

No. 638,731.

Patented Dec. 12, 1899.

R. MACRAE.

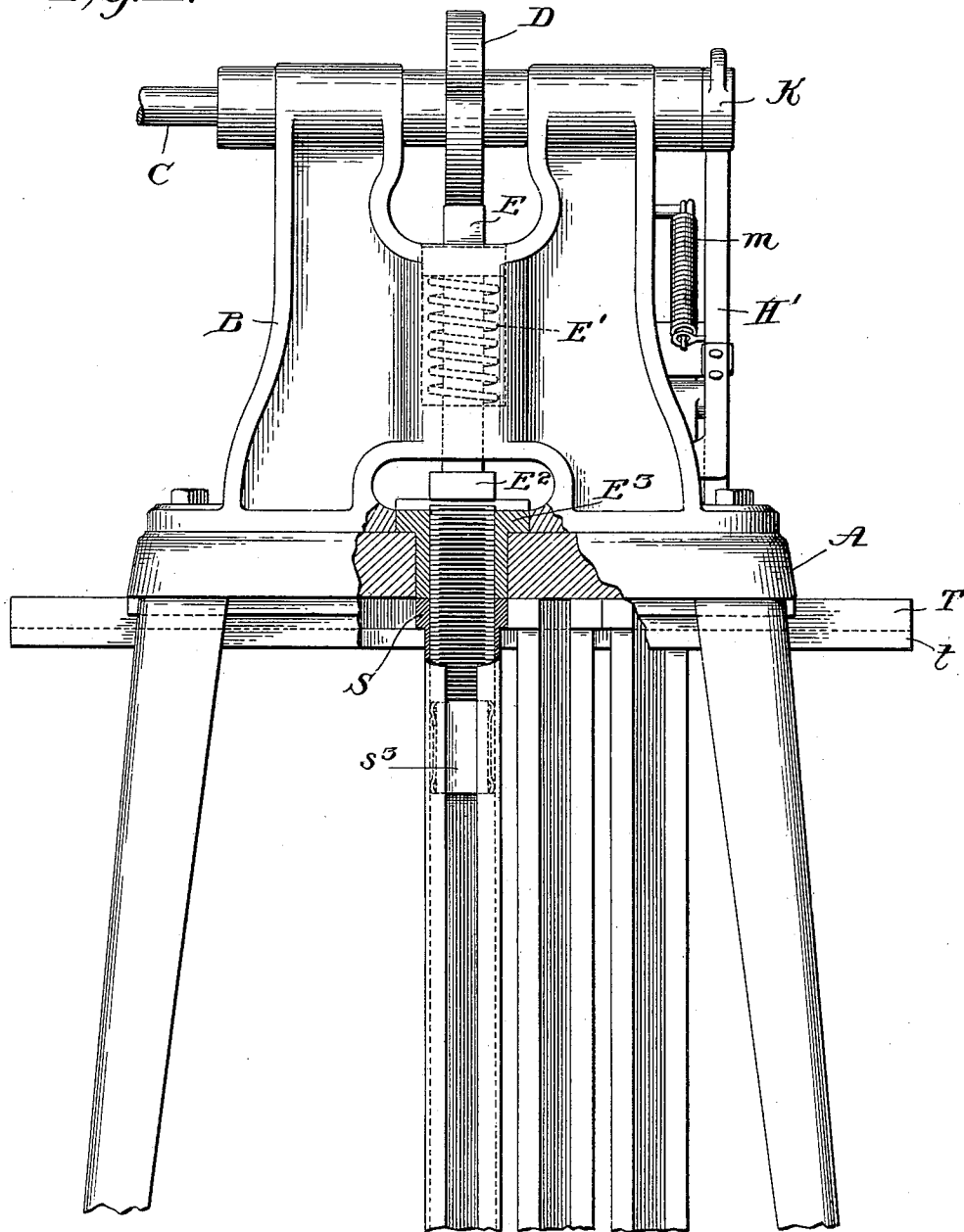
DEVICE FOR AUTOMATICALLY SHAPING, DELIVERING, AND STACKING BATTERY PLATES.

(Application filed May 4, 1899.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



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Fig. 2.

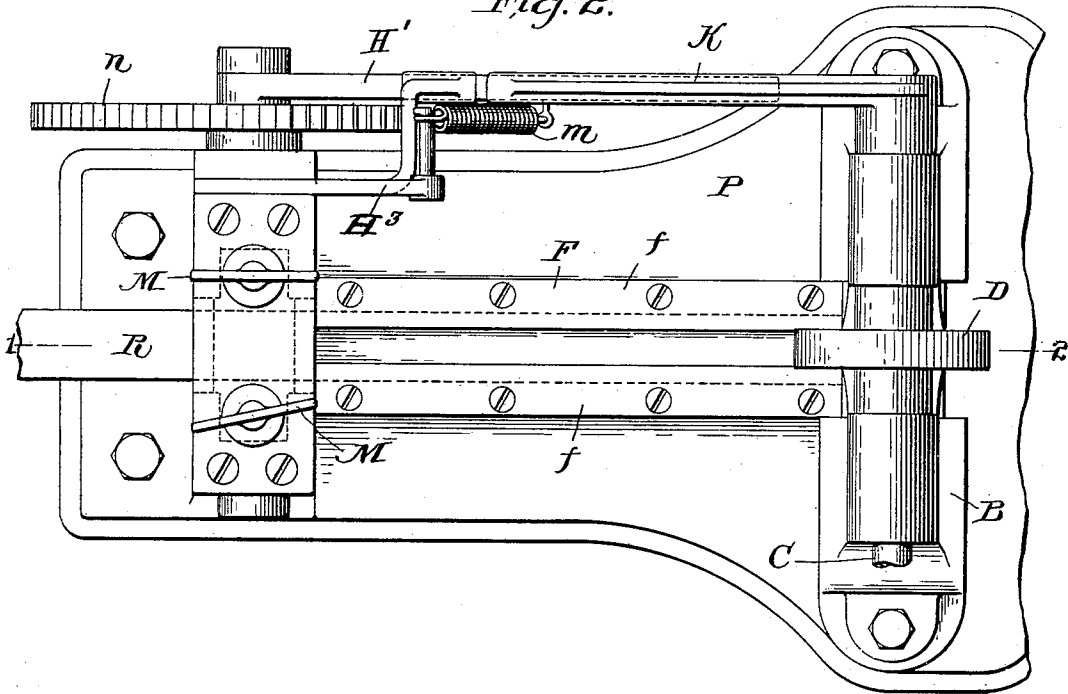
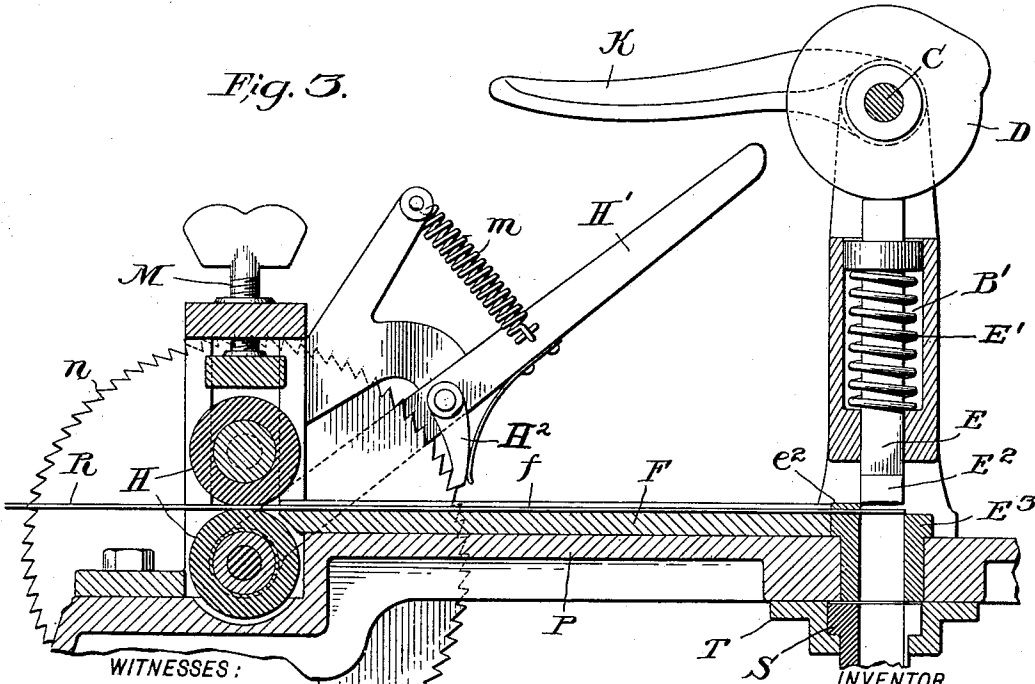


Fig. 3.



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3 Sheets—Sheet 3.

Fig. 5.

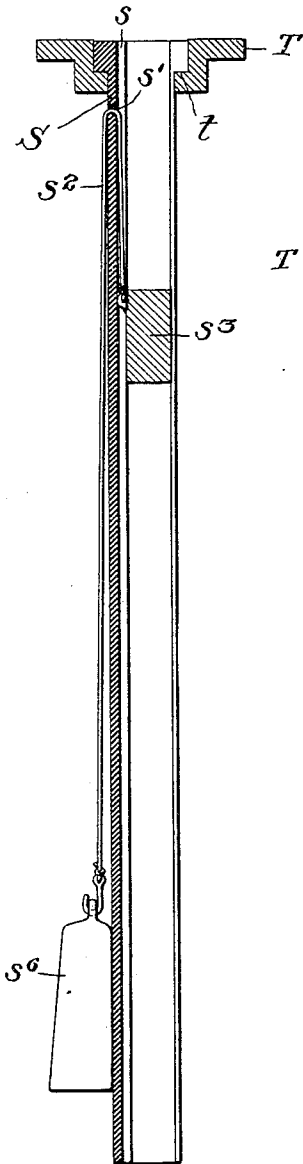


Fig. 4.

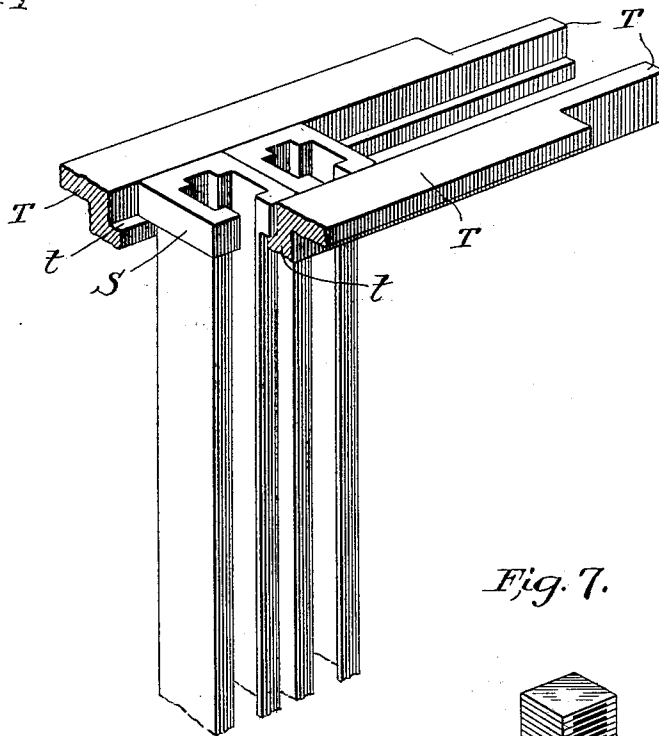


Fig. 7.

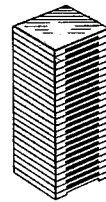
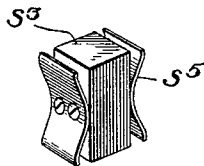


Fig. 6.



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# UNITED STATES PATENT OFFICE.

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TO WILLIAM C. L. EGLIN, OF PHILADELPHIA, PENNSYLVANIA.

DEVICE FOR AUTOMATICALLY SHAPING, DELIVERING, AND STACKING BATTERY-PLATES.

SPECIFICATION forming part of Letters Patent No. 638,731, dated December 12, 1899.

Application filed May 4, 1899. Serial No. 715,629. (No model.)

*To all whom it may concern:*

Be it known that I, RODERICK MACRAE, a subject of the Queen of Great Britain and Ireland, residing at Baltimore, State of Maryland, have invented certain new and useful Improvements in Devices for Automatically Shaping, Delivering, and Stacking Battery-Plates, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to mechanism for automatically feeding lead ribbon and shaping, delivering, and stacking small metallic battery-plates made therefrom for the more convenient, economical, and uniform construction of battery-electrodes formed from a stack or pile of such plates; and my invention consists of the novel mechanical features in a concrete machine, as hereinafter described.

In the drawings, Figure 1 is a front elevation, partly broken away; Fig. 2, a plan view; Fig. 3, a section on the line 1 2 of Fig. 2; Fig. 4, a perspective of the stacking device; Fig. 5, a vertical sectional view of the stacking-spout; Fig. 6, the spring-plug, which is part of same; and Fig. 7 a perspective of a stack of the shaped, stacked, and delivered battery-plates.

The material fed to the take-in rolls of the machine is in the form of lead ribbon, which may be a flat strip, as usual, and turned over or flanged at its edges by the guiding-channel of the machine, or it may be previously so flanged or rolled with thickened parallel edges. The resultant product of the machine, which automatically feeds and guides the lead ribbon and shapes, delivers, and stacks the plates made therefrom, is represented in Fig. 7 of the drawings, from which resultant product the finished electrode described in either of my pending applications, Serial Nos. 712,270 and 714,280, may be made as therein described.

In order to enable others to understand my invention, I will describe it by reference to the drawings.

On a suitable stand or frame (indicated at A) is mounted a housing B, in which is journaled a driving-shaft C, carrying a cam-wheel

D, the latter being arranged to depress the plunger E, which is reciprocated vertically in a suitable recess B' in the frame B. It is provided with a retracting-spring E' to cause its return to a normal position after each downward stroke, and it is provided on its lower end with a cutting or shaping block E<sup>2</sup>, which corresponds in rectangular shape to the lead plate to be cut from the ribbon and corresponds also with the rectangular delivery-throat E<sup>3</sup> (see Fig. 3) of the machine, said throat being slightly elevated on its inner side to form a cutting-surface in connection with the descending cutting-block E<sup>2</sup> on the end of the plunger E.

On the bed-plate P of the machine and at right angles with the delivery-throat E<sup>3</sup> is mounted a guiding-channel F, formed by edge plates *ff*, screwed to the base-plate and so arranged relatively thereto as to provide a channel, (indicated by the dotted lines, Fig. 2,) and at the rear of this guiding-channel and suitably disposed relatively thereto is a pair of take-in rolls H H. These are actuated by a step-by-step motion imparted to them by means of an arm H', mounted on the journal-shaft of one of them. The arm H' is provided with a spring-pressed pawl H<sup>2</sup>, which pawl engages a ratchet-wheel *n*, rigidly connected with the shaft upon which the arm H' is mounted, and it will thus be seen that by reason of the pawl connection described the take-in rolls are rotated a limited degree at each depression of said arm H'. To provide, however, for the return of the arm H' to its normal position, a retractile spring *m* has one of its ends connected to said arm H', while its other end is attached to a rigid arm H<sup>3</sup>, carried by the machine-frame adjacent to the take-in rolls, and said arm H' is adapted to abut against the arm H<sup>3</sup> when returning to its normal position, and thereby be limited in such movement. Adjusting devices for the upper roll are supplied by the thumb-screws M.

On the main driving-shaft C is mounted an arm K, which contacts with and depresses the arm H' at each rotation of said shaft C, thereby actuating the take-in rolls, and such contact of the arms K and H' is so timed that the

take-in rolls feed forward the lead ribbon after the plunger E has moved upwardly and the cutting-block E<sup>2</sup> has cleared the mouth of the delivery-throat E<sup>3</sup>.

5 The receiving and stacking device is shown in Figs. 4, 5, and 6, Sheet 3. It consists of a suitable frame T with an inset-ledge *tt* on either side, said frame being secured to the under side of the bed-plate of the machine and forming thereby a grooved and slotted  
10 frame, in which a series of receiving and stacking spouts S may be slid thereon and brought one by one into register with the discharge end of the delivery-throat E<sup>3</sup> of the machine.  
15 These spouts S conform interiorly to the shape of the battery-plate shaped and cut from the lead ribbon by the shaping and cutting devices of the machine. The arrangement thereof in the sliding frame is shown in perspective in Fig. 4, which clearly indicates their character and mode of operation to bring them into register with the delivery-throat E<sup>3</sup>, as aforesaid. In Fig. 5, which is a vertical section of one of said stacking-spouts, s<sup>3</sup> is a  
25 spring-controlled friction-plug, which in normal position is at the top of the spout. It is shown separately in Fig. 6; but obviously other kinds of friction-plugs may be employed. As the plug descends in the spout by the  
30 weight of the lead plates delivered thereto such weight may overcome the friction, and to guard against that I counterbalance it by making a groove *s* in the spout, in which a cord may lie, its one end fastened to the spring-plug and its other end passing through a hole  
35 *s'* in the spout and attached on the outside to a weight s<sup>6</sup>.

It is obvious that the machine may be provided with a power wheel and belt and be operated thereby.

The operation of the device is as follows: The lead ribbon (indicated at R, Figs. 2 and 3) is fed to the take-in rolls H H, the step-by-step motion of which delivers it into the channel F, and thence to and over the mouth of the delivery-throat E<sup>3</sup> beneath the cutting-block E<sup>2</sup> on the end of the plunger E, the length of lead ribbon delivered being equal to the width of the plate to be cut therefrom.  
50 The plunger E is caused to descend by the action of the cam D on the same shaft C, whose rotation actuates indirectly, as described, the step-by-step motion of the take-in rolls. The lead plate thus cut is forced by the plunger cutting-block into the delivery-throat E<sup>3</sup>, and thence to the receiving and stacking spout S, and as each of the spouts is filled they are slid along in the slide-frame T and the next one filled, so that the plates  
60 as discharged from the spouts consist of a stack of cut, shaped, and uniformly-piled plates, as shown in Fig. 7, which represents the ultimate product of the machine.

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

1. In a machine for automatically feeding in and guiding lead ribbon, shaping and cutting a series of uniform plates therefrom, and discharging the same to suitable receiving devices, by one continuous operation, the combination with the main driving-shaft and frame of the machine, of a pair of take-in rolls, mechanism to actuate said rolls by a step-by-step motion consisting of a ratchet-wheel and a spring-controlled actuating-arm, both mounted on the shaft of one of said take-in rolls, a guiding-channel for the lead ribbon, a spring-retracted plunger, actuating devices between the plunger-shaft and the spring-controlled arm of the take-in rolls operating to intermittently depress said spring-controlled arm in unison of time with the reciprocation of the plunger, and a throat-piece having an elevated inner edge formed with a transverse slot in line with said guiding-channel and arranged and operating relatively to the cutting-face of the reciprocating plunger to cut, receive and discharge said plates; substantially as described.

2. In a machine for automatically feeding and guiding lead ribbon, and cutting, delivering and stacking a series of plates made therefrom, the combination with mechanisms operating to take in and feed forward the ribbon and guide the same to the cutting devices, of means operating in unison of time therewith to cut the ribbon and form it into plates and simultaneously therewith to stack and discharge a uniform pile of such plates, and with mechanism operating to take in, receive and hold such plates to form piles stacked against counteracting frictional resistance; substantially as described.

3. In combination with mechanisms constituting a machine for automatically feeding lead ribbon and shaping or cutting a series of uniform plates therefrom and delivering the same in a stack, by a continuous operation, means for receiving such piles or stacks under frictional resistance, consisting of a slide-frame, and one or more stacking-spouts mounted thereon and adapted to slide in the same and be brought thereby into register with the delivery devices of the machine, said stacking-spout having a plug moving therein under frictional resistance; substantially as described.

In testimony whereof I have hereunto affixed my signature this 22d day of April, A. D. 1899.

RODERICK MACRAE.

Witnesses:

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