No. 641,546. Patented Jan. 16. 1900.

C. T. RICHMOND & M. M. ZELLERS.

BATTERY FILLER.

(Application filed Sept. 5, 1899.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

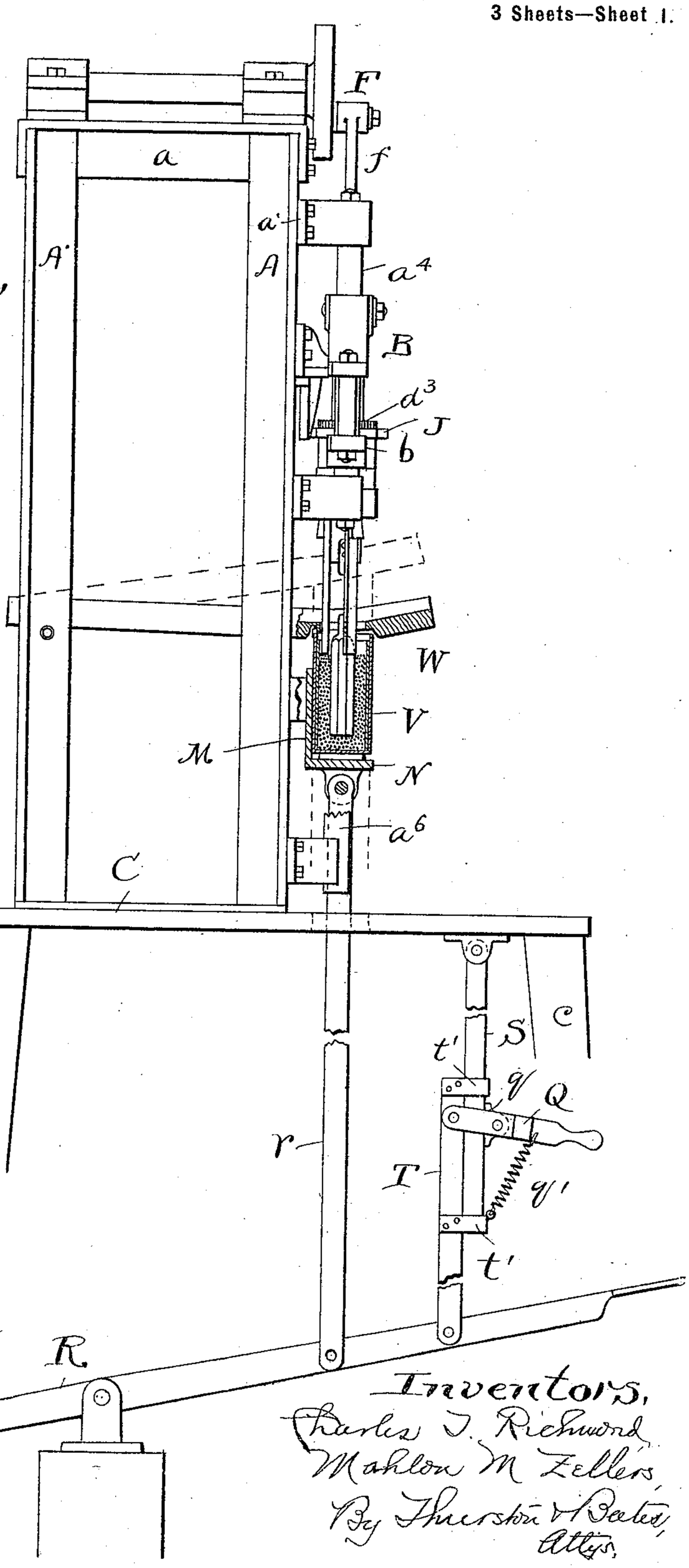

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Fig. 2.

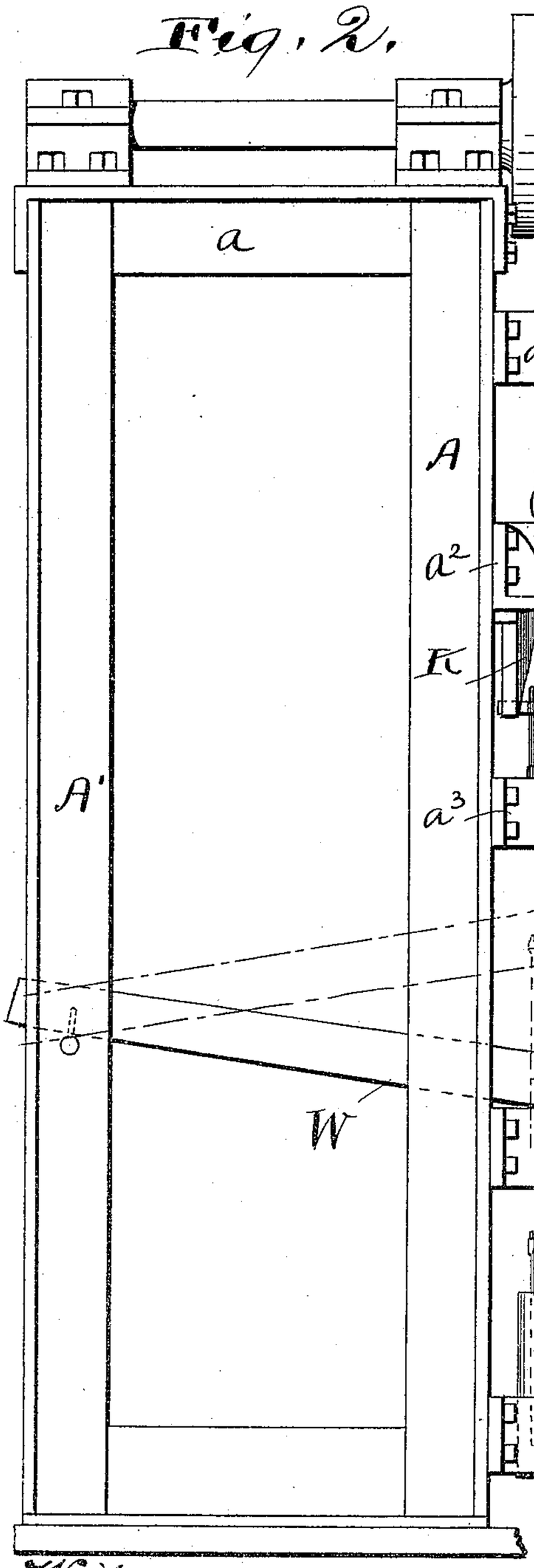

Fig. 3.

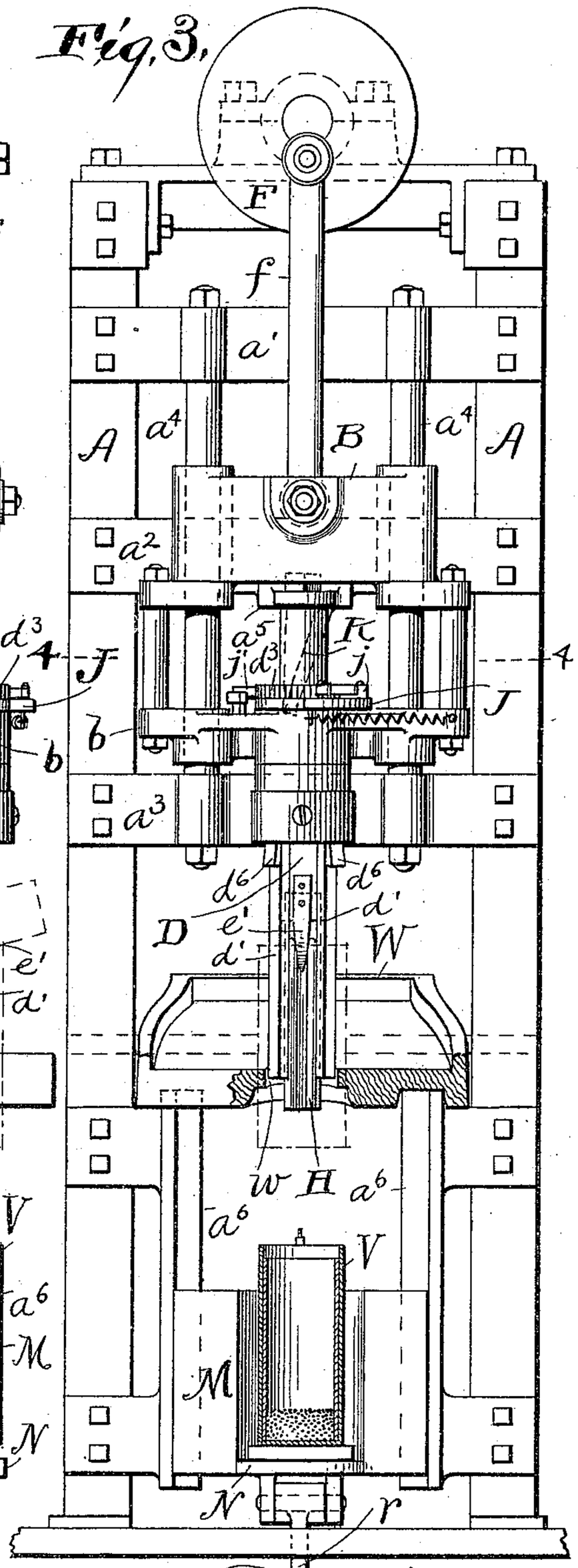

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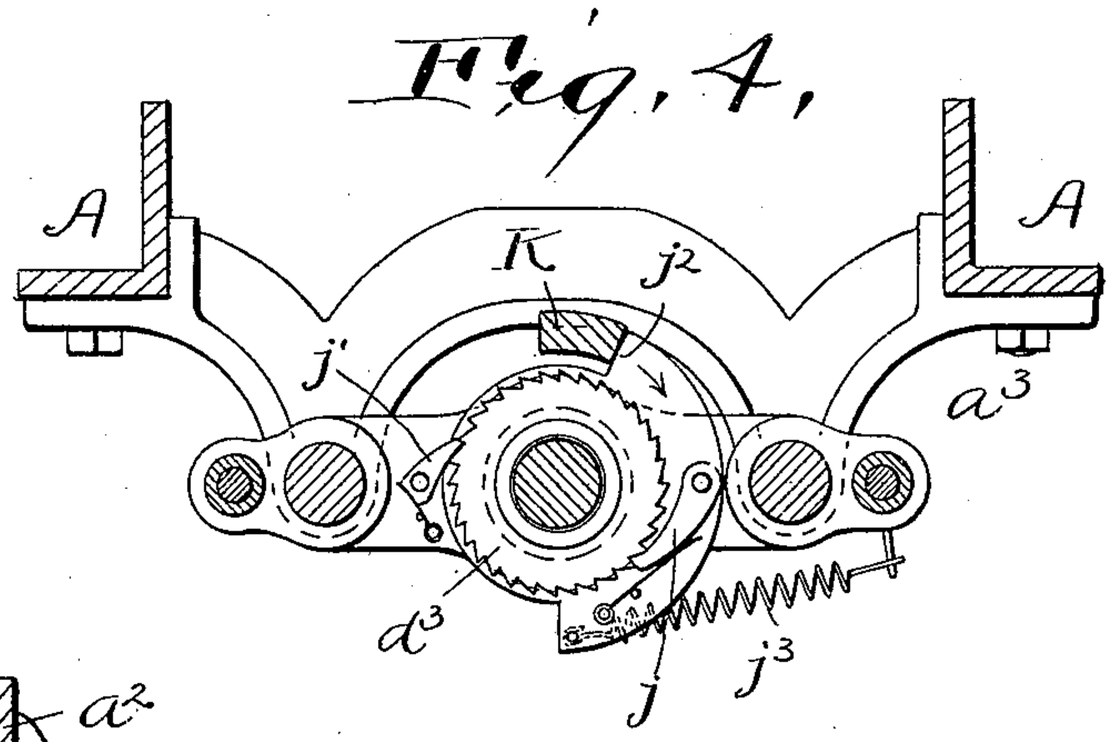
Fig. 4.



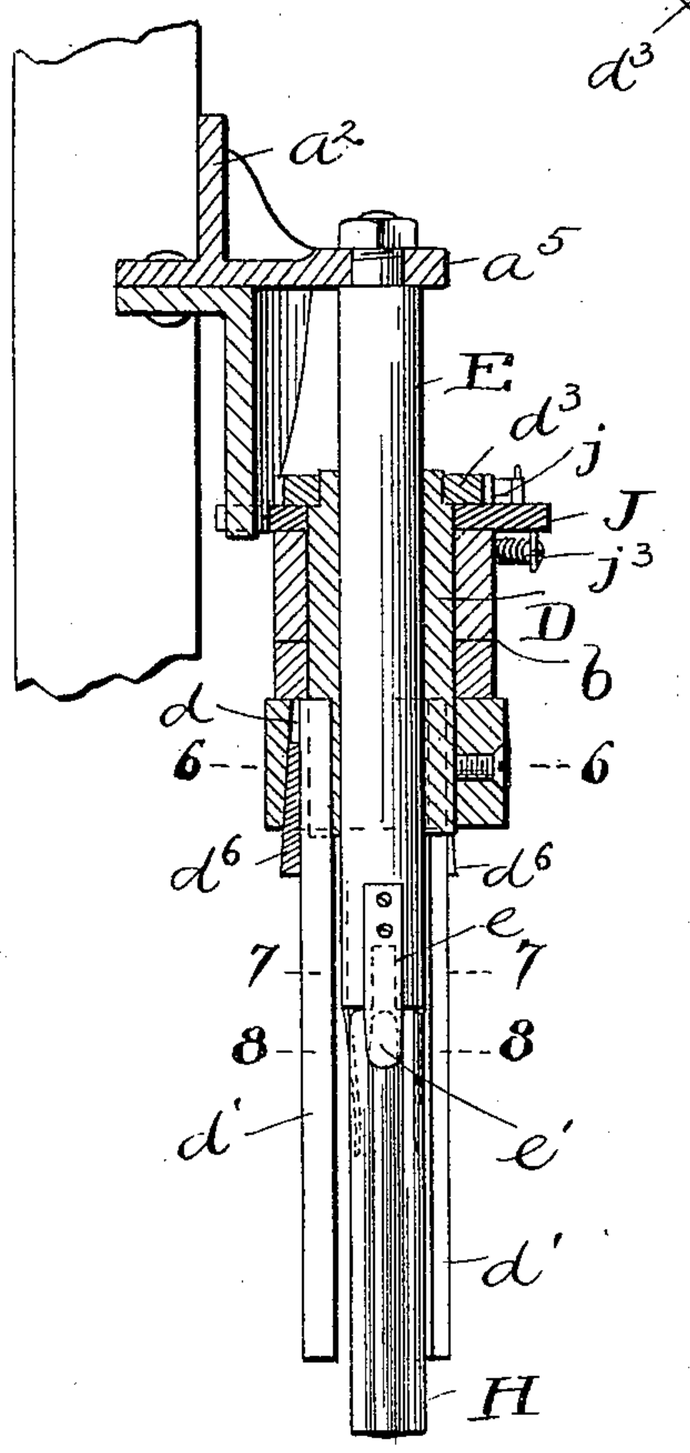


Fig. 5

Fig. 6.

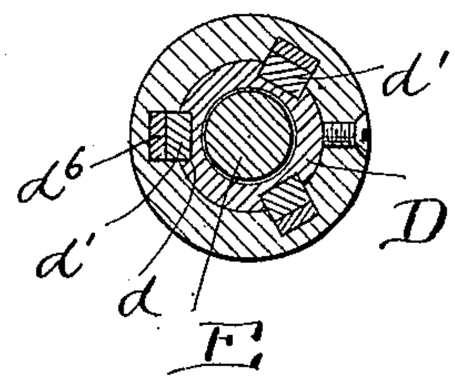


Fig. 7.

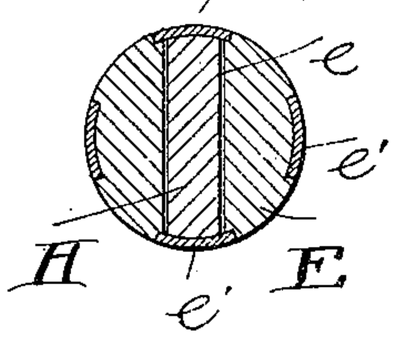
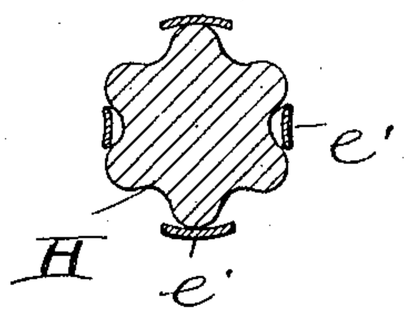


Fig. 8.



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UNITED STATES PATENT OFFICE.

CHARLES T. RICHMOND AND MAHLON M. ZELLERS, OF CLEVELAND, OHIO, ASSIGNORS TO THE NATIONAL CARBON COMPANY, OF TRENTON, NEW JERSEY.

BATTERY-FILLER.

SPECIFICATION forming part of Letters Patent No. 641,546, dated January 16, 1900.

Application filed September 5, 1899. Serial No. 729,513. (No model.)

To all whom it may concern:

Be it known that we, CHARLES T. RICHMOND and MAHLON M. ZELLERS, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Battery-Fillers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The invention is designed especially for filling dry-battery cups—that is to say, for mechanically inserting the carbon elements and packing the loose depolarizing material in the cup and around said carbon element.

The invention consists in the construction and combination of parts hereinafter described, and pointed out definitely in the claims.

In the drawings, Figure 1 is a side elevation, partly in section, of a machine embodying our invention. Fig. 2 is an enlarged side elevation of the part of the machine above and including the bed-plate. Fig. 3 is a front elevation, partly in section, of the mechanism shown in Fig. 2. Fig. 4 is a sectional view on line 4 4 of Fig. 3. Fig. 5 is a central vertical section of the tamping-plunger, showing also certain parts adjacent thereto; and Figs. 6, 7, and 8 show, respectively, horizontal sections in the planes indicated by lines 6 6, 7 7, and 8 8, respectively, of Fig. 5.

Referring to the parts by letters, C represents the bed of the machine, which may be supported by suitable legs *c*. Rising from the bed is a frame made of four upright standards A A′ and cross-bars a a' a^2 a^3, which connect them together. It will be understood, however, that the construction described is a simple and convenient framework for supporting the working parts and any other suitable framework may be employed in its stead. A vertical reciprocating cross-head B embraces and is guided by two vertical rods a^4 and is caused to move up and down upon said guides by the driven crank F and the connecting-rod *f*. In the lower member *b* of the cross-head B a vertical sleeve D is rotatably mounted. It embraces a vertical cylindrical rod E, the upper end of which is fixed to and depends from a bracket a^5 on the cross-bar a^2. In the lower end of the sleeve are recesses *d*, in which the tamping-bars *d′* may be secured by wedges d^6. An oscillating pawl-carrier or pawl-carrying plate J rests upon the member *b* of the cross-head and loosely embraces the sleeve D, and a ratchet d^3 is secured to the upper end of the sleeve above said plate J. A spring-pawl *j* is secured to the said plate and engages with this ratchet. A spring-detent *j′* is also pivoted to the member *b* of the cross-head, and it also engages with the said ratchet. The pawl-carrying plate J is provided with a shoulder j^2, which engages with the inclined face of a plate K, which is attached to some part of the framework, as the cross-bar a^2. When the cross-head B is moved upward, the inclined face of this plate K, acting against the shoulder j^2, turns the pawl-carrying plate in the direction indicated by the arrow in Fig. 4, the result being that the sleeve D is turned a short distance upon its axis. When the cross-head descends, a spring j^3 turns the pawl-carrying plate in the opposite direction, keeping its shoulder j^2 in contact with the plate K. It will be seen, therefore, that as the cross-head moves up and down this sleeve D is turned step by step in one direction, the detent *j′* preventing its movement in the opposite direction.

In the lower end of the bar E is a recess *e*, which receives the flattened head of the core—that is to say, in a dry battery, the carbon element H. Attached to the lower end of this rod E are a plurality of spring-fingers *e′*, which engage with the said carbon element and thereby hold it.

The cup V of the battery, which is to be filled, is placed upon a shelf N on a vertically-movable cross-head M, this shelf being located vertically below the bar E. This cross-head M has grooves on its sides, which take over the vertical guide-bars a^6. This cross-head is yieldingly upheld, preferably by a weight P. This weight is adjustably secured upon one arm of a pivoted lever R, the other arm of which is connected by a link *r* with said cross-head M. The cross-head may therefore be moved downward; but to so move it requires a force sufficient to overcome the force of

weight P. The said cross-head M is prevented from being moved upward during the operation of the machine by a suitable automatic clutch which permits it to move downward. This clutch in the form shown includes a bar S, which is pivoted to the under side of the bed C, a bar T, which is pivoted to the lever R and comes in contact with the bar S, the fingers t' being provided to maintain this contact, a lever Q, which is pivoted to the bar T, a clamping-shoe q, which engages with the bar S, and a spring which acts upon the lever Q to maintain this engagement.

The machine above described operates in the production of the desired result in the following manner: The cup V is first partially filled with the depolarizing material, as in Fig. 3. Then the cross-head M is raised, the lever Q being first lifted to permit this movement. As this cross-head, which carries the cup, is so lifted said cup passes over the lower end of the carbon element which is in the embrace of the spring-fingers on the lower end of the bar E and said carbon element is forced down into the depolarizing material in the cup with sufficient force to compact so much of the material as is below said element. A table W for holding the loose depolarizing material is pivoted to the rear standards A', and it has a hole w, through which the material may be fed into the cup. The cup engages with the under side of this table, wherefore the table rests upon the cup whatever be the elevation of said cup. When the cup has been raised to the proper elevation, the tamping-bars through the reciprocating action of the cross-head B pack the depolarizing material down into the cup and around the carbon element. The operator feeds new material through the hole in the table and it falls into the cup. During this tamping operation the sleeve D, to which the tamping-bars are secured, is being slowly turned around, wherefore said bars act with equal force upon all of the material. As fresh material is added and packed down the cup and the cross-head M are forced down in opposition to the weight P, the clutching device, of which the lever Q is a part, acting to prevent any upward return movement of said cup and the cross-head. The compactness of the material in the cup as a result of this tamping operation may be regulated by moving the weight in one direction or another along the lever R. The dotted lines in Fig. 1 show the position of the cup when the tamping operation begins and the full lines show the position of said cup when the same is nearly filled. It will be understood that as the cup is moved downward through the action of the tamping-bars upon the material therein it carries the carbon element with it, said element being drawn out of the embrace of the spring-fingers on the lower end of the bar E. When the cup has been filled, the cross-head M is moved downward far enough to permit the removal of the cup and the introduction of a new cup.

Having described our invention, we claim—

1. The combination of a yielding support for the article to be filled, with a vertically-reciprocating cross-head, a vertical member rotatably mounted in said cross-head, tamping-bars secured to said member, and means for turning said member on its axis, substantially as described.

2. The combination of a yielding support for the article to be filled, and a stationary vertical bar having on its lower end means for holding a core, with a vertically-reciprocating cross-head, a vertical sleeve which embraces the said vertical bar and is rotatably mounted in the cross-head, tamping-bars secured to said sleeve, and means for turning said sleeve upon its axis, substantially as described.

3. The combination of a vertical reciprocating cross-head, a member rotatably mounted therein on a vertical axis, tamping-bars secured to said member, a pawl-carrying plate supported on the cross-head and loosely mounted on the same axis as the rotatable member, and having a shoulder, a pawl carried by said plate, a ratchet secured to said member, an inclined plate engaging with said shoulder, and a spring, substantially as specified.

4. The combination of a yielding support for the article to be filled, an immovable vertical bar, and spring-fingers on the lower end of said bar, with a vertically-reciprocating cross-head which embraces said bar, a vertical sleeve which also embraces the bar and is rotatably mounted in the cross-head, tamping-bars secured to said sleeve, and mechanism for turning said sleeve upon its axis, substantially as specified.

5. The combination of a yielding support for the article to be filled, and means for packing material into said article and thereby forcing said support downward, with a table which is supported on a horizontal pivot at its rear end, and has its front end extended over said yielding support and provided with a hole directly over the article to be filled, whereby the table may rest upon the said article while the table is moving down during the packing operation.

6. The combination of a movable support for the article to be filled, means for yieldingly upholding the said support, and a clutching device which acts automatically to permit said support to move downward and to prevent it from moving upward, with a vertically-reciprocating cross-head, a member rotatably mounted therein, tamping-bars secured to said member, and means for turning said member upon its axis, substantially as specified.

7. The combination of a vertically-movable cross-head adapted to support the article to be filled, a pivoted lever having a weight upon one arm, a link connecting the other arm with said cross-head, and a clutching device which acts automatically to permit the

downward movement of said cross-head, and to prevent its upward movement, with a vertically-reciprocating cross-head, a member rotatably mounted in said cross-head, tamping-bars secured to said member, and means for turning said member upon its axis, substantially as specified.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

C. T. RICHMOND.
MAHLON M. ZELLERS.

Witnesses:
E. L. THURSTON,
FRANK D. LAWRENCE.