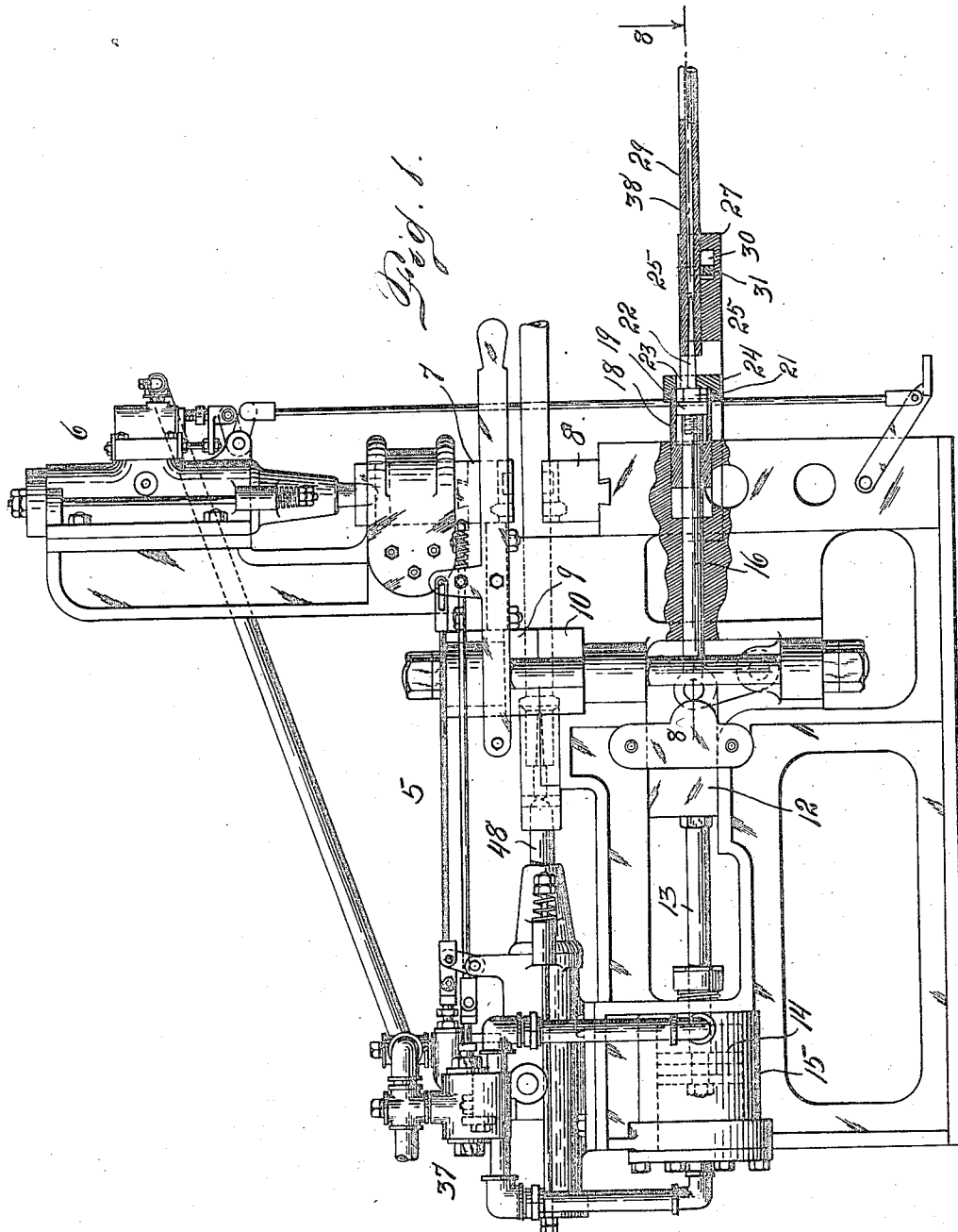


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 3 SHEETS—SHEET 1.

1,214,070.



Witnesses
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Grace Huston

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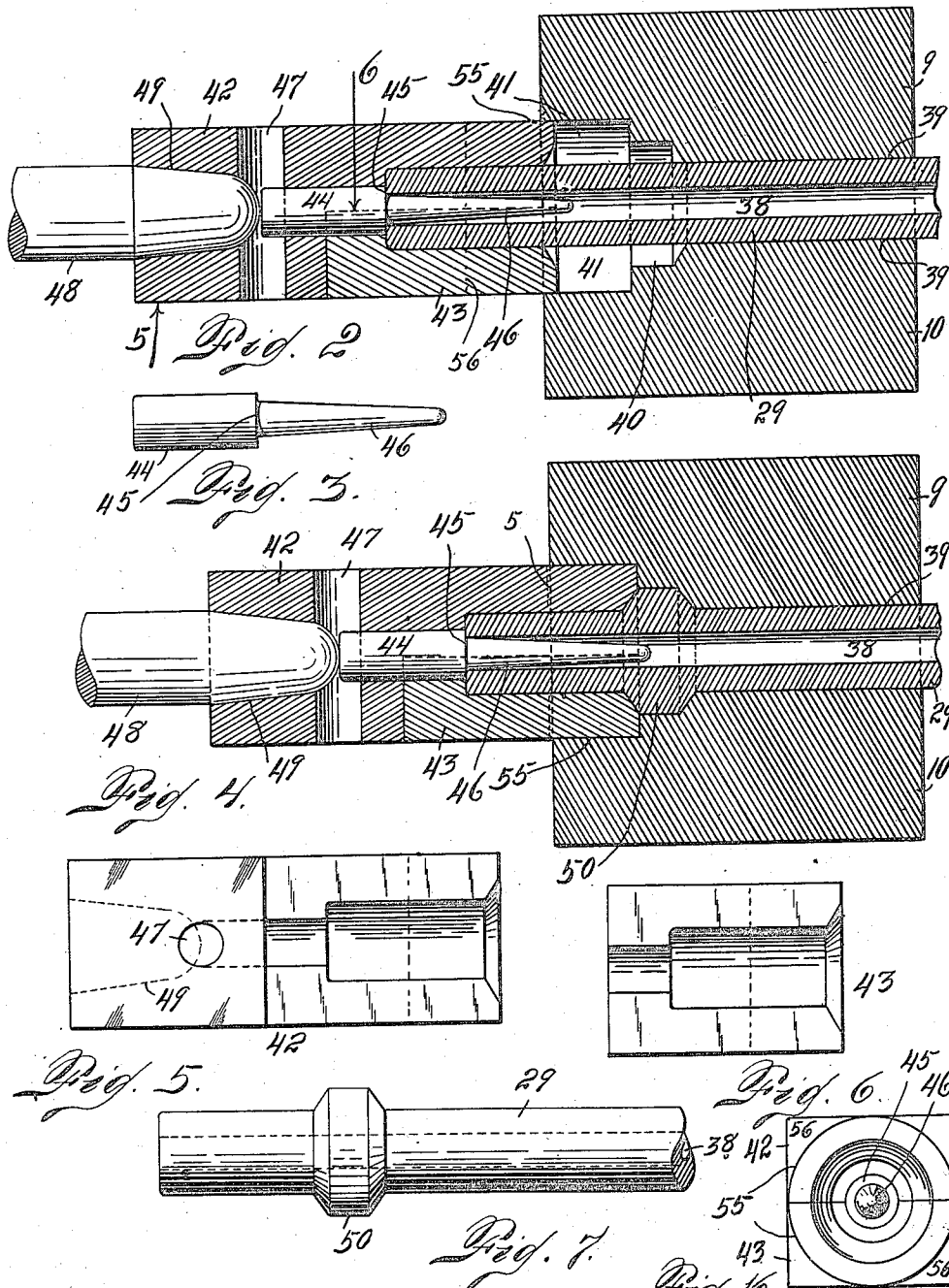
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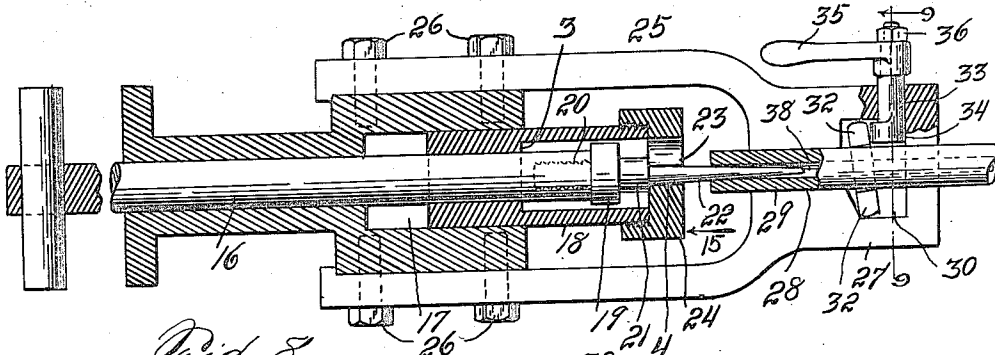
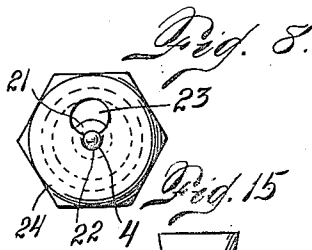
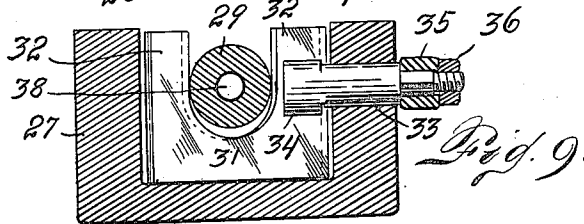
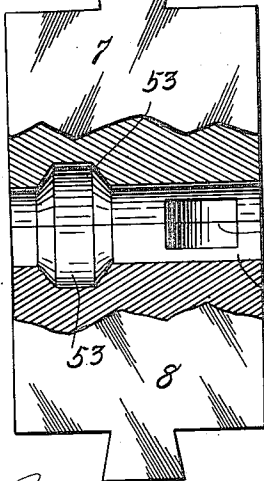
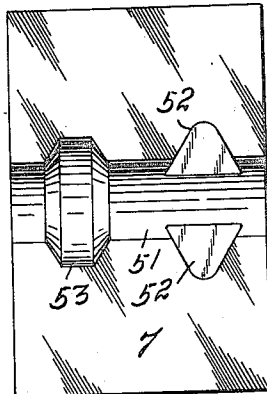
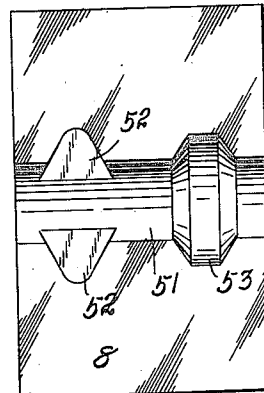
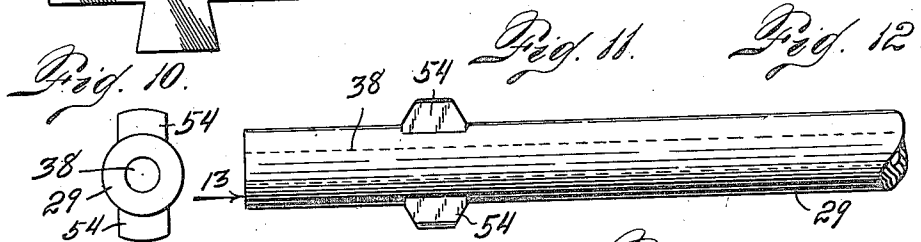


Fig. 13.

Fig. 14.

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UNITED STATES PATENT OFFICE.

THEODORE H. PROSKE, OF DENVER, COLORADO.

APPARATUS FOR FORMING LUGS UPON A DRILL-STEEL.

1,214,070.

Specification of Letters Patent.

Patented Jan. 30, 1917.

Application filed November 26, 1915. Serial No. 63,392.

To all whom it may concern:

Be it known that I, THEODORE H. PROSKE, a citizen of the United States, residing in the city and county of Denver and State of Colorado, have invented certain new and useful Improvements in Apparatus for Forming Lugs Upon a Drill-Steel; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in a device for forming lugs or projections upon the extremity of a drill steel which is engaged by the chuck of the drilling machine, and my special object is to prevent the contraction of the water passage through said drill steel while these lugs or projections are being formed.

Another object of my invention is to provide means which will slightly enlarge the water passage within the drill steel at the extremity upon which these lugs or projections are formed. For carrying out this purpose I employ practically the same machine disclosed in my previous Patent No. 1,123,372, issued January 5, 1915, with the exception that I connect a shaft with one of the crossheads of the machine, the said shaft projecting through the framework of the latter and beyond the same, and having a tapered pin secured in its outer extremity adapted to enlarge the inner extremity of the passage through the drill steel. I also employ special dies and dolly parts for forming the lugs upon the drill and another pin having a tapered extremity, the said pin adapted to be secured between the dolly parts, and its tapering extremity extending into the passage in the said drill to keep it from becoming contracted during the process of forming said lugs.

Having briefly outlined my improved construction, I will proceed to describe the same in detail, reference being made to the accompanying drawing, in which is illustrated an embodiment thereof.

In this drawing, Figure 1 is a view in elevation of the apparatus in its entirety, which I employ in carrying out my method. Fig. 2 is a cross sectional view taken through the dollies and two of the dies,

showing one tapered pin and the drill steel in place, the dolly parts being shown in their normal position. Fig. 3 is a detail view of the tapered pin employed to keep the passage through the drill open. Fig. 4 is a cross sectional view taken through the dollies and two of the dies, showing one tapered pin and the drill steel in place, the dolly parts being shown at their forward limit of movement. Fig. 5 is an under face view of the upper dolly taken in the direction of the arrow 5, Fig. 2. Fig. 6 is a top face view of the lower dolly taken in the direction of the arrow 6, Fig. 2. Fig. 7 is a view of the drill steel after it is removed from the position disclosed in Fig. 4. Fig. 8 is a view partly in section taken on the line 8—8, Fig. 1. Fig. 9 is a sectional view taken approximately on the line 9—9, Fig. 8, looking in the direction of the arrow. Fig. 10 is a detail view of the finishing dies partly broken away. Figs. 11 and 12 are detail views of the oppositely disposed faces of the two dies. Fig. 13 is an end view of the drill steel taken in the direction of the arrow 13, Fig. 14. Fig. 14 is a detail view of the drill steel with the finished lugs formed thereon. Fig. 15 is an end view of the cap with the pin projecting there-through, looking in the direction of the arrow 15, Fig. 8. Fig. 16 is an end view of the dolly parts with the pin in place between the same.

The machine which I employ in carrying out my improved method is designated in its entirety by the numeral 5. Upon this machine is mounted a vertical hammer cylinder 6 which controls upper and lower dies 7 and 8. Upper and lower grip dies 9 and 10 are also mounted upon the apparatus, and are connected in operative relation with a horizontally movable crosshead 12 which is connected by means of a piston stem 13 with a piston 14 located within the cylinder 15.

Pivottally connected with the crosshead 12 is a shaft 16 which projects through openings formed in the framework and extends beyond the latter. A portion of the framework is recessed at 17 to receive a bearing sleeve 18 for the shaft 16, the outer portion of the interior of said sleeve being slightly enlarged to receive the head 19 of a tappet pin 21 which is secured to the forward end of the shaft 16 and projects beyond the latter, the shank of said pin being threaded and adapted to be screwed into a recess in

said forward extremity of the shaft, the walls of said recess being threaded for this purpose. A cap 24 is screwed upon the outer extremity of the bearing sleeve 18 and is perforated at 23, the lower portion of the wall of said perforation being recessed at 4 to receive the offset tapered extremity 22 of a pin 21, said tapered extremity 22 projecting forwardly beyond the cap. The base of the pin is adapted to be inserted into the sleeve 18 through the perforation 23 in the cap 24, whereby a portion of the shoulder formed upon the said pin will bear against the inner face of the cap adjacent the periphery of the wall of the recess 4. A U-shaped frame 25 is secured to the main framework of the machine adjacent the recessed portion of the latter by means of bolts 26, the portion 27 of the said frame forward of the cap 24 being recessed at 28 to receive one extremity of a drill steel 29.

The recess in the part 27 is enlarged at 30 to receive a U-shaped locking member 31, the drill steel 29 adapted to rest upon the latter between its parallel parts 32. One side of the portion 27 of the U-shaped frame is perforated to receive a pin 33, the inner extremity of the latter projecting into the enlargement 30, and provided with a cam 34 adapted to engage one of the parallel sides 32 of the locking member 31. The outer extremity of the pin has an operating lever 35 secured thereon by means of a nut 36. By manipulating this lever the cam 34 is brought into engagement with one leg of the U-shaped locking member 31 which results in the opposite leg of said member being pressed against the wall of the pocket or enlargement 30. This causes the drill steel to be pressed against one wall of the longitudinal recess 28 forward of the pocket 30 and against the opposite wall of the recess 28 back of the pocket 30, thereby firmly locking the drill steel in the said recess 28.

By properly regulating a valve in a casing 37 of the machine, the piston stem 13 will be moved toward the right (referring to Fig. 1), and the crosshead 12 will project the shaft 16 outwardly, whereby the head of the tappet pin will strike the head of the pin 21, thereby projecting the latter and the sleeve 18 outwardly and forcing the tapered extremity 22 of the pin into the passage 38 within the drill steel for enlarging said passage (see Fig. 8), the drill steel, of course, being heated before this operation is commenced. After this is done the valve in the casing 37 is again manipulated to pull the shaft 16 inwardly through the instrumentality of the crosshead 12 and stem 13, and thus the head of the tappet pin 21 will move inwardly through the enlarged portion of the sleeve 18 until it engages the shoulder 3 formed in the latter, when the said sleeve will also move inwardly, thereby with-

drawing the tapered extremity 22 of the pin 21 sufficiently to release it from within the passage 38 of the drill steel 29. The lever 35 is then moved to release the drill steel 29, after which said drill steel is withdrawn from the frame 25 and secured between the two grip dies 9 and 10 which have an operative connection with the piston stem 13, the latter being controlled by a valve in the casing 37, as before mentioned. These dies 9 and 10 have correspondingly shaped recesses 39, 40 and 41 formed in their adjacent faces, and which surround the drill steel, the walls of the recesses 39 adapted to grip said drill. This drill steel projects beyond said dies and enters an opening formed in the adjacent face of a dolly composed of two parts, namely 42 and 43. A pin 44 is inserted in an opening formed in the part 42 and projects forwardly into a registering opening formed by the adjacent faces of the parts 42 and 43. This latter opening is smaller than the one which the drill steel enters, and, therefore, the end of the latter adjacent its periphery will engage a shoulder formed upon the respective dollies. The pin 44 is offset forming a shoulder 45 which engages the end of the drill steel adjacent the shoulders formed by the parts 42 and 43, the reduced portion of the pin projecting into the passage in the drill steel and tapering to its extremity as shown at 46. The rear extremity of the said pin extends into a vertical opening 47 formed through the part 42, and is engaged by the forward extremity of a stem 48 which also projects into said vertical opening through a tapered opening 49 in the rear end of the part 42. The rear portion of the part 42 projects beyond the dolly 43 and is widened so that its lower surface is flush with the lower surface of the part 43, the rear extremity of the latter abutting against said widened portion.

The forward extremity of the two parts 42 and 43 normally project slightly into the opening formed by the recesses 41 in the adjacent faces of the dies 9 and 10. Attention is called to the fact that the two parts 42 and 43 assume a rectangular shape except at their forward extremity 55 where they are cylindrical to permit said extremity to pass into the opening formed by the recesses 41. A valve in the casing 37 is then regulated to reciprocate a piston for striking the inner extremity of the stem 48, which operation will force the parts 42 and 43, together with the pin 44, successively against the end of the drill steel. As this drill steel is already heated, its sides will expand adjacent the openings formed by the recesses 40 and 41, whereby the drill steel will be shortened and the inner extremity of the dolly permitted to pass into the opening formed by the said recesses 41, the forward travel of the said dolly being

stopped by the shoulder 56 formed thereon. During this operation an annular collar 50 will be formed upon the drill steel, and at the same time the tapered extremity of the pin 44 will project into the forward portion of the passage within the said drill steel, thereby preventing the said passage from becoming contracted, which would be the case if this pin were not employed. The employment of this pin is one of the essential features of my invention, and is absolutely necessary in order to keep the passage open to the desired width. After this operation is completed, the upper die 9 is raised and the dolly withdrawn, whereby the drill steel is released. The latter is then placed between the dies 7 and 8, their adjacent faces forming an opening 51 to receive the drill steel, the collar 50 of the latter resting between correspondingly shaped recesses 52 also formed in said adjacent faces. The drill is then hammered until the collar portion is transformed into lugs or projections corresponding in shape to that of the recesses 52. The drill steel is then moved forward until the lugs thereon will enter the recesses 53 formed in the adjacent faces of the dies, when the drill steel is again hammered until the lugs assume the shape disclosed upon Fig. 14 at 54. The extremity of the drill steel is then properly equipped to be inserted into the chuck end of a drilling machine.

It will be understood that the metal forming the collar 50 is flattened in the recesses 52, so that it assumes a similar shape to the inner contour of these recesses, and the finished lugs 54 are then obtained by placing the steel into the annular grooves provided by the recesses 53.

Having thus described my invention, what I claim is,—

1. In combination with the frame of an apparatus, a shaft extending through said frame and a recess formed in the latter, a bearing sleeve inserted in said recess and surrounding the shaft, a tappet secured on the end of the shaft and projecting beyond the periphery of the latter into an enlarged portion of said sleeve, a pin located within the sleeve and having a portion offset and tapered, a cap secured upon one end of the sleeve and having a perforation therethrough, through which the tapered extremity of the pin projects, the head of the pin abutting against the inner surface of said cap, a member secured to the frame and located forward of the cap, said member being recessed, a U-shaped locking device located in said recess, the latter also adapted to receive a drill steel, which will lie between the legs of said locking device, a pin inserted through an opening in the side of said member and projecting into the recess of the latter, said pin having a

cam upon its inner extremity adapted to engage one of the legs of the U-shaped locking device, a lever secured upon its outer extremity, and means for forcing the shaft outwardly to project the first-named pin into the passage within the drill steel.

2. A device of the class described, comprising a bracket suitably mounted and provided with a recess, a U-shaped locking device located in said recess, the latter also adapted to receive a tool which will lie between the legs of said locking device, a pin inserted through an opening in the side of the bracket and projecting into the recess therein, said pin having a cam upon its inner extremity adapted to engage one of the legs of the U-shaped locking device, and a lever secured upon its outer extremity for manipulating purposes.

3. A device of the class described, comprising a bracket suitably mounted and provided with a recess, a U-shaped locking device located in said recess, the latter also adapted to receive a tool which will lie between the legs of said locking device, a pin inserted through an opening in the side of the bracket and projecting into the recess therein, said pin having a cam upon its inner extremity adapted to engage one of the legs of the U-shaped locking device, a lever secured upon its outer extremity for manipulating purposes, and means mounted adjacent one extremity of said tool and reciprocable to act thereon.

4. A device of the class described, comprising a shaft reciprocably mounted in a suitable framework and extending through a recess in the latter, a bearing sleeve located in said recess and surrounding the shaft, a pin carried by said bearing sleeve and projecting beyond one end of the latter, a bracket mounted adjacent this end of the sleeve and provided with a recess, means located in said recess for securing a drill steel in place, and means mounted upon one extremity of the shaft for engaging the pin and forcing it into the passage in the drill steel when the said shaft is actuated in one direction and for engaging the sleeve and withdrawing the pin from the passage within the drill steel when the shaft is actuated in the reverse direction.

5. In combination with the framework of an apparatus, a shaft extending through said frame and a recess formed in the latter, a bearing sleeve inserted in said recess and surrounding the shaft, a tappet secured upon the end of the shaft and projecting into an enlarged portion of said sleeve, a pin located within the sleeve and having a portion offset and tapered, a cap secured upon one end of the sleeve and having a perforation therethrough through which the tapered extremity of the pin projects, the head of the pin abutting against the inner surface of

said cap, a bracket secured to the frame and located forward of the cap, said bracket being recessed, a locking device located in said recess for securing a drill steel in place, and means for forcing the shaft outwardly to project the pin into the passage within the drill steel for the purpose set forth.

6. A device of the class described, comprising a bracket suitably mounted and provided with a recess, a U-shaped locking device located in said recess, the latter also adapted to receive a tool which will lie between the legs of said locking device, and means mounted upon said bracket and adapted to engage one of the legs of the U-shaped locking device, for the purpose set forth.

7. An apparatus for forming lugs upon a drill steel including two dies for gripping the drill steel, said dies having their faces recessed to form openings adapted to surround said drill steel, a dolly mounted adjacent said dies and provided with an opening into which the drill steel is adapted to project and abut against a shoulder formed in said dolly, a pin carried by the latter and having one extremity projecting into the passage within the drill steel, said pin having a shoulder formed thereon adapted to engage the end of the drill steel, and means for driving the said dolly and pin against the end of said drill steel, whereby a portion of

the latter is expanded, to form a collar thereon.

8. An apparatus for forming lugs upon a drill steel, including two dies, means for closing said dies to grip a drill steel, said dies having their faces recessed to form two openings adapted to surround said drill steel, a dolly mounted adjacent said dies and provided with an opening into which the drill steel is adapted to project and abut against a shoulder formed in said dolly, a pin carried by the latter having a shoulder abutting against the end of the drill steel, the portion of the pin forward of the shoulder being tapered and adapted to extend into the passage through the said drill steel, the forward extremity of the dolly normally extending into the outer opening formed by the die faces, and means for driving the said dolly and pin against the end of the drill steel whereby a portion of the latter is expanded and the forward extremity of the dolly is forced through the said outermost opening between the dies, to form a collar thereon.

In testimony whereof I affix my signature, in presence of two witnesses.

THEODORE H. PROSKE.

Witnesses:

GRACE HUSTON,
A. EBERT O'BRIEN.