

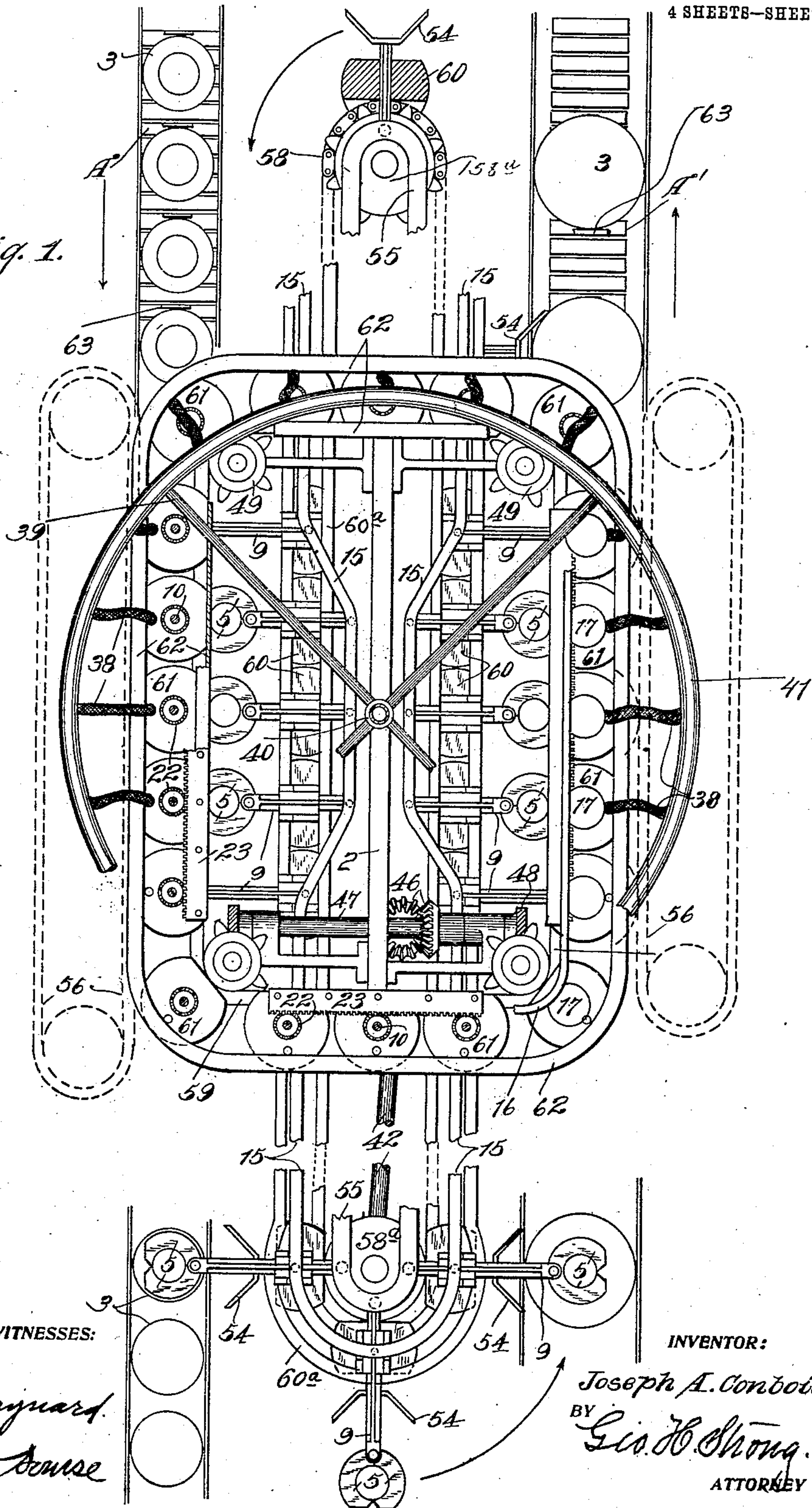
935,462.

J. A. CONBOIE.
CAN CAP SOLDERING MACHINE.
APPLICATION FILED JAN. 24, 1908.

Patented Sept. 28, 1909.

4 SHEETS—SHEET 1.

Fig. 1.



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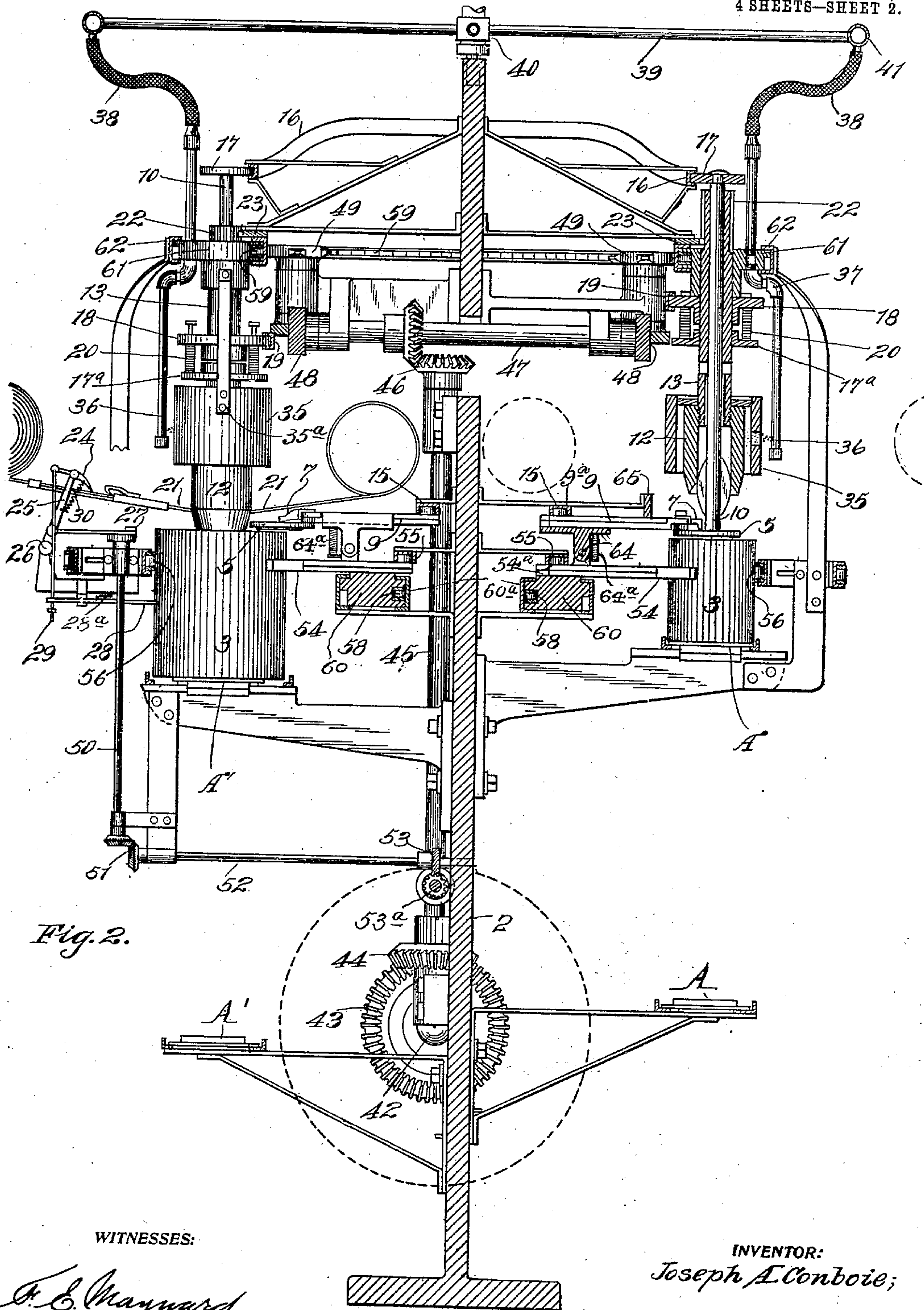


Fig. 2.

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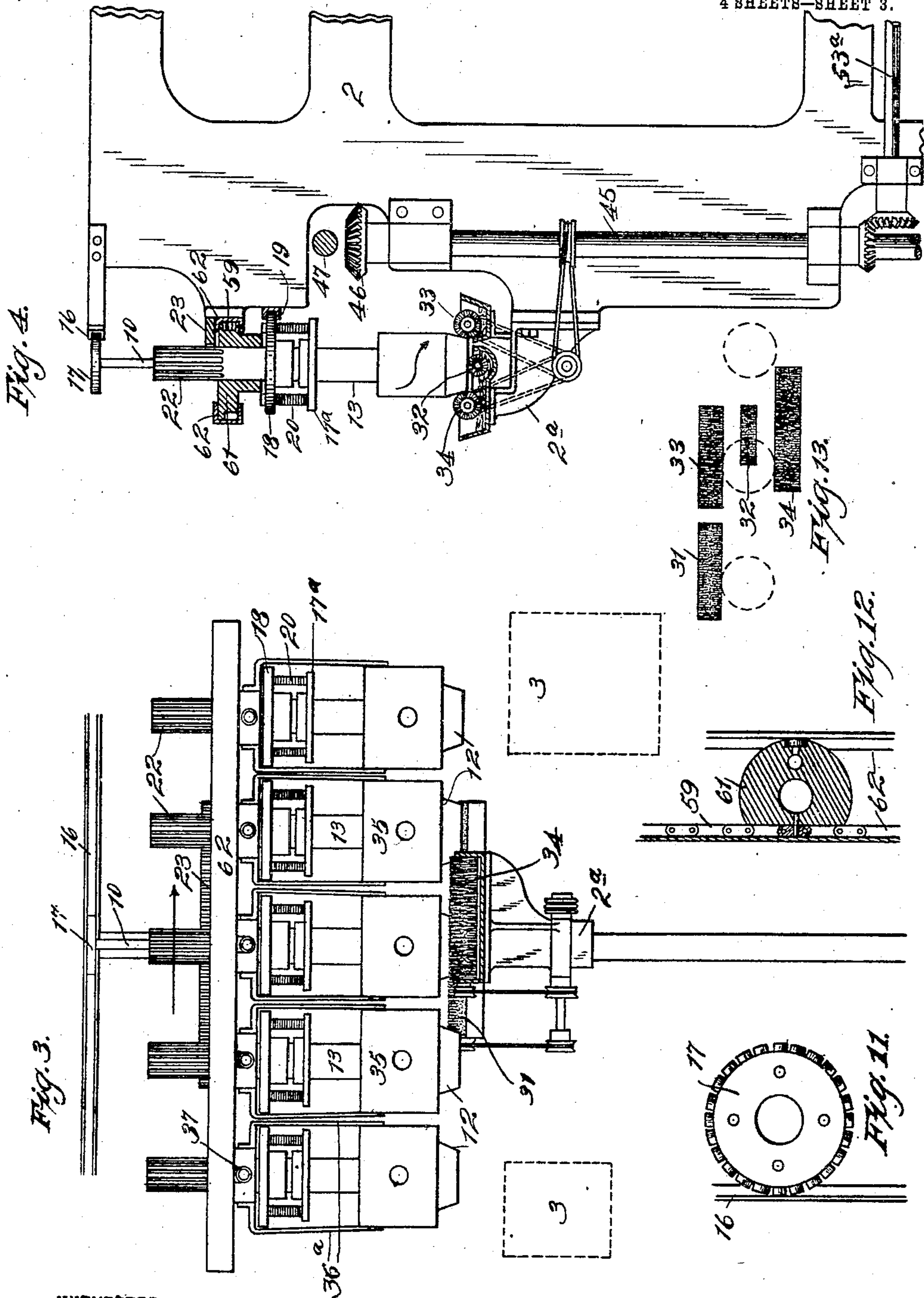
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4 SHEETS—SHEET 3.



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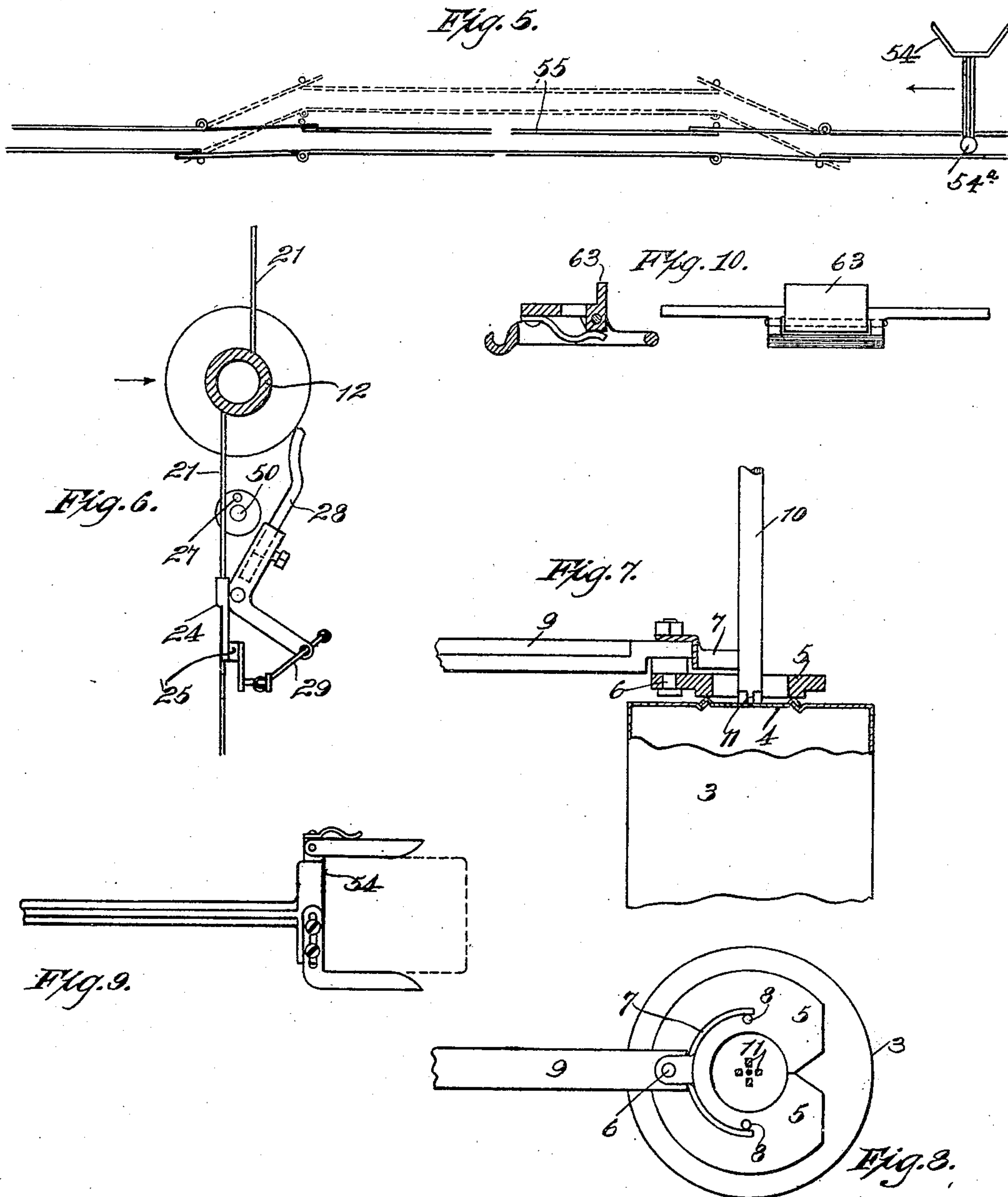
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UNITED STATES PATENT OFFICE.

JOSEPH A. CONBOIE, OF COLMA, CALIFORNIA.

CAN-CAP-SOLDERING MACHINE.

935,462.

Specification of Letters Patent.

Patented Sept. 28, 1909.

Application filed January 24, 1908. Serial No. 412,512.

To all whom it may concern:

Be it known that I, JOSEPH A. CONBOIE, a citizen of the United States, residing at Colma, in the county of San Mateo and State of California, have invented new and useful Improvements in Can-Cap-Soldering Machines, of which the following is a specification.

This invention pertains to can-soldering machines, and particularly to that class wherein caps are soldered upon cans that have been filled.

The objects of my invention are manifold, and among them an important one is the provision of means for automatically depressing a cap, which may be placed upon the can by any suitable means, down upon the protruding contents of a can until the cap is firmly seated over the opening.

Another object is to provide a machine that combines can-holding, cap-holding and can-soldering elements, having continuous motion, and independent of, but coöperative with can conveyers.

A further object is to provide a machine that will automatically cleanse and tin the irons.

It is an important purpose of the invention to provide a machine combining continuous traveling soldering irons for handling two sizes of cans simultaneously, and shoulders automatically adjusting themselves to the cans.

My invention consists of the elements, the construction and the combination of elements, or their equivalents, and will be fully set forth in the following specification and accompanying drawing, in which—

Figure 1 is a plan view of my apparatus. Fig. 2 is a vertical view and partial section. Fig. 3 is an end view. Fig. 4 is a side elevation of one end, showing the means for cleansing the irons, and for applying acid and solder thereto. Fig. 5 illustrates the preliminary can-holder, and the cam track by which it is actuated. Fig. 6 shows a method of feeding the solder wire to the irons. Fig. 7 is a side elevation and partial section of a can with the cap-holders. Fig. 8 is a plan view of the same. Fig. 9 shows holder for square cans. Fig. 10 shows a sectional view and an elevation respectively of a link in the can feed chain. Fig. 11 is a plan of plates 17 or 18, with anti-friction

rollers. Fig. 12 is a section through a soldering iron carrier. Fig. 13 is a view of the cleaning brushes.

It is frequently found, when canning peaches or other large-section, hard material, that a portion of this will project through the filling orifice, in the can top, and when the closing caps are placed on the cans, whether by hand or otherwise, the cap will become displaced before the can is under the soldering-iron. In common practice a simple rod or suitable holder is mounted within the iron and when the can is in place under the iron, the holder descends, followed by the iron, and presses the cap to the can top. Obviously, the cap is then soldered whether it is or is not in proper place.

For the purpose of accomplishing the several objects of my invention, I provide, in combination with the usual can-conveyers or belts A and A', which may be such as are now used in this art to convey cans past or to the various machines used in the canning processes, a suitable sprocket-chain 58 passing around sprocket-wheels 58^a disposed a suitable distance from the ends of the supporting frame 2 of the machine, as seen in Fig. 1, and driven by gears, not shown, through main shaft 42.

Secured at desirable intervals to certain links of the chain 58, are blocks 60 supported in tracks 60^a, which are fastened to the frame 2; the blocks are cut away in one side to receive the chains 58, and may be provided with rollers running in the tracks to reduce the friction.

Reciprocable in ways upon the top of each block 60 is a suitably formed can-holder 54, on the inner end of which is a roller 54^a engaged by cam track 55 which reciprocates the holder in its ways as may be required. In Fig. 5 this cam track is shown as being adjustable to suit the various sizes of cans which the machine is capable of handling.

The chain 58 is shown as running an indefinite distance in parallelism, with conveyor belt A on one side of the machine and returning similarly with conveyor belt A' on the opposite side. The belt A in this instance carries a small can 3, and the holder 54 is projected by cam track 55 as the can is brought up into alinement with it, the conveyor-belt A and holder belt 54 traveling at a uniform speed, so that the holder 54

engages the can on one side, and remains there until the can has passed the soldering elements.

In conjunction with the holder 54 is a movable, flexible support here shown as a chain 56 against which the can 3 is pressed by the holder 54. These elements cooperate to prevent the can from toppling over, tilting, or turning.

The cans 3 are brought on the conveyer A in a filled condition, and caps 4 (Fig. 7) are placed on the cans by any suitable means, but preferably by hand, and in which case the operator has only to grasp a slidable stem 9 of a cap-holder 5, and lift it about a pivot 64, which is formed on the top of the blocks 60, and place, over the orifice in the can top, a cap. A spring 64^a will then draw the holder 5 down on the cap with sufficient force to prevent its displacement until the stem 9 comes under a cam-bar 65, which is secured to frame 2, when the cap will be depressed, and will prevent the contents from protruding. The can is now conveyed, held between can-holders 54 and chain 56 and, in a measure, by the cap-holder 5, toward the soldering irons 12 (which will be described hereinafter).

Slidable centrally through the irons 12 are presser rods 10, notched at the lower ends 11 to permit the escape of steam through the usual vent-holes in the caps 4, and having at their upper ends a flange 17 engaging an undulating cam-track 16 which depresses the rods 10, successively, just as a can is brought under an iron 12. As soon as a rod 10 has firmly seated itself upon a cap 4, its contacting iron starts to descend, and simultaneously therewith the cap-holder stem 9, having upon its inner end a roller 9^a, is retracted by a cam-track 15 in which the roller 9^a runs. Since the cap 4 is now under the pressure of rod 10, the iron, carrying solder upon its lower edge, engages the groove in the can top and, by rotating, distributes the solder thoroughly.

An important feature of this invention is the embodiment of a yieldable, rotatable iron; and further a system of irons that are mounted upon a flexible traveling carrier cooperative with but independent of a plurality of can-conveyers, which may carry cans of different sizes.

In Fig. 2 the iron is clearly shown, and comprises a soldering member 12 secured to a tubular shank 13, which has cut upon its upper end a pinion 22 adapted to engage a rack 23, fixed to frame 2. The shank 13 is freely mounted in a carrier-block 61, of which a suitable number are carried by a continuously moving, flexible carrier chain or belt 59, in a suitable circuit here shown as polygonal. The blocks 61 are guided and supported by a set of tracks 62, and drawn along thereon by the chain 59 which is

driven by sprocket-wheels 49, these being caused to rotate by any desirable means; in this instance spiral gears 48, one of which is secured to shaft 47, are used.

The shaft 47 is driven by bevel gears 46, one of which is keyed to vertical shaft 45, this being driven through, suitable gears 44—43 by the main drive horizontal shaft 42.

The tracks 62 are so disposed that two sides of the polygonal circuit are parallel with the conveyers A and A', and substantially vertical over them so that the cans 3 will successively and synchronously register with the traveling irons 12.

The conveyers A and A' and the carriers 58 and 59, carrying respectively holders 54 and 5, and soldering irons 12, are all timed to travel in unison.

In order to depress the irons 12 as the cap-holders 5 are retracted, the shank 13 carries a loose collar 18, peripherally engaging a cam-track 19 which is positively effective to raise or depress the collar 18. Springs 20, or equivalent means, connect the collar 18 by a flange 17^a with the shank 13 of the iron 12, and form a cushion to prevent injury to the can by the iron, and since it is not necessary to apply any pressure through the iron to the can, the provision of this cushion is essential. Indeed, inasmuch as the can cap 4 is held at this period by the presser-rod 10, the rotating iron needs only to approach the cap just near enough to thoroughly distribute the solder, but the impossibility of obtaining cans of absolutely the same height, makes it compulsory to provide means that will automatically adjust themselves to the varying elevations of the caps 4. As the iron 12 descends, the pinion 22 meshes with rack 23, and is rotated as the belt 59 travels. The iron remains depressed until it has made a sufficient number of rotations, about two, as designed. When it is lifted, by cam-track 19 acting on collar 18, and the associated elements, the cap-holder 5, which is made in yieldable sections pivoted at 6, upon stem 9, and normally closed by spring 7 bearing against the pins 8 in the sections 5 (see Fig. 8), is advanced by the track 55, the sections 5 opening as they encounter the presser-rod 10. When the cap-holder 5 has reached its normal operative position, the rod 10 is elevated by cam-track 16, and held up thereby until its related iron has traversed the next short side of the circuit, when it will be lowered again to hold the caps 4 on the cans 3, carried on the conveyer A', running oppositely to the one (A) just cooperated with, and carrying, as shown, cans of larger size than conveyer A.

The irons 12 are each surrounded by a suitable fire-box 35 supported by straps 35^a secured to carrier-blocks 61. The fire-box is heated by means of a burner-pipe 36, de-

pending from block 61 from which any desired form of connection is made with a central turnable distributor 40, as by radially disposed tube 39 carrying a circularly bent pipe 41, from which flexible tubes 38 connect with each carrier-block 61. Manifestly the irons 12 are reciprocable and revoluble through the block 61, and the fire-box.

As the cans 3 pass from the soldering stage, the cap-holder 5, and can-holder 54 continue to travel with and engage the can an indefinite distance, but which need only be long enough to permit the solder to set, and are then carried around sprocket 58^a, the cap-holders 5 and can-holders 54, retracting under action of their respective cams 15 and 55.

Secured to one end of the frame 2, seen in Figs. 3 and 4, is a bracket 2^a, journaling a series of revoluble brushes or rollers disposed to encounter the exposed lower edges of the several rotating irons 12, while they are crossing the circuit from one conveyer to the other. These brushes are shown diagrammatically in Fig. 13; brush 31 first contacts with an iron 12, scraping and washing it with a suitable material. Brush 33 then applies acid, after which the iron is "tinned" by roller or brush 34. In order to insure "tinning," the brush 32 is journaled centrally under the irons and operates conjunctively with brushes 33-34. By this arrangement, each iron is automatically cleaned and tinned once in each cycle, during which it has operated upon two cans. After having been tinned, the irons are carried around, by belt chain 59 to run with and solder cans 3 on conveyer A'.

Any desirable efficient solder-feeder may be combined with the machine. A simple form adapted to feed the solder-wire 21 is shown in Figs. 2 and 6. Preferably the reels of solder 21 are arranged in pairs, adjacent to opposite sides of the traveling irons, in such a manner that the solder is fed against the hot iron at diametrically opposite points of the traveling irons, during a half revolution thereof; thus the iron receives solder around its entire circumference. This is accomplished by the reciprocation of a pawl 24 (one for each reel of solder) carried on lever 25, fulcrumed in a suitable bearing 26. The lever 25 is oscillated by link connection with crank 27 of shaft 50, which is driven through gears 51 and shaft 52, gear 53 and shaft 53^a, this being geared to vertical shaft 45. The pawl 24 is connected by a link 29 to the short arm of a horizontal crank-lever 28, the long arm of which is normally held in the path of the can 3, and is turned by each can so that the link 29 is free to permit the pawl 24, under tension of spring 30, to grasp and feed the solder-iron 21 when reciprocated by crank 27. When there is no can in position to oscillate the

lever 28, it is drawn by spring 28^a to idle position, thus retracting the pawl 24 and link 29; the pawl, though still reciprocating, is then disengaged from and does not feed the solder.

Fig. 11 shows a form of flange 17 secured to the presser-rod 10, and designed to reduce the friction during operation.

For the purpose of facilitating the use of a plurality of conveyers, each carrying cans of different diameters from the other, and thereby use a single machine having the functions embodied in my invention, and yet use conveyers of similar design, I provide a movable lug 63 (Fig. 10) upon as many of the links of the conveyers A and A' as will enable them to carry cans of any reasonable diameter; for instance, one conveyer may carry cans of four inches diameter, the lugs 63 then being upturned every five inches, while the other may bear cans of six inches diameter, the lugs 63 being "set" every ten inches. With this in view, it will be seen that if the irons 12 are pitched five inches apart, and operate to solder similarly spaced cans on conveyer A, then in order to cooperate with larger cans on conveyer A', these cans must be spaced apart a multiple of five inches, in this case, ten inches when every other iron is utilized.

The machine is adapted to run cans of any desired shape in cross section, since almost invariably the caps are round. Fig. 9 shows a form of holder 54 usable with square cans; other suitably designed holders may be substituted, at will, in place of those illustrated.

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

1. In a can-cap soldering apparatus, the combination of a plurality of flexible traveling can carriers, a plurality of soldering irons, a single carrier for said irons, said carrier operating with but being independent of the plurality of can carriers, can-cap holders movable with the carrier, and means whereby the irons are depressed to seal the caps upon the cans.

2. A can-cap soldering apparatus, having a plurality of flexible traveling chains, a plurality of soldering irons, a single flexible carrier for said irons, means connecting the irons with the chains whereby the irons and chains travel substantially together, a can-cap holder movable with the carrier said soldering-iron-carrier cooperating with but being independent of the plurality of can conveyers, and means for depressing the irons upon the cans on the conveyers during their movement.

3. In a can-cap soldering apparatus, the combination of a traveling chain, a plurality of soldering irons, means for connecting the irons with said chain, a traveling can car-

rier adapted to travel with the chain during a portion of its movement, a can-cap holder movable with the carrier, and means for bringing said holder and iron successively into contact with the can-cap and again retracting them.

4. In a can-cap soldering machine, traveling belts or chains, traveling can and can cap holder carriers, means whereby the chains and carriers are caused to travel substantially together during a part of their movement, can cap holding means, and can cap soldering means carried by the chains, and means for bringing said holding means and soldering means in contact with the can cap and again retracting them.

5. In a can cap soldering machine, a traveling can carrier, a chain traveling in unison with the can carrier during a portion of its progress, a can holder adapted to retain the can in position upon its carrier, a can cap holder connected with the chain, means for depressing said holder to hold the cap in proper position, a presser-rod, means by which said rod is depressed upon the can cap, means by which the first named cap-holder is withdrawn, a soldering iron and means by which solder is applied, and the iron subsequently depressed to complete the operation.

6. In an apparatus of the character described, the combination of a traveling chain, a can-cap holder, carried thereby, a can carrier movable in line parallel with the movement of the chain, a fixed cam track by which the holder is advanced and depressed to hold the cap in position, said track operating to subsequently raise and withdraw the can cap holder.

7. In an apparatus of the character described, an endless traveling chain, can cap holders connected therewith, can carriers traveling in unison with said chain and adapted to place the cans in line with the holders, fixed cam tracks by which the holders are advanced and depressed to hold the cap in position, centrally disposed presser-rods and cam tracks by which said rods are depressed upon the center of the can cap, and means by which the first named cap-holders are retracted.

8. In an apparatus of the character described, belts whose paths of travel coincide at certain periods of travel, means by which cans are supported and guided upon one of said belts, means by which can cap holders carried by the other belt are actuated to hold the caps upon the cans, soldering irons, and means carried by the second belt whereby said irons are depressed to seal the caps upon the cans.

9. In an apparatus of the character described, a can carrying belt, a cap holder and soldering iron, carrying belts or chains for the can holder and soldering iron, the paths

of said belts coinciding during a portion of their travel and separating at other portions of the travel, means by which the irons are depressed and solder supplied to secure the caps during their coincident progress, and means for cleansing and tinning the irons during their separate progress.

10. In an apparatus of the character described, a can-carrying belt composed of connected links, upwardly projecting lugs pivoted to certain of said links adapted to advance cans placed upon the belt, and maintain a distance between them, said lugs being depressible so that the distance between the lugs may be increased for larger cans, and springs by which the lugs are maintained in either position.

11. In an apparatus of the character described, the combination of carrying-belts and soldering-iron carriers, said belts and carriers moving in paths which coincide during a portion of their travel and separate at other portions of the travel, can-cap holders movable with the carriers, heating shells, means for bringing said holders and irons successively into contact with can-caps and again retracting them, means by which solder is applied to the irons before their depression, and racks and pinions by which the irons are revolved while in contact with the cans.

12. In an apparatus of the character described, the combination of carrying-belts and soldering-iron carriers, said belts and carriers moving in paths which coincide during a portion of their travel and separate at other portions of the travel, can-cap holders movable with the carriers, heating shells, means for bringing said holders and irons successively into contact with can-caps and again retracting them, gas burners opening into the heating shells, a superposed centrally journaled gas-conductor, flexible pipes leading therefrom, and connections between said pipes and the burners.

13. In an apparatus of the character described, traveling can carriers, a traveling chain interior thereto, forked arms carried by said chain adapted to engage the peripheries of the cans, an exterior chain against which the cans are forced by said holders to prevent their revolving while the soldering iron is applied, said chain being moved in unison with the movement of the cans by frictional contact.

14. In an apparatus of the character described, traveling can carriers, a traveling chain interior thereto, forked arms carried by said chain adapted to engage the peripheries of the cans, an exterior chain against which the cans are forced by said holders to prevent their revolving while the soldering iron is applied, and cam tracks with which the forked arms engage, and by which they are alternately advanced to contact with the cans, and retracted therefrom.

15. In an apparatus of the character described, a traveling can-carrier, devices by which the cans are interspaced upon the carrier, holders and a traveling chain between
 5 which the cans are held stationary during a portion of their travel, a traveling chain whose path is parallel with that of the can-carrier during a portion of its travel, cap-holding arms, blocks connected with the
 10 traveling chains, said blocks forming supports for the can-holders and the cap-holders respectively, and cam tracks with which the can and cap-holders are connected, and by which they are alternately advanced and
 15 retracted.

16. In an apparatus of the character described, traveling can-carriers, traveling chains whose path of travel is parallel with that of the can-carriers during a portion of
 20 their advance, cap-holders, connections by which said holders are moved in unison with the chain and the can-carrier, cam-tracks by which the cap-holders are advanced to a position above the can caps, and pressure
 25 plates beneath which the arms of the cap-holders pass, and by which they are forcibly depressed upon the can caps.

17. In an apparatus of the character described, traveling can-carriers and holders for the cans, chains whose path of travel is
 30 intermittently parallel with that of the can-carriers, soldering-irons having vertical stems registering with the axis of the cans, means by which said irons are raised, a heating shell into which they are received when
 35 raised, means for supplying solder to the irons and depressing them into contact with the can caps, and springs through which the downward movement and pressure is yieldingly effected.
 40

18. The combination with a plurality of can-conveyers, of a can-holder and a can-cap holder carrier, a carrier for soldering-irons, and means for bringing a can-cap
 45 holder and an iron successively into contact with a can-cap and then retracting them.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOSEPH A. CONBOIE.

Witnesses:

CHARLES A. PENFIELD,
 S. H. NOURSE.