D. C. GATELY.

Improvement in Vulcanized India Rubber Hose.

No. 133,219. Patented Nov. 19, 1872.

Fig. 1.

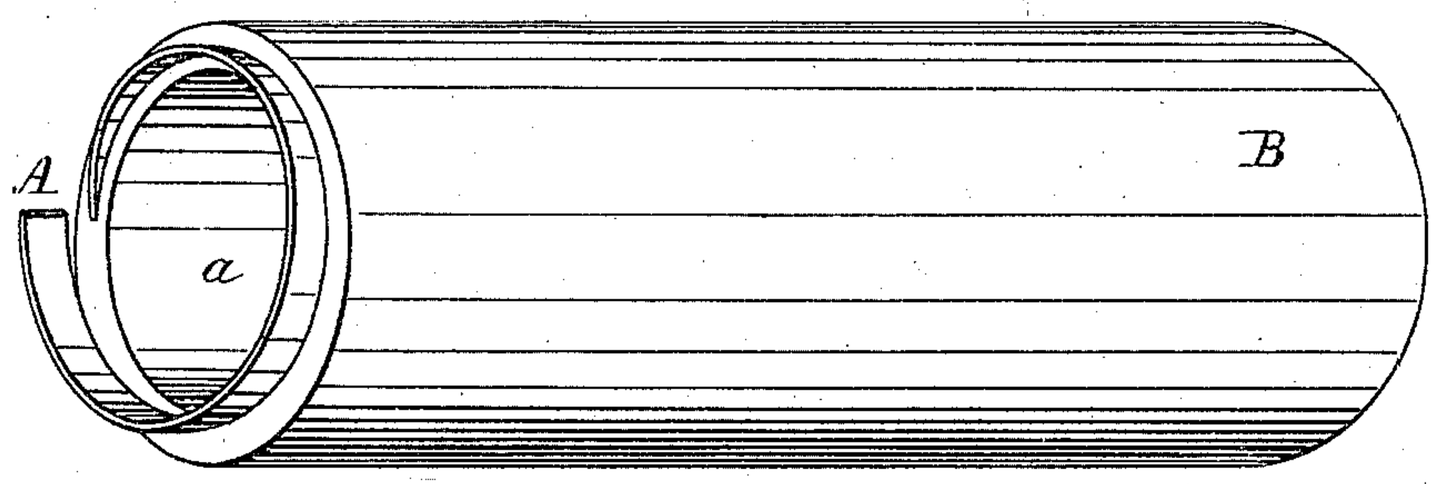
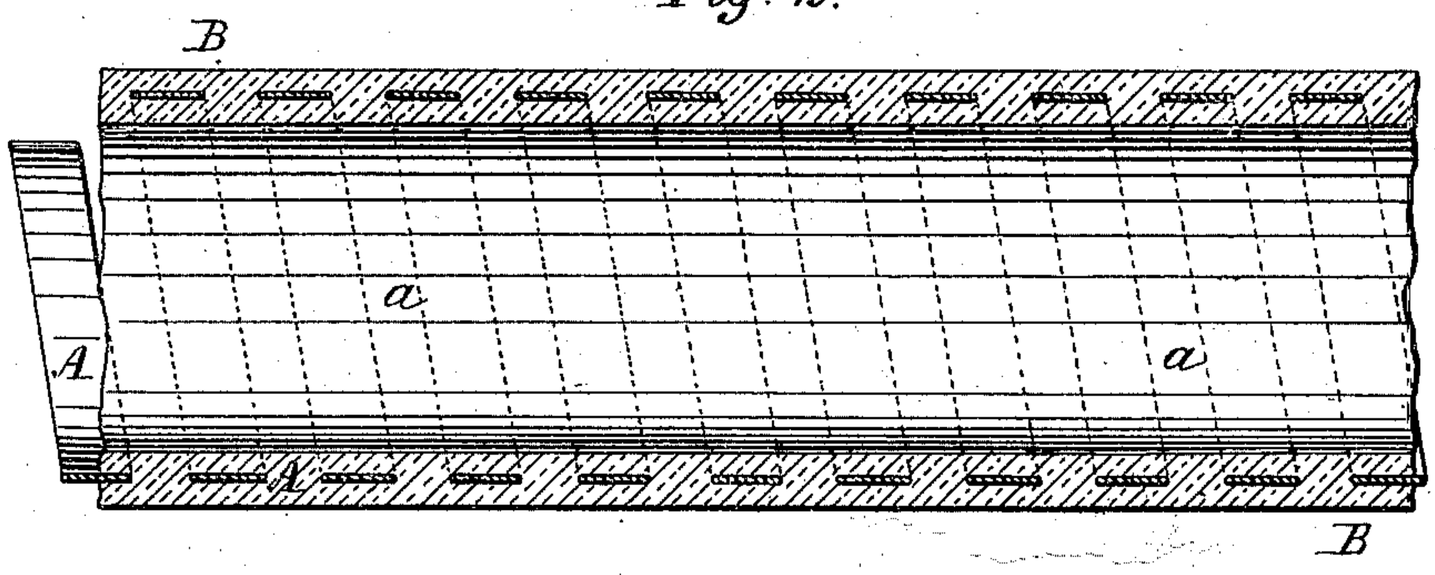


Fig. 2.



Witnesses.

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UNITED STATES PATENT OFFICE.

DENNIS C. GATELY, OF NEWTOWN, CONNECTICUT.

IMPROVEMENT IN VULCANIZED INDIA-RUBBER HOSE.

Specification forming part of Letters Patent No. **133,219**, dated November 19, 1872.

To all whom it may concern:

Be it known that I, DENNIS C. GATELY, of Newtown, Fairfield county, Connecticut, have invented certain new and useful Improvements in Vulcanized India-Rubber Hose, of which the following is a specification:

This invention relates to suction-hose or hose such as used with fire-engines or in analogous connection.

To enable hose to be used as suction-hose—that is to say, to fit it to permit water to be drawn through it—it has been found necessary to internally strengthen the walls of the hose, so as to prevent the same from collapsing and yielding to outside pressure when the equilibrium is destroyed by the formation within the hose of the partial vacuum needed in order to draw or suck through it the liquid. The hose has heretofore been strengthened by an internal coil of wire or a coiled band or flat thin strip or ribbon of galvanized steel or iron or other suitable metal. The wire coil has not answered the purpose for various reasons, principally because, in order to obtain the needed strength, the wire would be so thick as to render the hose unduly heavy and large, and its folds would be so near together as to destroy or seriously impair the flexibility of the hose. To avoid these defects the coil has usually been formed of a metallic ribbon, which avoids in a measure the objectionable features above named. The coiled metallic ribbon, however, has hitherto been so placed within the hose as to be exposed to the water and to form an irregular bore or interior surface for the hose, which impedes and retards the passage of the water; and there has been no proper union of the metallic ribbon and the body of the hose, which will prevent at all points the separation of the one from the other and the working and displacement of the folds of the coil. For instance, while the hose might answer when coupled with any body of water, like that contained in a well or tank, not under pressure, yet where, as is now generally the case in cities, it is coupled to a hydrant or fire-plug, or other source of supply from which the water will be ejected under pressure, the water will tend at times to expand the walls of the hose away from the coiled metal lining, and the latter will thus be left loose in places, and the folds of the coil become liable to be, and are in many instances, drawn together or displaced so as to be unequally distributed over the interior surface of the hose, leaving portions of the latter less supported by the coil, and consequently weaker than other portions. This soon results in the wear and rupture of the hose, which thus becomes unserviceable. And again, when the hose is bent or curved, as it is often required to be when in use, the folds of the coil are apt to become displaced at the curved parts with the result above stated. Other defects might be enumerated; but the above are sufficient to indicate the disadvantages attending the use of the coil when placed and held within the hose, as described.

The object of my invention is to remedy the above and other defects; and to this end it consists in providing the hose with a strengthening-coil composed of a coiled metallic ribbon or flat thin strip entirely embedded in and surrounded by and united with the body of the hose during the process of the building up or manufacture of the latter. By this mode of forming the hose the metallic coiled ribbon, while stiffening the walls of the hose to resist external pressure, is at the same time interposed between the body proper of the hose and the lining, and is wholly embedded in and covered by the walls, so as to leave a smooth unbroken bore within the hose, which will offer no resistance or obstruction to the passage of the water. The metallic ribbon, being embedded in its place while the rubber is in the green or plastic condition and before vulcanization, is held immovably and securely in its position after the vulcanizing process, and its folds or coils must always retain their proper place, and, as the coil is composed of a metallic ribbon or thin flat strip, the hose can be made very strong and with great capacity for resisting external pressure without materially increasing its bulk or weight or impairing in any essential degree its flexibility. Indeed, owing to the permanent union of the coil with the hose and its being thus fixed in place, the ribbon may, without detracting from the strength of the hose, be coiled with its folds much further apart than has heretofore been considered safe, and thus the hose may be made much more flexible than has hitherto been practicable, which is a matter of great importance.

In the accompanying drawing I have represented, in Figure 1, a perspective view of a

piece of hose made in accordance with my invention, a portion of the body of the hose being broken away to show the coiled metal ribbon; Fig. 2 being a longitudinal and central section thereof.

The body proper B of the hose is built up in the usual manner known to manufacturers of vulcanized India-rubber hose, and is composed of any ordinary or suitable combination of materials. The lining *a* or interior surface of the hose is formed of a vulcanizable compound, so as to give, as shown, a smooth unbroken bore. Back of this is the coiled metal strip or ribbon A, embedded in and entirely covered on all sides by the hose, and united with the same by the vulcanizing process. The coil is applied at the proper time during the building up of the hose, and while the latter is in the green or plastic state.

Having described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

Vulcanized India-rubber suction-hose composed of an exterior body proper, an interior lining, and an intermediate spirally-coiled metallic strengthening-ribbon, the three being combined and united together, substantially as and for the purpose shown and described.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

DENNIS C. GATELY.

Witnesses:
J. M. BLACKMAN,
W. W. PERKINS.