(No Model.)

T. O'LEARY.

FORGING DIE.

No. 435,855. Patented Sept. 2, 1890.

Fig. 1.

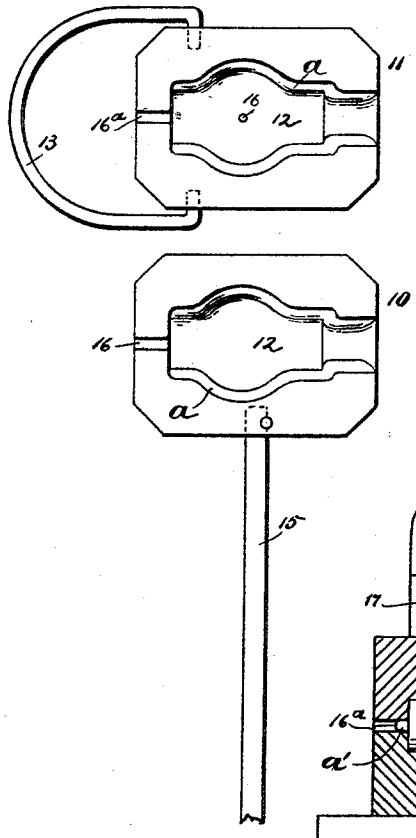


Fig. 2.

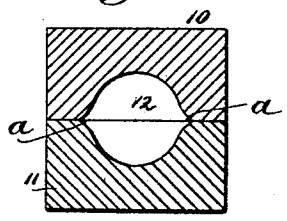


Fig. 3.

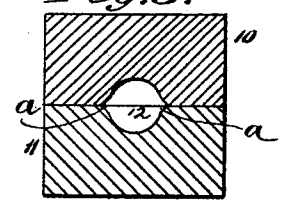


Fig. 4.

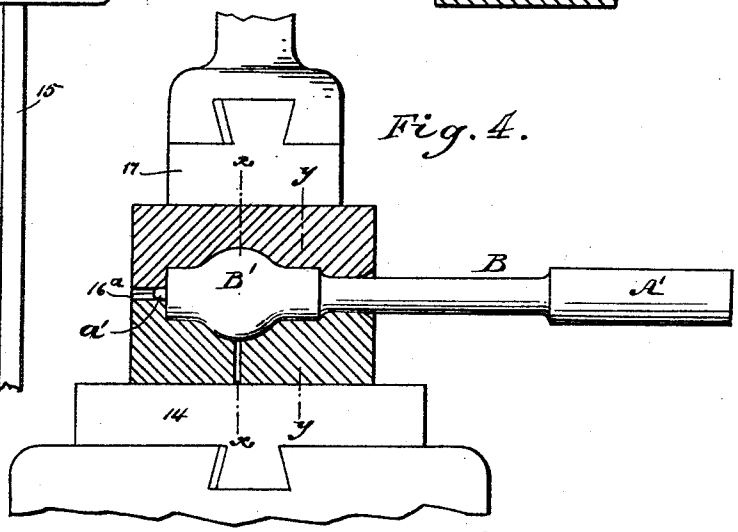


Fig. 5.

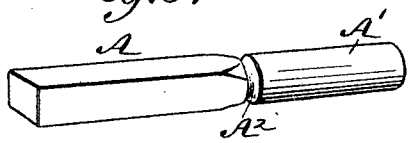


Fig. 6.

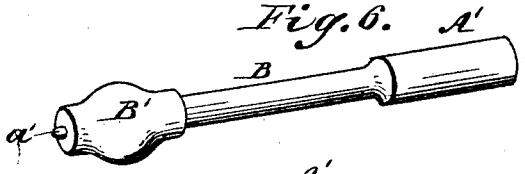
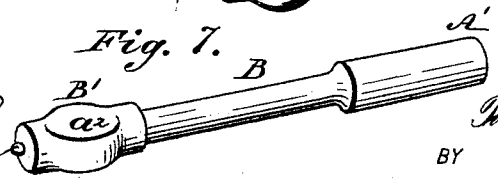


Fig. 7.



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TIMOTHY O'LEARY, OF NEW YORK, N. Y.

FORGING-DIE.

SPECIFICATION forming part of Letters Patent No. 435,855, dated September 2, 1890.

Application filed May 24, 1890. Serial No. 353,013. (No model.)

To all whom it may concern:

Be it known that I, TIMOTHY O'LEARY, of New York city, in the county and State of New York, have invented a new and useful Improvement in Forging-Dies, of which the following is a full, clear, and exact description.

My invention relates to an improvement in forging-dies, and has for its object to provide dies especially adapted for forging the heads of rock-drill pistons, and to so construct the dies that the rod may be shaped simultaneously with shaping the head.

A further object of the invention is to provide a process whereby the head and rod of a rock-drill piston may be expeditiously and accurately formed and finished in the forging, thus obviating the necessity of dressing the article to any great extent after leaving the dies, either by hand or by machine.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views

Figure 1 is a plan view of the top and bottom dies removed one from the other. Fig. 2 is a section through both of the dies when in position, the section being taken practically on line $x\ x$ of Fig. 4. Fig. 3 is a similar section taken practically on line $y\ y$ of Fig. 4. Fig. 4 is a longitudinal section through the dies, illustrating the piston-head in position therein, an anvil, and a hammer adapted to assist in the manipulation of the dies. Fig. 5 is a perspective view of a bar in condition to be placed between the dies. Fig. 6 is a perspective view of the piston when removed from the dies; and Fig. 7 is a similar view of the completed piston.

Two dies are employed—namely, an upper die 10 and a lower die 11. The exterior contour of the dies may be as fancy may dictate, and the opposed faces of each die have formed therein a cavity 12, corresponding in shape with the article to be forged. In this instance the shape is that of the head of a rock-drill piston. The lower die 11 is provided with a bail-handle 13, pivoted in one end thereof, to facilitate lifting the said die upon any suitable form of anvil 14. The upper die is also provided with a handle, but the said handle partakes of the nature of a bar 15, and the inner end of the bar is detachably yet firmly secured in any suitable or approved manner in one side surface of the die. The lower die, preferably at the central portion of the cavity therein, is further provided with a vent-aperture 16, and each of the dies at the closed end of the cavity has formed in its inner face a gutter or channel 16^a, adapted to register when one die is placed upon the other, the said gutters or channels being adapted for the escape of surplus metal.

The principal peculiarity of the die consists in the fact that the outer side edges of the cavities 12 therein are chamfered or beveled, as illustrated at a in Figs. 1 and 2. Thus when the two dies are brought together the central portion of the shaping-cavity of the completed die is of greater width than the width of the article to be forged therein.

In connection with the dies any approved form of hammer 17 is employed, the hammer preferred being a steam or drop hammer.

In the process of manufacturing a piston a bar of iron A of suitable length is turned off or otherwise rendered cylindrical, as illustrated at A′ in Fig. 5, which end represents the piston proper, and at the inner end of the piston A′ an annular channel or groove A^2 is produced in the bar. The remaining portion of the bar may be rectangular, polygonal, or of any desired shape. The end of the bar opposite that at which the piston is formed is heated in a proper manner and placed in the cavity of the lower die, which has previously been placed in position upon the anvil beneath the hammer, and the upper die is thereupon placed upon the lower die. The hammer is then manipulated to strike the contacting dies, as shown in Fig. 4, thus imparting to the inserted end of the bar somewhat of the desired shape. Between each stroke of the hammer the upper die is slightly lifted by means of its handle 15, and the position of the metal in the cavities of the dies is shifted by being slightly turned, and these movements are repeated throughout the process of

forging. The chamfered edges of the die-cavities admit of the metal spreading while in the die, and any thin surface formed thereby is pressed to shape into the body by a constant turning of the bar.

The rod B of the piston is formed by swaging, and this is accomplished by engaging the surface of the bar between the head portion B′ thereof and the piston A′ with a proper swaging-tool. The said tool performs two functions—namely, that of giving a circular form in cross-section to the rod of less diameter than the piston proper, and at the same time the tool serves to feed a necessary quantity of material to the dies for the proper formation of the head. When the head has been removed from the dies, it is completely finished, with the exception of a teat a', produced by the surplus metal finding an exit through the channel 16^a of the dies, and the rod B and head B′ are so finished that but very little, if any, after-dressing upon a lathe or by hand is required. Thus a piston for rock-drills or similar machines may be expeditiously, conveniently, and economically constructed.

The operation of forming the head is completed by placing the head upon one of its sides on the anvil or the upper die and striking it a blow with the hammer, thereby imparting thereto flattened opposed faces a^2, in which faces the ordinary form of eye is produced in the usual manner.

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

1. As an improved article of manufacture, a die having the sides of its shaping-cavity chamfered, as and for the purpose specified.

2. As an improved article of manufacture, an upper and a lower die, each provided with a shaping-cavity having beveled sides, the lower die being provided also with a vent-aperture and a pivoted handle, and the upper die with a fixed handle, as and for the purpose set forth.

3. The herein-described process of forming the heads of pistons, which consists in placing the end of a heated metal bar in the shaping-cavities of the dies, alternately striking the upper die and lifting said die, and turning the bar, substantially as shown, and for the purpose specified.

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