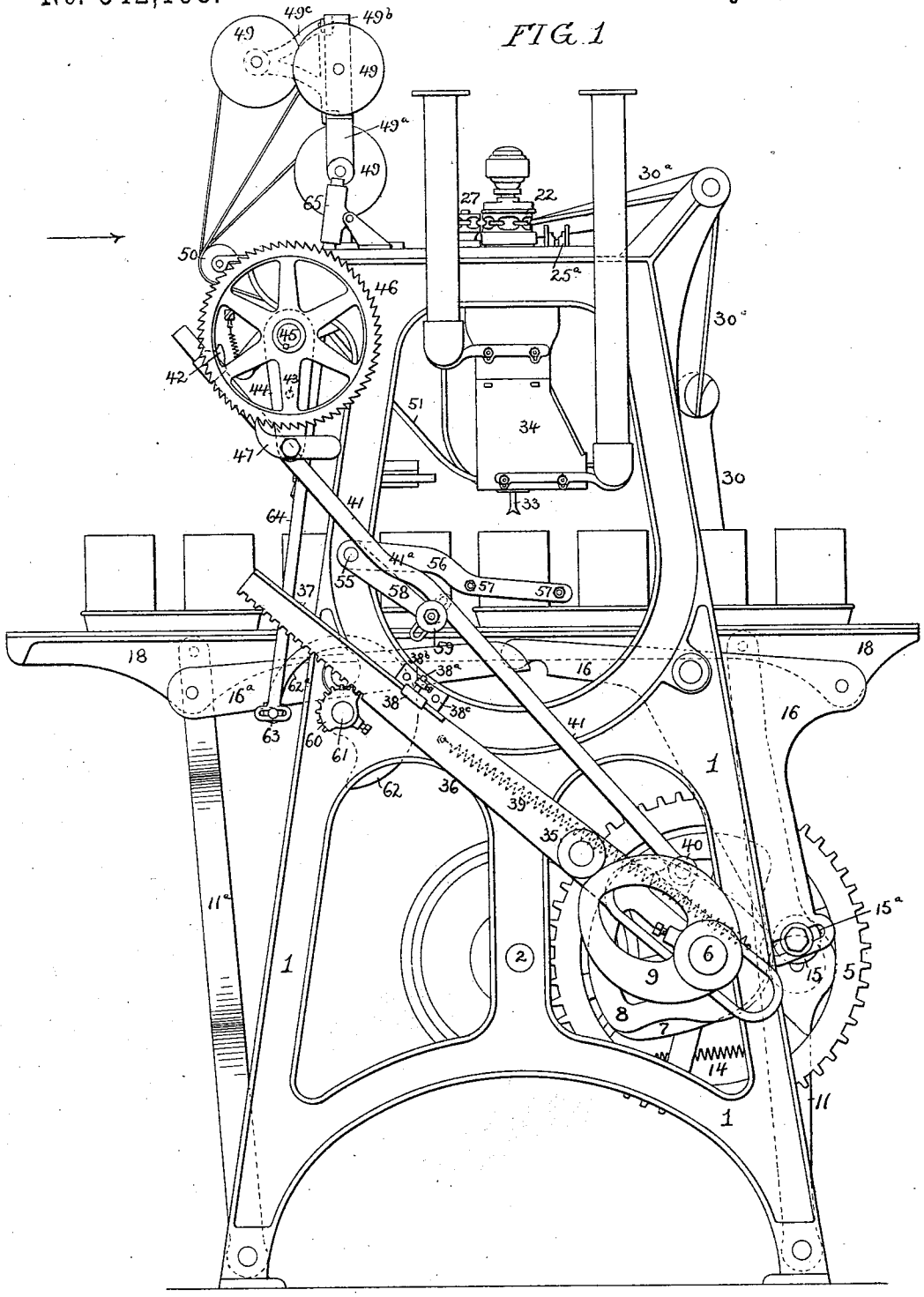
(No Model.) 5 Sheets—Sheet 1.

C. M. KRUSE.

CAN CAPPING MACHINE.

No. 542,198. Patented July 2, 1895.

FIG. 1



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(No Model.) 5 Sheets—Sheet 2.

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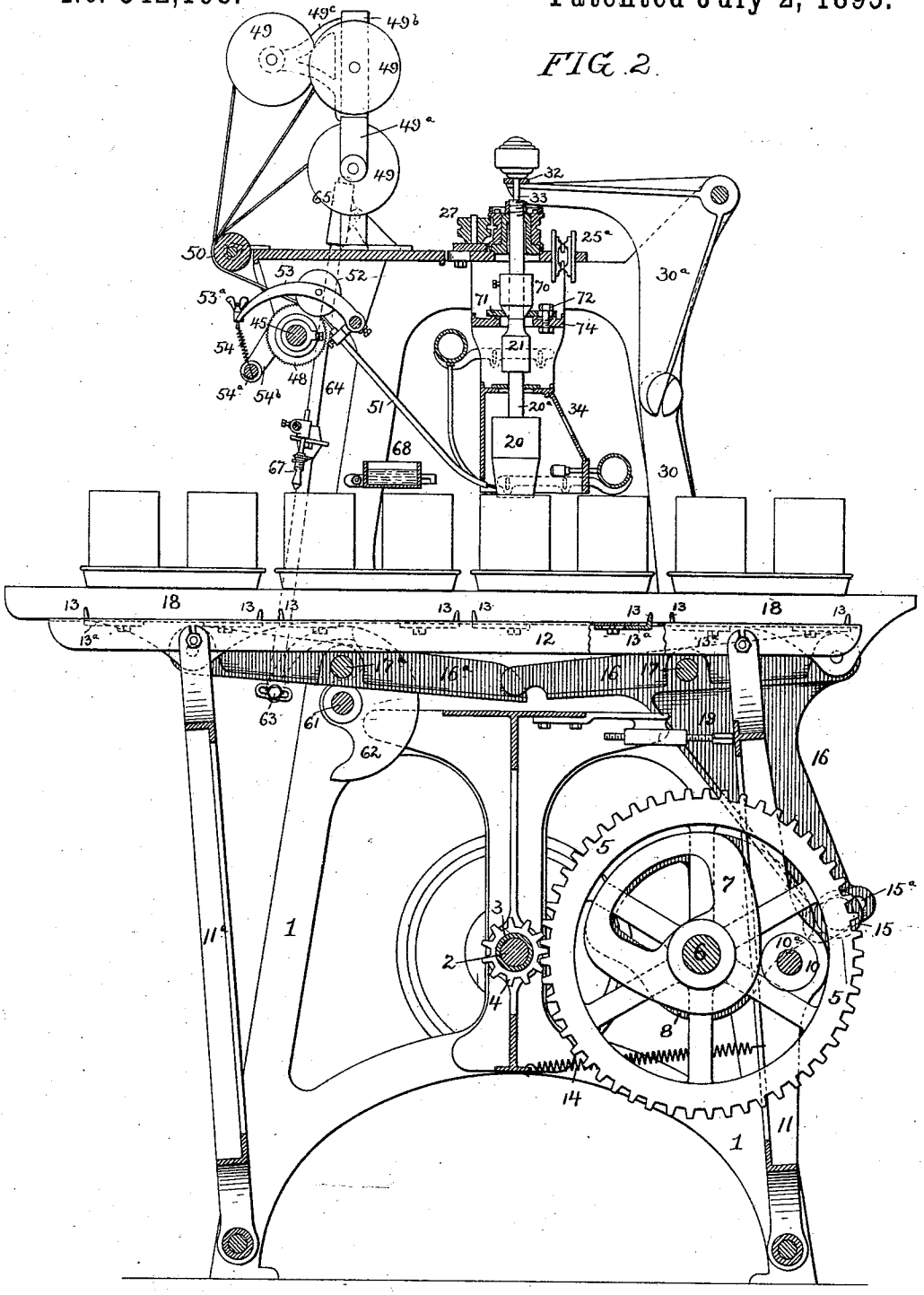
FIG. 2.



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CAN CAPPING MACHINE.

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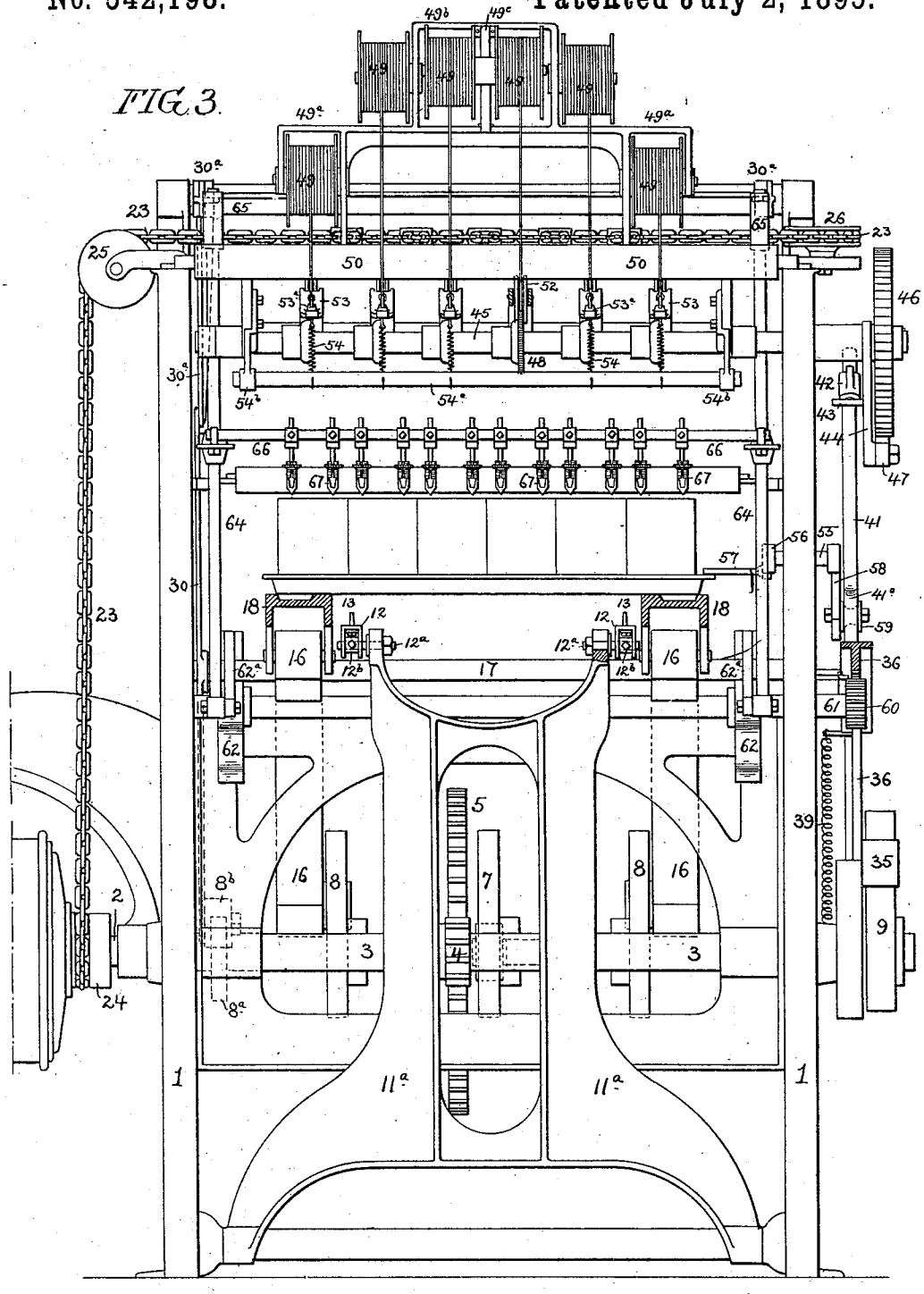
FIG. 3.



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(No Model.) 5 Sheets—Sheet 4.

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CAN CAPPING MACHINE.

No. 542,198. Patented July 2, 1895.

FIG. 4

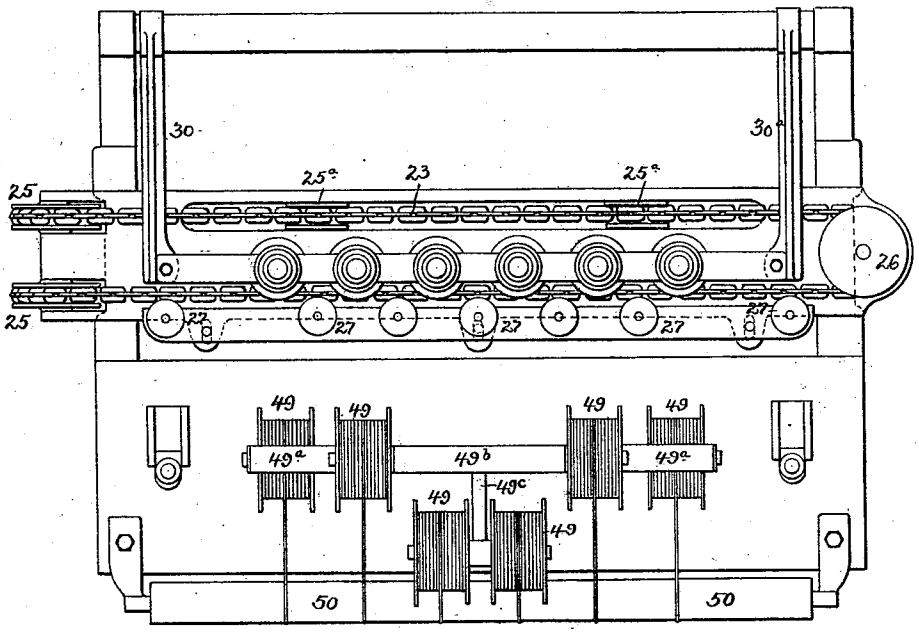

FIG. 7

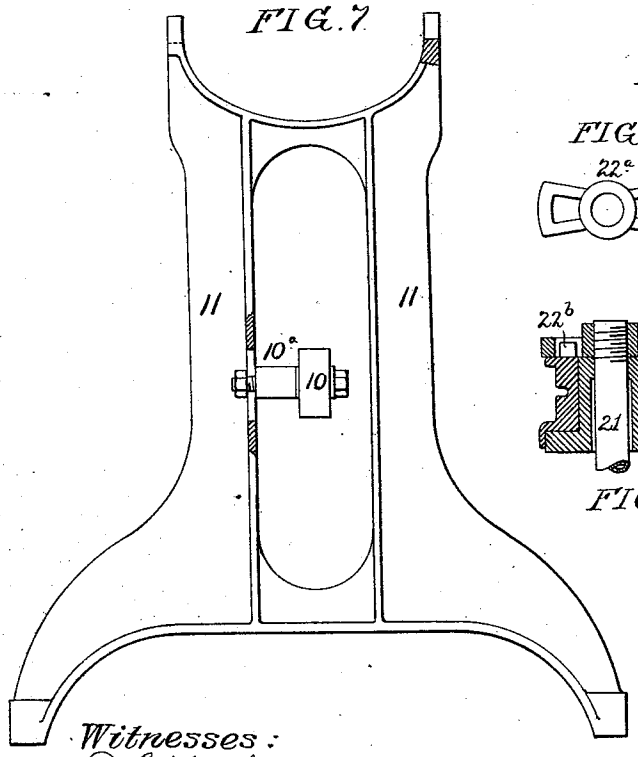

FIG. 6.

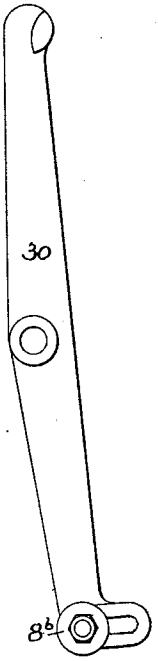

FIG. 10

FIG. 9.

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(No Model.) 5 Sheets—Sheet 5.

C. M. KRUSE.

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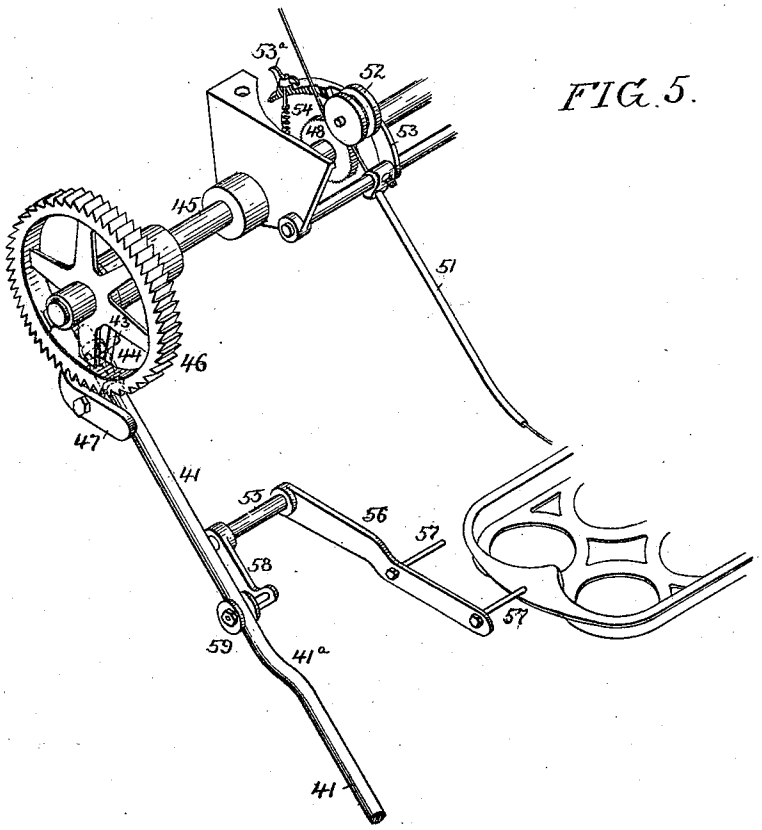

FIG. 5.

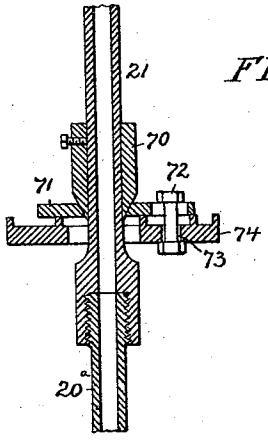

FIG. 8.

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UNITED STATES PATENT OFFICE.

CHARLES M. KRUSE, OF BRIDGETON, NEW JERSEY, ASSIGNOR TO THE CANNERS SUPPLY COMPANY, OF SAME PLACE.

CAN-CAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 542,198, dated July 2, 1895.

Application filed April 3, 1895. Serial No. 544,294. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. KRUSE, a citizen of the United States, and a resident of Bridgeton, New Jersey, have invented certain Improvements in Can-Capping Machines, of which the following is a specification.

My invention comprises certain improvements in the mechanism for feeding can-trays forward and presenting the cans to the rotating irons; also, certain improvements in the mechanism for supporting, rotating, and adjusting the irons; also, certain improvements in the solder-spool frame and in the mechanism employed for feeding the wire solder to the irons, and, finally, certain improvements in the devices employed for depositing a certain amount of acid upon each can prior to the soldering of the same. These movements are fully set forth and specifically claimed hereinafter, reference being had to the accompanying drawings, in which—

Figure 1 is a side view of a can-capping machine embodying my invention. Fig. 2 is a longitudinal section of the machine, with some of the parts in elevation. Fig. 3 is an end view of the machine, looking in the direction of the arrow, Fig. 1. Fig. 4 is a plan view of the upper portion of the machine. Fig. 5 is a perspective view of the solder-feeding devices. Fig. 6 is a side view of a lifter-lever forming part of the machine. Fig. 7 is a side view, partly in section, of a feed-lever constituting one of the elements of the machine. Fig. 8 is an enlarged sectional view of the supporting and adjusting devices for one of the soldering-irons. Fig. 9 is an enlarged sectional view of the supporting and driving device of one of the soldering-iron spindles, and Fig. 10 is a plan view of part of said driving device.

The frame 1 of the machine has bearings for the driving-shaft 2, to which power is applied, this shaft having a sleeve 3, which is provided with a spur-pinion 4, meshing with a spur-wheel 5 on a shaft 6, which carries a series of cams 7, 8, 8^a, and 9, the cam 7 being located centrally on the shaft, two cams 8 being arranged one on each side of the cam 7, the cam 8^a beyond one of the cams 8, and the cam 9 at one end of the shaft outside of the frame 1. The central cam 7 acts upon an antifriction-roller 10, carried by a bolt 10^a, secured to one side of a swinging frame 11, which is pivoted to a cross-bar near the bottom of the frame 1, and at the back of the machine is a similar frame 11^a, these two frames being pivoted at the upper ends to tray-feeding bars 12 of inverted-U shape, as shown in Fig. 3, the bars having projections 13, spaced in accordance with the width of the trays to be acted upon and adjustable to suit trays of different widths, each projection being adapted to a longitudinal slot in the horizontal web of the bar and having a plate 13^a bearing against the bottom of said web and secured thereto by a nut on a bolt which is adapted to a slot in the plate, as shown in Fig. 2.

A pin 12^a is secured in a vertical slot in each of the forks at the upper end of each frame 11 and 11^a, the pin having a collar on one side of the fork and a nut on the other side, so that it can be adjusted vertically, and on the pin is a collar 12^b, fitting between the flanges of the hollow bar 12 and secured in position on the pin 12^a by a set-screw, so that it can be adjusted laterally on the pin to accord with the desired lateral position of the bar 12 without interfering with the pivotal function of the pin.

The frame 11 is acted upon by a spring 14, which tends to keep the antifriction-roller 10 in contact with the face of the cam 7, so that as said cam rotates swinging movements will be imparted to the frames 11 11^a, and the tray-feeding bars 12 will be caused to move in a course represented by the arcs of circles traveled by the upper ends of said frames 11 and 11^a.

Each of the cams 8 acts upon an antifriction-roller 15, carried by a bolt which is adjustable in a slot 15^a at the end of the lower arm of a lever 16, which is hung to a cross-bar 17 of the frame 1, the inner end of the upper arm of each of said levers 16 overlapping and acting upon the inner end of a lever 16^a, hung to a cross-bar 17^a on the frame 1, the outer ends of the upper arms of each pair of levers 16, and the outer ends of levers 16^a being pivoted to tray-lifter bars 18, so that as the cams 8 are rotated the levers 16 and 16^a will be vibrated and the bars 18 will be caused to rise and fall, the cams 8 being

so shaped as to retain the bars for a certain length of time in both the elevated and depressed positions.

The positions occupied by the bars 18 when fully lifted can be regulated by the adjustment of the antifriction-rollers 15 on the levers 16, so as to adapt the machine for acting upon cans of different heights.

An adjustable stop 19, consisting of a screw-stem adapted to a nut forming part of a bracket on the fixed frame 1, serves to arrest the inward movement of the frame 11, and consequently provides for regulating the rearward position of the tray-feeding bars 12 so as always to bring the cap of the can directly under the soldering-iron, and the forward throw of the frames 11 and 11^a may be regulated by adjusting nearer to or farther from the fulcrum of the frame 11 the bolt 10^a, which carries the roller 10, acted on by the cam 7, the frame being slotted for this purpose, as shown in Fig. 7.

The soldering-irons 20 are carried by tubes 20^a, which, as shown in Fig. 8, are screwed into the enlarged lower ends of hollow spindles 21, and each of said spindles 21 has secured to it at the upper end a drive-plate 22^a, slotted for the reception of lugs 22^b, projecting upwardly from a sprocket-wheel 22, which turns on a hollow bearing projecting from the top bar of the frame, as shown in Fig. 9, and engages one run of an endless driving-chain 23, actuated by a sprocket-wheel 24 on the driving-shaft 2, suitable idler-wheels 25, 25^a, and 26 serving to properly support and guide this chain, and adjustable sprocket-wheels 27 serving to keep the driving-chain in proper engagement with the sprocket-wheels 22 of the spindles 21. The loose driving connection between the sprocket-wheel 22 and the drive-plate 22^a permits a certain play of the spindle 21, which would be impossible if said spindle was rigidly secured to the sprocket-wheel.

The cam 8^a acts upon an antifriction-roller 8^b, adjustable in a slot at the lower end of a lever 30, hung to the cross-bar 17 and engaging at the upper end with one arm of a bell-crank lever 30^a, which is secured to a rock-shaft 31 at the top of the machine, this rock-shaft also having another lever 30^a, and these levers acting upon a transverse bar 32, which supports the weighted cap-holding rods 30, so that when the cans are lifted into position to be soldered said cap-holding rods are permitted to descend in order to hold the caps firmly in position upon the cans, the rods being raised when the cams are lowered. The descent of the rods is governed by the adjustment of the roller 8^b at the lower end of the lever 30, to suit the height of the cans which are being acted upon.

The soldering-irons are inclosed in the hood or casing 34 and are heated by gas-flames in the usual way.

The cam 9 at the end of the shaft 6 acts upon an antifriction-roller 35 upon a sliding rack-bar 36, the latter being slotted at the lower end so as to embrace and be guided by the shaft 6, and having at the upper end a flange 37, which is guided by a bracket 38, having at the back a stem 38^a, secured to a lug 38^b, projecting from a plate 38^c, secured to the fixed frame, the antifriction-roller 35 being kept in constant engagement with the cam 9 by the action of a spring 39. The bracket, with its rotatable pivot-stem, can be adjusted to suit any possible variation in the position of the rack-bar 36.

Hung to a stud 40 on the sliding rack-bar 36 is a rod 41, which has at the upper end a lug 42, adapted, under certain circumstances, to engage with a pin 43 upon an arm 44 loosely hung to a shaft 45, which is mounted in suitable bearings at the upper end of the machine and has at one end a ratchet-wheel 46, keyed or otherwise secured to it, a weighted pawl 47 at the lower end of the arm 44 engaging with said ratchet-wheel. The shaft 45 also has a series of wire-solder feed-wheels 48 secured thereto so as to be laterally adjustable thereon, each of these wheels being toothed or roughened exteriorly so as to insure a proper hold upon the wire solder which is drawn from spools 49 mounted at the top of the machine, there being as many of these spools as there are cans in a row upon each can-tray. Each strip of wire solder in leaving the spool passes around a guide-roller 50, thence over the feed-wheel 48, and thence through a guide-tube 51, which terminates adjacent to the lower end of the iron. Hence, as the feed-wheel 48 is turned to the extent of part of a revolution a certain amount of wire will be fed through the tube 51 and into contact with the iron.

The frame which carries the spools 49 has a wide lower portion 49^a with a spool-spindle at each end, a narrower upper portion 49^b with a spool-spindle at each end, and a forwardly-projecting bracket 49^c, having at the front end a spindle projecting in both directions therefrom, each end of the spindle carrying a spool. By this means each spool-spindle is independent of the others and is readily accessible, so that any one of the spools can be removed or replaced without disturbing the others.

The solder is held in contact with each feed-wheel 48 by means of a grooved presser-wheel 52, carried by a pivoted arm 53, which has at the outer end an opening for the reception of a bolt acted upon by a thumb-screw 53^a, the lower end of this bolt being connected to the upper end of a spring 54, the lower end of which is connected to a rod 54^a carried by depending arms 54^b. By adjusting the nut 53^a any desired degree of pressure may be exerted upon the solder.

Solder should be fed to the irons only when the cans are presented for the action of said irons. Hence some means dependent for its action upon the presence of a can or can-tray in proper position should be used to govern

the engagement of the lug 42 of the rod 41 with the pin 43 of the pawl-carrying arm 44. I therefore provide at one side of the machine a short shaft 55, which carries at the inner end an arm 56, having inwardly-projecting pins 57, which extend into the path of the edge of the tray lifted by the bars 18, the outer end of said shaft 55 having an arm 58, which carries a grooved roller 59, serving as a support for the rod 41. When, therefore, the can-trays are depressed, or there are no cans in position for being acted upon by the soldering-irons on the rise of the lifting-bars 18, the rod 41 will be permitted to remain in the depressed position, as shown in Fig. 1, and hence the lug 42 will fail to engage with the pin 43 and there will be no operation of the arm 44, ratchet-wheel 46, and feed-wheel 45, and hence no feed of the solder to the irons; but if a tray is present on the lifter-bars it will, on the rise of said bars, strike the pins 57 of the arms 56 and cause upward movement of the arm 58 and a lift of the rod 41, so that on the upward movement of said rod its lug will engage with the pin of the arm 44, and there will be a movement of the feed-wheel 45 to the extent necessary to feed the desired amount of solder to the irons.

The rod 41 has a bent portion 41^a, which, as it passes over the roller 59, permits the upper portion of said rod 41 to move downwardly to accommodate the arc of a circle in which the pin 43 travels.

The sliding rack 36 acts upon a toothed segment 60 upon the end of a transverse shaft 61, which has near each end a segment 62, each segment having a projecting arm 62^a, carrying a pin 63, which is adapted to the slotted lower end of the rod 64, the upper end of which is guided in a swinging block 65, hung to a suitable bracket at the top of the machine. The rods 64 carry a transverse shaft 66, to which are secured acid-feeding devices 67, of which there are preferably two for each can, as shown in the end view, Fig. 3.

Mounted upon the frame of the machine is an acid-vessel 68, and owing to the means employed for mounting and operating the acid-feeding devices each of the same travels in an inverted V-shaped path, the cup of the acid-feeder at the termination of its descent of one leg of the V dipping into the acid-vessel 68, and at the termination of the descent of the other leg of the V coming into contact with the top of the can.

When the acid-cup dips into the acid-vessel 68, it is filled with acid, and when the descent of the acid-cup is stopped by contact with the top of a can a certain portion of the acid therein is caused to overflow from the same onto the top of the can. By adjusting the lower ends of the rods 64, in respect to the arms 62^a, the point upon the can at which the acid-cup descends can be readily governed.

Each of the soldering-iron spindles 21 has secured to it, so as to be adjustable vertically, a collar 70, with conical base adapted to a conical seat in a plate 71, slotted laterally for the reception of a bolt 72, which is adapted to a longitudinal slot 73, in the fixed cross-bar 74 of the frame, this construction providing for the vertical support and for the vertical, lateral, and longitudinal adjustment of the soldering-irons.

In the operation of the machine the cans are deposited upon the feeding-bars 12 at one end of the machine when the lifting-bars 18 are down and the feeding-bars are retracted. The feed-bars then move forward so as to advance each can-tray to the desired extent, and the lifting-bars then raise and elevate all of the can-trays, so that the cans of the row which is beneath the soldering-irons are subjected to the action of the same. Meantime the tray-feeding bars have been retracted for a fresh stroke, and when the row of cans has been soldered the lifting-bars descend, depositing the can-trays upon the feed-bars, on which they are properly centered and retained by the lugs 13, and the feed-bars then make another forward stroke, the lifting-bars again rise, and the operations are repeated indefinitely.

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

1. Can feeding mechanism for can capping machines, comprising tray lifting bars and tray feeding bars operating alternately, engaging levers carrying said lifting bars, swinging frames for the feeding bars, and cams for actuating said levers and frames, the lifter actuating levers having adjustable rollers on which their cams act, substantially as specified.

2. In can tray feeding devices for can capping machines, the combination of tray lifting bars and tray feeding bars operating alternately, said tray feeding bars having slotted webs and adjustable plates having lugs or pins for centering and retaining the trays on the feed bars, substantially as specified.

3. In can tray feeding mechanism for can capping machines, the combination of the swinging frames, having laterally projecting pins, tray feeding bars, and collars engaging with said bars, and laterally adjustable on the pins, substantially as specified.

4. In can tray feeding mechanism for can capping machines, the combination of the swinging frames having vertical slots, pins adjustable in said slots, and projecting laterally from the frames, and feed bars hung to said pins, substantially as specified.

5. In can tray feeding devices for can capping machines, the combination of the tray lifters and the tray feeders operating alternately, with engaging levers carring the lifting bars, a pair of swinging frames carrying the feeding bars, cams for operating said levers and frames, and an adjustable roller on one of the frames on which its cam acts, substantially as specified.

6. In can tray feeding devices for can capping machines, the combination of the tray lifters, the engaging levers carrying the same, the tray feeding bars, the swinging frames carrying the same, cams for actuating said frames and levers, an adjustable stop screw for limiting movement of one of the frames in one direction, and an adjustable roller on said frame for the action of the cam, substantially as specified.

7. The combination of the weighted can-cap holder, lifter levers for raising the same, a lever engaging with one of said lifters, a cam for actuating said lever, and an adjustable roller on the lever for engaging with said cam, substantially as specified.

8. The combination in solder feeding devices for can capping machines, of a feed shaft having a ratchet wheel, a loose arm having a pawl for engaging with said ratchet wheel, a reciprocating rod having an inclined portion, projections on the rod and arm for engaging one with the other, and a rod supporting device having a portion projecting into the path of the can tray whereby said rod is lifted into or dropped out of operative position, depending upon the presence or absence of the cans in position to be acted upon, substantially as specified.

9. The combination of the solder feed shaft and its ratchet wheel, the loose arm having a pawl for engaging with said ratchet wheel, the reciprocating rod, having an inclined portion, projections on the rod and arm for engaging each other, and a rock shaft having one arm serving as a support for the rod, and another arm with a projection extending into the path of the can tray, substantially as specified.

10. The combination of the acid feeding device, the acid vessel, and operating mechanism for said device, comprising a rod guided at its upper end in a swinging bar, a vibrating arm and means whereby the said rod is adjustably connected to the arm, substantially as specified.

11. The combination of the solder feed shaft and its feed wheels, the presser wheels, arms carrying the same, a suspended rod, and springs connecting the outer ends of said arms to said rod, substantially as specified.

12. The combination of the solder feed shaft and its feed wheels, the presser wheels, arms carrying the same, adjustable bolts carried by said arms, and springs connected at the upper ends to said bolts and at the lower ends to a fixed rod, substantially as specified.

13. The combination of the soldering irons, the spindles therefor, collars secured to said spindles and having tapered lower ends, a fixed supporting bar, and plates adjustable on said bar and having tapered seats for said collars, substantially as specified.

14. The combination of the soldering iron spindle, having a slotted drive plate at the upper end, with the driving sprocket wheel adapted to a bearing on the fixed frame, and having lugs engaging with the slots of the drive plate, substantially as specified.

15. The combination of the fixed frame, the acid feeding device, the reciprocating drive rack therefor having a back flange, the bracket for guiding said flange, a stem on said bracket, and a lug secured to the fixed frame and constituting a bearing in which said stem is free to slide and turn, substantially as specified.

16. The combination of the row of soldering irons, the series of solder spools, one for each iron of the row, and a solder spool frame comprising the expanded lower portion with spool spindle at each end, the contracted upper portion also having a spool spindle at each end, and a central forwardly projecting bracket having laterally projecting spool spindles at its forward end, substantially as specified.

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

CHARLES M. KRUSE.

Witnesses:
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