No. 740,599. PATENTED OCT. 6, 1903.

W. H. SMYTH.

MACHINE FOR HEADING CANS.

APPLICATION FILED NOV. 29, 1901.

NO MODEL. 3 SHEETS—SHEET 1.

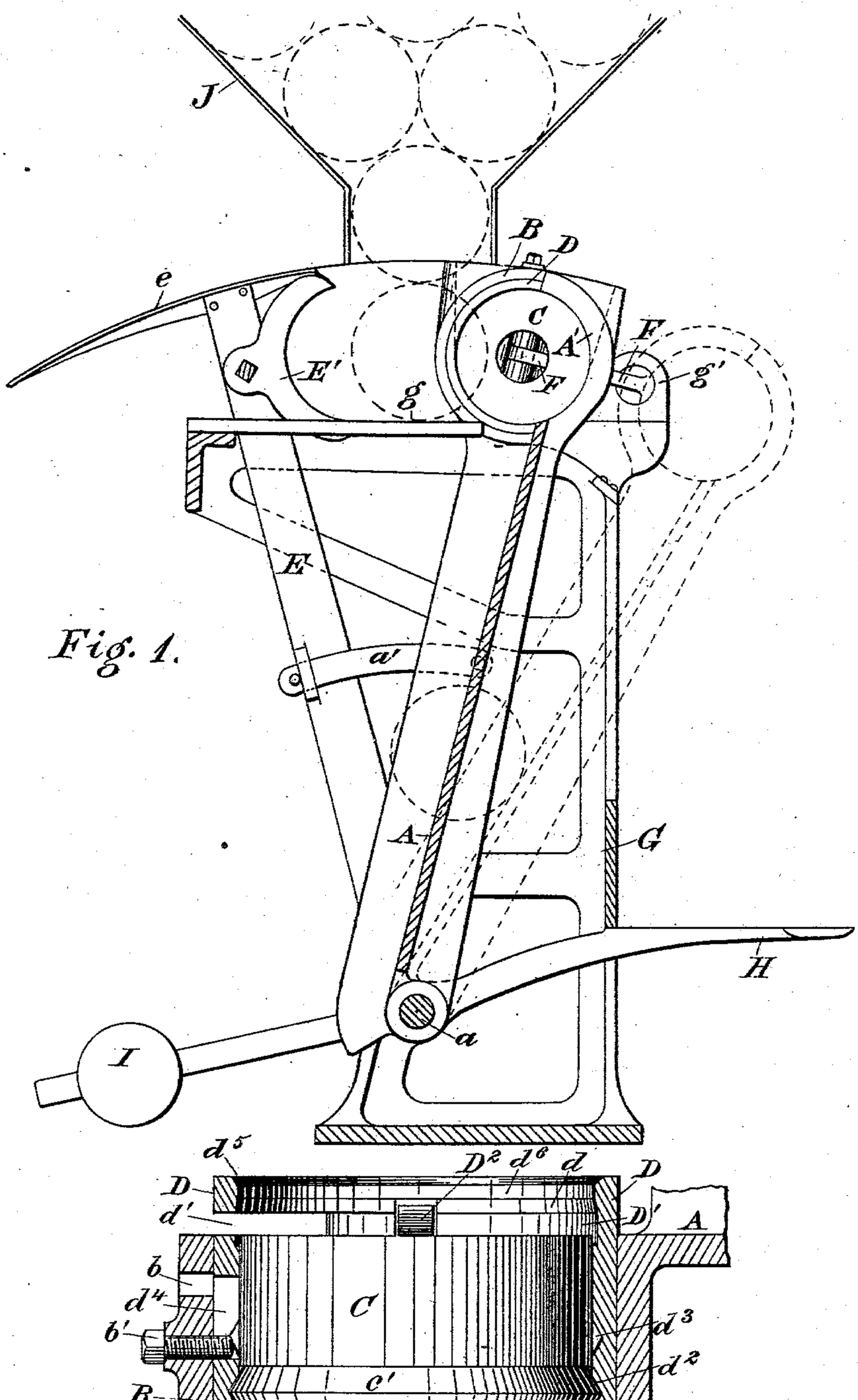

Fig. 1.

Fig. 2.

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NO MODEL. 3 SHEETS—SHEET 2.

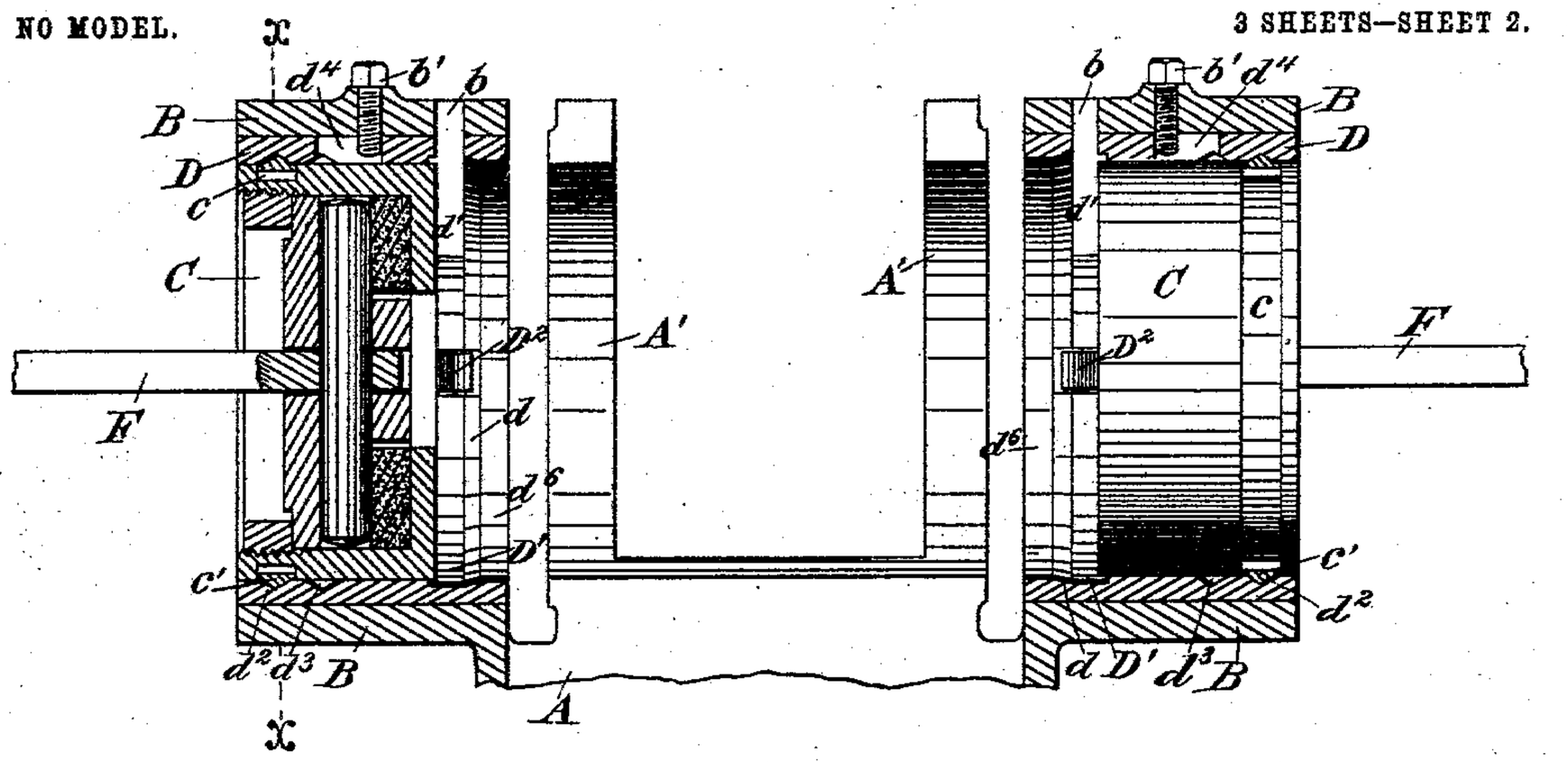

Fig. 3.

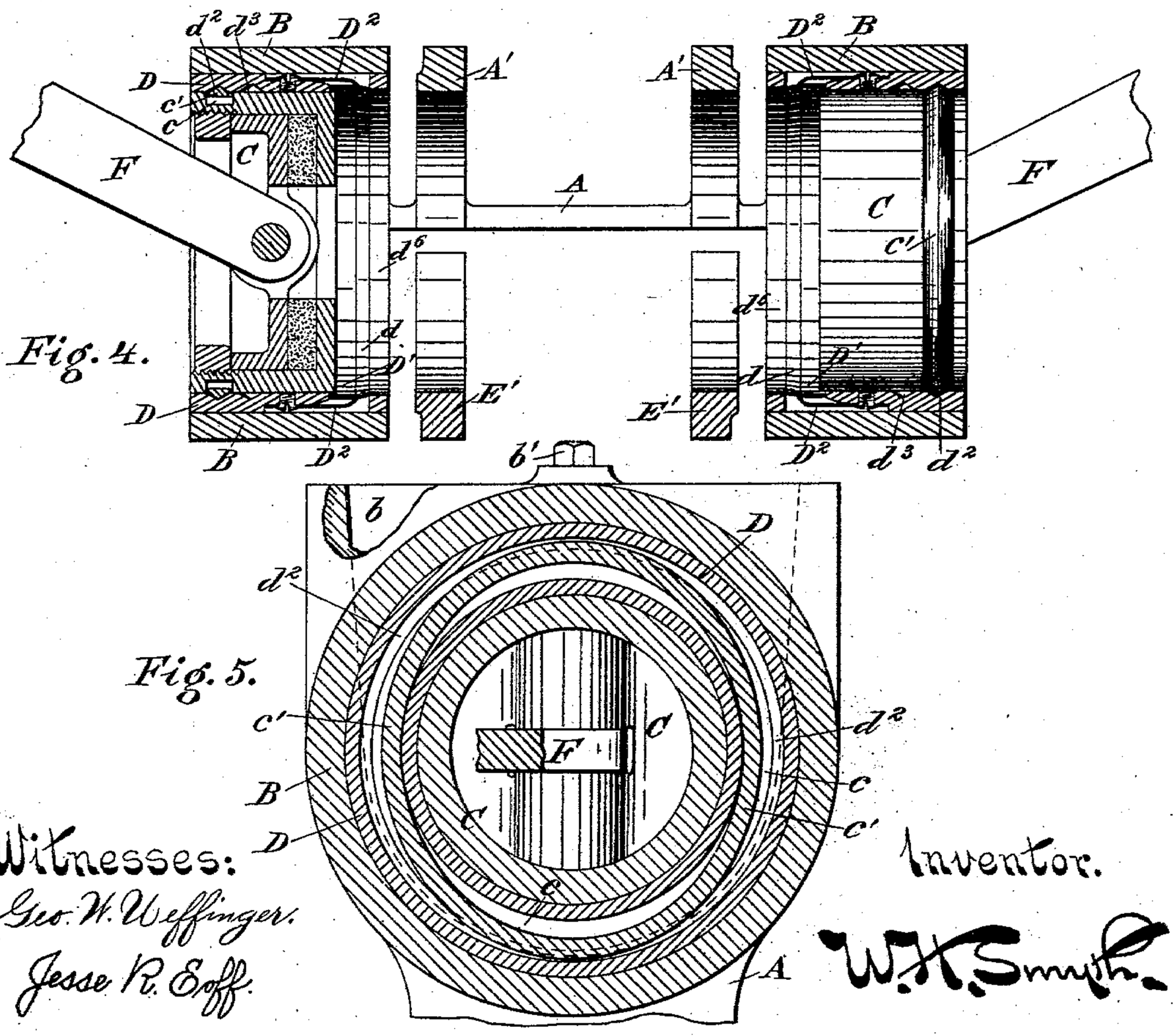

Fig. 4.

Fig. 5.

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NO MODEL. 3 SHEETS—SHEET 3.

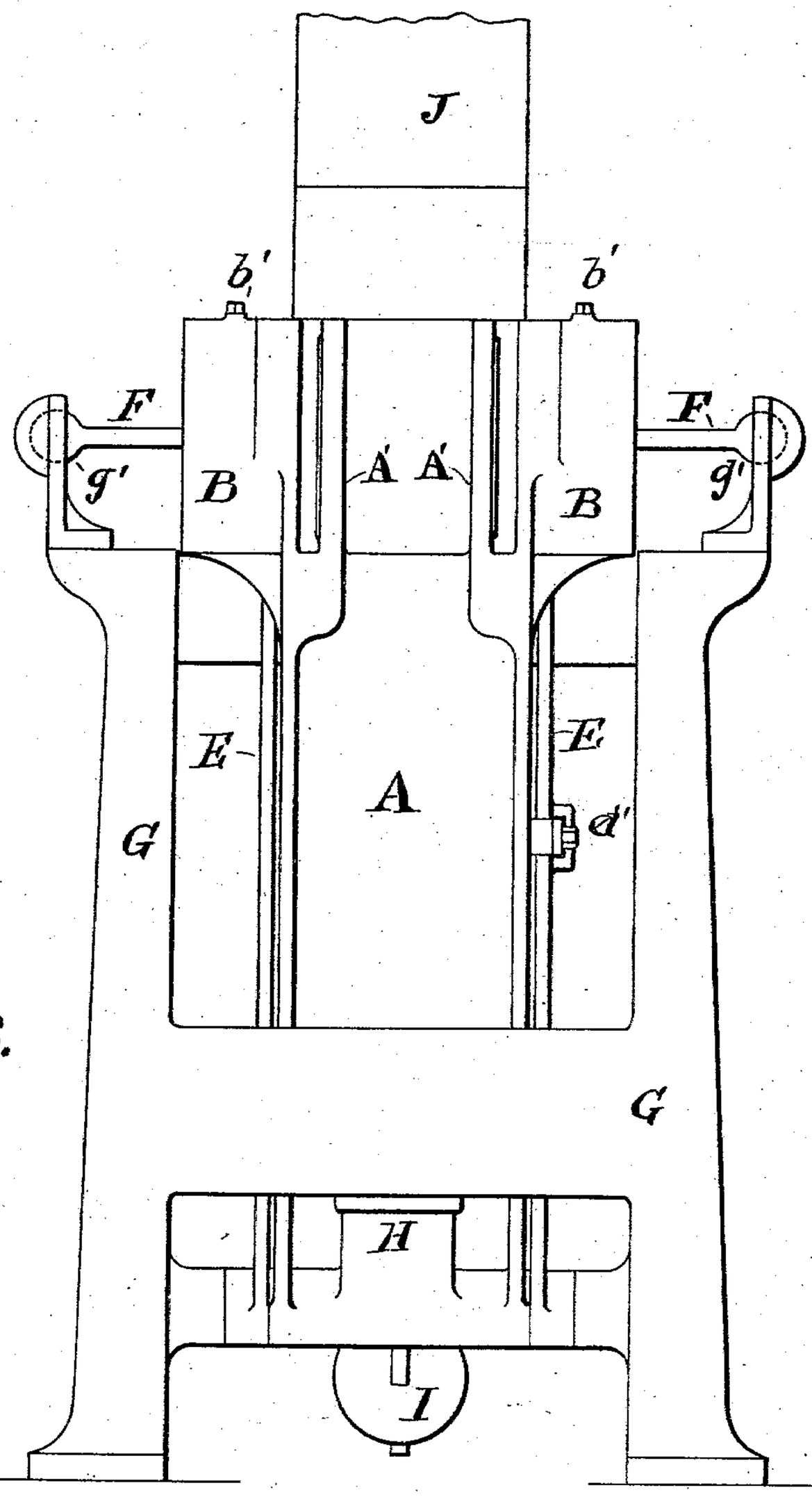

Fig. 6.

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No. 740,599. Patented October 6, 1903.

UNITED STATES PATENT OFFICE.

WILLIAM H. SMYTH, OF BERKELEY, CALIFORNIA.

MACHINE FOR HEADING CANS.

SPECIFICATION forming part of Letters Patent No. 740,599, dated October 6, 1903.

Application filed November 29, 1901. Serial No. 83,969. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. SMYTH, a citizen of the United States, residing at Berkeley, in the county of Alameda and State of California, have invented certain new and useful Improvements in Machines for Heading Cans; and I do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to a machine for assembling the heads and bodies of cans during the process of their manufacture.

The object of the present invention is to provide a simple, cheap, and efficient machine for the stated purpose particularly adapted for use in small factories or for conditions in which a foot-power machine is desirable.

Another object is to provide means which will avoid the destruction in the heading process of can-bodies which have become unduly distorted prior thereto.

One form of the machine is illustrated in the accompanying drawings, in which—

Figure 1 is a sectional elevation of the machine, showing an arrangement adapted to the employment of foot-power. Fig. 2 is a detail, partly in section, of one of the can-heading chucks with its presser. Fig. 3 is a detail sectional elevation of the heading-chucks in position. Fig. 4 is a horizontal section of Fig. 3. Fig. 5 is a vertical sectional elevation through $x\,x$ of Fig. 3. Fig. 6 is a front elevation of the machine.

As the machine consists of two sides which are alike in every particular with the exception of slight details in the power mechanism, which will be particularly pointed out later, it will simplify the description to refer to but one side of the machine. I will therefore adopt this method, it being understood that the description hereinafter refers equally to both sides.

Referring to the drawings, A is an arm pivoted at its lower end by means of a shaft a in a suitable frame and having, preferably, a trough-form section. To its upper end are attached, preferably, two curved fingers A′ A′, adapted to partially embrace a can-body.

a' is a stop-link limiting the independent motion between the arms A and E. Extending outwardly from each side of the trough-form arm A is a cylinder B, truly bored and concentric with the curvature of the fingers A′ A. Extending into the interior of the shell of the cylinder B is a transverse slot b, and extending through the wall of the cylinder is also a pin or bolt b'. In each of these cylinders is located a solid ring or annulus D, fitting snugly therein and bored to the exterior diameter of a can. This ring or annulus is also slotted a short distance from one end, the slot d' corresponding to that in the cylinder B. Corresponding to the position of the slot d' is an internal annular groove or recess D′, whose forward edge is tapered or sloped to the normal internal diameter of the ring, as shown at d. Near the outer end of the ring is provided two shallow V-shape grooves d^2 and d^3, and a longitudinal radial slot d^4 is provided to receive the inwardly-projecting end of the pin or bolt b'. The forward edge of the ring D is preferably beveled, forming a sloping enlarged mouth or entrance d^5 to the ring, as shown in Fig. 2, leaving between the slopes d^5 and d a plane internal ring surface d^6 of the exterior diameter of the can, or a trifle larger. All this is shown particularly in Fig. 2. Secured upon the outside of ring D in a depression beneath its normal exterior surface are springs D^2, their forward ends bent inward and slightly beyond the deepest portion of the annular groove D′. Seated within the ring D is a presser C, whose forward face when retracted is adjacent to the outer edge of the groove D′, as shown in Figs. 2, 3, and 4. Extending around the periphery of the presser C is a groove c, containing a spring-ring c', engaging with one of the grooves d^2 and d^3. E is an arm secured at its lower end upon the shaft a to be oscillated thereby and provided with curved jaws or fingers E′, whose inner curvature corresponds to that of a can and also as to position corresponds in distance from the center of oscillation with the fingers A′ A′, as shown in Figs. 1 and 4. Thus the parts E′ and the fingers A′ constitute the opposing jaws of a two-part segemental clamp. Upon the upper end of the arm E is a curved or arc-shape plate e, as shown in Fig. 1. Hinged to the presser by any suitable means (shown in the drawings as a transverse pin) is a lever F, its opposite end loosely connected to the inner side of the frame in any suitable man-

ner, (indicated in the drawings as a ball-and-socket connection g' in the frame G.) Attached to and intermediate of the side of the frame G, as shown in Fig. 1, is a body-rest g. A foot-lever H is secured upon the shaft a, which, as has already been stated, is journaled in the frame G. On the opposite side from H and secured upon the shaft a is a counterweighted arm I, and resting above and intermediate of the frame G is a suitable can-chute J of any suitable form.

In operation and assuming the chute J to be filled with cans the lowermost can will be supported upon the body-rest g. Heads having been deposited by the operator in the slots b, the treadle H will then be depressed, carrying the arm E forward, the jaw E′ carrying the lowermost can with it till it is embraced between and rounded up by the segmental clamp-chuck formed by the jaws E′ E′ and A′ A′. The arm A will be retained in the position shown in Fig. 1 during the independent motion of the arm E to embrace the can-body by the levers F, owing to the friction of the snugly-fitting pistons or pressers D in their seats in its upper end. Further motion of the treadle will carry the arm A and its grasped can between the levers F, which force the pressers C inward, and by frictional contact of the spring-ring c' the rings D, with the contained heads, which rest in front of the presser-faces. The heads are supported from displacement by the springs D^2. Continued motion of the foot-lever carries the pressers till the ring D rests against the fingers A′ E′, having passed over the end of the can. Still further motion of the foot-lever causes the levers to force the presser C forward in the ring D, the friction of the spring-ring c' being overcome. Thus the head is forced centrally on the end of the can by the incline d, the slightly-bell-mouthed character of the ordinary can-head assisting the entrance of the body thereinto, thus completing the heading of the can. A slight further motion of the foot-lever carries the levers past the central point, withdrawing the ring from around the headed can. During these operations the plate e has passed under the bodies in the chute, preventing them from dropping downward. The first return motion of the foot-lever H, which is caused by the counterbalance I, carries the arm E backward and permits the headed can to roll out, the trough-form character of the arm A guiding the can out of the machine. Further return motion brings the arm E into engagement with the stop-link a' and carries the arm A back to its original position. This has had the effect of retracting the piston C and ring D till the backward motion of the ring D is arrested by the pin or bolt b'. Thus the presser C, with its friction-ring c', is carried back to its normal starting position, with the friction-ring c' resting in groove d^2 and the plate e removed from beneath the can-bodies, and the machine is again ready to repeat these operations indefinitely.

By the construction heretofore described it will be seen that can-bodies which have been diametrically distorted to a greater extent than will enter the chuck are rounded up and trued in the can-body segmental clamp-chuck before being operated upon by the unbroken-ring heading-chuck, so that many can-bodies which would otherwise be irretrievably ruined in the process of heading are saved and made into good cans.

It is obvious that many changes may be made in the arrangement of this device without departing from the essential nature of the invention. For example, the power arrangement and frame-mounting shown are not of the essence of this invention and are merely shown in this form as illustrating a simple character of mounting. The foot-lever may be displaced by any suitable continuous-power mechanism, and the oscillating character of the cylinder motions may be changed to straight reciprocating motions. Feed-chutes may be supplied for the heads as well as the bodies; but all these changes and modifications being within the ordinary skill of mechanics it is not necessary that they should be more fully described or illustrated herein.

It is obvious, of course, that the means employed are adapted to effect the heading of other than cylindrical cans by merely changing the form of the chuck to correspond with the sectional form of the can. Therefore when I employ the word "ring" or "annulus" I intend it to be understood in its broadest and most generic sense as any unbroken circumscribing form of ring, such as oval, rectangular, or polygonal forms.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A can-heading machine comprising a can-heading chuck consisting of an unbroken ring or annulus and means for feeding heads thereto, means adapted to feed a can-body to and effect its entrance within the ring and means adapted to force the head on the body while held within the annulus and means adapted to oscillate the can-heading chuck in an arc path whereby its operations are effected.

2. A can-heading machine comprising a can-heading chuck consisting of an unbroken ring or annulus and means for feeding heads thereto, means adapted to feed a can-body to and effect its entrance within the ring and a movable presser adapted to force the head on the body while held within the annulus and means adapted to oscillate the can-heading chuck in an arc path whereby its operations are effected.

3. In a can-heading machine, an unbroken ring chuck adapted to head cans and means for feeding heads and bodies thereto and means adapted to oscillate the can-heading

chuck in an arc path whereby its operations are effected.

4. A can-heading machine comprising a can-heading chuck consisting of an unbroken ring or annulus and means for feeding heads thereto, means adapted to feed a can-body to and effect its entrance within the ring and means adapted to force the head on the body while held within the annulus and a second similar and similarly-mounted chuck opposing the first adapted to simultaneously apply heads to the opposite end of the can-body and means adapted to oscillate the can-heading chucks in an arc path whereby their operations are effected.

5. A can-heading machine comprising a can-heading chuck consisting of an unbroken ring or annulus and means for feeding heads thereto, means adapted to feed a can-body to and effect its entrance within the ring and a movable presser adapted to force the head on the body while held within the annulus and a similar and similarly-mounted chuck opposing the first adapted to simultaneously apply heads to the opposite end of the can-body, and means adapted to oscillate the can-heading chucks in an arc path whereby their operations are effected.

6. In a can-heading-machine, an unbroken ring chuck adapted to head cans and means for feeding heads and bodies thereto and a similar and similarly-mounted chuck opposing the first adapted to simultaneously apply heads to the opposite end of the can-body, and means adapted to oscillate the can-heading chuck in an arc path whereby its operations are effected.

7. A can-heading machine comprising an unbroken ring chuck, a transverse slot adjacent to said ring for feeding heads thereto, a segmental clamp adapted to hold and form up bodies into circular form and hold them concentric with the ring chuck and means for forcing the head through the unbroken ring chuck upon the body while held concentric with the ring and means adapted to oscillate the chuck in an arc path whereby its operations are effected.

8. A can-heading machine comprising an unbroken ring chuck, a transverse slot adjacent to said ring for feeding heads thereto, a segmental clamp adapted to hold and form up bodies into circular form and hold them concentric with the ring chuck and means for forcing the head through the unbroken ring chuck upon the body while held concentric with the ring, and means oscillating in an arc path adapted to open and close the segmental clamp to admit bodies and discharge headed cans therefrom.

9. A can-heading machine comprising a movable two-part can-body clamp adapted to grasp and hold a can-body in position, an unbroken ring chuck on each side thereof and moving therewith, a presser seated within each ring chuck, connections between each chuck and the presser therein whereby axial motion of the presser effects the motion of the chuck and a lever connected to each presser suitably arranged to effect its axial motion by the movement of the can-clamp.

10. A can-heading machine comprising a movable two-part can-body clamp adapted to grasp and hold a can-body in position, an unbroken ring chuck on each side thereof and moving therewith, a presser seated within each ring chuck, friction devices interposed between each chuck and the presser therein whereby axial motion of the presser effects the motion of the chuck and a lever connected to each presser suitably arranged to effect its axial motion by the movement of the can-clamp.

11. A can-heading machine comprising a movable two-part can-body clamp adapted to grasp and hold a can-body in position, an unbroken ring chuck on each side thereof and moving therewith, a presser seated within each ring chuck, connections between each chuck and the presser therein whereby axial motion of the presser effects the motion of the chuck and a lever connected to each presser suitably arranged to effect its axial motion by the movement of the can-clamp and means for feeding heads and bodies to the heading-chucks.

12. A can-heading machine comprising a movable two-part can-body clamp adapted to grasp and hold a can-body in position, an unbroken ring chuck on each side thereof and moving therewith, a presser seated within said ring chuck, friction devices interposed between each chuck and the presser therein whereby axial motion of the presser effects the motion of the chuck and a lever connected to each presser suitably arranged to effect its axial motion by the movement of the can-clamp, and means for feeding heads and bodies to the heading-chucks.

13. A can-heading machine comprising a movable two-part can-body clamp adapted to grasp and hold a can-body in position, an unbroken ring chuck on each side thereof and moving therewith, a presser seated within each ring chuck, connections between each ring chuck and the presser therein whereby axial motion of the presser effects the motion of the chuck and a lever connected to each presser suitably arranged to effect its axial motion by the movement of the can-clamp and means for feeding heads and bodies to the heading-chucks and power connections to effect the motion of the can-body clamp.

14. A can-heading machine comprising a movable two-part can-body clamp adapted to grasp and hold a can-body in position, an unbroken ring chuck on each side thereof and moving therewith, a presser seated within each ring chuck, friction devices interposed between each chuck and the presser therein whereby axial motion of the presser effects the motion of the chuck and a lever connected to each presser suitably arranged to effect its axial motion by the movement of the can-

clamp and means for feeding heads and bodies to the heading-chucks and power connections to effect the motion of the can-body clamp.

15. A can-heading machine comprising a segmental can-body chuck, a can-heading chuck consisting of an unbroken ring or annulus and means for feeding heads thereto, means adapted to feed a can-body to and effect its entrance within the ring and means adapted to force the head on the body while held within the annulus and means adapted to oscillate the can-heading chuck in an arc path whereby its operations are effected.

16. A can-heading machine comprising a segmental can-body chuck, a can-heading chuck consisting of an unbroken ring or annulus and means for feeding heads thereto, means adapted to feed a can-body to and effect its entrance within the ring and a movable presser adapted to force the head on the body while held within the annulus and means adapted to oscillate the can-heading chuck in an arc path whereby its operations are effected.

17. In a can-heading machine, a segmental can-body chuck, an unbroken ring chuck adapted to head cans and means for feeding heads and bodies thereto and means adapted to oscillate the can-heading chuck in an arc path whereby its operations are effected.

18. A can-heading machine comprising a segmental can-body chuck, a can-heading chuck consisting of an unbroken ring or annulus and means for feeding heads thereto, means adapted to feed a can-body to and effect its entrance within the ring and means adapted to force the head on the body while held within the annulus and a second similar and similarly-mounted chuck opposing the first adapted to simultaneously apply heads to the opposite end of the can-body and means adapted to oscillate the can-heading chucks in an arc path whereby their operations are effected.

19. A can-heading machine comprising a segmental can-body chuck, a can-heading chuck consisting of an unbroken ring or annulus and means for feeding heads thereto, means adapted to feed a can-body to and effect its entrance within the ring and a movable presser adapted to force the head on the body while held within the annulus and a similar and similarly-mounted chuck opposing the first adapted to simultaneously apply heads to the opposite end of the can-body and means adapted to oscillate the can-heading chucks in an arc path whereby their operations are effected.

20. In a can-heading machine, a segmental can-body chuck, an unbroken ring chuck adapted to head cans and means for feeding heads and bodies thereto and a similar and similarly-mounted chuck opposing the first adapted to simultaneously apply heads to the opposite end of the can-body and means adapted to oscillate the can-heading chucks in an arc path whereby their operations are effected.

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