H. L. GUENTHER.

MACHINE FOR FLANGING CAN BODIES.

APPLICATION FILED FEB. 26, 1913.

1,144,839.

Patented June 29, 1915.

6 SHEETS—SHEET 1.

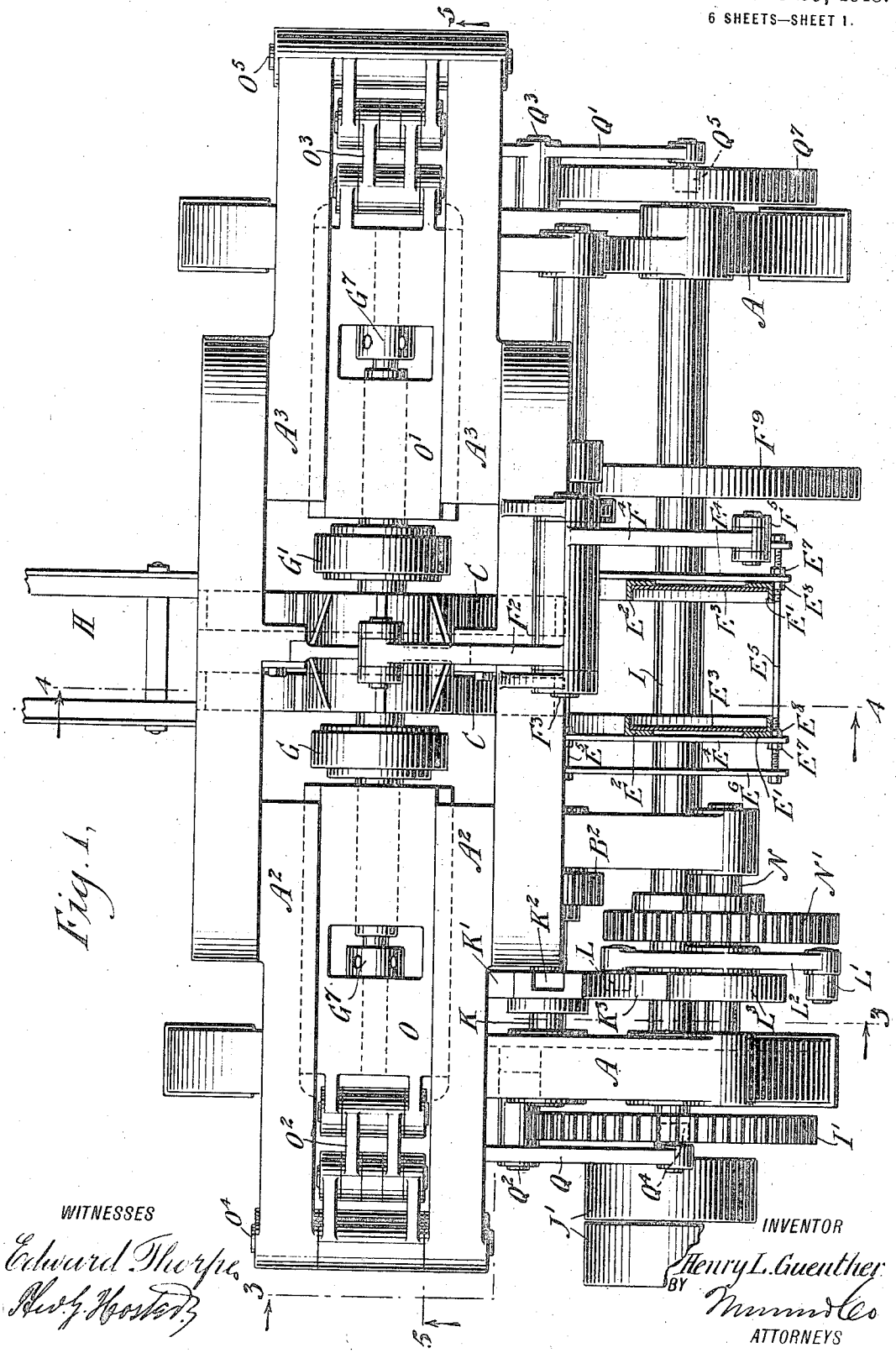


Fig. 1.

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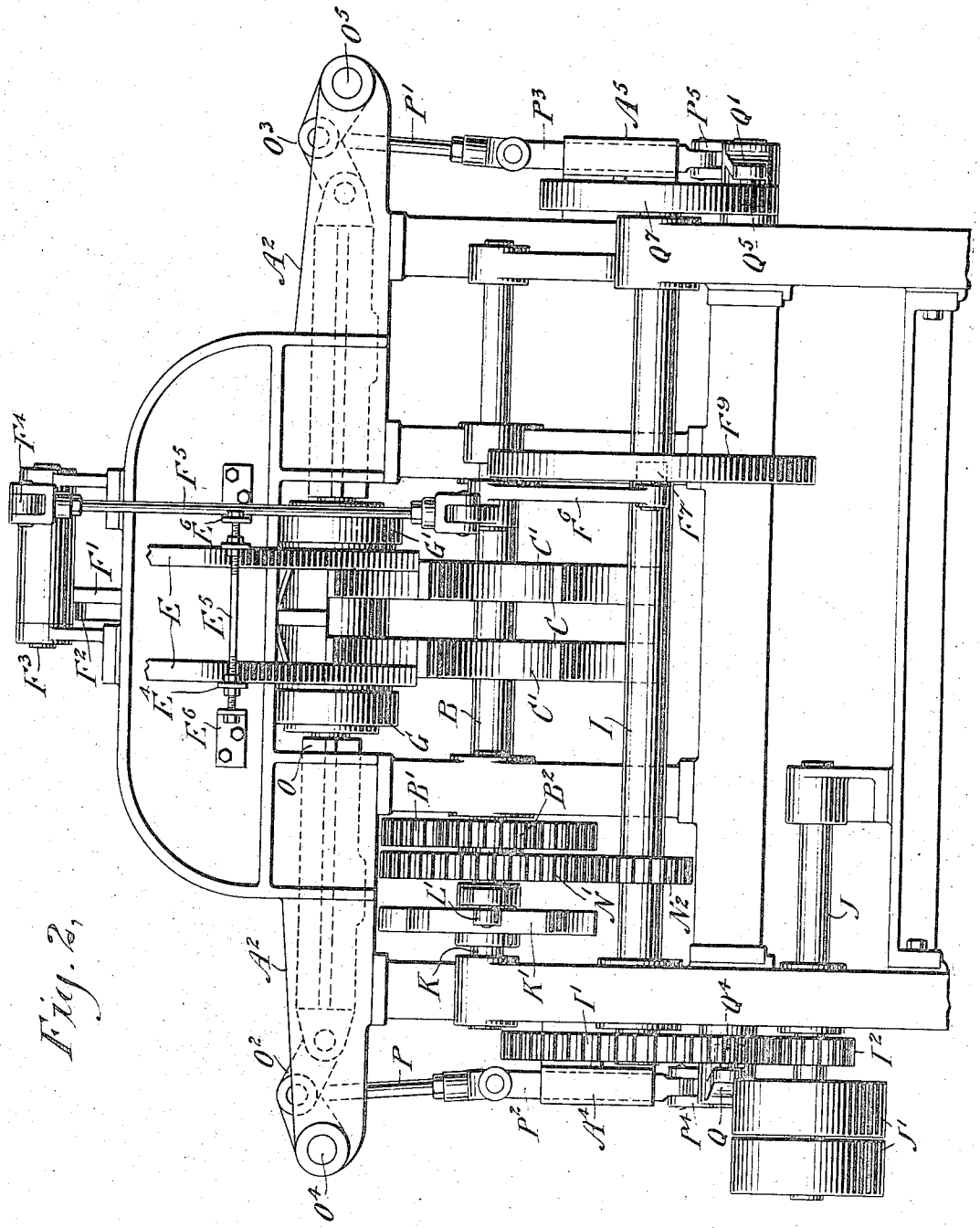


Fig. 2.

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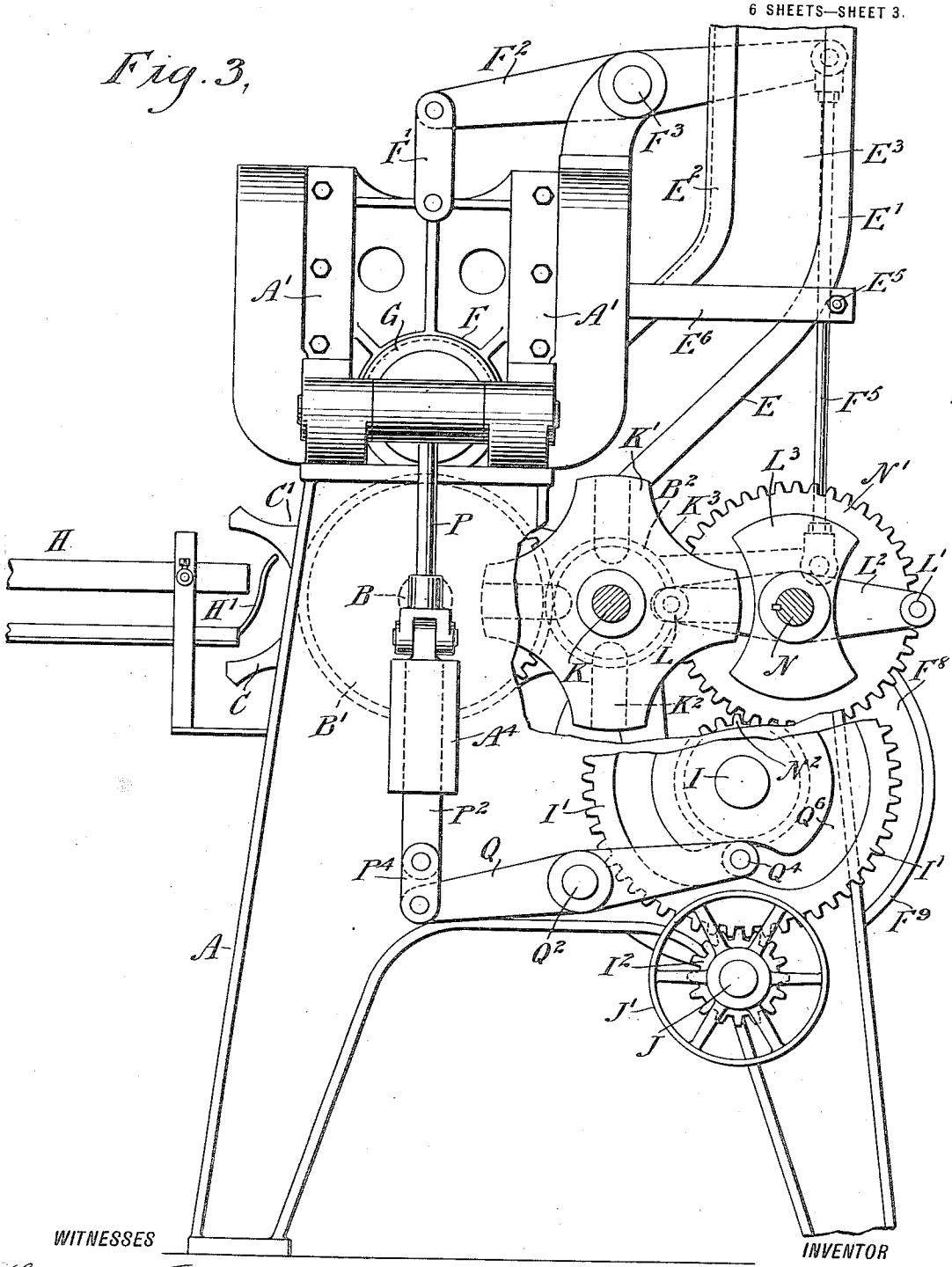
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6 SHEETS—SHEET 3.

Fig. 3.



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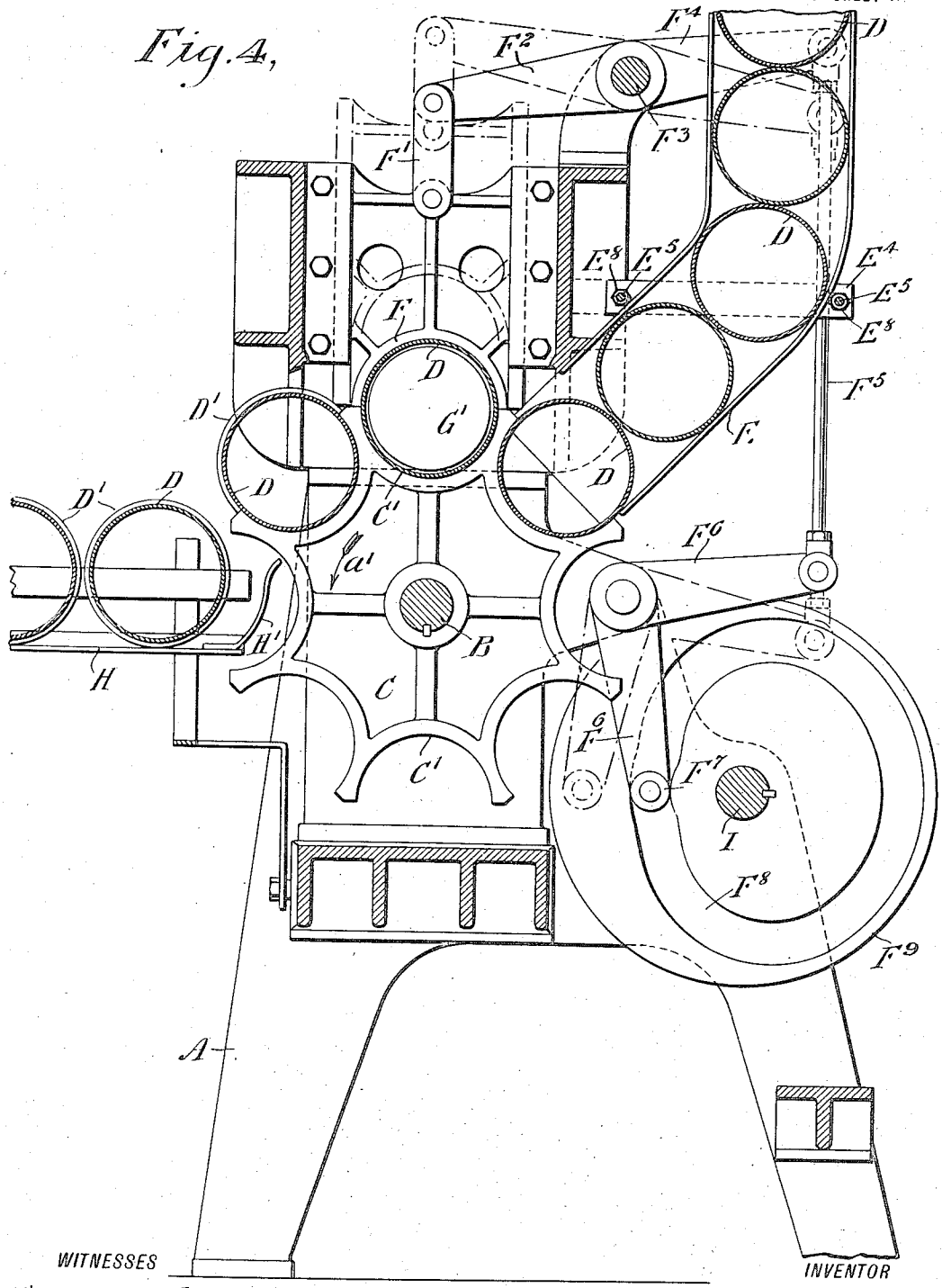
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6 SHEETS—SHEET 4.

Fig. 4.



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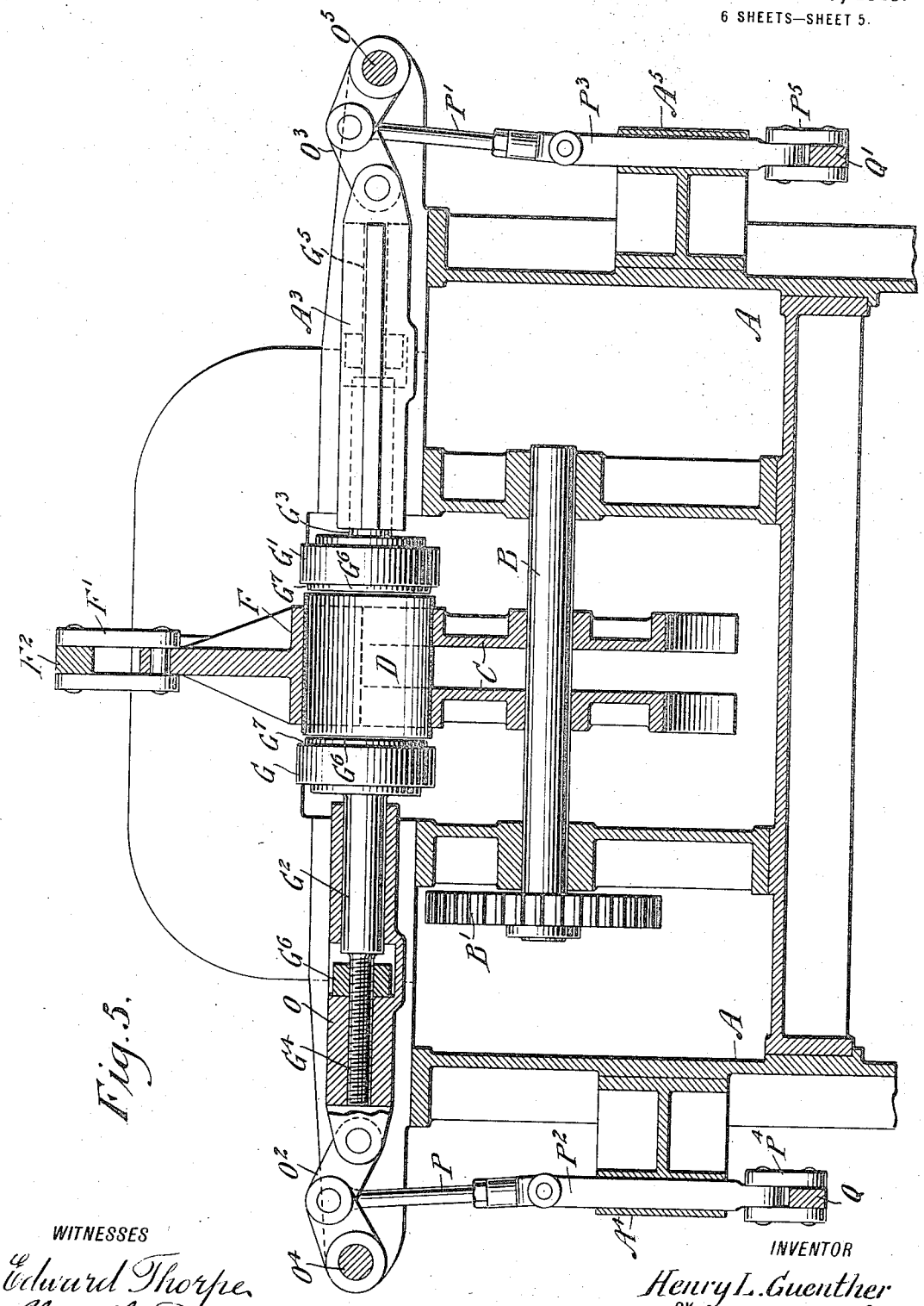


Fig. 5.

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6 SHEETS—SHEET 6.

Fig. 6,

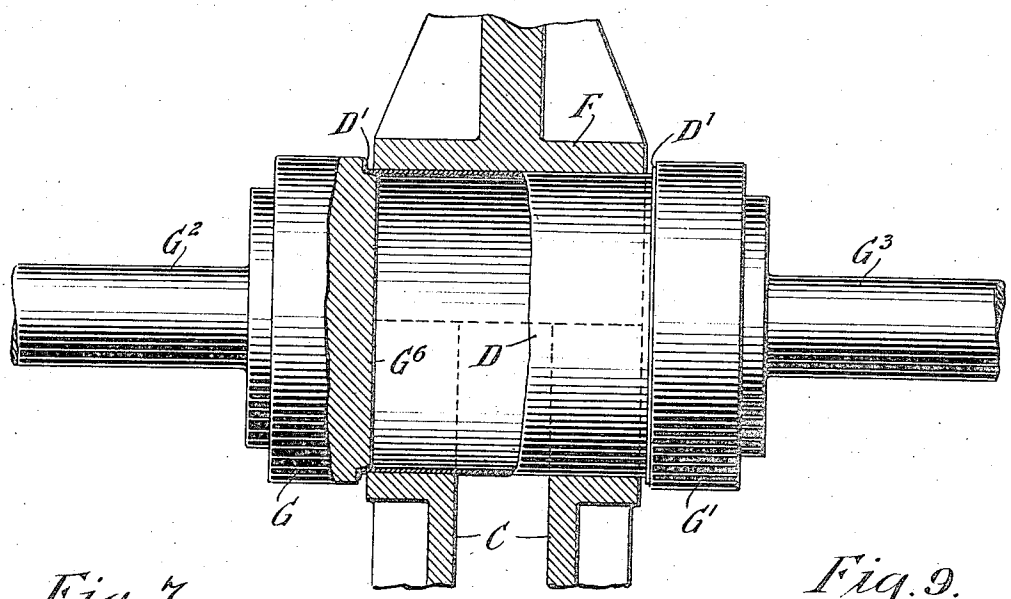


Fig. 7,

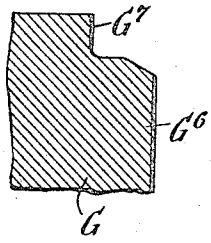
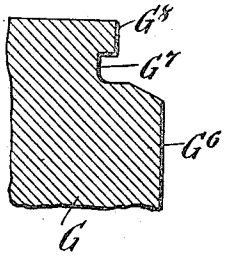


Fig. 8.

Fig. 9.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR FLANGING CAN-BODIES.

1,144,839. Specification of Letters Patent. Patented June 29, 1915.

Application filed February 26, 1913. Serial No. 750,764.

To all whom it may concern:

Be it known that I, HENRY L. GUENTHER, a citizen of the United States, and a resident of Los Angeles, in the county of Los Angeles and State of California, have invented a new and Improved Machine for Flanging Can-Bodies, of which the following is a full, clear, and exact description.

The invention relates to machines for flanging can bodies, such as shown and described in the Letters Patent of the United States, No. 723,602, granted to me March 24, 1903.

The object of the present invention is to provide a new and improved machine for flanging can bodies arranged to simultaneously provide the ends of a can body with outwardly-extending flanges and to automatically remove the completed can body from the machine.

In order to accomplish the desired result use is made of an intermittently revolving carrier having peripheral seats for the reception of can bodies, a reciprocating clamp for clamping a can body in a seat at the time the carrier is raised and a pair of reciprocating dies adapted to pass into the ends of the can body at the time the can body is clamped in position in the carrier by the said clamp.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the can body flanging machine; Fig. 2 is a front elevation of the same; Fig. 3 is an enlarged cross section of the same on the line 3—3 of Fig. 1; Fig. 4 is a similar view of the same on the line 4—4 of Fig. 1; Fig. 5 is a longitudinal sectional elevation of the same on the line 5—5 of Fig. 1; Fig. 6 is an enlarged sectional side elevation partly in elevation of a can body clamped in position in the carrier seat by the clamp and the dies in position after forming the flanges on the ends of the can body; Fig. 7 is an enlarged side elevation of a portion of a die; Fig. 8 is an enlarged sectional side elevation of a can body in clamped position in the carrier and clamped, and dies of modified form in position after forming the flanges on the ends of a can body; and Fig. 9 is an enlarged sectional side elevation of a portion of the die shown in Fig. 8.

The machine is mounted on a suitably constructed stand A in which is journaled an intermittently rotating carrier shaft B disposed horizontally and carrying a carrier C, preferably in the form of two spaced wheels, and provided on its peripheral face with seats C′ each adapted to receive or support a can body D delivered to the seat from a can body delivery chute E in register with the seat at the time the carrier C is at rest (see Fig. 4). A can body delivered into the seat C′ by the chute E is carried by the next turning movement of the carrier C into top position to be then engaged by a clamp F having an intermittently vertical movement in guideway A′ arranged on the main frame A and while the can body is in clamped position with the carrier C and clamp F at rest and with the ends of the can body projecting beyond the outer faces of the said carrier and clamp, the ends of the can body are engaged by dies G, G′ for forming end flanges D′ (see Figs. 6 and 8). The dies G and G′ are mounted to slide toward and from each other and have a common axis coinciding with the axis of the can body held at the time in clamping uppermost position on the carrier C. After the can body is provided with the flanges D′ and released by the dies G, G′ and clamp F, it is carried at the next movement of the carrier C to a chute H or other means for carrying the can body from the machine.

As shown in Fig. 4, the carrier C is provided with eight peripheral seats C′ approximately semicircular in shape, and the under side of the clamp F is likewise semicircular in shape so that the top seat C′ and the clamp F encircle a can body. The shaft B and the carrier C are intermittently rotated from a cam shaft I journaled on the main frame A and provided with a gear wheel I′ (see Figs. 2 and 3) in mesh with a pinion I^2 secured on the main shaft J journaled on the main frame A and provided with fast and loose pulleys J′ connected by belt with other machinery for imparting a continuous rotary motion to the main shaft J which by the pinion I^2 and the gear wheel I′ imparts a continuous rotary motion to the cam shaft I.

In order to intermittently rotate the carrier shaft B from the cam shaft I, the following arrangement is made: On the carrier shaft B is secured a gear wheel B′ in mesh with a pinion B^2 secured on a shaft K jour-

naled in suitable bearings on the main frame A. On the shaft K is secured a detent wheel K′ provided with four notches K^2 adapted to be engaged successively by friction rollers L and L′ journaled on the outer ends of an arm L^2 secured on a shaft N journaled in suitable bearings arranged on the main frame A. On the shaft N is secured a gear wheel N′ in mesh with a pinion N^2 secured on the cam shaft I so that the latter transmits a continuous rotary motion to the shaft N which by the arm L^2 and the friction rollers L, L′ imparts an intermittent rotary motion to the detent wheel K′ and consequently the shaft K, and this intermittent rotary motion of the shaft K is transmitted by the pinion B^2 and the gear wheel B′ to the carrier shaft B. On the shaft N is secured a locking disk L^3 adapted to engage segmental recesses K^3 in the peripheral face of the detent wheel K′ to lock the latter against accidental turning after the friction roller L or L′ is moved out of engagement with a corresponding recess K^2 of the detent wheel K′ and until such friction roller L or L′ engages the next following recess K^2. The transmission as described is so proportioned that at each revolution of the cam shaft I the carrier shaft B is given one-eighth of a turn with the carrier C at rest at the time that the top seat C′ is in register with the clamp F, the next following seat to the right being in register with the delivery chute E, as indicated in Fig. 4.

In order to impart an intermittent up and down movement to the clamp F, the following arrangement is made: The upper end of the clamp F is pivotally connected by a link F′ with an arm F^2 secured on a shaft F^3 journaled in suitable bearings arranged on the main frame A, and on the said shaft F^3 is secured an arm F^4 connected by a link F^5 with one arm of a bell crank lever F^6 (see Fig. 4) carrying at its other arm a friction roller F^7 engaging a cam groove F^8 in one face of a cam F^9 secured on the cam shaft I and rotating with the same. By reference to Fig. 4 it will be noticed that the cam groove F^8 is shaped in such a manner that a downward movement is given to the clamp F during a portion of one revolution of the cam shaft I, and then the clamp F is held stationary in clamping position on the top can body D for another period of one revolution of the shaft I, and then the clamp F is moved upward during the remaining portion of the one revolution of the cam shaft I. The clamp F is held stationary during the time the dies G and G′ enter the ends of the can body and form flanges thereon, and then return to outermost position after which the clamp F is raised as above described.

In order to impart an intermittent reciprocating movement to the dies G and G′, the following arrangement is made, special reference being had to Figs. 2, 3 and 5: The dies G and G′ are provided with spindles G^2, G^3 terminating in reduced threaded portions G^4 and G^5 screwing in cross heads O and O′ mounted to slide longitudinally in guideways A^2, A^3 arranged on the main frame A. By the arrangement described the dies G and G′ can be adjusted lengthwise in the cross heads O and O′ so as to move the inner or opposite faces of the dies G, G′ in proper position relative to the ends of the can body D to be flanged at the time. It is understood that this adjustment is necessary to flange can bodies of different length. Lock nuts G^6, G^7 screw on the threaded portions G^4, G^5 to lock the dies G and G′ against accidental movement after the desired adjustment has been made. The outer ends of the cross heads O and O′ are pivotally connected with toggle mechanisms O^2, O^3 fulcrumed at O^4, O^5 on the main frame A. The said toggle mechanisms O^2, O^3 are pivotally connected by links P and P′ with slides P^2, P^3 mounted to slide vertically in suitable guideways A^4 and A^5 arranged on the main frame A, as plainly indicated in Fig. 5. The lower ends of the slides P^2, P^3 are connected by links P^4, P^5 with levers Q, Q′ fulcrumed at Q^2, Q^3 on the main frame A. The levers Q and Q′ are provided at their outer ends with friction rollers Q^4, Q^5 engaging cam grooves Q^6, of which one is formed in one face of the gear wheel I′ and the other is formed in one face of a cam Q^7 secured on the cam shaft I. When the cam shaft I is rotated an intermittent reciprocating movement is given to the dies G and G′ by the mechanism just described so that the inner ends of the dies G and G′ pass into the ends of the can body D and form the flanges D′ thereon. Each of the dies G and G′ is provided at its inner face with a reduced portion G^6 and shoulders G^7, of which the reduced portion G^6 has a tapering or a conical outer portion so as to permit the reduced portion G^6 to readily enter a corresponding open end of the can body D, each of which finally comes in contact with the shoulder G^7 to turn the said edge outward with a view to form the flange D′ on the corresponding end of the can body D, as will be readily understood by reference to Fig. 6. If desired, the shoulder G^7 of each die G or G′ may be provided with an overhang G^8 (see Figs. 8 and 9) to limit the width of the flange D′ formed on the can body D.

The chute E is made adjustable to accommodate can bodies D of different length, and for this purpose the following arrangement is made, special reference being had to Figs. 1, 2, 3 and 4. The chute E consists of two side pieces each formed of two angle irons E′, E^2 connected with each other by a side plate E^3 and to the outer faces of the angle irons E′, E^2 of each side piece is secured a

supporting bar E^4 adjustably held on screw rods E^5 attached to brackets E^6 secured to the main frame A. On each screw rod E^5 screw pairs of nuts E^7, E^8 between which extends the corresponding supporting bar E^4, and by adjusting the nuts E^7, E^8 the supporting bars can be adjusted to move the side pieces of the chute E toward or from each other according to the length of the can body D to be flanged at the time. It is understood that the angle irons E′, E^2 are spaced apart a distance corresponding to the outside diameter of the can body, and the side portions have their lower portions inclined inwardly and downwardly to direct the can bodies toward the carirer C, as will be readily understood by reference to Fig. 4. The inner end of the chute H is provided with an upwardly and inwardly extending tongue H′ reaching between the two wheels forming the carrier C to engage a flanged can body and move the same out of its seat C′ and onto the chute H.

The operation is as follows: When the machine is running and the several parts are in the position shown in Fig. 4, then the lowermost can body in the chute E is seated in the seat C′ of the carrier C while a previously introduced can body is in uppermost position on the carrier C and is engaged by the clamp F. At this time the dies G and G′ are moved toward each other so that the terminals G^6 pass into the projecting ends of the top can body D to form the flanges D′ thereon, and then the dies G and G′ move out of the ends of the flanged can body back to their original position, after which the clamp F is raised and hence moved out of engagement with the flanged can body. A turning motion in the direction of the arrow a' is now given to the carrier C to move the latter one-eighth of a revolution, so that the previously introduced can body now moves into uppermost position, and another can body passes from the chute E into the seat C′ now in register with the lower end of the chute. The clamp F now moves downward into clamping engagement with the uppermost can body D, after which the dies G and G′ are again moved inward toward each other, and the above-described operation is repeated. At the next turning movement given to the carrier C the can body first flanged is moved out of its seat by the tongue H′ and directed onto the chute H which carries the flanged can body away from the machine.

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

1. A can body flanging machine provided with a can body delivery chute, comprising side pieces each formed of spaced angle irons, a side plate connecting the angle irons of a side piece with each other, supporting bars attached to the angle irons of the side pieces, fixed screw rods supporting the said supporting bars, and pairs of nuts screwing on the said screw rods and engaging the said supporting bars to permit of adjusting the side pieces toward and from each other.

2. A can body flanging machine comprising the combination with a frame, of a can body delivery chute comprising side pieces, brackets secured to the frame and projecting therefrom at opposite sides of the chute, a screw rod rigidly connected to the ends of the brackets and extending therebetween, supporting bars connected to the side pieces of the delivery chute and through portions of which the said screw rod loosely extends, and nuts adjustable upon the screw rod on opposite sides of the supporting bars, whereby the side pieces of the chute may be readily adjusted with respect to one another for the purpose described.

3. A can body flanging machine, comprising an intermittently revolving carrier having peripheral seats for the reception of can bodies, a reciprocating clamp for clamping a can body in a seat at the time the carrier is at rest, a pair of reciprocating dies adapted to pass into the ends of the can body at the time the can body is clamped in position in the carrier by the said clamp, said dies having threaded spindles, sliding cross heads in which the said spindles are adjustably held and toggle mechanism connected directly to the cross heads through which movement is imparted to said dies.

4. A can body flanging mechanism, comprising an intermittently rotating carrier having a horizontal axis and provided on its peripheral face with can seats, means for feeding can bodies to the said seats, a vertical intermittently reciprocating clamp coacting with the carrier when the latter is at rest to clamp a can body in its seat, a pair of horizontally reciprocating dies adapted to pass simultaneously into the ends of a clamped can body, said dies having threaded spindles, sliding cross heads in which the said spindles are adjustably held and means for actuating the said dies, including a toggle mechanism for each of the dies connected directly to its crosshead, substantially as described.

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

HENRY L. GUENTHER.

Witnesses:
FRANK JAMES,
E. KATHERINE MOLITOR.