3 Sheets—Sheet 1

J. D. CUSTER.

BULLET MACHINE.

No. 43,102. Patented June 14, 1864.

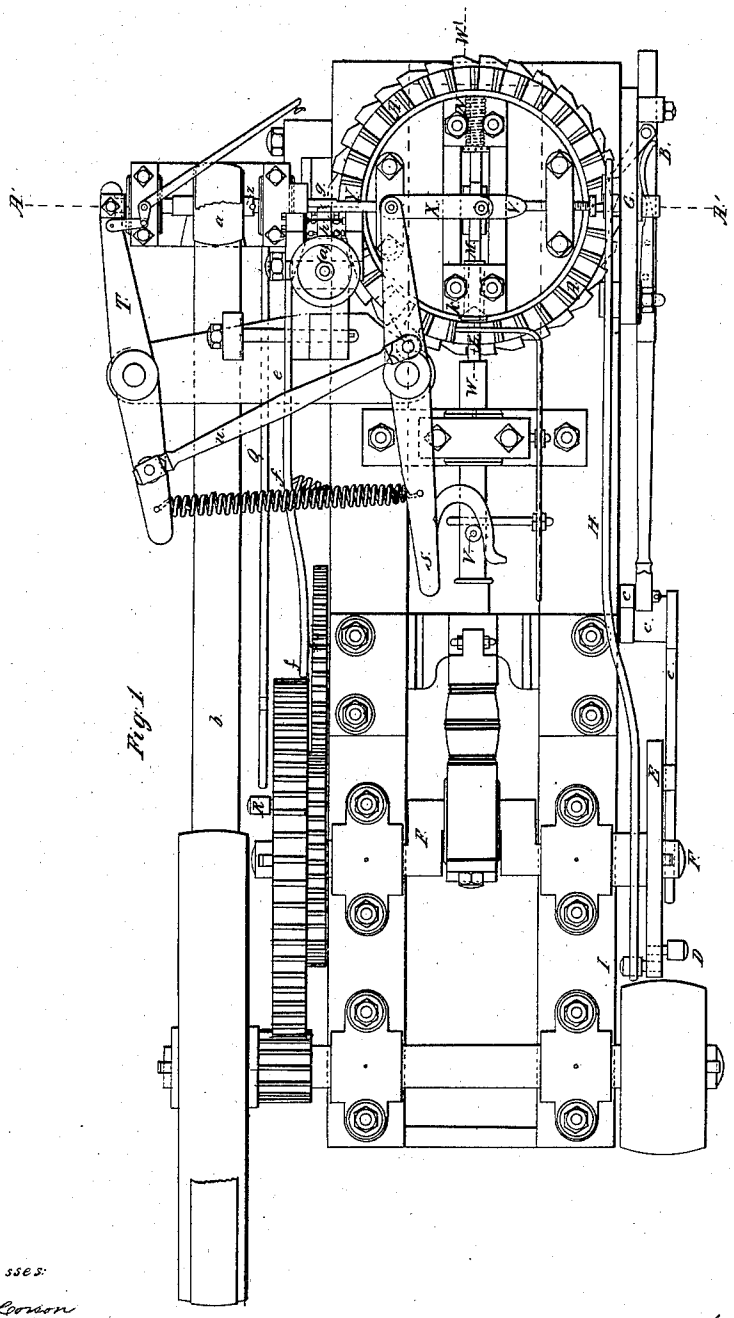


Fig. 1.

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3 Sheets—Sheet 2.

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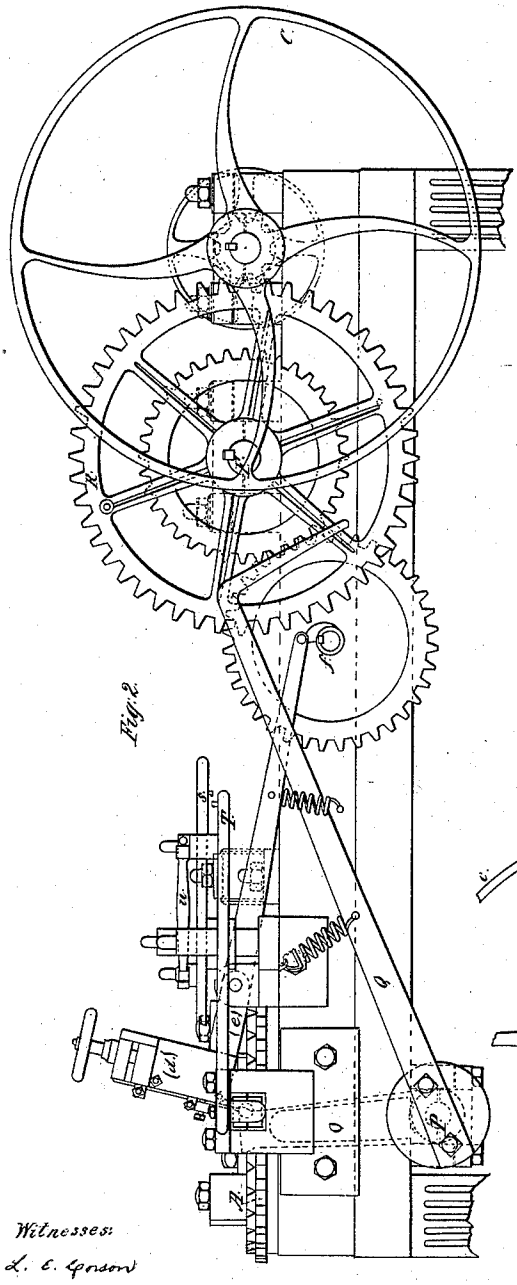


Fig. 2.

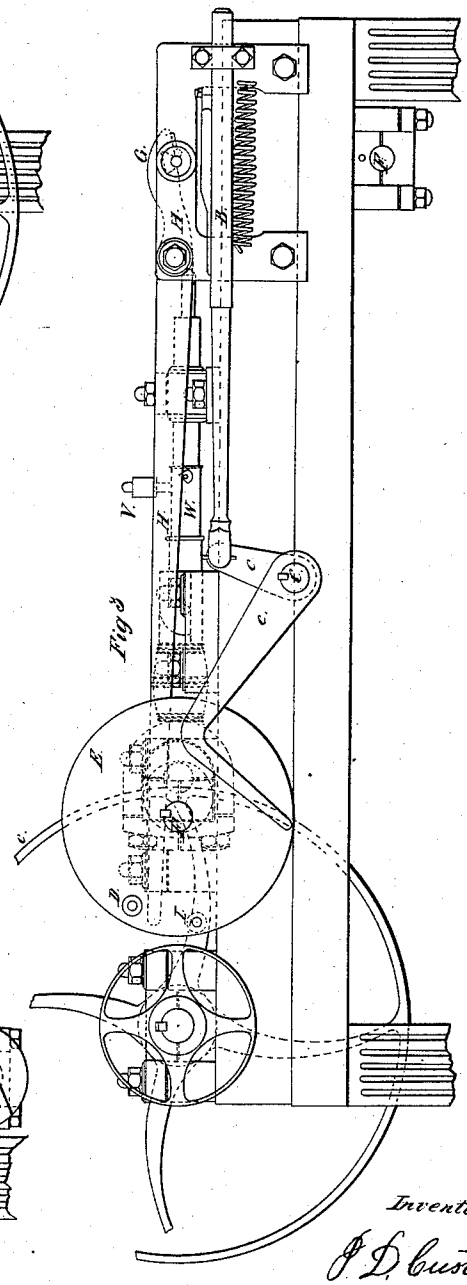


Fig. 3

Witnesses:
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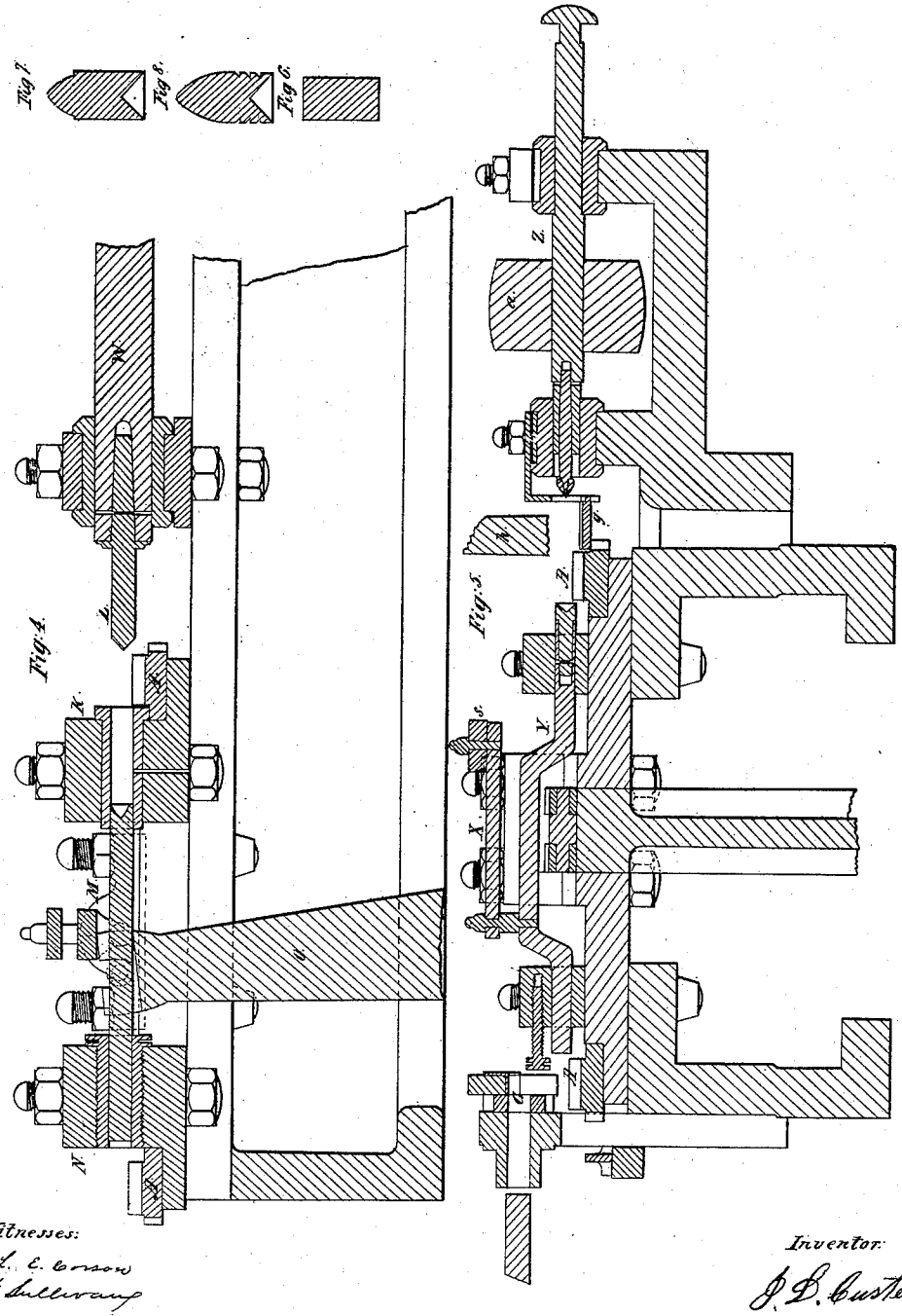
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3 Sheets—Sheet 3.

J. D. CUSTER.

BULLET MACHINE.

No. 43,102. Patented June 14, 1864.



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UNITED STATES PATENT OFFICE.

J. D. CUSTER, OF NORRISTOWN, PENNSYLVANIA.

IMPROVED BULLET-MACHINE.

Specification forming part of Letters Patent No. **43,102**, dated June 14, 1864.

To all whom it may concern:

Be it known that I, J. D. CUSTER, of Norristown, Pennsylvania, have invented certain new and useful Improvements in the Machine for Making Leaden Bullets; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan. Figs. 2 and 3 are side views. Fig. 4 is a section through W W′ of Fig. 1. Fig. 5 is a section through A′ A′ of Fig. 1. Fig. 6 is a representation of the blank. Fig. 7 is a representation of the pressed lead. Fig. 8 is a representation of the finished bullet.

The same letters indicate the same parts in all the figures.

My said invention relates to that class of bullet-machines which cut the lead in blank, press it to an approximate shape, and turn it to a finished bullet: and my improvement consists in the employment, in combination with improved tools for cutting, pressing, and turning, of a turn-table or other equivalent device for the purpose of transporting the lead from the place where the blank is first cut off to where it is pressed, and thence to where it is turned.

In the machines heretofore attempted these operations were performed in the same locality. The tools had to be brought in succession to the work. The cylinder for pressing was made in several pieces, whose joints left a fin upon the pressed lead, and the punch which pressed the hollow in the rear of the bullet afterward served as a mandrel to turn it upon, and necessarily came in contact with the cutter and dulled its edge.

In the accompanying drawings, A is a horizontal flat ring or turn-table, which derives an intermittent ratchet movement from a slide and ratchet, B, moved by levers and rock-shaft C C, which derive their motion by the long bent lever coming in contact with a pin, D, upon the wheel E upon the crank-shaft F. The return motion is caused by a spiral spring.

In the machine in operation the turn-table is in motion during about one-eighth of the revolution of the crank-shaft F, and while the cutting, pressing, and turning tools are not actually at work. During seven-eighths of the time the turn-table is stationary. Its upper surface is cut with radial grooves extending from the periphery toward the center, about one and a quarter inch long and the same distance apart. The ratchet is cut upon the exterior surface of the turn-table, whose intermittent ratchet motion is such that each groove is brought in succession to any given point.

The lead is introduced to the machine in the form of a wire, which is cut into blanks of the required length by a pair of shears at G. A set-crew determines the length of the blank, Fig. 6. The fixed cutter of the shears is formed by the inside lower edge of the hole in which the wire enters, and the movable cutter is upon the short end of a lever, H, which is moved by contact with a pin, I, upon the inside of the wheel E. The blank when cut off drops into one of the radial grooves of the turn-table A which is at rest with the groove directly under the shears. The next movement of the turn-table presents another empty groove, which is likewise filled, and so on. Meanwhile the turn-table bearing in its grooves the cut blanks carries them around about ninety degrees, where they arrive in succession at the pressing apparatus. This consists, first, of a stationary horizontal cylinder, K, situated within the circle of the turn-table, with its axis a little above the axis of a blank, lying in one of the grooves; secondly, of a punch or male piston, L, actuated by the main crank, F, by which it is driven into the cylinder K, Fig. 1, and withdrawn as in Fig. 4; third, of a die or female piston, M, which is never withdrawn from the cylinder, but during the pressing of the lead rests against a back screw, N, which may be set so as to determine the length of the cavity within the cylinder, between the ends of the two pistons. The female piston has an entering motion through the cylinder, and about a quarter of an inch beyond. This motion is derived from the vertical lever O upon the rock-shaft P, placed under the frame of the machine. The rock shaft P is moved by a lever, Q, acted upon by a pin, R, upon the spur-wheel on the crank-shaft F. The return motion of the female piston is effected by a spiral spring acting upon the lever Q.

When a blank upon the turn-table arrives exactly opposite the mouth of the cylinder K, the turn-table becomes stationary, the male piston L advances and drives the blank into

the cylinder, (whose other end is stopped by the female piston M,) and thus presses the lead into the approximate shape shown in section in Fig. 7. The continued motion of the crank withdraws the male piston out of the cylinder and back clear of the turn-table, as represented in Fig. 4. The female piston now advances in its turn and expels the pressed bullet from the cylinder and redeposits it upon the groove of the turn-table, whose movement now commences, and carries the bullet away toward the turning-lathe, presenting at its next stoppage another blank, to be pressed in the cylinder as before. The turning-lathe is so situated that a horizontal line passing through its centers is a little above the axis of a pressed bullet lying in a groove of the turn-table while at rest about ninety degrees from the pressing apparatus, and in the same diameter as the groove when the blank first falls from the shears. (See Fig. 5.) Both centers of the lathe have a longitudinal motion approaching each other, derived from a pair of combined levers, S and T, connected together by the rod U. The primary lever S is moved by the pin V upon the punch-rod W, and by means of the connecting link X gives motion to the dead-center of the lathe Y. The secondary lever T gives longitudinal motion to the revolving center Z of the lathe. The return motion of these levers is caused by a spiral spring. The revolving spindle or center Z carries a pulley, *a*, which is driven by a belt, *b*, from a first-motion wheel, *c*. The cutting-tool *h* is attached to a slide, *d*, upon one end of a lever, *e*, whose other end is acted upon by a cam, *f*, upon the wheel *f*. The turn-table, having become stationary, with one of its grooves bearing a pressed bullet between the lathe-centers, the punch-rod W advances, and the pin V (striking the horn of the lever S) causes the two lathe centers to advance toward each other. The dead-center attached to the lever S, having the greatest motion, thrusts the bullet endwise upon the bridge *g*, when the two centers catch it up between them and revolve it against the cutting-tool, which, by the cam movement, is caused to descend at the proper time. The turning being effected, the centers release the bullet, now finished to the desired shape, and it falls into a box placed under the machine.

I have thus described the construction and operation of a machine in actual use. It might be variously modified without departing from the principle of my invention.

A machine has been designed, (but is not in operation,) in which the lead wire enters vertically and is cut off by a horizontal-sliding shear. The blank falls down a conducting-chute and lodges in a notch in a vertical wheel, one motion of which brings it to the pressing apparatus and another takes it away to an inclined plane, which conducts it to the turning-lathe.

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination of the turn-table or transporting-wheel, or analogous device, with the shears, the cylinder and pistons, and the automatic lathe, for the purpose of making pressed and turned bullets, substantially as described.

J. D. CUSTER.

Witnesses:
L. E. CORSON,
F. SULLIVAN.