(No Model.) 3 Sheets—Sheet 1.

C. R. DAELLENBACH.

MACHINE FOR COATING SHEET METAL PLATES.

No. 549,562. Patented Nov. 12, 1895.

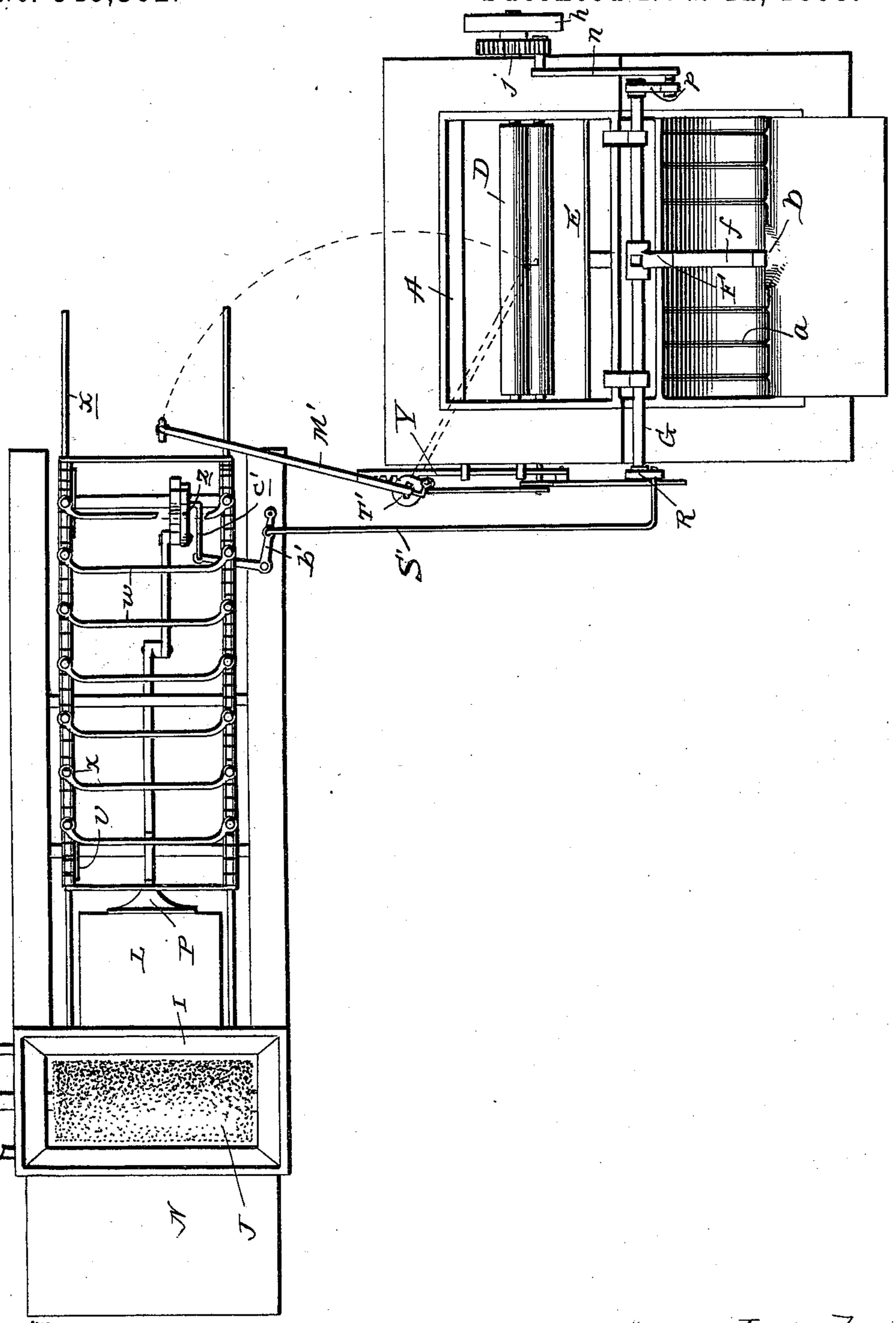

Fig. 1.

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Fig. 2.

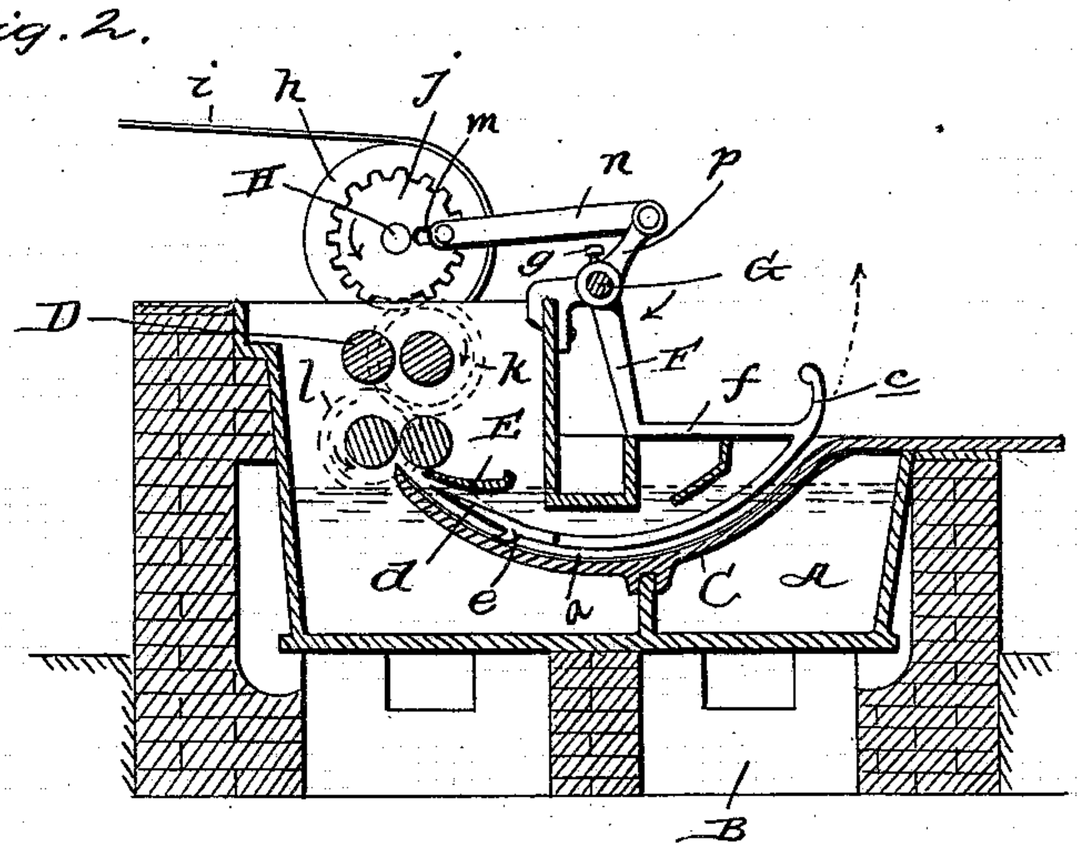

Fig. 6.

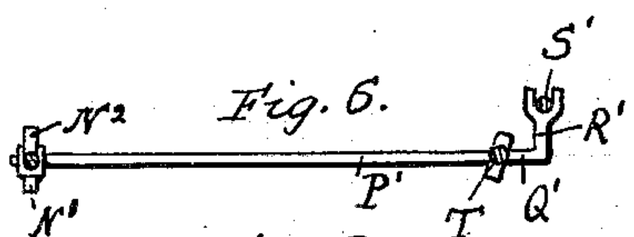

Fig. 5a.

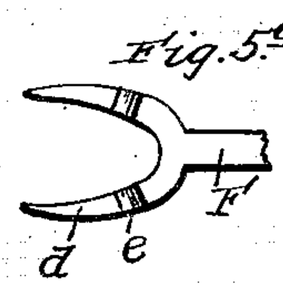

Fig. 7.

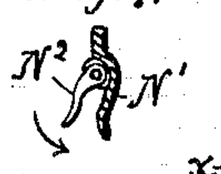

Fig. 3.

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Fig. 4.

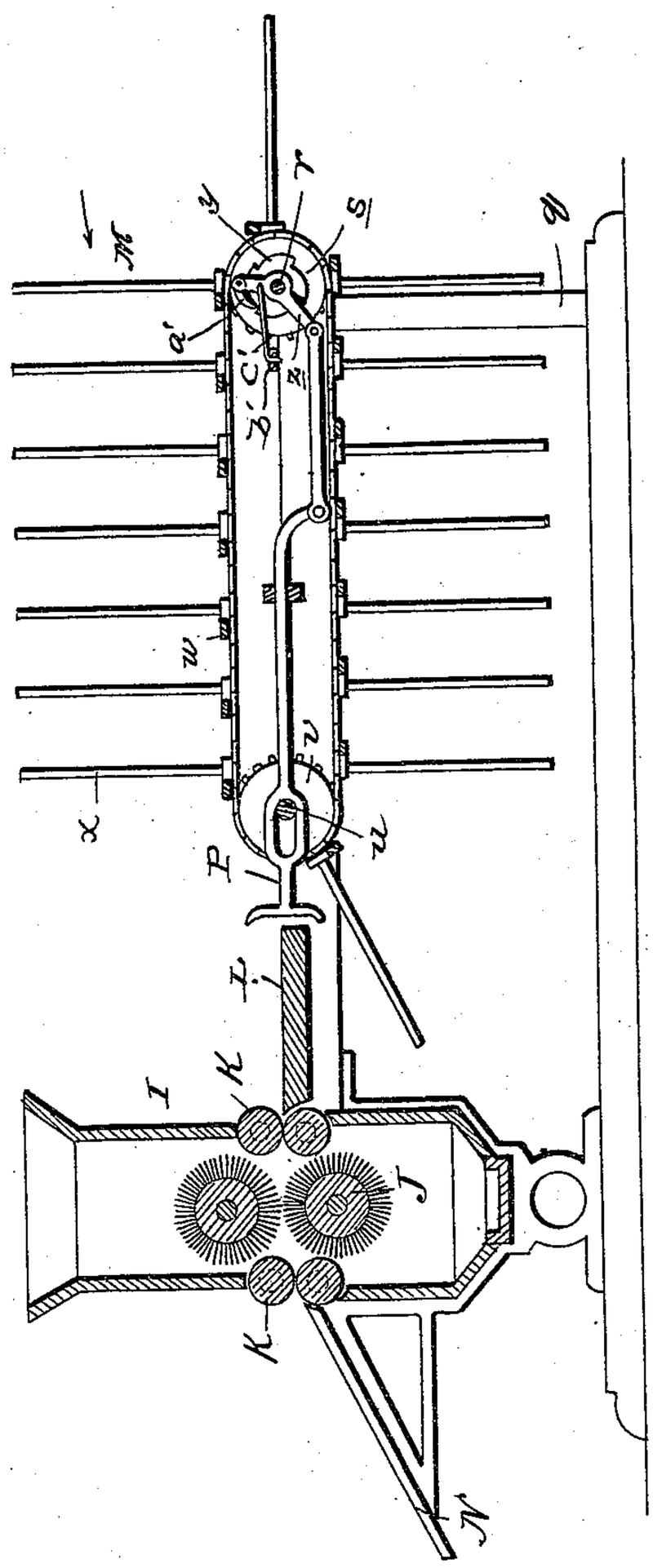
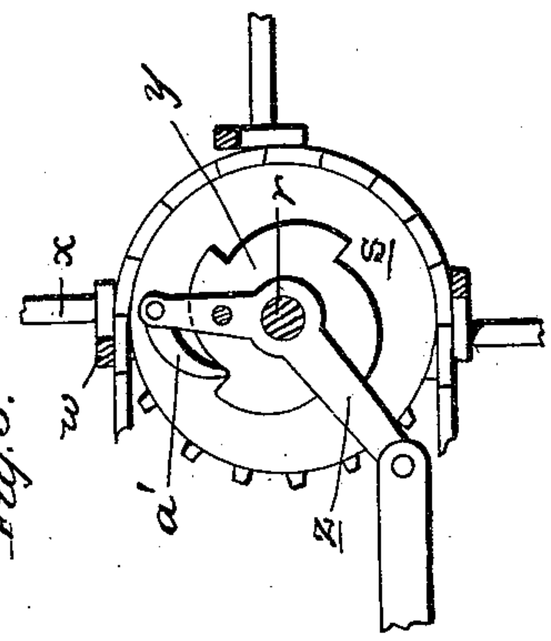


Fig. 5.



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UNITED STATES PATENT OFFICE.

CHARLES R. DAELLENBACH, OF ELLWOOD CITY, PENNSYLVANIA.

MACHINE FOR COATING SHEET-METAL PLATES.

SPECIFICATION forming part of Letters Patent No. 549,562, dated November 12, 1895.

Application filed August 1, 1895. Serial No. 557,877. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. DAELLENBACH, a citizen of the United States, residing at Ellwood City, in the county of Lawrence and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Coating Sheet-Metal Plates; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in machines for coating sheet-metal plates with tin or alloys thereof; and it consists in the peculiar constructions, certain novel combinations, and the adaptation of parts hereinafter described, and particularly pointed out in the claims appended.

In the accompanying drawings, Figure 1 is a plan view of my improved machine. Fig. 2 is a vertical section of the tin-pot and its appurtenances. Fig. 3 is a detail elevation, partly in section, illustrating the traveling rack and the mechanism for conveying the tinned plates from the tin-pot to said rack. Fig. 4 is a sectional view illustrating the traveling rack to cool the plates and deliver the same to the branning device, such branning device being illustrated in its proper position. Fig. 5 is a detail view which will be hereinafter referred to. Fig. 5ª is a detail inverted plan view of the forward end of the plate-moving lever; and Figs. 6 and 7 are detail sections taken in the planes indicated by the lines *x x* and *y y*, respectively, of Fig. 3.

Referring by letter to said drawings, A indicates the tin-pot of my improved machine, which is arranged over a suitable furnace B, as shown. This tin-pot A is provided with a curvilinear guide C, which is designed to guide the plates to be tinned and is provided on its upper side with the longitudinal ribs *a*, designed to support the plates above its bottom and is also provided with the depression *b* to receive the hand of the operator when he places a plate on the guide.

D indicates a series of four (more or less) rollers of iron or other suitable material, which are arranged above the forward end of the guide C and are designed to regulate the thickness of the coating as the plates emerge from the molten mass of tin.

E indicates a guard, which is arranged above the guide C, adjacent to the forward end thereof, and F indicates a lever which is designed and adapted to force the plates through the mass of molten tin and up between the rollers D. This lever F comprises the curvilinear bar *c*, which conforms to the guide C, and has its forward end forked, as indicated by *d*, and is provided on its under side with shoulders *e* to bear against the rear edges of the plates to be tinned, and the bar *f*, which is keyed (preferably by a set-screw *g*) on a transverse rock-shaft G, and is designed to engage a portion of the frame, as shown in Fig. 2, so as to limit the downward and forward movement of the lever.

H indicates a transverse shaft which is journaled in suitable bearings above the tin-pot A and is provided with a wheel *h* to receive a band *i* connected with a suitable motor, and is also provided with a gear-wheel *j*, as shown. This gear-wheel *j* meshes with a gear-wheel *k*, fixed on the shaft of one of the upper rollers D, and said gear-wheel *k* meshes with a similar gear-wheel *l* on the shaft of one of the lower rollers D, whereby it will be seen that when the shaft H is rotated an upper roller D and a lower roller D will also be rotated to facilitate the upward movement of the tinned plates from the guide C and bath of tin. The gear-wheel *j* on shaft H is further provided with a slot *m*, and in this slot is arranged a pin connected to a pitman *n*, which is connected to a crank *p*, fixed on the shaft G, whereby it will be seen that when the shaft H is rotated the shaft G will be rocked to properly move the lever F.

I indicates a hopper which is designed to contain bran and is preferably arranged in the relation shown in Fig. 1 to the tin-pot A. This hopper I is provided with the burnishing-brushes J and is also provided in its opposite transverse walls with feed-rollers K, all of which may be rotated through the medium of any suitable gearing. Said hopper I is furthermore provided with the table L, to receive the plates from the traveling rack M,

and with the inclined slide N, down which the plates move after passing through the hopper and between the brushes J.

The traveling rack M, as shown in Figs. 1 and 4, comprises a suitable supporting-frame *q*, the transverse shaft *r*, journaled in said frame and provided adjacent to its ends with sprocket-wheels *s*, the transverse shaft *u*, also journaled in the frame *q* and provided adjacent to its ends with wheels *v*, and the endless sprocket-chains taking around the wheels *s v* and carrying the transverse bars *w*, which serve as rests for the tinned plates and also carrying the pins *x* at the ends of the rests *w*, which pins serve to support the tinned plates while in the rack, as presently described. Said rack is moved step by step through the medium of the ratchet-wheel *y*, fixed on the shaft *r*, the lever *z*, which is fulcrumed on said shaft *r* and is provided with a pawl *a'*, designed to engage the teeth of the wheel *y* and the bell-crank lever *b'*, which has one end connected with the lever *z* by a pitman or link *c'*, and is designed to be moved in concert with the lever G, as presently described. The lever *z* is also designed to transmit motion to the device P, which is connected with said lever and is designed and adapted to push the tinned plates out of the traveling rack and between the forward feed-rollers K of the hopper I, as will be more fully hereinafter described.

The parts are so timed, as will be presently described, that the rack will be moved forwardly when the device P is in its rearward position, so as to permit the rests or bars *w* to pass downwardly in front of said device P.

In addition to the devices before described the rock-shaft G, above the tin-pot A, is provided at one end with a crank-arm R. (See Fig. 3 of the drawings.) This crank-arm R is connected by a pitman S with one end of the bell-crank lever *b'*, whereby it will be seen that when the shaft G is rocked for the purpose before described the traveling rack M will be moved step by step in the direction indicated by arrow in Fig. 4.

T indicates a vertical rock-shaft, which is journaled in suitable bearings on the side wall of the tin-pot A. This rock-shaft, which is vertically movable, has its lower end connected with one end of a bell-crank lever U, the other end of which is connected by a link V with the crank-arm R on shaft G, whereby it will be seen that when the said arm moves in the direction opposite to that indicated by arrow in Fig. 3 the shaft T will be raised for a purpose presently made plain. The link V is preferably made in two sections connected by a turnbuckle *m'*, as shown.

The shaft T is normally held in and returned to the position illustrated in Fig. 3 by the coiled spring W, and said shaft is rotated by the crank-arm R of shaft G through the medium of the pinion X, which is keyed on the shaft and is held against vertical movement therewith by any suitable means, such as lugs fixed above and below it to the side of the tin-pot, the slidable rack-bar Y, which meshes with the pinion X, and the link Z, which is pivotally connected with the rack-bar and is provided with a longitudinal slot to receive a stud on arm R, as shown. This slot in link Z is provided in order that when the arm R swings in direction opposite to that of the arrow (see Fig. 3) the shaft T will be moved upwardly before it is rocked, for a purpose presently explained.

The shaft T is provided at its upper end with an angular arm M', which carries at its outer end the jaws $N' N^2$, as better shown in Fig. 3 of the drawings. The movable jaw N^2 is fixedly connected with an arm or portion P' at one end of a crank-shaft Q', journaled in the shaft T, which crank-shaft is provided at its opposite end with an arm R'. This latter arm R' is designed to receive a rod S', which rises from an arm T', fixed with respect to the pinion X, and said arm is engaged and the jaw N^2 is closed against jaw N' by the coiled spring U', which is held under tension by the adjustable nut V', as shown. Through the medium of said spring and adjustable nut V' the clamping-jaws $N' N^2$ may be readily adjusted to engage long or short plates, as desired. When desired, the spring may be omitted and the nut V' alone employed for the purpose.

In the practical operation of my improved machine, after the parts are set in motion, the plates to be tinned are placed one by one on the guide C by an attendant. After a plate is placed on the said guide C the lever F, swinging downwardly, will force said plate through the molten mass of tin above the gude and up through the rollers D, which will assist the upward movement of the plate, as before described, and carry it up between the jaws $N' N^2$. As the lever F moves in the direction opposite to that indicated by arrow in Fig. 3, the shaft T will be raised and the plate, with its upper edge resting between the jaws $N' N^2$, will also be raised by the rollers D until the arm R' of shaft Q' comes into contact with the spring U', when the jaws will be clamped upon the plate and the same will be carried out of engagement with the wheels D. At this point the stud on the arm R will engage the end of the slot in the link Z, and in consequence the rack-bar Y will be drawn and the shaft T turned to carry the plate in the jaws above the traveling rack M. At this point the lever F will again start to move in the direction indicated by arrow in Fig. 3, when the spring W will draw the shaft T downwardly, so as to move the arm R' out of engagement with the spring U' and enable the jaws $N' N^2$ to open, so as to release the plate and enable it to fall upon two of the rods *x* of the rack M. As the lever F continues to move in the direction indicated by arrow, the shaft T will be turned so as to

bring the jaws N′ N² back over the tin-pot and the operation before described will be repeated.

It will be appreciated from the foregoing that, while very simple and comparatively cheap, my improved machine is highly efficient for the purpose described. It will also be observed that a single attendant for feeding the plates to the tin-pot is all that is necessary to operate my improved machine.

Having described my invention, what I claim is—

1. In a plate tinning machine, the combination of a tin pot, a branning device having a table L, the traveling rack M, arranged adjacent to the table L, of the branning device and the tin pot and comprising a suitable frame, the transverse shafts *r*, *u*, journaled in said frame, wheels *s*, carried by said shafts, belts taking around said wheels, the transverse rests *w*, connected at their ends to the belts, the pins *x*, also connected to the belts, the ratchet wheel *y*, fixed on the shaft *r*, the lever *z*, fulcrumed on the shaft *r*, and carrying a pawl at one end engaging the ratchet wheel, the plate pushing device, a link connecting said device and the lever *z*, a suitable means for transferring tinned plates from the tin pot to the rack M, and a suitable means for rocking the lever *z*, substantially as and for the purpose set forth.

2. In a plate tinning machine, the combination of the tin pot, the curvilinear guide C, arranged therein and having the longitudinal ribs *a*, on its upper side and also having the depression *b*, the guard E, arranged above the guide C, adjacent to the forward end thereof, the lever F, having the curvilinear portion *c*, conforming to the guide C, and provided with the bifurcated forward end *d*, and also with the shoulder *e*, on its under side in rear of the bifurcated end *d*, the rollers D, arranged above the forward end of the guide C, and guard E, and a suitable means for actuating the lever F, and the rollers D, all substantially as specified.

3. In a machine for tinning plates, the combination of a branning device, a traveling rack for conveying tinned plates to the branning device, a tin pot having a guide arranged therein, rollers D, arranged above the forward end of the guide, a rock shaft G, arranged above the tin pot, a lever fixed on said rock shaft and having a portion conforming to the guide in the tin pot, an arm R, fixed on said rock shaft G, the vertically movable shaft T, journaled at the side of the tin pot, and having the arm M′, at its upper end, the gear wheel X, keyed or feathered on said shaft T, and held against vertical movement, the arm T′, fixed with respect to the gear wheel X, and adapted to move with the same, the rod S′, connected to and rising from said arm T′, the rack bar engaging the gear wheel X, a link connected to said rack bar and having a slot receiving a stud on arm R, a bell-crank lever engaging the shaft T, a link connecting one end of said lever and the arm R, clamping jaws N′ N², carried by the arm M′, of shaft T, a shaft journaled in the shaft T, and connected with one of the clamping jaws and having an arm R′, a suitable stop on the rod carried by gear wheel X, adapted to engage the arm R′, when the shaft T, is raised, the spring W, for moving the shaft T, downwardly and means for actuating the rock shaft G, the rollers D, the traveling rack and the branning device, substantially as and for the purpose set forth.

4. In a machine for tinning plates the combination of a branning device, a traveling rack arranged adjacent to the branning device, a tin pot, a guide arranged therein, a rock shaft G, arranged above the tin pot, and having an arm R, a lever fixed on the rock shaft and having a portion conforming to the guide in the tin pot, rollers D, arranged above the forward end of the guide in the tin pot, a vertically movable shaft journaled at the side of the tin pot and carrying jaws adapted to engage and hold the tinned plates as they leave the tin pot, means for closing such jaws upon a tin plate so as to enable them to hold the same, mechanism intermediate of the arm R, and the shaft T, adapted to raise and rotate said shaft, mechanism intermediate of the arm R, and the traveling rack adapted to transmit motion to the latter and means for actuating the rock shaft G, rollers D, and branning device, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

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