

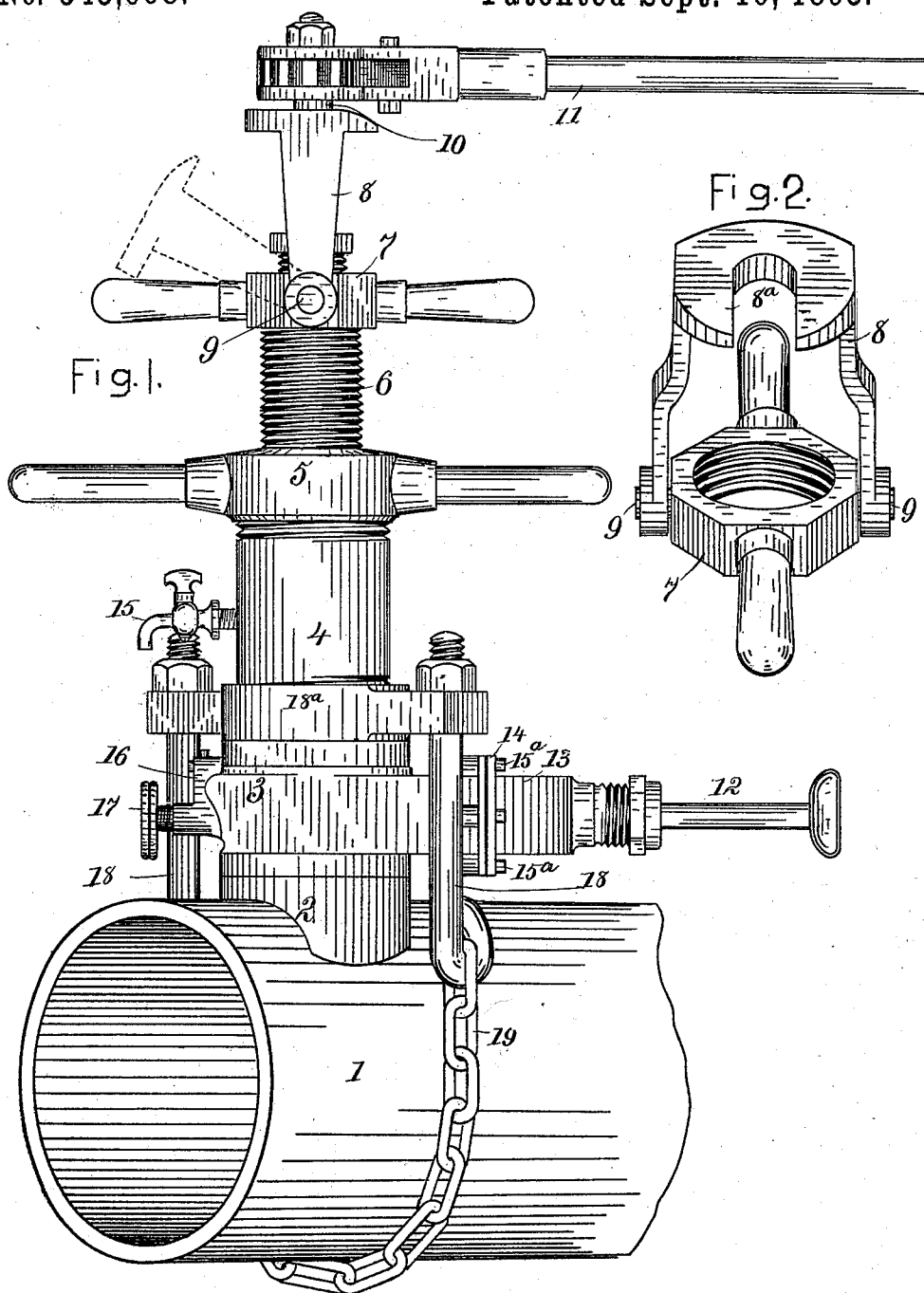
(No Model.)

2 Sheets—Sheet 1.

H. MUELLER.
TAPPING MACHINE.

No. 545,968.

Patented Sept. 10, 1895.



ATTEST

Helen Graham
William Graham

INVENTOR
H. MUELLER.

By his attorney
L. P. Graham

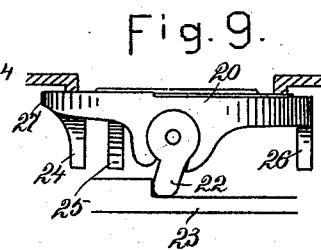
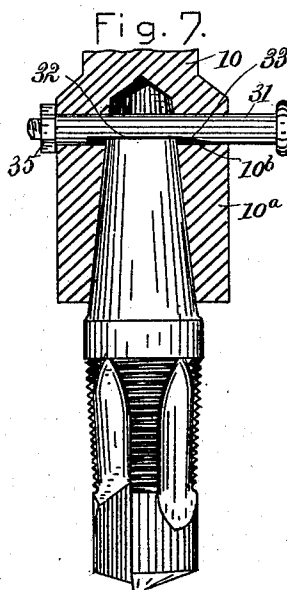
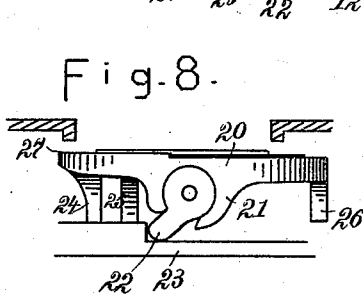
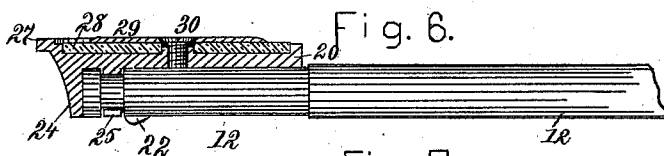
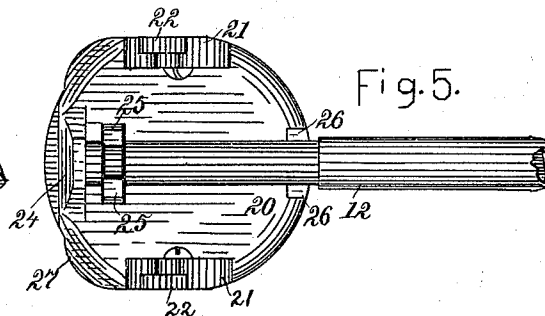
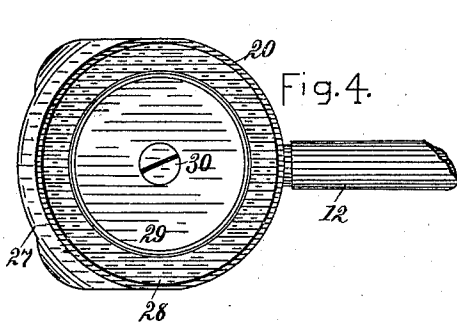
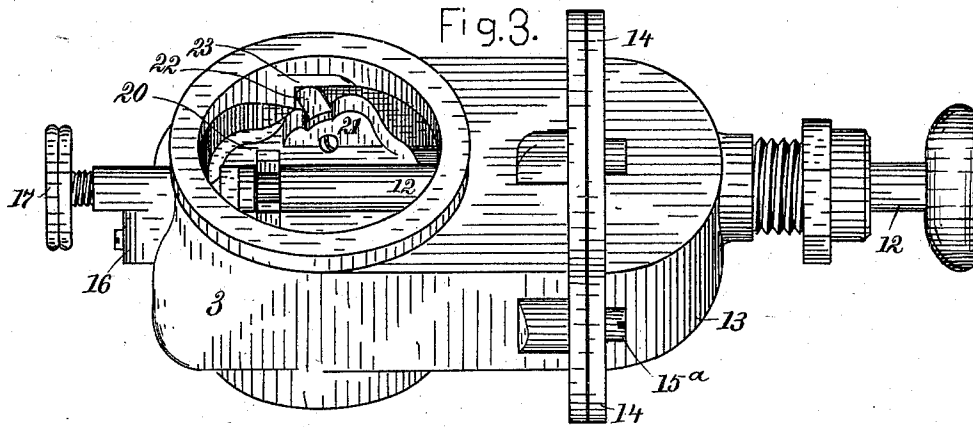
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

HIERONYMUS MUELLER, OF DECATUR, ILLINOIS.

TAPPING-MACHINE

SPECIFICATION forming part of Letters Patent No. 545,968, dated September 10, 1895.

Application filed May 28, 1894. Serial No. 512,647. (No model.)

To all whom it may concern:

Be it known that I, HIERONYMUS MUELLER, of Decatur, in the county of Macon and State of Illinois, have invented certain new and useful Improvements in Main-Tapping Machines, of which the following is a specification.

This invention relates to machines for tapping mains under pressure. It is designed to shorten such machines, with a view to saving metal, lightening the machines, and diminishing the tendency of the operation of the ratchet-handle to loosen and displace the machines on the mains. It is also designed to preclude the loss or temporary displacement of the feed-yoke, to provide for readily detaching the drill and tap from its socket, and to improve the valve in various particulars. It is exemplified in the structure hereinafter described and it is defined in the appended claim.

In the drawings forming part of this specification, Figure 1 is an elevation of a complete machine embodying my improvements. Fig. 2 is an oblique projection of the feed nut and yoke. Fig. 3 is an oblique projection of the valve-chamber and valve, showing such parts inverted. Fig. 4 is a plan of the top of the main valve. Fig. 5 is a plan of the bottom of the main valve. Fig. 6 is a central vertical section through the valve. Fig. 7 is a vertical section through the socket of the boring-bar, showing the means employed to detach the drill and tap from the socket. Figs. 8 and 9 are diagrams illustrating the seating motion of the principal valve.

In Fig. 1 a section of main is shown at 1, the saddle of the tapping-machine at 2, the valve-chamber at 3, the cylinder at 4, the cylinder-cap at 5, the feed-screw at 6, the feed-nut at 7, the feed-yoke at 8, the boring-bar at 10, and the ratchet-handle at 11. The machine is secured to the main, in the customary manner, by means of the yoke 18^a, hook-bolts 18, and chain 19, though so far as this invention is concerned the manner of making the connection is an immaterial matter. The feed-screw 6 is threaded externally to receive the feed-nut, and is also threaded internally to admit the stuffing-nut and permit the shortening of the machine at this point, an exercise of skill rather than invention. The valve-

chamber 3 has a by-pass 16, which is controlled by valve 17 and which enables pressure to be equalized on both sides of the main valve preparatory to opening the same for the admission of the corporation-cock. The by-pass has been covered by me in a prior patent and is shown in this connection merely to complete the machine. The same is true of the cock 15, which is placed in cylinder 4 and may be opened, after the tap is made, to create a flow that may be utilized in forcing the valve closed. The feed-nut 7 has trunnions 9, that engage bearings in the ends of the yoke 8, thereby making a permanent swinging connection between the nut and the yoke. The yoke has the customary slot, as seen at 8^a in Fig. 2, and when the machine is in operation the head of the yoke fits around the boring-bar and bears against the upper surface of a collar on the bar. In adjusting the parts of the machine between operations the yoke is swung to one side, as indicated in dotted lines in Fig. 1, where it rests in constant readiness for use. The end 13 of the valve-chamber has a flange 14, which fits against a corresponding flange on the body of the chamber. A gasket is interposed between the flanges, and screws 15^a are used to connect the parts together. A stuffing-box is formed in the detachable part of the chamber, and through such stuffing-box the valve-stem 12 extends. The valve-plate 20 has a block 24 extending downward from its under surface, and also has downward-extending guide-fingers 25 and 26. The block receives the thrust of the end of the valve-stem, the guide-fingers embrace the sides of the stem in such manner as to not interfere with movement of the valve-plate upward and downward in the chamber, and fingers 25 engage a reduced portion of the stem in a manner to compel the plate to partake of the withdrawal motions of the stem. Downward extensions 21 are formed on the valve-plate, at the edges thereof and on opposite sides of the valve-stem, and in such extensions are pivoted the rocking fingers 22. The rocking fingers project downward and forward with relation to the closing motion of the valve, they move on ways 23 at the sides of the bottom of the chamber, and their swinging ends strike shoulders at right angles to the ways (see Fig. 3) and raise

the valve in an oblique direction to its seat. The valve-raising action of the rocking fingers is developed by impeding the free ends of the fingers, while continuing the thrust of the valve-stem, thus causing the fingers to approach the vertical and increase the height of the ends that carry the valve. The opening of the valve is effected by a reverse movement of the stem, and the valve may be made to open and close more or less quickly with relation to the time of the thrust of the stem by varying the inclination of the fingers in their bearings, setting them more nearly horizontal to increase the speed, and vice versa.

15 The contact-surface of the valve 28 is elastic, and therefore subject to wear from sliding friction. It is in the form of a disk, and it is preferably partly covered by the smaller metallic disk 29, which is secured to the valve-plate by set-screw 30. The peculiar closing motion of the valve tends to develop sliding friction of the front edge of the contact-surface of the valve against the valve-seat. To neutralize this I provide a metallic nosing 27

25 at the front edge of the valve-plate and raise such nosing above the elastic contact-surface 28. Then as the valve moves obliquely to and from its seat the sliding friction immediately preceding closing and following the initial opening motion is received by the metallic and consequently durable nosing to the protection of the comparatively soft elastic contact-surface.

30 In order to conform to the general purpose of the invention, the drill and tap is made unusually short, and special provision is needed to remove it from the socket 10^a of the

boring-bar. This provision comprises a transverse bore 10^b at or near the inner end of the socket, and extending through such bore a pin, as 31, having a depressed portion 32, an inclined surface 33, and a head 34 on one end and a nut or other securing device 35 on the opposite end. The pin is longer than the diameter of the socket, and the depressed portion and inclined surface are so placed that when the drill is placed in the socket, as shown in Fig. 7, with its inner end resting against the depressed surface of the pin, the pin will extend from a side of the socket in one direction and the incline will be on the same side of the end of the drill as the extension of the pin. Then when it becomes necessary to remove the drill and tap the pin is driven lengthwise through the bore and the inclined surface acts as a wedge to start the drill out of the socket.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

In a main tapping machine the combination of the saddle 2, the cylinder 4 and feed screw therein, and between the saddle and said cylinder a valve chamber, and an oblique closing valve having an elastic contact surface, a central metal disk 29 and a raised metallic nosing on the valve plate in front of the contact surface, substantially as described.

In testimony whereof I sign my name in the presence of two subscribing witnesses.

HIERONYMUS MUELLER.

Attest:

W. H. ELWOOD,
H. E. KIZER.