T. J. SLOAN.

Implement for Thawing Frozen Water-Pipes.

No. 168,353. Patented Oct. 5, 1875

Fig 1.

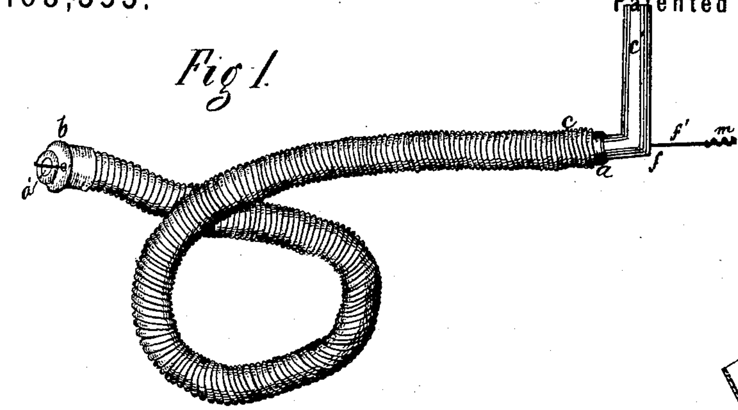


Fig 2.

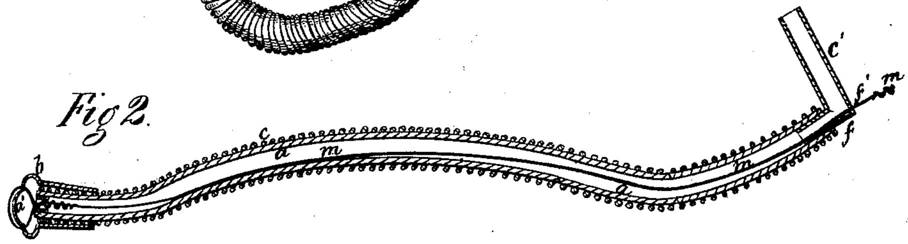
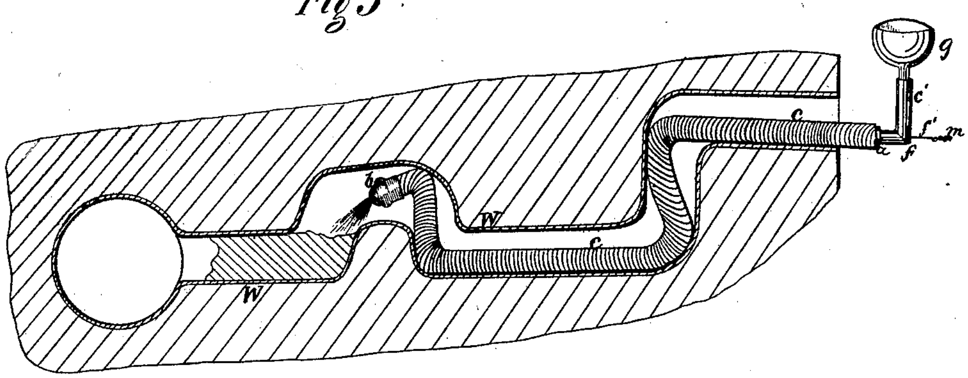


Fig 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN IMPLEMENTS FOR THAWING FROZEN WATER-PIPES.

Specification forming part of Letters Patent No. **168,353**, dated October 5, 1875; application filed March 2, 1875.

To all whom it may concern:

Be it known that I, THOS. J. SLOAN, of the city, county, and State of New York, have invented an Improvement in Implements for Thawing Frozen Water-Pipes, of which the following is a specification:

In all northern latitudes, where, as is usually the case in cities, buildings are supplied with water from street-mains, much trouble, inconvenience, and expense is caused by the freezing of the water-pipes, the ordinary remedy being to dig up the street and thaw out the pipes by heat externally applied. In some cases hot water and steam are forced into the pipes; but this, when done by means hitherto in use, produces but a slight result, as the water quickly cools and the steam condenses. It has been attempted to cause the hot fluid to act more effectually by thrusting a flexible tube of rubber or leather into the pipe to be thawed, so that the hot fluid injected through the tube may be made to impinge directly upon the ice, the resultant water flowing out through a space between the tube and the pipe into which it is thrust; but the use of a simple tube in this manner is found ineffective for the purpose desired, inasmuch as a tube of the character mentioned does not possess sufficient rigidity to permit its longitudinal thrust into a pipe for any considerable distance. Moreover, the squared end of the tube will not follow readily the sinuosities commonly existing in the pipe to be thawed. The surface of the rubber, leather, or like material of which the tube is made has a strong frictional adhesion to the metallic surface of the pipe, which retards the passage of the tube within the latter, and the withdrawal of the tube, when of considerable length, is not only difficult because of this adhesive or frictional action, but tends to destroy the tube because of the tensile strain exerted thereon.

My invention is designed to provide a tubular instrument which may be easily thrust into the water-pipe to any required distance, which will follow without difficulty all sinuosities or curves therein, which will direct the hot fluid upon the ice within the pipe, to rapidly melt the same, and which, when the desired thawing or clearing of the pipe is accomplished, may be drawn intact from the pipe with very great ease and convenience. To this end my said invention consists in an implement comprising a flexible tube of india-rubber or other suitable material, provided externally with a shield of closely-coiled wire, provided with a rounded nozzle, and having an internal draft-wire extending from the said nozzle to the outer or inlet end of the tube, whereby the desired result is secured.

Figure 1 is a side view of a tubular instrument made according to my invention. Fig. 2 is a longitudinal section of the same; and Fig. 3, on a smaller scale, illustrates the manner in which the invention is applied to use.

a is a tube, of any requisite length and diameter, the latter being such that when the implement is completed its total diameter will be less than that of the bore of the pipe to be thawed, in order to afford space through which the water may flow out and be discharged from the pipe, this latter being indicated at W in Fig. 3. Around this tube *a* is coiled the wire *c*, the coils touching each other. Upon one end of the tube, as thus fitted, is provided the nozzle *b*, having an outlet-opening at *a'*. Upon the opposite end of the tube is a tubular elbow, *f*, the outer arm *c'* of which is turned more or less at right angles to the normal axis of the tube, and which, in the use of the instrument, as hereinafter explained, may have a funnel attached to it, as indicated at *g* in Fig. 3. Within the tube is a longitudinal draft-wire, *m*, attached at one end to the nozzle *b*, and at the other passing through a hole of corresponding size in the elbow *f*, as shown at *f'*.

In the use of the implement it is thrust nozzle foremost into the pipe to be thawed or cleared of ice, and is forced longitudinally inward until the said nozzle strikes the ice within the pipe. The facile performance of this is insured by the rounded form of the nozzle, which enables it to glide past abrupt turns in the pipe, by the coiled wire or external shield, which provides a metallic surface on the tube, to move in contact with the metal surface of the pipe, thereby avoiding friction, and which, by contact of the coils, stiffens the pipe, so that it may be thrust inward with a positive movement without in any wise diminishing its flexible character requisite to the proper following of the curves and turns of the pipe. The noz-

zle being brought to the ice as just set forth, hot water is poured into the tube—as, for example, through the funnel placed in the elbow *f*—and, passing inward through the tube, is ejected from the nozzle against the ice, and then, together with the water resulting from the melting of the latter, passes, in a reverse direction, between the tube and the pipe, and out from the entrance or open end of the latter, the tube being thrust inward as the ice is removed by thawing or melting until the entire length of the pipe is made clear. When this is accomplished the outer extremity of the wire *m* is grasped by its projecting end, and, by a longitudinal strain upon it, the tube is drawn out. As the strain is exerted upon the nozzle to compress the coils one upon another in thus withdrawing the instrument, it follows that the same stiffness (fully consistent with a bending movement in passing through the sinuosities of the pipe) is given to the tube as when thrust inward, so that buckling is prevented, and the reverse or outward movement is rendered as facile and convenient as the inward thrust; and, moreover, the action exerted upon the tube being a compressing one, all tension or stretching action upon the tube itself is avoided, and the fracture or injury of the instrument is thereby prevented.

When desired, a jet of steam may be thrown through the tube instead of a flow of hot water; but for all ordinary occasions the latter will be found sufficient, and more cheaply and easily used than the other.

It is preferred that the draft-wire be of such character as to be more or less elastic as concerns bending, and in many cases a chain of small diameter may be used as a substitute for the wire with advantage. In other cases a strong cord of any suitable material may be used for the same purpose, this being, like the chain, a mechanical equivalent for the wire.

What I claim as my invention is—

The combination of the flexible tube *a*, the coiled-wire shield *c*, the nozzle *b*, and draft-wire *m*, the whole combined and arranged for operation substantially as and for the purpose set forth.

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