

F. RUDOLPHI.
CAN BODY FLANGING MACHINE.
APPLICATION FILED SEPT. 1, 1911.

1,055,418.

Patented Mar. 11, 1913.

4 SHEETS—SHEET 1.

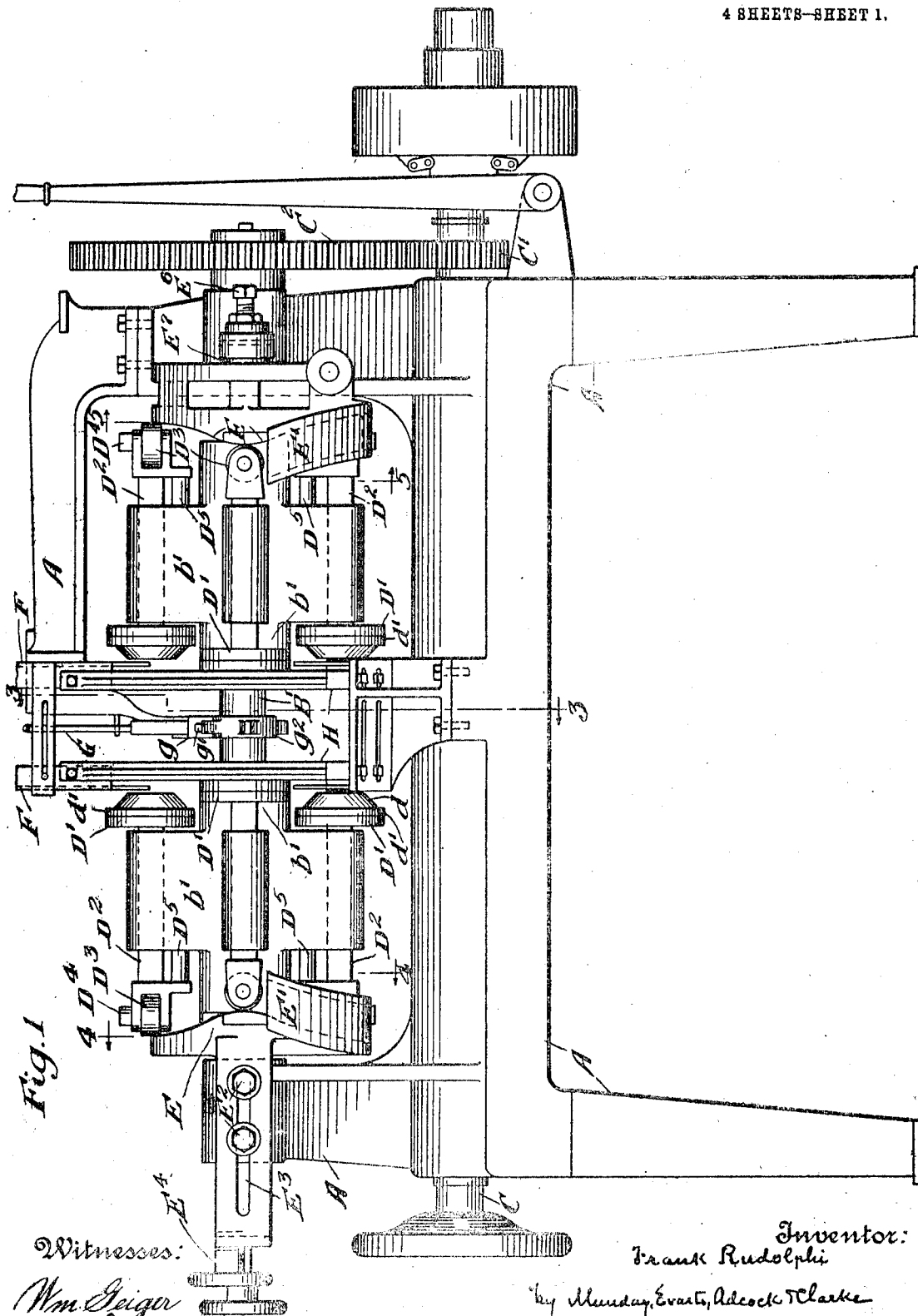


Fig. 1

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Inventor:
Frank Rudolphi

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Attorney

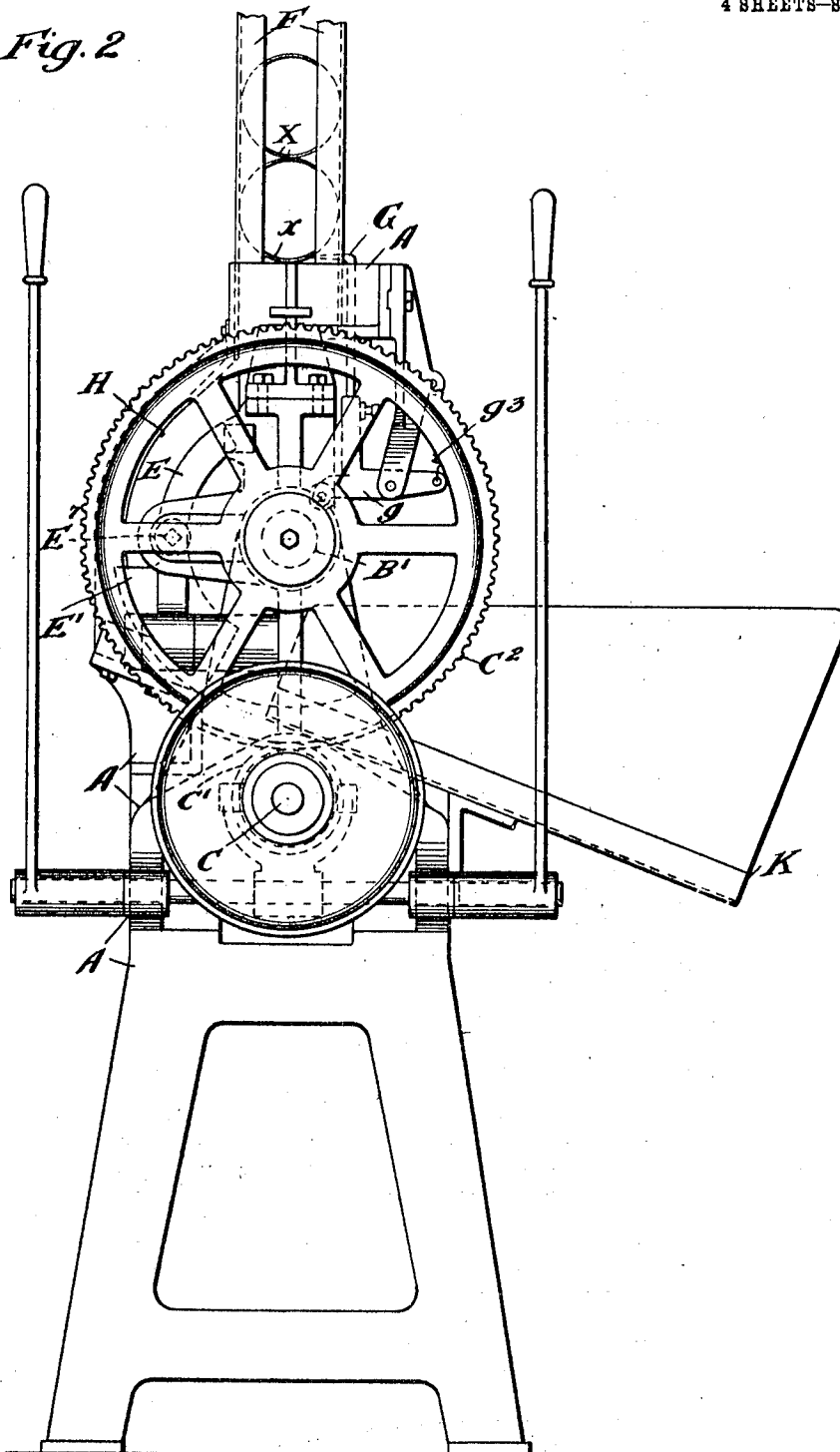
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4 SHEETS—SHEET 2.

Fig. 2



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4 SHEETS—SHEET 3.

Fig. 4

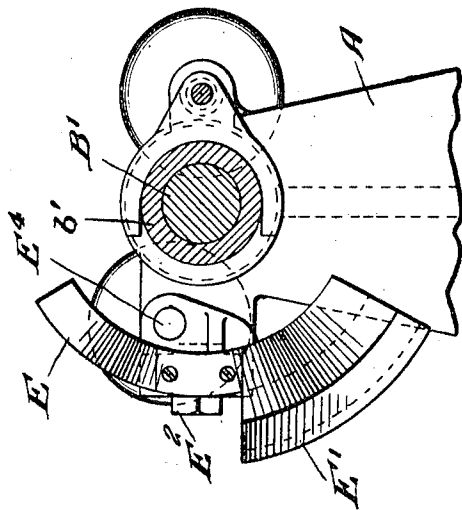


Fig. 5

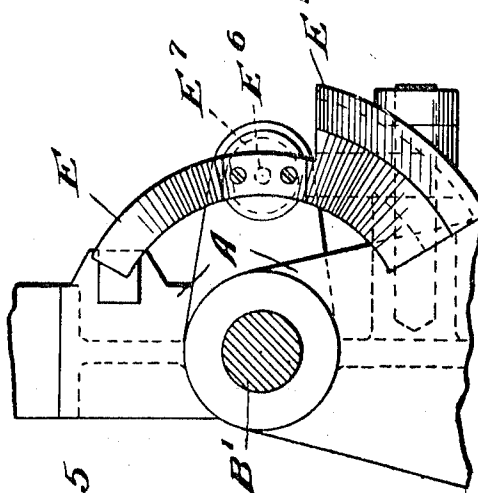
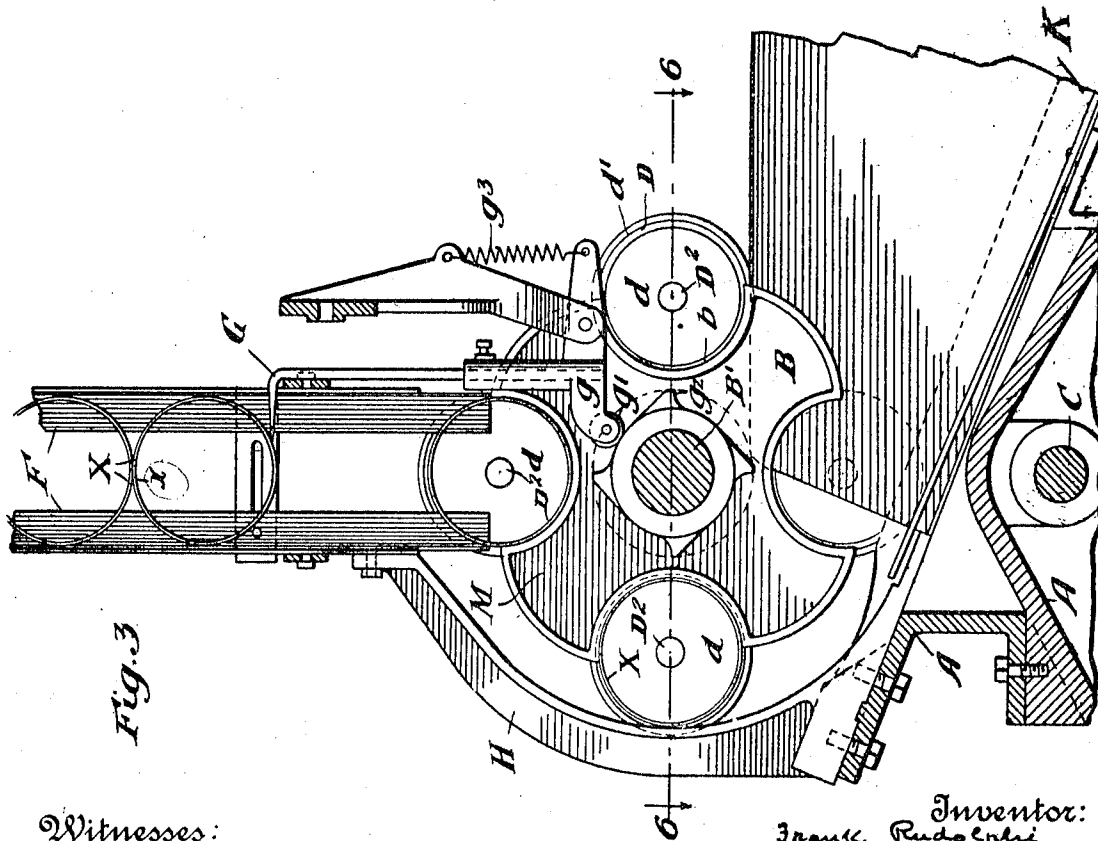


Fig. 3



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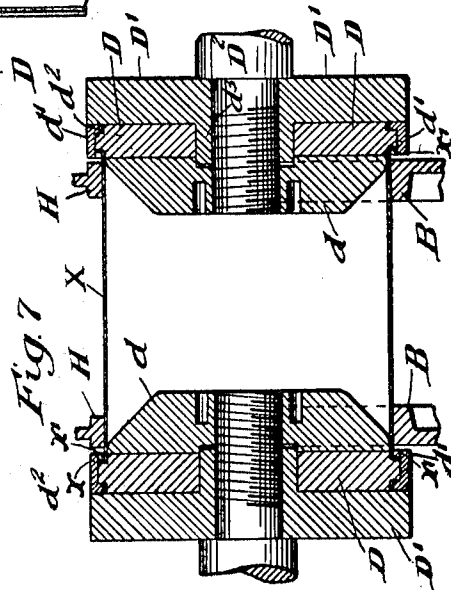
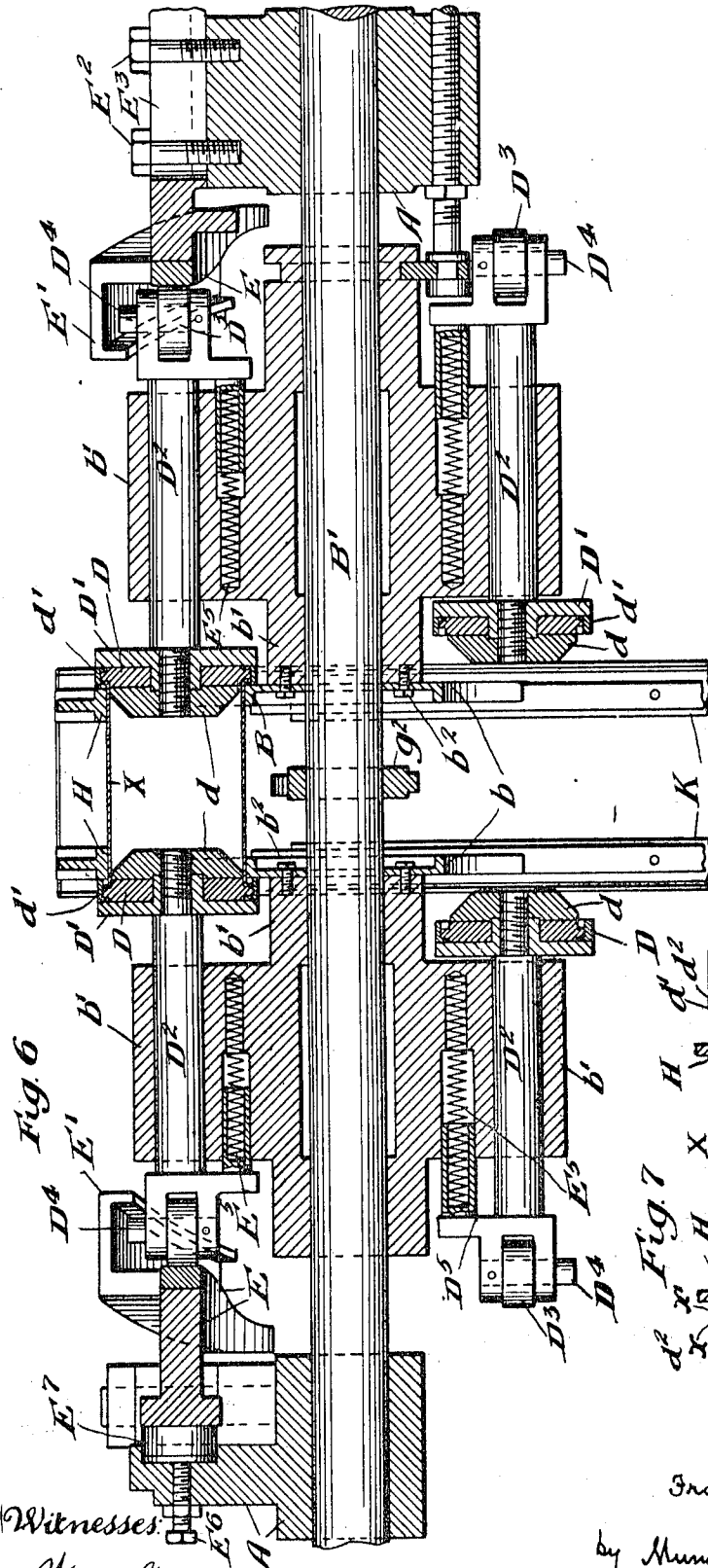
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

FRANK RUDOLPHI, OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN CAN COMPANY, OF
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CAN-BODY-FLANGING MACHINE.

1,055,418.

Specification of Letters Patent.

Patented Mar. 11, 1913.

Original application filed June 5, 1910, Serial No. 536,660. Divided and this application filed September 1, 1911. Serial No. 647,153.

To all whom it may concern:

Be it known that I, FRANK RUDOLPHI, a citizen of the United States, residing in New York, in the county of New York and State of New York, have invented a new and useful Improvement in Can-Body-Flanging Machines, of which the following is a specification.

This application is a division of my application, Serial Number 536,660 filed June 6, 1910.

My invention relates to can body flanging machines.

The object of my invention is to provide a can body flanging machine of a simple, efficient and durable construction, by means of which can bodies may be rapidly and cheaply flanged and by which the flanges will be formed upon the ends of the can bodies uniformly and perfectly and also equally upon each end of the can body in cases where both ends of the can body are to be flanged.

The machine embodying my invention comprises in coöperative combination, a movable carrier, preferably a continuously rotating carrier, a plurality of reciprocating flanging dies mounted on the carrier, and each having a tapering head adapted to enter the can body and a surrounding limiting wall or ring to limit the extent to which the flange may be turned on the can body, a plurality of can body holders or pockets on the carrier adapted to hold or support the can bodies between opposing flanging dies as the dies close upon the can body, and also adapted by engagement with the formed flange to strip or eject the can body from the flanging die as the flanging die withdraws, a delivery chute and feeder for the can bodies adapted to automatically deliver the can bodies one by one into the pockets or holders of the carrier as the carrier rotates, a discharge chute for the flanged can bodies and means, preferably stationary cams, for reciprocating the flanging dies as the carrier rotates.

My invention consists in the novel construction of parts and devices and in the novel combinations and sub-combinations of parts and devices herein shown and described and more particularly set forth in the claims.

In the accompanying drawing forming a

part of this specification, Figure 1 is a side elevation of a continuous rotary can body flanging machine embodying my invention. Fig. 2 is an end view. Figs. 3, 4 and 5 are detail sections on lines 3—3, 4—4 and 5—5 of Fig. 1 respectively. Fig. 6 is a detail horizontal section on line 6—6 of Fig. 3 and Fig. 7 is an enlarged detail sectional view, showing one pair of the flanging dies.

In the drawing, A represents the frame of the machine, which may be of any suitable construction adapted to give support to the other parts.

M is a rotary carrier furnished with a series of can body holders or semi-circular pockets *b*. Its shaft *B*¹ is preferably continuously rotated from the driving shaft C through intermeshing gears *C*¹ *C*². The can body carrier M is preferably formed of two separate disks secured to separate heads *b*¹ on the carrier shaft *B*¹ which may be adjusted closer together or farther apart as may be required for operation upon can bodies of different sizes or lengths. The carrier disks B are preferably removably secured to the heads *b*¹ by screws *b*² so that carrier disks having can body holders or pockets *b* of different diameters or sizes may be changed, one for the other, to adapt the machine for operation upon can bodies of different diameters.

The carrier heads *b*¹ are furnished each with a plurality of reciprocating can body flanging dies D, each having a tapering head or nose *d* to facilitate the entrance of the die within the end of the can body when the can body is bent or distorted out of shape, and each also provided with a limiting shoulder or wall *d*¹ against which the extreme outer edge *x* of the flange *x*¹ of the can body X may engage and thus limit the extent to which the flange will be turned upon each end of the can body as the flanging dies D enter the can body at opposite ends and approach each other. The limiting wall or shoulder *d*¹ and the tapering head or nose *d* of the die are preferably formed in separate pieces from the main portion D of the die for convenience of manufacture. The limiting wall or ring *d*¹ of the die preferably has an inwardly projecting flange or shoulder *d*² fitting in a corresponding annular recess in the outer face of the die D so that the tapering head

d will serve to hold all the parts assembled. Each of the dies D is carried by a plate or holder D^1 , having a hub d^3 fitting within the die D and carried by the reciprocating stem or bar D^2 which is mounted to slide in the head b^1 of the carrier. The die stem D^2 is provided at its outer end with an anti-friction roller D^3 which engages a stationary cam E on the frame of the machine to reciprocate the die. The die stem or slide D^2 is also provided with a pin D^4 which may engage a further stationary cam E^1 to insure the proper withdrawal of the die as the carrier rotates. The die stem or slide D^2 also has an arm D^5 against which a spring E^5 mounted in the head b^1 acts to normally withdraw the die after each inward stroke of the die.

F is the chute or runway from which the can bodies are delivered one by one by the feeder G to the pockets of the carrier B as the carrier rotates continuously. The feeder G preferably consists of a vibrating finger or arm having a pivoted operating lever g carrying a roller g^1 which is engaged by a cam g^2 on the carrier shaft B^1 , thus withdrawing the feeder so as to release the lowermost can body X in the feed chute F . The can body feeder lever g is preferably furnished with a spring g^3 to hold the same normally against the cam g^2 .

As the can body carrier disks B rotate and move each holder b from the can body receiving position, the can bodies are held snugly in the pockets b of the carrier by a curved guide or guard H secured to the frame of the machine and which encircles the carrier from the can body receiving position to near the can body discharging position. To cause the carrier disks B to also serve as means for stripping or ejecting the flanged can body from the flanging dies D as the opposing dies withdraw from each other and from the can body, in case the can body should tend to stick in one or the other of the two opposing dies, the can body carrier disks B are arranged so that their outer faces are near the flanged end of the can body, and thus in position to be engaged by the flange of the can body in case the can body should tend to stick in one or the other of the dies as the dies withdraw.

K is the can body discharge chute for the flanged can body.

The stationary cams E at each end of the machine are adjustably mounted upon the frame, one of these cams preferably having a bolt and slot adjustment E^2 E^3 and screw E^4 to adjust the cams closer together or farther apart as may be required for operation upon can bodies of different lengths, and the other cam being furnished with an adjusting screw E^5 for accurately adjusting the approaching movement of the flanging dies toward each other to the length of

flange to be turned upon the can body. A rubber cushion E^7 is preferably interposed between one of the cams E and the adjusting screw E^6 .

My machine, as illustrated in the drawings, is especially intended and designed for simultaneously flanging both ends of can bodies. If, however, it is desired to form the flanges upon one end only of the can bodies, this may be readily done by simply substituting plain can body supporting dies or heads for the straight end of the can body to abut against for the flanging dies at one end of the machine.

I claim:—

1. In a can body flanging machine, the combination with a continuously rotating carrier having a series of can body holders adapted to laterally receive and discharge the can bodies, of a series of reciprocating flanging dies mounted on said carrier at each end of said can body holders, and having tapering heads to enter the can bodies and limiting walls to cause the flanges to form truly and uniformly and equally on each end of the can bodies as the dies engage the ends thereof, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

2. In a can body flanging machine, the combination with a continuously rotating carrier having a series of can body holders adapted to laterally receive and discharge the can bodies, of a series of reciprocating flanging dies mounted on said carrier at each end of said can body holders, and having tapering heads to enter the can bodies and limiting walls to cause the flanges to form truly and uniformly and equally on each end of the can bodies as the dies engage the ends thereof, said can body holders having outer faces adapted to engage the flanges of the can bodies to strip or free the can bodies from the dies as the dies withdraw, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

3. In a can body flanging machine, the combination with a continuously rotating carrier having a series of can body holders adapted to laterally receive and discharge the can bodies, of a series of reciprocating flanging dies mounted on said carrier at each end of said can body holders, and having tapering heads to enter the can bodies

and limiting walls to cause the flange to form truly and uniformly and equally on each end of the can bodies as the dies engage the ends thereof, and a curved guard for holding the can bodies in said holders of the carrier as the carrier rotates, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

4. In a can body flanging machine, the combination with a continuously rotating carrier having a series of can body holders adapted to laterally receive and discharge the can bodies, of a series of reciprocating flanging dies mounted on said carrier at each end of said can body holders, and having tapering heads to enter the can bodies and limiting walls to cause the flanges to form truly and uniformly and equally on each end of the can bodies as the dies engage the ends thereof, said can body holders having outer faces adapted to engage the flanges of the can bodies to strip or free the can bodies from the dies as the dies withdraw, and a curved guard for holding the can bodies in said holders of the carrier as the carrier rotates, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

5. In a can body flanging machine, the combination with a continuously rotating carrier having a series of can body holders adapted to laterally receive and discharge the can bodies, of a series of reciprocating flanging dies mounted on said carrier at each end of said can body holders, and having tapering heads to enter the can bodies and limiting walls to cause the flanges to form truly and uniformly and equally on each end of the can bodies as the dies engage the ends thereof, and a can body feeder for automatically delivering the can bodies one by one to the holders of said carrier, each of said flanging dies being adapted to engage the end of the can bodies simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

6. In a can body flanging machine, the combination with a continuous rotating carrier having a series of can body holders adapted to laterally receive and discharge

the can bodies, of a series of reciprocating flanging dies mounted on said carrier at each end of said can body holders, and having tapering heads to enter the can bodies and limiting walls to cause the flanges to form truly and uniformly and equally on each end of the can bodies as the dies engage the ends thereof and stationary cams for operating said dies as the carrier rotates, said dies acting independently of said holders to form said flanges, substantially as specified.

7. In a can body flanging machine, the combination with a carrier having a plurality of can body holders adapted to laterally receive and discharge the can bodies, of a plurality of reciprocating flanging dies mounted on said carrier, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

8. In a can body flanging machine, the combination with a carrier having a plurality of can body holders adapted to laterally receive and discharge the can bodies, of a plurality of reciprocating flanging dies mounted on said carrier, and having tapering heads to enter the can bodies and limiting walls to cause the flanges to form truly and uniformly, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, substantially as specified.

9. In a can body flanging machine, the combination with a carrier having a plurality of can body holders adapted to laterally receive and discharge the can bodies, of a plurality of reciprocating flanging dies mounted on said carrier, and having tapering heads to enter the can bodies and limiting walls to cause the flanges to form truly, and uniformly, said can body holders having outer faces adapted to engage the flanges of the can bodies and strip or free the same from the dies as the dies withdraw, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

10. In a can body flanging machine, the combination with a carrier having a plurality of can body holders adapted to laterally receive and discharge the can bodies, of a plurality of reciprocating flanging dies mounted on said carrier, and having taper-

ing heads to enter the can bodies and limiting walls to cause the flanges to form truly and uniformly, and a feed chute and feeder for delivering the can bodies one by one to said holders of the carriers, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

11. In a can body flanging machine, the combination with a carrier having a plurality of can body holders adapted to laterally receive and discharge the can bodies, of a plurality of reciprocating flanging dies mounted on said carrier and having tapering heads to enter the can bodies and limiting walls to cause the flanges to form truly and uniformly, said can body holders being adapted to engage the flanges formed on the can bodies to free the same from the dies as the dies withdraw, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

12. In a can body flanging machine, the combination with a continuously rotating carrier having a plurality of can body holders adapted to laterally receive and discharge the can bodies, of a plurality of pairs of reciprocating flanging dies mounted on said carrier, the dies of each pair being at the opposite ends of each can body holder, and each die having a tapering head to enter the can body, and a limiting wall to cause the flange to form truly and uniformly, a can body feed chute and a can body feeder, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

13. In a can body flanging machine, the combination with a can body holder adapted to laterally receive and discharge a can body, of opposing reciprocating can body flanging dies, one at each end of said holder, having each a head adapted to enter and fit within the end of the can body, and provided each with a limiting wall to cause the can body flange to form truly, said holder being adapted to engage the can body flange to strip or free the can body from the die in which the can body may stick as

the die withdraws, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holder to form said flanges, substantially as specified.

14. In a can body flanging machine, the combination with a rotating carrier, of a plurality of can body holders on the carrier adapted to laterally receive and discharge the can bodies, and a plurality of reciprocating flanging dies on the carrier, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

15. In a can body flanging machine, the combination with a rotating carrier, of a plurality of can body holders on the carrier, adapted to laterally receive and discharge the can bodies, and a plurality of reciprocating flanging dies on the carrier, said holders being adapted to engage the flanges of the can bodies and free the can bodies from the dies as the dies withdraw, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

16. In a can body flanging machine, the combination with a rotating carrier, of a plurality of can body holders on the carrier adapted to laterally receive and discharge the can bodies, a plurality of reciprocating flanging dies on the carrier, and stationary cams for reciprocating said dies, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

17. In a can body flanging machine, the combination with a rotating carrier, of a plurality of can body holders on the carrier adapted to laterally receive and discharge the can bodies, a plurality of reciprocating flanging dies on the carrier, and a curved guard for retaining the can bodies in said holders, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous

flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

18. In a can body flanging machine, the combination with a rotating carrier, of a plurality of can body holders on the carrier adapted to laterally receive and discharge the can bodies, a plurality of reciprocating flanging dies on the carrier, a can body chute and a can body feeder, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

19. In a can body flanging machine, the combination with a rotating carrier, of a plurality of can body holders on the carrier adapted to laterally receive and discharge the can bodies, a plurality of reciprocating flanging dies on the carrier, a can body chute, a can body feeder, and a cam and connecting means for operating said feeder, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

20. In a can body flanging machine, the combination with a rotating carrier, of a plurality of can body holders on the carrier adapted to laterally receive and discharge the can bodies, a plurality of reciprocating flanging dies on the carrier, stationary cams for reciprocating said dies, a can body chute, a can body feeder, and a cam and connections for operating said feeder, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

21. In a can body flanging machine, the combination with a can body holder, of a flanging die having a separate piece tapering die and a separate piece can body flange limiting wall ring removably secured to said die, said die acting independently of said holder to form the flange on the can body, substantially as specified.

22. In a can body flanging machine, the combination with a can body holder, of a flanging die having a separate piece tapering head and a separate piece limiting wall ring removably secured to said die, said

limiting wall ring having an inwardly projecting shoulder engaged by the die to cause the die to hold said ring in assembled position, said die acting independently of said holder to form the flange on the can body, substantially as specified.

23. The combination with a carrier, of a can body holder thereon adapted to laterally receive and discharge a can body, and reciprocating flanging dies, one at each end of said holder, said holder serving to support the can body in registry with the dies as they enter the ends of the can body, and to strip the can body from the die in which it may stick as the die withdraws, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holder to form said flanges, substantially as specified.

24. The combination with a carrier, of a can body holder thereon adapted to laterally receive and discharge a can body, and reciprocating flanging dies, one at each end of said holder, said holder serving to support the can body in registry with the dies as they enter the ends of the can body, and to strip the can body from the die in which it may stick as the die withdraws, and a can body chute and feeder, each of said flanging dies being adapted to engage the end of the can body simultaneously at its entire circumference and acting to form a continuous flange around the whole circumference of the can body at the same time, said dies acting independently of said holders to form said flanges, substantially as specified.

25. A flanging machine including in combination, continuously operating mechanism including a plurality of independently operated flanging stations, each including non-rotating dies, and means for moving said dies toward and from each other, to turn flanges at each end of the can body, means for bodily moving said flanging stations, and means for presenting can bodies to said flanging stations.

26. A flanging machine having in combination, a rotatable support, a plurality of sets of non-rotating flanging dies bodily movable with said support, means for feeding can bodies to said dies, and means for automatically moving the flanging dies toward and from each other, to flange the can body, said means being timed so that the flanging operation occurs during a portion only of the rotation of the support.

27. A flanging machine having in combination, a support rotating about a horizontal axis, a plurality of pairs of non-rotating flanging dies bodily movable with

said support, a feed chute for feeding can bodies to said support, spaced disks carried by said support on which the can bodies in the feed chute rest while said support is rotating, said disks having pockets formed therein in alinement with the flanging dies for receiving a can body and presenting the same to the flanging dies, said disks being disposed adjacent to the ends of said can bodies, whereby the flanges turned on the can body by the dies will engage said disks and strip the can bodies from the dies.

28. A flanging machine having in combination, continuously operating mechanism including independently operating non-rotating flanging stations, each comprising flanging dies adapted to operate simultaneously upon the opposite ends of the can body, means for bodily moving said flanging

stations, and means for operating said dies to flange the can bodies during the bodily travel of the flanging station.

29. In a machine for flanging can bodies, the combination of a feed chute, and a discharge chute, of a plurality of pairs of non-rotating flanging heads constructed to engage the entire end of the can body, means for bodily traveling said pairs of flanging heads past said feed chute and said discharge chute, and means for causing said flanging heads to move into the can body while traveling from the feed chute to the discharge chute for turning a flange on the can body.

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