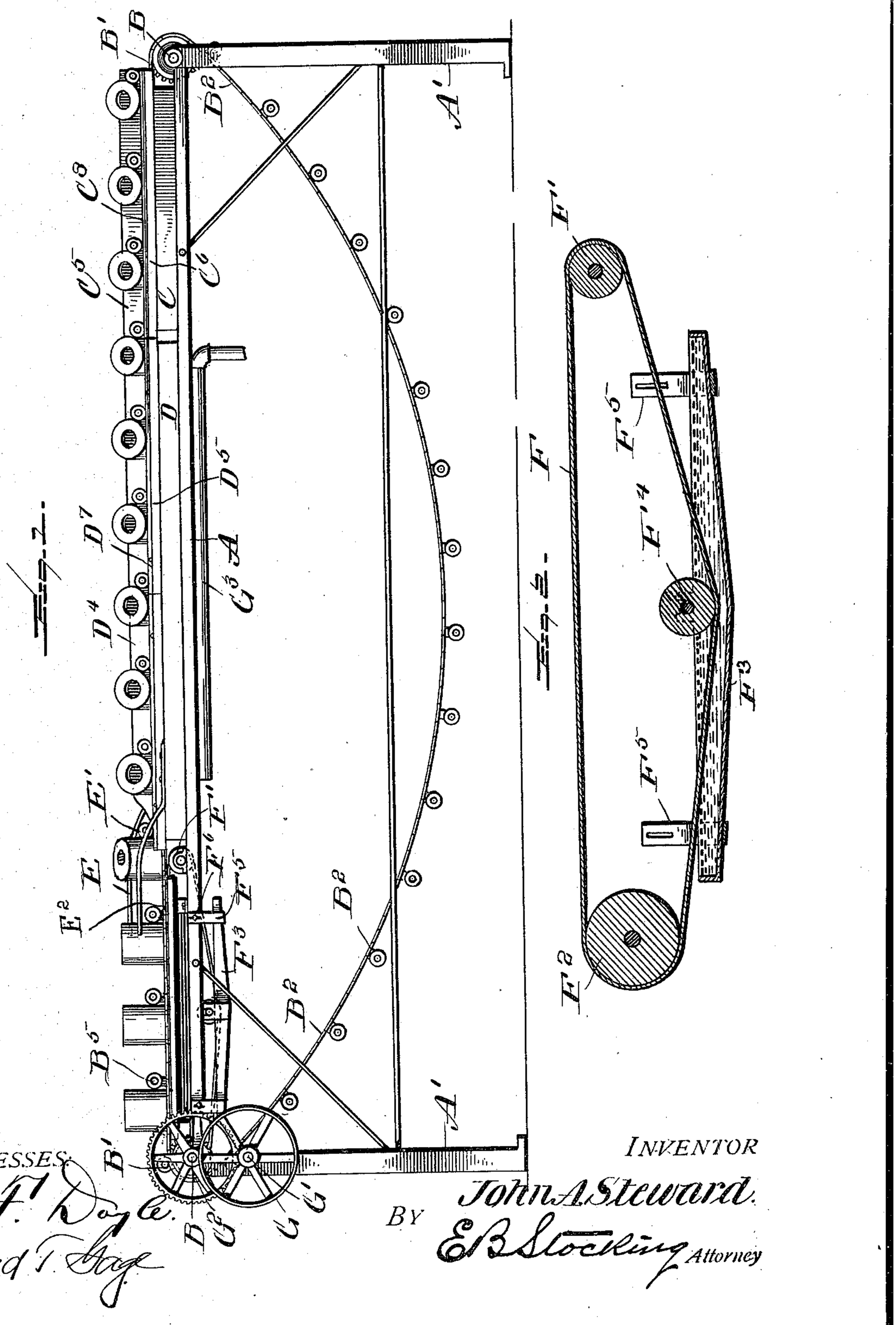
No. 732,970. PATENTED JULY 7, 1903.

J. A. STEWARD.

CAN SOLDERING MACHINE.

APPLICATION FILED AUG. 2, 1902.

NO MODEL. 2 SHEETS—SHEET 1.



WITNESSES:
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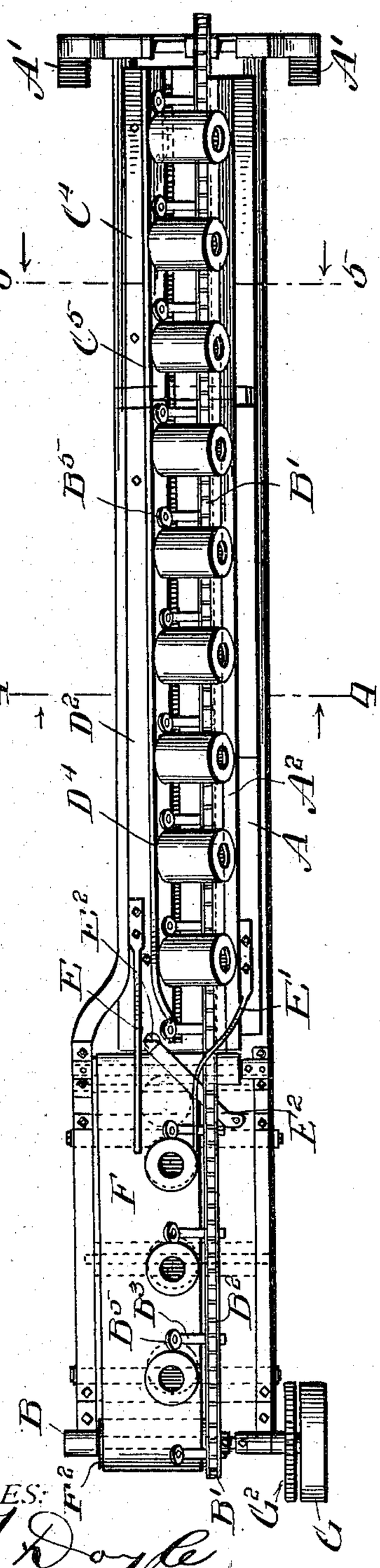

FIG. 5.

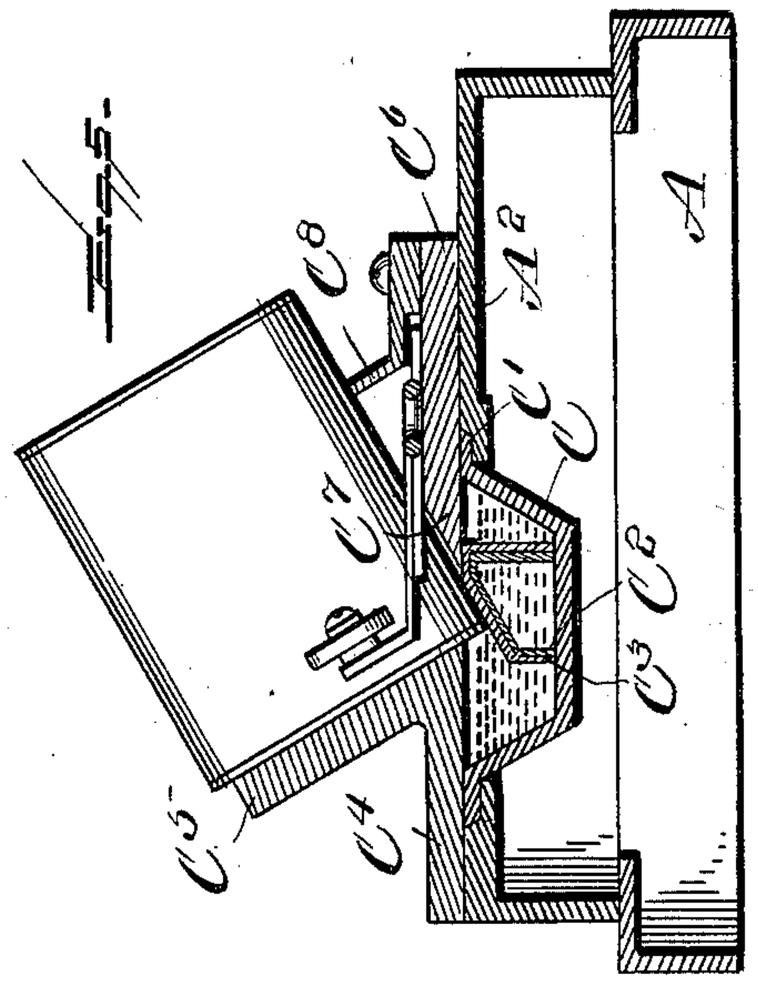

FIG. 6.

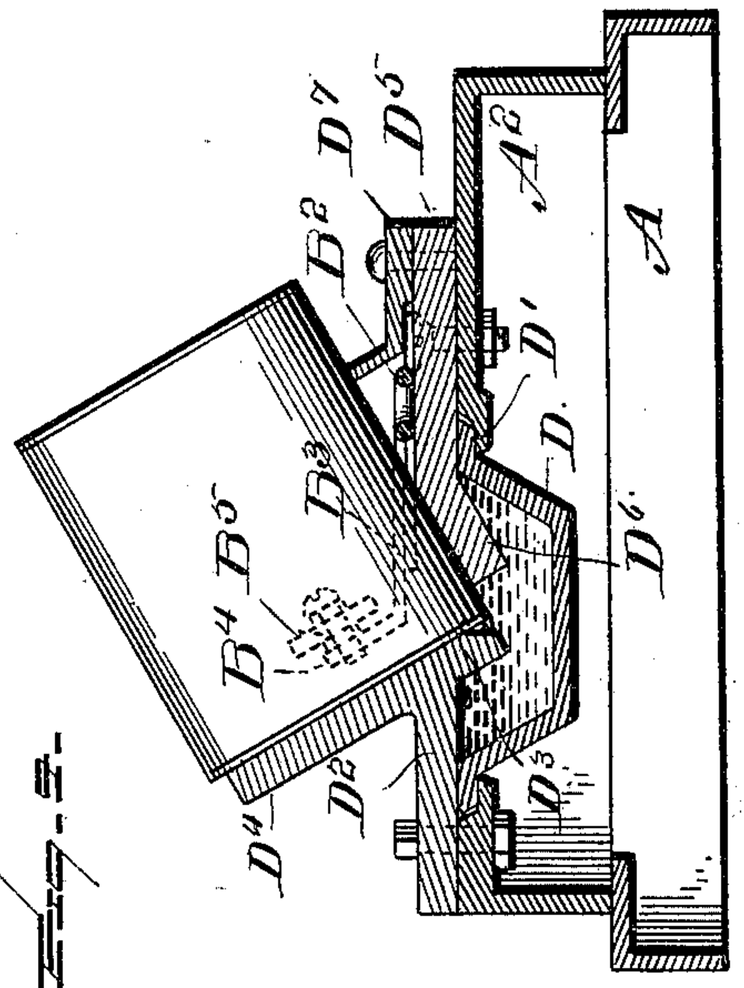

FIG. 7.

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UNITED STATES PATENT OFFICE.

JOHN A. STEWARD, OF RUTLAND, VERMONT.

CAN-SOLDERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 732,970, dated July 7, 1903.

Application filed August 2, 1902. Serial No. 118,166. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. STEWARD, a citizen of the United States, residing at Rutland, in the county of Rutland, State of Vermont, have invented certain new and useful Improvements in Can-Soldering Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a can-soldering machine, and particularly to a construction wherein the can is conveyed by a carrier successively over an acid and solder bath for the purpose of soldering a head to a can.

The invention has for an object to provide a novel construction of apparatus for successively applying acid to the head of a can, then moving the can through a soldering-bath, and finally cooling the soldered end preparatory to the delivery of the can.

A further object of the invention is to provide a novel construction of cooling-belt adapted to move at a different speed from the can, and thus present a succession of cooling-surfaces to the soldered end of the can in order to quickly set the solder and permit an immediate delivery of the completed can.

Another object of the invention is to provide means for arresting the rolling movement of the can over the acid and solder baths and turning the can into an upright position, so that the head thereof will rest upon the cooling-belt.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claims.

In the drawings, Figure 1 is a side elevation of the machine; Fig. 2, an enlarged vertical section of the cooling-belt; Fig. 3, a plan of the machine; Fig. 4, a vertical section on the line 4 4 of Fig. 3, and Fig. 5 a similar section on the line 5 5 of Fig. 3.

Like letters of reference refer to like parts in the several figures of the drawings.

The letter A designates a frame of any suitable material, preferably iron, and provided with legs or supports A′ and suitably braced, as may be found necessary. At each end of this frame driving-shafts B are provided, upon which sprocket-wheels B′ are secured for the purpose of carrying and driving the sprocket-chain B^2, which forms the carrier used in connection with this invention. This carrier is provided with arms B^3, having at their outer ends an angularly-disposed portion B^4, upon which a contact-wheel B^5 is rotatably mounted. These arms are spaced from each other, so as to receive between the same a can which is carried forward by the contact of the roller with the side of the can, which contact also tends to rotate the can when the latter is in an inclined position over the acid and solder tanks.

At one end of the frame A an acid tank or pan C is supported in any desired manner—for instance, by means of a platform A^2, adapted to receive the flanges C′ of the tank and support the same below the level of the holder. Within this tank a supporting-frame C^2 is provided, and upon this frame a covering of absorbent material, such as flannel or felt, is provided for the purpose of absorbing the acid and delivering the same to the edge of the can as the same is rolled over the frame. The can is supported at its end upon a guide C^4, secured to the platform and having an inclined face C^5 to contact with the end of the can. A cover-plate C^6, having a beveled inner edge C^7, is located upon the platform A^2 and extends to the frame C^2, so as to expose only a small surface of the acid into which the edge of the can may extend, as shown in Fig. 5. This cover-plate is provided with a side guide C^8 in contact with the side of the can for supporting the same during its rotation. Within the space between the cover-plate C^6 and the side guides C^8 the carrier-chain B^2 is adapted to travel.

The can in its travel passes from the acid-tank to a solder pan or tank D, which is also supported upon the platform A^2 and provided with flanges D′, adapted to rest upon this platform. This solder-tank is further provided with a cover-plate D^2, having a depending flange D^3, extending into the solder, and a back guide D^4 to contact with the end of the can, while at the opposite side of the tank a cover-plate D^5 is secured and provided with a deflected flange D^6, extending into the solder. Upon this plate D^5 a side guide D^7 is secured and forms a bearing for contact with the side of the can, similar to the guide C^8. The can as it passes over the acid and solder

tanks is disposed upon its side obliquely to the top of the machine, and as it leaves the solder-tank the can is turned into an upright position by means of a straight guide-rod E at one side of the tank and a coöperating rod E′ at the opposite side, which is curved inward, as shown in Fig. 3, so that the inner end thereof is disposed in a parallel horizontal plane to the outer or fixed end, while upon the face of the machine a flat trip-bar E^2, Fig. 3, is disposed obliquely to the line of travel of the cans and by engaging the lower edge of the can arrests the rolling movement, so that as the rod E′ presses the upper end of the can laterally the draft of the carrier moves the can over the bar and causes the same to rest upon the soldered head and upon the cooling-belt F, which is in alinement with the travel of the cans over the tanks. This belt F is mounted at one end upon a journaling-roller F′ and at its opposite end upon a driving-roller F^2 on shaft B, while below the belt a water-tank F^3 is provided, through which the lower layer of the belt passes beneath a bearing-roller F^4. This tank is adjustably supported by any desired means—for instance, the hangers F^5 at opposite ends, which are secured to the frame of the machine by set-screws F^6. This belt is formed of suitable absorbent material, so that when the heated end of the can rests thereon it is quickly cooled, and this cooling is facilitated by moving the belt at a different rate of speed from the carrier for the can. This is effected by means of the sprrocket-wheel B′, which is of greater diameter than the driving-roller F^2 for the belt. Thus as the can is placed upright upon the belt by the guide-rods the carrier, which is moving at a slightly greater speed, moves or slides the can upon the cooling-belt, thus presenting to the head thereof more wet or cooling surface of the belt to come into contact with the can. The driving-shaft B may be driven by any desired means—for instance, by the pulley G upon the shaft G′, which shaft is provided with a pinion adapted to mesh with a gear G^2 upon the shaft B—while the solder-tank is adapted to be heated by any suitable means—such, for instance, as the burners G^3, as indicated in Fig. 1.

In the operation of the machine the can to be soldered is placed between the arms of the carrier at the acid bath or tank, and the carrier then moves or rolls the can through the acid, thence through the narrow opening in the solder-tank, and as the can leaves the solder the carrier-arm pushes the same up the incline upon the guide-rod and brings the lower edge against the trip-bar, which arrests the rolling motion, when the carrier, continuing to move the can, causes it to tip over this bar and stand with its soldered end upon the carrying-belt between the guide-rods. The motion of the carrier being slightly greater than that of the belt, the can is slid upon the belt, so as to change its position thereon, as indicated by dotted lines in Fig. 3, to bring the moistening-surface of an area of the belt greater than the head of the can into contact with said head for cooling the same, while the continued movement of the belt carries the same through the water-pan, thus again moistening the same. As the can leaves the solder-tank and is turned upright the solder on the sides of the can runs downward and fills up any spaces which may exist in the seam, thus providing a practically tight joint. By providing the belt below the can different diameters of cans can be rolled through and soldered without any change of adjustment of the machine, save the adjustment of proper guide-rods for turning the can upon its end after soldering. It will also be noted that in this machine the solder and acid are both covered by the plates, so as to prevent the formation of dross thereon and retain it always bright and in proper condition for use, thus effecting great saving in the solder used.

It will be obvious that changes may be made in the details of construction and configuration without departing from the spirit of the invention as defined by the appended claims.

Having described my invention and set forth its merits, what I claim, and desire to secure by Letters Patent, is—

1. In a can-soldering machine, a carrier, means for soldering, and a moistened apron at one end of the soldering means arranged to contact with the soldered portion of the can; substantially as specified.

2. In a can-soldering machine, a carrier, means for soldering, a moistened apron at one end of the soldering means arranged to contact with the soldered portion of the can, a water-tank beneath said apron, and means for causing said apron to travel through said tank; substantially as specified.

3. In a can-soldering machine, a carrier, means for soldering, a moistened apron at one end of the soldering means arranged to contact with the soldered portion of the can, a water-tank beneath said apron, and means for causing said apron to travel through said tank at a different rate of speed from the can-carrier; substantially as specified.

4. In a can-soldering machine, a soldering device, a can-carrier mounted to convey cans through said device, a traveling apron located at one end of the soldering device, a water-tank supported beneath said apron, a bearing-roller in said tank for submerging said apron in its passage therethrough and means for moving said apron at a less speed than the can-carrier; substantially as specified.

5. In a can-soldering machine, a soldering device, a can-carrier mounted to convey cans through said device, a traveling apron located at one end of the soldering device, a water-tank supported beneath said apron, a bearing-roller in said tank for submerging said apron in its passage therethrough, means for moving said apron at a less speed than the can-carrier, means for adjusting said tank relative to said apron, and means between

said apron and soldering device for changing the position of the can to bring the heated end into contact with the moistened apron; substantially as specified.

6. In a can-soldering machine, a table provided with a flux-tank and a solder-tank, an end guide for supporting the end of a can in a position obliquely to the face of the table, cover-plates for said tanks, a side guide disposed upon said cover-plates, and a carrier disposed in the space between said guides and cover-plates; substantially as specified.

7. In a can-soldering machine, a table provided with a flux-tank and a solder-tank, an end guide for supporting the end of a can in a position obliquely to the face of the table, cover-plates for said tanks, a side guide disposed upon said cover-plates, a carrier disposed in the space between said guides and cover-plates, an angularly-disposed arm carried by said carrier, and a contact-roller pivoted upon said arm to bear against the lower portion of the can; substantially as specified.

8. In a can-soldering machine, a table provided with a flux-tank and a solder-tank, an end guide for supporting the end of a can in a position obliquely to the face of the table, cover-plates for said tanks, a side guide disposed upon said cover-plates, a carrier disposed in the space between said guides and cover-plates, an angularly-disposed arm carried by said carrier, a contact-roller pivoted upon said arm to bear against the lower portion of the can, a trip-bar at the end of the solder-tank to arrest the rolling motion of the can, and a curved guide to engage the upper portion of the can and turn the same into a vertical position; substantially as specified.

9. In a can-soldering machine, a table provided with a flux-tank and a solder-tank, an end guide for supporting the end of a can in a position obliquely to the face of the table, cover-plates for said tanks, a side guide disposed upon said cover-plates, a carrier disposed in the space between said guides and cover-plates, an angularly-disposed arm carried by said carrier, a contact-roller pivoted upon said arm to bear against the lower portion of the can, a trip-bar at the end of the solder-tank to arrest the rolling motion of the can, a curved guide to engage the upper portion of the can and turn the same into a vertical position, a cooling-apron adapted to receive the can when thus turned, and means for moistening said apron; substantially as specified.

10. In a can-soldering machine, a table provided with a flux-tank and a solder-tank, an end guide for supporting the end of a can in a position obliquely to the face of the table, cover-plates for said tanks, a side guide disposed upon said cover-plates, a carrier disposed in the space between said guides and cover-plates, an angularly-disposed arm carried by said carrier, a contact-roller pivoted upon said arm to bear against the lower portion of the can, a trip-bar at the end of the solder-tank to arrest the rolling motion of the can, a curved guide to engage the upper portion of the can and turn the same into a vertical position, a cooling-apron adapted to receive the can when thus turned, means for moistening said apron and a driving-roller for said apron, and a sprocket for said carrier of greater diameter than the roller for the apron; substantially as specified.

11. In a can-soldering machine, an acid-tank, a supporting-frame therein having an inclined surface, an absorbent covering for said surface, and cover-plates for said tank adapted to present the edge of a can to said absorbent covering; substantially as specified.

12. In a can-soldering machine, an acid-tank, a supporting-frame therein having an inclined surface, an absorbent covering for said surface, cover-plates for said tank adapted to present the edge of a can to said absorbent covering, a solder-tank at one end of said acid-tank, and covering-plates therefor adapted to present a narrow opening to the solder through which the edge of a can may project; substantially as specified.

13. In a can-soldering machine, an acid-tank, a supporting-frame therein having an inclined surface, an absorbent covering for said surface, cover-plates for said tank adapted to present the edge of a can to said absorbent covering, a solder-tank at one end of said acid-tank, covering-plates therefor adapted to present a narrow opening to the solder through which the edge of a can may project, a straight guide-rod at one end of said soldering-tank to engage the upper portion of a can, and an inwardly-curved guide-rod opposite said straight rod; substantially as specified.

14. In a can-soldering machine, an acid-tank, a supporting-frame therein having an inclined surface, an absorbent covering for said surface, cover-plates for said tank adapted to present the edge of a can to said absorbent covering, a solder-tank at one end of said acid-tank, covering-plates therefor adapted to present a narrow opening to the solder through which the edge of a can may project, an inwardly-curved guide-rod opposite said straight rod, a traveling apron to receive cans from said rods, and means beneath said apron for moistening the same; substantially as specified.

15. In a can-soldering machine, an acid-tank, a supporting-frame therein having an inclined surface, an absorbent covering for said surface, cover-plates for said tank adapted to present the edge of a can to said absorbent covering, a solder-tank at one end of said acid-tank, covering-plates therefor adapted to present a narrow opening to the solder through which the edge of a can may project, a straight guide-rod at one end of said solder-

ing-tank to engage the upper portion of a can, an inwardly-curved guide-rod opposite said straight rod, a traveling apron to receive cans from said rods, means beneath said apron for moistening the same, a carrier for the cans having laterally-projecting arms thereon, means for driving said cooling-apron, and means for driving said carrier at a greater speed than the apron; substantially as specified.

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

JOHN A. STEWARD.

Witnesses:

GEO. R. BOTTUM,

GEO. M. WELLS.