

J. VAN D. REED.
Fire-Hose.

No. 161,273.

Patented March 23, 1875.

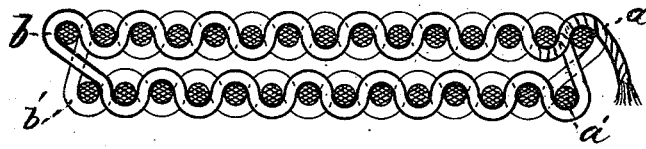


Fig 2.

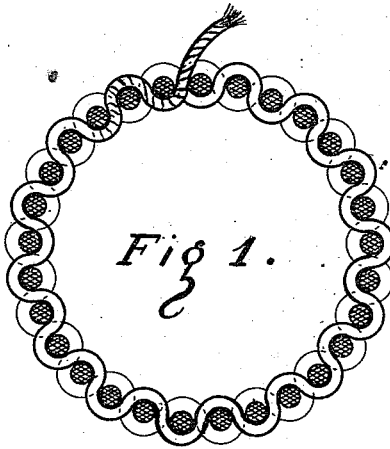


Fig 1.

WITNESSES.

B. Clark
Fred. C. Bond

INVENTOR.

John van Dusen Reed
 per *A. P. Kirk*
 his Atty.

J. VAN D. REED.
Fire-Hose.

No. 161,273.

Patented March 23, 1875.

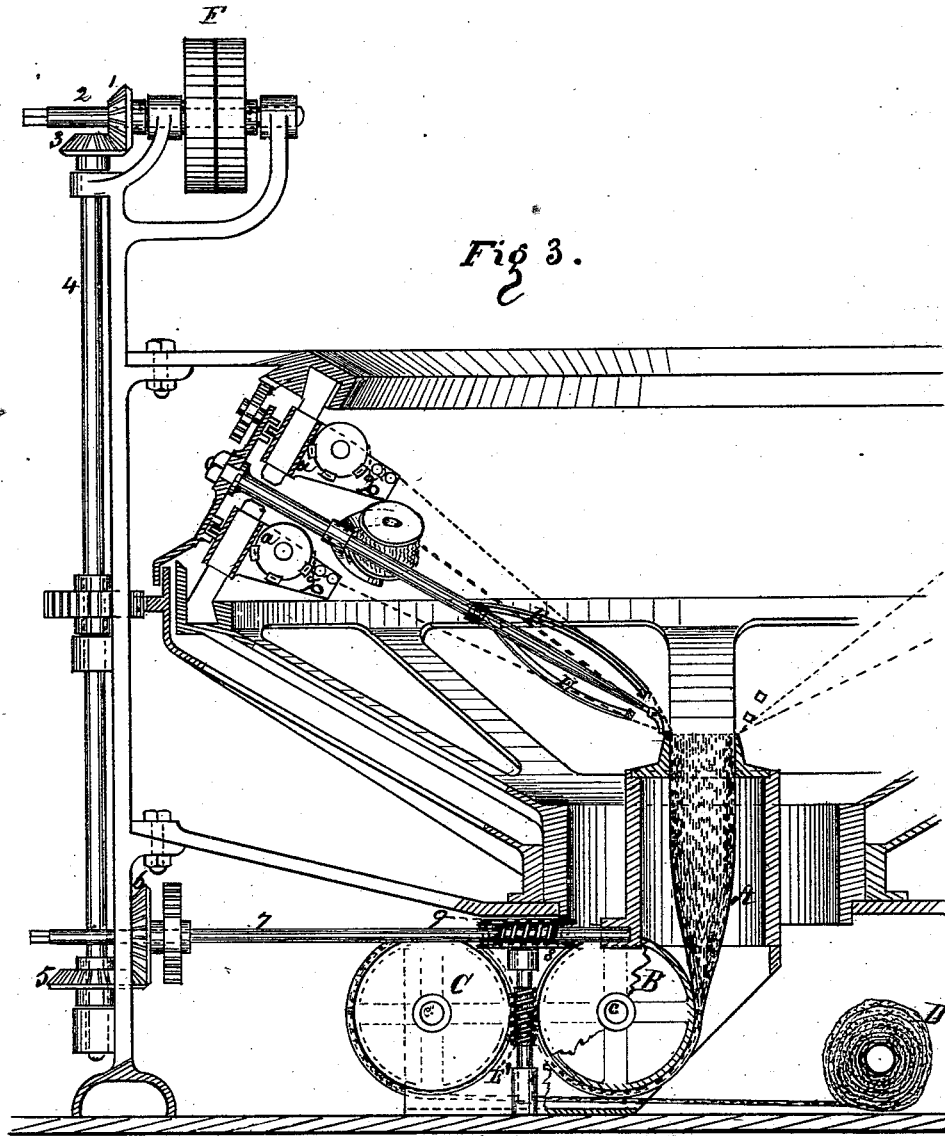


Fig 3.

WITNESSES
B. E. Clark.
J. E. Bond

INVENTOR
John van Dussen Reed
per A. H. Hunt
his atty

UNITED STATES PATENT OFFICE.

JOHN VAN DUSSEN REED, OF NEW YORK, N. Y.

IMPROVEMENT IN FIRE-HOSE.

Specification forming part of Letters Patent No. 161,273, dated March 23, 1875; application filed March 16, 1875.

To all whom it may concern:

Be it known that I, JOHN VAN DUSSEN REED, of the city of New York, county and State of New York, have invented a new and Improved Manufacture of Fire-Hose, of which the following is a specification, reference being had to the accompanying drawings forming part of the same.

My invention relates to fire-hose fabricated from cotton, linen, or other analogous fibrous material, woven into the form of a tube entire and without a seam, the warp-threads running parallel with each other the whole length of the tube, and the filling being a single thread wound spirally continuously around between the warp-threads, and pack up close and compactly, forming a woven fabric sufficiently strong and compact to bear the strain to which fire-hose is subjected in use.

Fire-hose has been fabricated by weaving a tube entire and without a seam; but the method hitherto employed in the weaving necessarily results in separating, on opposite sides of the tube, two adjacent warp-threads somewhat farther apart from each other than are the intermediate threads from each other, and the sharp bend at these lines of the warp remains permanently in the web, whereby there is formed along the lines of this separation two weak places running the entire length of the hose, at which places the hose is liable to give way under a pressure which the other parts of the hose will bear without rupture or injury. When such hose is woven upon a mandrel, as is sometimes done, the warp is evenly spaced; but it is impossible to beat up the weft to form a close, compact fabric. These defects in woven hose are well known to all persons engaged in the manufacture, sale, or use of fire-hose, and great efforts have been made to obviate them, and produce woven hose of uniform texture and strength throughout, but hitherto without success.

The common practice in weaving hose is to arrange the warp-threads in the loom in two sets, one above the other in parallel planes, as if to form two webs, each one being in width half the diameter of the tube to be formed, and then to throw the shuttle carrying the warp, alternately in one direction, straight through between one set of the warp-threads, and back

through between those of the other. In Figure 2 of the drawings I have represented, on an enlarged scale, the position of the threads in this operation; and it is evident from the said drawing, as is true in practice, that it must be impossible to draw the outer threads *a* and *b* so near to the threads *a'* and *b'*, respectively, as the intermediate threads can be drawn to each other and to said outer threads, and that the hose along these lines of separation of the warp-thread will not have the compactness and strength which the intermediate portions of the web have. In all the woven hose made these lines of separation are visible to the eye, and it is also evident that at these lines of separation the woof-threads have a sharp and permanent bend, to which the adjacent warp-threads can never afterward be adjusted so as to give the web at these lines the same texture as at the intermediate portions, and it is at these lines that such woven hose invariably gives way first under pressure.

In my new hose the web is of uniform texture throughout, all the warp-threads around the entire circle of the tube being separated by uniform spaces, or, rather, being laid uniformly in contact with each other, and there are no lines of separation or sharp curvature, and none of weakness. The difference in this respect between my new woven hose and any that has been heretofore fabricated not only manifests itself by use, but is visible to the eye.

In order that those skilled in the art may fabricate this new woven hose, I will describe one way in which it may be done, though I do not, of course, limit myself to any particular method.

On the 4th day of June, 1872, reissued Letters Patent were granted to me, the said J. V. D. REED, for improvement in circular looms, said reissued Letters Patent being numbered 4,930. Upon this loom, with certain additions to be described presently, my new hose may be woven. To the Letters Patent mentioned I refer for the general method and mechanism therein described, and shall not here repeat that description. Fig. 3 of the accompanying drawings shows a sectional view of the parts of this loom, which are directly employed in holding and delivering the warp-threads indi-

cated by the dotted lines *a*. These threads, as is shown, all converge to the upper edge or rim of a hollow cylinder, A, over which they pass into and down through the said cylinder. Their ends are gathered together and carried around under a drum, B; then over an adjoining drum, C, and back to a drum, D, about which they are wound. Upon the shafts *c c'* of the drums B C are gears, which are driven by the worm E, to which motion is communicated from the driving-pulley F, through the shafts and gears 1, 2, 3, 4, 5, 6, and 7, and the worm and gear 8 and 9. By these devices the warp-threads are arranged and laid parallel with each other, and at uniform distances apart, around the cylinder A, in position for weaving them into a tube open at both ends, having the strength and compactness which will render it suitable for fire-hose. Then, as the warp-thread is delivered and beaten into the warp by the shuttle on the arm G, the drum takes up the woven tube as fast as formed, and produces the proper tension in the warp-threads. I attach to the ends of the shuttle-carrying arm, at essentially right angles, a divider, consisting of two arms, *e e*, formed into an oblate frame. The shuttle

travels between the arms of the divider, and delivers the weft evenly and closely between the warp-strands, which are forced apart in its passage, and these warp-strands, being crossed after the passage of the divider, tie the weft up solidly and firmly, and it is further compacted by the next passage of the shuttle and divider.

A cross-section of the hose produced is shown in Fig. 1 of the drawings.

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

As a new manufacture, woven hose, suitable for fire-hose, in which the warp-threads around the entire tube are laid substantially uniformly contiguous to each other, and the weft-threads are packed up closely, the fabric being thus of substantially uniform compactness and strength throughout, and of uniform curvature of cross-sections, as described.

In witness whereof I have hereunto set my hand this 11th day of March, 1875.

J. VAN D. REED.

Witnesses:

B. S. CLARK,
FRED. E. BOND.