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PATENTED JULY 2, 1907.

H. C. BLACK.

END FLANGING MECHANISM FOR CAN BODIES.

APPLICATION FILED APR. 6, 1906.

2 SHEETS—SHEET 1.

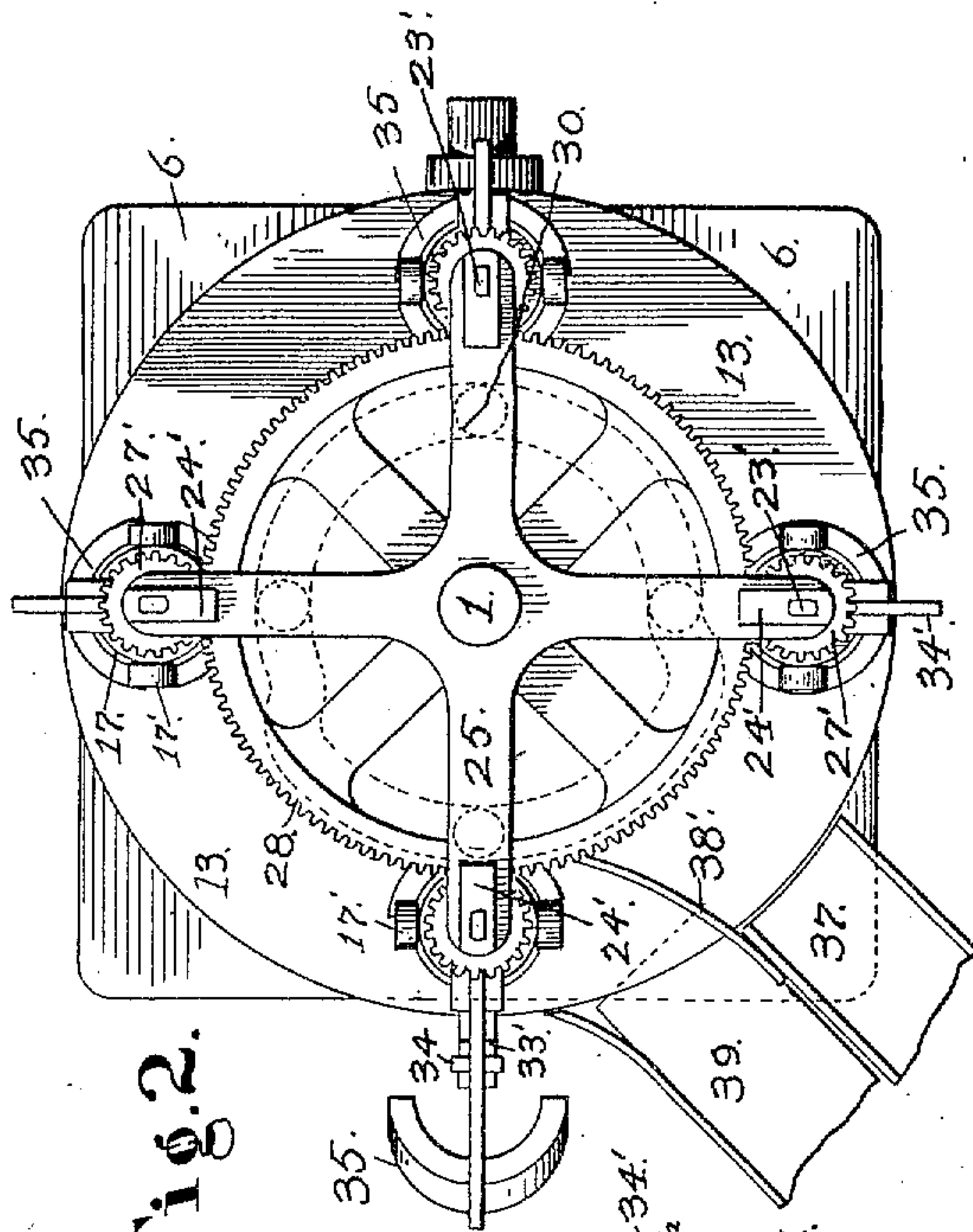


Fig. 2.

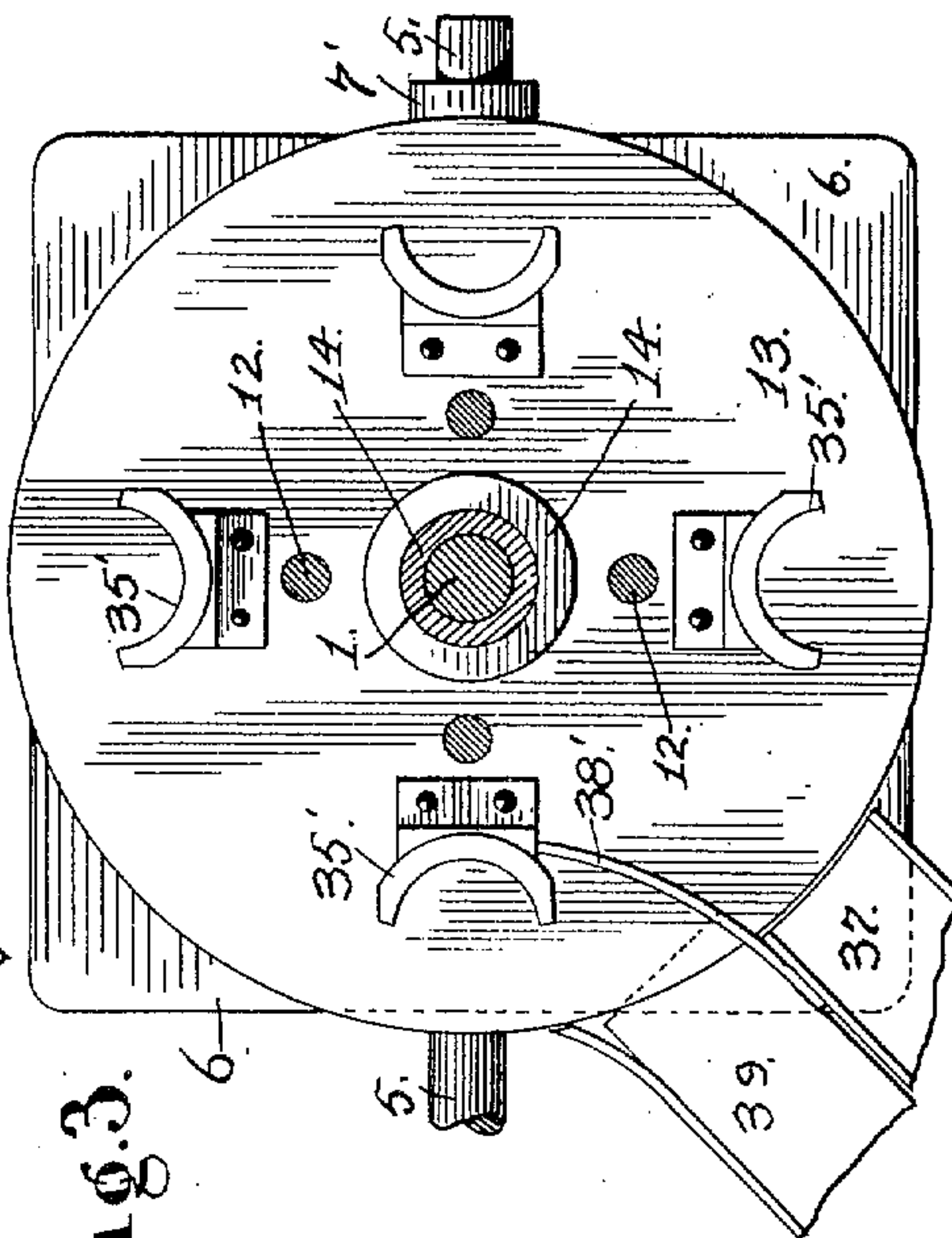


Fig. 3.

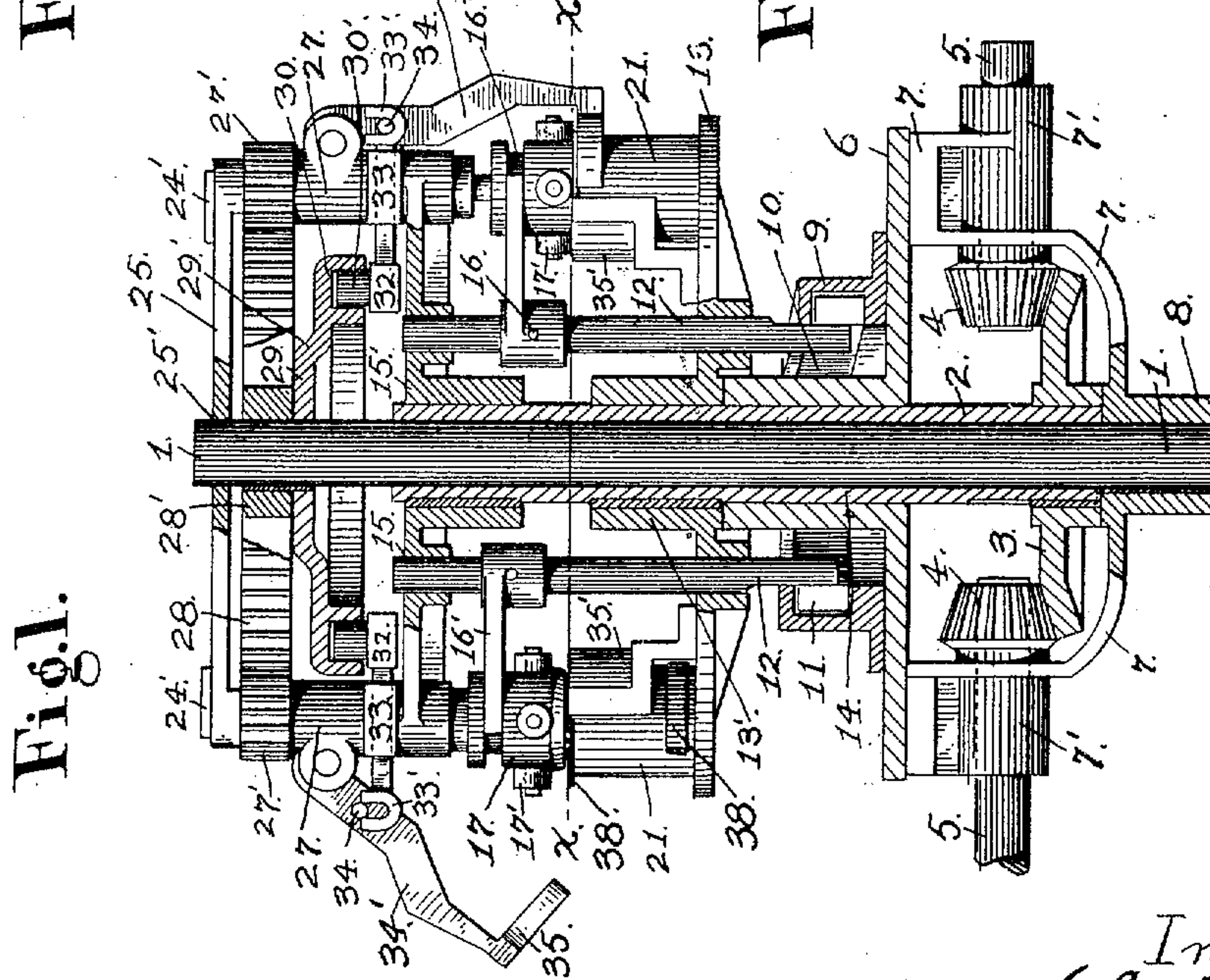


Fig. 1.

Witnesses:  
Arthur L. Slee,  
D. B. Richards

Inventor  
H. C. Black  
by M. A. Black  
his atty.

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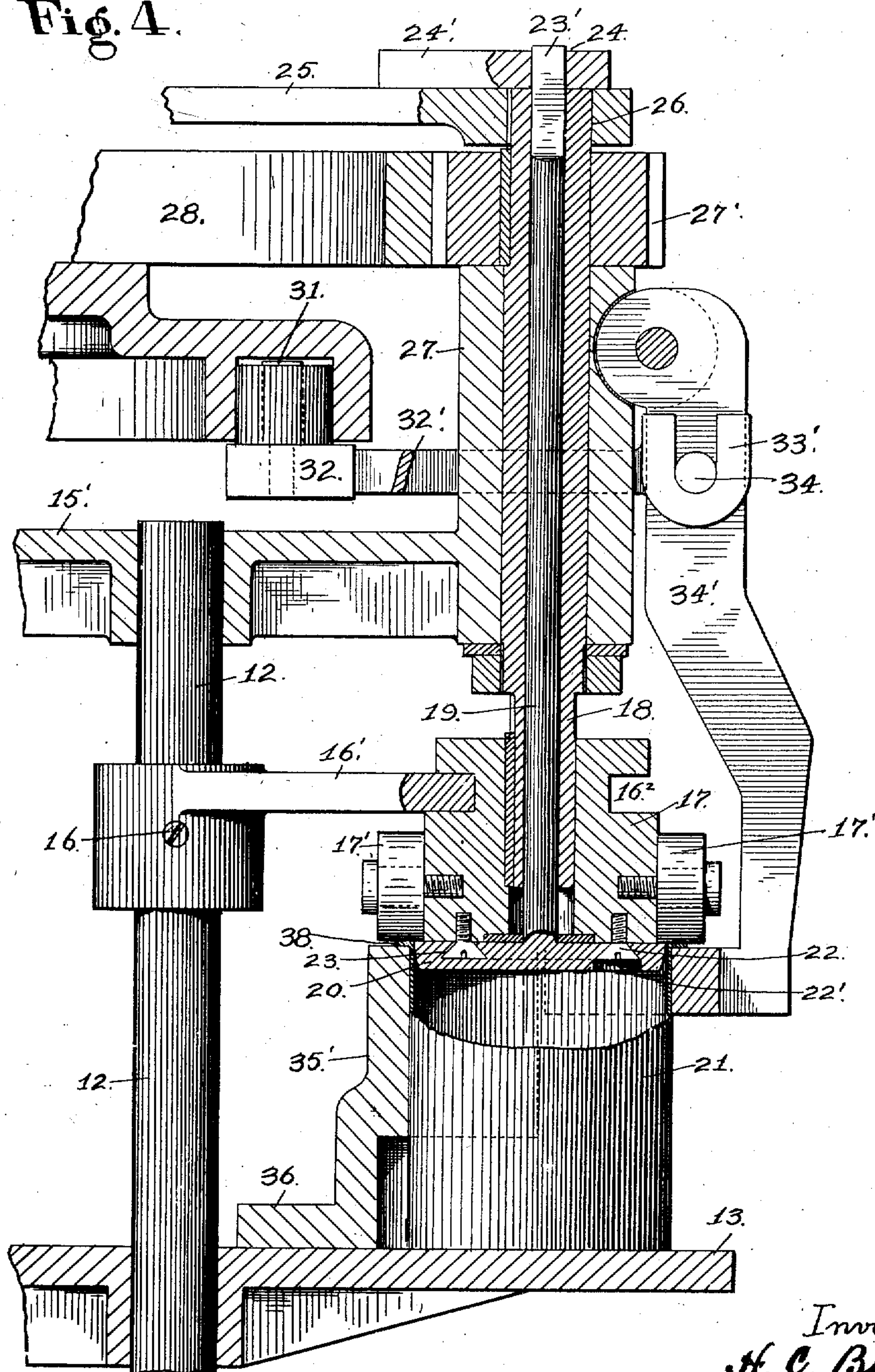
H. C. BLACK.

## END FLANGING MECHANISM FOR CAN BODIES.

APPLICATION FILED APR. 6, 1906.

2 SHEETS—SHEET 2.

**Fig. 4.**



Witnesses:  
Arthur L. Slee.  
D. B. Richards

Inventor  
H. C. Black  
by ~~W. A. Black~~  
his atty.



# UNITED STATES PATENT OFFICE.

HENRY C. BLACK, OF SAN FRANCISCO, CALIFORNIA.

## END-FLANGING MECHANISM FOR CAN-BODIES.

No. 858,783.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed April 6, 1906. Serial No. 310,314.

*To all whom it may concern:*

Be it known that I, HENRY C. BLACK, a citizen of the United States, residing at the city and county of San Francisco, State of California, have invented certain new and useful Improvements in End-Flanging Mechanism for Can-Bodies; and I do hereby declare the following to be a full, clear, and exact description of the same.

The present invention relates to mechanism for receiving can bodies and flanging the ends thereof, to prepare the same for the double seam crimping of the tops and bottoms thereto, such double seam crimping being utilized in the formation of what is known to the trade as a "sanitary can," that is a can body having the top and bottom secured thereto by crimping, in contra-distinction to a can having the tops and bottoms soldered thereto.

The hereinafter described mechanism is adapted for the flanging of either end of a can body; hence the machine is especially adapted for the use of packers generally employing cans for the placing of their goods upon the market. Ordinarily, the can is supplied to the packer or canner with its bottom double seamed thereto, the upper end of the can body being outwardly flanged to receive a head, after the can has been filled, the cans after being filled having their heads crimped thereon to form a double seam. The serious objection to the cans thus supplied to the packer, resides in the fact that the formed end flange is mashed or otherwise damaged or injured during shipment and transportation; hence it is oftentimes impossible to properly secure the head to the can after the same has been filled or packed.

By the use of the presently described apparatus, the empty can is supplied to the packer with its opened end unflanged. The can after being filled or packed, is then delivered to the flanging machine, and its opened end properly flanged to receive the can head to be applied thereto, said head being crimped and double seamed thereto by means of an apparatus to form the subject of a separate application.

To comprehend the invention, reference should be had to the accompanying sheets of drawings, wherein—

Figure 1 is a side view of the machine in elevation, the central drive sleeve on the fixed vertical spindle, and the bearing sleeves keyed thereto being sectioned, one of the can clamping devices being illustrated in an opened position, while the oppositely disposed can clamping device is shown closed for the holding of the can, the can end flanging means for the closed can clamping device being in lowered position, the fixed cam grooved disks being sectioned, likewise the supporting spider carrying the rotating means for the flanging rolls; Fig. 2 is a top plan view of the apparatus, disclosing the feed device for supplying the cans onto the rotatable receiving table, and the means for removing

the flanged cans from said receiving table; Fig. 3 is a cross sectional top plan view disclosing the receiving table, said view being taken on line  $x-x$  Fig. 1 of the drawings; and Fig. 4 is a broken detail enlarged part sectional view disclosing one of the can end flanging means, said view illustrating a can held to the rotatable receiving table, the plunger of the clamping means lowered, and the mandrel head thereof within the open end of the held can, and the flanging rolls as having flanged the open end of the can above the mandrel held therein, the means for actuating the vertically movable plunger, the means for imparting rotation to the rotatable sleeve carrying the flanging rolls, and the mechanism for actuating the hinged arm carrying the clamp for the can being disclosed.

Referring to Fig. 1 of the drawings, the numeral 1 is used to designate a vertically arranged spindle, which serves as a guide post for the rotatable drive sleeve 2, fitted thereon. To this sleeve, near its lower end, is keyed a bevel gear 3, which gear is driven to rotate the sleeve 2, by means of the pinions 4, said pinions being secured to the drive shafts 5, which shafts are driven in any suitable manner. Two shafts and two drive pinions are illustrated, simply to permit of the machine being driven from either side. The drive sleeve 2 extends through the base plate 6, which plate carries the brackets 7 for the bearings 7', said brackets also being secured to the bearing 8, to which the guide post 1 is keyed. To this base plate 6 is secured the cam grooved ring 9, within the upwardly inclined cam groove 10 of which work the rollers 11, of the hereinafter described rods 12. Each plunger rod 12 extends through the receiving table 13, the hub 13' of which is keyed to the drive sleeve 2. This receiving table is held a distance above the plate 6, by means of the hub 14, of said plate, on which the hub 13' of the receiving table bears. The plunger rods 12, four of such rods being shown, Fig. 3 of the drawings, extend through guide openings 15, of a spider 15', which spider is keyed to the drive sleeve 2, so as to rotate therewith. Each plunger rod 12 has secured thereto by a set screw 16, a projecting lift arm 16', the outer end of each arm being forked to fit within a circular groove 16<sup>2</sup>, formed in the heads 17, which heads carry the flanging rolls 17', Fig. 4 of the drawings. The said heads 17 are feathered to the spindles 18, which spindles rotate about the vertically movable rods 19, each rod at its lower end carrying a mandrel 20, which mandrel, when its rod 19 is lowered, as hereinafter described, moves within the open end of the held can 21 to be flanged. The mandrel 20 is supported by the head 17, being connected thereto by means of the screws 22. These screws extend through a vertical opening 22', in the mandrel 20, the same being inserted from the under face of the said mandrel such portion of the opening being slightly enlarged to permit of the head of the screws



moving into the dove-tailed circular groove 23, intercepted by the vertical opening 22'. While the mandrel 20 and rod 19 are supported by the head 17, the said head is free to turn or rotate without its motion being imparted to the mandrel 20, the said mandrel being held against rotation by reason of the rectangular end portion 23', of its rod 19, fitting within a similarly shaped socket 24 formed in a holding plate 24', secured to the upper face of each arm 25 radially projecting from the hub 25' loosely fitted on the central guide post 1. Within a vertical guide opening 26 in the outer end portion of each arm 25, works the upper end of the spindles 18. The spindles 18 rotate within the vertical guide bearings 27, upwardly extending from the spider 15', and on each of the spindles 18, immediately above its guide bearings 27, is keyed a pinion 27'. These pinions mesh with a gear ring 28, the hub 28' of which gear ring is keyed to the upper end portion of the central guide post 1.

To the guide post 1, immediately below the hub of the gear ring 28, is secured the hub 29, of the disk 29', Fig. 1 of the drawings. In the under face of this disk 29', is formed the circular cam groove 30, within which work the rollers 30'. These rollers are secured to the studs 31, upwardly extending from the inner end portion of the slide blocks 32. These blocks are formed with the projecting arm or arms 32', which arm or arms work through bearings 33, on the side of the guide bearings 27, the outer ends of each arm, there being two shown in the drawings, terminating in trunnion bearings 33', in which rest the trunnions 34, projecting from each hinged clamp arm 34'. These arms are hinged to the guide bearings 27, the lower end of each arm carrying a can retaining jaw or clamp section 35. These retaining jaws or clamp sections are to hold the upper portion of the body of the can 21, firmly into its fixed jaw or mold 35', which mold is secured by a bracket portion 36, to the rotatable receiving table 13. In height the mold or jaw 35' is slightly less than the can body to be flanged, the retaining jaw or clamp section 35, when thrown downward by the action of its clamp arm 34', completing the ring which compresses the upper end portion of the can body circumferentially and trues the same, in case the can body should be mashed by handling.

The cans 21, filled or empty, are delivered onto the rotating receiving table 13, by means of any suitable feed conveyer, or device 37, the lower most can of the series contained therein being removed and forced onto the table 13, the moment the same is engaged by one of the fixed molds or jaws 35'. After the can 21 to be flanged has been removed from the feed conveyer 37 onto the receiving table 13, the said table will have rotated to such a position as to carry the roller 30', for actuating the clamp arm 34', carrying the companion can jaw 35 which registers with the fixed mold or jaw 35', into the inwardly inclined portion of cam groove 30, the travel of the said roller 30' within such portion of the cam groove 30, causing the slide block 32 to be drawn inward. This movement of the slide block, through the medium of the arms 32', throws the hinged clamp arm 34' downward. As the said arm 34' is swung downward, its cam jaw or clamp section 35 engages the upper end portion of the can body and forces the said can body firmly into the fixed retaining

jaw or mold 35'. At the same time, due to the continued rotation of the receiving table, the roller 11, of the plunger rod 12 connected with the action of the described clamp devices for the can body, rides within the downwardly inclined portion of the cam groove 10, of the fixed ring 9, Fig. 1 of the drawings, and the said plunger rod 12 is drawn downward. This movement of the plunger rod 12, through the medium of the arm 16', carries therewith the head 17, feathered on the rotating spindle 18, and draws downward the rod 19, forcing the mandrel 20 into the open end of the can body. With the downward movement of the head 17, the flanging rolls 17', carried around by the rotation of the head 17, which, as stated, is feathered to the rotating spindle 18, are gradually moved downward against the projecting end of the can body rigidly held between the clamping jaws, and the end of the body above the mandrel 20, is gradually outwardly flanged, so that by the time the head 17 has moved its full downward distance, an outwardly projecting circular flange 38, for the open end of the can body is formed, Fig. 4 of the drawings. Inasmuch as the action of each of the series of flanging devices is the same as the described movements, no attempt has been made to follow other than the action of one of the clamping and flanging means, it being understood that the successive means receive the cans to be flanged, clamp the same and outwardly flange the open end in the manner just described, the action of any one set of operative parts being the same as that of the remaining ones of the series.

Where the apparatus is used to flange the open end of filled cans, the downward movable mandrel 20, serves to firmly compress or pack the material therein.

The moment the end of the can body has been properly flanged, the roller 11, by the continued rotation of the receiving table, will have moved into such a position within the cam groove 10, as to ride upon the upwardly inclined portion of the said cam groove, which imparts a reverse movement to the plunger rod 12, lifting the same so as to move the head 17 upward, and lifting the flanging rollers 17' and the mandrel 20 clear of the flanged can body. At the same time, the roller 30', controlling the action of the hinged clamp arm 34', rides upon the outwardly inclined portion of the cam groove 30, forcing its slide block 32 outward, which throws the hinged clamp arm 34' upward, thus moving the clamp jaw 35 away from the flanged can, and leaving the same free within its seat, mold or jaw 35'. The can thus freed is engaged by the curved delivery finger 38', which gradually forces the flanged can from off the receiving table onto the delivery belt 39. The flanged can is then ready to be taken to any suitable mechanism for applying the head thereto.

The requisite rotation is imparted to the flanging rollers by the rotary motion of the spindle 18, which spindle is driven by the pinion 27' thereof meshing with the teeth of the fixed gear ring 28, as the said pinion is carried around the gear ring by the rotary travel of the spider 15', which spider is propelled during the rotation of the receiving table 13, by reason of its connection with the drive sleeve 2. By reason of the connection between the propelled pinion 27' of the spindle 18 and the stationary gear ring 28, the said spindle 18, carrying the flanging rollers 17', will be rotated at a much higher speed than the drive sleeve 2.



Any desired number of clamp devices and connected flanging means may be employed in connection with the described apparatus, but a series of four of such clamping devices and flanging means will suffice to

5 flange the end of approximately thirty-five thousand cans per day, which is a sufficient output for one machine to be used in a packing establishment, although a greater output may be obtained by increasing the capacity of the machine.

10 Having thus described the invention, what is claimed as new and desired to be protected by Letters Patent is—

1. An apparatus for receiving and automatically flanging the end of a can, the same comprising a receiving table for the can to be flanged, devices for holding the can to the said table against rotation, a mandrel for fitting within the open end of the can to be flanged, rotating means for flanging the end of the can projecting above the mandrel, mechanism for imparting rotation to the flanging means, and devices for moving the mandrel and the flanging means toward and from the can body.

2. An apparatus for receiving and automatically flanging the end of a can, the same comprising a rotatable table means thereon for receiving and holding against rotation a can to be flanged, devices operated by the movement of the table for engaging and flanging the projecting end of the held can, and means for moving the flanging devices toward and from the end of the held can, and devices for releasing the held can after its end has been flanged.

3. In an apparatus for receiving and automatically flanging the ends of cans, the same comprising a rotatable table onto which the cans to be flanged are received and held, devices for clamping the cans to the table against rotation, flanging means for engaging the ends of the held cans and forming an outwardly projecting flange at the open ends thereof, mechanism automatically actuated by the movement of the table for imparting rotation to the flanging means during the rotary travel of the receiving table, devices also governed by the movement of the table for moving the flanging means toward and from the held cans, and, means for releasing the clamped cans when their open ends have been flanged.

4. In an apparatus for receiving and automatically flanging the open end of cans, the same comprising a rotatable table provided with a series of fixed can receiving jaws or molds, swinging clamp jaws for clamping the cans into the fixed molds of the table and holding the same against rotation, devices for actuating said swinging jaws to clamp the cans and to release the same, flanging rolls for engaging the projecting end of the held cans and flanging the same outwardly, means for imparting rotation to the flanging rolls, including a pinion carried by the flanging rolls, and a stationary gear, about which the pinion rides during the rotary movement of the table and devices for moving the flanging rolls toward and from the open end of the cans.

5. In an apparatus for the described purpose, the combination with the fixed mold, of the swinging jaws each pivoted at one end and having an engaging face at its opposite end for holding the cans clamped within said mold against rotation, of flanging means for outwardly flanging the open projecting end of the held cans, of devices for moving the flanging means toward and from the held cans, and devices for actuating the swinging clamp jaw to release the clamped can after its end has been flanged, including a slidably mounted bar engaging said jaw intermediate its ends.

6. In an apparatus for receiving and automatically flanging the upper end of a can, the combination with a rotatable receiving table, of means for delivering cans thereto to be flanged, of clamping means for holding a can clamped to the table against rotation while the end thereof is flanged, of devices for actuating said means during the rotation of the table to clamp the can and release the same after having been flanged, of a mandrel fitting

within the open end of each can while being flanged, of flanging rolls for flanging the open end of the held can, of mechanism for imparting rotation to said flanging rolls, and devices for moving the mandrel and the flanging rolls toward and from the open end of the held can.

7. In an apparatus for receiving cans and automatically flanging the open end thereof, the combination with means for receiving and holding the can to be flanged against rotation, a mandrel fitting within the open end of the cap, of mechanism for flanging the open end of the held can, means for moving said mechanism toward and from the can and devices for releasing the clamped can after the open end thereof has been flanged.

8. In an apparatus for the described purpose, the combination with the flanging rolls, of the head to which said rolls are held, of a rotatable sleeve to which the said head carrying the flanging rolls is feathered, of means for imparting rotation to said sleeve, devices for imparting vertical movement to the head for moving the flanging rolls toward and from the open end of a can, and means for holding the can from rotation during said flanging operation.

9. In an apparatus for the described purpose, the combination with the flanging rolls, of the head to which said rolls are held, of a rotatable sleeve to which the said head carrying the flanging rolls is feathered, of a non-rotating mandrel held by the rotatable head, of means for imparting rotation to the sleeve, and devices for imparting vertical movement to the head feathered to said sleeve for moving the flanging rolls and the mandrel toward and from the open end of a can, and means for holding the can in position.

10. In an apparatus for the described purpose, the combination with means for receiving and holding a can to be flanged, of mechanism for flanging the open end of the held can, of devices for imparting rotation to said flanging mechanism, of a non-rotating mandrel for the open end of the can, and devices for moving the said mandrel and the flanging means toward and from the end of the held can.

11. In an apparatus for receiving and automatically flanging the open end of cans, the combination with a rotatable table, of means for delivering cans to be flanged thereto, of devices for clamping the cans against rotation to the receiving table, of means for flanging the open end of the held cans, of mechanism for imparting rotation to said means, a mandrel fitting within the open end of the can of devices for moving the flanging means toward and from the end of the held cans, of means for releasing the held cans after having the end thereof flanged, and devices for removing the flanged cans from the rotatable table.

12. In an apparatus for the described purpose, the combination of a vertical shaft, of a sleeve rotatable about the axis of said shaft, a can-receiving table carried by said sleeve having a stationary receiving mold, of a swinging mold co-operating with said stationary mold to clamp the can against rotation, means for so operating the movable clamp, including a cam-actuated reciprocating rod in engagement with said swinging mold, of flanging devices for flanging the upper end of the held can, including a vertical movable rod having connection with the flanging devices and movable with said sleeve.

13. In an apparatus for the described purpose, the combination with a vertically arranged shaft, of a sleeve rotatable about the axis of said shaft, a receiving-table carried by the sleeve, a receiving-jaw for the can on the table, a swinging jaw, arranged to co-operate with the first-mentioned jaw, and flanging devices arranged to flange the upper end of the can, and means for imparting rotary movement to the flanging devices, including a spindle for the latter, a pinion on the spindle, and an inter-meshing gear wheel mounted upon said shaft.

In testimony whereof I have hereunto affixed my signature in the presence of witnesses.

HENRY C. BLACK.

Witnesses:

J. COMPTON,  
D. B. RICHARDS.