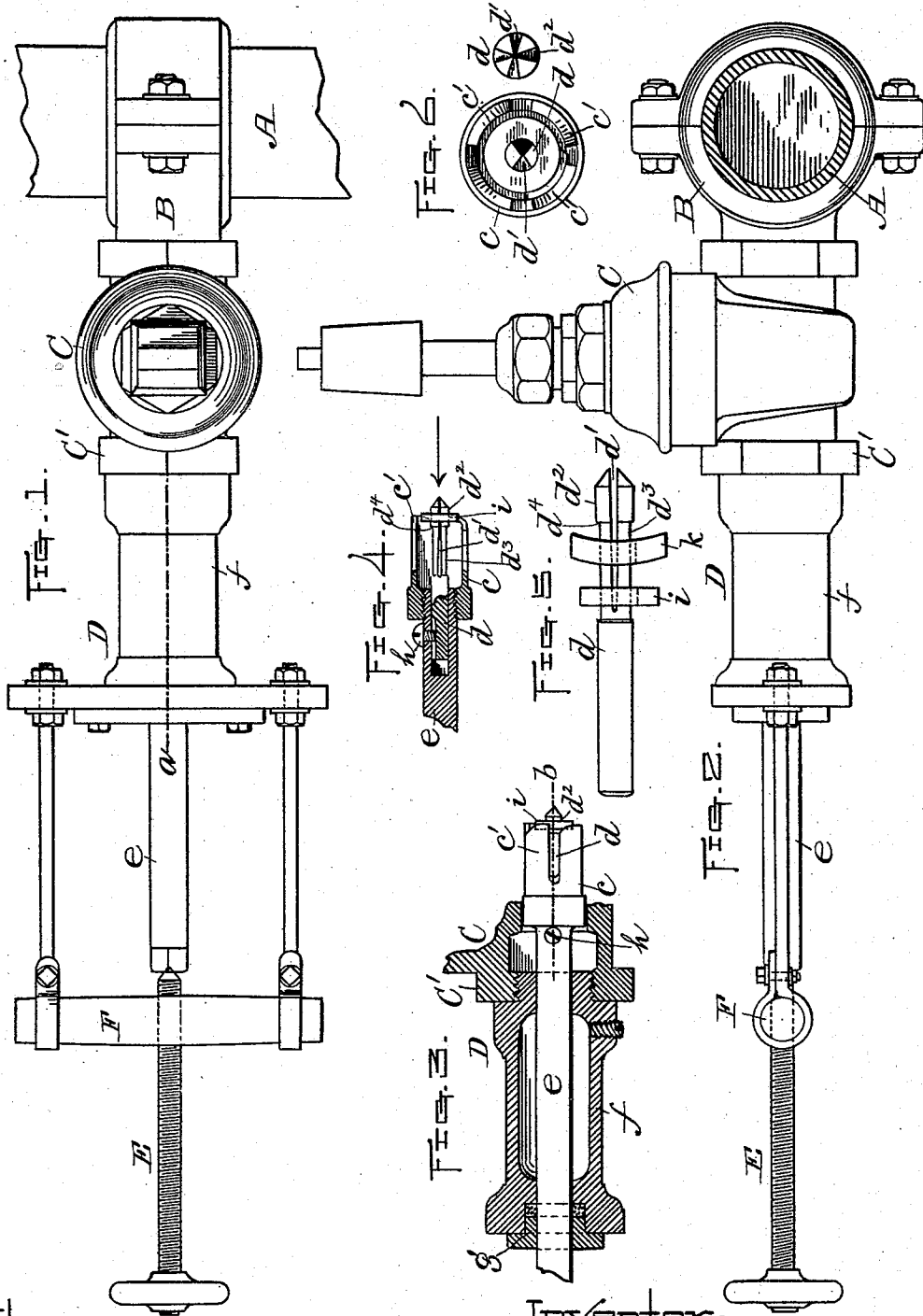


(No Model.)

W. DOWNEY.
APPARATUS FOR TAPPING PIPES OR MAINS.

No. 572,786.

Patented Dec. 8, 1896.



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APPARATUS FOR TAPPING PIPES OR MAINS.

SPECIFICATION forming part of Letters Patent No. 572,786, dated December 8, 1896.

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To all whom it may concern:

Be it known that I, WILLIAM DOWNEY, of the city and county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Apparatus for Tapping Pipes or Mains; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents my improved tapping apparatus applied to a section of large pipe or main. Fig. 2 is a side or edge view of said apparatus and a transverse section through said pipe or main. Fig. 3 is a central longitudinal section through the part of the apparatus to which my invention relates, taken on line *a*, Fig. 1. Fig. 4 represents a central longitudinal section, partly in side view, of the tapping device of the apparatus hereinafter described. Fig. 5 is a detached side view of the split center drill of said device, shown upon an enlarged scale, with its holding-ring and the circular piece cut from the pipe by the tapping operation forced back of its expanded head, as and for the purpose also hereinafter described; and Fig. 6 represents at the left of the figure, upon the same enlarged scale as Fig. 5, an end view of the tapping device shown in Fig. 4, looking in the direction of the arrow in said figure, also at the right of said end view a detached end view of the split center drill, showing a modification in the construction thereof hereinafter described.

My invention relates more especially to apparatus or machines for tapping large pipes, such as street-mains and similar pipes, and also more particularly to those operated by hand-power, although they may be constructed to be operated by mechanical power.

It also relates more especially to the tapping device of said apparatus or machines, and consists in combining a central longitudinally-split spring-drill of novel construction and a hollow reamer surrounding said drill with the longitudinal supporting-spindle upon which said drill and reamer are mounted, and also the same with the other adjacent parts of the apparatus, as will be

hereinafter more fully set forth, and pointed out in the claims.

To enable others skilled in the art to which my said invention appertains to better understand the nature and purpose thereof, I will now proceed to describe it more in detail.

In the drawings, A represents a section of a street-main or other large pipe.

B is a sleeve adapted to be clamped thereon.

C is a valve or gate, and D the tapping apparatus to which my improvements more especially relate.

In practice the valve or gate is adapted to be connected with the sleeve on the pipe and also with the tapping apparatus, said sleeve and valve or gate being attached to the part of the pipe which is to be tapped before being tapped and left permanently thereon after the tapping operation has been performed for connection with any other branch or main, as in other cases of this kind. Said parts, except the tapping apparatus, may be of any well-known construction, and as the same, aside from said tapping apparatus, constitutes no part of my present invention it is deemed unnecessary to illustrate or describe the same in detail to make clear the nature and purpose of my improvements. Said improvements, as previously stated, relate to the tapping device illustrated in Figs. 3 to 6, inclusive, and consist of the hollow reamer or external circular cutter *c*, having in this instance four teeth *c'*, and of the central longitudinal drill *d*, arranged inside of said reamer or outer cutter *c*.

Both are secured to the inner end of the usual longitudinal spindle *e*, adapted to turn and also fitted to slide longitudinally in the sleeve *f*, the latter being provided at the outer end with the usual stuffing-box *g* to prevent the water from escaping around the spindle during the tapping operation. In this instance the reamer *c* is shown attached to the spindle by threading the outside of the end of said spindle and providing corresponding internal threads on the reamer, so that the latter may be turned onto the former, and the central drill *d* is secured by fitting its inner end in a central longitudinal opening in

the spindle and fastening the same in position by means of a set-screw *h*; but as various other ways may be adopted to accomplish the same result I do not limit myself to the method shown in the drawings.

The center drill *d* is split transversely part way back from its point, as is indicated at *d'*, and the parts of said drill at each side of the slot *d'* are sprung apart or expanded when in their normal positions, as is shown in Fig. 5. The drill is also made with a head *d²*, substantially cylindrical in shape and a little larger than the neck portion *d³*, to form a shoulder *d⁴* a short distance back from the point of the drill, and a ring *i* is arranged to fit over said head *d²*, the opening in said ring corresponding in size to the diameter of the head when the latter is contracted, as is shown in Fig. 4, the purpose thereof being to hold said drill from expanding until the ring is pushed from the head back of the shoulder *d⁴* and onto the neck portion *d³*. It is thus pushed back in the operation of tapping the pipe as follows: In performing said operation the sleeve B and valve C are first applied to the pipe A as usual. The tapping apparatus D is then connected with the hub C' of the valve, as is shown in Fig. 3. By now turning the screw E in the cross-piece F against the outer end of the spindle *e*, upon the inner end of which the reamer *c* and drill *d* are mounted, said reamer and drill are moved forward against the pipe, and as the drill projects a little beyond the reamer it enters said pipe in advance of the reamer, and thus acts as a center to hold the piece *k* cut from the pipe by the reamer when the latter reaches and acts upon the pipe.

As the drill and reamer are thus moved forward to cut the hole in the pipe the ring holds the drill in its contracted position until the cylindrical portion of the drill-head has entered the pipe. By the continued forward movement of the drill and reamer said ring and then the piece *k*, severed from the pipe, are pushed from the head back of its shoulder, and thus permits the drill to expand to its normal position, as is shown in Fig. 5, thereby preventing said severed piece *k* from dropping off of the drill into the pipe.

For ordinary tapping of street-mains I prefer to make the pointed end of the drill in two parts with one transverse slot *d'* therein, as is shown in Figs. 4 and 5 and the left-hand side of Fig. 6; but for extra-heavy work it is preferable to form said end in four parts with

two cross transverse slots *d' d²*, as is shown in the detached view shown at the right-hand side of Fig. 6, and I therefore do not limit myself to the number thereof.

Those skilled in the art to which my invention appertains will at once perceive that the tapping device, while simple in construction, is strong and durable and is therefore not liable to get out of repair, and by its use the desired result may be perfectly and expeditiously performed.

The invention, it will be understood, is designed for the purpose of a reamer or tapping-machine rather than a drilling-machine, the drill in this instance serving simply as a center and to properly hold the piece *k* at the completion of the cutting operation. Although the apparatus is designed more especially for tapping large pipes or street-mains, it is equally applicable for use in tapping smaller pipes by adapting the construction thereto as circumstances may require.

Having described said invention, what I claim therein as new, and desire to secure by Letters Patent, is—

1. In an apparatus for tapping pipes, the combination of rotary and longitudinally-sliding spindle *e*, with the hollow reamer *c* mounted thereon; the central split drill *d* also mounted on spindle *e* and having the separate parts of its pointed end sprung apart or expanded in their normal state, also having a substantially cylindrical-shaped head with a shoulder back of it, and the loose holding-ring *i* adapted to fit over said drill-head to hold it in a contracted condition until pushed back therefrom, substantially as and for the purpose set forth.

2. In an apparatus for tapping pipes, the combination of valve C, rotary and longitudinally-sliding spindle *e* and sleeve or casing *f* in which said spindle is fitted, with the hollow reamer *c* mounted on the end of spindle *e*; the central split drill *d* also mounted thereon and having the separate parts of its pointed end sprung apart or expanded in their normal state, also having a substantially cylindrical-shaped head with a shoulder back of it, and the loose holding-ring *i* adapted to fit over said drill-head to hold it in a contracted condition until pushed back therefrom, substantially as and for the purpose set forth.

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