

R. GRACEY.
Dies for Heading Bolts.

No. 158,484.

Patented Jan. 5, 1875.

Fig. 2.

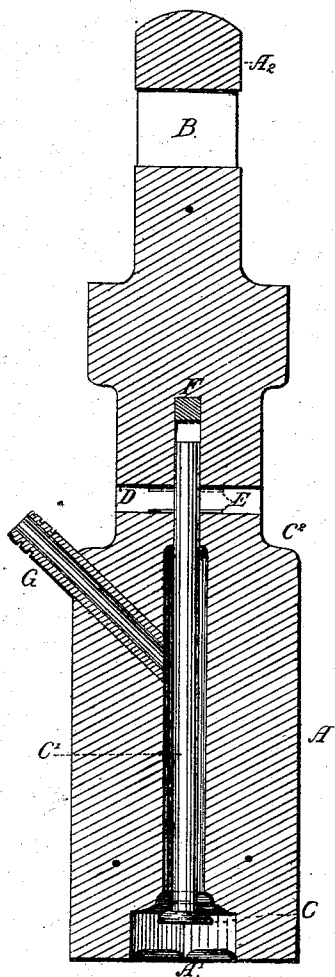
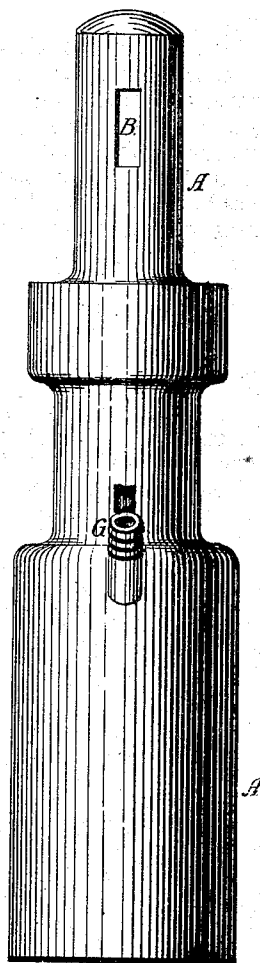


Fig. 1.



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UNITED STATES PATENT OFFICE.

ROBERT GRACEY, OF ALLIANCE, OHIO, ASSIGNOR OF TWO-THIRDS HIS RIGHT TO CHAS. E. MARCHAND AND THOS. R. MORGAN, OF SAME PLACE.

IMPROVEMENT IN DIES FOR HEADING BOLTS.

Specification forming part of Letters Patent No. **158,484**, dated January 5, 1875; application filed July 10, 1874.

To all whom it may concern:

Be it known that I, ROBERT GRACEY, of Alliance, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Dies for Heading Bolts, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings and to the letters of reference marked thereon, which form a part of this specification—

Figure 1 being an elevation of my improved die, showing the pipe for admitting water or other liquid to its central cavity, and a slot through its shank for holding it in the machine, to which it is attached, or of which it forms a part; and Fig. 2 is a central section of the same, showing a recess in its end, in which the head and collars are formed, the valve working in its central cavity, a spring against which the valve-stem bears when closed, a stop for regulating the distance which the valve shall be allowed to open, and the induction-passage for the water.

Corresponding letters refer to like parts in both of the figures.

This invention relates to a die to be used in machines which form heads upon bolts, spikes, and rivets, and other similar devices; and it consists in providing such dies with a central cavity, and with a valve working therein, for the purpose of admitting and controlling the eduction of water or other liquid for washing away the scales and dirt which accumulate in such dies, and for the further purpose of keeping the die cool while being used.

In dies heretofore constructed, and especially in those which have cavities formed in their surfaces for the formation of the heads of bolts and other devices, great difficulty has been experienced from the scales, which have fallen from the bolt previously headed, remaining in the cavity, and from which it has been difficult to remove it, such scales, if permitted to remain, causing a very rough appearance of the heads of the bolts which are afterward headed, and, not unfrequently, a defective head has been the result. Another difficulty which has

attended these dies as previously constructed has been, that no adequate means have been provided for keeping them cool while in use, and hence, in machines which are capable of rapid operation, the dies soon become heated to such an extent as to cause them to become softened by having their temper withdrawn, by which operation they are rendered comparatively worthless; and, hence, the object had in view in this case is the production of a die which shall be free from the objections above referred to.

In constructing dies with my improvements applied I use a piece of steel, or other suitable metal, of the proper form to adapt it to the machine in which it is to be used, forming in its surface a cavity, in which to make the head of the bolt or other device. When it is desirable to forge bolts or screws with a collar upon their heads the outer cavity in which the collar is formed is made annular for such a depth as to cause it to receive a sufficient amount of metal to form such collar, which is made at the same time that the head is formed, and by the same movement of the die. From the bottom of the cavity in which the head is formed there is bored, or otherwise made, an aperture, which extends inward a distant sufficient to enable me to use a valve, the seat of which is in the bottom of the cavity in which the head is formed, it being so constructed that when it rests upon its seat the outer surface of its head shall be flush with the inner surface of the cavity, so that in forming the head a smooth surface shall be presented for the metal to rest against. The aperture, through which the stem of the valve passes, is larger than said stem for a considerable distance, in order that the water, which passes in through a tube provided for that purpose, may flow toward the valve-seat, and, when the valve is removed therefrom, out into the cavity in which the head is formed, and thus wash away any scale or dirt that may remain therein. The inner end of the valve-stem passes through a smaller part of the central aperture of the die, so that the water may be prevented from flowing in that direction, and that portion of the stem which fits this reduced part is provided with a stop in the form

of a pin or key, which passes through it, and thus determines the amount of motion that shall be imparted to the valve. In the inner portion of the aperture in which the valve-stem moves there is placed a spring, which, when the valve is closed, bears against the end of its stem, and aids in opening the valve when the head is removed from the die. For the introduction of water into the aperture of the die a tube is inserted therein, the inner end of which communicates with said aperture, its outer end being provided with a screw-thread, or other means, for attaching thereto a pipe or hose for conducting the water thereto from any suitable source of supply.

In the example of a die shown in the drawing, A represents a round die, with a cavity, A¹, in its outer end, in which the heads are formed, the collar being formed by the enlarged cavity outside thereof, its inner end being provided with a shank, A², for entering the cross-head, or other part of the machine which carries and operates it. This shank is provided with a slot, B, through which a key passes to secure it in place. The valve-seat is shown at C, and the enlarged portion of the aperture, through which the stem of the valve moves, at C¹, while its reduced portion is lettered C². The slot through the die which, in conjunction with the pin or key D in the valve-stem, regulates the throw of the valve is shown

at E. The spring, which acts upon the valve-stem, as above described, is lettered F, and the water-induction tube G.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A die for forming heads upon bolts and screws, having a cavity in its outer surface for shaping the heads, an aperture extending therefrom, in which a valve is placed for controlling the flow of water through said cavity for the purpose of washing away any scale or dirt which may accumulate therein, and for keeping the die cool while in use, said die being provided with a tube or passage for conducting the water to the aperture through which the valve-stem moves, substantially as described.

2. In a die for forming heads upon bolts and screws, the combination of a heading-cavity, the valve C, stop E, spring F, and water-induction pipe G, the parts being arranged to operate substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own invention I affix my signature in presence of two witnesses.

ROBERT GRACEY.

Witnesses:

SAML. H. GREGORY,
C. M. CONNELL.