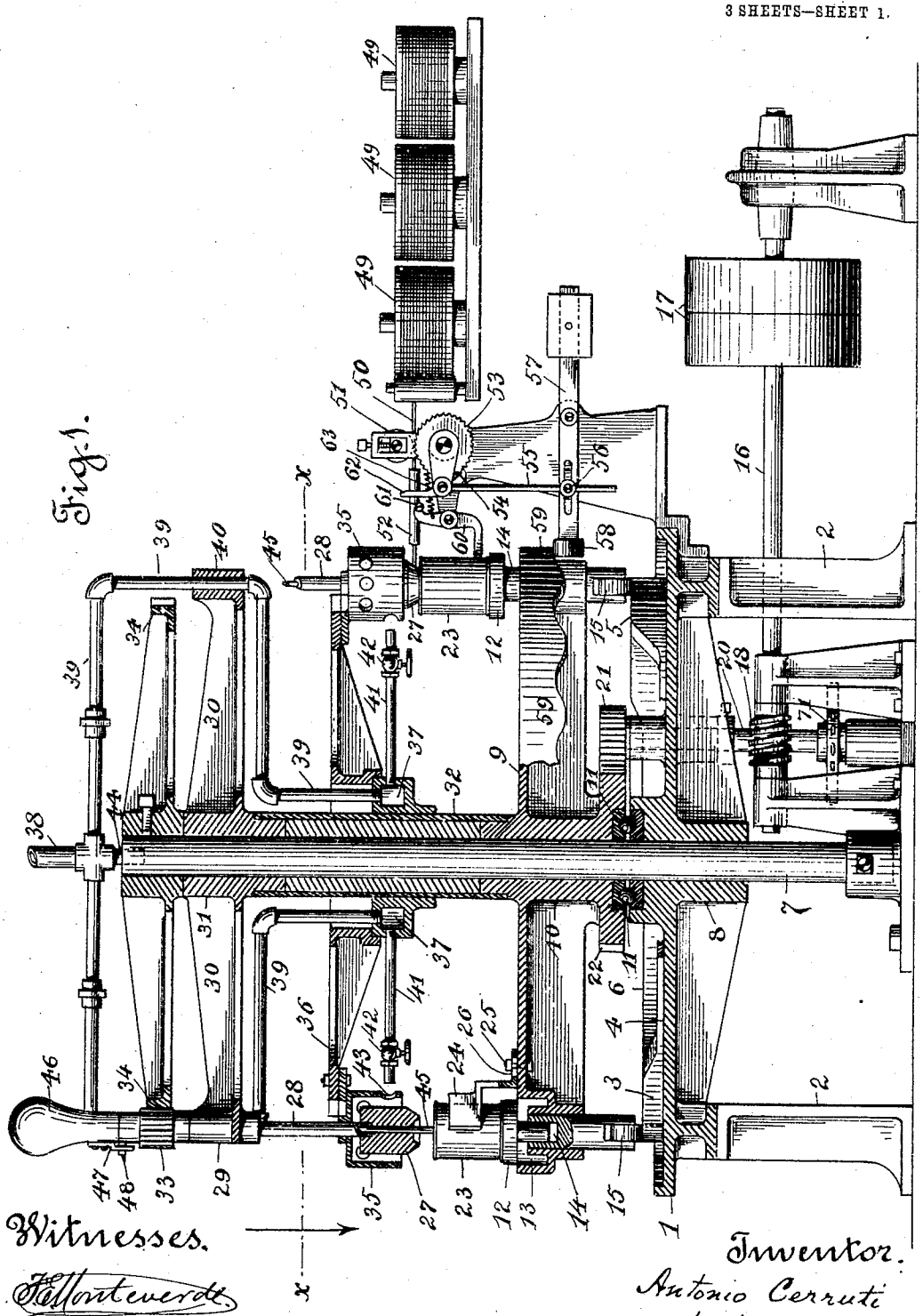
No. 779,526. PATENTED JAN. 10, 1905.

A. CERRUTI.

CAN CAP SOLDERING MACHINE.

APPLICATION FILED MAY 18, 1904.

3 SHEETS—SHEET 1.



Witnesses.

F. Monteverde

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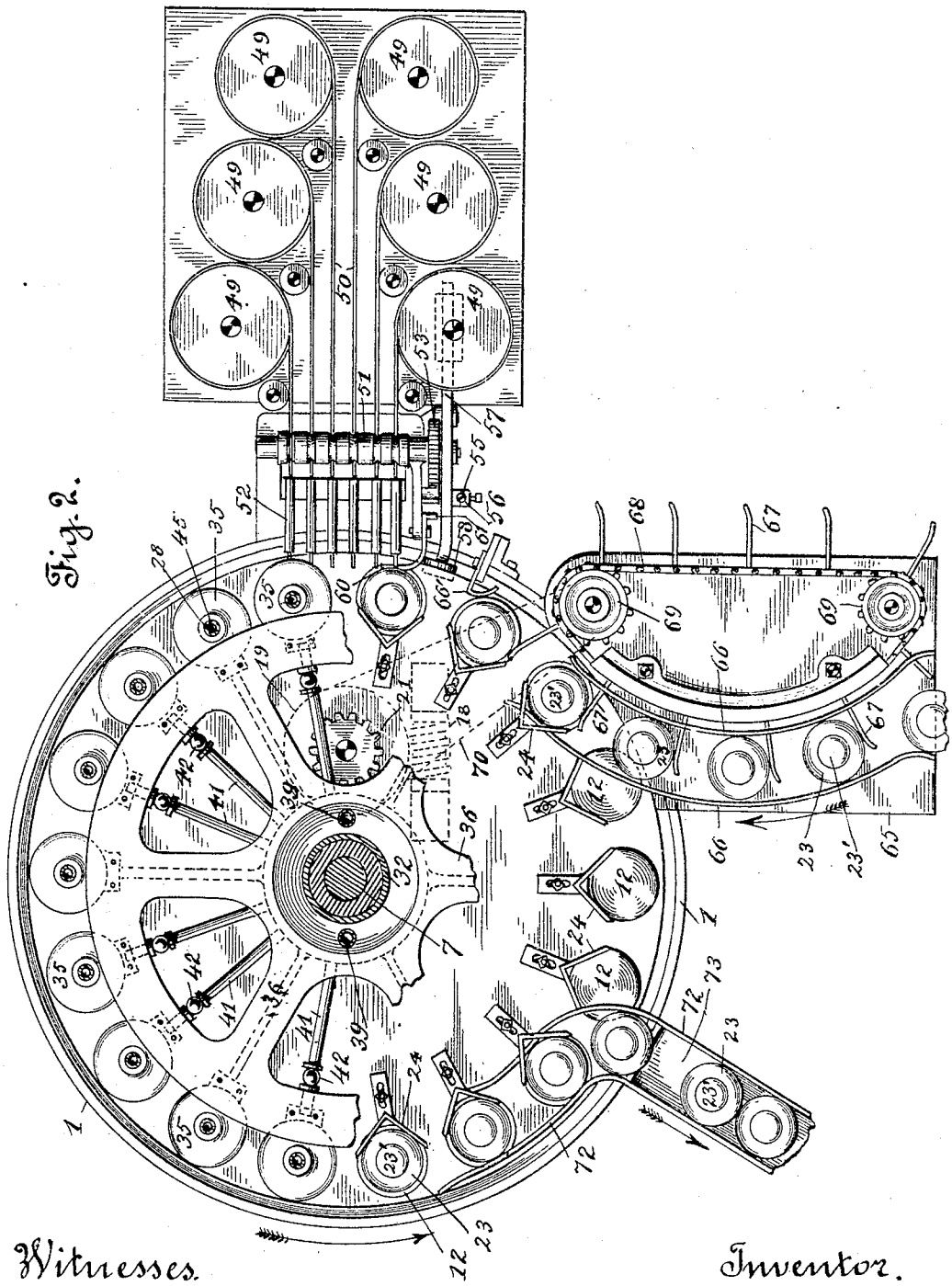
3 SHEETS—SHEET 2.

Fig. 2.



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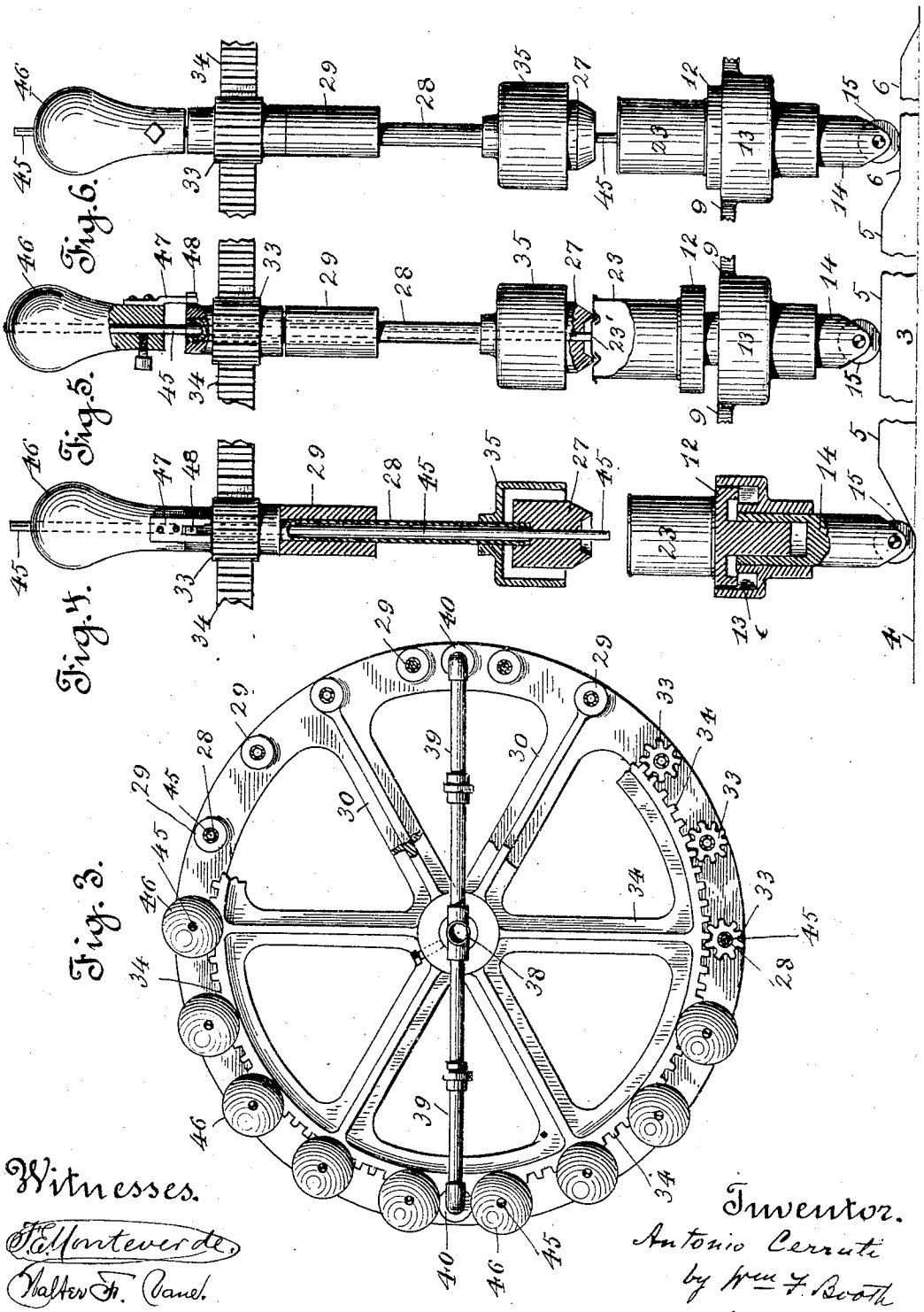

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UNITED STATES PATENT OFFICE.

ANTONIO CERRUTI, OF SAN FRANCISCO, CALIFORNIA.

CAN-CAP-SOLDERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 779,526, dated January 10, 1905.

Application filed May 18, 1904. Serial No. 208,519.

To all whom it may concern:

Be it known that I, ANTONIO CERRUTI, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Can-Cap-Soldering Machines; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of machines for soldering the caps of cans.

The object of my invention is to provide a machine for this purpose of a continuous-rotating type adapted to present the cans in endless single succession to the soldering appliances and to continuously discharge them after the caps have been soldered, whereby the capacity of the machine is increased.

My invention consists in the novel constructions, arrangements, and combinations of parts, which I shall hereinafter fully describe.

Referring to the accompanying drawings, Figure 1 is a vertical sectional elevation, partly broken, of my machine. Fig. 2 is a partly-broken and sectional top view of the machine on the line $x x$ of Fig. 1. Fig. 3 is a partly-broken top plan of the machine, the feeding and delivering mechanism and the solder-feeding device being omitted. Fig. 4 is a sectional detail, enlarged, showing the can-lifting means, the soldering-irons, and the follower-rod, the can in this view being shown in its lowest position. Fig. 5 is a view similar to Fig. 4, but in elevation, partly broken, the can being shown in its highest position. Fig. 6 is a view similar to Fig. 5, showing the can in its intermediate position.

Referring now to Fig. 1, the numeral 1 represents a fixed bed mounted on legs 2. Upon this bed 1 is an annular cam-track 3, which is made in three levels or elevations, the lowest of which is represented by 4, the highest by 5, and the intermediate by 6. These elevations merge into one another by suitable inclines, as seen in Fig. 1.

7 is a vertical non-rotating shaft or axis which passes up through the central hub 8 of the bed 1 and has journaled upon it above said bed the can-table 9 the hub 10 of which is preferably mounted upon the hub 8 of the bed by means of antifriction-bearings, such as are represented by the balls 11. In the outer edge of the can-table 9 is an annular series of can-rests 12, which are guided in their vertical movement in suitable socket-bearings 13 in the can-table and have stems 14, the lower ends of which are provided with rollers 15, which travel upon the cam-track 3. The stems 14 of the can-rests 12 are best made adjustable as to length, which may be done in any suitable manner—as, for example, by the means shown in Figs. 1 and 4, wherein the stem is made up of telescopic sections—the object being to initially adjust the can-rests as to height so as to suit different heights of cans. By the rollers 15 traveling upon the cam-track 3 the can-rests are elevated and are allowed to drop according to the position of the rollers on the cam-track. For example, when the roller 15 is on the lowest level 4 of the cam-track the can-rest 12 will be down to its lowest limit, which is flush with the top of the table, as is shown in Fig. 4. When the roller is upon the highest level 5 of the track, the can-rest will be at its highest limit, as is shown in Figs. 1 and 5, and when the roller is on the intermediate level 6 the can-rest will be at its intermediate height, as is shown in Fig. 6. A rotary motion about the shaft or axis 7 is imparted to the can-table 9 by any suitable power-transmitting mechanism. For present illustration I have shown this mechanism as consisting of a main power-shaft 16, Fig. 1, having the usual fast and loose pulleys 17. This shaft carries on its inner end a worm-pinion 18, which meshes with a worm-gear 19, (indicated in Fig. 2,) which said gear is upon a counter-shaft 20, the upper end of which carries a pinion 21, Figs. 1 and 2, which meshes with a gear 22 on the base of the hub 10 of the can-table 9. It is by this rotary motion of the can-table 9 that the cans are carried around and are raised and lowered.

In order to accurately receive and define the position of the cans 23 upon the can-rests 12, there are secured to the can-table 9 the V-shaped holding-stops 24, Fig. 2, which are best secured to the table adjustably, as is shown, by the securing-bolt 25 passing through an elongated slot 26 in the foot of the stop. By this

adjustable connection the holder-stop may be set accurately to position to receive the can and hold it properly upon the can-rest 12.

27 represents the soldering-irons. There is an annular series of these in vertical alinement with the series of can-rests below. Each iron is carried on the lower end of stem 28, (see Figs. 1, 4, 5, and 6,) the upper end of the stem passing through a socket-guide 29 on the periphery of a spider 30, the hub 31 of which is journaled on the central axis or shaft 7 and is connected by a coupling-hub 32 with the hub of the can-table 9, whereby said spider rotates in unison with the can-table. To the upper end of the soldering-iron stem 28, above the spider-socket 29, is fixed a pinion 33, which pinion engages with a stationary gear 34, firmly secured, as is seen in Fig. 1, to the central axis or shaft 7, so that said gear does not rotate, but the series of pinions 33 revolve around said gear, and thereby turn the soldering-irons 27, each on its own axis, and said irons, in addition to the rotation on their own axes, revolve around the central axis or shaft 7 with the can-table. A heat-hood 35 is fitted over each soldering-iron, said hood being provided with air-vents, as shown in Fig. 1, and secured to a spider 36, the central hub of which is formed into a gas-distributing chamber 37, secured rigidly to the hub-coupling 32, whereby said spider and its connected parts rotate with the can-table about the central axis or shaft 7.

38 is a gas-inlet pipe from which branches 39 extend radially and downwardly past the periphery of gear 34, through sockets 40 in the spider 30, and then inwardly again and downwardly into the gas-distributing chamber 37. From this chamber radiate the gas-delivery pipes 41 in annular series, each being controlled by a cock 42 and adapted to deliver the gas to an opening 43 in the heat-hood 35 of the soldering-iron. The gas-pipe 38 is supported in the top of the fixed shaft 7 by a rotary step at 44, Fig. 1, which permits the gas branches 39 to revolve about the central shaft 7.

In order to hold the cap 23′ (see Fig. 5) of the can in place while being acted upon by the soldering-iron and to keep a pressure upon it for a short time while the solder is cooling, Fig. 6, there is a gravity follower-rod 45. This rod passes freely down through the stem 28 and the soldering-iron 27 and projects below the latter. To the projecting upper end of this follower-rod is secured a weight 46, the base of which coming in contact with the upper hub of the pinion 33 serves to limit the downward movement of the follower-rod. In order to prevent the follower-rod from being accidentally fastened by solder to the can-cap, it is best to give it a movement on its own axis. This is effected by means of the forked clip 47, Figs. 1, 4, and 5, attached to the weight 46 and playing freely over a stud 48, secured to the pinion-hub. This connection, while not interfering with the up-and-down movement of the weight and follower-rod, imparts the rotary movement of the pinion to said weight and rod.

In order to supply the solder to the irons, I have the feed mechanism shown in Figs. 1 and 2.

49 represents rotatively-mounted spools upon which the solder-strips 50 are wound and from which they are paid out. The solder-strips 50, suitably guided, are directed between grooved feeder-rolls 51 and pass through tubular guides 52, the ends of the several strips projecting into the path of the lower ends of the soldering-irons, whereby said irons are supplied with the solder. In order to feed the solder-strips 50 to the irons as fast as needed, I have on the end of the lower feed-roll a ratchet 53, with which an actuating-pawl 54 engages, said pawl being operated by means of a rod 55, (see Fig. 1,) adjustably connected at 56 with a pivoted weighted lever 57, the inner end of which has a roller-bearing 58 traveling against an undulating and serpentine cam-track 59, formed on the periphery of the can-table 9. This track is constructed to vibrate the lever 57 and through the rod 55 to cause the pawl 54 to actuate the ratchet 53 and through the feed-rolls 51 to feed the solder-strips 50 up to the irons. In order to make this feed of the solder-strips dependent upon the approach of a can and to render it inactive between times, I have a pivoted lever 60, the lower end of which projects into the path of the cans and is adapted to be rocked by said cans as they pass. The upper end of this lever 60 has a contact-stud 61, which is adapted to come in contact with a tailpiece 62 of the pawl 54. A spring 63, attached to the lever 60, is so arranged as to cause the stud 61 to remain in normal contact with the tailpiece 62, whereby the normal position of the pawl 54 is out of engagement with the ratchet 53, whereby it follows that although the movement of the pawl, due to the cam-track 59, is constant, yet being normally out of engagement with the ratchet the feed of the solder-strips is intermittent; but when the can comes in contact with the pivoted lever 60 it causes the stud 61 to withdraw from the tailpiece 62 of the pawl 54, whereupon said pawl falls to its engagement with the ratchet 53 and causes the feed of the solder-strips 50 to the irons 27.

In order to feed the cans to the can-rests, there is a platform 65, Fig. 2, upon which are guide-rails 66, between which the cans 23 travel and are directed successively and at proper time to the can-rests 12, a fixed outer guide 66′, Fig. 2, serving to insure their position against the holder-stop 24. The travel of the cans is effected by means of pusher-arms 67, carried by an endless chain 68, mounted upon terminal sprockets 69, one of which is driven by suitable means—as, for example, by the drive-chain 70, (shown in dotted line in Fig. 2,) said chain being driven from a sprocket 71, Fig. 1, on the shaft 20. The cans are delivered from

the can-rests by means of deflecting-guides 72, Fig. 2, which direct them to and upon a discharge-conveyer 73.

A better understanding of the machine will be had from the following description of its entire operation: The cans 23, having been previously provided with the caps 23′, (seen in Fig. 2, and particularly in Fig. 5,) are placed successively upon the platform 65 and by the pusher-arms 67 are advanced in single continuous succession, as indicated in Fig. 2, each one being successively placed upon succeeding can-rests 12, its position thereon being accurately defined by the holder-stop 24. At the time a can is thus placed upon a can-rest 12 the latter is at its lowest limit flush with the table 9, as is seen in Fig. 4, this position being due to the fact that its stem-roller 15 is traveling upon the lowest level 4 of the cam-track 3. In this position also, as shown in Fig. 4, the follower-rod 45 is down to its lowest limit, but out of contact with the can. Now as the can-table 9 and its connected spiders 36 and 30, which carry the irons, their heat-hoods, and the gas-supply channels, are continuously rotating in unison about the central axis it will be seen that immediately after a can reaches its position upon a can-rest 12 the stem-roller 15 of said can will pass upon the highest level 5 of the cam-track, as is shown on the right of Fig. 1 and as is shown clearly in Fig. 5. This rise will cause the can-rest to lift the can up to the iron, as is shown in Fig. 5, the gravity follower-rod 45 being lifted to its highest limit by the contact of the cap 23′ with the lower end of the rod. Now while the parts are maintained in the position shown in Fig. 5 and are revolving around the central axis or shaft 7 the soldering-iron is revolving on its own axis, due to the engagement of its stem-pinion 33 with the fixed gear 34 above. At this same time the can, having come in contact with the solder-feed-regulating lever 60, causes, through the pawl-and-ratchet mechanism heretofore described, the feed of the solder-strips to position against the iron, whereby solder is supplied to said iron and being melted flows down to its place to solder the cap to the head of the can. Also it will be seen that through the gas connections the irons will be kept hot. The position of the parts shown in Fig. 5 continues long enough to insure the soldering of the cap, and then the stem-roller 15 of the can-rest reaching the intermediate level 6 of the cam-track 3 allows the can-rest, with its can, to drop down to an intermediate position away from the soldering-iron, as is shown in Fig. 6. This drop, however, is within the limit of the drop of the follower-rod 45, so that said rod still remains, as shown in Fig. 6, in contact with the can-cap, and as said rod is rotating on its own axis it is not liable to be accidentally fastened to the cap by solder. While the parts remain in this intermediate position the follower-rod holds the cap well down to its seat until the solder cools. By this time the can is approaching the deflecting-guides 72 and having entered between them, as shown in Fig. 2, is shortly dropped still lower to the lowest level 4 of the cam-track 3, away from the follower-rod, as is shown in Fig. 4, and being now entirely free is directed by the rails 72 to the discharge-conveyer 73. This operation is repeated with successive cans indefinitely.

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

1. In a can-cap-soldering machine, the combination of a can-table, an overlying annular series of soldering-irons, a vertically-movable follower-rod centrally disposed in each iron, to press upon the can-cap, means for rotating the can-table, and the series of soldering-irons with their follower-rods in unison, means for rotating said irons on their own axes, means for positively rotating said rods on their own axes, means for elevating the cans from the table successively into operative contact, each with its overlying iron and follower-rod, and means for withdrawing said cans successively from said irons and rods.

2. In a can-cap-soldering machine, the combination of a can-table, an overlying annular series of soldering-irons, means for heating said irons, a vertically-movable follower-rod centrally disposed in each iron to press upon the can-cap, means for rotating the can-table, the series of soldering-irons with their follower-rods and the heating means in unison, means for rotating said irons on their own axes, means for positively rotating said rods on their own axes, means for elevating the cans from the table successively into operative contact, each with its overlying iron and follower-rod, and means for withdrawing said cans successively from said irons and rods.

3. In a can-cap-soldering machine, the combination of a can-table having an annular series of vertically-movable rests to receive and carry the cans, an annular series of axially-rotatable soldering-irons in vertical alinement above said can-rests, means for rotating the can-table and the series of soldering-irons in unison about a common axis, and a fixed cam-track engaging the can-rests, said track having different levels adapted to elevate said rests to lift the cans into operative contact with the irons, and to permit them to drop therefrom, to withdraw the cans from the irons.

4. In a can-cap-soldering machine, the combination of a can-table having an annular series of vertically-movable rests to receive and carry the cans, an annular series of soldering-irons in vertical alinement above said can-rests, a vertically-movable follower-rod centrally disposed in each iron to press upon the can-cap, means for rotating the can-table and the series of soldering-irons with their follower-rods in unison about a common axis,

and a fixed cam-track engaging the can-rests, said track having a level adapted to elevate said rests to lift the cans into operative contact with the irons and rods, a second level to drop the rests to lower the cans from the irons, while maintaining contact with the rods, and a third level to drop the rests to withdraw the cans from said rods.

5. In a can-cap-soldering machine, the combination of a fixed bed having an annular cam-track upon it, a can-table having an annular series of can-rests with vertically-movable stems having rollers bearing on the cam-track whereby the rests are elevated and lowered, an annular series of soldering-arms alined above the can-rests, means for heating the irons, a connection between the can-table, the irons and heating means and means for rotating them in unison about a common axis.

6. In a can-cap-soldering machine, the combination of a fixed bed having an annular cam-track upon it, a can-table having an annular series of can-rests with vertically-movable stems having rollers bearing on the cam-track whereby the rests are elevated and lowered, an annular series of soldering-irons alined above the can-rests, means for heating the irons, a connection between the can-table, the irons and heating means, means for rotating them in unison about a common axis, a non-rotating gear in the axis of rotation of said series of irons, and pinions carried by the irons and engaging said gear whereby the irons are rotated on their own axis.

7. In a can-cap-soldering machine, the combination of a fixed bed having an annular cam-track upon it, a can-table having an annular series of can-rests with vertically-movable stems having rollers bearing on the cam-track whereby the rests are elevated and lowered, an annular series of soldering-irons alined above the can-rests, means for heating the irons, a connection between the can-table, the irons and heating means, means for rotating them in unison about a common axis, a non-rotating gear in the axis of rotation of said series of irons, and pinions carried by the irons and engaging said gear whereby the irons are rotated on their own axis, a vertically-movable follower-rod centrally disposed in each iron adapted to press upon the can-cap, and a connection for rotating the rod on its axis with the axial rotation of said iron.

8. In a can-cap-soldering machine, the combination of a can-table having an annular series of vertically-movable can-rests adapted to alternately lift and lower the cans, an annular series of soldering-irons alined above the can-rests, heating-hoods around the soldering-irons, a central gas-distributing chamber, pipes leading to said chamber to supply it, and radial gas branches from the chamber to supply the heating-hoods, a connection between the can-table, soldering-irons, hoods and gas-channels and means for rotating them in unison about a common axis.

9. In a can-cap-soldering machine, and in combination with the rotating can-table and annular series of soldering-irons, the solder-feed rolls, and the means for actuating them consisting of a pawl and ratchet, a pivoted lever, a cam-track on the rotating table to vibrate the lever and a connection from the lever to operate the pawl, and the means for controlling said feed-roll-actuating mechanism, consisting of a pivoted lever normally held in contact with the pawl to keep it from engagement with the ratchet, said lever projecting into the path of the cans and adapted by contact therewith to relieve the pawl to permit its engagement with the lever.

In witness whereof I have hereunto set my hand.

ANTONIO CERRUTI.

Witnesses:
WALTER F. VANE,
D. B. RICHARDS.