D. C. SASSEMAN.

RIVET HOLDING AND DRIVING CHUCK.

APPLICATION FILED FEB. 8, 1908.

916,026. Patented Mar. 23, 1909.

Fig. 1.

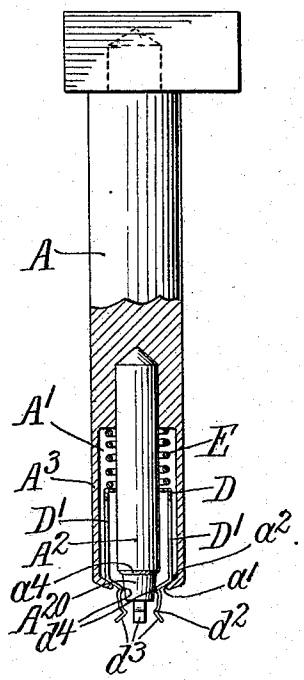


Fig. 2.

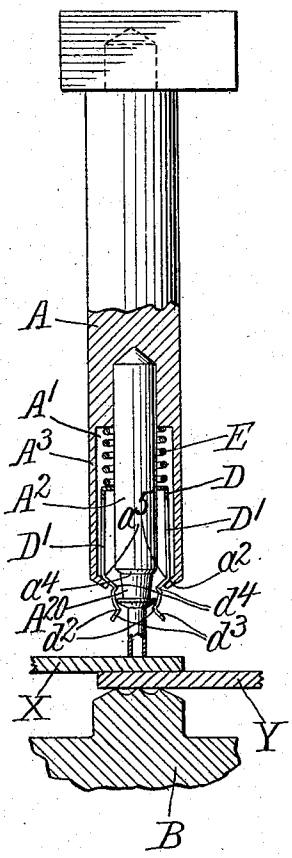


Fig. 3.

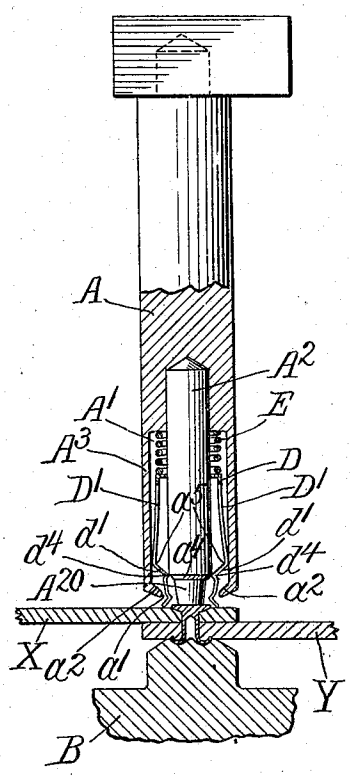


Fig. 4.

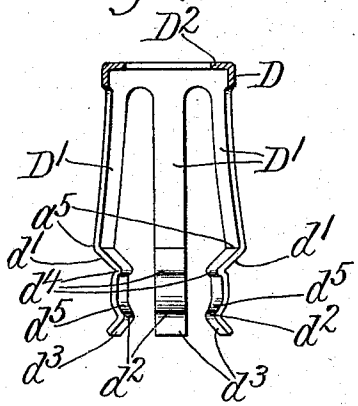
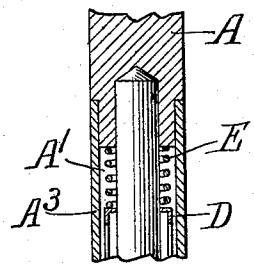


Fig. 5.



Witnesses.
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UNITED STATES PATENT OFFICE.

DAVID C. SASSEMAN, OF RIVER FOREST, ILLINOIS, ASSIGNOR TO F. H. SMITH MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

RIVET HOLDING AND DRIVING CHUCK.

No. 916,026. Specification of Letters Patent. Patented March 23, 1909.

Application filed February 8, 1908. Serial No. 414,862.

To all whom it may concern:

Be it known that I, DAVID C. SASSEMAN, a citizen of the United States, residing at River Forest, in the county of Cook and State of Illinois, have invented new and useful Improvements in Rivet Holding and Driving Chucks, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention relates to riveting machines, and particularly to the means for holding the rivet in the reciprocating head of such machine, or in any tool which might be operated similarly to such reciprocating head.

It consists of the features of construction shown and described as indicated in the claims.

In the drawings:—Figure 1 is a partly sectional side elevation of the rivet-holding head or rivet chuck of a riveting machine, section being made axially through the parts relating to the invention, which are shown in normal position without the rivet and when out of action. Fig. 2 is a view similar to Fig. 1 showing a device holding a rivet, and in connection with the anvil and parts to be riveted, which are shown in section in the same plane as the tool, the parts being in position occupied before the riveting operation is performed. Fig. 3 is a view similar to Fig. 2, showing the parts in position at the completion of the riveting operation. Fig. 4 is an axial section of the rivet-holding device of the chuck disassociated from the remaining parts. Fig. 5 is a detail axial section of a portion of the rivet head showing a slightly modified construction.

In the drawings, A represents the rivet-holding chuck and plunger for holding and driving home the rivet; B, the anvil upon which the rivet is clenched; X—Y, the two pieces,—as leather,—to be secured together by the rivet. The rivet-holding plunger and chuck is formed with an annular chamber, A^1, between the central rivet driver, A^2, and the outer shell, A^3, the said central element constituting the rivet driver being preferably, as shown, a separate piece finished and driven into place in the body of the plunger, A. This central rivet driver protrudes through the end opening, a^1, of the plunger which is contracted by spinning or other means, as shown, after the rivet-holding devices hereinafter described are inserted; or the plunger may be made in two parts, the portion constituting the shell, A^3, being formed separate from the remainder and telescoped on to the reduced end of the latter, as seen in Fig. 5. Within the annular chamber, A^1, encompassing the rivet driver, A^2, there is lodged the rivet gripper, D, which is most conveniently made from pieces of steel tubing rifted from one end nearly to the other to form spring fingers, D^1, connected by the unrifted portion at the upper end, which is preferably flanged inward, as seen in the drawings, for stiffness, and to afford the seating surface for a spring, E, as hereinafter described.

The fingers, D^1, are deflected inwardly for converging them to form sloping shoulders, d^1, which seat upon the inner sloping shoulders, a^2, of the contracted margin of the open end of the shell, A^3, and to adapt the fingers to protrude through the end opening of the shell. The ends of the fingers are further shaped, as shown, to form the inwardly protruding bends or angles, d^2, with sloping shoulder, d^5, just back of the outwardly flaring terminals, d^3, of said fingers. The spring, E, is lodged in the annular chamber of the plunger above or back of the rivet gripper, D, reacting between the top of the annular chamber and the angle head, D^2, of the gripper, as seen in Figs. 1, 2 and 3, and operating to hold the gripper thrust downward or forward with its sloping shoulder, d^1, seating on the inner sloping shoulder, a^2 of the shell with the converging rivet-gripping fingers protruding through the end opening around the end of the rivet driver, A^2, which is tapered, as seen at A^{20}, at the end which protrudes between the converging fingers and out through the end opening of the shell. The tension of the spring, E, is sufficient to cause the fingers, D^1, of the gripper to be crowded together as their sloping shoulders, d^1, are forced against the sloping shoulder, a^2, of the shell. This action being limited by the tapered end of the central rivet driver, A^2, against which the fingers stop as they are thus crowded together, as shown in Fig. 1. Preferably the fingers are shaped to form the knees or protruding bends, d^4, for encounter with the taper-shoulder, a^4, of the driver, A^2, as the latter advances relatively to the gripper when the latter is stopped on the article being riveted,

and the said shoulder thus operates to spread the fingers of the gripper for releasing the rivet. Preferably also the gripper, D, is formed so that the fingers normally react, elastically expanding it to the full capacity of the chamber, A^1,—that is, to the position shown in Fig. 3; but the tendency to be thus expanded is overcome by the reaction of the spring, E, in the ordinary position of the parts for receiving the rivet and holding it as shown in Figs. 1 and 2. When in that position the head of the rivet may be readily forced into the gripper upon being entered between the diverging terminals, d^3, and pushed back past the bends, d^2, the opening of the fingers to permit the head to be thus entered occurring partly through the yielding of the spring, E, as the entire gripper is pushed upward a little, permitting the sloping shoulders, d^1, to follow the sloping shoulder, a^2, outward, and permitting the fingers to spread toward their normal slightly expanded position, and partly through the springing of the portion of the fingers which project beyond the contracted margin of the shell,—that is, from the angle, a^5, to the end. The rivet being thus held with the head uppermost and in position to receive the stroke and pressure of the driver, A^2, is forced by the descent of the plunger down through the parts, X—Y, which are to be secured by it, which are penetrated by the time or before the ends of the fingers, D^1, encounter the upper surface of the material, which is thus penetrated by the rivet. Upon such encounter, the gripper, D, being stopped in its descent while the remainder of the device continues to descend, the spring, E, is compressed yielding to the gripper which is relatively forced back in the shell and around the central driver, A^2, which thus forces the rivet out from between the fingers which withdraw outwardly to release the head of the rivet as the shoulders, d^1, of the fingers follow back along the sloping shoulder, a^2, of the shell in the relative movement of the gripper with respect to the shoulder, the fingers being also positively crowded outward by the encounter of the shoulder, a^4, with the knees or protruding bends, d^4, of the fingers, to whatever extent they may be prevented, from any cause, from reacting elastically outward; and in so far as this movement is insufficient to complete the release of the head, it is supplemented by the elastic yielding of the fingers from the shoulders, d^1, to the end as the driver, A^2, forces the rivet head out past the bend, d^2, of the fingers separating them to the full diameter of the rivet head as it thus emerges. The result is that upon the completion of the riveting stroke, as seen in Fig. 3, the rivet is entirely clear of the gripper, and upon the retraction of the plunger the reaction of the spring, E^1, restores the parts to the original position shown in Fig. 1, ready to receive another rivet.

I claim:—

1. A rivet-holding and driving chuck, comprising, in combination with the plunger having the rivet-driving spindle, a rivet gripper mounted for sliding on the spindle, consisting of fingers which protrude past the end of the spindle, and provided with means for engaging the rivet head and projecting therebeyond for encounter with the surface of the riveted article; a spring reacting between the plunger and the gripper for holding the latter yieldingly protruded with respect to the spindle, the plunger comprising a shell encompassing the spindle, such shell and the gripper fingers having coöperating shoulders for stopping the gripper to limit its protrusion.

2. A rivet-holding and driving chuck, comprising, in combination with a plunger having a rivet-driving spindle, a rivet gripper mounted for sliding on the spindle, consisting of fingers which protrude past the end of the spindle, and provided with means for engaging the rivet head and projecting therebeyond for encounter with the surface of the riveted article; a spring reacting between the plunger and the gripper for holding the latter yieldingly protruded with respect to the spindle, the plunger comprising a shell encompassing the spindle, said shell having an inwardly facing shoulder and the gripper fingers having shoulders for encounter therewith for stopping the gripper to limit its protrusion, said shoulder being sloped to cause the thrust of the gripper against said shoulder by the spring to deflect the fingers inward for gripping the rivet head.

3. A rivet-holding and driving chuck, comprising, in combination with a plunger having a rivet-driving spindle, a rivet gripper mounted for sliding on the spindle, consisting of spring fingers which protrude past the end of the spindle for engaging the rivet head, provided with means beyond the spindle for such engagement and projecting there-beyond for encounter with the surface of the riveted article; a spring reacting between the plunger and the gripper to hold the fingers yieldingly protruded; the plunger having a shell exterior to the gripper provided with an inwardly facing shoulder, the spring fingers having each a corresponding shoulder for encounter with the shoulder of the shell to limit the protrusion of the gripper under the thrust of the spring, the encountered shoulder of one of said parts being sloped to cause the thrust of the plunger by its spring in such encounter to crowd the fingers together for gripping the rivet head.

4. A rivet-holding and driving chuck, comprising, in combination with a plunger having a rivet-driving spindle; a rivet gripper mounted about the spindle, consisting of

fingers which protrude past the end of the spindle and provided at their protruding part with means for engaging the rivet head and projecting there-beyond for encounter with the surface of the riveted article; a spring reacting on the gripper to yieldingly hold the fingers thus protruded, said fingers being normally disposed to spread elastically for releasing the rivet head, the plunger having a shell exterior to the gripper which limits the spread of the fingers, said shell having an inwardly facing shoulder and the fingers having each a shoulder for encounter therewith to limit the protrusion of the gripper fingers under the thrust of the spring, the shoulder on one of the parts thus encountering being sloped to cause the fingers to be crowded together by the thrust of the spring on the gripper for protruding them.

5. A rivet-holding and driving chuck comprising, in combination with a plunger having a chambered shell open at the end and a rivet driving spindle axially situated within the shell, a rivet gripper mounted for moving longitudinally in the shell consisting of fingers which protrude out through the end opening of the shell past the end of the driving spindle, provided with means at their protruding part for engaging the rivet head, and projecting beyond said rivet-engaging means for encountering the surface of the riveted article; a spring reacting on the gripper to force it yieldingly outward, the shell having an interiorly projecting stop shoulder, and the fingers having shoulders for encounter with the shoulders of the shell, said shoulders being sloped to cause their encounter under pressure of the spring to deflect the fingers inward for gripping the rivet.

6. A rivet-holding-and-driving chuck, comprising, in combination with the plunger having a rivet-driving spindle, a rivet gripper, comprising yielding fingers which protrude past the end of the spindle, and provided at the protruding part with shoulders for engaging under the rivet head and projecting beyond such shoulders adequately for encounter with the surface of the riveted article, while the rivet is held by said shoulders, said projecting portions diverging obliquely from the shoulders for receiving and guiding the rivet into engagement with the latter.

In testimony whereof, I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 4th day of February, 1908.

DAVID C. SASSEMAN.

In the presence of—
FRED H. SMITH,
HERMAN SCHOSANSKI.