UNITED STATES PATENT OFFICE

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RIVET INSERTING TOOL

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3 Claims. (Cl. 78—46)

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My invention relates to a rivet setting tool and has for its principal object the provisions of a relatively simple, practical and inexpensive manually operable tool for inserting rivets in holes which are drilled or punched in parts which are to be united by rivets and which tool, with slight changes, may be employed for the feeding and inserting of screws, short nails, tacks and the like.

A further object of my invention is to provide a rivet inserting tool which embodies an elongated tube which serves as a holder for a series of rivets or the like, and one end of said tube being provided with means for controlling the discharge of rivets from the end of the tube and another form of the tool comprising an elongated tubular holder with a separately formed rivet discharging head which is removable positioned on one end of the tubular holder, thus making it possible to utilize different holders with the rivet discharging head.

A further object of my invention is to provide a rivet inserting tool of the character referred to with flexible means adapted to pass around the wrist of the user of the tool, thus enabling said tool to be conveniently employed for the rapid insertion of rivets or the like into their holes.

With the foregoing and other objects in view, my invention consists in certain novel features of construction and arrangement of parts which will be hereinafter more fully described and claimed and illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view of a rivet inserting tool held in and on the user’s hand as the same appears while setting rivets in a row of holes.

Fig. 2 is a section taken lengthwise through the center of the tool.

Fig. 3 is a sectional view taken in line 3—3 of Fig. 2.

Fig. 4 is an elevational view taken in the direction indicated by the arrow 4 in Fig. 3.

Fig. 5 is a sectional elevational view taken on the line 5—5 of Fig. 3.

Fig. 6 is a sectional view partly in elevation and showing a modified form of the rivet discharging means.

Fig. 7 is an elevational view of a further modified form of the rivet discharging means.

Fig. 8 is an elevational view looking in the direction indicated by the arrow 8 in Fig. 7.

Fig. 9 is a cross section taken on the line 9—9 of Fig. 7.

Fig. 10 is a perspective view of a portion of the form of rivet discharge head seen in Figs. 7 and 8.

Fig. 11 is an elevational view, partly in section, showing a further modified form of the rivet discharging means.

Fig. 12 is an elevational view, partly in section, of a further modified form of rivet discharge head.

Fig. 13 is a longitudinal section taken through the center of a further modified form.

Referring by numerals to the accompanying drawings, and, particularly to the form or rivet inserter illustrated in Figs. 1 to 5 inclusive, 10 designates a tube which may be of any desired and convenient length, for instance, from twelve to twenty inches or more, the upper end of which plug is closed by a removable plug or cap 11, and 15 formed through the wall of said tube adjacent its upper end is an opening 12 surrounded by a cup 13 opened at its upper end, thus permitting rivets, screws or the like to be loaded into the tube.

Arranged for sliding movement in tube 10 is a plunger 14 provided with oppositely arranged studs 15 which project through longitudinally disposed slots 16 formed in said tube and arranged between said plunger and the plug 11 is an expansible coil spring 17 which as it expands forces plunger 14 downwardly through the tube. At the upper end of the slots 16 are formed notches 18 which receive the studs 15 when the same is moved to its upper limit of movement, and when the plunger is so positioned, rivets or the like, may be delivered into the tube through the opening 12.

The lower end of the tube 10 is partially closed by an arcuate flange 19, the opening 20 in which is approximately semicircular in shape and which is concentric with the axis of the tube, such construction being for the accommodation of the stems 8 of the rivets when the heads 12 thereof are resting on top of the flange 19 (see Figs. 2 and 5).

Formed in the side of the wall in the lower end of the tube immediately above the rivet head supporting flange 19 is an opening 21 through which the heads of the rivets pass as the end of the tool is drawn away from the rivet.

Secured on the lower portion of the tube 10 just above the opening 21 is a collar 22 having oppositely arranged ears 23 and pivoted to these ears are arms 24 provided on their lower ends with fingers 25 which pass through openings 26 formed through the wall of tube 10 to the sides of the opening 21 therein. The inner ends of these fingers 25 are pointed for engagement with the lower ends of the rivets that are handled by the tool, and the underfaces of said fingers are convexly curved for engagement with the upper sur-
3 faces of the heads of the rivets when said heads are resting upon the flange 18.

In Fig. 1, I have illustrated the fingers 25 shaped for engagement with round headed rivets and in Fig. 6, said fingers are shaped for engagement with flat headed rivets. Where the tool is constructed for use in handling flat headed rivets, flange 18 is inclined as designated by 18a, Fig. 6, so as to conform with the inclined under faces on the heads of such rivets.

Projected between the upper portions of the arms 24 and the tube 10 are expansive coil springs 27 which normally maintain said arms in position with the fingers 25 projecting through the apertures 26 so as to engage the two lowermost rivets as illustrated in Figs. 2 and 6.

Detachably secured to an eye 28 which projects from collar 26 is a hook 29 and connected to said hook is a strap 30 which is adapted to pass around the wrist of the user’s hand as illustrated in Fig. 1, thus enabling the tool to be carried upon the user’s arm while rivets are being inserted in their holes or while the tube is being loaded with a fresh supply of rivets.

In the use of my improved rivet inserting tool, the lower portion of the tube 10 is held by the fingers and thumb in a manner similar to the holding of a pen or pencil, and thus the thumb and index finger are in position to exert inward pressure on the upper ends of the arm 24.

During rivet inserting operations, the shank of the lowermost rivet projects through opening 20 from the lower end of the tool with the head of said rivet resting upon flange 18 with the convex under faces of the fingers 25 resting on the upper surface of the rivet head and with the ends of said fingers positioned beneath the lower end of the shank of the next adjacent rivet as illustrated in Fig. 2.

The shank of the lowermost rivet is now inserted in the aperture in the work and the upper ends of the arms 24 are now pressed inwardly and at the same time, the lower end of the tool is drawn toward the operator or in the direction indicated by the arrow, on the surface of the lower portion of tube 10 as seen in Fig. 3, which movement disengages the tool from the head of the inserted rivet and permits the next adjacent rivet, under pressure of spring 12, to move downwardly through the tool past the withdrawn fingers 25 until the head of said rivet rests on flange 19 with the shank projecting through opening 20.

The operations just described may be quickly performed, thus greatly expediting the work incident to the setting or inserting of a large number of rivets, or the like, in their holes.

In the construction illustrated in Figs. 7 to 10 inclusive, a collar 35 similar to collar 22 is adjustably mounted upon the tube 16 by means of a set screw 36 and this collar carries the pivoted arms 37 which control the discharge of rivets from the lower end of the tube. Protecting outwardly from collar 35 is a perforated ear 38 for the reception of the hook 29 and projecting downwardly from said collar is an L-shaped bracket 37 in the lower horizontal portion of which is located a notched pin 39.

The upper end of a spring 29 is secured to collar 35 below the ear 38 and the horizontally disposed lower portion 40 of said spring occupies a substantially horizontal position and extends beneath the opened lower end of the rivet feeding tube 10. Formed in the end of member 40 is a notch 41 and that portion of said member sur-
rivet from its position at the end of the rivet tube around the chamber 48 to a position as shown by dotted lines in Fig. 11 so that it may be inserted in the rivet hole and when trigger 52 is released, the spring 53 will return the disc to its normal position so as to engage the next rivet discharging from the end of the tube.

In Fig. 12, I have illustrated a head which may be detachably applied to the discharge ends of rivet tubes and this head comprises a tubular member 58 provided at its outer end with a rivet discharge opening 59 and with rivet supporting flanges 60 similar to the flanges 19 previously described, and this head is detachably secured on the end of the rivet tube by means of a conventional bayonet joint 61. Thus, a few heads 58 provided with differently shaped openings 59 and rivet retaining flanges 60 may be utilized with an indefinite member of rivet containing tubes, such as 10.

In Fig. 13, I have shown a modified construction wherein a tube 62 is adapted to contain rivets such as "R" and which rivets are forced toward the lower or forward end of the tube by a spring pressed plunger 63. This plunger is moved toward the discharge end of the tube by an engagement with a spring 64 and is held at its upper limit of movement when the tube is loaded with rivets by means of a stud 65 which engages in a notch 66 at the upper or rear end of a slot 67 through which said stud travels as the rivets are fed from the lower or forward end of the tube.

The lower or forward end of the tube 62 is provided with a flange 68 for supporting the head of the lowest rivet one of the rivets in the tube, and formed in the tube just above said flange is an aperture 69 through which the rivets pass as they discharge from the tube. Rivets are loaded into tube 62, by inserting the rivets, one at a time into the lower end of said tube, with the rivet heads passing horizontally through aperture 69 and then moving said rivets upwardly within the tube against the yielding resistance of spring 54.

In Figs. 3 and 6, I have shown a construction wherein the collar 22 which carries the arms 25 is mounted for longitudinal adjustment on the lower end of the tube 10, and to accomplish such an adjustment, a screw 22A is seated in the collar 22 and the inner end of said screw is adapted to engage in any one of a series of closely spaced indentations 22B which are formed in the surface of tube.

Thus, the fingers 25 which engage between the two lowermost rivets in the tube may be adjusted longitudinally with respect to said tube for the accommodation of rivets having different head shapes.

Thus, it will be seen that I have provided a rivet inserting tool which is simple in construction, inexpensive of manufacture, and very effective in performing the functions for which it is intended. Practically all of the parts of my improved setting tool and particularly the tube, the plunger and the pivoted levers at the forward or lower end of the tube for controlling the discharge of rivets therefrom may be formed of any of the well known plastics now on the market.

It will be understood that minor changes in the size, form and construction of the various parts of my improved rivet inserting tool may be made and substituted for those herein shown and described without departing from the spirit of my invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. A tool for inserting rivets, screws and the like, a tube, a spring pressed plunger arranged for sliding movement in said tube, a rivet supporting flange located within the discharge end of said tube and provided with a notch for the accommodation of the shanks of rivets and the like, there being an opening in the wall of said tube just above the notch in said flange for the discharge of the heads of rivets from said tube, there being openings formed in the tubes to the sides of the first mentioned opening, a ring mounted for longitudinal adjustment on the lower portion of said tube, spring pressed arms pivoted on said ring and fingers projecting from the lower ends of said arms through said last mentioned openings for engaging between the head of the lowermost rivet and the end of the shank of the next adjacent rivet the length of said last mentioned openings being substantially greater than the thickness of said fingers in order to permit the latter to be adjusted to different positions lengthwise of said openings.

2. A tool for inserting rivets and the like as set forth in claim 1 with a wrist engaging strap detachably connected to said ring.

3. A tool for inserting rivets and the like as set forth in claim 2, said tool being provided near its upper end with a rivet receiving opening and a cup disposed below and to the sides of said opening.

LOUIS FRANK.

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