No. 740,600. PATENTED OCT. 6, 1903.

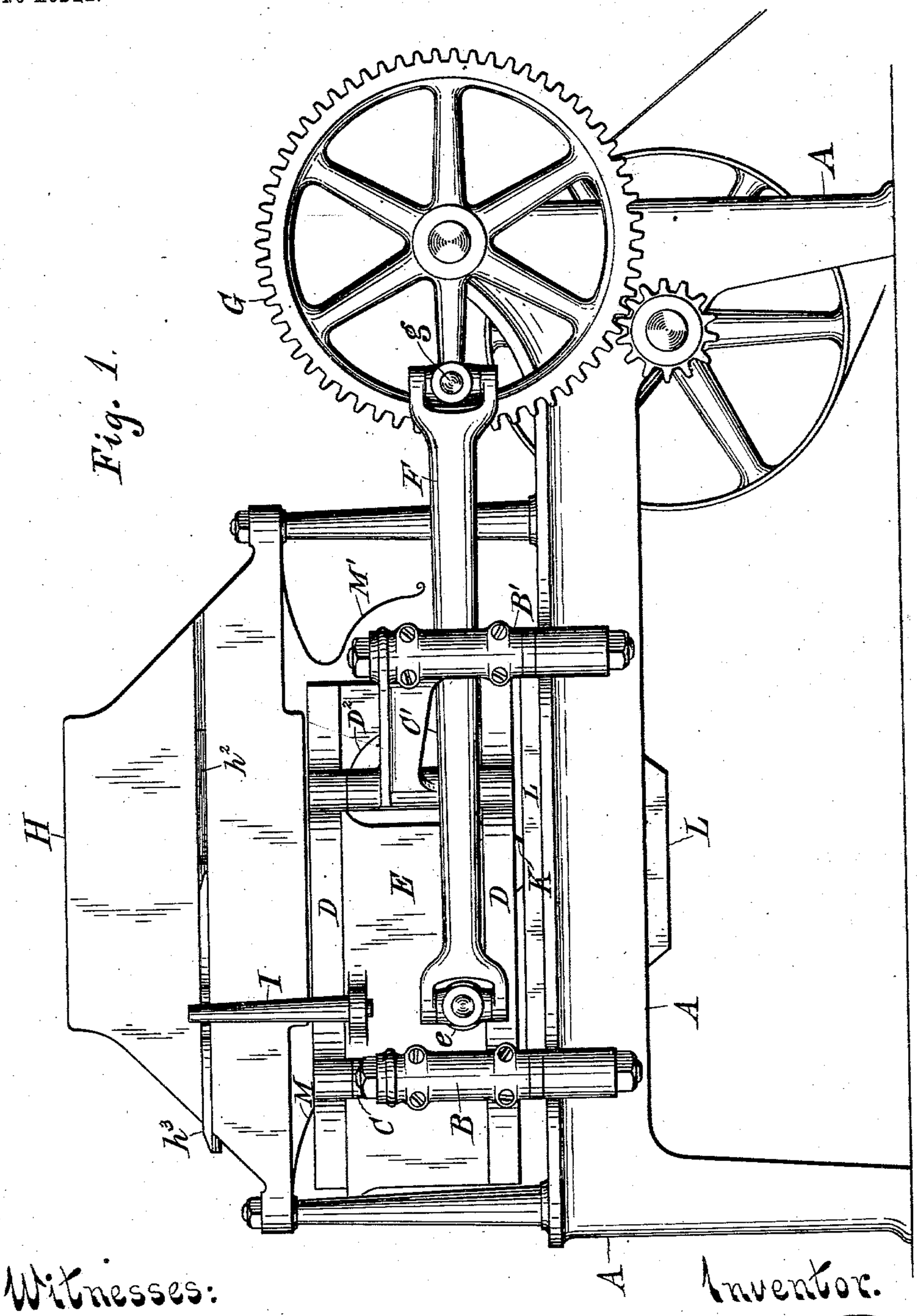
W. H. SMYTH.

MACHINE FOR HEADING CANS.

APPLICATION FILED NOV. 29, 1901.

NO MODEL. 6 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Geo. W. Uffinger
H. A. McKown

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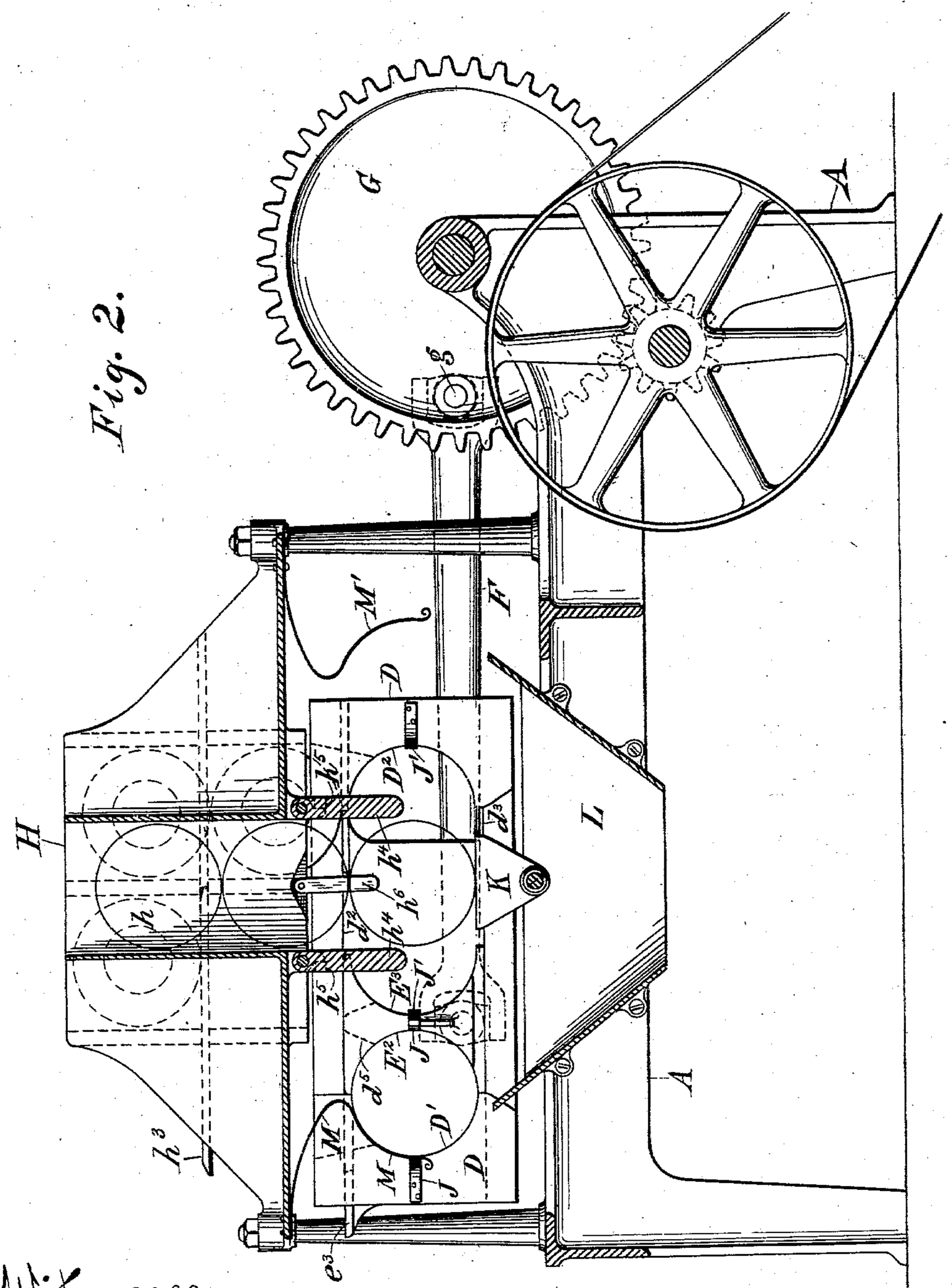
NO MODEL. 6 SHEETS—SHEET 2.

Fig. 2.



Witnesses:
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NO MODEL. 6 SHEETS—SHEET 3.

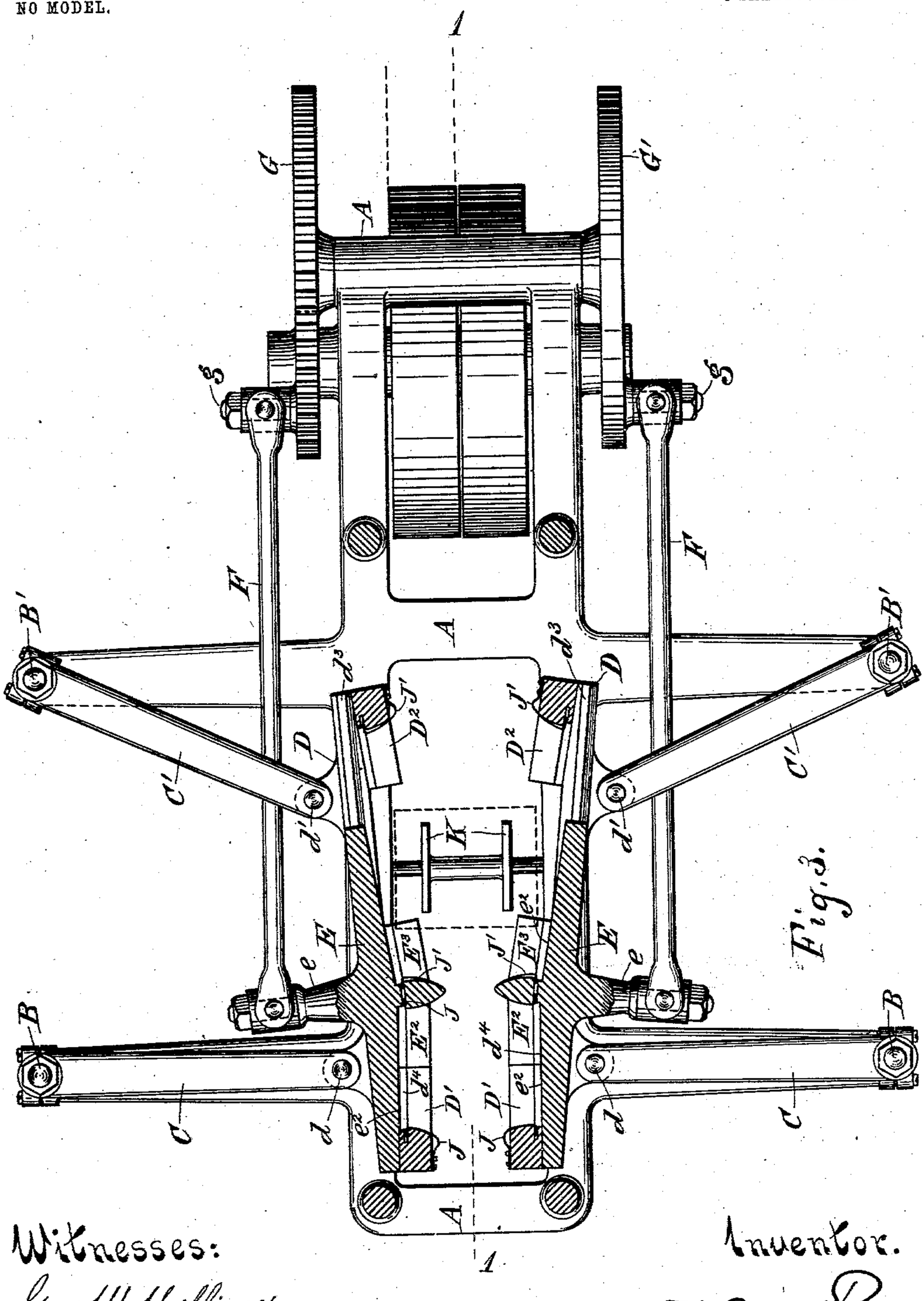

Fig. 3.

Witnesses:
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NO MODEL. 6 SHEETS—SHEET 4.

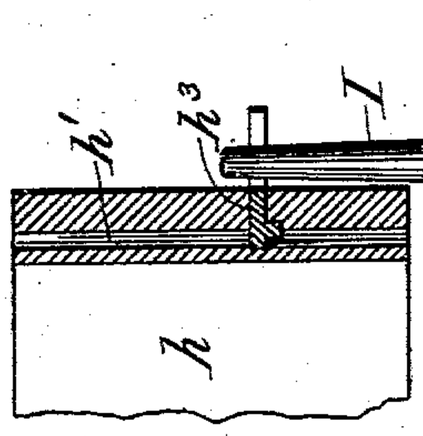

Fig. 5.

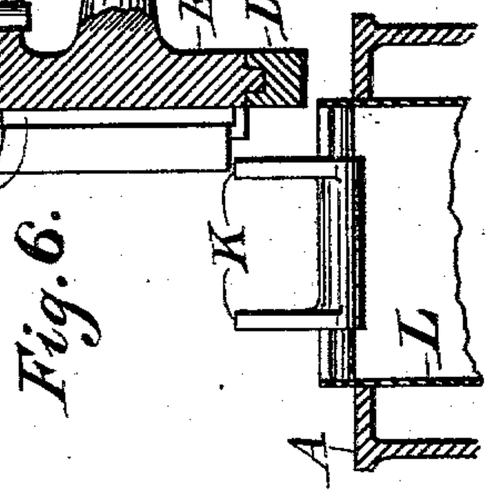

Fig. 6.

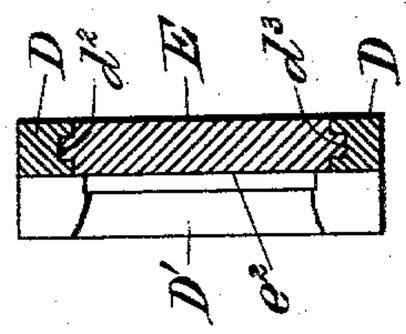

Fig. 7.

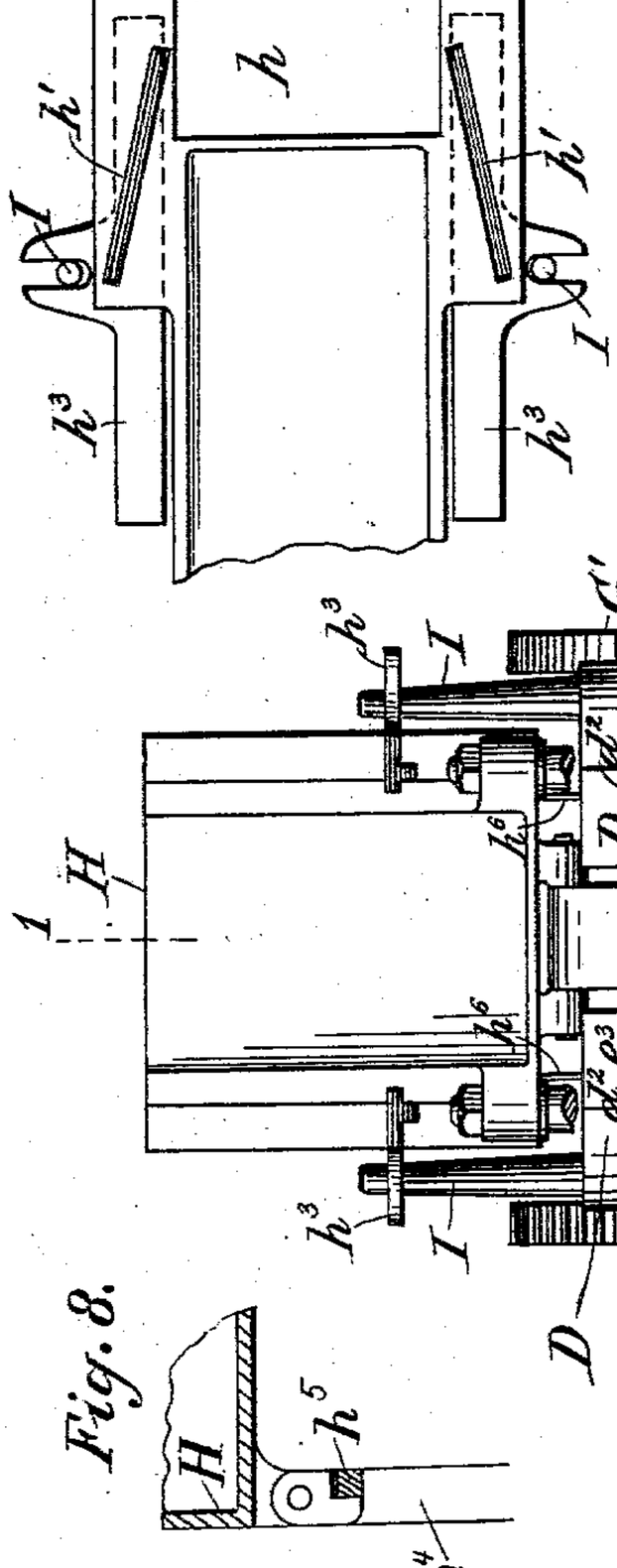

Fig. 8.

Fig. 4.

Witnesses:
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NO MODEL. 6 SHEETS—SHEET 5.

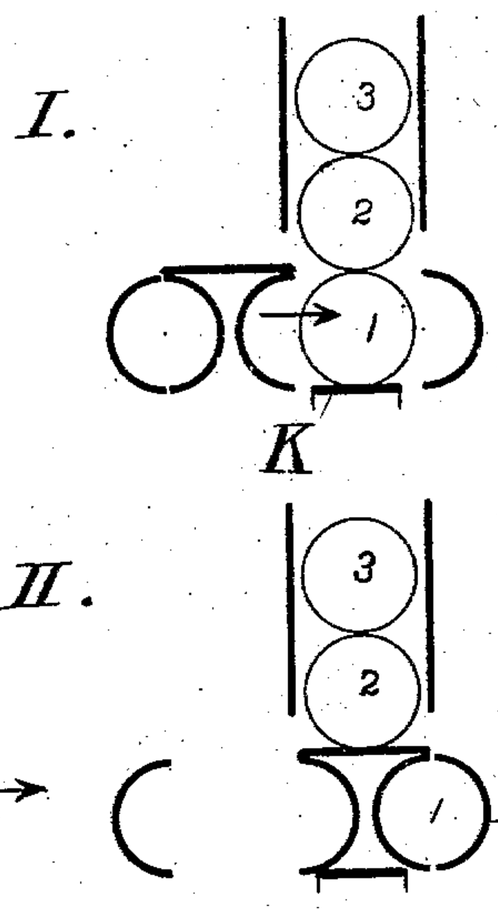
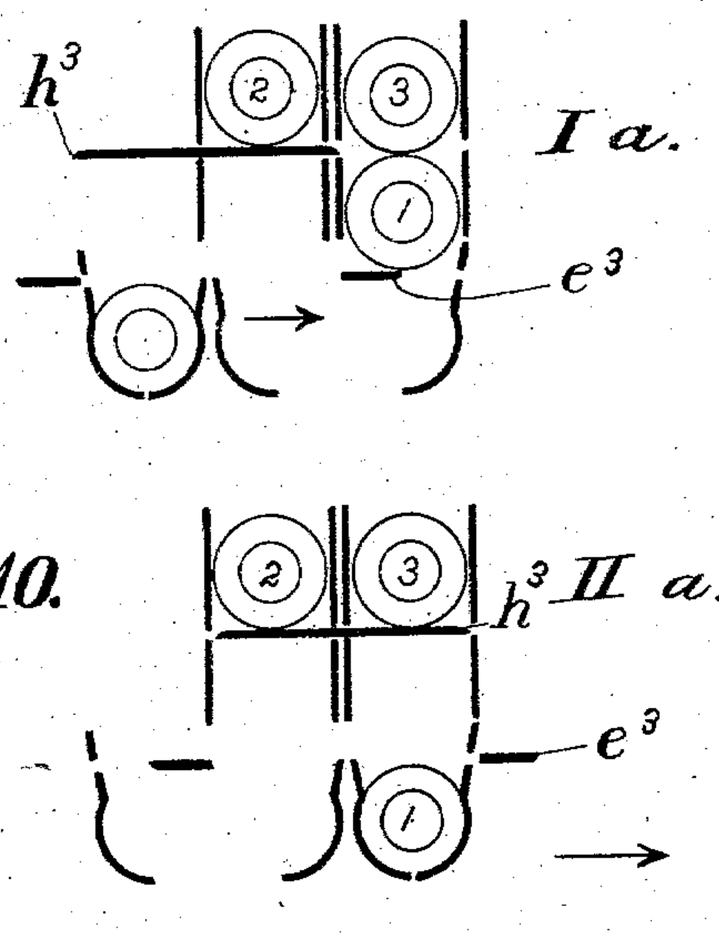


Fig. 10.



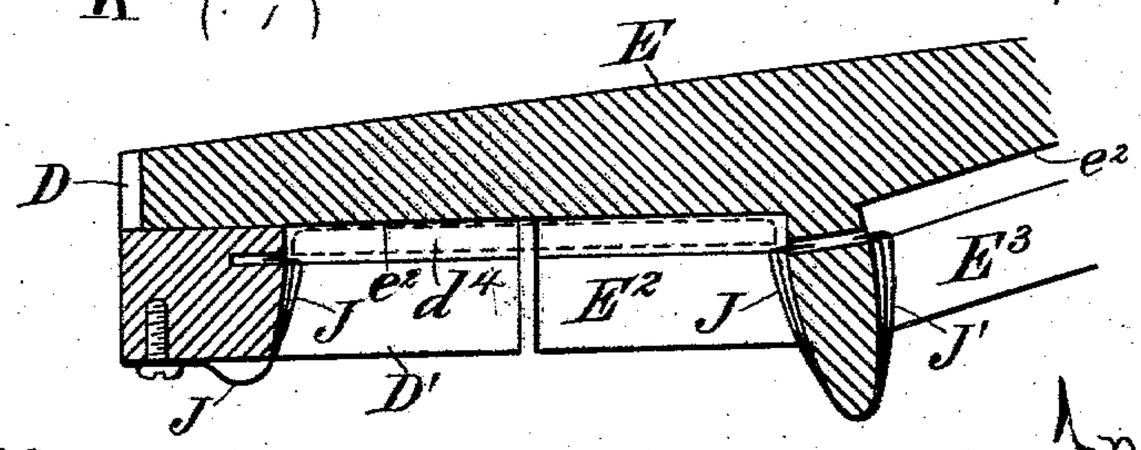


Fig. 9.

Witnesses:
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APPLICATION FILED NOV. 29, 1901.

NO MODEL. 6 SHEETS—SHEET 6.

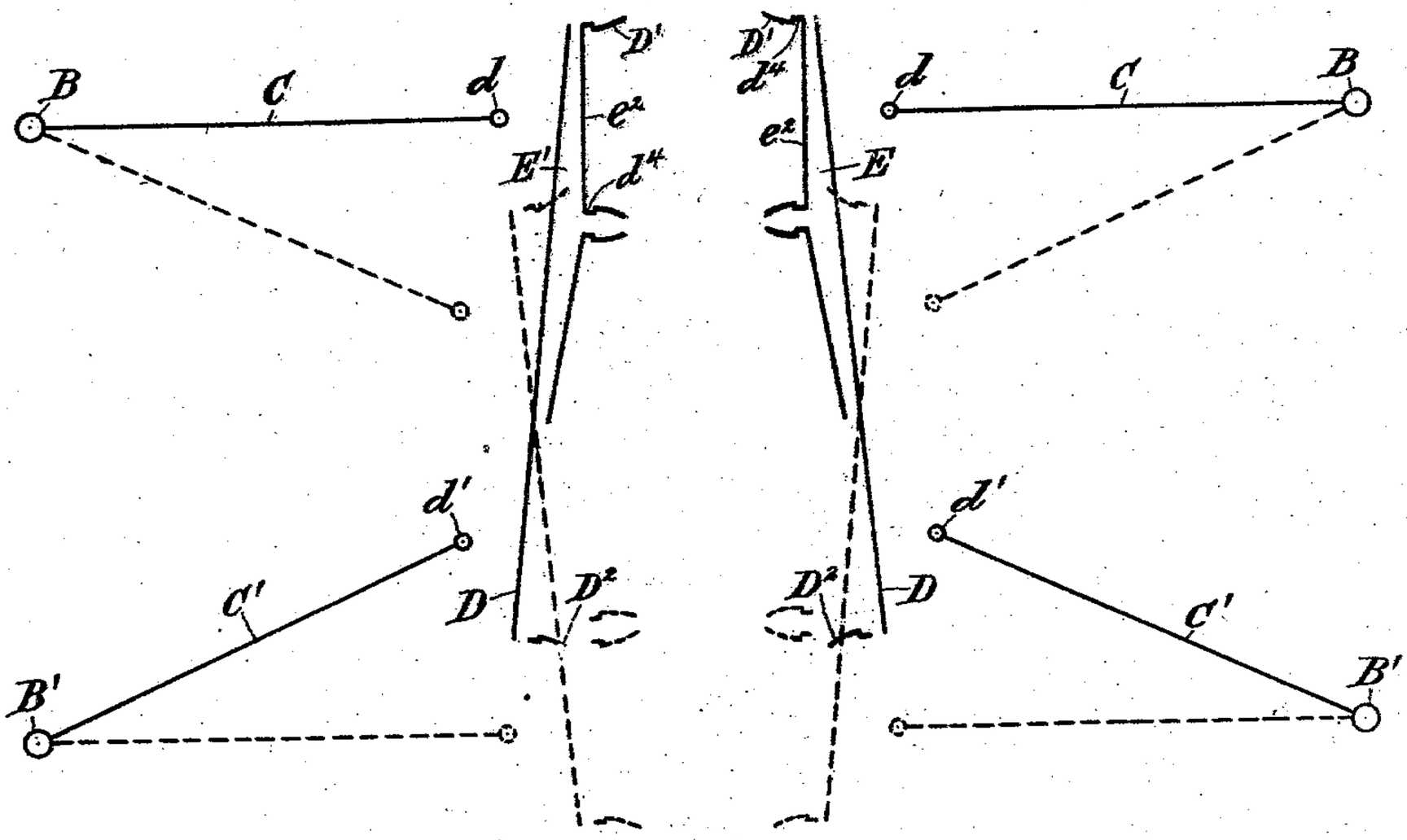
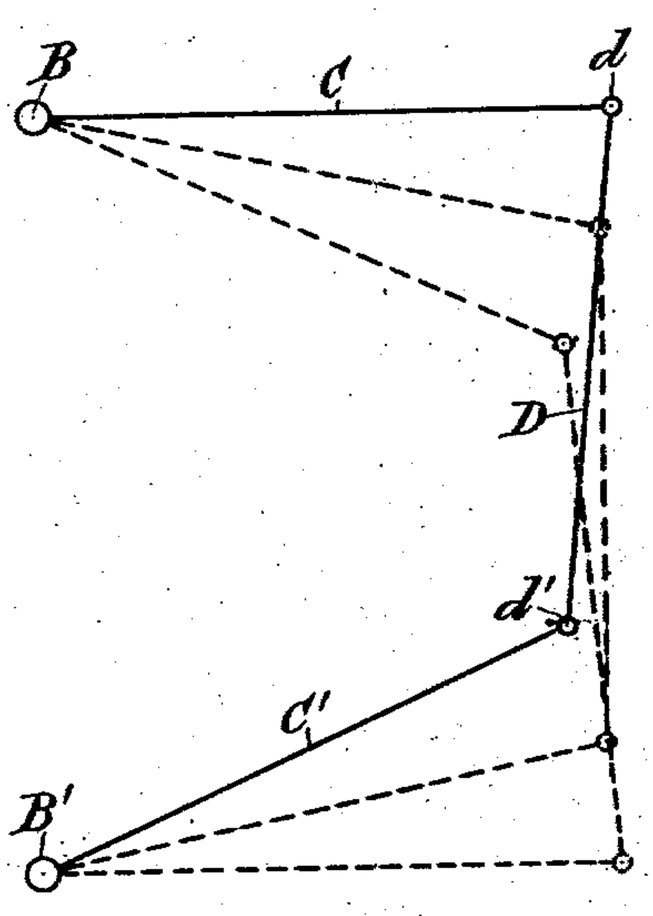


Fig. 11.



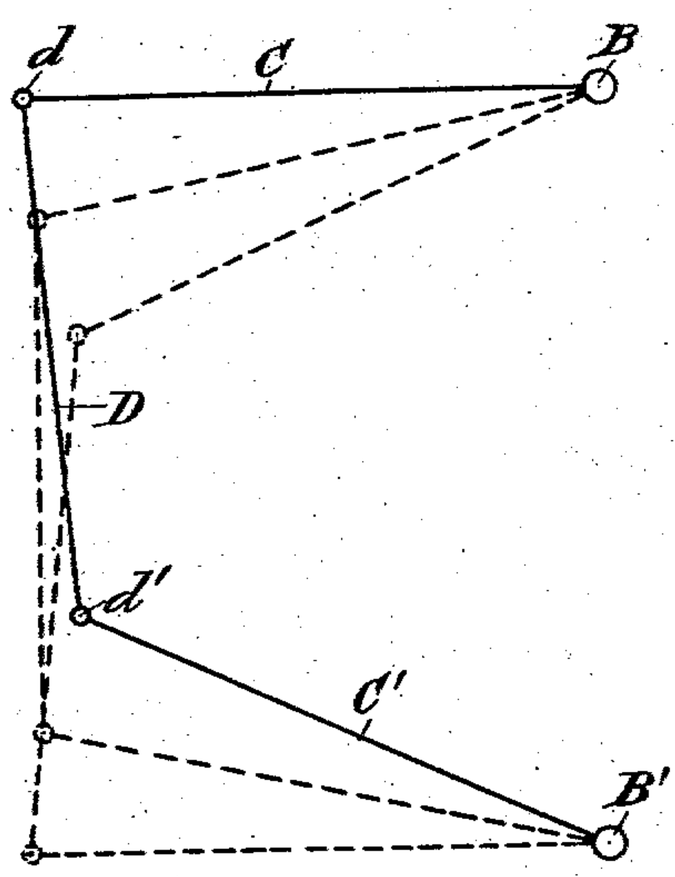


Fig. 12.

Witnesses:
Geo. W. Uffinger.
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Inventor:
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No. 740,600. 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. 740,600, dated October 6, 1903.

Application filed November 29, 1901. Serial No. 83,970. (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 heading cans.

The object of the present invention is to provide a simple, durable, and efficient device for assembling the top and bottom covers with the bodies of cans in the process of manufacture.

One of the objects of the present invention is to provide a can-heading machine of great capacity and of the fewest possible number of moving or working parts and thus eliminate to a great extent the necessity for adjustment; also, to construct such a device so that when owing to imperfection in the heads or bodies fed thereto one becomes jammed in the machine the liberating of it may be done simply and expeditiously and without further injury to the can. These objects are accomplished by means of the devices illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation. Fig. 2 is a sectional elevation of Fig. 1. Fig. 3 is a plan view and section through dies. Fig. 4 is an end view. Fig. 5 is a plan view of a detail, showing the feed-chutes for the heads and bodies. Fig. 6 is a cross-section in detail, showing feeding device. Fig. 7 is a cross-section of carriage D and cross-head E, showing guides. Fig. 8 is a detail showing the hanging gate h^4 with its stop. Fig. 9 is an enlarged detail of the two-part die. Fig. 10 is a diagrammatic series, showing course of can-body and head through the machine. Fig. 11 is a diagrammatic plan showing the position of the cross-head and carriage at opposite ends of the stroke, the positions at one end of the stroke being shown in full lines and the positions at the other end of the stroke being indicated by dotted lines. Fig. 12 is a diagrammatic plan of the levers and their centers, showing their end and intermediate positions.

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 described and 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 with reference to a vertical plane bisecting the machine on the line 1 1 of Fig. 3 and Fig. 4.

Referring to the accompanying drawings, A is a frame or stand having laterally-projecting wings or brackets, to which are secured vertical standards or uprights B and B′. Journaled thereon to pivotally swing upon these vertical standards or uprights are toggle-arms C C′. Set somewhat closer together than the pivots B B′, connected to these arms C C′ by hinge-joints d d' and supported thereby, is a frame or carriage D. (Shown in Figs. 1, 3, and 4.) At the ends of carriage D are provided beveled-mouth half-chucks, jaws, or dies D′ D^2 with can-head recesses d^4 and head-feeding grooves d^5. The carriage or frame D consists of an upper and lower member forming slides d^2 d^3, between which is guided a slidable cross-head E, having on its inner face two half-chucks, jaws, or dies E^2 and E^3, corresponding to and alternately opposing the half-chucks on the carriage D and forming therewith substantially complete circular chucks at each end of frame or carriage D, the half-chuck E^2 opposing the half-chuck D′ and forming therewith a complete circular chuck, and the same with reference to the half-chucks E^3 and D^2. The half-chucks D′ and D^2 are set at a slight angle to the carriage D and to each other, and the chucks E^2 and E^3 are set on the cross-head E at similar angles to correspond each with its respective opposing half. Upon the opposite or outer side of the cross-head E from the chucks E^2 and E^3 is a pin or lug e. Projecting outwardly and journaled with a universal-joint connection upon this pin e is a connecting-rod F, which at its other end is connected by a similar universal-joint connection with a crank-pin g of a crank-wheel G, all of which is shown best in Fig. 3. e^2 is the back surface of the circular chuck formed of the half-jaws, forming the pressure and resisting surfaces for the can-head. From

the upper surface of the cross-head and at each end thereof is a flange e^3. The flange e^3 projects laterally inwardly into a groove in the frame D, intersecting the head-chute d^5.

Supported upon the frame A in any suitable manner and shown in the drawings as columns is a feeding-frame H for bodies and heads. (Shown in Figs. 1 and 2 and in detail in Fig. 5.) It is provided with a central opening or chute h for bodies and side openings or chutes h' and h^2 at one side of said opening h, passing downwardly through the frame H, as shown in detail, Fig. 5. In the side of frame H and longitudinal thereof is a groove or channel cutting transversely the chutes h' and h^2. In this channel is slidably placed a movable slide or gate h^3, which is shown in Figs. 1, 2, 3, 4 and particularly in Fig. 5 and in section in Fig. 6. Depending from the forward and rearward lower edge of the central chute in frame H is a hinged gate h^4, as shown in Fig. 2, and provided with a stop h^5, limiting its oscillating motion to one direction, as is shown in Fig. 8. Depending from the lower edge of each side of the body-chute h is a swinging finger h^6, its inner surface being substantially in the same plane and a continuation of the side of the chute h. Extending upwardly from the outer side of the cross-head E is a pin I, loosely socketed in a bracket projecting from the side of cross-head E. The upper end of pin I engages with a transverse slot in a movable slide h^3. Secured upon each of the half-jaws of the frame or carriage D are light springs J and J', respectively. (Shown in Fig. 3.) Secured centrally of the frame A and intermediate of the swinging carriages D is a can-support K, as shown in Figs. 2, 3 and particularly in Fig. 6. Secured between the sides of the frame A and centrally beneath the frame H is a discharge-chute L, as shown in Figs. 1, 2, and 6.

Power connections for giving motion to the cross-head and carriage preferably consist, as shown in Figs. 1, 2, and 3, of a transverse shaft journaled in frame A and provided with a tight and loose belt-pulley and a pinion, the pinion meshing with a gear G, secured upon a transverse shaft, also secured in frame A, and having secured upon the last-named shaft an untoothed crank-plate G', similarly provided with a crank-pin and connections, as already described with reference to the toothed crank-plate G.

Suitably attached to the stationary frame in the path of the can to be headed are springs M and M'.

Runways may be provided for heads and bodies to supply the chutes h, h', and h^2 and also from the discharge-chute L to carry away the headed cans; but as these are common expedients in the art and familiar to mechanics it is not necessary to describe them further.

In operation and assuming the belt to be on the tight pulley, reciprocating motion will be communicated to the cross-heads E, reference being had particularly to Fig. 3. The first motion of the cross-heads E will cause them to slide in their respective carriage D to the limit of their motion therein. Further motion of the cross-heads E will pick up and carry along the carriages D to the end of the stroke of the cranks g. This motion will bring the carriages D to a position in which the centers of the toggles C' will be slightly beyond a straight line with the circular chuck form of the opposing jaws E^3 D^2 opposite to each other and their back surfaces e^2 parallel, as they are shown at the opposite end of the carriage D in Fig. 3. The other end of the carriage will then have assumed the position with reference to K, reversed to that shown in Fig. 3.

Referring now particularly to Fig. 1 and also to Figs. 2 and 4, it will be seen that the motion of the cross-head through the intervention of the pin I has been given to the slide h^3, the slotted character of the hole, as shown in Fig. 6, permitting the pin to move inward and outward with the undulating character of its path. Assuming now that heads and bodies are fed to the machine, and taking up the diagrammatic series, Fig. 10, in connection with the various views, the course of the heads and bodies and the consequent operation of the machine will be readily followed therefrom, and for the purpose of the following description it will be assumed that the machine starts from the position shown in Fig. 3. The first column of diagrams represents motions in connection with the bodies. The second column of diagrams represents the same motions in relation to their heads.

I. The bodies are piled one above the other, the lowermost resting upon the support K, the jaws being open, as shown in Fig. 3, to receive the bodies.

I^a. The heads for the lowermost body rest upon the support e^3, and the heads for the next body rest upon the slide h^3.

II. The first motion of the cross-head has carried the lowermost body into the chuck D^2 and separated it from the second body, which now rests upon the top of the cross-head.

II^a. The motion of the cross-head just referred to has carried the support e^3 from under the lowermost head and the slide h^3 simultaneously under the third head and the first head has dropped into the annular recess D^2.

III. The cross-head has continued its journey, picking up the carriage and carrying it along, as already described, permitting the bodies to drop from off the cross-head on the rest K and by the closing action of the carriages D has forced the heads upon the body.

III^a. The same motion has carried the slide h^3 from under the second head, permitting it to drop upon the support e^3.

IV. The first return motion of the cross-head has carried the second body into the op-

posite jaw, past under the third and fourth body, and opened chuck E^3 D^2, discharging the first headed can.

IV^a. This motion has carried the support e^3 from under second head and the slide h^3 under fourth head and as in IV opened chuck E^3 D^2 and discharged first headed can.

The motion of the cross-head continuing, the same operations will take place with reference to the other end of the machine and the chucks E^2 D', and the operation of the machine and the heading of the cans will be continuous. Each motion of the cross-head in one direction heads a can and each complete reciprocation or each revolution of the crank g heads and discharges two cans, the machine performing its function upon cans as fast as gravity will feed heads and bodies to it.

The springs M′ press upon the can as the carriage moves toward them and force the headed can out of the half-chuck. The motion of the carriage to a point slightly beyond the straight line of the toggles slackens up the pressure of the back face of the chucks, so that the cans when headed are free to drop out. The fingers h^6 prevent the bodies from getting out of place endwise and the depending stops h^5 prevent the lateral displacement of the bodies till moved by the cross-head, when the stops h^5 are swung backward by the body and dropped back into place when the body has passed. The springs J and J′ prevent the heads falling forward out of the annular recess of the chuck.

It is obvious that many modifications in the device herein described will readily suggest themselves to mechanics to adapt it to particular circumstances or conditions of operation without departing from the essential character of the invention. For example, 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 section of the can. Therefore when I employ the word "chuck or sectional chuck" I intend it to be understood in its broadest and most generic sense as any unbroken circumscribing form of chuck, such as oval, rectangular, or polygonal forms.

What I claim as new, and desire to secure by Letters Patent, is—

1. A can-heading machine comprising a movable carriage adapted to oscillate in a curved path provided with a chuck and a lever connected therewith, suitably arranged whereby through the motion of the carriage, a head carried by the chuck is forced upon a body.

2. A can-heading machine comprising a movable carriage adapted to oscillate in a curved path having chucks, toggle-arms connected with said carriage whereby through its motion between the toggles, heads carried thereby are forced upon a body.

3. A can-heading machine comprising a movable carriage adapted to oscillate in a curved path having a chuck-segment at each of its ends, a device interposed between the chuck-segments carrying other chuck-segments adapted to move to and from the carriage chuck-segments, levers connected to the carriage suitably arranged whereby through the motion of the carriage, heads carried thereby are forced upon bodies by the segments alternately at each end of the carriage.

4. A can-heading machine comprising a movable carriage adapted to oscillate in a curved path having chucks at each of its ends, toggle-arms connected with said carriage whereby through its motion between the toggles, heads carried thereby are forced upon bodies by the chucks alternately at each end of the carriage.

5. A can-heading machine comprising a movable chuck having a pressure-surface adapted to travel in a curved path, two oscillating levers connected therewith and mounted upon separate centers, so arranged that the path of the chuck combines the arc path of both levers whereby through the motion of the chuck, a head carried thereby is forced upon a body.

6. A can-heading machine comprising a movable carriage having a chuck at each of its ends, two oscillating levers connected therewith and mounted upon separate centers so arranged that the path of the carriage combines the arc path of both levers whereby through the motion of the carriage heads carried thereby are forced by the chucks upon bodies alternately at each end of the carriage.

7. A can-heading machine comprising a movable two-part carriage having chucks at each of its ends, two oscillating levers connected to each part member of the carriage mounted upon separate centers so arranged that the path of each member combines the arc path of the levers connected therewith whereby through the motion of the carriage, heads carried thereby are forced by the chucks upon a body lying between them alternately at each end of the carriage.

8. A can-heading machine comprising a movable carriage having two sides, each side provided with a chuck-segment at each of its ends, a movable cross-head interposed between the sides and having chuck-segments adapted to move to and from the carriage chuck-segments, two oscillating levers connected to each side of the carriage mounted upon separate centers so arranged that the path of each side combines the arc path of the levers connected therewith whereby through the motion of the carriage heads carried thereby are forced by the chucks upon a body lying between them.

9. In a can-heading machine, levers provided with a chuck having a pressure-surface adapted to oscillate in a curved path and thereby force heads upon bodies, which levers describe arcs of different circles.

10. In a can-heading machine, a movable carriage adapted to oscillate in a curved path

connected to levers controlling its path, which levers describe arcs of different circles, the carriage being provided with a chuck on each of its ends adapted to force heads upon bodies of cans.

11. In a can-heading machine, a movable chuck having a pressure-face adapted to oscillate in a curved path adapted to force a head upon a body, connected to levers controlling its path which levers describe arcs of different circles and a similar and similarly-mounted chuck.

12. In a can-heading machine, a movable carriage adapted to oscillate in a curved path having a chuck at each of its ends adapted to force heads on bodies of cans, connected to levers controlling its path, which levers describe arcs of different circles.

13. In a can-heading machine, a movable carriage adapted to oscillate in a curved path having a chuck at each of its ends adapted to force heads on bodies of cans, connected to levers controlling its path, which levers describe arcs of different circles and a similar and similarly-mounted chuck.

14. In a can-heading machine, a movable carriage having a chuck-segment at each of its ends and a cross-head movable between said chuck-segments provided with other chuck-segments adapted to form with the carriage chuck-segment a chuck at each end of the carriage adapted to force heads upon bodies, the carriage being connected to levers controlling its path, which levers describe arcs of different circles.

15. In a can-heading machine, a movable carriage having a chuck at each of its ends and a cross-head movable between said chuck-segments provided with other chuck-segments adapted to form with the carriage chuck-segment a chuck at each end of the carriage adapted to force heads upon bodies, the carriage being connected to levers controlling its path, which levers describe arcs of different circles and a similar and similarly-mounted carriage.

16. A can-heading machine comprising a movable carriage adapted to oscillate in a curved path provided with a chuck and a lever connected therewith, suitably arranged whereby through the motion of the carriage, a head carried by the chuck is forced upon a body and automatic means for feeding heads and bodies to the heading devices.

17. A can-heading machine comprising a movable carriage adapted to oscillate in a curved path having chucks, toggle-arms connected with said carriage whereby through its motion between the toggles, heads carried thereby are forced upon a body and automatic means for feeding heads and bodies to the heading devices.

18. A can-heading machine comprising a movable carriage adapted to oscillate in a curved path having a chuck-segment at each of its ends, a device interposed between the chuck-segments carrying other chuck-segments adapted to move to and from the carriage chuck-segments, levers connected to the carriage suitably arranged whereby through the motion of the carriage, heads carried thereby are forced upon bodies by the segments alternately at each end of the carriage and automatic means for feeding heads and bodies to the heading devices.

19. A can-heading machine comprising a movable carriage adapted to oscillate in a curved path having chucks at each of its ends, toggle-arms connected with said carriage whereby through its motion between the toggles, heads carried thereby are forced upon bodies by the chucks alternately at each end of the carriage and automatic means for feeding heads and bodies to the heading devices.

20. A can-heading machine comprising a movable chuck having a pressure-face adapted to oscillate in a curved path, two oscillating levers connected therewith and mounted upon separate centers, so arranged that the path of the chuck combines the arc path of both levers whereby through the motion of the chuck, a head carried thereby is forced upon a body, and automatic means for feeding heads and bodies to the heading devices.

21. A can-heading machine comprising a movable carriage adapted to oscillate in a curved path having a chuck at each of its ends, two oscillating levers connected therewith and mounted upon separate centers so arranged that the path of the carriage combines the arc path of both levers whereby through the motion of the carriage heads, carried thereby, are forced by the chucks upon bodies alternately at each end of the carriage and automatic means for feeding heads and bodies to the heading devices.

22. A can-heading machine comprising a movable two-part carriage adapted to oscillate in a curved path having chucks at each of its ends, two oscillating levers connected to each part member of the carriage mounted upon separate centers so arranged that the path of each member combines the arc path of the levers connected therewith whereby through the motion of the carriage, heads carried thereby, are forced by the chucks upon a body lying between them alternately at each end of the carriage and automatic means for feeding heads and bodies to the heading devices.

23. A can-heading machine comprising a movable carriage having two sides, each side provided with a chuck-segment at each of its ends, a movable cross-head interposed between the sides and having chuck-segments adapted to move to and from the carriage chuck-segments, two oscillating levers connected to each side of the carriage mounted upon separate centers so arranged that the path of each side combines the arc path of the levers connected therewith whereby through the motion of the carriage heads carried

thereby are forced by the chucks upon a body lying between them and automatic means for feeding heads and bodies to the heading devices.

24. In a can-heading machine, a movable chuck adapted to force heads upon bodies connected to levers controlling its path, which levers describe arcs of different circles and automatic means for feeding heads and bodies to the heading devices.

25. In a can-heading machine, a movable carriage adapted to oscillate in a curved path connected to levers controlling its path, which levers describe arcs of different circles, the carriage being provided with a chuck on each of its ends adapted to force heads upon bodies of cans and automatic means for feeding heads and bodies to the heading devices.

26. In a can-heading machine a movable chuck having a pressure-surface adapted to oscillate in a curved path and adapted to force a head upon a body, connected to levers controlling its path which levers describe arcs of different circles and a similar and similarly-mounted chuck and automatic means for feeding heads and bodies to the heading devices.

27. In a can-heading machine, a movable carriage adapted to oscillate in a curved path having a chuck at each of its ends adapted to force heads on bodies of cans, connected to levers controlling its path, which levers describe arcs of different circles and automatic means for feeding heads and bodies to the heading devices.

28. In a can-heading machine, a movable carriage adapted to oscillate in a curved path having a chuck at each of its ends adapted to force heads on bodies of cans, connected to levers controlling its path, which levers describe arcs of different circles and a similar and similarly-mounted opposing chuck and automatic means for feeding heads and bodies to the heading devices.

29. In a can-heading machine, a movable carriage adapted to oscillate in a curved path having a chuck-segment at each of its ends and a cross-head movable between said chuck-segments provided with other chuck-segments adapted to form with the carriage chuck-segment a chuck at each end of the carriage adapted to force heads upon bodies, the carriage being connected to levers controlling its path, which levers describe arcs of different circles and automatic means for feeding heads and bodies to the heading devices.

30. In a can-heading machine, a movable carriage adapted to oscillate in a curved path having a chuck-segment at each of its ends and a cross-head movable between said chuck-segments provided with other chuck-segments adapted to form with the carriage chuck-segment, a chuck at each end of the carriage adapted to force heads upon bodies, the carriage being connected to levers controlling its path, which levers describe arcs of different circles and a similar and similarly-mounted carriage and automatic means for feeding heads and bodies to the heading devices.

WILLIAM H. SMYTH.

Witnesses:
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K. E. MONTAGUE.