

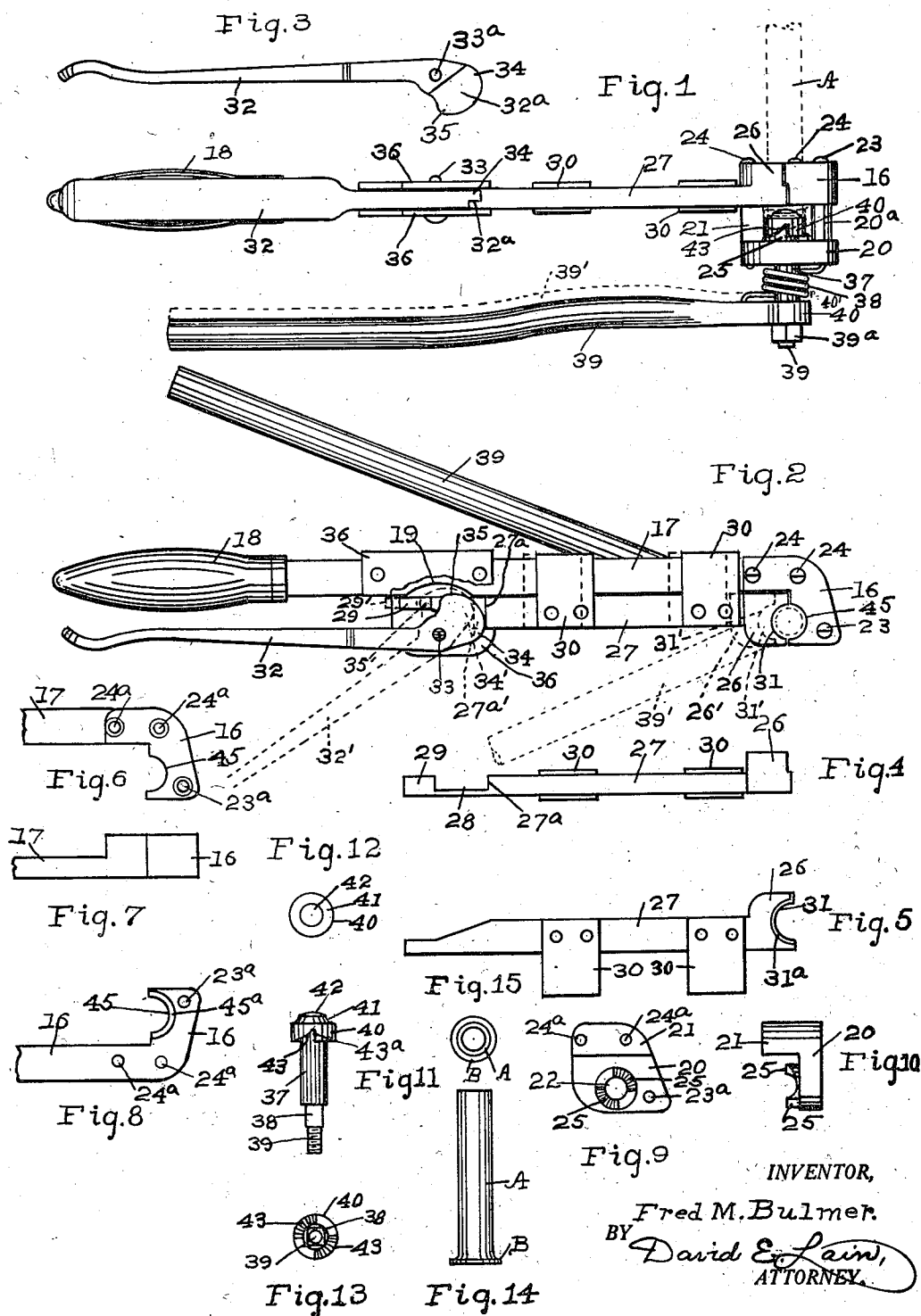
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HAND OPERATED TUBING FLANGER

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HAND OPERATED TUBING FLANGER

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1 Claim. (Cl. 153—81)

My invention relates to improvements in hand operable tubing flangers, and has for an object to provide a hand tool suitable for pressing a flange on an end of a copper tube even though the said tubing end is disposed near a wall or stove.

Other objects of my improvement will appear as the description proceeds.

I attain these and other objects of my improvement with the mechanism illustrated in the accompanying sheet of drawings, forming a part of this specification, in which Figure 1 is a front edge elevation of my flanging tool, Fig. 2 is a front side elevation of Fig. 1, Fig. 3 is a front side elevation of the clamp cam lever, segregated, Fig. 4 is a front edge elevation of the movable clamp jaw and bar, segregated, Fig. 5 is a rear side elevation of Fig. 4, Fig. 6 is a front side elevation of the fixed clamp jaw and bar, segregated, part of the said bar being broken away, Fig. 7 is a front edge elevation of Fig. 6, Fig. 8 is a rear side elevation of Fig. 6, Fig. 9 is an interior side elevation of the punch bearing and cam plate, segregated, Fig. 10 is an end elevation of Fig. 9, Fig. 11 is a side elevation of the punch and cam, segregated, Fig. 12 is the inner end elevation of Fig. 11, Fig. 13 is the outer end elevation of Fig. 11, Fig. 14 is a side elevation of a piece of tubing which has been flanged in my tool, and Fig. 15 is an end elevation of Fig. 14.

Similar characters refer to similar parts throughout. Certain parts are broken away to show other parts hidden thereby.

With more particular reference to the designated parts: The stationary clamp jaw 16 is fastened to one end of the stationary jaw bar 17 and to its other end is fastened the handle 18. In the front edge of the jaw bar 17 is the notch 19 for purposes to be explained. The punch-bearing plate 20 has the inner boss 21, the bearing hole 22 and the bolt holes 23^a, 24^a, 24^a. The diametrically-disposed, 45°, segmental cam bosses 25, 25 are disposed on the inner side of the plate 20 concentric with the bearing hole 22. The plate 20 is fastened to the stationary jaw 16 with the boss 21 and a collar 20^a intervening by the screw bolts 23, 24, 24 extended through the holes 23^a, 24^a, 24^a in both the jaw 16 and plate 20 and the collar 20^a. The said holes in the plate and boss thereon being threaded and the said bolts engaged threadwise therein.

The movable jaw 26 is fastened on one end of the movable jaw bar 27. On the other end of the jaw bar 27 is the tooth 29 the notch 28 and the cam shoulder 27^a. The slide clips 30, 30 are

fitted to reciprocate on the stationary jaw bar 17 and fastened to the movable jaw bar 27 to dispose the adjacent edges of the bars 17 and 27 in close bearing relation. There are semicircular recesses 31 and 45, respectively, in the adjacent surfaces of the jaws 26 and 16, together providing clamping bites or grooves whereby a tube may be held while being flanged. When disposed in tube-clamping relation the bites 31 and 45 are concentric with the bearing hole 22 in the plate 20.

The U-shape bearing bracket 36 is fastened on the stationary jaw bar 17 between the clips 30 and the handle 18 at the notch 19 and between its legs is pivoted the clamping lever 32 on the pin 33. The lever 32 has the cam 34 to bear on the cam shoulder 27^a of the jaw bar 27 and the tooth 35 to bear on the tooth 29 of the jaw bar 27 when the lever oscillates on the pin 33 extended through the hole 33^a. When the lever 32 is in its solid-line position in Figs. 1 and 2 the cam 34 bears on the shoulder 27^a and has moved the jaw 26 to its clamping position and retains it therein. By turning the lever 32 to its dotted position at 32' the tooth 35 thereon bears on the tooth 29 on the jaw bar 27 and has moved the jaw 26 to its open position shown in dotted lines at 26', the cam surface 27^a to its dotted position at 27^a' and the tooth 29 to its dotted position at 29'. By moving the lever 32 farther out on its pivot 33 the jaws are more widely separated. In so mounting the lever 32 in the bracket 36 the lever end 32^a is required to be thin enough to extend within the notch 28 in the jaw bar 27 as shown in Figs. 2 and 3.

The body of the punch 37 is extended through the bearing hole 22 in the plate 20 in which it may oscillate and reciprocate while the cams 43, 43 on the head 40 thereof bear on the cams 25, 25 on the plate 20. The coil spring 38 is mounted on the punch body 37 exterior to the plate 20. The flanging or punch handle 39 has a square hole in the end 40 thereof through which the square 38 near the outer end of the punch body 37 is extended and the handle is retained in place on the punch by nut 39^a engaged threadwise on the threaded end 39 of the said punch. The punch head 40 has the annular groove 41 in its outer end and the central convex shape 42 of its extreme outer end. The ends of the spring 38 are engaged with the plate 20 and the handle 39.

The spring 38 reacts in two ways, viz.: Tending to turn handle 39 and the punch 37 in a counter-clockwise direction, as viewed in Fig. 2, and tending to move the punch outward through

bearing plate 20. If the latter movement occurs, the cams 43 are seated on the cams 25 thus engaging the outer tips of cams 25 in notches 43^a and preventing the former movement from being carried farther than allowed by the solid-line position of handle 39 as shown in Figs. 1 and 2.

The countersunk semicircular shapes of the jaws 26 and 16 shown at 31^a and 45^a in Figs. 5 and 8, respectively, provide for smoothly turning the end of the tube A over these parts of the jaws when forming the flange B, and the annular groove 41 in the punch head 40 aids in smoothly turning the interior wall of the tube into the outer wall of the flange.

In operation: Move the clamp lever 32 to or beyond its dotted position at 32' wherewith the jaw 26 is withdrawn to its dotted position at 26', or farther open if desired, and insert the end of the tube A to be flanged between the open jaws till it bears on the punch head 40. The convex end 42 of the punch head will aid in properly placing the tube end in the jaws, or, as is more often the case in practice, the jaws over the tube end. Now return the handle or cam lever 32 to its solid-line position and the cam 34 moving over the shoulder 27^a will forcibly clamp the tube between the jaws and prevent it from being moved in any direction therebetween. Then, while retaining the handle 18 and cam lever 32 within, say, the left-hand grasp, with the right hand move the handle 39 to its position at 39', shown in dotted lines in Fig. 2. This movement of the handle 39 will turn the punch head 40 within the tube end and turn the cams 43 on the cams 25, thus forcibly pushing the punch head into the tube end and pressing the latter into the shape of flange B on the inner flat surfaces of the jaws 16 and 26. Then the handle 39 is returned to its solid-line position and the lever 32 is turned to its dotted position at 32', thus opening the jaws, allowing space therebetween for the removal of the tubing from the flanger or the flanger from the tubing, as the case may be, thus completing the flanging operation.

Having thus disclosed my invention, what I claim as new therein and desire to secure by Letters Patent is,—

A tubing flanger including, a fixed jaw having a semicircular groove therein and a surface at one end of the groove to form a tubing flange thereon, a jaw bar one end of which is fastened to the fixed jaw disposing the jaw groove at right angles to the said bar, a movable jaw having a semicircular groove therein and a surface at one end of the groove to form a tubing flange thereon, a movable jaw bar one end of which is fastened to the said movable jaw having means on the other end thereof to engage the cam end of a cam lever, means to mount the movable jaw bar on the fixed jaw bar for reciprocation disposing the said groove in the movable jaw adjacent the said groove in the fixed jaw with the axes of the two grooves coinciding when the jaws are in tube-clamping relation and the said flanging surfaces on the jaws in the same plane, a cam lever pivoted for oscillation on the said fixed jaw bar disposed with its cam end engaged with the said cam-engagement means on the movable jaw bar to reciprocate the movable jaw bar on the fixed jaw bar and clamp tubing between the said jaws in the said grooves therein, a tubing flanging punch having cams thereon mounted for oscillation and reciprocation in a bearing plate, the said punch bearing plate fastened to the said fixed jaw, having cams thereon, disposed to align the axis of the said punch when mounted in the plate with the axes of the said jaw grooves when clamping tubing and the said plate cams engaging the said punch cams, a punch handle fastened to the said punch disposed external to the said bearing plate spaced apart therefrom, and a coil spring mounted on the punch between the said plate and handle fastened to the plate and to the handle reacting to tend to maintain the said punch cams in bearing contact with the said plate cams and to withdraw the said punch from contact with any tubing in the said jaws.

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