

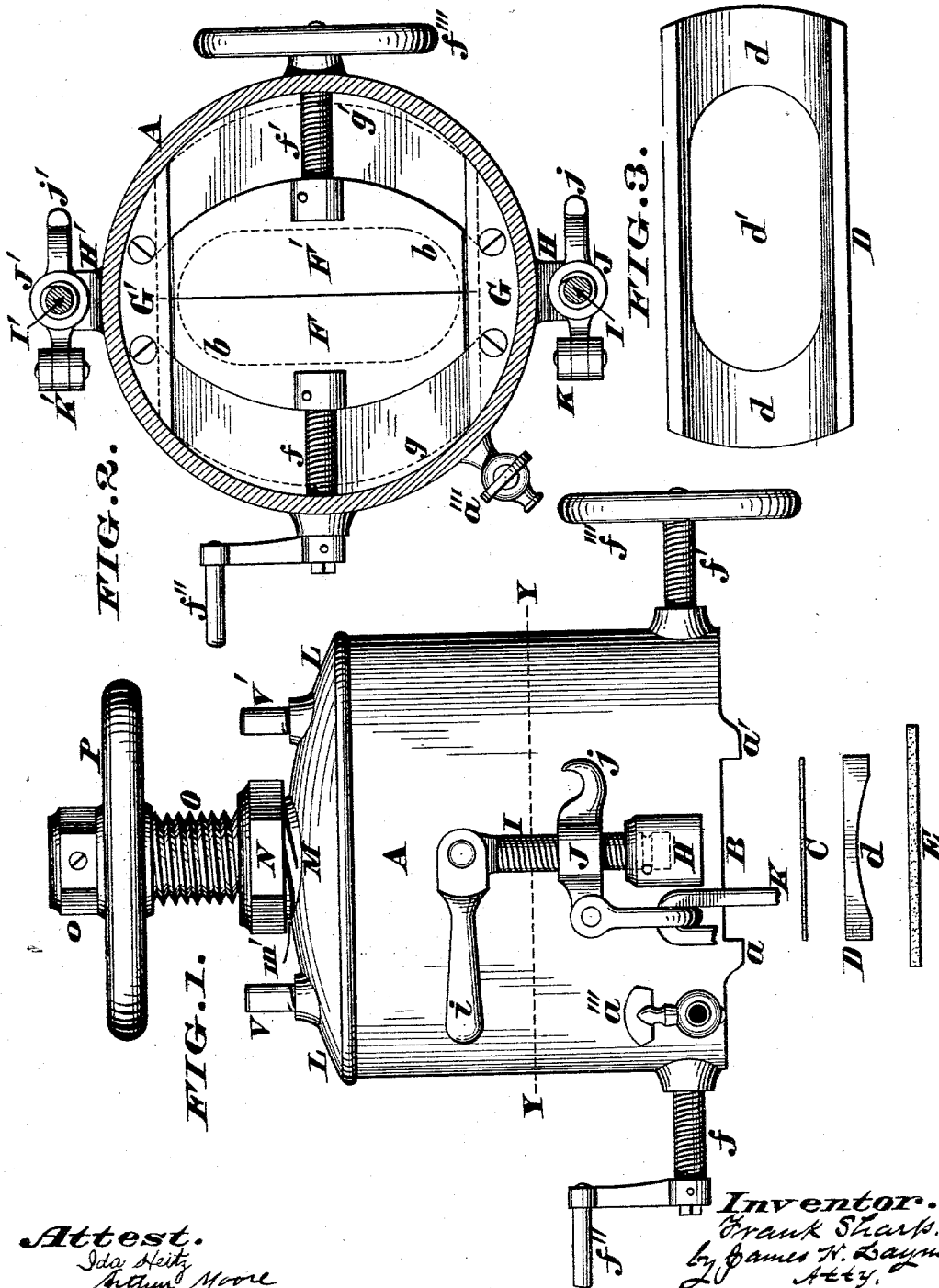
(No Model.)

2 Sheets—Sheet 1.

F. SHARP.
PIPE TAPPING MACHINE.

No. 561,620.

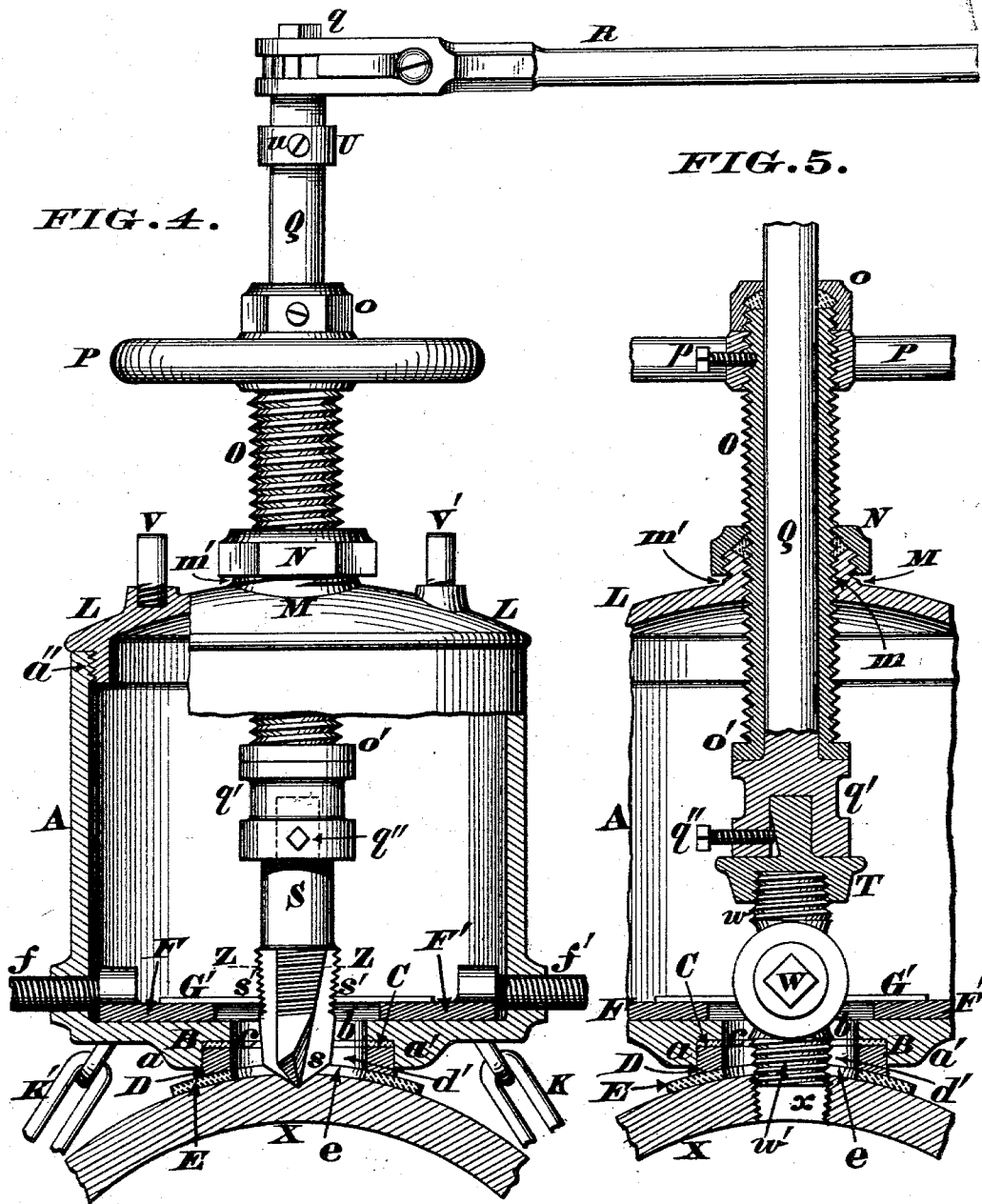
Patented June 9, 1896.



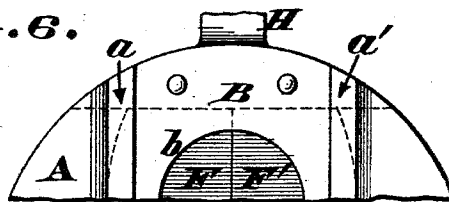
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PIPE TAPPING MACHINE.

No. 561,620.

Patented June 9, 1896.



Attest.
J. A. Hertz
Notary Public



Inventor.
Frank Sharp.
By James H. Layman.
Atty.

UNITED STATES PATENT OFFICE.

FRANK SHARP, OF MOUNT AUBURN, KENTUCKY.

PIPE-TAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 561,620, dated June 9, 1896.

Application filed February 6, 1896. Serial No. 578,277. (No model.)

To all whom it may concern:

Be it known that I, FRANK SHARP, a citizen of the United States, residing at Mount Auburn, in the county of Pendleton and State of Kentucky, have invented certain new and useful Improvements in Pipe-Tapping Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the annexed drawings, which form a part of this specification.

This invention relates to those machines which enable mains or pipes to be drilled and screw-threaded and cocks to be engaged with said threads without permitting any material escape of gas or water or other fluid under pressure in said pipes; and my improvement comprises a novel combination of parts, which greatly facilitates the above-described operations, the details of said combination being hereinafter more fully explained.

In the annexed drawings, Figure 1 is a side elevation showing the casing of my machine and a pair of washers and saddle-plates to be used therewith, two screws that operate a pair of cut-offs within the casing being run out, so as to open these latter devices. Fig. 2 is a horizontal section of the machine, taken at the line Y Y of the preceding illustration, the casing cut-offs being closed. Fig. 3 is a plan of the under side of the saddle-plate seen in the first illustration. Fig. 4 is a sectionized elevation showing the machine lashed to a main, the cut-off open, a tapering drill inserted within the casing, and a ratchet-lever applied to the upper end of a stock that operates said drill. Fig. 5 is an axial section through said stock and its accessories, a cock being engaged with the stock and in the act of being screwed into the threaded hole made by the drill. Fig. 6 is a plan of a portion of the lower end of the casing.

The principal member of my machine is a stout casing A, preferably of the cylindrical form shown, and having at its lower end a pair of parallel ribs $a a'$, between which is arranged a flat seat B, provided with a slot, whose shape is more clearly indicated by the dotted lines b in Fig. 2. C is a thin flexible gasket to be applied to this seat and having a slot c of the same size and shape as the casing-slot b .

D is a saddle-plate having a concavity d along its under side of the proper curvature to fit snugly upon a gas or water pipe or main, and d' is a slot in said plate of the same size and shape as the other slots $b c$.

E is a comparatively thick washer to be interposed between the saddle-plate D and a water-main and having a slot e of the same size and shape as the slots $b c d'$.

F F' are horizontally-sliding cut-offs of the shape seen in Fig. 2 and capable of being opened and closed by screws $f f'$, which latter may be turned by a crank f'' or hand-wheel f''' . These cut-offs work water-tight against the floor of the casing A, and are held therein by undercut guides G G', securely bolted upon said floor. Furthermore, these cut-offs, when fully retracted, as seen in Figs. 4 and 5, expose the casing-slot b ; but when advanced and their meeting edges brought in close contact with each other said devices F F' prevent water or gas entering said casing. (See Fig. 2.) Again, the dotted lines $g g'$ in this illustration show that the outer or curved edges of said cut-offs are not of the same radius as the interior of the casing, the object of this arrangement being explained hereinafter.

H H' are diametrically opposite lugs projecting from the casing A and in line with the parting of the closed cut-offs. These lugs serve as bearings for a pair of stout screws I I', that carry nuts J J', provided with hooks $j j'$ for the engagement of the free ends of chains K K', the fixed ends thereof being coupled to said nuts in the manner shown in Fig. 1. The upper portion of the casing is screw-threaded, as seen at a'' in Fig. 4, to permit the ready engagement of a cap L, from the center of which projects a short vertical neck M, screw-threaded internally at m and externally at m' , as shown in Fig. 5, a stuffing-box N being engaged with said external thread. Engaged with the internal thread m is a tubular feed-screw O, having at top a stuffing-box o and at bottom an annular flange o' , a hand-wheel P being engaged with said screw and held in place by a set-screw p , tapped in the hub of said wheel. Furthermore, this screw O is traversed by a stock Q, vertically in line with the axis of the casing and having at top a square arbor q for the ready application of an ordinary ratchet-

lever R; but the lower or inner end of said stock consists of an integral chuck q' , having a clamp-screw q'' for holding certain attachments used with the machine. One of these attachments is a drill S, having cutters s at its lower end and above these cutters a set of threaded chasers s' , the drill being grooved vertically, in the usual manner, to permit an escape of the shavings made by boring through a pipe. Another of these attachments is a threaded holder T for grasping a cock to be engaged with the hole bored in said pipe or main. (See Fig. 5.) U is an adjustable collar applied to the exposed portion of the stock Q, and u is a set-screw for holding said collar in place.

V V' are pins projecting from the cap L to enable the application of a spanner or other lever when said cap is screwed to the casing or detached therefrom.

W is a stop-cock having threaded ends $w w'$.

X is a main or pipe for conveying gas, water, or oil, and x is a hole bored in said pipe by the drill attachment of the machine.

a'' is a drain-cock for the casing.

My drilling-machine is secured to a pipe and operated in the following manner: The pipe X is first marked to indicate where the tapping is to be done, and the thick washer or gasket E is then placed upon said pipe, so as to bring this mark about in the center of the slot e of said washer. Saddle-plate D is now mounted upon this washer and its slot d' is made to coincide with the slot e . The thin packing C is next applied to the saddle and its slot c caused to coincide with the slot d' . Casing A is then brought to bear, so as to cause its seat B to rest flatly upon the packing C, while the ribs $a a'$ fit snugly against the edges of said packing and also against the sides of the saddle D, the slot b of said seat being now in line with the other slots $c d' e$, as seen in Figs. 4 and 5. The chains K K' are now passed around the pipe, their free ends linked to the hooks $j j'$, and then the screws I I' are so turned by their swivel-handles i as to elevate the nuts and thereby tighten said chains until the casing A is immovably lashed to said pipe. After this act the screws $f f'$ are turned until the sliding cut-offs F F' are completely retracted and the slot b uncovered, so as to permit the drilling operations to be proceeded with. The drill S must be fitted to the stock Q before the cap L is screwed upon the casing, but previous to this act the thread w' of the cock W is calipered, and its largest diameter measured on said drill. Now, supposing this diameter to be indicated by the dotted lines $z z$ in Fig. 4, the adjustable collar U must be so clamped to the stock Q as to come in contact with the upper stuffing-box o the moment the drill has penetrated the pipe to the level of said line. This adjustment having been effected, the cap is fastened to the casing, the ratchet-lever R applied to the stock Q, and the hand-wheel P

is turned so as to cause the flange o' of the feed-screw O to bear upon the chuck q' , and thereby bring the drill-point firmly against the pipe. Lever R is then operated in the usual way, the combined actions of said lever and screw serving to gradually advance the drill until its cutters have bored their way completely through the pipe, and then the chasers s' begin their work. These chasers or taps thread the hole just made, and continue to operate until the drill has penetrated as far as the line Z Z, at which moment the collar U comes in contact with the stuffing-box o , and stops all further action of said drill. The feed-screw and ratchet-lever are now operated in a reverse manner to disengage the drill from the pipe, and as soon as this is done the casing A is instantly filled with gas or water. There can, however, be no escape of water at the present time, because the two stuffing-boxes N o close the only joints where a leakage would be liable to occur; but as soon as the drill has been raised a sufficient distance the cut-offs F F' are closed so as to relieve the casing from any further internal pressure, and the cap L, with its attachments, is disengaged from the casing, which may now be drained through the little cock a'' . Drill S is at once detached from the chuck q' , the holder T substituted for said drill, the upper screw w of the cock W engaged with said holder, the cap fastened to the casing, the cut-offs F F' opened, and the stock Q turned in such a manner as to run the lower thread w' of said cock into the hole x of the pipe X, it being understood that the cock is now closed. After thus screwing the cock in place, the ratchet-lever R and collar U are detached from the stock Q, the cap L disengaged from the casing and lifted off, while said stock still remains coupled to the cock. The casing is next detached, and if the cock is not exactly in line with the center of slot b said casing can be readily turned either to the right or left until the proper position is reached for its removal. The holder T is now unscrewed from the cock, and if necessary the latter can be finally turned with a wrench until it is immovably secured to the main. The slotted devices C c , D d , and E e are then lifted off the main, and, a branch pipe being connected to the cock W, the tapping of said main and the attaching of said lateral connection is completed without wasting any more water than is caused by once emptying the casing A.

It is evident that the two operations of drilling the main and engaging the cock therewith are effected by one and the same stock or spindle, and as said stock is always guided exactly in the axis of the casing there is no need of especial care in centering the drill and cock-holder. It is also evident that the flange o' , at the lower end of the feed-screw O, enables the power to be applied as near the work as possible, and, on this account, there is no danger of the drill springing out

of its proper vertical position and boring an irregular-shaped hole in the pipe.

Attention is called to the fact that when the cut-offs $F F'$ are fully opened their outer edges reach the positions indicated by the dotted lines $g g'$ in Fig. 2, and do not come in contact with the inner sides of the casing. Consequently the screws $f f'$ can be turned so tightly as to bind within their bearings, and thereby prevent the passage of water around the threads of said screws when an unusual pressure is let into the casing. Finally, by providing each machine with five or six saddle-plates having concave surfaces of different degrees of curvature the casing can be readily mounted upon or attached laterally to all ordinary sizes of gas or water mains or other conduits for conveying fluids under pressure.

I claim as my invention—

1. In a tapping-machine, the combination of a casing having means for lashing it to a pipe; an opening in said casing; a cut-off that closes said opening; a detachable cap applied to the machine; a feed-screw engaged with said cap; and a stock that traverses said screw, and has means thereon for detachably coupling thereto either a drill or cock-holder,

substantially as herein described, and for the purpose stated.

2. In a tapping-machine, the combination of a casing A , having means for lashing it to a pipe; an opening b in said casing; a pair of sliding cut-offs F, F' , operated by screws f, f' , and adapted to close said opening; a detachable cap L applied to the machine and having a neck M , screw-threaded internally at m ; a tubular feed-screw O engaged with said thread m ; a stock Q traversing said feed-screw, and a device at the inner end of said stock to permit the coupling thereto of a drill and cock-holder, substantially as herein described.

3. In a tapping-machine, of the class specified, a slotted casing; means for cutting off a flow of fluid into said casing; a feed appliance, a stock traversing said appliance and a chuck at the inner end of said stock, and adapted to have a drill and cock detachably fitted to it, for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK SHARP.

Witnesses:

JAMES H. LAYMAN,
ARTHUR MOORE.