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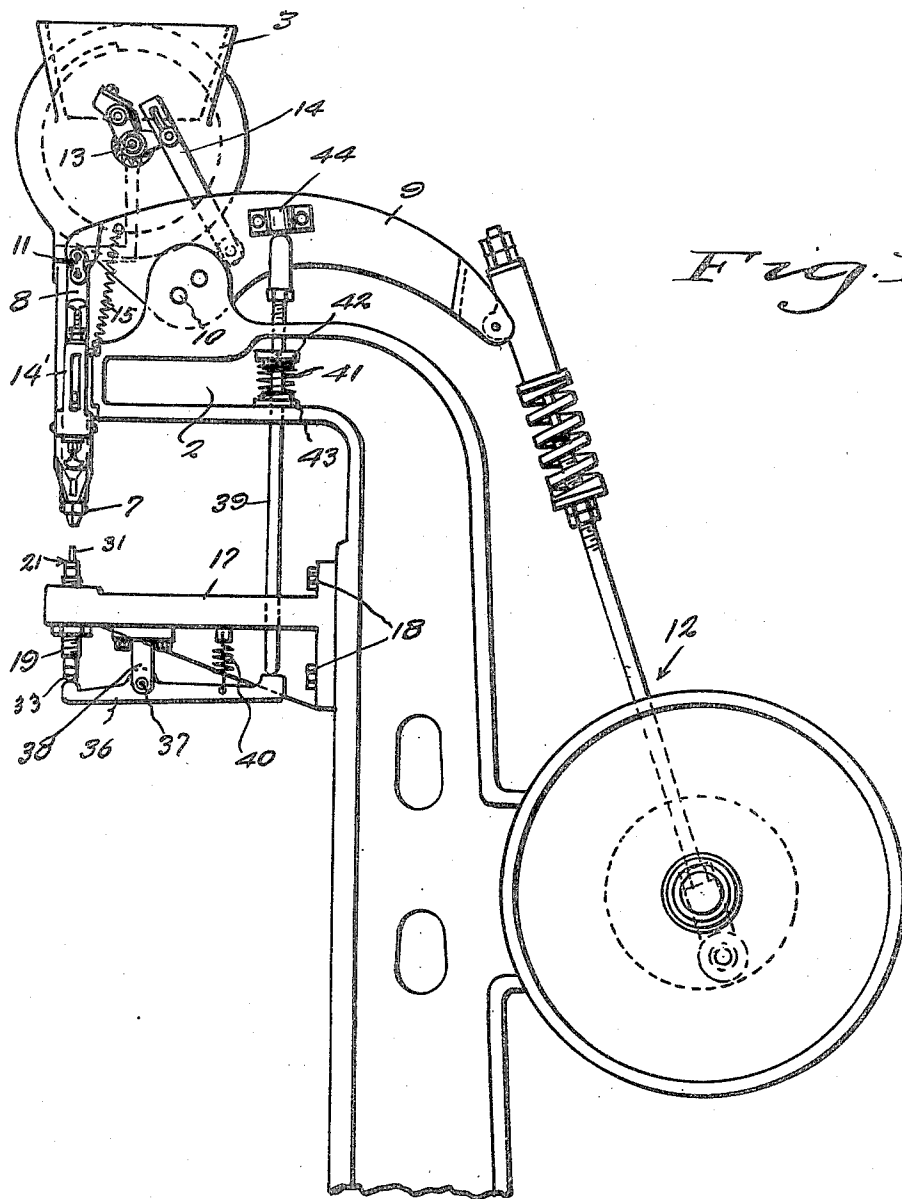
F. L. SHEANE

2,179,900

RIVET SETTING MACHINE

Filed Feb. 5, 1938

3 Sheets-Sheet 1



Inventor
Francis L. Sheane

By *Almonce A. O'Brien*
Hyman Berman
Attorneys

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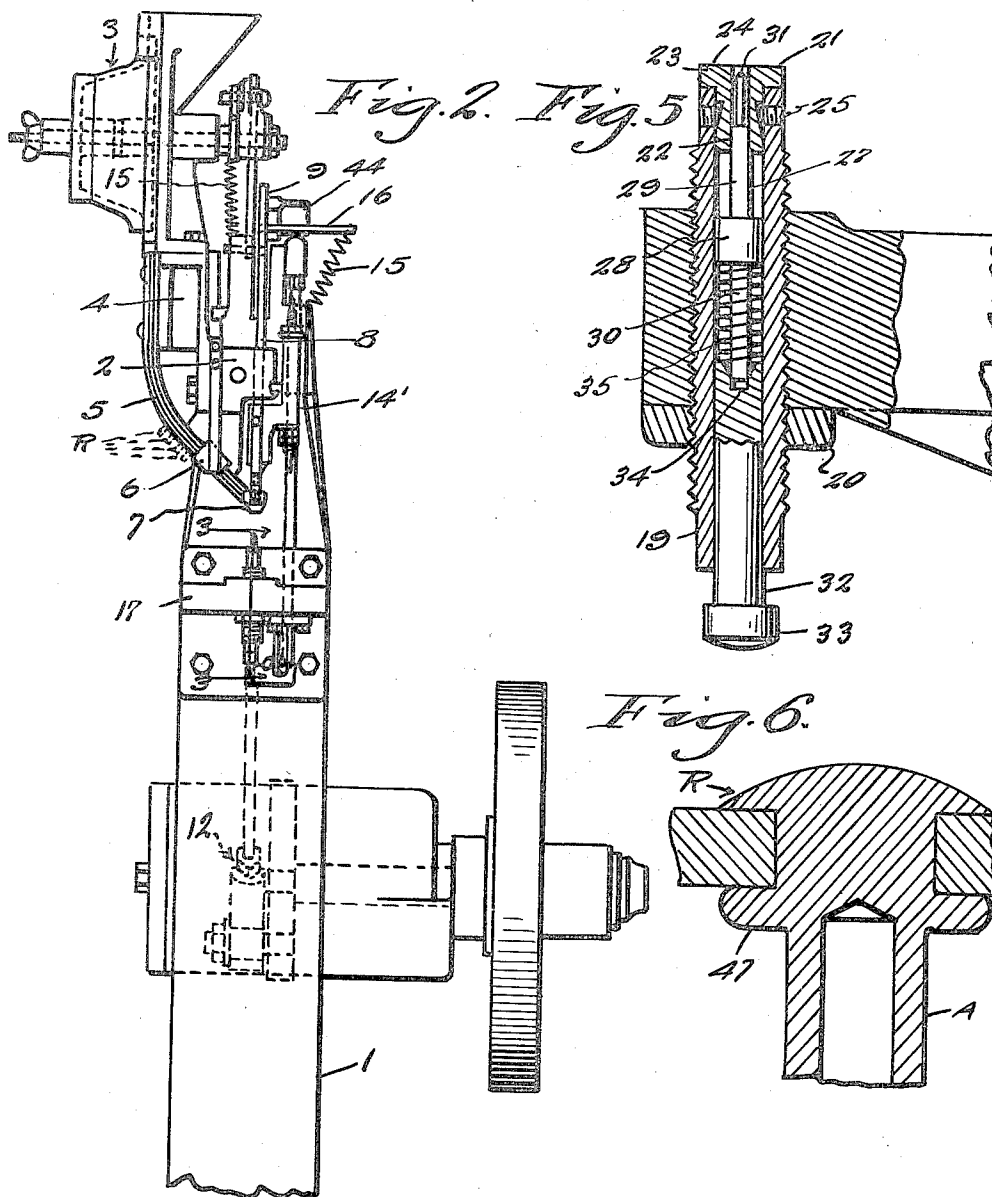
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3 Sheets-Sheet 2



Inventor

Francis L. Sheane

By

Alfonso A. O'Brien
Hyman Berman

Attorneys

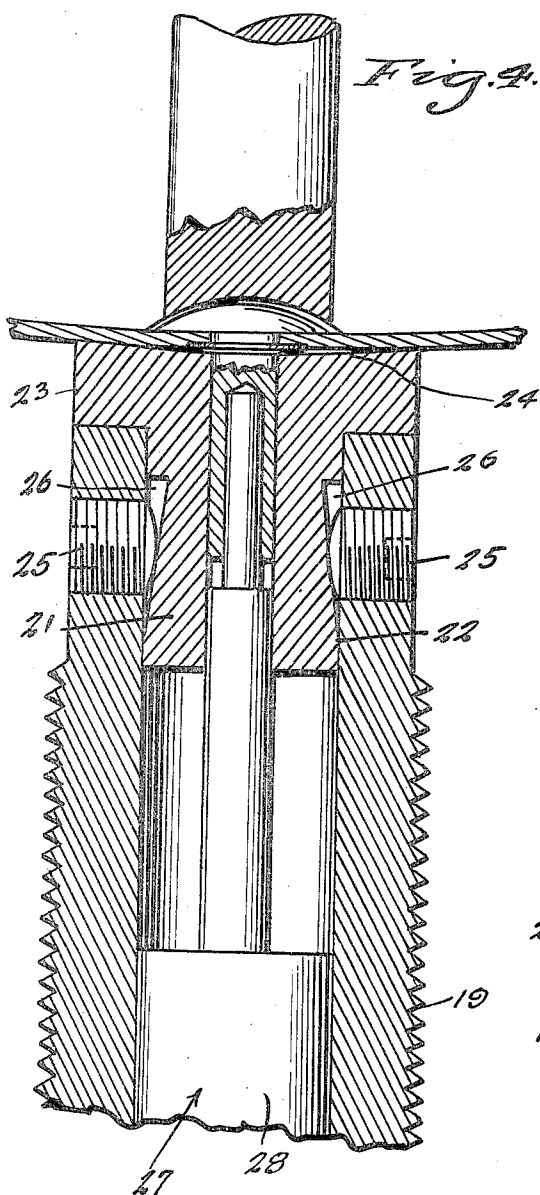
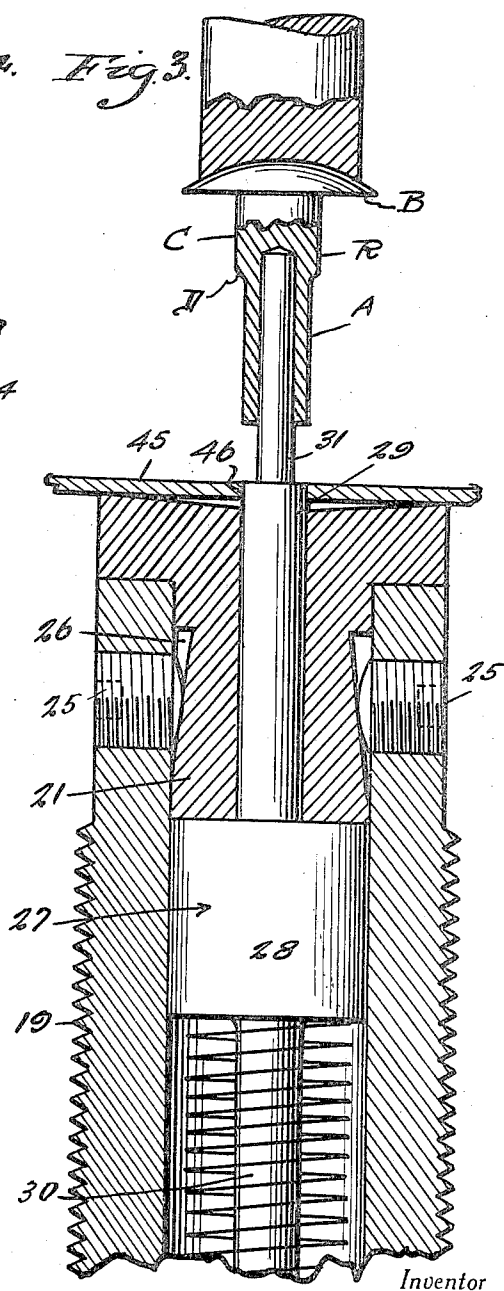
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F. L. SHEANE
RIVET SETTING MACHINE

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3 Sheets-Sheet 3



Inventor
Francis L. Sheane

By *Clarence A. O'Brien*
Hyman Berman
Attorneys

UNITED STATES PATENT OFFICE

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RIVET SETTING MACHINE

Francis L. Sheane, Bridgeport, Conn., assignor to
Shelton Tack Company, Shelton, Conn., a corporation of Connecticut

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2 Claims. (Cl. 218—2)

My invention relates to improvements in rivet setting machines and the primary purpose of the invention, broadly stated, is to equip standard type rivet setting machines for operation to clinch tubular shouldered rivets in leather, or fabric, particularly in key cases.

Another object is to equip a rivet setting machine with mechanism for the above described purpose which involves few parts, is inexpensive to manufacture, and capable of high speed and accurate operation.

To the accomplishment of the above, and subordinate objects presently appearing, a preferred embodiment of my invention has been illustrated in the accompanying drawings, treated in detail in the succeeding description, and defined in the claims appended hereto.

In said drawings—

Figure 1 is a fragmentary view in side elevation of a rivet setting machine equipped according to my invention,

Figure 2 is a view in front elevation,

Figure 3 is a view in vertical longitudinal section taken on the line 3—3 of Figure 2 looking in the direction indicated by the arrows and illustrating the pilot in normal position with a rivet positioned on the rivet carrying end thereof and the driver about to initiate the rivet setting operation,

Figure 4 is a view similar to Figure 3 illustrating the position of the parts at the end of the rivet setting operation,

Figure 5 is a view similar to Figures 3 and 4 illustrating an intermediate position of the pilot and drawn to a reduced scale, and

Figure 6 is a detailed view in transverse section illustrating the manner in which the rivet is clinched by the setting operation.

Referring to the drawings by numerals, my invention has been shown therein as part of the equipment of a well known type of rivet setting machine, the basic parts of which need merely be identified in passing in order to impart a clear understanding of the invention. The type of rivet setting machine illustrated comprises a standard 1 having a forwardly extending head 2. A feed hopper 3, of the agitator type, is secured, by a bracket 4, to one side of said head. A gravity feed runway 5 depends from the bottom of the hopper through which the rivets are fed one by one by means of a shuttle feed 6 to clamping jaws, represented at 7, adapted to clamp and release the rivets all in a manner well understood and requiring no detailed explanation. A rivet driver 8, of rod-like form, is mounted in the head

2 for vertical reciprocation therein to eject the rivets from between the jaws 7. The driver 8 is reciprocated through the medium of a vertically movable rocker 9 pivotally mounted, as at 10, on said head 2 and operatively connected to the driver as at 11. The rocker 9 is operated by means of a pitman drive, designated as a unit by the numeral 12. The rocker 9 is operatively connected to the agitator shaft 13 of the hopper 3 by means of connections designated as a unit by the numeral 14. The drive 12 is controlled by means of a clutch, not shown, to initiate operation of the machine at will. The numerals 14', 15 and 16 designate adjunctive parts of the machine associated with the jaws 7 and which being immaterial to the present invention need not be entered into herein.

According to my invention, a machine of the type identified in the foregoing is equipped for the setting, in leather or fabric, of a tubular rivet R 20 having an internally threaded shank A, a rounded, or convex, head B, and a thickened shank portion C at the upper end of the shank terminating in a shoulder D below said head. The means or mechanism forming such equipment 25 will now be described in detail.

At a suitable point below the jaws 7, a bracket 17 is bolted, as at 18, to the standard 1 to extend forwardly therefrom beneath said jaws. The bracket 17 has threaded therein to extend above 30 and below the same a tubular combined anvil support and pilot guide 19 axially aligned with the driver 8 and adjustable in said bracket for a purpose presently seen. A lock nut 20 on the lower end of said support and guide serves to 35 secure the same in adjusted position.

At the upper end of the combined support and guide 19 is a tubular anvil 21, of T-shape, having a shank 22 fitting into said end and a head 23 seating on said end, the head having a concave upper face 24. The anvil 21 is removably mounted in said support and guide 19 by means of screws 25 threaded into said support and guide and engaging notches 26 in the shank 22. The combined support and guide 19 has slidably 45 mounted therein a vertically reciprocable pilot 27 of spindle like form comprising a central cylindrical portion 28 slidably fitting in said support and guide and upper and lower reduced ends 29 and 30, the upper end slidably fitting in the anvil 21 and having a reduced rivet carrying mandrel 31 extending axially therefrom.

Slidably mounted in the lower end of the combined guide and support 19 is a vertically movable plunger 32 extending from said end and 55

having a head 33 on the lower end thereof. The plunger 32 has a socket 34 in the upper end thereof for receiving the lower end 30 of the pilot 27. A compression spring 35 is interposed between

said plunger 32 and the portion 28 of the pilot 27. In the normal position of the driver 8, i. e., in the limit of its upward stroke, the plunger 32 is held in an upward normal position in the combined support and guide 19 with the head 33 thereof in engagement with the lower end of said support and guide 19. This is accomplished by means of a rocker arm 36 pivoted intermediate its ends, as at 37, for vertical rocking movement on a bracket 38 depending from the bracket 17. One end of the rocker arm 36 underlies and engages the head 33 of plunger 32. A vertical tappet rod 39 slidably mounted in the bracket 17 and head 2 bears at its lower end on the other end of said rocker arm 36. A tension spring 40 having its opposite ends suitably connected to said other end of the rocker arm 36 and to the bracket 17 urges said arm in a direction to permit the plunger 32 to descend. A compression spring 41 interposed between a set collar 42 on the rod 39 and a flange 43 on the head 2 urges said tappet rod upwardly. An abutment 44 on the rocker 9 engaging the upper end of the tappet rod 39 blocks upward movement of said rod under the urge of the spring 41 and rocking movement of the rocker arm 36 under the urge of the spring 40.

In the normal position of the plunger 32 the pilot 27 is held in an elevated normal position with the mandrel 31 projected out of the anvil 21 in spaced relation to the jaws 7 and the upper end 29 of said pilot projected slightly above the face 24 of said anvil 21 all as shown in Figure 3. In this position of the pilot 27 the lower end 30 thereof is elevated slightly out of the socket 34 of plunger 32 by the spring 35. The described normal position of the pilot is established by engagement of the portion 28 thereof with the shank 22 of the anvil 21 and said pilot is supported by said spring 35 for slight independent movement downwardly and relative to the plunger 32.

Referring to the operation, it will be understood that at each cycle of operation of the machine the driver 8 descends and displaces a rivet R from between the jaws 7. Operation of the machine is initiated under control of the aforementioned clutch as will be understood. Prior to initial operation of the machine, the leather or fabric piece 45 into which the rivet is to be set is positioned over the mandrel 31 and pilot end 29, a hole or holes 46 having been cut in the piece for that purpose, and said piece is disposed against the face 24 of the anvil 21. As the rivet R is ejected, in the manner previously described, from between the jaws 7, it is sleeved onto the mandrel as shown in Figure 3. In this connection it is to be noted that the lower end of the shank A is spaced above the piece 45 when the rivet R is initially positioned on the mandrel 31.

As the driver 8 descends to eject the rivet R and sleeve the same onto the mandrel 31, the abutment 44 releases the upper end of the tappet rod 39 which, under the urge of the spring 41, moves upwardly under control of said abutment thereby releasing the rocker 36 for operation by the spring 40 in a direction permitting the plunger 32 to move downwardly under the urge of the spring 35. Until the driver 8 has descended a sufficient distance to contact the head B of the rivet A on the mandrel 31, said spring 35 maintains the pilot 27 in the before described elevated

position with the mandrel 31 projected out of the anvil 21. At this point the driver 8 operating against the head B of the rivet R drives the latter down together with the mandrel 31 until the shank A of said rivet is driven through the hole 46 and into the anvil 21 with the head B of the rivet depressing the piece 45 into the face 24 of said anvil. A feature of my invention is that the internal diameter of the anvil 21 is such that the smaller end of the shank A of the rivet R fits therein. Hence, as the shoulder D of the rivet R engages the face 24 of the anvil 21 the enlarged portion C of said shank A is compressed between said face 24 and the rivet-head B and clinched, or set, beneath the piece 45 as shown in Figure 6 at 47. On the upstroke of the driver 8 the pilot 27 is forced upwardly into normal position by the rocker 9, abutment 44, tappet rod 39, rocker arm 36, plunger 32 and reduced end 30 all in a manner which will be clear from the foregoing, thus forcing the shank of the rivet out of the bore in the anvil 21. As the parts 8, 44, 39, 36 and 32 reach normal position, previously described, the driver 8 releases the head B of the rivet R and moves upwardly into a position providing for sufficient clearance between said driver and head to permit the shank A of said rivet to be slipped off the mandrel 31. After the rivet shank has been released from the anvil 21, and as the driver 8 recedes from rivet-head B, the pilot 27 is moved to normal position, previously described, under the urge of the spring 35 with the mandrel 31 projected above the anvil 21 for receiving another rivet A.

The foregoing will, it is believed, suffice to impart a clear understanding of the invention without further explanation.

Manifestly my invention, as described, is susceptible of modification without departing from the inventive concept and right is herein reserved to all such modifications falling within the scope of the subjoined claims.

What I claim is:

1. In a riveting machine for setting rivets having tubular shanks, a vertically reciprocating driver, operating means for said driver including a rocker, a tubular anvil mounted below said driver for receiving the shank of a rivet driven by said driver, a pilot vertically slidable in said anvil to recede therein under the drive of a rivet into the anvil and operative upwardly to eject the rivet out of said anvil, and means to operate said pilot upwardly under operation of said rocker comprising a tappet on said rocker, a tappet rod operative by said tappet, a lever operative by said rod, and an operating connection between said lever and pilot.

2. In a riveting machine for setting rivets having tubular shanks, a vertically reciprocating driver, operating means for said driver including a rocker, a tubular anvil mounted below said driver for receiving the shank of a rivet driven by said driver, a pilot vertically slidable in said anvil to recede therein under the drive of a rivet into the anvil and operative upwardly to eject the rivet out of said anvil, and means to operate said pilot upwardly under operation of said rocker comprising a tappet on said rocker, a tappet rod operative by said tappet, a lever operative by said rod, and an operating connection between said lever and pilot comprising a vertically slidable plunger beneath the pilot, and a coil spring interposed between said plunger and pilot.