A. J. MORSE.

Attaching Hose to Hose-Couplings.

No. 160,696. Patented March 9, 1875.

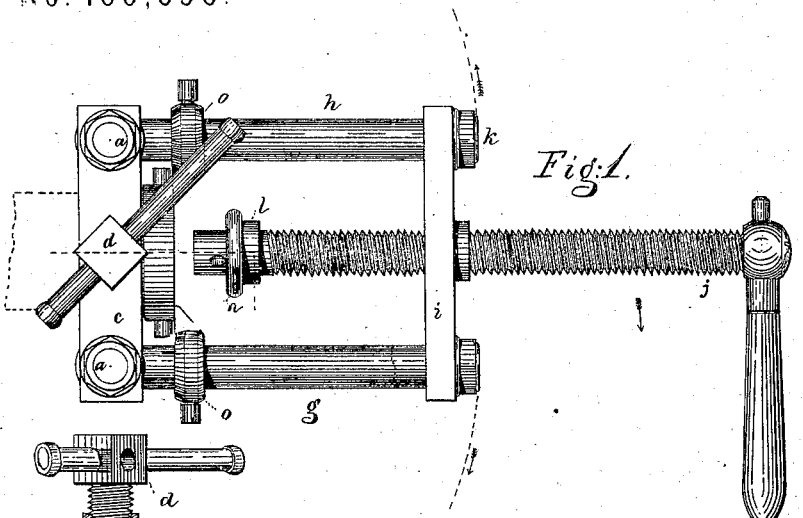

Fig. 1.

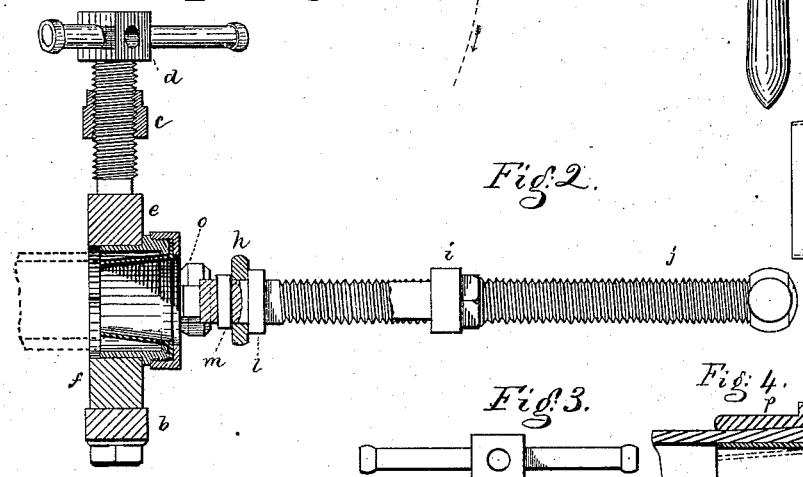

Fig. 2.

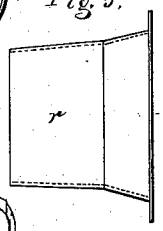

Fig. 5.

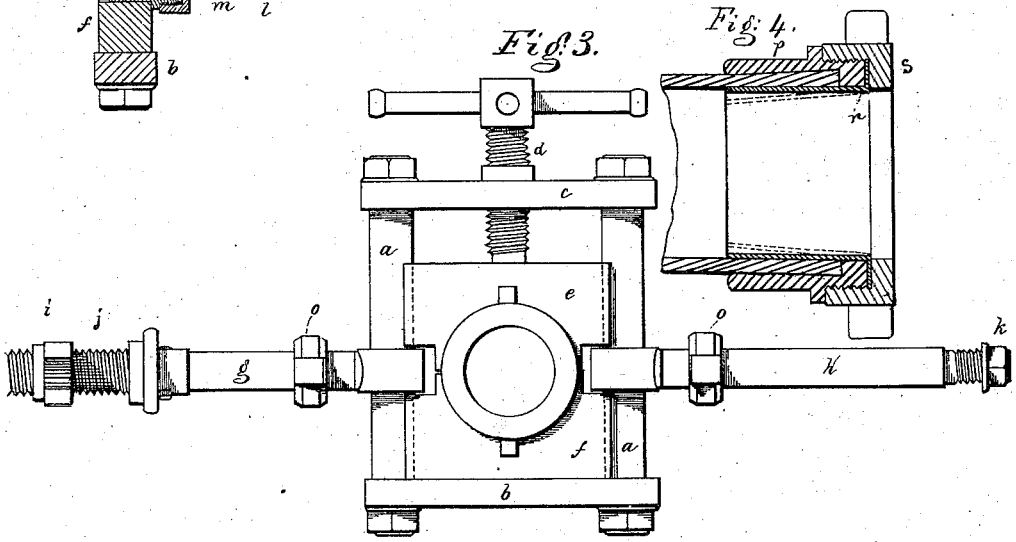

Fig. 3.

Fig. 4.

Witnesses.
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UNITED STATES PATENT OFFICE.

ANDREW J. MORSE, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN ATTACHING HOSE TO HOSE-COUPLINGS.

Specification forming part of Letters Patent No. **160,696**, dated March 9, 1875; application filed February 6, 1875.

To all whom it may concern:

Be it known that I, ANDREW J. MORSE, of Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented Improvements in Attaching Hose to Hose-Couplings, of which the following is a specification:

My invention relates to mechanism for attaching hose to hose-couplings. The mechanism consists in a coupling-holding clamp for holding the hose-binding outer ring, combined with devices for forcing one or more expanding-disks through an inner ring or tube, and for withdrawing the same, the movement of the expander being first toward or into the hose, and next a withdrawal therefrom, this operation holding the hose end firmly between the outer binding ring or tube and the inner expanded ring or tube. Also, in the details shown and described, by which the expanding mechanism is held in position relatively to the clamp and to the part of the hose-coupling held thereby, and by which it is removed to afford access to the clamp when adjusting the hose and the parts of the coupling which are to be connected. Also, in combination with the clamping and expanding mechanism, of stops, arranged to prevent end motion of the coupling while the expander is withdrawn therefrom. The inner tube or ring is stretched or expanded toward the outer ring, and made to clamp the hose contained between the rings by forcing a disk from the outer end of the inner ring through said ring, and by withdrawing the disk, repeating the process, if necessary, (which is commonly the case,) with one or more disks, each being slightly larger than the one used in the preceding operation.

Figure 1 is a plan of my improved hose and hose-coupling attaching mechanism, showing the parts in readiness to force an expanding-disk through the inner expanding-ring of the coupling. (Seen in the clamp.) Fig. 2 is a sectional elevation, showing the parts in the same position as seen in Fig. 1. Fig. 3 is an end view, showing the expanding mechanism removed from before the clamp, so as to give room for the adjustment therein of the parts to be united. Fig. 4 shows, on a larger scale, in longitudinal sectional elevation, a hose end and one part of a hose-coupling, as they appear after being operated upon by my improved mechanism, the dotted lines showing the position of the inner ring as it appeared before expansion. Fig. 5 shows, in elevation, an inner ring of the form I prefer to use.

The coupling-holding clamp consists of side rods *a a*, fixed in bottom and top pieces *b c*, the latter having nut-threads adapted to the screw *d*, by which the top holding-jaw *e* is forced toward the lower jaw *f*, said jaws being interchangeable with other similar jaws of different sizes. These holding-jaws are notched, as shown in Fig. 3, to accommodate the links *g* and *h*, which hinge on the rods *a a*, the lower jaw *f* thus forming shoulders, which prevent the dropping of the links. The cross-bar *i* is fixed to the link *g*, and has at the center of its length nut-threads, which receive the screw *j*, these parts forming a supporting-frame for the shaft or screw of the expanding device or disk. The free end of bar *i* is slotted to receive the screw-threaded free end of link *h*, on which is a binding-nut, *k*, by which the parts *g i h* are confined in the position seen best in Fig. 1, and on loosening which nut the parts can be moved to the position best seen in Fig. 3, the movement being indicated by the dotted lines and arrows in Fig. 1. The screw *j*, which is best worked by hand with a suitable lever, has at its other end a collar or shoulder, *l*, beyond which projects a cylindrical end slotted to receive a key, *m*, which keeps the steel expanding-disk *n* from being drawn off from its bearing. On each rod *g* and *h* is an adjustable gripe, *o*, set so as to bear against the face of the coupling projecting from the jaws *e f*, the purpose of said gripe-pieces being to prevent withdrawal of the coupling from the jaws when the expanding-disk is being retracted by the action of the screw.

The parts *g h i* being in the position shown in Fig. 3, the binding-ring *p* is clamped between the jaws *e f*, and the hose end is inserted in *p* up to the shoulder therein, as seen in Fig. 4, and the flanged inner ring or tube *r*, preferably of copper, but other ductile metal may be used, is inserted, it being then in the condition shown in dotted lines in said figure, and the end of the hose is contained in an inclosed chamber. The ring *r* is brought to position with its flange resting against the end

of the binding-ring *p*, by means of the clamping-ring *s*. The parts *g h i* are then brought into the position shown in Fig. 1, and are held there by tightening-nut *k*, and then by turning screw *j* in the proper direction, the steel disk *n*, of suitable size, is first forced into and through the inner ring *r*, and is then retracted therefrom, after which the key *m* is driven out, the disk removed, and a slightly larger one secured in place, and the operation of forcing it through the ring *r* is repeated.

In practice, three or four disks are used to obtain the best results. The expanding-ring is held loosely on the screw end, and in the act of expanding the inner ring the expanding-ring does not rotate, as the friction between it and the inner ring prevents such movement. Its movement is only in a line through the ring *r*, the screw end turning within the disks.

By the passage of the expanding disks or rings, the opening through the ring *r* is made of uniform diameter wherever the disks take a bearing. The body of the ring *p* is somewhat larger where the end of hose comes or rests, than it is where the hose emerges therefrom, in consequence of which, and of the generally-tapered form first given the ring *r*, the hose is at first griped between the ends of both rings most remote from the ring *s*. This difference in the bore of the binding-ring *p* assists the hold which the coupling obtains upon the hose by the expansion of the inner ring, as described, and the end of the hose passes into this enlarged space as the inner ring is expanded. The flange on the inner ring prevents it from being moved with the expander or ring *n* as the same is forced therein.

I do not desire to limit this my invention to the use of expanders of the exact kind described, as it is evident that other forms and kinds of expanders commonly used for other purposes might be used with beneficial results; but I prefer the expander described, and so, too, the expander might be forced forward and retracted by a system of levers, or the expander might be attached to a slide-rod operated by power from a crank or piston.

The joint between the hose and outer and inner rings *p r*, is preferably and in practice packed with rubber cement or white lead. The parts *p r*, when bound to the hose by this expanding action, are immovably fixed to the hose, and the working parts of the coupling are attached to the screw-threaded portion of the outer or binding ring *p*, as described in another application heretofore made by me for a patent for a hose-coupling, and filed in the United States Patent Office December 22, 1874.

Having described my invention, I claim—

1. The coupling-holding clamp, in combination with a movable expanding-disk, and a supporting-frame for the screw or shaft of the expanding-disk, the expander being adapted to move through or into the inner ring of the coupling, substantially as described.

2. The combination, with the clamp, of the pivoted links and cross-bar to support and adjust the shaft or screw of the expanding device, substantially as described.

3. The combination, with the clamps, of links and adjustable gripes for holding the coupling against end movement, substantially as described.

4. The combination, with the clamp adapted to receive and hold the tubular binding-ring *p*, and the clamping-ring *s*, to center and hold the inner ring *r*, of the shaft or screw, and the loose expanding disk or ring, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ANDREW J. MORSE.

Witnesses:

G. W. GREGORY,

J. B. CROSBY.