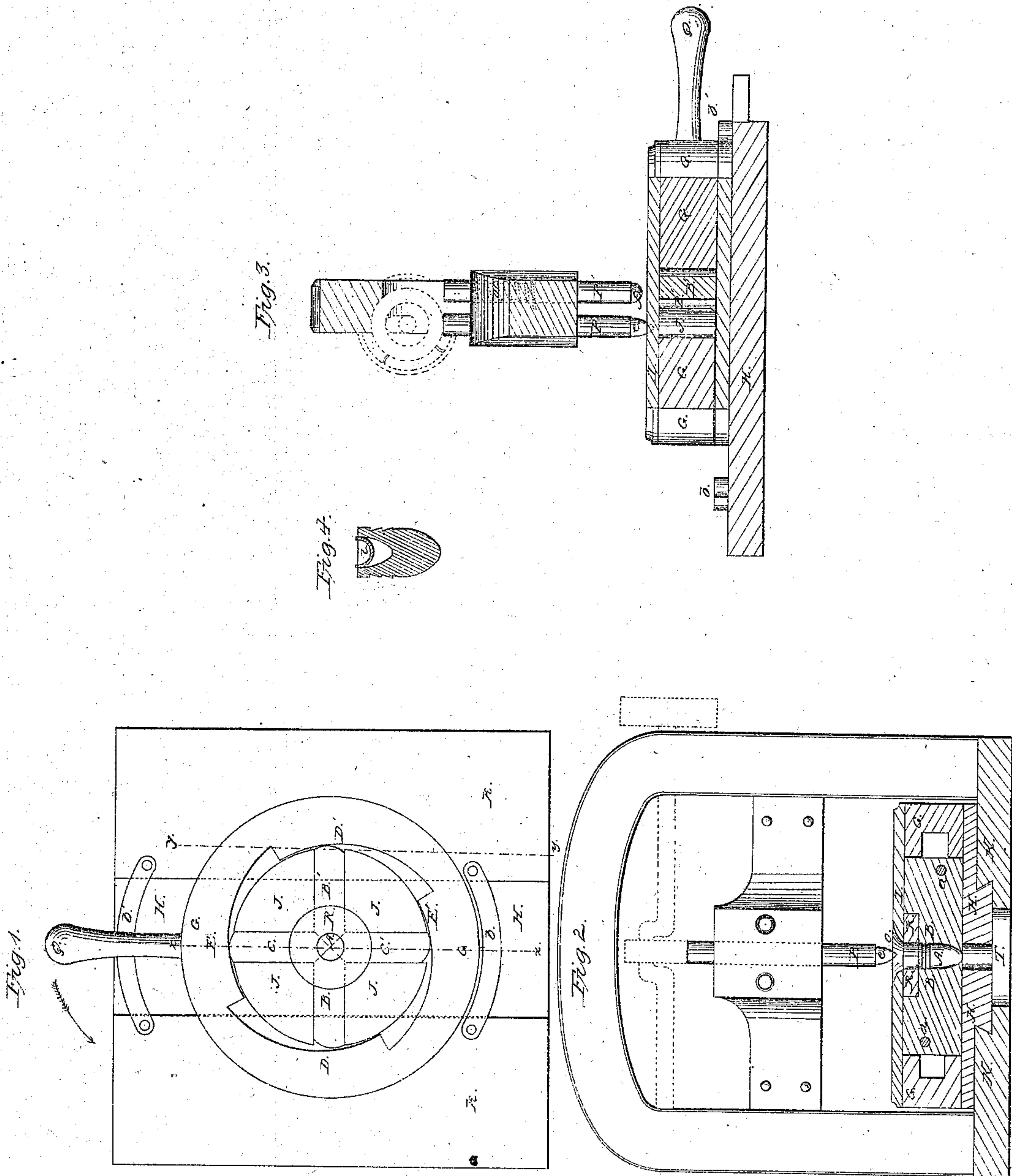


W. M. B. Hartley,

Making Hollow Shot,

N^o 12,574.

Patented Mar. 20, 1855.



UNITED STATES PATENT OFFICE.

W. M. B. HARTLEY, OF NEW YORK, N. Y.

PRESS FOR MAKING CYLINDROCONICAL HOLLOW PROJECTILES BY PRESSURE.

Specification of Letters Patent No. 12,574, dated March 20, 1855.

To all whom it may concern:

Be it known that I, WILLIAM M. B. HARTLEY, of the city and State of New York, have invented a new and useful Hollow-Ball Press; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, forming part of this specification, in which—

Figure 1 is a plan view of die and parts connected therewith: the cover I being removed to show sliding sections. Fig. 2 is a vertical section on line $x x$ of Fig. 1, showing formation of die and position of punches. Fig. 3 is a vertical section on line $y y$, Fig. 1. Fig. 4 is a longitudinal section through the axis of ball formed by this machine.

Similar characters of reference in the several figures denote the same part of the machine.

The object of my invention is the formation of hollow balls by pressing machinery so constructed and arranged as to effect great rapidity of manufacture, and insure uniformity in the caliber of the balls produced. Its nature consists in mounting the die and parts connected therewith upon a sliding carriage so adjusted relative to the forming and capping punches, that the ball may at will receive the action of either; and in so combining with the movable dies, a hardened steel collar, that the butt of the ball shall be formed therein for insuring uniformity of caliber to the balls and materially aiding their discharge from the machine; the details of construction and operation being as set forth in the following description and annexed drawing, in which—

A is the die for forming the exterior surface of the ball, made up of the edge of the collar R, and four sections B, B', C, C', said sections moved inward by the eccentrics D, D', E, E', on the rim G, and separated by the action of the springs a , when the pressure of the eccentrics is removed. The rim and slides rest on a carriage or bed H, and are held down by a perforated cover I. The collar constituting the upper portion of the die A is formed of hardened steel, and rests upon the guides J and beneath the cover I; the upper portions of the sliding sections B, B', C, C', being cut out to admit said collar, and at the same time capable of moving beneath it. The inner surface of this collar is smooth and true and is designed to form

the straight portion of the ball, its width being sufficient to insure the requisite strength. The movable portion of the die need not necessarily be formed of four sections, as two or any suitable number may be employed. On the sections are ridges C for grooving the balls as shown in Fig. 4, though this machine is of course applicable to the formation of smooth balls.

Above the die are arranged the punches P P', the former for giving the concavity and pressing the ball into the die, and the latter for capping and discharging the ball from the machine. The forming punch P is operated by an eccentric shaft or in any suitable manner, and the capping punch is driven down by a blow from a hammer or in any other way that will serve the end in view: springs maintaining these punches in an elevated position. As however the operation of moving these punches is not essential to this invention, the details need not be here dwelt upon; their position relative to the die being all that it is necessary to consider. The carriage or bed H, upon which the die and parts connected therewith rest, is movable upon the bed K between the stops b and b' , a sufficient distance to bring the opening o in the cover I alternately under the punches P and P'.

The operation of this machine is as follows: The solid ball is formed by press, or in any other manner, of a size to enter the die without difficulty; the smooth surface of the ball passing clear of the ridges c . The die being closed as shown in the drawing; the solid ball is inserted, the carriage H run to the stop b , and the punch P permitted to descend. The head e of this punch enters the ball, forming the cavity shown in Fig. 4, and spreading the ball so as to fill the die; the straight portion exactly filling the collar R. The punch P rises instantly, and the operator after moving the carriage H so that the rim G rests against the stop b' places the cap i (Fig. 4) on the butt of the ball and depresses the punch P', the head f of which drives the cap to its place. This punch flies up by reason of the spring m , when the operator turning the lever Q as shown by arrow 1, removes the pressure of the eccentrics from the die sections, permitting them to move back and leave the ball suspended in the collar R. The punch P is then made again to descend, and by striking the ball, frees it from the collar and causes it to drop

through the opening T in the bed K. The die is then closed by turning rim G, and the machine is ready for the reception of another ball.

5 The collar R by forming the butt, prevents the change which would take place in the caliber of the balls by the wear of the machine, if the butt were formed by the sectional die; as from the pressure and other
10 causes there would necessarily be a variable expansion of the parts from the wear of the machine, and thus render the caliber of the balls unequal. The capping of the ball while in the die also serves to preserve the equality
15 of the caliber, and also saves much labor in capping, as from the principle on which this ball acts it must be held firmly at its base while being capped. Besides gaging the caliber of the ball, the collar R aids very
20 materially in the discharge of the finished ball from the machine, as when the die is opened the sections separate from the ball and leave it suspended by the collar in the center of the die and in position to be readily
25 discharged by the downward stroke of the punch P', and thus insure a certain delivery, a result likely to be frustrated were the sectional dies used alone, for in most cases the ball would adhere to one of the sections
30 by reason of the grooves of the ball and

ridges of the die and fail to leave the die when opened.

I do not claim the manner of operating the die sections, but

What I do claim as new and of my own invention, is—

1. The collar R in combination with the sectional parts of the die, constructed, arranged, and operating, substantially as and for the purposes set forth. 40

2. I also claim the arrangement relative to the punches P P', of the die A, with a horizontal motion of sufficient amplitude to admit of the successive action of the punches, substantially as and for the purposes set forth. 45

3. I further claim capping the ball while in its die, and while held firmly at its base, by a punch, which punch on the opening of the sections, will by a subsequent or continuous motion discharge the ball, capped and ready for use. 50

In testimony whereof, I have hereunto signed by name before two subscribing witnesses.

W. M. B. HARTLEY.

Witnesses:

GEO. PATTEN,

JOHN L. SMITH.