

(No Model.)

3 Sheets—Sheet 1.

F. KING.

MOLD FOR MANUFACTURING SECONDARY BATTERY PLATES.

No. 579,877.

Patented Mar. 30, 1897.

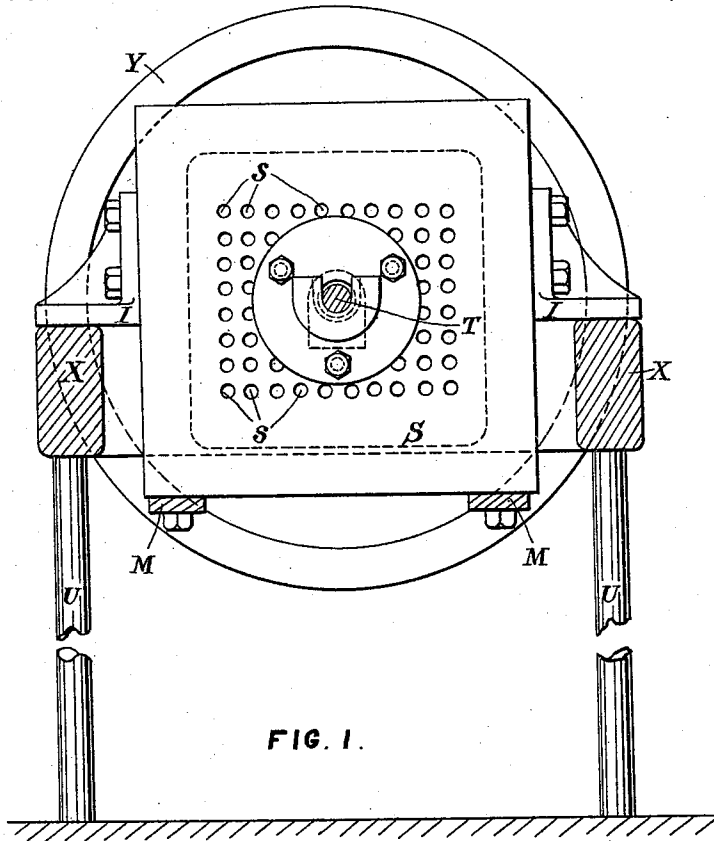


FIG. 1.

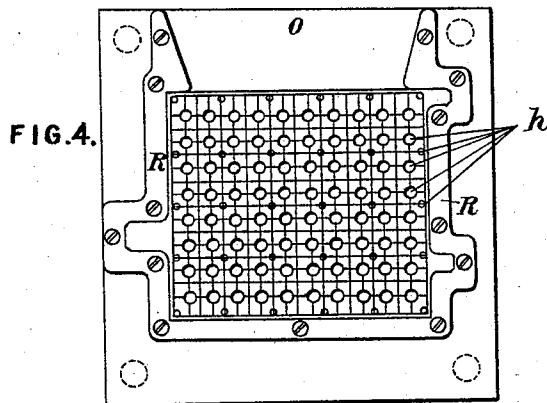


FIG. 4.

Witnesses

W. R. Edelen.

Inventor.

Frank King by
Follock & Mauro
his attorneys.

(No Model.)

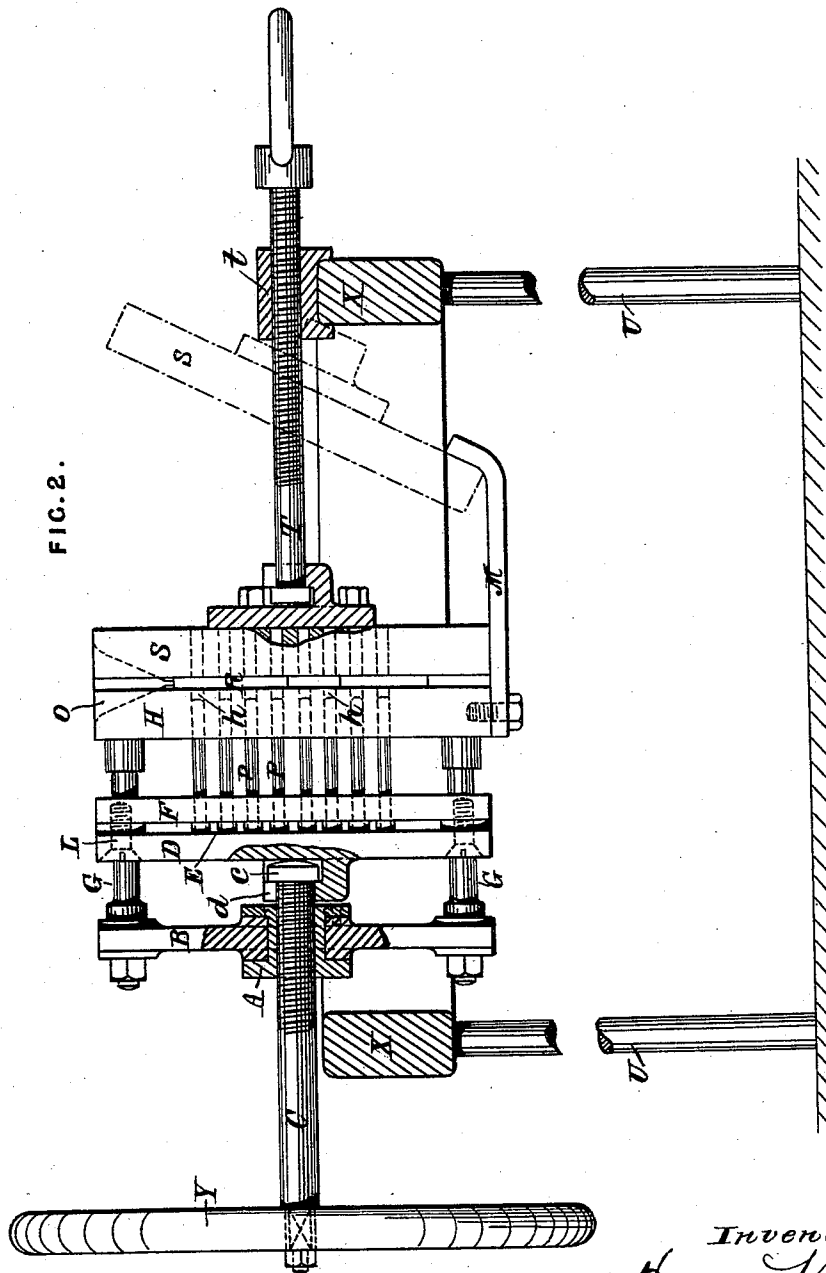
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Witnesses:-

W. R. Edelen.

Inventor

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his attorneys.

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3 Sheets—Sheet 3.

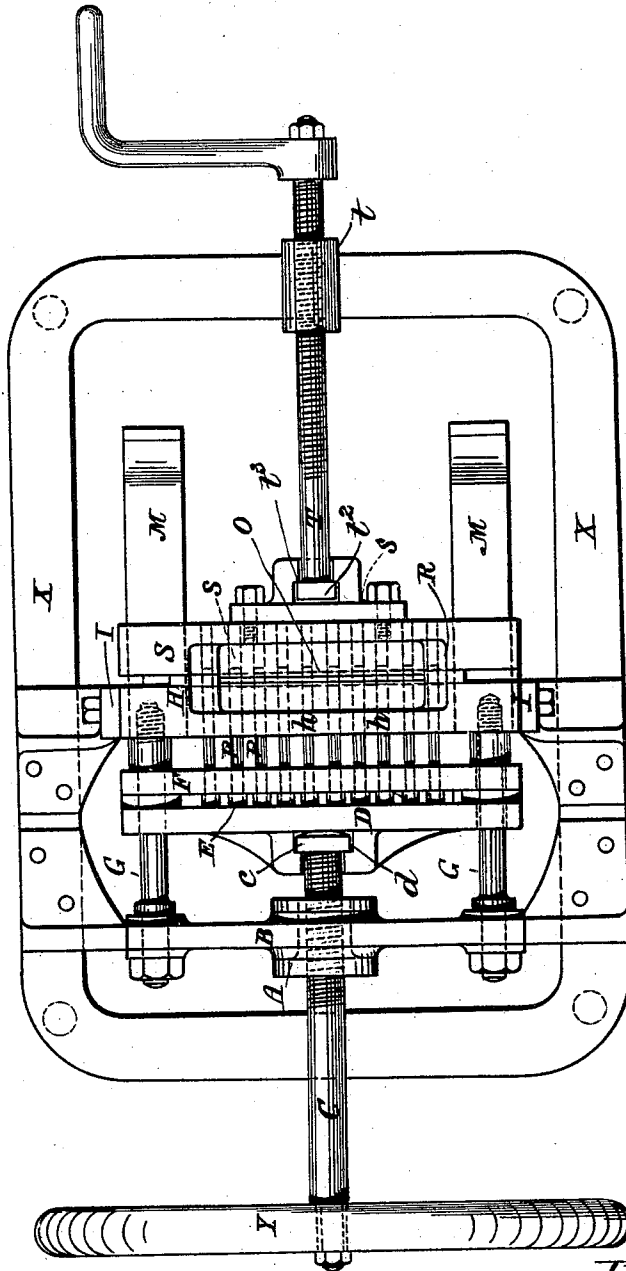
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Patented Mar. 30, 1897.

FIG. 3.



Witnesses

Edw. Lewis
W. R. Edelen.

Inventor.

Frank King by
Pollock & Mann
his attorneys.

UNITED STATES PATENT OFFICE.

FRANK KING, OF LONDON, ENGLAND, ASSIGNOR TO JOHN IRVING
COURTENAY, OF SAME PLACE.

MOLD FOR MANUFACTURING SECONDARY-BATTERY PLATES.

SPECIFICATION forming part of Letters Patent No. 579,877, dated March 30, 1897.

Application filed April 10, 1896. Serial No. 587,027. (No model.)

To all whom it may concern:

Be it known that I, FRANK KING, engineer, a subject of the Queen of Great Britain and Ireland, residing at 4 Great Winchester Street, in the city of London, England, have invented certain Improvements in or Connected with Molds for Use in the Manufacture of Secondary-Battery Plates or Supports, of which the following is a specification.

My invention relates to molds for use in the manufacture of secondary-battery plates or supports; and it consists in an arrangement whereby the making of the said plates or supports is more effectively and readily performed. It has hitherto been found very difficult to remove the casting from the mold without damaging or twisting the casting, especially when the form which the plate or support of a secondary battery is desired to take is such that the mold is of a complicated and deeply-cut section; and my invention has for its object to enable the cast plate or support to be readily removed from the said mold.

It is found in practice, when grip plates or supports are molded in two-part molds, that while it is easy to separate the two parts of the mold the casting remains fast in one part. I therefore, according to my invention, mount a plate in any suitable position with reference to the plane of the mold, and to this plate I fix a number of pins or rods which pass through holes of corresponding size and shape in the body of one or both of the parts of the mold, so that when the molten metal is poured into the mold it fills the spaces in the mold and also runs round and takes the shape of the pins which are attached to the aforesaid plate.

I sometimes use two plates carrying pins or rods one on each side of the mold, and I can thus operate from either or both sides.

When the casting is cooled, the two parts of the mold are separated, and it will be found that when only one plate with pins is used the casting adheres to that part of the mold adjacent to that plate. The plate with pins is mounted on a slide or its equivalent, so that the pins may be withdrawn from the holes or recesses in the mold. The movement which it is necessary to give to the plate or plates

carrying the pins may be accomplished in any desired manner—for example, by means of screws, toggles, or cams. The screw is turned so as to draw back the plate with its pins, the latter being withdrawn from the casting into the stationary part of the mold. A turn is then given to the screw in the opposite direction, which has the effect of forcing the casting forward or outward from the recesses in the mold, the holes molded in the casting by the pins being somewhat contracted by the cooling of the casting, so that the resistance to pins reëntering the holes will be such as to cause the casting to be forced out from the mold. The screw may then be again reversed, while the casting is held so that the pins will be drawn out of the casting, which is thus readily removed from the mold.

Figure 1 of the accompanying drawings is a transverse vertical section of a molding apparatus constructed according to my invention, showing the back of the movable part of the mold in elevation. Fig. 2 is a longitudinal sectional elevation, and Fig. 3 a plan view of the apparatus. Fig. 4 is an inside face view of the stationary part of the mold.

X is a strong metal frame supported on legs V, to which frame is bolted brackets B and I, to the latter of which the stationary part H of the mold is connected. To the face of the stationary part H of the mold is secured a distance-piece R, the internal shape of which corresponds to three sides of the perimeter of the plate to be cast, the fourth side being open to form a gate O, through which the casting metal is introduced. The part H of the mold is perforated with a number of holes *h* for the reception of pins or rods P, carried in a plate F, the said rods being provided with nuts on heads E, against which bears a plate D, connected to the plate F by screws L, so as to retain the rods in position in the plate F.

The plates D and F are capable of sliding on guide-rods G, which connect the part H of the mold to the bracket B, which bracket carries an internally-screwed bush or nut A, in which works a screw C, provided with a hand-wheel Y for turning the said screw. The inner end of the screw C has an enlargement *c*, which engages in a notched recess *d*, formed on the back of the plate D, so that by turning

the screw in the screwed sleeve A the plates D and F, together with the pins or rods P, will be moved inward or outward, according to the direction in which the screw is turned. The
 5 movable part S of the mold is provided with holes or recesses s, coinciding with the holes h in the stationary part H of the mold, into which holes s the pins or rods P enter when the mold is closed and the plates D and F are
 10 moved forward. When the parts are in this position, molten metal is poured into the mold through the gate O, the metal running round the pins or rods and filling up the space between the two parts of the mold, after which
 15 the movable part of the mold is moved backward by means of the screw T, working in a nut t, carried by the frame X, the inner end of which screw has an enlarged head t², which engages in a notched recess t³, formed in a
 20 block attached to or formed on the back of the part S of the mold. The said part S is supported on arms or brackets M, along which it slides in its backward and forward movements, and when in its extreme backward po-
 25 sition it assumes the inclined position indicated by dotted lines in Fig. 2, thereby providing ample space to permit of the removal of the casting from the mold.

When the movable part S is moved into this
 30 position, the casting is still retained in the stationary part H of the mold, although the pins or rods P may have been withdrawn therefrom, and in order to expel the casting the pins or rods, after having been withdrawn,
 35 are again moved forward by turning the screw C in the reverse direction, and as the casting in the meantime will have somewhat contract-

ed in cooling the friction of the pins or rods P entering the holes formed in the casting is sufficient to force the said casting from the
 40 mold, which casting can then be removed and the mold be closed, ready for the next molding operation.

Having now particularly described and ascertained the nature of my said invention and
 45 in what manner the same is to be performed, I declare that what I claim is—

In a two-part mold for use in the manufacture of secondary-battery plates, or supports, a stationary part having perforations or holes
 50 therethrough, and a part provided with means for moving the movable part having openings in its face corresponding to the perforations in the stationary part, a plate mounted on
 55 suitable slideways to the rear of the stationary part and carrying a series of pins or rods passing through the perforations in the stationary
 60 part and into the openings in the movable part, so that when the molten metal is poured into the mold it surrounds the pins or rods,
 65 and means for moving the plate to withdraw the pins from the casting, and by an advance movement of the plate to release the casting from the stationary part after the movable part has been separated therefrom, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK KING.

Witnesses:

CHARLES HENRY DENNIS,
 MALCOLM LEGGETT.