(No Model.) 5 Sheets—Sheet 1.

J. SOLTER.

CAN HEADING MACHINE.

No. 382,567. Patented May 8, 1888.

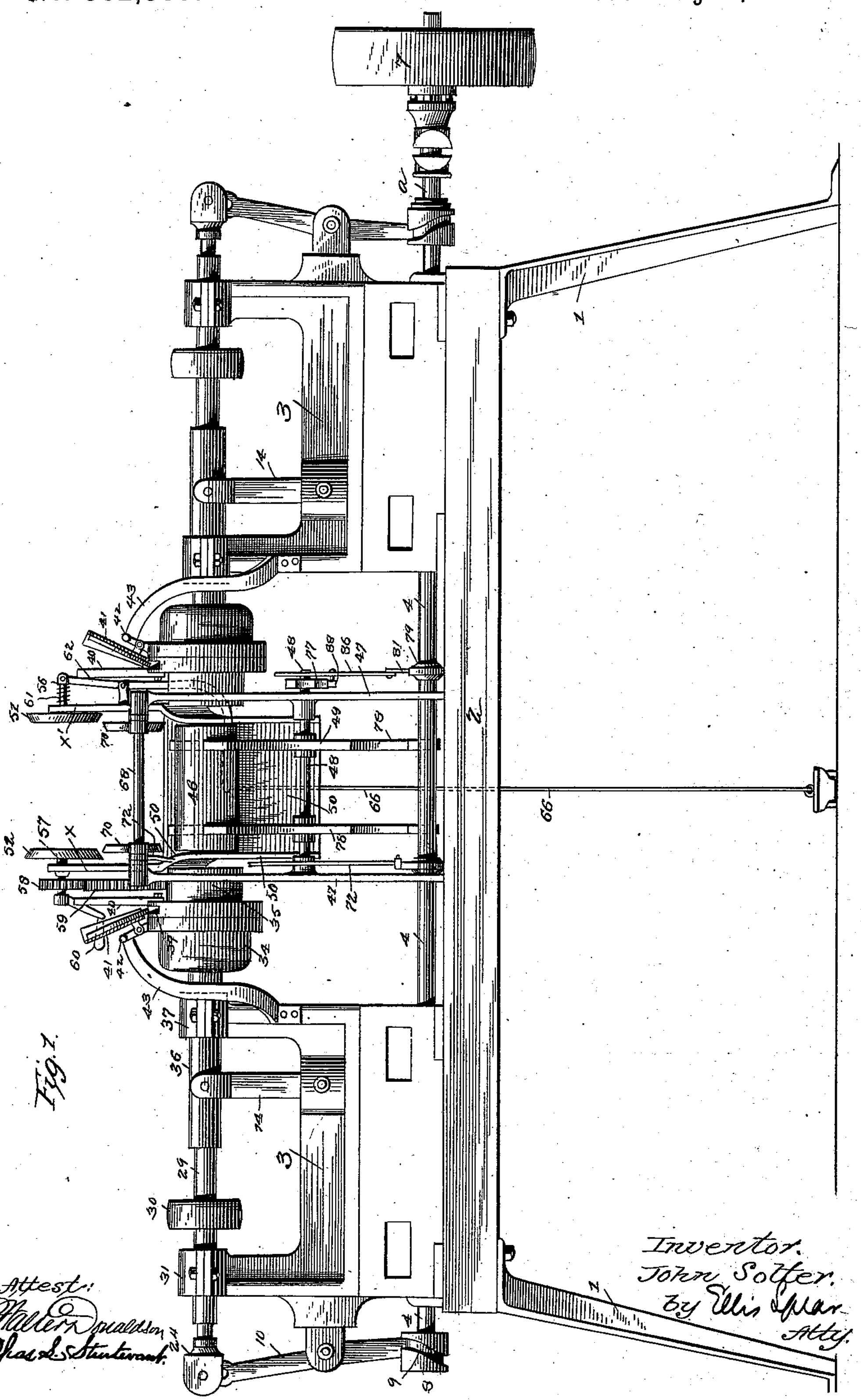


Fig. 1.

Attest:
Walter Donaldson
Chas. L. Sturtevant.

Inventor.
John Solter.
by Ellis Spear
Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 5 Sheets—Sheet 2.

J. SOLTER

CAN HEADING MACHINE.

No. 382,567. Patented May 8, 1888.

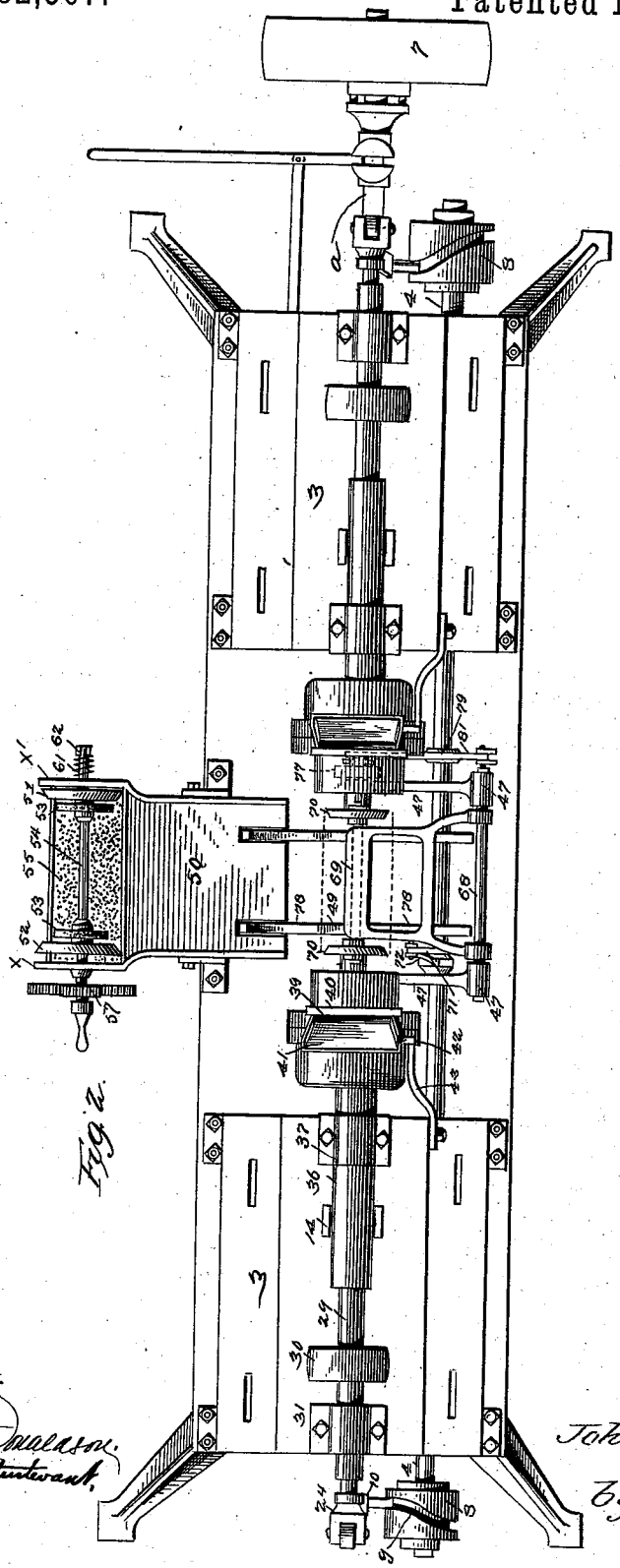


Fig. 2.

Attest.
Walter Dallas.
Chas. L. Stinebrant.

Inventor.
John Solter.
by Ellis Spear.
Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 5 Sheets—Sheet 3.

J. SOLTER.

CAN HEADING MACHINE.

No. 382,567. Patented May 8, 1888.

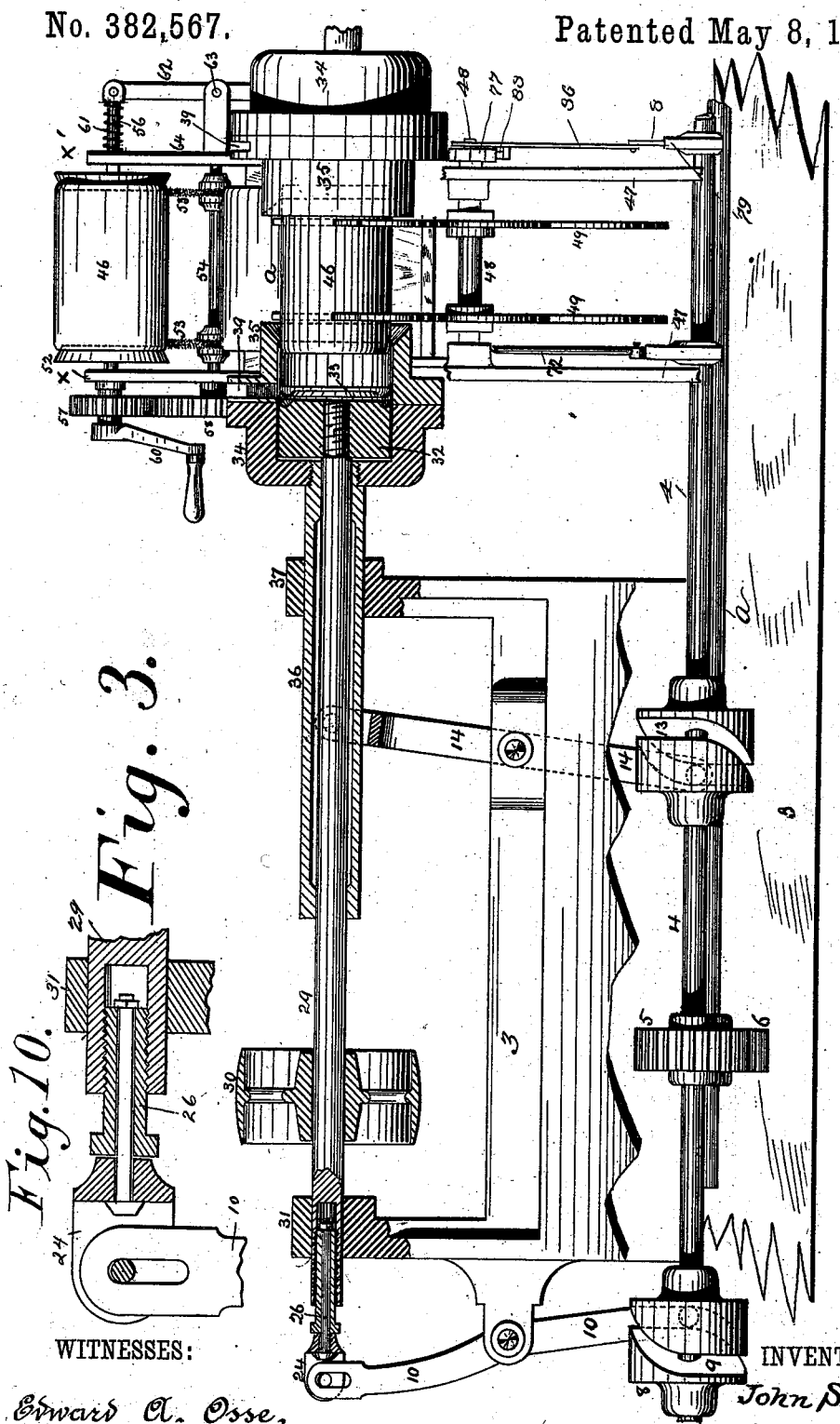


Fig. 3.

Fig. 10.

WITNESSES:

Edward A. Osse,

L. H. Snow

INVENTOR.

John Solter.

BY S. Brashears.

ATTORNEYS.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.) 5 Sheets—Sheet 4.

J. SOLTER.

CAN HEADING MACHINE.

No. 382,567. Patented May 8, 1888.

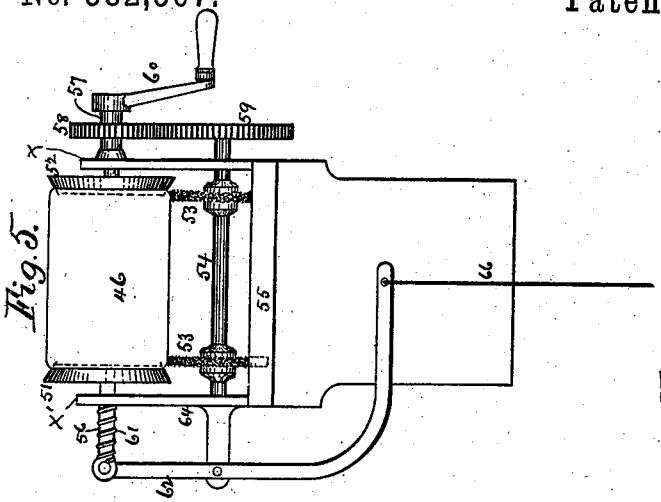


Fig. 5.

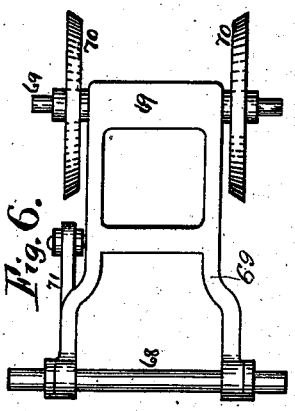


Fig. 6.

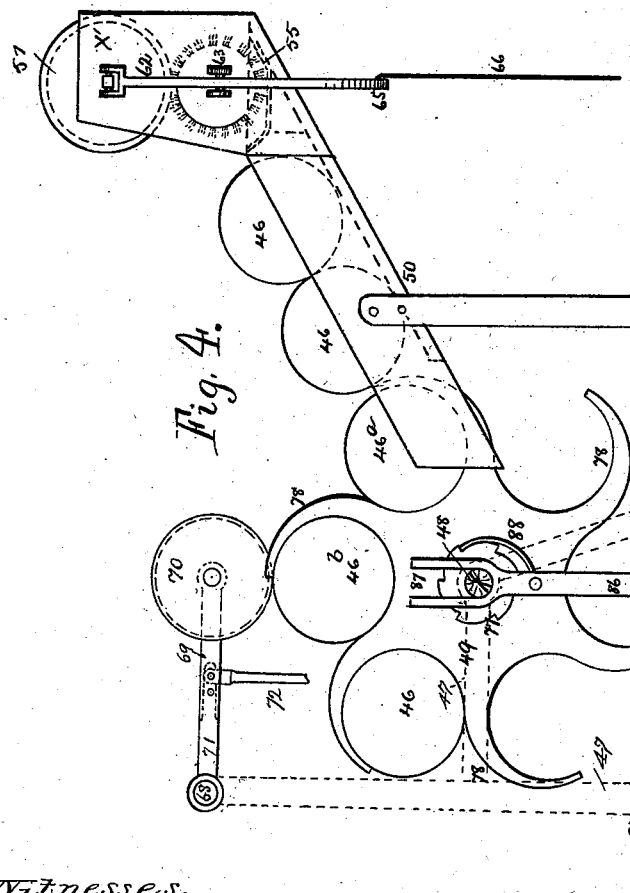


Fig. 4.

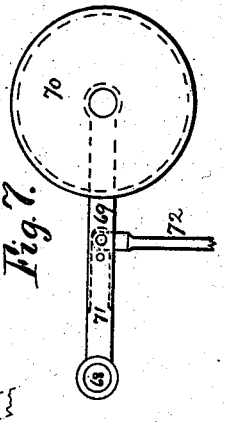


Fig. 7.

Witnesses.
Chas. M. Werle.
Frank. R. Harding.

Inventor.
John Solter.
Per
L. Brashears
Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.)

5 Sheets—Sheet 5.

J. SOLTER.

CAN HEADING MACHINE.

No. 382,567.

Patented May 8, 1888.

Fig. 8.

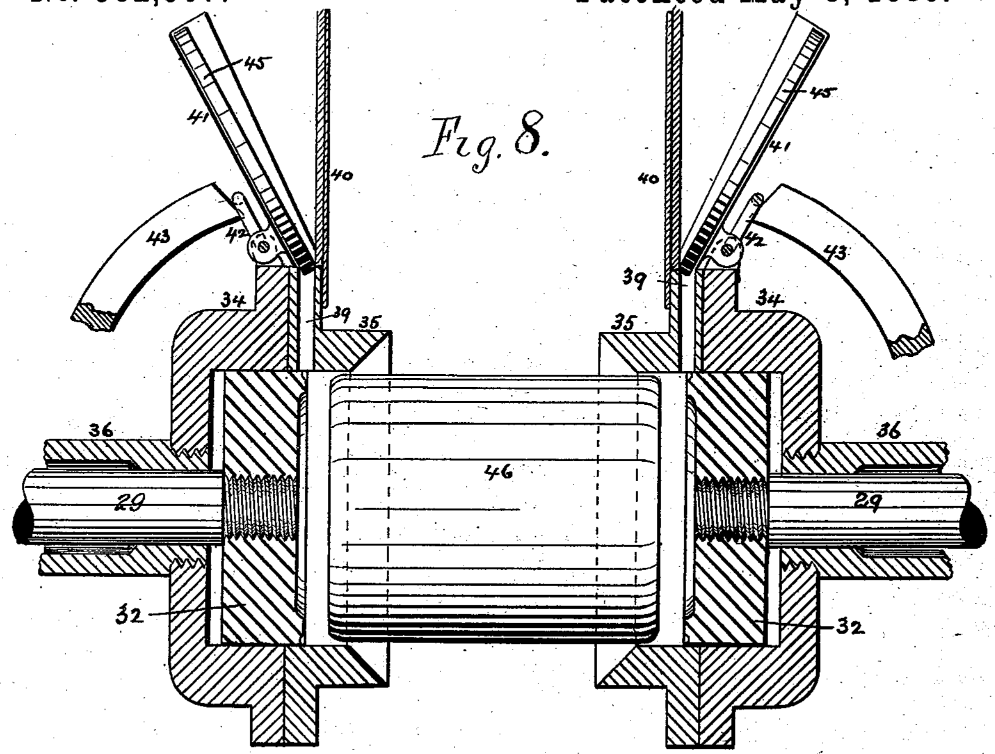
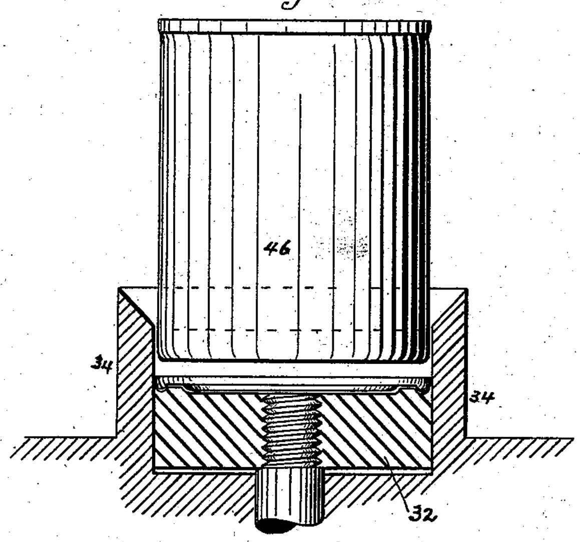


Fig. 9.



Witnesses.

Chas. M. Werle.

Harry J. Rohrer.

Inventor

John Solter.

Per S. Brashears.

Atty.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JOHN SOLTER, OF BALTIMORE, MARYLAND.

CAN-HEADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 382,567, dated May 8, 1888.

Application filed November 16, 1884. Serial No. 183,031. (No model.)

To all whom it may concern:

Be it known that I, JOHN SOLTER, of Baltimore city, State of Maryland, have invented certain new and useful Improvements in Can-Heading Machines, of which the following is a specification, reference being had to the accompanying drawings, forming part hereof.

My invention relates to can-heading machines, and is of that class in which the heads are placed upon the cans by means of plungers which force the head into place while the can-body is held in position to receive it. The machine shown is adapted to receive the can-bodies and apply the flux thereto, and to deliver them by means of a carrier and chute to the heading device, by means of which the heads are applied to the body; and it also includes devices for crimping the can after the application of the heads.

The particular form in which my invention is embodied is illustrated in the accompanying drawings, in which—

Figure 1 is an elevation showing the rear or discharge side of the machine. Fig. 2 shows a top plan view of the same. Fig. 3 represents, on an enlarged scale as compared with Figs. 1 and 2, one of the heading-dies with its operating parts and the parts adjacent thereto, the figure showing the dies and its stem and the plunger therein in central vertical section, taken longitudinally, the other parts being in side elevation. Fig. 4 is a view in side elevation of the carrier and chute, and some parts adjacent thereto. Fig. 5 is a front view showing the fluxing device. Fig. 6 represents a top plan view of the fluxing device. Fig. 7 represents the crimping-wheel detached slightly larger than the same part as represented in Fig. 4. Fig. 8 represents the dies and plungers in central vertical section taken longitudinally with a can-body in place and with the device in side elevation for introducing the heads to their position in front of the plunger. Fig. 9 shows, in central longitudinal section, the die and plunger adapted to the application of one head. Fig. 10 is an enlarged detail of Fig. 3, hereinafter explained.

The working parts of this machine are supported upon a table, 2, formed with any suitable legs, as 1. On this table are mounted duplicate frames 3, which consist of hollow castings in which are the bearings for the shafts and levers which operate the parts.

The machine consists of two distinct main parts, one of which brings the can-bodies into place after the flux is applied and the other applies the heads to the bodies. As represented in Figs. 1 and 2, the head-applying devices for the can-bodies are duplicate—one for each head—and the conveying devices are located between these two. The chute is shown at 50 in Figs. 1 and 2, and more plainly in Fig. 4. The upper and front end has vertically-extended sides $x\,x'$, in each of which is mounted a beveled disk marked, respectively, 51 and 52. These beveled disks are adapted to fit into the ends of the can 46, which is the form of can shown in Letters Patent of the United States granted to me on the 19th day of July, 1881, and which this machine is particularly adapted to head, though not limited to this particular form of can. The disk 52 is fixed upon its shaft, which is provided with a crank representing any suitable means for turning it. The other disk, 51, turns upon its shaft, which slides in its support, being forced outward normally by a spring, 61; but it may be held in against the can by means of a lever, 62, connected to any suitable treadle by a cord, 66.

Below the disk and parallel with the axis is a shaft, 54, which carries brushes 53, which are arranged to have their lower edges dipped into flux contained in the pan 55, while the upper edges are in contact with the can in position to apply the flux properly thereto. The shaft 54 is turned by a gear-wheel, 59, in mesh with a pinion, 58, on the shaft 57. Therefore the can 46, being held by the bevel faces of the disks inserted partly in their ends, is turned one way while the brushes revolve the other way and place the flux. The can released by the releasing of the treadle falls into the chute 50 and descends by gravity to the revolving carrier. This consists of two approximately circular plates, 49, having arms 78 curved to fit the cans, as shown, mounted upon a shaft at a distance apart less than the length of the cans. This shaft has its bearing in standard 47, Figs. 1 and 3, on the table. This rotary carrier requires a step-by-step movement sufficient to take a can from the position shown

at 46ª to the position shown at 46ᵇ at each step, the first being the lowest position in the chute and the second the position in the machine between the dies. The bottom of the chute 50 is cut away to allow the curved arms to rise between the sides thereof.

Convenient means are shown for giving the required step-by-step movement to the carrier in Fig. 4. The immediate device is a pushing-arm, 86, slotted to embrace the shaft and carrying a spring-pawl, 88, which engages with the teeth of the ratchet-wheel 77 on the shaft 48. The arm is moved by lever 81 of the third order fulcrumed on the arm 82, and having a spur, 80, to which the power is applied to lift the free end of the lever and the pawl-arm by means of a cam, 79, on the counter-shaft 4. This cam is placed on the shaft in proper relation to the cam-grooves hereinafter described. This mechanism for moving the cam-carrier is illustrated in Figs. 1, 2, 3, and in detail, Fig. 4, on the same shaft, so as to operate the pawl-arm when the dies are back and the space open between them to receive the can, which is held in position by the carrier-arms while the dies and their plungers operate thereon.

In describing the dies and their operating parts and attachments I refer to one side only of the machine, as shown more clearly in Fig. 3, the other side being exactly duplicate and having its parts marked by the same figures, so far as they are shown.

Referring now more particularly to Figs. 3 and 8, the die will be observed as mounted upon a tubular stem, 36, arranged to slide in the standard 37, but not to turn therein. The die is shown as composed of two parts—a cup, 34, and ring 35, fixed thereto—and the die is adapted to fit snugly over the end of the can-body to conform to the proper shape thereof. Reciprocating movement is imparted to the die in proper order relatively to the other parts of the machine, as more particularly hereinafter explained, by means of a lever, 14, pivoted on a frame and to the stem, and worked by a groove-cam, 13, on the counter-shaft 4. The forward movement of the die is for the purpose of embracing the can-body and holding it in proper position and shape to receive the head, and its backward movement is to release the can-body after the head has been applied thereto.

Within the cup 34 of the ring is a plunger, 32, when drawn backward, as shown in Fig. 3. This plunger has its face fitted to correspond to the shape and configuration of the can-head. It is mounted on a shaft, 29, which has its bearing at one end in the hollow stem of the die and at the other in a standard, 31, on a frame. Reciprocating movement lengthwise is imparted to it by means of the lever 10, pivoted on the frame and working at its lower end by means of a cam-groove, 9, on the counter-shaft 4 in due order, more particularly explained hereinafter. In order to allow rotary movement of the shaft 29, for the purpose hereinafter explained, the lever 10 is connected to a head, 24, which is swiveled to the shaft 29, as shown clearly in detail, Fig. 10, the head being connected to the shaft by the bolt 26. The flange of the die has a slot, 39, in its upper part, across the die-axis, adapted to receive the head, and it is in position to admit the head in front of the plunger when the plunger is back, as shown in Fig. 3, the head being there represented in position at 33.

In Fig. 8 are shown pivoted chutes 41, for delivering the heads into position in the dies. They are in the form of plates having flanges to receive the head. They are supported on ears pivoted to the die-plunger, these ears having arms 42, which come in contact with arms 43, fixed on the frame of the machine. In front of the chutes 41 are vertical plates 40, fixed to the flange on which the chutes are pivoted. The heads are placed in the chutes, and when the dies move back after one can has been headed the arms 42 strike against the arms 43 and tip the chutes to a vertical position against the plates 40 and allow the heads to drop into position, the lower parts of the chutes being open and registering with the slots in the dies when the chutes are vertical.

It will be observed that the can head is an outside head, and in order to secure it in place I have made provision for crimping the flange of the head into or upon the can-body. This is accomplished by means of the pair of disks 70, Figs. 4, 6, and 7, turned with the shaft carried in the frame 69, pivoted at 68 to any suitable support, as an extension of the standards 47 on the frame of the machine. The frame is fixed rigidly to the shaft, and the shaft has a rigid arm, 71, connected to a vertical rod, 72. The rod 72 is connected to a cam on the counter-shaft, as shown in Fig. 3. The disks 70 are formed with suitable edges and arranged to bear upon the flanges of the heads when the frame which carries them is pressed down and the can is rotated, thus crimping the flange, as above explained.

The can is rotated while it is between the plunger, after the dies are withdrawn, by means of a pulley, 30, on the shaft 29, which is driven by any suitable means. The revolution is imparted to the shaft while the connections of the lower end of levers 10 are traveling in a straight part of the cam and hold the plunger forward.

The counter-shaft 4 is driven by means of a shaft, *a*, having a driving-pulley, 7, and suitable clutch mechanism. The shaft and counter-shaft are connected by gears 5 and 6. The various parts of the machine are set and timed to operate as follows: Supposing the can 46 to be in position shown at 46ᵇ in Fig. 4, and that when the can is in this position both the dies and the plungers are retracted. A quarter-revolution of the shaft 4 will now cause the parts to assume the position shown in Fig. 3—that is, the lower end of the lever 14 will have been carried to the left and its upper end carried to the right, bringing the ring 35 of the

die over the ends of the can-body 46ª, the arrangement of the cam-grooves 13 and 9 being such that the lever 10, and consequently its connections to and including a plunger, 32, will have remained at rest during the last-referred-to quarter-revolution of the shaft 4. The next quarter-revolution of the shaft 4 will cause the lower end of lever 10 to be moved to the left and its upper end to the right, Fig. 3, carrying with the die the shaft 29 and plunger 32, forcing the head previously inserted in the die upon the end of the can-body. The next movement will be the withdrawal of the die from around the can-body, during which withdrawal the crank 42 of the hinged plate 41, Fig. 8, will come in contact with the arm 43 and cause the said hinged plate 41 to assume a position parallel to plate 40, which will cause a can-head, 45, previously placed on plate 41, to drop into the slot 39 and rest on the side of the plunger 32, ready to drop when the die advances. The die is now retained in its forward position, leaving the headed can clamped between it and its fellow on the opposite side of the machine. While the can is thus clamped, and immediately after the withdrawal of the die, as before stated, the clamp-disks 70 are brought in contact with the can, being so located in this instance as to curl or crimp the edge of the can-head into the body, thus firmly securing it thereon. When, however, the machine is operating on cans which are not to be crimped, the crimping apparatus is dismantled, in which case the can held between the plungers need not be rotated, such rotation being purely a part of the clamping operation. The next quarter-revolution of the shaft 4 will cause the withdrawal of the plunger 32 from the can, leaving it free to be discharged by the next movement of the can-carrier A, which movement will bring the next can to its place between the dies. The next movement will cause the die to be carried forward to the position shown in Fig. 3, when the pair of heads held in the groove 37 will drop in front of the plunger 32, to be placed at the action of the machine, as before described, upon the can-body now in the position A.

The rotation of the shafts 29 and 29ª by means of pulleys 30 and 30ª is for the purpose of retaining the can held between the heads when the crimper is in contact with said can.

I claim as my invention—

1. In a can-heading machine, a pair of reciprocating dies placed opposite to each other, fitted to receive the ends of the can-body and hold them in proper shape while the heads are placed thereon, said dies having open slots to admit the can-heads, independently-reciprocating plungers in the dies to force the head upon the can-bodies, and mechanism for operating the dies and plungers, all substantially as described.

2. In a can-heading machine, a pair of reciprocating dies placed opposite to each other and fitted to receive the ends of the can-body and hold them in proper shape while the heads are placed thereon, said dies having open slots to receive the heads, independently-reciprocating plungers in the dies to force the heads upon the can-body, chutes for delivering the heads to the dies, and operating mechanism for these parts, all substantially as described.

3. In a can-heading machine, a pair of reciprocating dies placed opposite to each other and fitted to receive the ends of the can-body and hold them in proper shape while the heads are placed thereon, independently-reciprocating plungers in the dies to force the heads upon the body, and an intermediate carrier having a series of arms fitted to receive the cans, and having an intermittent motion to bring the cans successively to the dies and hold them with their ends in position to be acted on by the dies and plungers, substantially as described.

4. In a can-heading machine, a pair of reciprocating dies placed opposite to each other and fitted to receive the ends of the can-body and hold them in proper shape while the heads are placed thereon, independently-reciprocating plungers in the dies to force the heads upon the body, said plungers being on shafts provided with mechanism for giving them rotary motion, crimping-disks, and means for forcing said disks upon the can, all substantially as described.

5. In combination, the reciprocating die fitted to the can-body, having an open slot to receive the can-head, the reciprocating plunger located in the die and fitted to the can-head, mechanism for operating the die and plunger, and a carrier for the can-body, all substantially as described.

6. The combination of the die 34, reciprocating tubular stem 36, plunger 32, and a longitudinal reciprocating shaft 29, as set forth.

7. The combination of the die 34, tubular shaft 36, pivoted lever 14, cam 12, with plunger 32, shaft 29, pivoted lever 10, and cam 8, as set forth.

8. The combination, with a can-heading machine having a trough for feeding the cans to the headers, of a fluxing-machine mounted over said trough and constructed and arranged to discharge the fluxed cans directly into the trough, as set forth.

9. The combination of the disks 51 52, adapted to receive a can-body between them, a pan for containing flux material, and rotary brushes 53, arranged in proper relation to the disks and pan for distributing the material upon the edges of the can-body, substantially as described.

10. The combination, with the plungers 32, shafts 29, and means for retaining them and forcing them together, of the crimping-disks 70, arranged in relation thereto, as described.

11. The combination of the dies having slots 39, and the plates 40 and 41, the latter being hinged to the dies and having mechanism for tilting them to discharge the can-heads through the slots, as and for the purpose set forth.

12. The combination, with the slotted pivoted lever 10, fork 24, rod 26, collar 27, and a bored shaft, 29, carrying the head 32, of mechanism for oscillating the lever 10 on its pivot, as set forth.

13. The combination of the can-carriers 49, having fingers 78, trough 50, and dies 34 35 36, as set forth.

14. The combination of plunger 36, die-cup having slot 39, and means for giving them reciprocating movement, the plate 40, hinged plate 41, having crank 42, and the bar 43, attached to the rigid portion of the machine, as set forth.

15. The combination of the die-cup and the plunger with mechanisms whereby the die-cup is reciprocated and the plunger reciprocated and rotated, as set forth.

16. The combination of plungers 32, their stems, and their rotating and reciprocating mechanism, with the crimping-disks 70, mounted on frame 67, and the cam-operated levers for bringing them into contact with the can-body held between plungers 32, as set forth.

17. The combination of the disks 51 and 52 upon suitable shafts, the supports x x', the bent lever 62, and spring 61, the gears 58 and and 59, the shaft 54, and the brushes 53, substantially as set forth.

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

JOHN SOLTER.

Witnesses:
FELIX R. SULLIVAN,
S. BRASHEARS,
G. E. REARDON.