No. 864,072. PATENTED AUG. 20, 1907.

W. BOYD.

TAPPING MACHINE.

APPLICATION FILED FEB. 7, 1907.

Fig. 1.

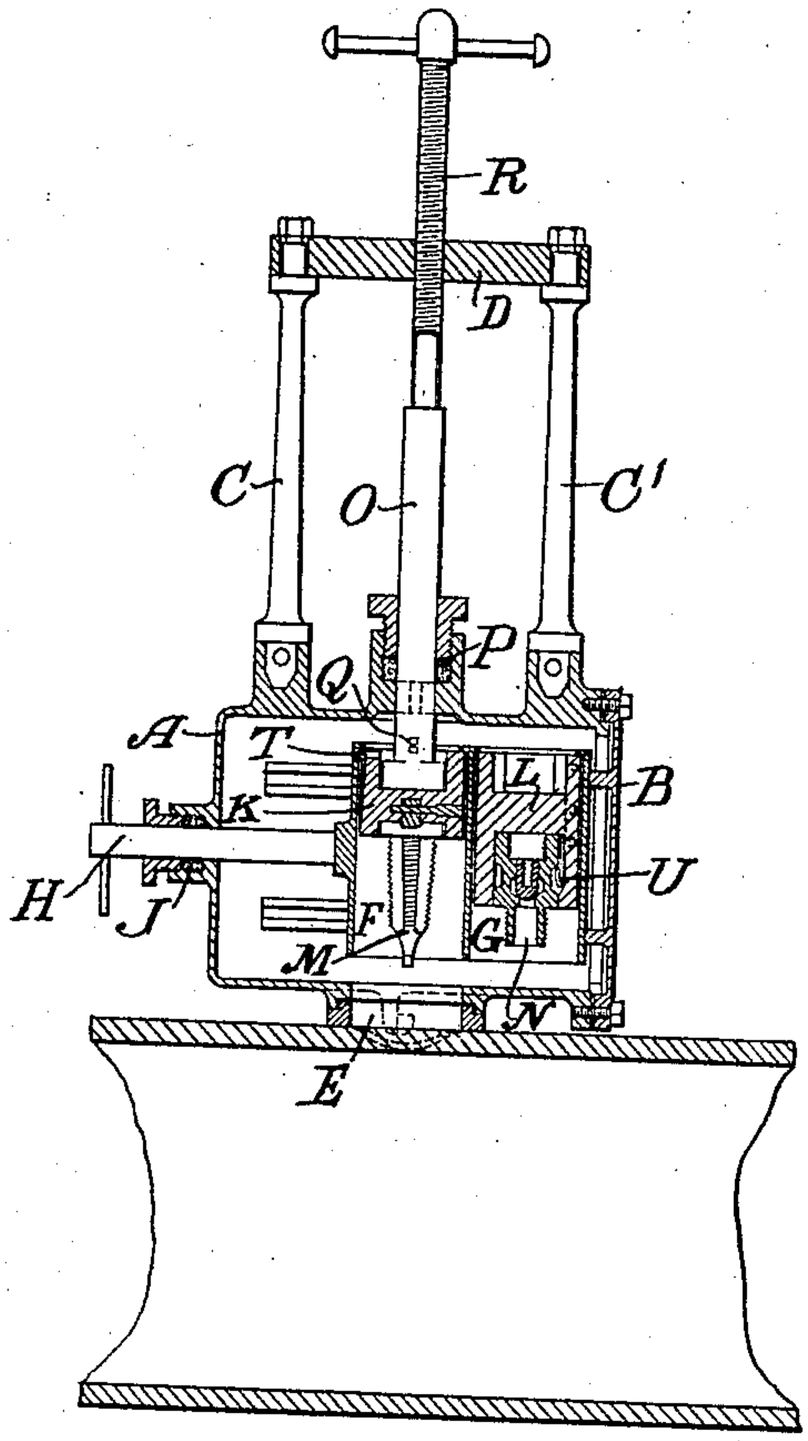


Fig. 2.

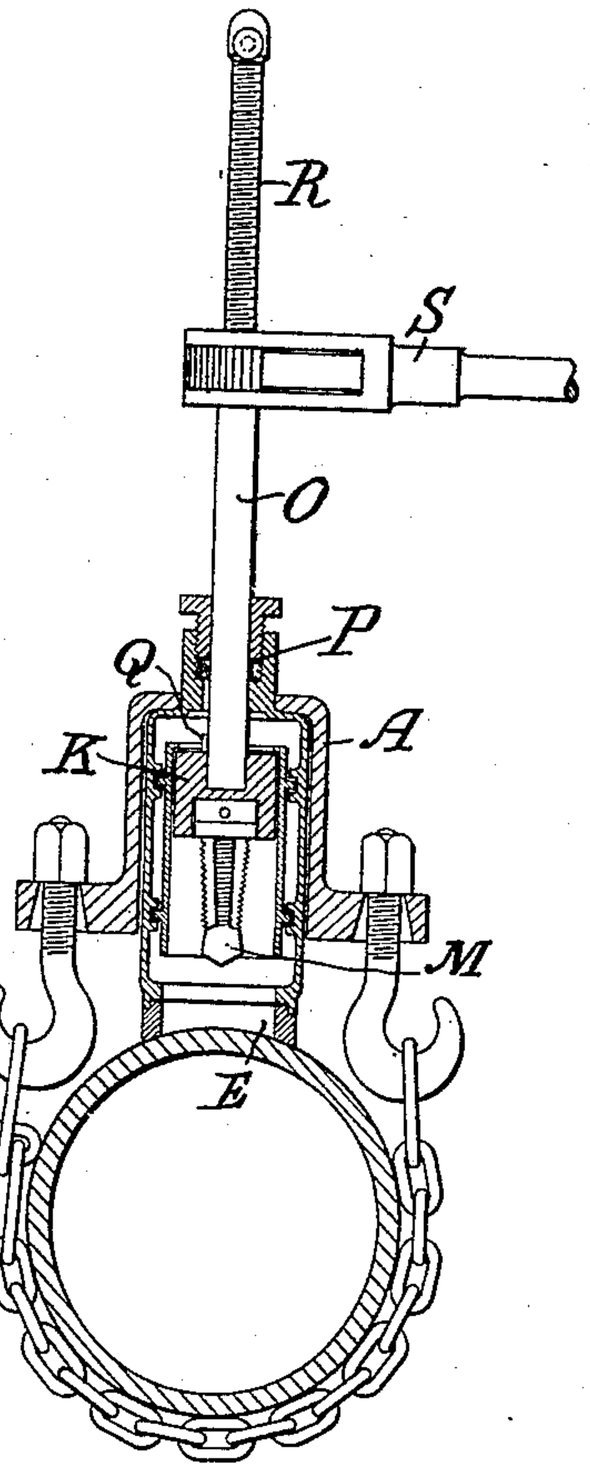


Fig. 3.

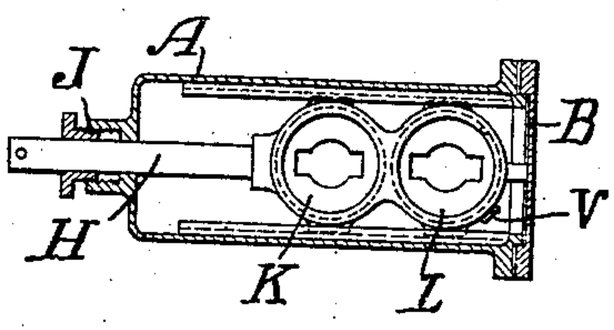
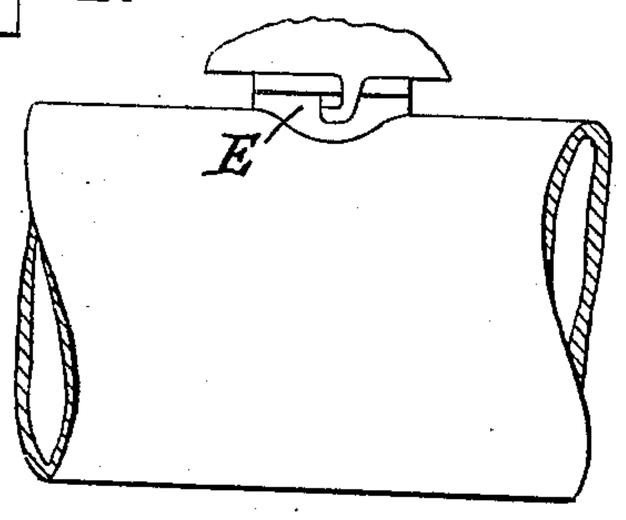


Fig. 4.



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UNITED STATES PATENT OFFICE.

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TAPPING-MACHINE.

No. 864,072. Specification of Letters Patent. Patented Aug. 20, 1907.

Application filed February 7, 1907. Serial No. 356,223.

To all whom it may concern:

Be it known that I, WILLIAM BOYD, a subject of King Edward VII of Great Britain, and a resident of Brighouse, in the county of York, England, have invented certain new and useful Improvements in Tapping-Machines, of which the following description, in connection with the accompanying drawings, is a specification.

The object of my invention is the construction of an improved apparatus for drilling and tapping a pipe or vessel containing fluid, gas, or air under pressure, and for inserting a union ferrule or branch connection into the tapped hole, and while my invention relates principally to the connection of branch pipes or service pipes to water and gas mains, the said invention is also applicable with advantage where steam connections may have to be made under pressure.

In carrying out my said invention, I employ a box shaped casing, together with an intermediate or saddle piece curved to suit the pipe or vessel into which it is desired to insert the branch connection or ferrule, the said box shaped casing being suitably held in position by a chain or band which embraces the pipe or vessel, and the ends of such chain or band being provided with screwed bolts and nuts which engage with suitable lugs or flanges attached to the aforesaid casing, or alternatively, the said lugs or flanges may be formed in a loose bridge or band of wrought iron supported by but not attached to the said casing.

My invention consists in certain novel features of construction and combination of my improvements, as will be fully described in the subjoined specification and particularly pointed out in the following claims.

Referring to the drawings:—Figure 1 of the drawings is a longitudinal section of the apparatus and the pipe to which it is temporarily attached; Fig. 2 is a transverse section of the apparatus and pipe referred to; Fig. 3 is sectional plan of the apparatus, and Fig. 4 shows the method of connecting the curved intermediate or saddle piece to the bottom of the apparatus.

The box shaped casing A may be made of gun-metal or other suitable material and consists of a casting provided at the end with a cover plate B, the said casing having bosses cast on the top for the purpose of receiving and supporting the wrought iron or steel pillars C and C′, which latter are braced together at the top by the wrought iron or steel cross-head D.

The box shaped casing A is supported by an intermediate or saddle piece E which is curved on the underside to suit the pipe, and the said intermediate or saddle piece is capable of easy attachment or detachment to or from the aforesaid casing A by means of two lugs working in bayonet lug joints, as shown at Fig. 4.

A holder consisting of two barrels F and G with extension spindle H all cast in one piece is inclosed in the casing A and arranged to be capable of easily sliding horizontally backwards and forwards inside the aforesaid casing, this being accomplished by means of fins or bearers cast on the aforesaid holder and which fins or bearers work in grooves correspondingly arranged on the inside of the aforesaid casing.

A stuffing box J is provided round the spindle H to prevent leakage, and the two barrels F and G contain respectively two sockets or cylinders K and L, the socket K being attached to a combined drill and tap M, and the socket L supports the ferrule N which is to be inserted in the main, the support for the ferrule being obtained by means of a spring U.

The sockets K and L are recessed to receive the vertical spindle O and are operated each in turn by the said spindle. The spindle O is provided with a stuffing box P, and the said spindle is also furnished with a feather key Q working in a groove in the aforesaid stuffing box in such a manner that, in operation, the feather key does not cease to engage with the groove in the stuffing box until the spindle end has engaged with either the socket K or the socket L, according to the operation which is next to be performed.

Each of the sockets K and L is provided with a spring T and V respectively, to retain them in position at the top of the barrels F and G until such time as they are to be brought into operation, but the means for retaining the sockets in their respective positions differ in method of construction, as the socket K attached to the combined drill and tap is required to travel downwards and then back again to its former position, while the socket L attached to the ferrule is only required to travel downwards. The pressure of the water under the socket K raises it and the spindle O vertically, when the said spindle is in engagement with the socket, because the said spindle O projects through the stuffing box and the area of the combined parts is larger on the underside of the socket by an amount equal to the area of the said spindle. As soon as the spring-catch engages with the socket K the spindle can be disengaged, and the pressure of the water then slides the barrels F and G to the left, because the area of the left hand side of the said barrels is diminished by the area of the projecting spindle H. The spindle H is used to push back the barrel F under the spindle O when required.

The necessary pressure to release the springs which hold the aforesaid sockets in position is imparted by the adjustable screw R which also serves to give the requisite feed to the drill and tap and in turn to start the screwed ferrule into the tapped hole. The requisite revolution to actuate the drill and tap and to screw the

ferrule into the tapped hole is imparted to the spindle O by a ratchet brace S which is capable of rotating the spindle in either direction.

The apparatus is equally applicable for making various sized connections and this to various diameters or sizes of mains or other gas, water, or steam apparatus under pressure. This is accomplished by attaching a drill and tap of the size required to the socket K, and by having separate sockets to suit the various sizes of ferrules to be used, and by having a set of saddle pieces suitably curved on the underside to suit the various diameters of pipes or mains to which the apparatus is to be attached, which saddle pieces are interchangeable and are connected to the apparatus in such a manner that they are easily disconnected and changed.

In practice, after the hole is drilled and tapped by the combined drill and tap M and the tap is reversed and withdrawn from the tapped hole, the pressure of water now inside the casing A lifts the socket K back to its original position and the moment the spindle O is withdrawn clear, the pressure of water causes the holder to move horizontally, thus bringing the socket L containing the ferrule into the position formerly occupied by the drill and thus ready for the second portion of the operation to be performed, *i. e.* the insertion of the ferrule in the tapped hole. Alternatively I may employ a holder with three sockets, each operation then having a separate socket and tool viz:—one socket with a drill, one socket with a tap, and the other holding a ferrule or union.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. The combination, with a casing provided with longitudinal guides, of two barrels secured side by side and slidable in the said guides, a spindle which projects from the said barrels through one end of the said casing and which permits the said barrels to slide automatically in one direction, revoluble piston sockets slidable vertically in the said barrels, spring-catches which engage automatically with the said sockets when raised in the said barrels, and an operating-spindle slidable through the top of the said casing and engaging with either socket when slid under it, each said socket being raised automatically by the water pressure beneath it when the said operating-spindle is connected to it.

2. The combination, with a casing provided with a stuffing-box having a guide-groove, of a horizontally slidable barrel supported in the said casing, a piston socket slidable vertically in the said barrel and provided a recess at its top, and an operating spindle working in the said stuffing-box and provided with a head for engaging with the recess and having also a feather key which slides into and out of the said guide-groove so that the spindle head is retained in a position suitable for engaging with the said recess when raised out of engagement with it.

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

WILLIAM BOYD.

Witnesses:
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