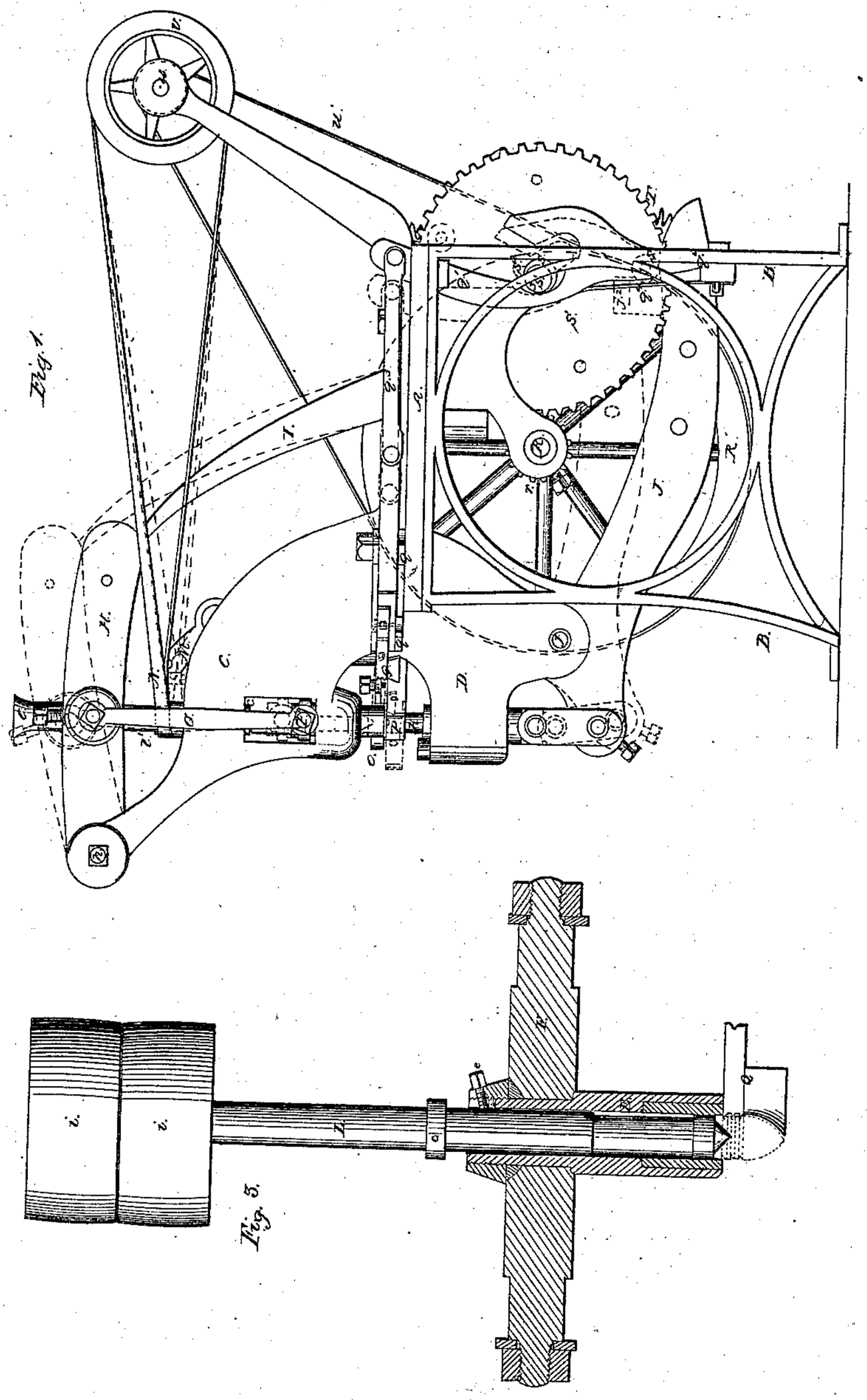
Sheet 1 - 2 Sheets.

R. Gornall,

Bullet Machine,

No. 32,232. Patented Apr. 30, 1861.



Witnesses:

Octavius Knight.

L. A. Bembé.

Inventor:

Richard Gornall

Per Munn & Co

Attorneys.

Sheet 2 - 2 Sheets.

R. Gornall,

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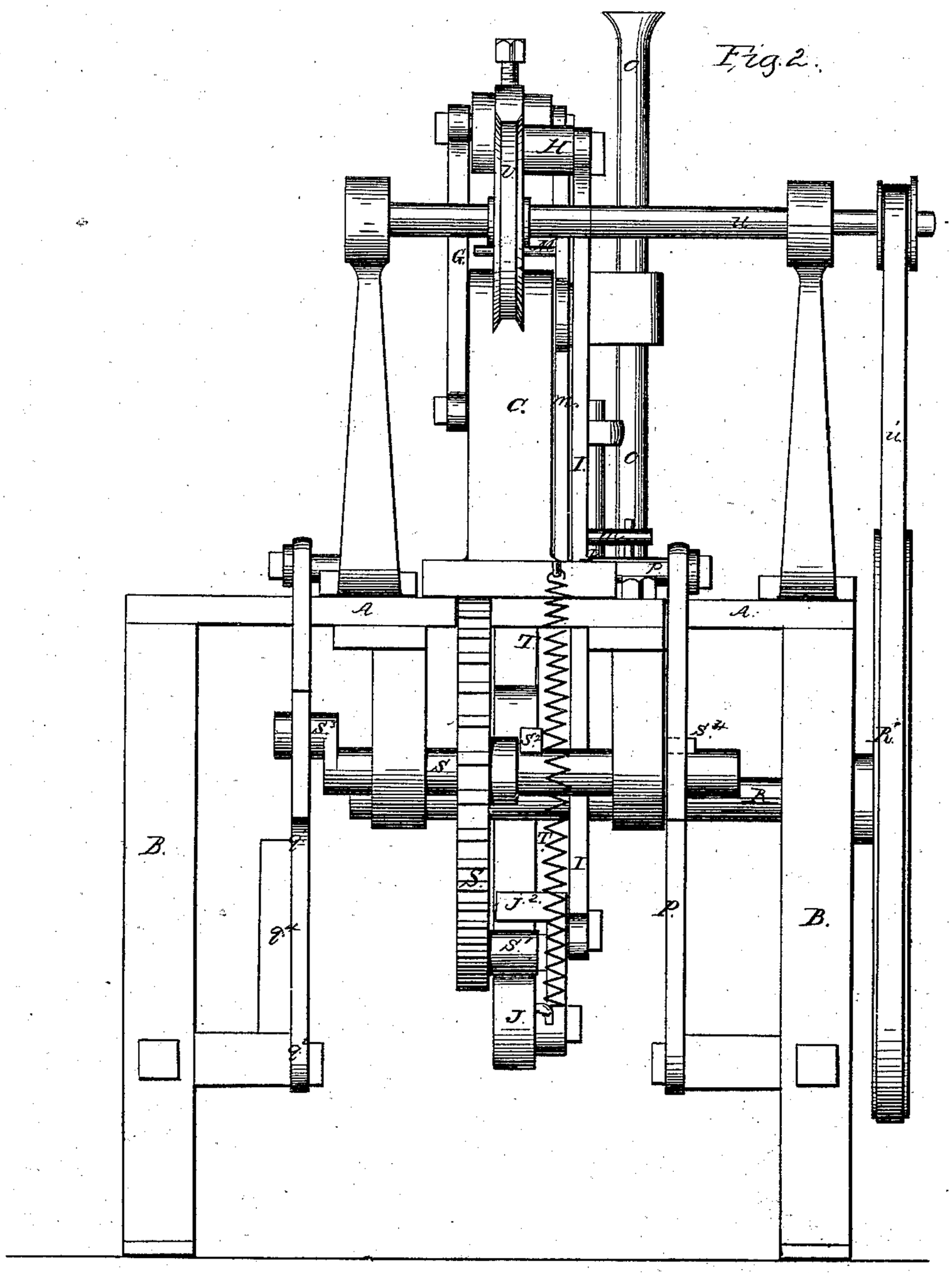
Fig. 2.



Witnesses:
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L. W. Bendré

Inventor:
Richard Gornall.
Per Munn & Co

UNITED STATES PATENT OFFICE.

RICHARD GORNALL, OF BALTIMORE, MARYLAND, ASSIGNOR TO HIMSELF AND WM. J. HOOPER, OF SAME PLACE.

MACHINE FOR MAKING BULLETS.

Specification of Letters Patent No. 32,232, dated April 30, 1861.

To all whom it may concern:

Be it known that I, RICHARD GORNALL, of Baltimore, State of Maryland, have invented a new and Improved Machine for Making Bullets; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, is a side elevation of the machine. Fig. 2, is a rear view of the same. Fig. 3, is an axial section of the matrix representing its full size.

Similar letters of reference indicate corresponding parts in the several figures.

The subject of my invention, consists, 1st, in a cylindrical undivided matrix adapted to first compress the bullet approximately into form, and then hold it to be turned. 2nd, in devices for imparting intermittent longitudinal and rotary motion to the said matrix to accomplish the objects above stated.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation, with reference to the drawings.

A, represents the bed of the machine supported upon standards B, B.

C, D, are knees extending above and below the bed and constituting sockets for the punches and matrix to work in as hereinafter explained.

E, is a cylindrical matrix journaled within a cross-head F, by which it is raised and lowered at proper times through the medium of the links G, lever H, and connecting rod I, attached to the rear end of a lever J. The levers H, and J, are fulcrumed at *h* and *j*, respectively.

K, is a punch working in a socket in the knee D, and connected with the front end of the lever J, so as to raise the said punch simultaneously with the depression of the matrix and vice versa. The said punch is provided at its upper end with a suitable cavity to form the conical front of the bullet.

L, is a core journaled in the knee C, concentrically within the matrix E, and held against longitudinal motion by a collar *c*, engaging beneath a shoulder in the knee. The said core is provided at its lower end with a conical projection to form the necessary cavity in the rear of the bullet. A screw *e*, projecting through the matrix into a longitudinal groove in the core affords to the former a longitudinal motion independently of the latter but compels them to rotate in unison.

l, *l'*, are respectively a fast and loose pulley upon the core L.

M, is an automatic shipper which at the proper period throws the belt N, onto the fast pulley *l*, in order to impart an intermittent rotation to the core and matrix.

O, is the feeding tube.

P, is a carrier adapted to receive the lower end of the bar of lead at the bottom of the feeding tube, separate a blank and carry it around beneath the matrix, into which it is forced by the ascent of the punch.

Q, is a cutter, sliding in ways *q*, and advanced at the proper period to form the exterior of the bullet.

R, is the main driving shaft carrying a pinion *r*, which gears with a cogged disk S, secured to a shaft *s*. The said disk carries near its periphery a roller *s'*, which serves to depress the rear end of the lever J.

T, is a spring serving to elevate the rear end of the said lever when released by the roller *s'*.

s^3, is an eccentric working in a yoke lever lug j^2, upon the lever J, to impart a further motion to the latter in order to expel the bullet, as hereinafter explained.

s^3, is an eccentric working i na yoke lever *q'*, pivoted at q^2, and operating through the medium of a connecting rod q^3, to forward the cutter Q, at the proper time. q^4, is a spring which retracts the said cutter when released by the eccentric s^3.

s^4, is a cam working in a yoke lever *p*, operating the carrier P, and shipper M, through the medium of a connecting rod *p'*, and lever *m*. The belt N, is driven by a pulley V, upon a shaft *u*, driven by means of a belt *u'*, from the band fly wheel R'.

The shaft *s*, being rotated by any suitable means and the tube O, supplied with bar lead, the end of the bar is received in a suitable socket in the carrier P, and the latter swinging around separates a blank, and carries it beneath the matrix E. The punch K, ascending at this moment forces the blank into the matrix, the cavity in the top operating to form approximately the conical front of the bullet, while the conical protuberance on the lower end of the core L, produces the cavity required in the rear.

The positions of the respective parts at this period are shown by black lines in Figs. 1 and 2. By the continued movement of the machine the matrix E, is elevated, partially forcing out the compressed blank which is supported above by the immovable core L, while the punch K, descends releasing the carrier P, which swings around to its former position to receive a new blank. At the same moment the belt N, is shipped upon the fast pulley *l*, which rotates the core and matrix and with them the pressed and partially exposed blank, while the cutter Q, advancing to contact with the said blank, imparts to its surface the desired finish, and the bullet is completed. The positions of the respective parts at this period are shown by red lines in Fig. 1, and the relative positions of the matrix, core, and cutter are exhibited in Fig. 3, the finished bullet being here represented in red. A further elevation of the lever J, by the action of the tappet s^2, beneath the lug j^2, withdraws the matrix completely from the bullet when the latter falls from the punch or is separated therefrom by any suitable means.

I prefer to contract the diameter of the matrix very slightly at its lower end in order more firmly to hold the bullet. The force with which the blank is compressed within the matrix causes it to be held with perfect security, for turning, by the small part of its heel shown within the matrix in Fig. 3.

Many important advantages will be manifest in the above described machine, over those in common use for making bullets of this description. It is very rapid in its operation and produces bullets of truer form and more perfect finish than is possible with the most careful and laborious manipulation, where hand trimming is required.

I have described the construction and arrangement of parts which I prefer for carrying out my invention, but do not desire to be understood as confining myself thereto. By a slight modification the bullet may evidently be expelled by a longitudinal motion of the core while the matrix remains stationary and the final shaping of the bullet may be effected by a suitable rotary cutter while the core and matrix are at rest.

What I claim as new and desire to secure by Letters Patent; is,

1. The solid matrix E, operating in connection with a suitable punch and core to first compress the bullet and then hold it as a chuck or mandrel to be turned, substantially as set forth.

2. The crosshead F, links G, lever H, and rotary core L, operating in connection with the matrix E, to impart an intermittent vertical and rotary motion thereto substantially in the manner explained.

The above specification of my improved machine for making bullets signed this 19th day of January 1861.

RICHARD GORNALL.

Witnesses:
OCTAVIUS KNIGHT,
LEW BENDRÉ.