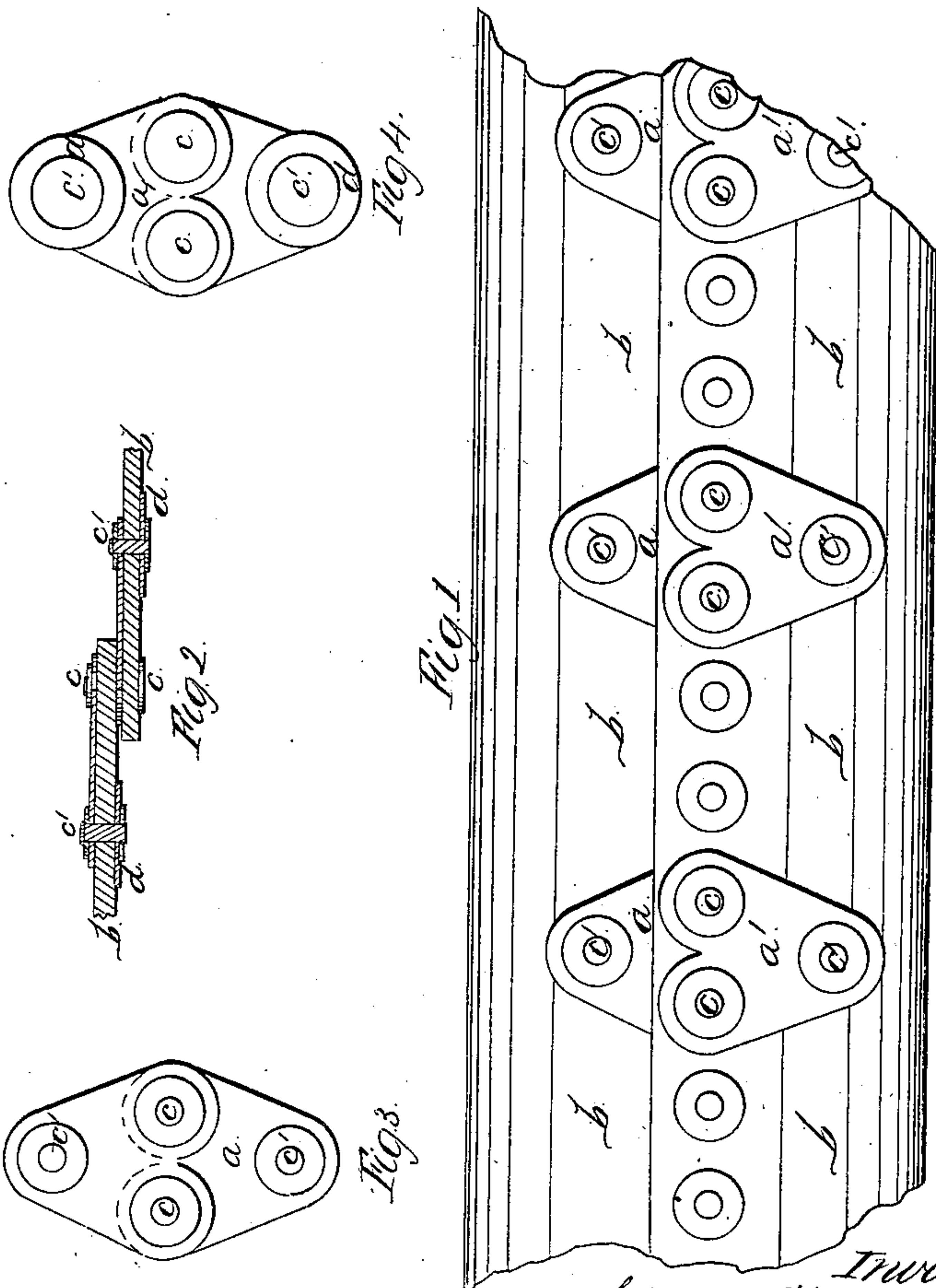


*G. H. Bonnaffon,*

*Making Hose.*

*N<sup>o</sup> 68,344.*

*Patented Sep. 3, 1867.*



*Witnesses*  
*W D Lewis*  
*E B Quising*

*Inventor*  
*Glaucus H. Bonnaffon,*  
*by Bakewell & Christy*  
*his attorneys*

# United States Patent Office.

GLAUCUS H. BONNAFFON, OF ALLEGHENY CITY, PENNSYLVANIA.

*Letters Patent No. 68,344, dated September 3, 1867.*

## IMPROVEMENT IN THE MANUFACTURE OF HOSE.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, GLAUCUS H. BONNAFFON, of Allegheny City, in the county of Allegheny, and State of Pennsylvania, have invented a new and useful Improvement in Manufacture of Hose; and I do hereby declare the following to be a full, clear, and exact description thereof.

The hose now in ordinary use by our hose and fire-companies is commonly constructed by folding or lapping the edges of a strap or belt over each other, and attaching them together by rivets. In consequence of the punching of the rivet-holes, the strength of the leather at those points is of course very much lessened, both by loss of leather and by the consequent loss of tenacity in the leather around each rivet-hole to the depth of from one-eighth to one-fourth of an inch, so that in the line of the riveting the hose is liable to give way, and generally does give way, under a strain or pressure which the other parts of the hose are sufficient to withstand. Such hose almost invariably breaks or tears by a rupture extending from rivet to rivet. Lapping the edges sufficiently to fasten them by two rows of rivets, while dividing the strain, adds but little to the strength or durability of the hose, since, for the reason above stated, any considerable increase in the number of rivets, especially when the rivet-holes are in close proximity, correspondingly weakens the hose at those points. The object of my invention is to add to the strength of riveted hose along this the line of greatest weakness; and the nature of it consists in strengthening hose along the main line or lines of riveting by plates or straps of metal or other suitable material riveted therein or thereon, the other ends of which plates or straps are riveted to the hose at a point or at points laterally back from the main riveting.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and mode of operation, referring for that purpose to the accompanying drawings, making a part of this specification, in which—

Figure 1 is an outside view of part of a section of hose riveted by my improved plan.

Figure 2 shows in cross-section my mode of attaching and riveting the plates to the hose.

Figures 3 and 4 show in outline the relative position of the plates when riveted, as seen on the outside and inside of the hose respectively.

The belt from which the hose *b* is to be made, being punched in the usual way for the insertion of rivets, as hereinafter to be described, the edges are folded over in the usual manner for the purpose of being riveted. Between the folds, however, I introduce, at suitable intervals, a series of plates, *a*, or straps of metal, leather, or other suitable material, and outside the folds attach another and similar series of plates *a'*, and fasten the whole together by the rivets *c c*, passing through both leather and plates, inserted and riveted with or without washers in the usual way. Such plates or straps *a a'* extend on either side of the main line of riveting, back a short distance therefrom, and at or near their rear ends are riveted to the hose by rivets *c'*. Thus the plates *a'* lie on the outer face of the outer fold, and the other plates *a* on the outer face of the inner fold, with one end between the folds; the rivets *c* passing through both rivets and both folds. In order the better to secure the rivets *c'* to the hose, I commonly use under the rivet-heads, and on the inside of the hose, a washer, *d*, somewhat larger than those of the usual size, but, in order to secure sufficient pliability in the hose, the rivets *c*, alternately by twos, may be furnished with such plates, as shown in fig. 1, or in any other desirable order. For the form of plate, I prefer those shown in the drawings, as the rear rivet *c'* then acts as a support to, and divides the strain with, the corresponding inner rivets *c c*. But I do not wish to limit myself to any particular form of plate or strap, nor of material for making the same. The plates or straps of metal, leather, or other material, may be heart-shaped, as shown in the drawings, triangular, rectangular, or have any other regular or irregular shape. They may be attached in any desirable order, and each plate or strap secured at either end by one, two, or more rivets, as may be preferred.

The hose thus constructed is sufficiently pliable to be easily manipulated in active service, or wound on a reel. It combines the necessary elements of strength and durability. And as the bursting of a hose pipe, when, during the prevalence of a fire, it is most needed, is often attended with disastrous results, the utility of an invention which lessens the danger of breakage is sufficiently obvious.

I also apply the devices above described to fasten the ends of belting, and thus obviate in the same way substantially the same danger of breakage. If designed for use over small wheels, the plates may, if made of



rigid material, be slightly curved, if thought preferable. I apply my invention to fastening all kinds of hose and belting, whether made of leather, gum, or canvas, or other material adapted to such uses.

What I claim as my invention, and desire to secure by Letters Patent, is—

Strengthening hose or belting by plates or straps of metal or other suitable material, connected with the riveting in the folded edges, which plates or straps are also riveted to the hose or belting at points laterally back from the main riveting, substantially as and for the purposes above set forth.

In testimony whereof I, the said GLAUCUS H. BONNAFFON, have hereunto set my hand.

GLAUCUS H. BONNAFFON.

Witnesses:

GEO. H. CHRISTY,

A. S. NICHOLSON.