

*P. & J. Riley,*

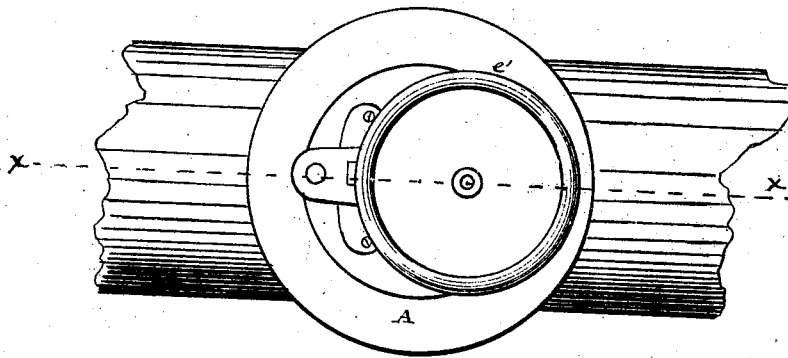
*2. Sheets. Sheet 1.*

*Tapping Mains.*

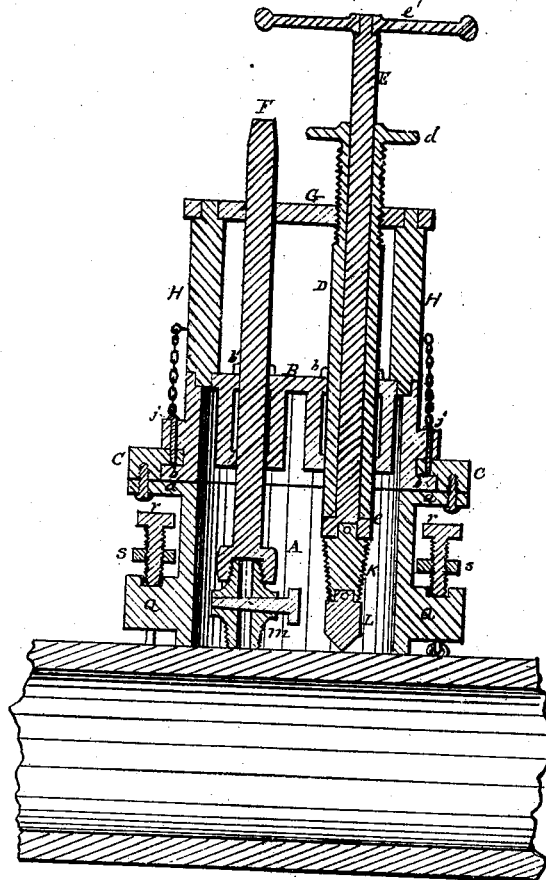
*No. 111,474.*

*Patented Jan. 31. 1871.*

*Fig. 1.*



*Fig. 2.*



*Witnesses*  
*Joseph S. Coombs*  
*Chas. S. Coombs.*

*Inventors*  
*Patrick Riley*  
*James Riley*  
*By J. S. Coombs*  
*Attorney*

*P. & J. Riley,*

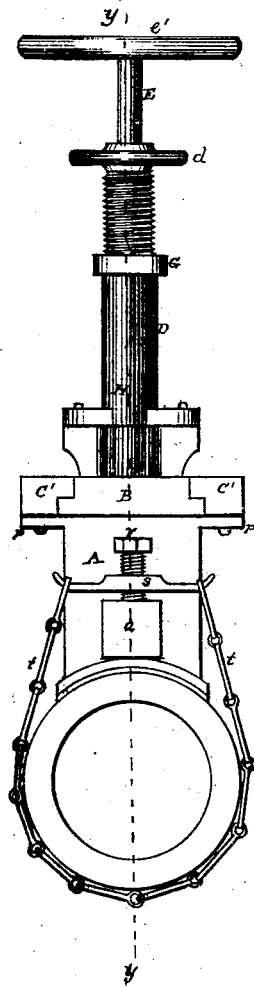
*2. Sheets, Sheet 2.*

*Tapping Mains.*

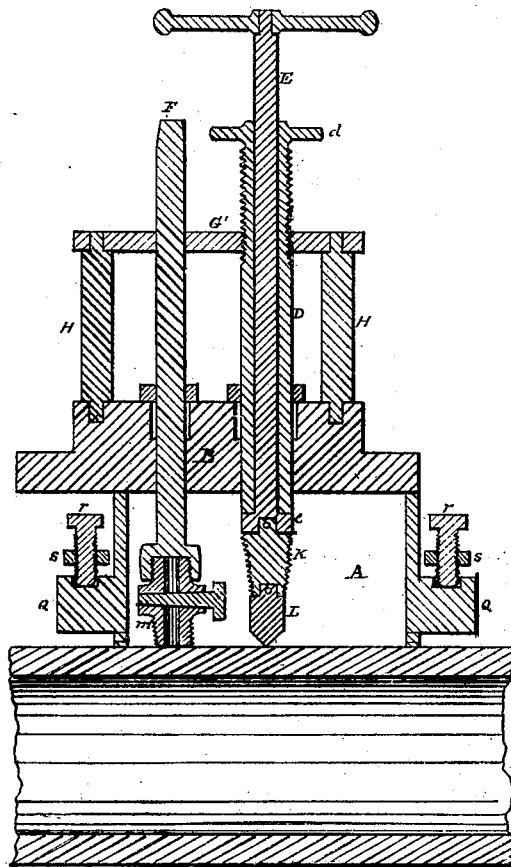
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*Fig. 3.*



*Fig. 4.*



*Witnesses*  
*Joseph L. Coombs*  
*Chas. L. Coombs*

*Inventors*  
*Patrick Riley*  
*James Riley*  
*By J. L. Coombs*  
*Attorney*

# United States Patent Office.

JAMES RILEY AND PATRICK RILEY, OF NEW YORK, N. Y.

Letters Patent No. 111,474, dated January 31, 1871.

## IMPROVEMENT IN MACHINES FOR DRILLING AND TAPPING WATER AND GAS-MAINS.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that we, JAMES RILEY and PATRICK RILEY, of the city of New York, in the county of New York, and State of New York, have invented a new and useful Improved Machine for Drilling and Tapping Water and Gas-Mains; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing and the letters of reference marked thereon.

Our invention relates to a machine by which water and gas-mains may be drilled and tapped, and service or stop-cocks inserted, while the mains are filled with water or gas, under pressure, without causing the escape of water or gas, which necessarily occurs in tapping and inserting cocks in the ordinary way.

Two modifications of our machine are shown in the drawing, both, however, operating on the same general principles.

Figure 1 represents a top view of one modification of our machine, and

Figure 2, a vertical section of the same through line *x x*, fig. 1.

Figure 3 represents an end view of the other modification, and

Figure 4, a vertical section on line *y y*, fig. 3.

In figs. 1 and 2 *A* represents a metal cylinder with its lower end concaved to fit and conform to the exterior surface of the main to be tapped, and its upper end provided with a flange, *a*, for the purpose hereinafter described.

The concave lower end of said cylinder contains a recess into which is fitted a packing of rubber or other suitable material, to form a tight joint with the exterior surface of the main.

*B* is a cylindrical top or cover to the cylinder *A*, having a flange, *b*, at its lower end, which lies on the flange *a*, at the upper end of the cylinder *A*, and is secured thereto by a rebated ring or follower, *C*, which is bolted down upon the flange *a*, the rebate in said ring forming an annular recess or groove, into which the flange *b* of the cylindrical cover *B*, fits.

These parts are ground so as to form a tight joint, and yet not so tight but that the cover *B* will be easily rotated, its flange *b* moving in said annular recess. A packing may be employed to render said joint perfectly water and gas-tight.

In the top of the cylindrical cover *B* are two stuffing-boxes *b' b'*, through one of which passes a sleeve, *D*, which surrounds and carries a drill-shaft, *E*. Through the other passes a shaft, *F*, which carries the stop or service-cock to be inserted.

The upper portion of the sleeve *D* has a screw-thread cut upon it, which passes through and engages

with a female-screw in a cross-piece, *G*, which is supported by two standards *H H*, rising vertically from the cover *B*, and firmly attached thereto.

On the upper end of the sleeve *D* is a wheel, *d*, for the purpose of turning it, and its lower end rests upon a shoulder, *e*, on the lower end of the drill-shaft *E*.

The upper end of the shaft *F* passes through the cross-piece *G*, and the lower end is enlarged to receive the shank of the stop or service-cock, and also to form a shoulder, preventing it from being forced through the stuffing-box by pressure within the cylinder.

In the lower end of the drill-shaft *E* is formed a socket, into which is inserted the shank of the screw-tap *K*, which is secured therein by a pin passed transversely through the shaft and shank.

The lower end of the screw-tap has a similar socket, into which is inserted the shank of the drill-bit *L*, and secured therein as aforesaid.

The lower end of the shaft *F* has a female-screw socket in it, into which is inserted the screw-shank of the service-cock *m*, preparatory to being inserted into the water or gas-main.

To use the apparatus the lower face of the cylinder *A* is placed upon the main over the place to be tapped, and the apparatus secured to the main by means of the chains or bands hereinafter described.

The drill is then forced down upon the main by turning the sleeve *D*, and the drill-shaft is put in operation by rotating it by means of the wheel *d*.

After the main is drilled the sleeve *D* is to be still further depressed, causing the tap *K* to enter the opening made by the drill, and form the screw-threads necessary to hold the service-cock.

The tap and drill-bit are then withdrawn by elevating the sleeve *D* and shaft *E*, and the cover *B* is turned or partially rotated so as to bring the lower end of the cock *L* over the aperture, and said cover is secured in position by means of pins *j j*.

The cock is inserted by turning the shaft *F*, which screws the lower end of said cock into the aperture. The cylinder *A* is then detached from the main and removed, with all the machinery pertaining to it, except the shaft *F*, which remains attached to the cock. The cylinder *A* being thus removed, the shaft *F* is easily detached from the cock by turning it in a reverse direction.

In the modification shown by figs. 3 and 4, instead of the cylinder *A* we use a rectangular chest, *A*, the lower side of which is open and concave, to conform to the shape of the main to be tapped, and provided with suitable packing to make a water and gas-tight joint, and, instead of rotating the cover to bring the

service-cock over the hole made by the drill, it slides longitudinally to effect that object.

The upper side of said rectangular chest A, figs. 3 and 4, is formed with flanges *p p*, on opposite sides, and planed or ground perfectly true, for the purpose hereinafter described.

To the said flanges are attached, by means of screws or otherwise, the metallic strips *O'*, rebated on the lower side, which form recesses, in which the flanges on the cover B slide. These flanges are planed or ground, so as to fit the upper face of the chest A, and form a water and gas-tight joint.

The sliding flanged cover B contains the stuffing-boxes, through which the sleeve D, carrying the drill-shaft E, and the shaft F, for carrying the service-cock, pass, as in the other modification. The said sleeve and shaft pass through a cross-piece, *G'*, as in the first modification, which is attached to standards H, secured to the sliding cover of the rectangular chest.

At each end of the rectangular chest, or on opposite sides of the cylinder A, is a lug, *Q*, in the upper side of which a set-screw, *r*, is inserted, passing through a cross-head, *s*. To the ends of these cross-heads truss-chains or bands *t*, passing round the main, are attached. The chains or bands may be tightened so as to draw the chest more closely down upon the

main, by turning the screws *r* so as to raise the cross-heads to which the chains are attached.

The apparatus in the last-mentioned modification is used by securing the chest over the main by means of the chains, and the aperture drilled and tapped as before. The service-cock is then inserted by sliding the cover B along the face of the chest until the shaft F, with the service-cock, is brought over the aperture. The said cock is inserted by means of the shaft, as before described, when the chest may be removed, leaving the shaft F attached to the cock, as in the first-mentioned modification.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In combination with the water and gas-tight cylinder or chest, herein described, a rotating or sliding cover, carrying a drill-shaft and shaft to insert the service-cock, substantially as described.

2. In combination with the subject-matter of the preceding claim, the drill-shaft E and screw-sleeve D, constructed and arranged to operate substantially as described.

JAMES RILEY.  
PATRICK RILEY.

Witnesses:  
T. S. WATERS,  
WILLIE EDOUIN.