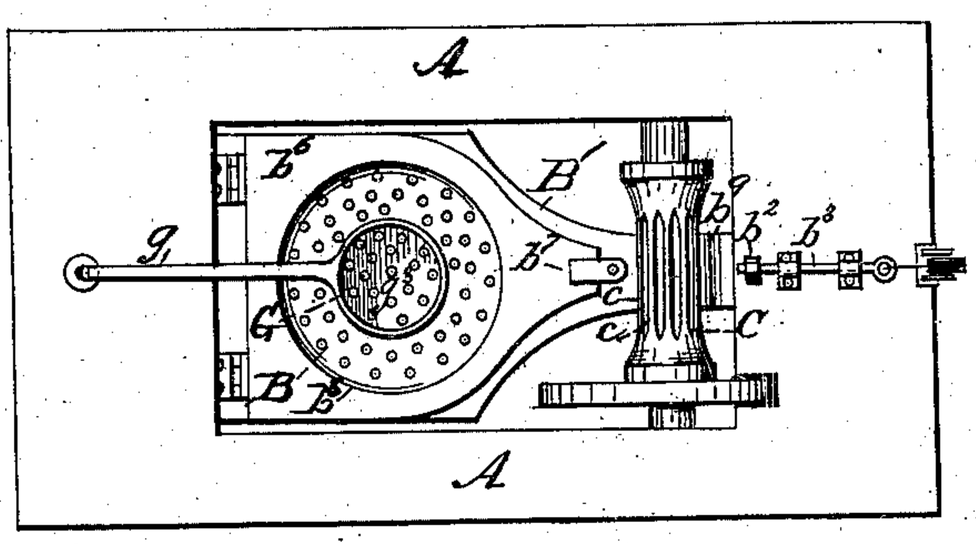
E. SHIVER.

SHOT-MACHINES.

No. 194,271. Patented Aug. 14, 1877.

FIG. 1.


A
B
B
B

UNITED STATES PATENT OFFICE.

ELISHA SHIVER, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO JOSEPH LOCKEY, OF SAME PLACE.

IMPROVEMENT IN SHOT-MACHINES.

Specification forming part of Letters Patent No. 194,271, dated August 14, 1877; application filed July 11, 1877.

To all whom it may concern:

Be it known that I, ELISHA SHIVER, of Washington, in the county of Washington and District of Columbia, have invented a new and useful Method of and Apparatus for Making Shot; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon.

This invention consists mainly, first, in the manufacture of shot, of an improved method of dividing lead into globules, consisting, essentially, in imparting to the suspended perforated card or sieve, upon which the melted lead is poured, a double vibration, for the purpose of throwing down the lead more perfectly and producing better results; second, in an improved method of dividing lead into globules, consisting, essentially, in continuously supplying sal-ammoniac and rosin to the molten lead upon a suspended card, and in imparting to said card a double vibration.

It consists, further, in the special mechanism employed to carry these methods practically into effect.

In the drawings, Figure 1 represents a plan view of the machine employed to carry my methods into effect, and Fig. 2 a vertical section of the same.

To enable others to understand my methods, and use the machine for carrying them into effect, I will now proceed to describe the same fully.

A represents the main frame of the machine, having the perforated card or sieve B horizontally suspended in the frame B′, near its top, by means of the spiral springs *b b* and b^1. The springs *b b* support the rear of the frame B′, and are fixed above to a frame, A, while the upper end of the spring b^1 (which supports the front end of the sieve-frame) passes through the frame A, and is bent at right angles to form the hook b^2, by which, in conjunction with the long tapered piece b^3, the front end of the sieve may be slightly raised or lowered, and consequently adjusted to the fluted roller C when the latter is in position. The sieve-frame B′ is provided with the large central opening b^4, diametrically across which run the rods or braces b^5, to prevent the sieve from sagging downward, when in place over the central opening, where it may be secured by the hinged cover or clamp b^6 and button b^7, said cover or clamp having a central opening, b^8, which corresponds and rests directly over the central opening b^4 in the sieve-frame. The front upper surface of the sieve-frame is provided with the transverse grooves b^9 b^9, into which mesh the projections *c c* of the fluted roller C, which has its bearings in the sides of the main frame A. Said roller is rotated by means of a belt, D, or gearing connecting it with the driving-shaft E. When the belt D is used, a pulley, *c′*, is formed on the shaft of the roller for its accommodation.

F is a vessel containing water or other cooling fluid, into which the drops of melted lead from the sieve fall, and which is placed on a support at a suitable distance perpendicularly below the sieve.

G is the distributer of the sal-ammoniac and rosin, or equivalent material. Said distributer is cup-shaped, and provided with a perforated bottom, g^3, and is suspended over the sieve by the flexible bent rod *g*, the lower end of which is bent at right angles to form a tappet, g^1, which tappet, being regularly struck by the teeth of a revolving wheel, g^2, imparts a horizontal vibratory motion to the distributer by means of the connecting-rod *g*.

The wheel g^2 may be one of a regular train, communicating motion to the fluted roller C, or its sole function may be to strike the tappet g^1.

It will be readily seen that two motions are communicated to the sieve-frame by the fluted roller—first, a horizontal reciprocating motion, caused by the engagement of the projections *c c* with the transverse grooves b^9 b^9, and, secondly, a vibration in a vertical plane, caused by the downward push of the projections *c c* upon the upper surface of the sieve-frame, which recovers its position after each such push by the action of the springs *b* and b^1.

It will also be seen that the bent upper end of the front spring b^1, in conjunction with the tapered piece b^2, renders the upper surface of the sieve-frame adjustable to the fluted roller.

The method here employed is substantially as follows: The machine having been set in motion, the sal-ammoniac and rosin, which are preferably used in the proportions of seven parts of sal-ammoniac to one part of rosin, will be continuously sifted upon the sieve-frame below. The molten lead then having been started, it may also be continuously delivered to the sieve, the latter receiving a double movement—that is, a vertical and horizontal vibration. The lead is caused to fall from the same in drops into the water-receptacle below, through which a continuous stream of water may flow, if desired.

By means of the continuous flow of sal-ammoniac the same is supplied to the sieve in regular quantities. By means of the double movement given to the sieve the lead is more perfectly acted upon, and better results thus produced.

The operation of the machine is substantially as follows: The motion being communicated to the fluted roller in any suitable manner, from any proper source of power, the latter will be caused to revolve and actuate the sieve-frame, this consequently receiving a vertical and horizontal vibration. The extent of this vibration may be varied by properly adjusting the tapered piece b^3.

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

1. In a machine for manufacturing shot, the combination, with a suitable driving mechanism, of the fluted roller C, sieve-frame B′, provided with transverse grooves b^9 b^9, sieve B, and spiral springs b and b^1, all constructed and arranged substantially as shown and described, for the purpose specified.

2. In a machine for manufacturing shot, the combination, with a suitable driving mechanism, of the fluted roller C, sieve-frame B′, provided with transverse grooves b^9 b^9, sieve B, spiral springs b b^1, and vibrating flux-distributer G, all constructed and arranged substantially as shown and described, for the purpose specified.

3. In a machine for manufacturing shot, the combination, with the roller C, provided with longitudinal projection c c, sieve-frame B′, provided with transverse grooves b^9 b^9, and spiral springs b, of the spiral spring b^1, hook b^2, and tapered piece b^3, all constructed and arranged substantially as shown and described, for the purpose specified.

4. In combination with the sieve-frame, means for giving the frame a vibratory movement, and means for determining the extent of the vibration, substantially as described.

5. The combination of the sieve to throw down drops of molten lead and a flux-distributer adapted to deliver continuously the flux upon the sieve.

6. In combination with the sieve, mechanism for giving the same a vertical and horizontal vibration, substantially as described.

7. In the manufacture of shot, the described method of dividing lead into globules, consisting, essentially, in pouring the molten lead on a perforated suspended card, and imparting to the suspended card a double vibration, substantially as described.

8. In the manufacture of shot, the described method of dividing lead into globules, consisting, essentially, first, in supplying a perforated suspended card with sal-ammoniac and rosin; second, in pouring upon the suspended card the molten lead; and, third, in imparting to the same a double vibration, substantially as described.

This specification signed and witnessed this 6th day of June, 1877.

ELISHA SHIVER.

Witnesses:

JNO. FULLWOOD,

A. L. MILLER.