

UNITED STATES PATENT OFFICE.

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RIVET-SETTING TOOL.

SPECIFICATION forming part of Letters Patent No. 477,241, dated June 21, 1892.

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To all whom it may concern:

Be it known that we, WILLIAM CLAXTON BRAY, of Newton Centre, in the county of Middlesex, and EDWARD A. HEMMENWAY, of Boston, in the county of Suffolk, State of Massachusetts, have jointly invented certain new and useful Improvements in Rivet-Setting Tools, of which the following, taken in connection with the accompanying drawings, is a specification.

Our invention relates to rivet-setting tools; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the drawings and to the claims hereinafter given and in which our invention is clearly pointed out.

Figure 1 of the drawings is a side elevation of so much of a rivet-setting machine as is necessary to illustrate our invention. Fig. 2 is a front elevation of the setting-plunger with our improvements applied thereto and showing a small portion of the frame in section. Fig. 3 is a vertical sectional elevation of the same, the cutting-plane being on line 2 2 on Fig. 2. Fig. 4 is a sectional elevation, the cutting-plane being on line 3 3 on Fig. 3. Fig. 5 is a transverse section on line 4 4 of Figs. 2, 3, and 4. Fig. 6 is a vertical section, and Fig. 7 an inverted plan, of a portion of the setting-plunger and its accessories in the positions they assume when the rivet is set; and Fig. 8 represents elevations of three different sizes and styles of rivets to be set thereby.

In the drawings, A is the frame of a rivet-setting machine, B is the setting-plunger mounted in bearings in the front end of the upper portion of said frame, and C is the lever by which a vertical reciprocation is imparted to said plunger, all in a well-known manner. The plunger B has set in its lower end the rivet-driving tool *a*, and the lower portion of the frame A has set therein the clinching-anvil *b*, also of well-known construction. The lower end of the plunger B is made frusto-conical, as shown at *c* in Figs. 3 and 4, and has fitted thereon the tubular nose-piece *C'*, in such a manner as to be movable endwise thereon, it being prevented from axial movement thereon by means of the stop-pin *d*,

which passes freely through the slot *d'* in said nose-piece, and is screwed into the plunger B, as shown in Figs. 2 and 3. The plunger B also has fitted thereon, above the nose-piece *C'*, the collar D, provided with a sleeve-like hub *e* in such a manner that it may be moved endwise of said plunger, a coiled spring *f* being placed between the upper end of said nose-piece *C'* and said collar D, the tension of which tends to separate said nose-piece and collar.

E E are two springs secured by their upper ends to opposite sides of the collar D and extending downward therefrom substantially parallel with the curved sides of the nose-piece *C'*, and having their lower ends turned inward under the lower end of said nose, as shown at *e' e'* in Figs. 2, 4, and 6. The inner edge of each of the inwardly-turned lower portions *e'* of the springs E E has formed in the center thereof a notch *g* to receive the shank of the rivet to be set, and the portions of said edge between said notch and the front and rear edges of said spring, are rounded or beveled, so that when the two springs are in position and the plunger has been raised to the extreme of its upward movement, and the collar D has been arrested by contact with the frame A, and the pin *d*, coming in contact with the upper end of the slot *d'*, has moved the nose *C'* away from the horizontally-projecting portions of said spring, as shown in Figs. 1 and 2, a rivet *h* may be inserted between said inwardly-projecting portions of the springs with its head in contact with the nose *C'* by placing said rivet with its head just above the horizontal parts *e'* of said springs, with its shank bearing against the beveled or rounded corners of *e'*, and pressing said rivet toward a position in axial line with the setting-plunger, in doing which the parts *e'* will separate to allow the shank of the rivet to pass between them and then close upon said shank, so as to hold it firmly in said axial line with the setting-plunger, as shown in Fig. 2.

The springs E E have formed therein the slots *e²*, into each of which projects the outer flat-sided end portion of a pin *i*, fitted to a bearing in the nose-piece *C'* and provided with a shoulder *i'* to bear against the inner

surface of said spring upon opposite sides of said slot, as shown in Fig. 5. The inner ends of the pins *i i* are rounded, and they are so located that when the nose-piece is in its normal position, or so that the upper end of the slot *d'* is in contact with the pin *d*, the pins *i i* will be in contact with or in close proximity to the small end of the frusto-conical portion *c* of the plunger B, as shown in Fig. 4.

The operation of our invention is as follows: The plunger B being at the extreme of its upward movement, as shown in Figs. 1 and 2, a rivet *h* is inserted between the inner surfaces of the horizontal portions *e'* of the springs E, with its head between the upper surfaces of said horizontal portions *e'* and the lower end of the nose-piece C', with its center in axial line with the setting-plunger B and the setting-tool *a*, where it is firmly held by the tension of the springs E E. The work to be riveted being placed on the anvil *b*, the plunger B is moved downward, carrying with it the nose-piece C', the collar D, and the springs E E until the end of the rivet comes in contact with the material in which it is to be set, the nose-piece C' only bearing upon the upper surface of the rivet-head. When the end of the rivet has come in contact with the material to be riveted, the movement of the nose-piece is temporarily arrested, while the plunger B and the setting-tool *a* continue their downward movements till the end of the tool *a* comes in contact with the head of the rivet *h*, during which portion of the downward movement of the plunger B its frusto-conical surface *c*, acting upon the inner ends of the pins *i i*, forces them outward, and their shoulders *i' i'*, acting upon the springs E E, force their lower ends outward, so as to remove the parts *e'* from beneath the head of the rivet and the lower end of the nose. The continued downward movement of the plunger and the setting-tool forces the rivet through the material upon the anvil *b* and clinches the rivet upon the under side of the material. When the rivet is set and the plunger B is moved upward, the collar D, the springs E, and the nose C' move upward with said plunger with the parts in the positions shown in Fig. 6 until the collar D comes in contact with the lower end of the goose-neck portion of the frame A, when the motion of said collar will be arrested, while the plunger continues to move upward till the conical portion thereof is withdrawn from between the pins *i i* sufficiently to allow the springs E E to assume the positions shown in Fig. 2, when another rivet may be inserted between the parts *e'* of said springs, and the operation may be repeated.

By the use of our invention rivets of different sizes and lengths and having flat or convex heads, as shown in Fig. 8, may be set with equal facility and without change of setting-tools, and as the ordinary pocket here-

tofore used, and in which the rivet was forced downward between two spring-jaws which were forced open by contact with the rivet-head, is dispensed with, all danger of turning up a burr or fin on the edge of the head is obviated.

We claim—

1. In a rivet-setting machine, the combination of a clinching anvil or die, a reciprocating plunger and a setting-tool carried thereby, a nose-piece in the form of a sleeve having a bore of varying diameter mounted loosely on and movable endwise of said plunger and provided with the slot *d'*, a pin set in said plunger and projecting into said slot, the collar D, mounted loosely upon said plunger above said nose-piece, two springs secured to and pendent from said collar and having portions of their lower ends turned inward beneath the lower end of said nose-piece, a spring interposed between said collar and the nose-piece, and means having provision for withdrawing the inwardly-projecting portions of said spring from beneath the nose to permit the rivet to be driven independently of any action of the rivet-head thereon.

2. In a rivet-setting machine, the combination of a clinching anvil or die, a reciprocating plunger and a setting-tool carried thereby, a tubular nose-piece surrounding the lower end of said plunger and tool and movably connected to said plunger by a pin and slot, as set forth, a collar loosely mounted on said plunger above said nose-piece, a spring interposed between said collar and nose, two spring-arms secured to and depending from said collar, and provided at their lower ends with inwardly-projecting portions, each having formed in its center a notch to fit the shank of the rivet and having its corner on each side of said notch rounded or beveled, as set forth, and means having provision for withdrawing said inward projections of said springs from beneath the nose-piece independently of any action of the rivet thereon, substantially as described.

3. The combination of the anvil *b*, the plunger B, provided with the inverted frusto-conical surface *c*, the nose-piece C', provided with the slot *d'*, the collar D, the springs E E, provided with the slots *e'*, and the inwardly-turned portions *e'*, the push-pins *i i*, the stop-pin *d*, the spring *f*, and the frame A, all constructed, arranged, and adapted to operate substantially as described.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, on this 3d day of October, A. D. 1890.

WILLIAM C. BRAY.
EDWARD A. HEMMENWAY.

Witnesses:

N. C. LOMBARD,
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