

L. C. SHARP.
CAN FLANGING AND HEADING MACHINE.
APPLICATION FILED JAN. 3, 1907.

983,002.

Patented Jan. 31, 1911.

4 SHEETS-SHEET 1.

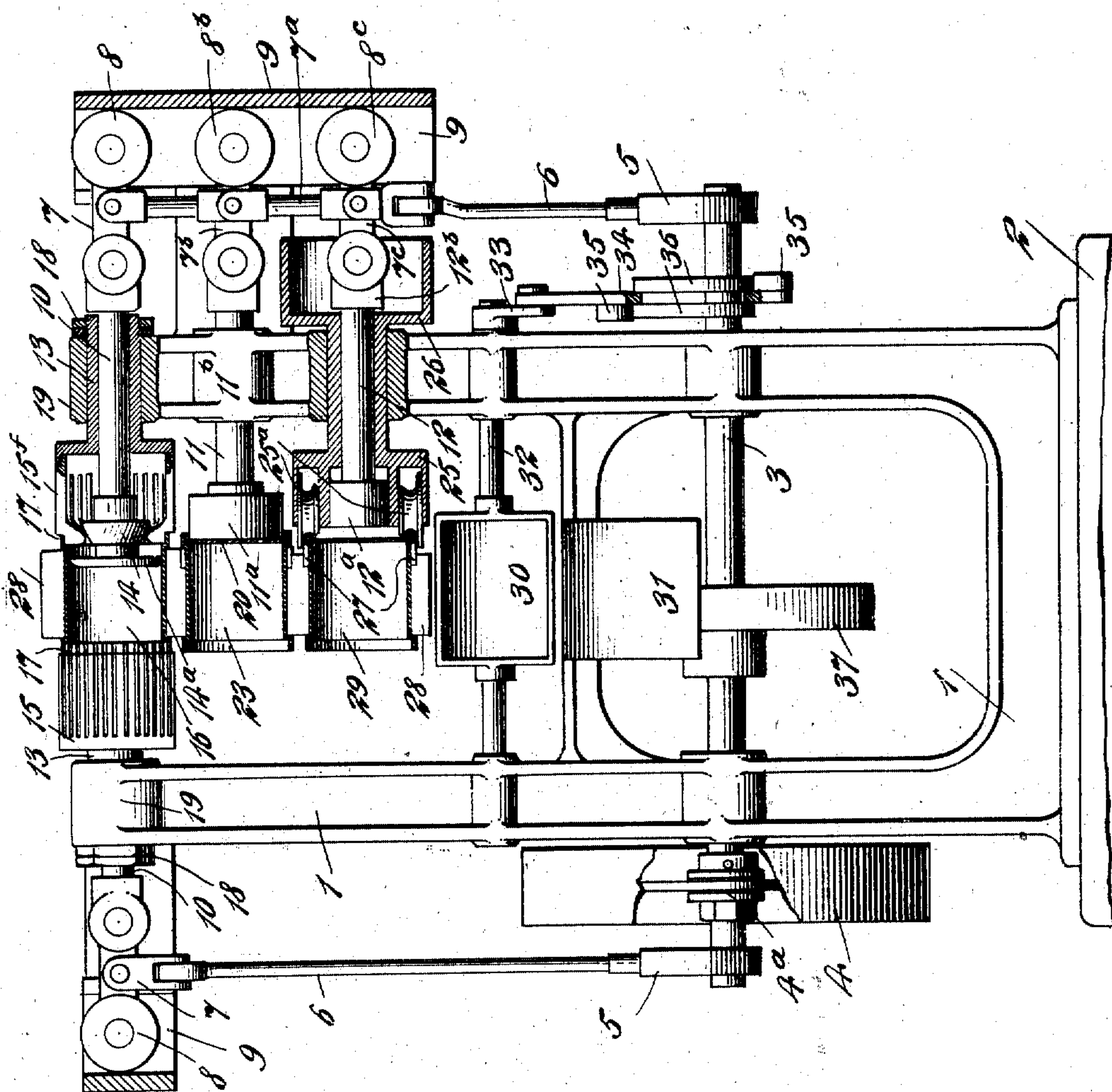


Fig. 1.

WITNESSES

John H. Smith
G. V. Una.

INVENTOR

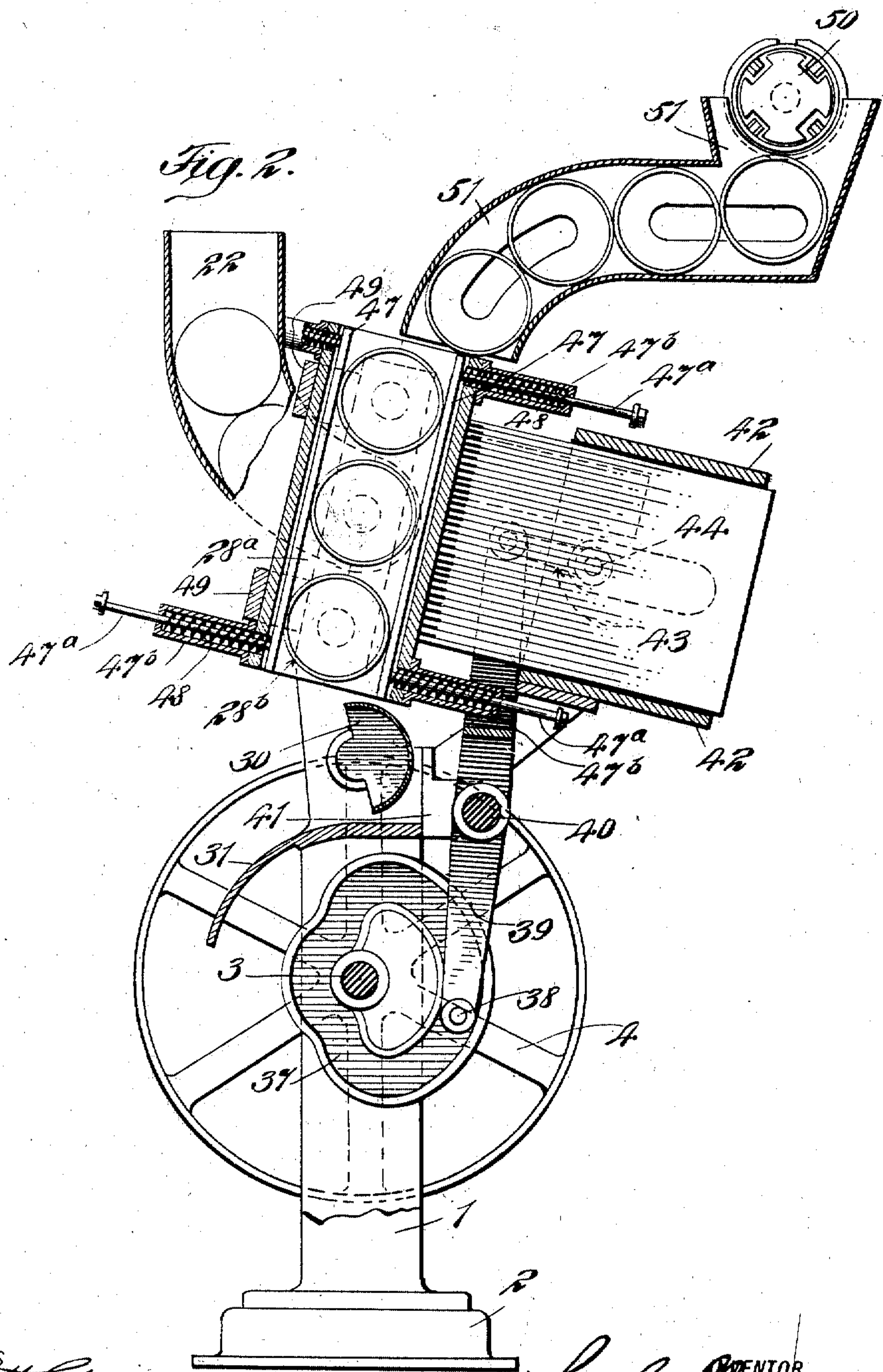
Lee C. Sharp
BY *Wm. B. Owens*
ATTORNEY

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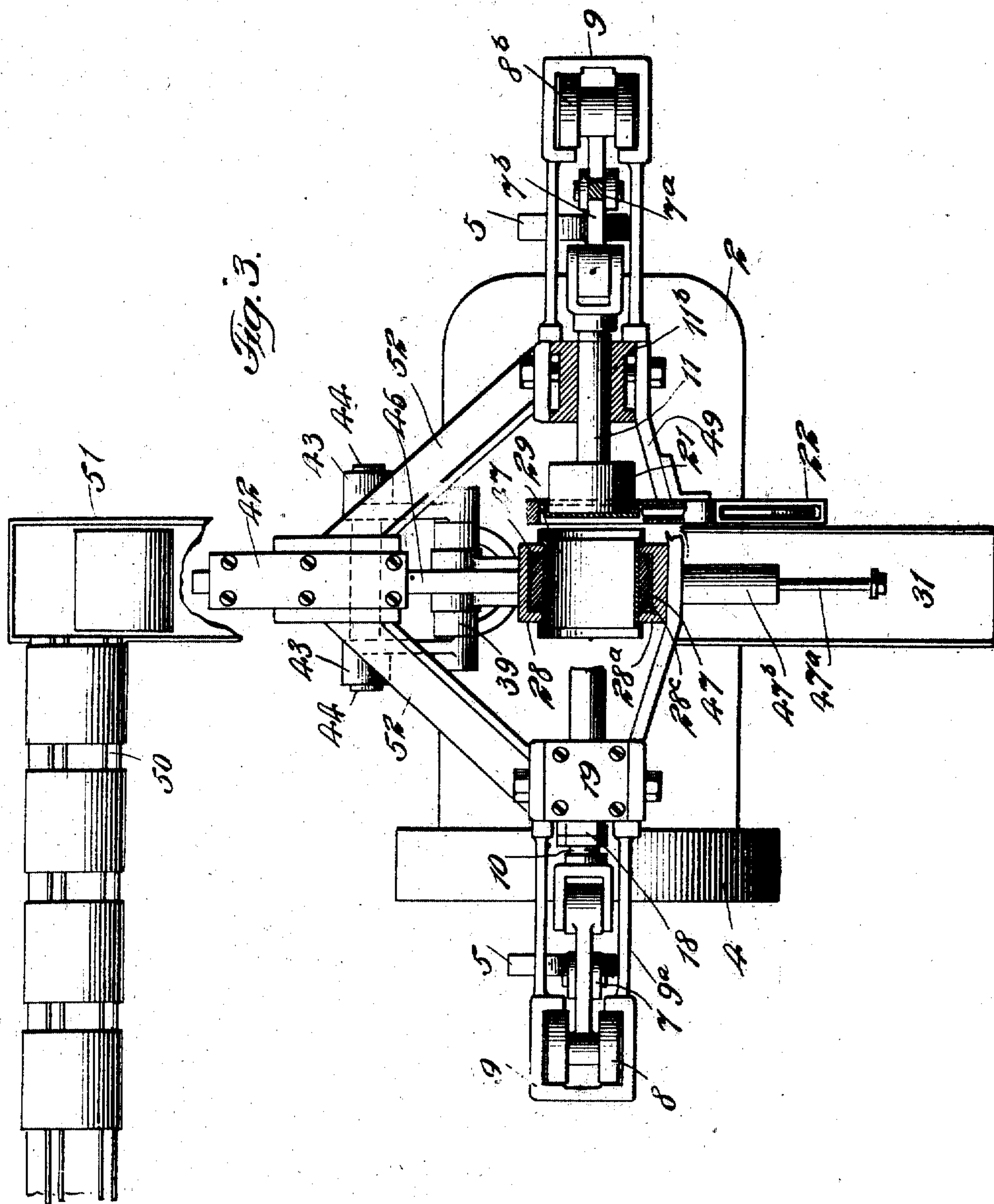
INVENTOR
Lee C. Sharp
BY
Wm. B. Owens
ATTORNEY,

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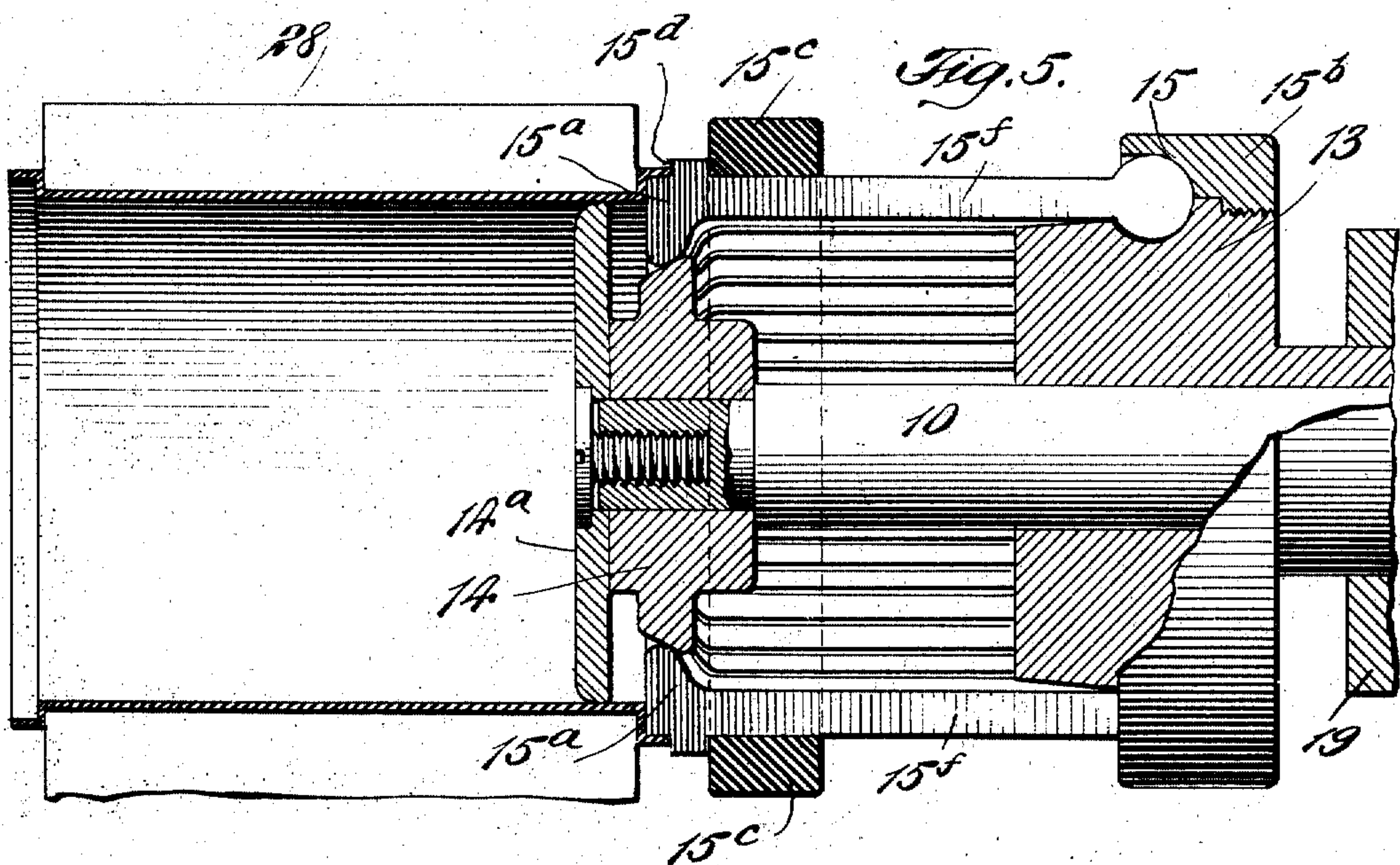
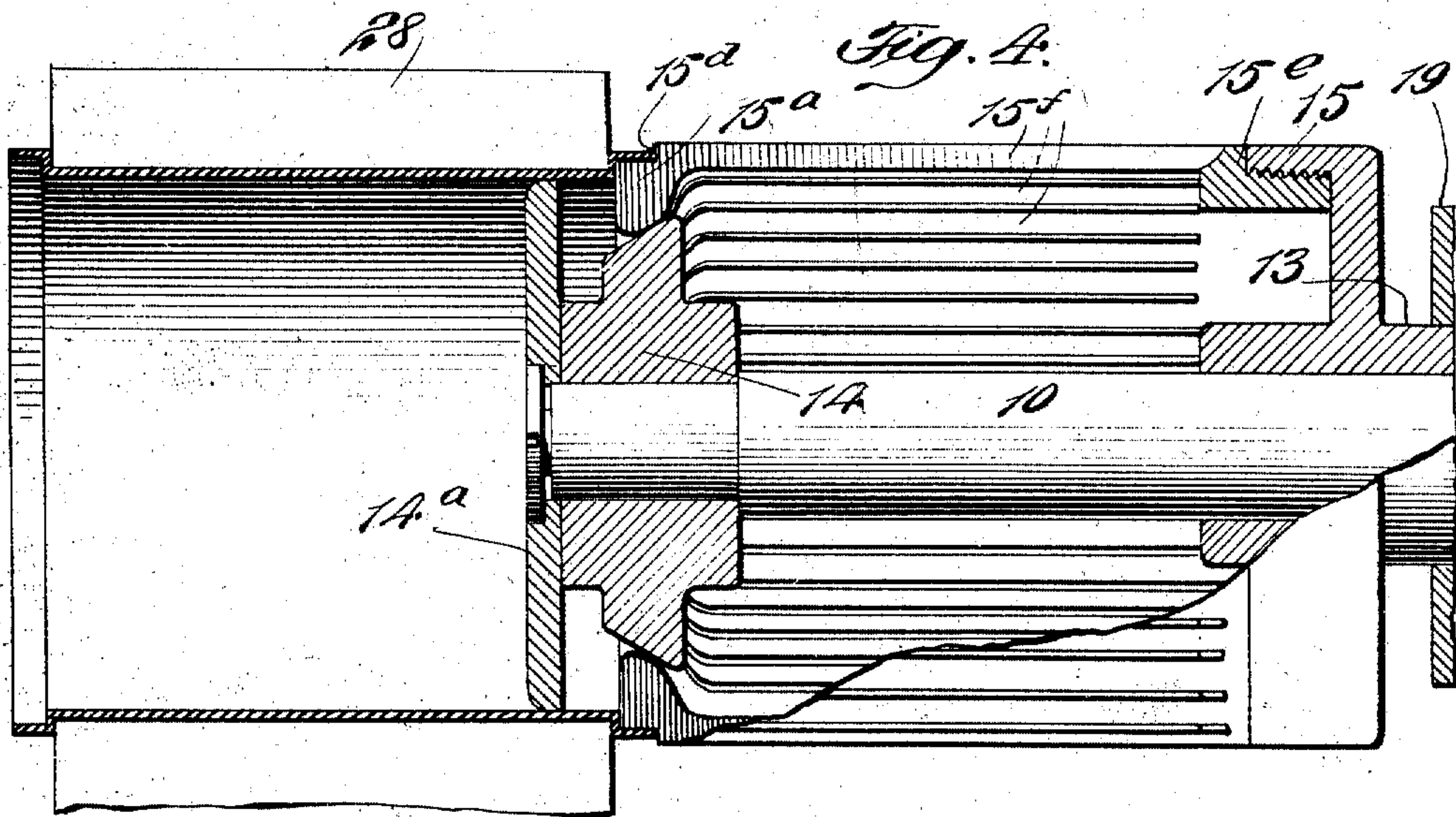
INVENTOR
Lee C. Sharp
BY
Wm. B. Owens
ATTORNEY

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4 SHEETS-SHEET 4.



WITNESSES
Julian H. Smith
G. H. Hna

INVENTOR
Lee C. Sharp
BY
Wm. B. Curtis
ATTORNEY

UNITED STATES PATENT OFFICE.

LEE C. SHARP, OF PLATTSMOUTH, NEBRASKA.

CAN FLANGING AND HEADING MACHINE.

983,002.

Specification of Letters Patent.

Patented Jan. 31, 1911.

Application filed January 3, 1907. Serial No. 350,684.

To all whom it may concern:

Be it known that I, LEE C. SHARP, a citizen of the United States, resident of Plattsmouth, Cass county, and State of Nebraska, have invented a new and useful Machine Pertaining to the Flanging and Heading of Tin Cans, of which the following is a specification.

My invention relates to an automatic machine for applying the heads or caps to can bodies.

In its preferred embodiment, the machine embraces devices for flanging or preparing the end or ends of the bodies for the reception of the heads, engaging the heads to the flanged end or ends of the body and forming a roll seam between the heads and bodies, although these functions are in some cases susceptible to segregation as will hereinafter appear and my invention is not therefore limited to the presence of all of such functions in a single organism.

The embodiment of the invention here shown is especially adapted for use in connection with my improved can body former covered by my copending application Serial No. 354,348, filed Jan. 26, 1907, while the devices for producing the roll seam in the preferred embodiment of the invention constitute the subject matter of my copending application, Serial No. 345,260, filed November 26, 1906.

Primarily, the object of my invention is to construct a compact machine capable of receiving can bodies directly from the body former and apply and seam the heads by a series of rapid and continuous operations.

It is further an object of the invention to arrange the mechanism so that by easy adjustments one or more of its functions may be temporarily or permanently dispensed with, thus rendering the machine what is ordinarily termed "universal"; i. e., adaptable to the various different situations daily arising in a modern can factory.

Still a further object of the invention is to provide a machine capable of successfully and automatically carrying out the operations necessary to the formation of the so-called "sanitary" cans, in which the heads are united to the body usually without the use of solder and by rolling together the edges of the body and head.

My invention involves various other features of major or minor importance and all will be fully set forth hereinafter and particularly pointed out in the claims.

Reference is had to the accompanying drawings, which illustrate, as an example, one manner in which the various elements of my invention may be embodied.

Figure 1 is a front elevation of the machine with parts in vertical section; Fig. 2 is a sectional elevation, the line of section extending from the front to the rear of the machine; Fig. 3 is a plan view with parts in horizontal section and showing part of the body former in the position it assumes when the two machines are used together. Fig. 4 is an enlarged sectional view of the flanging device and Fig. 5 is a similar view of a modification.

1 indicates the vertical frame of the apparatus which may if desired, be mounted on a base 2. Curving upward and rearward from the top of the frame is the chute 51 which receives the can bodies from the body former, a part of which is indicated at 50 in the drawings, while the heads are led down to the heading devices through a chute 22.

Arranged below the chute 51 to receive the can bodies therefrom are two coacting holder blocks 28 and 28^a having matching semi-circular or other cavities 28^b on their adjacent faces conforming to the cross sectional shape of the can bodies and arranged to receive and snugly hold the same when the holder blocks are engaged together. When the holder blocks are disengaged the cans are free to drop between the blocks. As here shown, the holder blocks accommodate three cans, but this may be varied to suit the varying conditions. The holder blocks 28 and 28^a are formed with longitudinal grooves or passages 28^c intersecting the cavities 28^b and receiving ejector bars 47. The bars have rods 47^a attached to their ends which slide freely in guides 47^b on the holder blocks and which are surrounded by springs 48 serving to press the rods inward, with the result that when the blocks 28 and 28^a disengage, the bars 47 spring inward, start the cans from the cavities 28^b and guide them in their movement between the holders. This prevents the cans from sticking in the cavities and insures their easy movement. When the holders reengage, the cans force the bars 47 back in the passages 28^c as shown

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in Fig. 2. When the holder blocks separate, the column of three can bodies therein falls, the lowermost can entering the semi-circular ejector 30 which at this time sustains the column of cans. At this time a fourth can falls from the chute 51 and enters the space between the holder blocks. The holder blocks then reengage and the three uppermost can bodies are again held in the blocks. The can in the ejector 30 is, by the regular rocking motion thereof, thrown out on an inclined table 31 and rolls from the machine. The ejector is mounted on a horizontal shaft 32 and is rocked in proper time through a crank 33 joined to a link 34. This link is slotted to receive the prime mover shaft 3 and has rollers 35 engaging cams 36, whereby the link is reciprocated. The shaft 3 is rotatably mounted in boxes in the frame 1 and is fitted with a band pulley 4 connected to the shaft by a friction device 4^a which yields on overload and prevents breaking parts of the machine. The motion of the ejector may be simply a quarter turn to receive the can and discharge it or it may be a half revolution to receive the can and to instantly turn bottom up, thus first discharging the can and next presenting its convex bottom to the column of cans to sustain them instantly before and during the return or closing movement of the holders. The effect is the same by either operation and the change from one to the other may be easily effected by changing the ratio and arrangement of the operating gearing.

One or both of the blocks 28 and 28^a may be movable; I prefer and have here shown one block movable; according to this, the block 28^a is held stationary by bridge members 49 attached to the frame, while the block 28 has fastened thereto a plate-like stem 46 which projects outward and is slidably fitted in a guide 42 in turn sustained by brackets 52 attached to the frame. The guide 42 is slotted to receive a transverse pin 44 and to this pin are joined links 43 in turn articulated to the members of a forked lever 39 fulcrumed to the frame at 40. The lower end of the lever 39 has a roller 38 which runs in the race of a cam 37, carried fast on the prime mover shaft 3. By this means the movable holder block is reciprocated regularly in unison with the other parts of the machine.

The can bodies lie in the holder blocks with their ends exposed to the operation of the flanging, heading, seaming or other means and such means are located at one or both sides of the holders according to the specific operations to be performed. Since the machine here shown is designed to flange, head and seam the can at one end and to flange it only at the other end (leaving the can open for the introduction of its contents), the machine, has, at one side of

the holders, flanging, heading and seaming devices and, at the other side of the holders merely a flanging device.

The flanging devices constitute an important feature of my invention and two forms thereof are shown in detail respectively in Figs. 4 and 5, (see also Fig. 1). The flanging device shown in Figs. 1 and 4 comprises a head 15 having a tubular stem 13 fitted slidably in a box 19 forming part of the frame. Fastened to the head 15 is a band 15^a with which is integral a cylindric group of spring fingers 15^b. These fingers are notched at their ends as indicated at 15^d to receive the end of the can body and are provided at their inner sides with cam surfaces 15^a. Sliding within the tubular stem 13 is a shaft 10 which extends through the cylindric group of fingers and carries an enlarged head or knob 14 designed to engage the cam surfaces 15^a of the fingers 15^b and force the fingers outward. The fingers having been first entered into the end of the can when thus forced outward, coact with the holder blocks 28 and 28^a and form on the edge of the can a flange, the form and dimensions of which depend upon the form and arrangement of the fingers, all of which may be varied as desired to adapt the machine to different sorts of work. 14^a indicates a pilot plate or member attached to the shaft 10 and arranged to enter the can to guide the parts and insure their proper operation. The modification of this device shown in Fig. 5 differs from that shown in Fig. 4 in that the fingers 15^b are separate from and pivotally mounted on the head 15^b, they being held yieldingly inward by a spring, for example a stout rubber ring 15^c. In the present machine two of these flanging devices are provided, one at each side of the holders and both opposite the top cavities therein, to act on the cans immediately upon their passage from the chute 51. The tubular stems 13 have nuts 18 on their ends engaging the boxes 19 to limit the inward movement of the flanging devices. Pivoted to the outer ends of the shafts 10 are links 7 which have rollers 8 at their free ends running in guides 9 attached rigidly to the frame by arms 9^a. The guides engage the rollers 8 at opposite horizontal points so that as the links 7 swing vertically they impart a back and forth motion to the shafts 10 bringing about the above described operation of the flanging devices. As the shafts 10 move inward the heads 14 engage the cam surfaces 15^a and move the parts 15^b, 15 and 13 toward the cam causing the fingers 15^b to enter the end of the same. This movement continues until the nuts 18 engage the boxes 19 and the movement of the parts 15^b, 15 and 13 is arrested whereupon the head 14 rides on the cam surfaces 15^a and expands the fingers 15^b. Upon return or outward

movement of the shaft 10, the pilot 14^a (see Fig. 4) engages the ends of the fingers 15^f and returns them and their connections to normal position. The links 7 are pivoted intermediate their ends to vertical bars 7^a which in turn are articulated to connecting rods 6 actuated by eccentrics 5 on the ends of the shaft 3.

The lower end of the head chute 22 opens opposite the middle cavities of the holder blocks so that the heads may be affixed to the flanged ends of the can when in said cavities. The heads are thus moved out of the chute 22 and into engagement with the can by a plunger 21 operating in the lower end of the chute and attached to a shaft 11 sliding horizontally in a box 11^b in the frame 1 below the box 19. Connected with the shaft 11 are parts 7^b and 8^b similar in arrangement and operation to the parts 7 and 8 and by which the plunger 21 is reciprocated in proper time. From the middle cavities in the holder blocks the cans, upon the separation of the blocks, drop into the bottom cavities at which point the seam between the body and head is formed. This is effected by the coaction of rotary seamers 25^a and anvil rings 27, the former mounted on a rotary head 25 and the latter on the holder blocks 28 and 28^a. The detail construction and operation of these devices are set forth at length in my copending application Serial No. 345260, above referred to. The head 25 is mounted on a tubular shaft 24 which is rotatably and slidably mounted in a box 24^a on the frame 1 and fitted with a pulley 26 adapted to receive a belt for rotating the head 25 and its attachments. Within the tubular shaft 24 is loosely arranged a shaft 12 having heads 12^a and 12^b, the former loosely received in the heads 25 and the latter arranged in the pulley 26 at the outer end of the tubular shaft 24. This shaft 12 is combined with parts 7^c and 8^c similar in arrangement and purpose to the parts 7 and 8 before described, whereby the shaft and its attachments are moved regularly inward and outward. This brings the seaming or crimping devices into engagement with the head and body-end and rolls over or otherwise treats the edges of the said parts producing a seam by which they are firmly united. It will be observed that the seaming or crimping device operates with a combined rotary and reciprocal motion and this is preferred since the seam may be rolled with less power than otherwise, although reciprocal or other dies may be employed if desired.

The organized operation of the machine may be traced as follows:—Assuming that the machine is used in juxtaposition to my improved seamer, as indicated in Figs. 2 and 3, the can bodies discharged from the seamer are delivered from the horn 50 into

the chute 51 and roll down the same by gravity. The heads it will be remembered, are, in the particular type of machine here illustrated, applied only to one end of the can and hence there is but one head chute 22 to which the heads are supplied, if desired, directly from the die or press in which they are formed. As the holder blocks open or separate, the cans fall into the space between the blocks and the bottom can rests on the ejector 30. The holder blocks then re-engage each other, the rounding surfaces of the cavities in said blocks engaging the cans and moving them upward slightly until the cans are held snugly in the cavities of the closed holder blocks. At this time the rotation of the shaft 3 causes the flanging devices at both sides of the holder blocks and the heading and seaming devices at one side of the holder blocks, to operate simultaneously, that is to say, by an instantaneous operation the ends of the uppermost can (designated 16 in Fig. 1) are flanged, the head is applied to the middle can (designated 23 in Fig. 1) and the seam is seamed or rolled on the lowermost can (designated 29 in Fig. 1). The flanging, heading and seaming devices now recede and the holder blocks open. The lowermost can, which is now a finished product, drops into the ejector 30 the same being rocked horizontally from the position shown in Fig. 2 to receive the can. The cans designated 16 and 23 in Fig. 1 then drop respectively to the middle and bottom cavities of the holder blocks and a fourth can enters the uppermost cavity from the chute 51. The holder blocks then return and the operation is repeated. As the holder blocks move toward each other the ejector 30 is turned over to or beyond the position shown in Fig. 2 and the finished can previously deposited in the ejector is dumped out onto the inclined table 31 and rolls from the machine.

It will be perceived that the operation of the machine is entirely automatic and when it is used in connection with the body former it is so timed that it will flange, head and crimp or seam the cans as fast as they are delivered from the body former. It will also be seen that my invention provides for the widest possible range of adjustment and adaptation enabling the machine to be readily suited to any of the numerous conditions which may arise in practice.

In the particular type here illustrated it is designed to prepare both ends of the can body for the reception of the head and to actually fasten the head at one end. The can body is then ready to be filled and the second head to be applied and seamed to inclose the contents of the can. This operation is performed by another machine, that shown in my copending application filed March 8, 1907, Serial No. 361311 being especially adapted for this purpose. How-

ever, the machine could readily be made to apply and seam both heads by duplicating on the left hand side of Fig. 1 the devices shown at the right hand side; and it can, with equal facility, be made to perform various other operations by changing the devices shown in connection with the shafts 10, 11, and 12. Being of the upright type, it occupies little floor space in the factory and its comparative simplicity insures reliability and effective operation.

Having thus described the preferred embodiment of my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. A can machine having means for holding the cans in a plurality of positions one below the other and spaced apart, said means periodically releasing the cans to allow them to fall by gravity from one position to the other, and guides serving to direct the movement of the cans when released by said means.

2. A can machine having means for holding the cans in a plurality of positions one below the other, said means periodically releasing the cans to allow them to fall by gravity from one position to the other, and yieldingly sustained guides serving to direct the movement of the cans when released by said means.

3. A can machine having opposing holders relatively movable to engage and disengage a plurality of cans simultaneously and between which the cans move in series when disengaged, and guides serving to direct the movement of the cans when so disengaged.

4. A can machine having opposing holders relatively movable to engage and disengage the cans and between which the cans move when disengaged, and guides yieldingly mounted on the holders and serving to direct the movement of the cans when so disengaged.

5. A can machine having vertically disposed opposing holders relatively movable to engage and disengage the cans and between which the cans move by gravity when disengaged, and guides serving to direct the movement of the cans when so disengaged.

6. A can machine having vertically disposed opposing holders relatively movable to engage and disengage the cans and between which the cans move by gravity when disengaged, and guides yieldingly mounted on the holders and serving to direct the movement of the cans when so disengaged.

7. A can machine having opposing holders adapted to move relatively toward and from each other to engage and disengage the cans, and guides carried by the holders and pressed yieldingly against the cans whereby as the holders separate the guides retain engagement with the cans to direct their movements.

8. A can machine having opposing holders with cavities to receive the cans, the holders periodically disengaging the cans to allow them to move from one cavity to another, and guides carried by the holders in the cavities thereof and pressed yieldingly against the cans, whereby as the holders separate the guides retain engagement with the cans to direct their movements.

9. A can machine having opposing holders with cavities to receive the cans and grooves intersecting the cavities, the holders being adapted to separate to allow the cans to move between them and guides in said grooves and pressed yieldingly against the cans, whereby as the holders separate the guides retain engagement with the cans to direct their movements.

10. A can machine having opposing holders with cavities to receive the cans said holders being vertically disposed and adapted to periodically separate to allow the cans to fall from one cavity to another, and means for guiding the cans in their descent.

11. A can machine having opposing holders with cavities to receive the cans said holders being vertically disposed and adapted to periodically separate to allow the cans to fall from one cavity to another, and means for guiding the cans in their descent, comprising members spring pressed against the cans and retaining their engagements therewith upon the separation of the holders.

12. A can machine having opposing holders with cavities to receive the cans, said holders being vertically disposed and adapted to periodically separate to allow the cans to fall from one cavity to another, and means for guiding the cans in their descent, comprising members movably mounted on the holders and spring pressed against the cans and retaining their engagements therewith upon the separation of the holders.

13. A can machine having means for holding a plurality of cans, said means adapted periodically to release the cans to allow them to advance, and an ejector below said means, the ejector serving to discharge one can and retain the remainder in position each time that the cans are released by the aforesaid means.

14. A can machine having means for holding the cans in a plurality of positions one below the other, said means periodically releasing the cans to allow them to fall by gravity from one position to the other and means for performing progressive operations on the cans as they move through such positions.

15. A can machine having means for holding the cans in a plurality of positions one below the other, said means periodically releasing the cans to allow them to fall by gravity from one position to the other, means for performing progressive opera-

tions on the cans as they move through such positions, and guiding means serving to direct the movement of the cans when released by said holding means.

16. A can machine having means for holding the cans in a plurality of positions one below the other such means periodically releasing the cans to allow them to fall by gravity from one position to the other and tools for operating on the cans at such positions.

17. A can machine having means for holding the cans in a plurality of positions one below the other such means periodically releasing the cans to allow them to fall by gravity from one position to the other and tools for operating on the cans at such positions, and guiding means serving to direct the movement of the cans when released by said holding means.

18. A can machine having means for holding the cans in a plurality of positions one below the other, said means periodically releasing the cans to allow them to fall by gravity from one position to the other and tools for acting on the cans at said positions, the tools including a flanging device at the uppermost position.

19. A can machine having means for holding the cans in a plurality of positions one below the other, said means periodically releasing the cans to allow them to fall by gravity from one position to the other, a flanging device at the uppermost position, a head applying device at the intermediate position and a crimping device at the lowermost position.

20. A can machine having means for holding the cans in a plurality of positions one below the other, said means periodically releasing the cans to allow them to fall by gravity from one position to the other, a flanging device at the uppermost position, a head applying device at the intermediate position and crimping device at the lowermost position and guiding means serving to direct the movement of the cans when released by such holding means.

21. A can machine having means for holding cans in a plurality of positions one below the other said means moving periodically to release the cans to allow them to fall by gravity from one position to the other and devices for performing operations on the cans at said positions such devices operating toward and from the cans along lines at an angle to the line of movement to said holding means.

22. A can machine having means for holding cans in a plurality of positions one below the other said means moving periodically to release the cans to allow them to fall by gravity from one position to the other, devices for performing operations on the cans at said positions, such devices operating to-

ward and from the cans along lines at an angle to the line of movement to said holding means, and guiding means serving to direct the movement of the cans when released by said means.

23. A can machine having means for holding cans in a plurality of positions one below the other, such means comprising two opposing holders with matching cavities to receive the cans which holders are relatively movable periodically to release the cans to allow them to fall by gravity from one position to the other and means for operating on the cans at such positions.

24. A can machine having means for holding cans in a plurality of positions one below the other, such means comprising two opposing holders with matching cavities to receive the cans which holders are relatively movable periodically to release the cans to allow them to fall by gravity from one position to the other, means for operating on the cans at such positions, and guiding means to direct the movement of the cans when released by said holders.

25. A can machine having means for holding the cans, said means adapted periodically to release the cans to allow them to advance and a rocking cup shaped ejector below said means, the ejector serving to receive and discharge one can and retain the remainder in position each time that the cans are released.

26. A can machine having a means forming a vertical pathway for the cans and for holding the same against movement, said means adapted periodically to release the cans to allow them to drop by gravity, and an ejector below said means serving to discharge one can and retain the remainder in position each time that the cans are released by the aforesaid means.

27. A can machine having a means forming a vertical pathway for the cans and for holding the same against movement, said means adapted periodically to release the cans to allow them to drop by gravity, and a rocking cup shaped ejector below said means and serving to discharge one can and retain the remainder in position each time that the cans are released by the aforesaid means.

28. A can machine having a means forming a vertical pathway for the cans and for holding the same against movement, said means adapted periodically to release the cans to allow them to drop by gravity, an ejector below said means and serving to discharge one can and retain the remainder in position each time that the cans are released by the aforesaid means, and means for guiding the cans operative upon the downward movement thereof.

29. A can machine having means for holding the cans, said means adapted periodically to release the cans to allow them to ad-

vance, an ejector below said means the ejector serving to discharge one can and retain the remainder in position each time that the cans are released by the aforesaid means, and means for guiding the cans operative upon the downward movement thereof.

30. A can machine having a means forming a vertical pathway for the cans and for holding the same against movement, said means adapted periodically to release the cans to allow them to drop by gravity, an ejector below said means and serving to discharge one can and retain the remainder in position each time that the cans are released by the aforesaid means, and guides spring-pressed against the cans and retaining their engagement therewith when the cans are released by the said means for holding them.

31. A can machine having means for holding the cans, said means adapted periodically to release the cans to allow them to advance, an ejector below said means, the ejector serving to discharge one can and retain the remainder in position each time that the cans are released by the aforesaid means, and guides spring-pressed against the cans and retaining their engagement therewith when the cans are released by the said means for holding them.

32. A can machine having opposing holders with cavities to receive the cans and grooves intersecting the cavities, the holders being adapted to separate to allow the cans to move between them, guides in said grooves and pressed yieldingly against the cans, whereby as the holders separate the guides retain engagement with the cans to direct their movements, and an ejector coacting with said holders and serving, each time that they separate, to discharge one can and retain the others in position.

33. A can machine having opposing holders with cavities to receive the cans said holders being vertically disposed and adapted periodically to separate to allow the cans to fall from one cavity to another, means for guiding the cans in their descent, and an ejector coacting with said holders and serving, each time that they separate, to discharge one can and retain the others in position.

34. A can machine having opposing holders with cavities to receive the cans said holders being vertically disposed and adapted to periodically separate to allow the cans to fall from one cavity to another, means for guiding the cans in their descent, comprising members movably mounted on the holders, and spring pressed against the cans and retaining their engagement therewith upon the separation of the holders, and an ejector coacting with said holders and serving, each time that they separate to discharge one can and retain the others in position.

35. A can machine having opposing hold-

ers with cavities to receive the cans, said holders being vertically disposed and adapted to periodically separate to allow the cans to fall from one cavity to another, means for guiding the cans in their descent, comprising members movably mounted on the holders, and spring pressed against the cans and retaining their engagement therewith upon the separation of the holders, and a rocking cup shaped ejector below the holders and serving, each time that they separate to discharge one can and sustain the others in position.

36. A can machine having opposing holders with cavities to receive the cans and grooves intersecting the cavities, the holders being adapted to separate to allow the cans to move between them and guides in said grooves and pressed yieldingly against the cans, whereby as the holders separate the guides retain engagement with the cans to direct their movements, and a rocking cup shaped ejector below the holders and serving, each time that they separate to discharge one can and sustain the others in position.

37. A can machine having a frame, a holder rigidly mounted thereon and having cavities to receive the cans, a second and movable holder matching and coacting with the first, a stem on the movable holder, a rigid guide in which the stem is movable, a lever linked to the stem, a drive shaft, a cam thereon to drive the lever, and means controlling the movement of the cans as the guides separate.

38. A can machine having a frame, a holder rigidly mounted thereon and having cavities to receive the cans, a second and movable holder matching and coacting with the first, a stem on the movable holder, a rigid guide in which the stem is movable, a lever linked to the stem, a drive shaft, a cam thereon to drive the lever, and means controlling the movement of the cans as the holders separate, such means comprising spring pressed guides mounted on the holders and retaining their engagement with the cans at all times.

39. A can machine having a frame, a holder rigidly mounted thereon and having cavities to receive the cans, a second and movable holder matching and coacting with the first, a stem on the movable holder, a rigid guide in which the stem is movable, a lever linked to the stem, a drive shaft, a cam thereon to drive the lever, means controlling the movement of the cans as the holders separate, and an ejector below the holders and adapted when they separate to discharge one can and sustain the others until the holders reengage.

40. A can machine having a frame, a holder rigidly mounted thereon and having cavities to receive the cans, a second and movable holder matching and coacting with

the first, a stem on the movable holder, a rigid guide in which the stem is movable, a lever linked to the stem, a drive shaft, a cam thereon to drive the lever, means controlling the movement of the cans as the holders separate, such means comprising spring pressed guides mounted on the holders and retaining their engagement with the cans at all times, and an ejector below the holders and adapted when they separate to discharge one can and sustain the others until the holders reengage.

41. The combination with means for holding the work, of a tool adapted to act thereon, a swinging link having connection with the tool, a guide for the free portion of the link, the guide being eccentric to the center of swinging movement of the link and means for swinging the link to move the tool toward and from the work.

42. A can machine having opposing holders with cavities to receive the cans and grooves intersecting the cavities, the holders being adapted to separate to allow the cans to move between them and guides in said grooves and pressed yieldingly against the cans, whereby as the holders separate the guides retain engagement with the cans to direct their movements, a tool adapted to act on the cans in the holder, a swinging link having connection with the tool, a guide for the free portion of the link, the guide being eccentric to the center of swinging movement of the link and means for swinging the link to move the tool toward and from the cans.

43. A can machine having opposing holders with cavities to receive the cans said holders being vertically disposed and adapted to periodically separate to allow the cans to fall from one cavity to another, means for guiding the cans in their descent, a tool adapted to act on the cans in the holder, a swinging link having connection with the tool, a guide for the free portion of the link, the guide being eccentric to the center of swinging movement of the link and means for swinging the link to move the tool toward and from the cans.

44. A can machine having means for holding the cans, said means adapted periodically to release the cans to allow them to advance, an ejector below said means, the ejector serving to discharge one can and retain the remainder in position each time that the cans are released by the aforesaid means, a tool adapted to act on the cans in the holder, a swinging link having connection with the tool a guide for the free portion of the link, the guide being eccentric to the center of swinging movement of the link and means for swinging the link to move the tool toward and from the cans.

45. A can machine having a frame, a holder rigidly mounted thereon and having cavities to receive the cans, a second and

movable holder matching and coacting with the first, a stem on the holder, a rigid guide in which the stem is movable, a lever linked to the stem, a drive shaft a cam thereon to drive the lever, means controlling the movement of the cans as the holders separate, a tool adapted to act on the cans in the holder, a swinging link having connection with the tool, a guide for the free portion of the link, the guide being eccentric to the center of swinging movement of the link and means for swinging the link to move the tool toward and from the cans.

46. A can machine having opposing holders with cavities to receive the cans, the holders periodically disengaging the cans to allow them to move from one cavity to another, and guides carried by the holders in the cavities thereof and pressed yieldingly against the cans, whereby as the holders separate the guides retain engagement with the cans to direct their movements, a tool adapted to act on the cans in the holder, a swinging link having connection with the tool, a guide for the free portion of the link, the guide being eccentric to the center of swinging movement of the link and means for swinging the link to move the tool toward and from the cans.

47. The combination with means for holding the work, of tools adapted to act thereon, swinging links respectively connected with the tools, a guide for the free portions of the links, the guide being eccentric to the center of swinging movement of the link and a reciprocal operating member connected to the links.

48. The combination with means for holding the work, of a tool, a sliding shaft on which it is mounted, a link pivoted to the shaft, a guide for the free end of the link, the guide being eccentric to the center of swinging motion of the link, and means for swinging the link to move the tool toward and from the work.

49. In a can machine the combination of two holders relatively movable to hold and release the cans, a tool at each side of the holders to work respectively on the ends of the cans, swinging links connected to the tools, guides for the free portions of the links the guides being eccentric to the center of swinging motion of the link, and means for swinging the links.

50. A can machine having opposing holders with cavities to receive the cans and grooves intersecting the cavities, the holders being adapted to separate to allow the cans to move between them, guides in said grooves pressed yieldingly against the cans, whereby as the holders separate the guides retain engagement with the cans to direct their movements, an ejector coacting with said holders and serving, each time that they separate, to discharge one can and retain the

others in position, a tool at each side of the holders to work on the respective ends of the cans, swinging links connected to the tools, guides for the free portions of the links, the guides being eccentric to the center of swinging motion of the links and means for swinging the links to advance and retract the tools.

51. In an organized can making machine the combination of means for preparing the end of the can body to receive the head, means for applying the head to the end of the body, means for fastening the head to the body, means for holding the bodies and successively advancing them to the three means above mentioned and gearing for driving the several parts in unison.

52. In an organized can making machine, the combination of means for preparing the end of the can body to receive the head, means for applying the head to such end of the body, means for seaming the head on the body, means for holding the bodies and successively advancing them to the three means above mentioned, and gearing for driving the several parts in unison.

53. In an organized can making machine, the combination of means for flanging the ends of the can body, means for applying the head thereto, means for seaming the flanged body and head together to secure the head, means for holding and successively advancing the cans to the three means above mentioned and gearing for driving the several parts in unison.

54. In an organized can making machine the combination of means for preparing the end of the can body to receive the head, means for fastening the head to the body, means for holding the bodies and successively advancing them to the two means above mentioned and gearing for driving the several parts in unison.

55. In an organized can making machine, the combination of means for preparing the end of the can body to receive the head, means for seaming the head on the body, means for holding the bodies and successively advancing them to the two means above mentioned, and gearing for driving the several parts in unison.

56. In an organized can making machine, the combination of means for flanging the end of the can body, means for seaming the flanged body and head together to secure the head, means for holding and successively advancing the cans to the two means above mentioned and gearing for driving the several parts in unison.

57. In a can machine, the combination of a sliding shaft, a rotating sleeve carried thereon, a seaming tool mounted on the sleeve, means for holding the can, and means for sliding the shaft to engage and disengage the tool with and from the work.

58. In a can machine, the combination of a sliding shaft, a rotating sleeve carried thereon, a seaming tool mounted on the sleeve, means for holding the can, means for sliding the shaft to engage and disengage the tool with and from the work, the means for sliding the shaft comprising a link pivoted to the shaft, an eccentric guide for the free portion thereof and means for swinging the link.

59. In a can machine, the combination of a sliding shaft, a rotating sleeve carried thereon, a seaming tool mounted on the sleeve, means for holding the can, means for sliding the shaft to engage and disengage the tool with and from the work and a band pulley on the sleeve to rotate it.

60. In a can machine, the combination of a means for holding the can body, a group of tools adapted to engage the end of the can body and to move laterally thereof to form a flange on the said end of the body, the tools working against the face of the means for holding the can body and means for so moving the tools and means for releasing said can body from said holder.

61. In a can machine, the combination of a means for holding the can body, a series of tool fingers arranged in a hollow group and adapted to engage the end of the can body and to move laterally thereof to form a flange on the said end of the body, means for so moving the tools, such means being movable through said group of tools and a pilot member connected to said means and adapted to enter the can body.

62. In a can making machine a series of tool-fingers arranged in a hollow group and adapted to engage a part of a can, means for moving said tool-fingers laterally causing them to act on the said part of the can and a pilot member connected to said means and adapted to engage the part of the can.

63. In a can machine, the combination of a means for holding the can body, a group of tools adapted to engage the end of the can body and to move laterally thereof to form a flange on the said end of the body, means for so moving the tools, a slidable sleeve carrying said tools, a slidable shaft carrying said means for moving the tools, means for limiting the movement of the sleeve on the shaft, a link pivoted to the shaft, an eccentric guide on the free end of the link, and means for swinging the link for the purpose specified.

64. In a can machine, the combination of a slidable shaft, a sleeve having limited sliding motion thereon, means carried by the shaft and sleeve for flanging the can, a link pivoted to the shaft, an eccentric guide for the free portion of the link and means for swinging the link.

65. A can machine having means for holding the cans, said means periodically re-

leasing the cans to allow them to advance, and a rotating ejector below said means serving to receive and discharge one can and retain the remainder in position each time that the cans are released.

66. In a can machine the combination of a sliding shaft, a rotating sleeve thereon, a seaming head mounted on the sleeve, means for holding the can, means for sliding the shaft to engage and disengage the seaming heads with and from the can and means on the sleeve for rotating it.

67. In a can flanging machine the combination of means for embracing and temporarily holding the can body with one end exposed, a plurality of tool fingers arranged in a hollow group and adapted to enter the end of the can body, means movable into said group of tools and acting against their inner surfaces to move them outward and flange said end of the body and means for releasing said body from said holding means.

68. In a can flanging machine the com-

bination of means for embracing and releasably holding the can body with its end exposed, said means having plain surfaces adjacent to said end, a series of tool fingers arranged in a hollow group adapted to enter said end of the can and means operative within said group of tool fingers to expand them whereby the end of the can is flanged outward against said plane surfaces of the holding means.

69. In a can flanging machine a series of tool fingers arranged to enter the end of the can body, means for forcing the tool fingers upward to flange said end and a guiding member preceding the tool fingers into the body and adapted to direct their movement into said end of the body.

In testimony whereof I have hereunto subscribed my name in the presence of two witnesses.

LEE C. SHARP.

Signed in presence of—

J. M. LEYDA,

F. G. FRICKE.