June 3, 1941. K. BUTTER 2,244,047

HOLDER-UP FOR RIVETING

Original Filed Oct. 14, 1938

Fig. 1

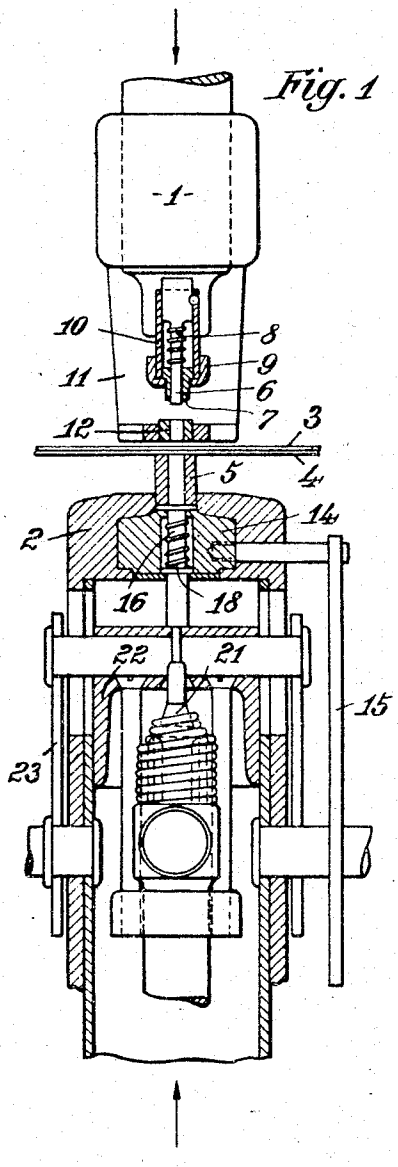


Fig. 2

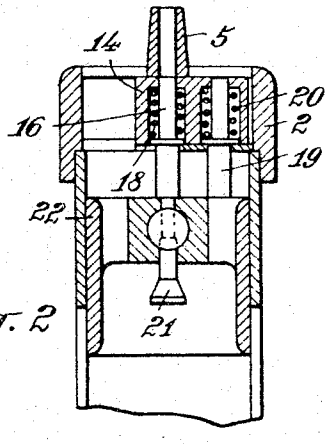
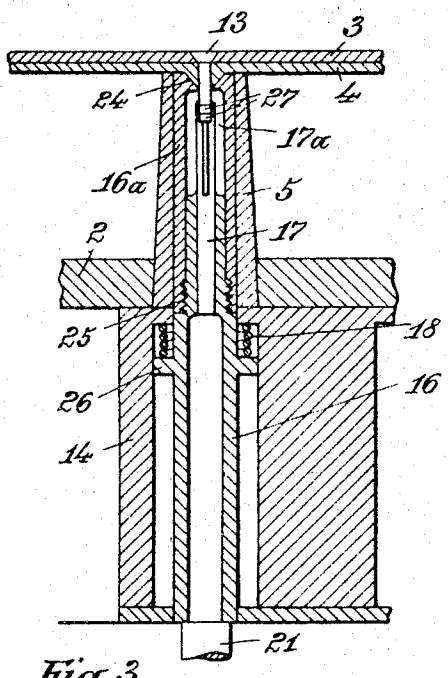


Fig. 3



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HOLDER-UP FOR RIVETING

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10 Claims. (Cl. 78—49)

The present invention relates to an improved holder-up for use in riveting.

It is an object of the invention to provide a holder-up for use in riveting operations wherein the material to be riveted is perforated by the shanks of the rivets.

It is found that in such operations the punchings struck from the work may stick to the shank of the rivet and interfere with the performance of subsequent operations, for instance the formation of a closure head on the rivet. This difficulty may, for instance, be encountered when riveting imperforate sheets by means of a machine as disclosed in my co-pending application, Serial No. 235,043, Patent No. 2,215,388, of which the present application is a divisional.

It is accordingly a further object of the invention to provide an improved holder-up for use in riveting machines for riveting imperforate sheets which are to be perforated by the shank of the rivet.

It is a further object of the invention to provide a holder-up having means for receiving punchings from the work and resiliently gripping them.

My invention also includes within its scope riveting machines incorporating my improved holder-up.

In order that my invention may be well understood, an embodiment thereof will now be described by way of example, with reference to the accompanying drawing, as incorporated in a riveting machine of the kind disclosed in my aforesaid co-pending application.

In the drawing,

Figure 1 is a sectional elevation of a riveting machine constructed in accordance with the invention of my said co-pending application, and embodying one form of holder-up according to the present invention,

Figure 2 is a sectional elevation of part of the machine, taken at right angles to Figure 1, and

Figure 3 is a sectional view of part of the machine on a larger scale, showing the holder-up in detail.

Referring to the drawing, the riveting machine comprises an upper part 1 and a lower part 2 between which parts imperforate workpieces 3 and 4 are placed on a hollow rest 5 of the lower part 2. Arranged in the upper part 1 is a stamp 6 reciprocable vertically by any suitable means and partly surrounded by a slidable sleeve 7 cooperating with a coil spring 8 which tends to move the sleeve against a cap nut 9 screwed to a pipe 10 which surrounds the stamp 6. To the upper part 1 of the machine is fastened an arm 11 carrying an interchangeable ring 12 for the reception of the rivets, which may be fed by hand or automatically. The ring 12 is arranged in such a way as to allow of a slight downward movement when the stamp 6, during its downward stroke, presses the sleeve 7 on to the ring 12 which, therefore, is pressed on to the workpiece 3 before the stamp 6 reaches the rivet 13 (Figure 3) to be struck through the sheets 3 and 4. In the working head of the lower part 2 of the machine there is arranged a slide 14 carrying two different tools and reciprocable through the intermediary of a lever 15 driven by a crank guide drive, part of which is illustrated at 15. One tool comprises a snap head die 19 mounted in the slide 14 and subject to the action of a spring 20 which tends to hold the die in such a position as not to project above the surface of the slide 14.

The second tool carried by the slide 14 consists of the holder-up illustrated in detail in Figure 3. This holder-up comprises a main part 16 having a narrowed upper portion 17 which at its upper end is slotted longitudinally to provide three resilient fingers 17a. A sleeve 16a surrounds the portion 17 and has screw-threaded engagement therewith at 25, the sleeve 16a having a countersunk upper surface 24. A spring 18, co-operating with a flange 26 on the part 16, tends to maintain the holder-up in such a position as not to project above the upper surface of the slide 14.

The holder-up and the snap-head die 19 are brought into working position by means of a spring-pressed spindle 21 connected to a piston 22 movable up and down in the head of the lower part 2 of the machine by means of an eccentric 23 driven in any suitable manner.

The movements of the slide 14 and piston 22 are so timed that the piston is lifted as soon as the axis of one or other of the two tools carried by the slide 14 reaches the vertical axis of the hollow rest 5 and of the stamp 6. The lifted spindle then strikes the lower surface of the tool and lifts the latter until it reaches the shank of the rivet 13 struck through the workpieces by the stamp 6.

The operation of the machine is as follows:

The workpieces 2 and 3 to be riveted are put on the rest 5, and a countersunk rivet is fed to the movable ring 12. The slide 14 is moved into the position in which the holder-up and the bore of the rest 5 are in alignment. The piston 22 is then lifted so that the spindle 21 strikes the lower surface of the holder-up and lifts the latter into

the rest 5 against the action of the spring 18 until the upper countersunk surface 24 reaches the work. In the meantime the stamp 6 has started its downward stroke so that the sliding sleeve 7 presses down the ring 12 to press the workpieces on to the holder-up 16 and the rest 5. In continuing its stroke the stamp 6 strikes the head of the rivet 13 and strikes the shank of the rivet through the workpieces, pressing the edges of the rivet hole into the countersink 24. The punchings 27 are pushed by the rivet shank into the resilient chuck formed by the resilient fingers 17a.

The spindle 21 is then lowered to allow the holder-up to be withdrawn under the action of the spring 18, carrying with it the punchings 27, and the slide 14 is then moved into its other working position, whereupon the plunger 21 is again raised to lift the snap head die 19 to set the closure head of the rivet. The plunger 21 is then lowered, permitting the spring 20 to withdraw the die 19, and the slide 14 is then shifted again to its previous working position in which the holder-up and stamp are vertically aligned. A further rivet can then be struck through the workpieces.

The punchings driven into the part 17 of the holder-up by each rivet will be pressed further down each time a further rivet is driven through the work-pieces and eventually they will reach the wider bore at the lower end of the holder-up and will fall through the holder-up, whereupon they can be removed from the machine in any suitable manner.

The holder-up thus positively removes the punchings from the shanks of the rivets and prevents the trouble which might otherwise be experienced due to punchings sticking to the rivet shanks and interfering with the operation of the snap-head die.

It is to be understood that although I have described my invention as incorporated in a particular riveting machine, no limitation is thereby implied as to the scope of my invention.

I claim:

1. In or for a machine for riveting imperforate sheets to be perforated by the shanks of the rivets, a bored holder-up having disposed therein and at the work-engaging end a bored resilient chuck for receiving punchings from the work and resiliently gripping them.

2. A holder-up for riveting, comprising a bored member having a narrowed end of reduced bore, slots in said end to provide a resilient chuck, and a sleeve enclosing said narrowed end and having a countersunk work-engaging end.

3. A holder-up for riveting, comprising a tubular member having an end of reduced bore, said end being slotted to provide resilient gripping fingers and a sleeve having screw-threaded engagement with said member and enclosing said slotted end thereof.

4. In a riveting machine a reciprocable stamp, a slide, a snap head die carried by said slide, a holder-up carried by said slide, means for reciprocating said slide whereby to bring said die and holder-up alternately into opposed relation to said stamp, and means in said holder-up for receiving and resiliently gripping punchings from the work.

5. A riveting machine comprising, in combination, a reciprocable stamp operative to strike a rivet through the work to be riveted, an apertured work support, a slide reciprocable with reference to said work support, a holder-up and a snap-head die carried by said slide, means for reciprocating said slide to bring said holder-up and die alternately into alignment with the aperture of said work support, means normally maintaining said holder-up and die in retracted positions, means for advancing said holder-up and die into the aperture of said work support when one or other is in alignment therewith, and means in said holder-up for receiving and resiliently gripping punchings from the work.

6. A holder-up for riveting comprising a flanged tubular body part, a further tubular part of reduced internal diameter, coaxial and co-extensive with said body part, said further part having longitudinal slots, and a sleeve having screw-threaded engagement with said body part and surrounding said further part, said sleeve having a countersunk work-engaging end.

7. A holder-up for riveting provided with a through bore for the passage of punchings from the work, said bore having resilient walls for gripping said punchings.

8. A holder-up for riveting provided with a through bore for the passage of punchings from the work, said bore at the work-engaging end of said holder-up having resilient walls whereby punchings received in said bore may be resiliently gripped.

9. In or for a machine for riveting imperforate sheets to be perforated by the shanks of the rivets, a holder-up having a through bore for the passage of punchings from the work and including means to resiliently grip punchings received in said bore.

10. In or for a machine for riveting imperforate sheets to be perforated by the shanks of the rivets, a holder-up having a through bore for the passage of punchings from the work, and a chuck operatively disposed in said bore for resiliently gripping punchings received therein.

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