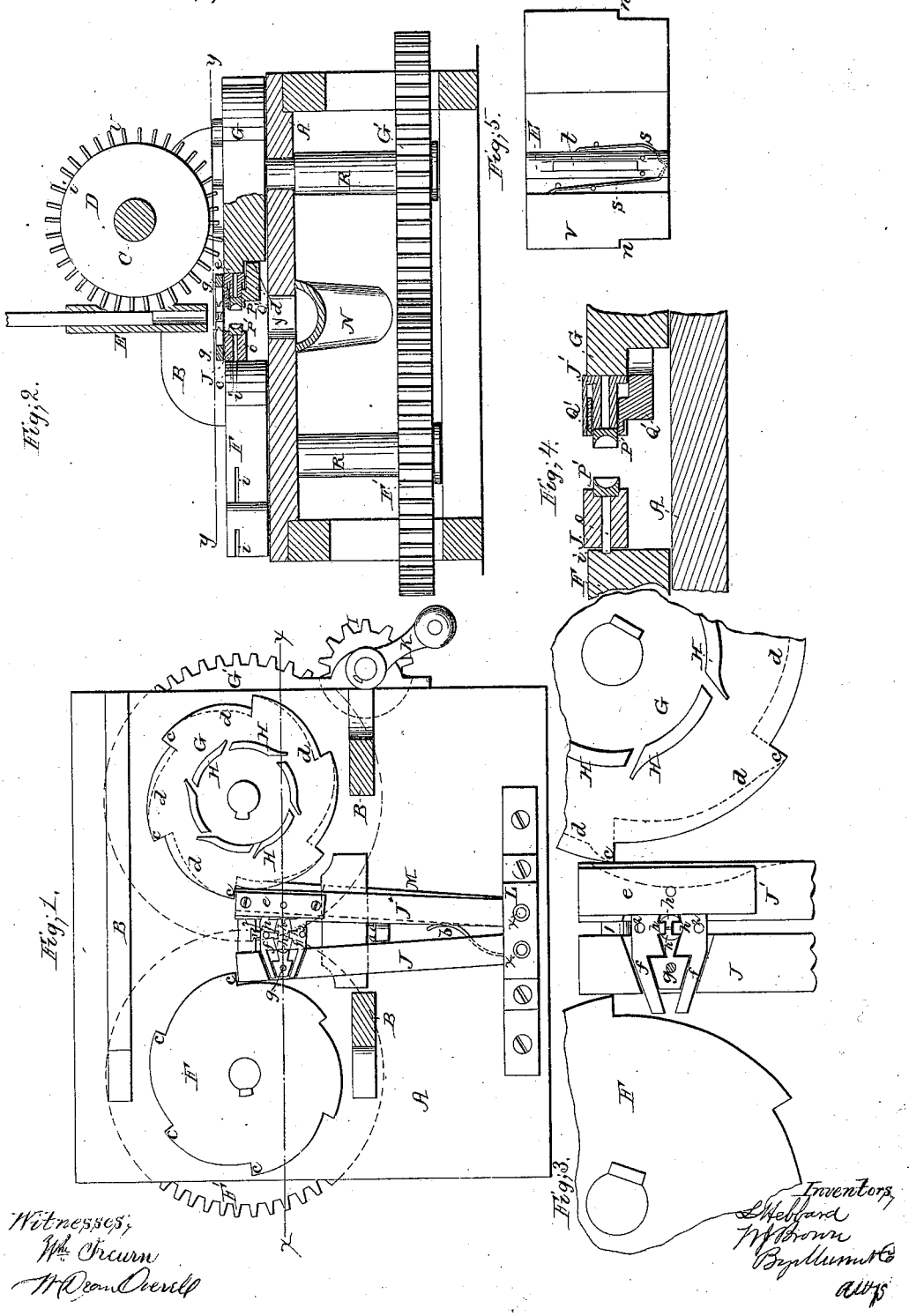
Hebard & Brown.

Bullet Machine.

No. 52,996. Patented Mar. 6, 1866.



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UNITED STATES PATENT OFFICE.

LEWIS HEBARD AND WILLIAM S. BROWN, OF LEXINGTON, CALIFORNIA.

MACHINE FOR MOLDING BULLETS.

Specification forming part of Letters Patent No. **52,996**, dated March 6, 1866; antedated March 2, 1866.

To all whom it may concern:

Be it known that we, LEWIS HEBARD and WILLIAM S. BROWN, of Lexington, in the county of Santa Clara and State of California, have invented a new and useful Improvement in Machines for Molding Bullets; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan of a machine made according to our invention, showing parts thereof in section cut along the line *y* of Fig. 2. Fig. 2 is an elevation of a vertical section taken on the line *x* of Fig. 1. Figs. 3, 4, and 5 are detailed views of several of the parts.

Similar letters of reference indicate like parts.

The object of this invention is to produce an automatic machine which shall feed the leaden rod from which bullets are to be made to the molding devices, separate a sufficient portion for a bullet, mold the portion cut off, and remove from the edges of the mold any metal that may protrude thereout.

A designates a frame and platform which sustain the operative parts of the machine. F and G are cam-wheels placed in horizontal positions on vertical shafts, upon whose lower ends are fixed gear-wheels F′ G′, which mesh with each other, and which are driven by a crank, K, and pinion-wheel I, or by any other convenient device. The cam-wheels have cams *c* formed on their periphery, six in number on each wheel in the present illustration. The face of each cam on the wheel F has a groove, *i*, which extends from the toes of the cams for the distance of about one-third of their respective faces. The object of these grooves is to receive the end of a pusher, O, which passes centrally through the half-mold P′. (See Fig. 4.)

B B are standards which rest on the platform of the machine and furnish bearings for the journals of the shaft C of the feeding-wheel D, and these standards also support a feed-board, V, whose shoulders *n n* rest on their upper edges. That face of the feed-board which is turned toward the feeding-wheel carries a tube, E, of a suitable size to receive the leaden rod or bar from which the bullets are to be cut, and the front of said tube is slotted, as at *t*, Fig. 5, to expose such bar to the contact of the teeth U′ of the feed-wheel. When a bar of lead is being fed through the tube its lower end is clasped by the ends of springs *s*, whose office is to produce enough friction on the leaden bar to prevent it from pressing with its whole weight on the molds and cutting devices of the machine, but not enough to prevent the descent of the bar when the molds and cutters are out of its way.

J J′ are shears, whose outer ends are pivoted to a cap, L. Their inner ends are extended between the cam-wheels and terminate just beyond a line which would pass through the axis of said wheels. Said inner ends are are provided with dies *f f*, which extend across both shears, and which are brought together and forced apart by means of wedges *g g*, one of which is fixed on each shear. The ends of the dies are held in place by caps *e*, the cap which belongs to the shear J having been removed in the views given in Figs. 1 and 3 in order to show the positions of the dies and one of the wedges. The shears are forced apart by the action of springs *a a*, placed between their shanks, and they are brought toward each other by the impact of the cams *c*. The shape of the wedges is illustrated in Figs. 1 and 3, the latter being an enlarged view. Its outline resembles two truncated cones, the vertex or top of the inner one, which is also the smaller, being joined to the base of the outer and larger. The inner edges of the dies are shaped so as to fit against the wedges. The wedges and dies are each fitted in depressions made in the faces of the shears, so as to be almost flush therewith, but the caps are not to fit so close as to bind the ends of the dies which lie across the shears. The recesses in the shears are also conical or wedge-shaped, (see Figs. 1 and 3,) their lines being parallel with the conical sides of the wedges. The inner end of each wedge has a sharp knife-edge, *h*, which are brought close together when the shears are forced toward each other, and each die has a like sharp knife-edge, *h*, projecting inward from the middle of the dies. When the dies are brought toward each other these knife-edges approach each other, and in concert with the knife-edges of the wedges they serve to cut off a piece of the leaden bar. These knives are just above the molds. The dies are forced toward each other when the

shears are brought together by reason of the shape of the grooves in which the ends of the dies travel, and they are also acted upon by springs 1, whose free ends enter into holes 2, made through the dies at the middle of their length. These springs rise from the platform of the bench, and only one of them is seen in the drawings. (See Figs. 1 and 3.)

The molds or punches are lettered P P′, and are severally fixed to the inner sides of the shears exactly opposite to each other. The mold P′ has a rod, *o*, passing centrally through it, one end of which extends through the outer side of the shear J, so as to come in contact with the faces *c* of the cam F. It is, moreover, in line with the grooves *i* in said faces. The other end of the rod forms part of the bottom of the punch or mold P′. When the molds close, that end of the rod which extends through the mold P′ is forced outward by the lead until its end is flush with the bottom of the mold. At this time the outer end of the rod is found in the groove *i* of that cam *c* which is in contact with the shear J, so that it is not acted on; but so soon as the cam has passed the shear, and the latter has been opened by its spring *a*, that part of the face of the cam which is not grooved acts on the rod to push it inward against the bullet in the mold P′, and thus release it, so that it may fall through the opening *y* into the trough N, which will guide it into a suitable receptacle. The other punch or mold may be fitted with a rod in like manner.

M is a lever working beneath the shear J′, and whose outer end is pivoted by the same pin, *x*, which holds the end of that shear. It is acted on by cams *d* on the cam-wheel G in the same way as described of the cams *c;* but the cams *d′* are more abrupt, so that they act on the lever M only at the time when the shears have been brought together. The free end of the lever carries a circular knife, Q′, which surrounds the mold P. When this knife is advanced it proceeds along the sides of the mold and cuts off the ridge of lead, if any, which protrudes from the joint made by the edges of the punches P P′, where any excess of lead will be forced out of the punches. By these means we produce a bullet which has no excrescence or ridge about it. The lever M is forced constantly outward against the cam by the spring *b*.

The feed-wheel D is rotated by means of pins U, which are set in lines parallel with the feeding-teeth U′, but which are longer than these, so as to become engaged in succession by the projecting teeth of cams H, laid on the upper side of the wheel G. The cams H are equal in number to the cams *c*, so that the feed takes place in connection with the other operations of the machine.

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

1. The cutting-dies *f f*, in combination with the cutters on the wedges *g g*, all constructed and operated substantially as shown, for the purpose of cutting off the lead above the place of the molds.

2. The combination of the shears J J′ with the cutting-dies *f* and wedges *g*, substantially as described.

3. The rod *o*, passing through the center of the mold P′ and operated by the cams *c*, as described, for the purpose of freeing the bullet from the mold.

4. In combination with the mold P′, the knife Q′, for cutting off the surplus lead from the edges of the molds, constructed and operated substantially as shown.

5. The mode substantially as herein described of feeding the lead to the molds—to wit, by means of the tube E, the feed-wheel D, with its pins U U′, and the cams H on the upper side of the cam-wheel G.

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