J. MILLER.

MACHINES FOR TAPPING PIPES UNDER PRESSURE.

No. 184,686. Patented Nov. 21, 1876.

Fig 1.

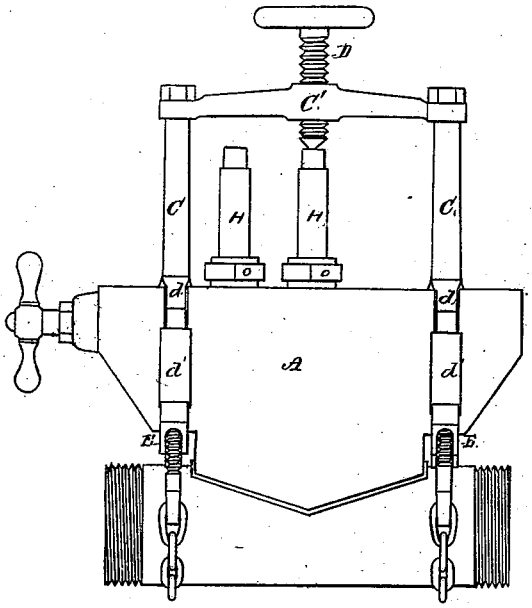


Fig 3.

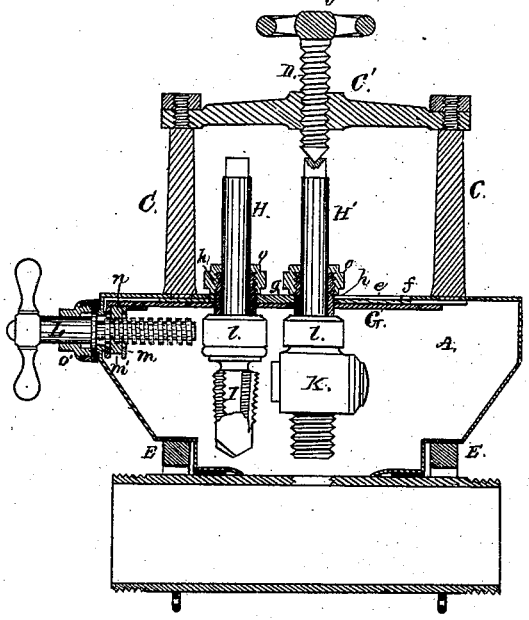


Fig 2.

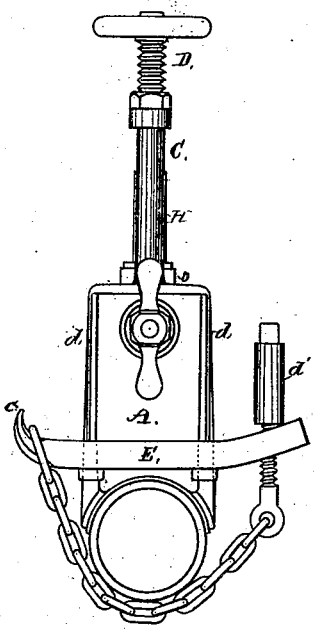


Fig 4.

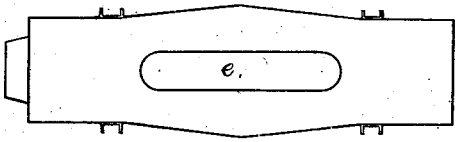
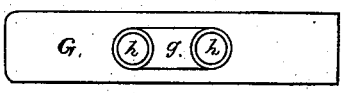


Fig 5.



Witnesses
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UNITED STATES PATENT OFFICE

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IMPROVEMENT IN MACHINES FOR TAPPING PIPES UNDER PRESSURE.

Specification forming part of Letters Patent No. **184,686**, dated November 21, 1876; application filed April 24, 1876.

To all whom it may concern:

Be it known that I, JOHN MILLER, of Cambridgeport, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Machines for Tapping Pipes under Pressure; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form a part of this specification.

In such drawing, Figure 1 denotes a side elevation of a machine constructed in accordance with my invention, the same being represented as applied to a main or pipe. Fig. 2 is an end elevation, and Fig. 3 a longitudinal section, of the same. Fig. 4 is a top view of the case, and Fig. 5 is a top view of the sliding valve or spindle carrier.

My invention has reference to that class of machines for tapping tubes or pipes containing water, steam, gas, or other fluid under pressure, in which the power and mechanism used to drill the hole and cut the thread may also be employed to screw in the cock without moving or adjusting the case of the apparatus.

The object of my invention is to provide a simple and effective machine in which sundry defects incident to the construction and working of machines of this character as heretofore existing are remedied; and my invention consists, first, in the arrangement of the sliding plate (carrying the combined drill and tap and the stop-cock spindles) within the case, and on the under surface of the cap-plate thereof, so that the liquid contained in the case, instead of forcing the spindle-carrier away from the opening or aperture in the case, and requiring set-screws or other external appliances to preserve it in impingement with the opening, (as is the case when the sliding carrier is arranged on the top of the case,) shall tend to force the carrier in closer contact with the case, and this in proportion to the head or pressure of the fluid in the case. By this arrangement the carrier is free to be moved at any time, requiring no removal of any clamping-screws to enable it to be moved, and, besides, it is always packed by the pressure of the fluid after the hole has been bored, and thereby prevents any issue of the fluid through the aperture in the top of the case, as is liable to result when the slider is disposed on the top of the case, such issue producing great annoyance or serious injury to the operator; and, besides, when the slider is disposed on the top plate of the case, and confined thereto by set-screws, in order to effect the necessary adjustment of the slider after the hole has been bored, all the set-screws require to be removed, the slider next to be moved, and the set-screws again screwed down, such requiring a large expenditure of time, which my arrangement entirely obviates; and my invention further consists in the combination, with the slider arranged within the case, of a screw for moving and adjusting the carrier, such screw being arranged within the case, whereby the mechanism is rendered more compact and less exposed to injury, and, at the same time, enables the machine to be used in many places where such could not be employed were the appliances used for moving the slider disposed wholly without the case.

In the drawing, A denotes a metallic case, having any suitable external form, the bottom thereof being formed concave longitudinally, and having an opening through the same of sufficient size to allow the tap and drill and the shank of the stop-cock to pass through and be moved longitudinally of the case the requisite distance, a packing of india-rubber or other suitable elastic material being disposed around the aperture, and impinging against the pipe, serving to make a close joint therewith. Affixed to the case A is a stationary frame, which consists of two vertical standards, C C, united at their upper ends by a horizontal bar, C′, which carries a feed-screw, D. The bases of the standards C C span and rest upon the top of the case A, and have screw-rods *d d* extending down the sides of the case, and are connected to bars E E, extending transversely of the case, and underneath shoulders formed on the same, such arrangement serving to rigidly connect the frame with the case. One end of each of the bars E terminates in a hook, *c*, to which one end of a chain is to be attached, such chains extending around the pipe, and having their other ends provided with rods having a male

screw cut upon their outer ends. These rods extend up through slots formed in the opposite ends of the bars E, and have nuts *d'* connected with them, by means of which the machine may be firmly affixed to the pipe to be tapped. Within the top of the case A is a narrow oblong aperture, *e*. G is a slider, which consists of a rectangular plate, having a length and width somewhat greater than the aperture *e*, such plate being disposed on the under surface of the cap-plate of the case A, and serving to close such aperture, a packing, *f*, of leather or other suitable material, being disposed around the mouth of the aperture, and resting against the upper surface of the plate G. *g* is a guide plate or projection, which extends up from the top of the plate G, flush with the top of the case A, impinging against the vertical faces of the aperture in the same. The plate G has also guide-tubes *h h* cast on and extending up therefrom, which are provided with packing-caps *o o*, screwed on the same, the caps, when screwed down, impinging against the top surface of the case A, and serving to maintain the plate or slider G in place when the machine is not under pressure.

H H' are two spindles, which extend up through the said tubes and caps, each of such spindles having on its lower end a socketed projection, *l*, into one of which is screwed a tool, I, composed of a tap and drill, the other of such sockets receiving the threaded end or neck of a stop-cock, K, the lower end or neck of such stop-cock being threaded to be inserted into the hole drilled in the pipe.

Affixed to one end of the plate or slider G, and extending down therefrom, is a projection, *m*, having a rectangular chamber or opening, *m'*, made through the same, such serving to receive a square or rectangular nut, *n*, and allow the same a free vertical movement therein. A rod, L, provided with a wheel or lever on its outer end to rotate the same, extends through a stuffing-box, *o'*, on the end of the case, and has a male screw cut on its inner end, which operates with the nut *n*, and serves, when put in rotation, to move the spindle plate or carrier G, so as to bring the spindle of either the tool or the cock in an axial line with the feed-screw, as may be desirable.

By this arrangement of the nut *n* within the chamber *m'*—viz., so as to be capable of vertical play therein—all binding action of the male and female screws is prevented, whether the packing be of a greater or less thickness, or the slider be under pressure or not, the screw and nut being always maintained in the same plane.

I would remark that the upper end of each of the spindles is formed square or rectangular to receive the eye of an operating wrench-ratchet, the spindles being operated by the latter in the usual manner.

From the above it will be seen that when the machine is affixed to a main or pipe, and such pipe has been drilled, the case A is perfectly tight, so that no water or other fluid rushing through the drilled hole into the case can escape from the latter while the spindle-carrier is being moved to bring the cock-spindle into coincidence with the operating feed-screw, the pressure of the fluid tending to insure a perfectly-tight joint between the carrier and the aperture in the case.

The operation of my improved machine is as follows: If we suppose the apparatus to be secured to a pipe by means of the chains, as shown in Figs. 1 and 2, we first move the spindle-carrier by turning the screw L so as to bring the spindle carrying the tool I into a vertical line with the feed-screw. A ratchet-wrench of the ordinary kind is next to be applied to the upper end of the spindle, when, by operating the ratchet and the feed-screw in the usual manner, the hole will be drilled in the pipe, and a screw cut in the same. This having been effected, the action of the feed-screw and the ratchet is to be reversed until the tool I is withdrawn from the hole. By next reversing the movement of the screw L the spindle carrying the stop-cock is brought into coincidence with the axis of the feed-screw, and the ratchet-wrench is next to be applied to the top of the latter spindle, when, by the combined forward movements of the said wrench and feed-screw, the stop-cock may be moved downward, and its lower threaded neck screwed into the hole in the pipe. This having been effected, by reversing the action of the feed-screw and wrench, the socketed end of the spindle carrying the cock may be unscrewed from the cock, when, by removing the chains, the apparatus may be removed from the pipe.

Having described the construction and operation of my invention, what I claim is as follows:

1. In a machine for tapping pipes under pressure, the case A and stationary frame C C C', carrying feed-screw D, in combination with the sliding plate G *g*, carrying spindles H H', when the said plate is arranged within the case A so as to be packed by the pressure of the fluid, substantially as and for the purpose set forth.

2. In a machine for tapping pipes under pressure, in which the sliding spindle-carrier is arranged within the case, and so as to be packed by the pressure of the fluid, the operating-screw L, arranged and combined with the said carrier and case, substantially as shown and described.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

JOHN MILLER.

Witnesses:
F. P. HALE,
F. C. HALE.