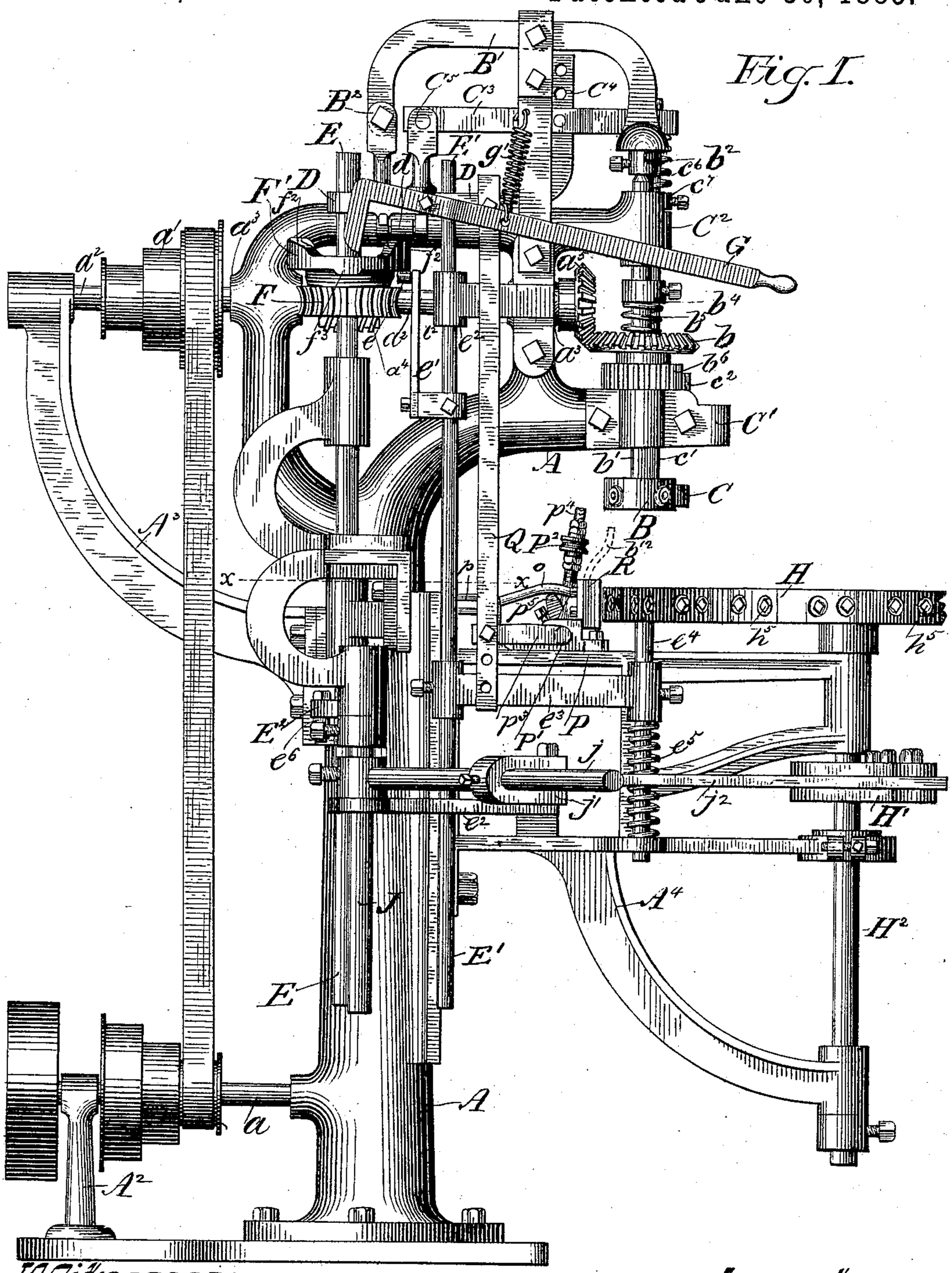
(No Model.) 6 Sheets—Sheet 1.

F. A. WALSH.

CAN HEADING MACHINE.

No. 321,263. Patented June 30, 1885.

Fig. 1.



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(No Model.)

6 Sheets—Sheet 2.

F. A. WALSH.

CAN HEADING MACHINE.

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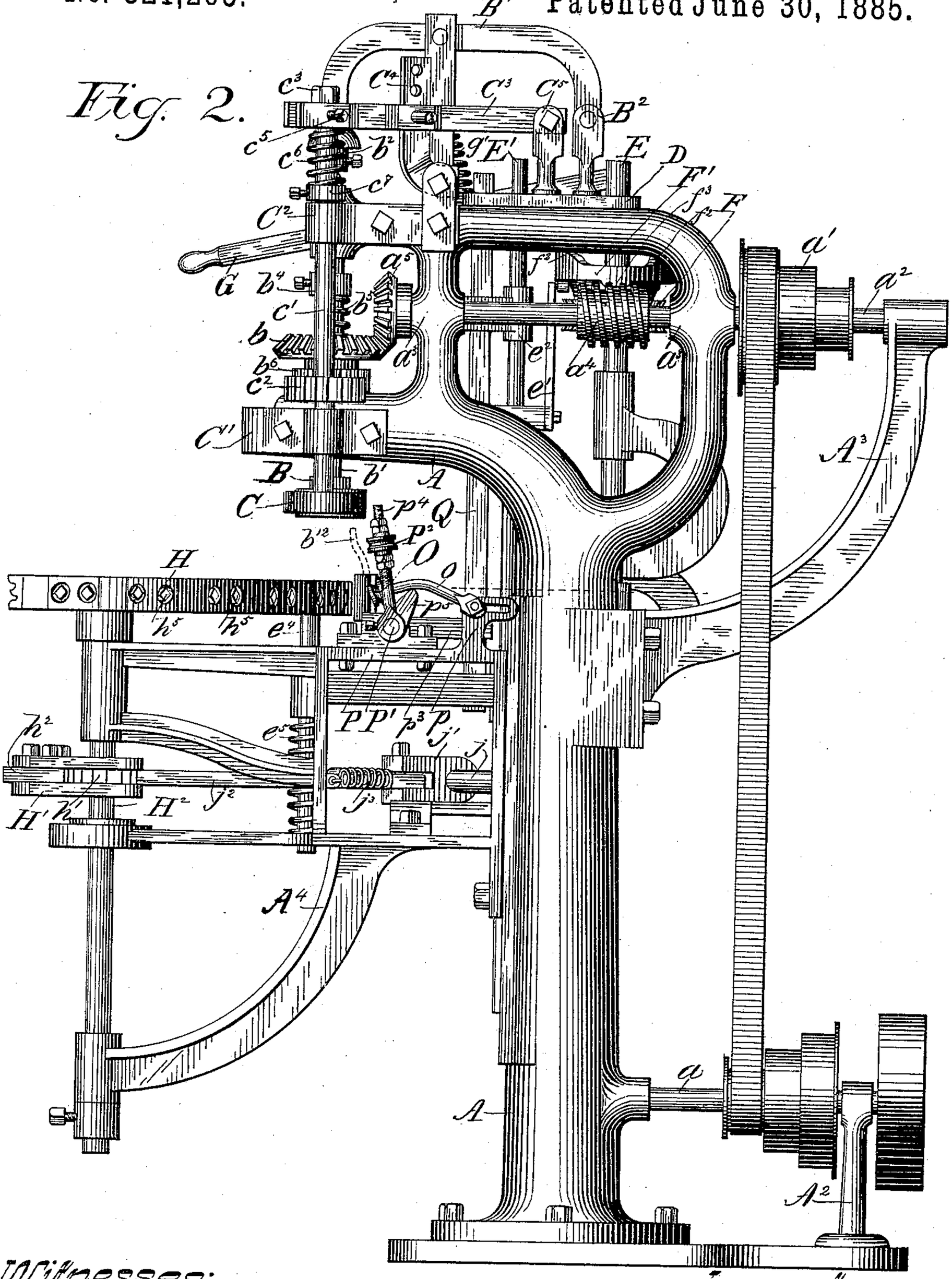
Fig. 2.



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(No Model.) 6 Sheets—Sheet 3.

F. A. WALSH.

CAN HEADING MACHINE.

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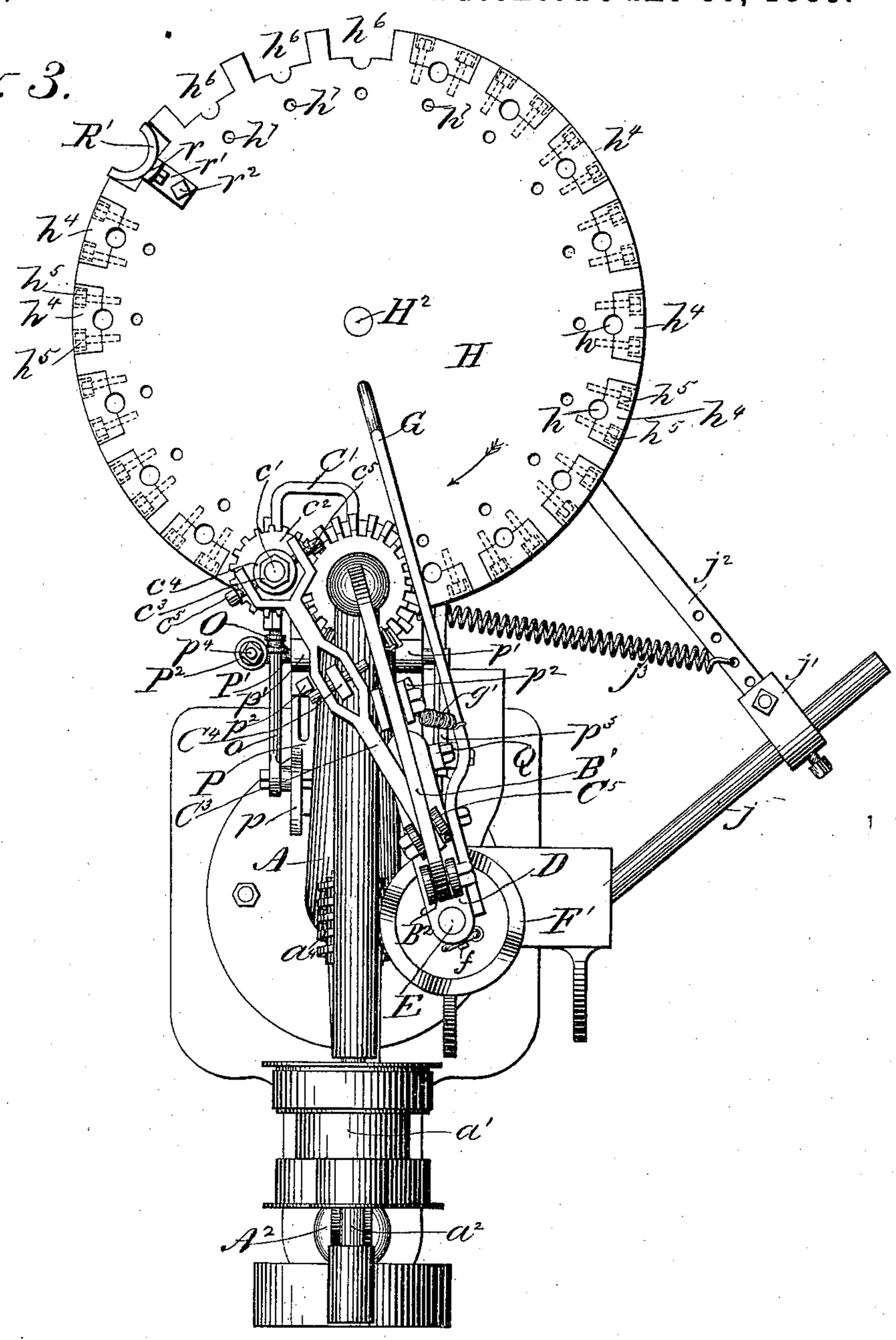
Fig. 3.



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(No Model.) 6 Sheets—Sheet 4.

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CAN HEADING MACHINE.

No. 321,263. Patented June 30, 1885.

Fig. 4.

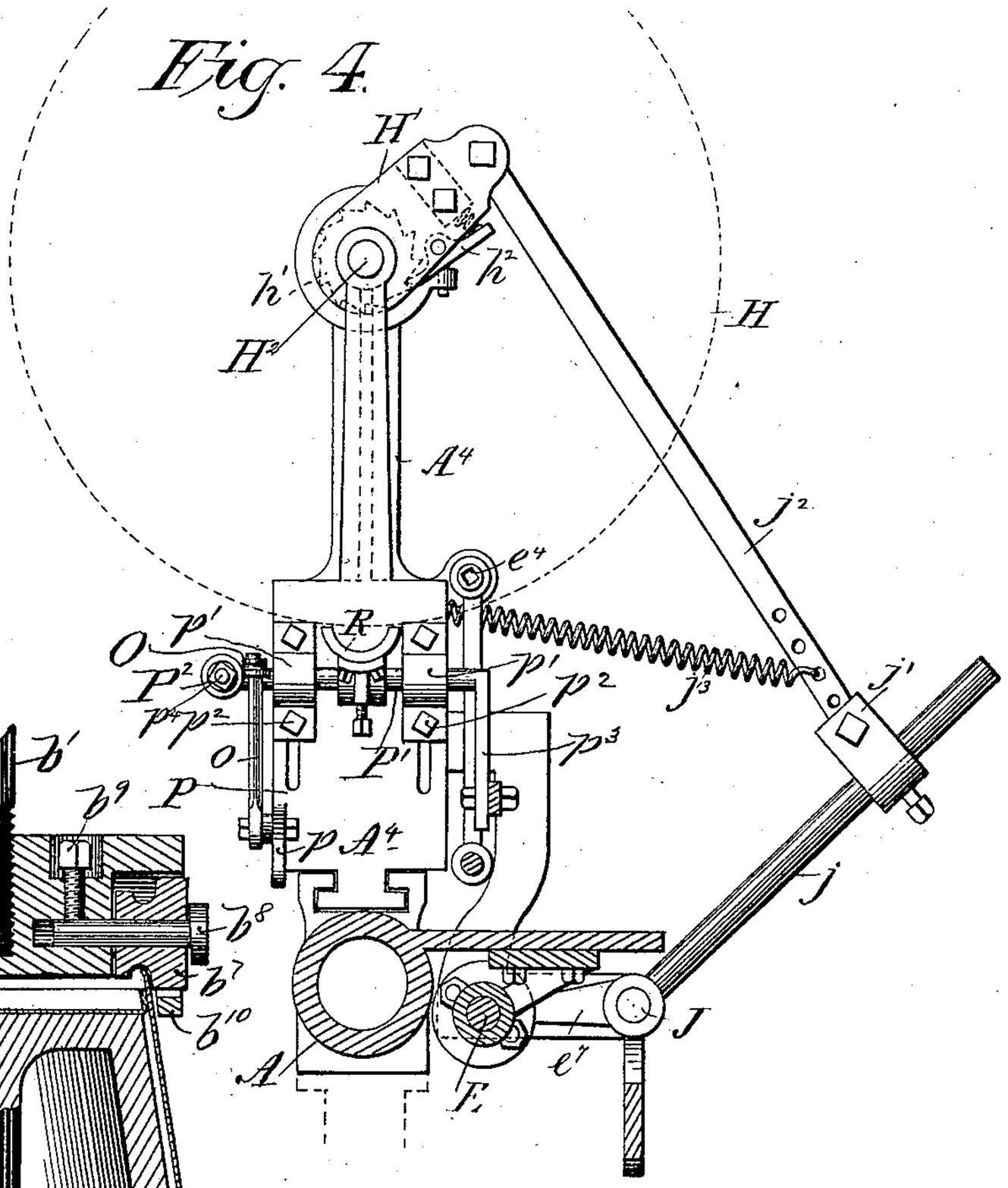


Fig. 5.

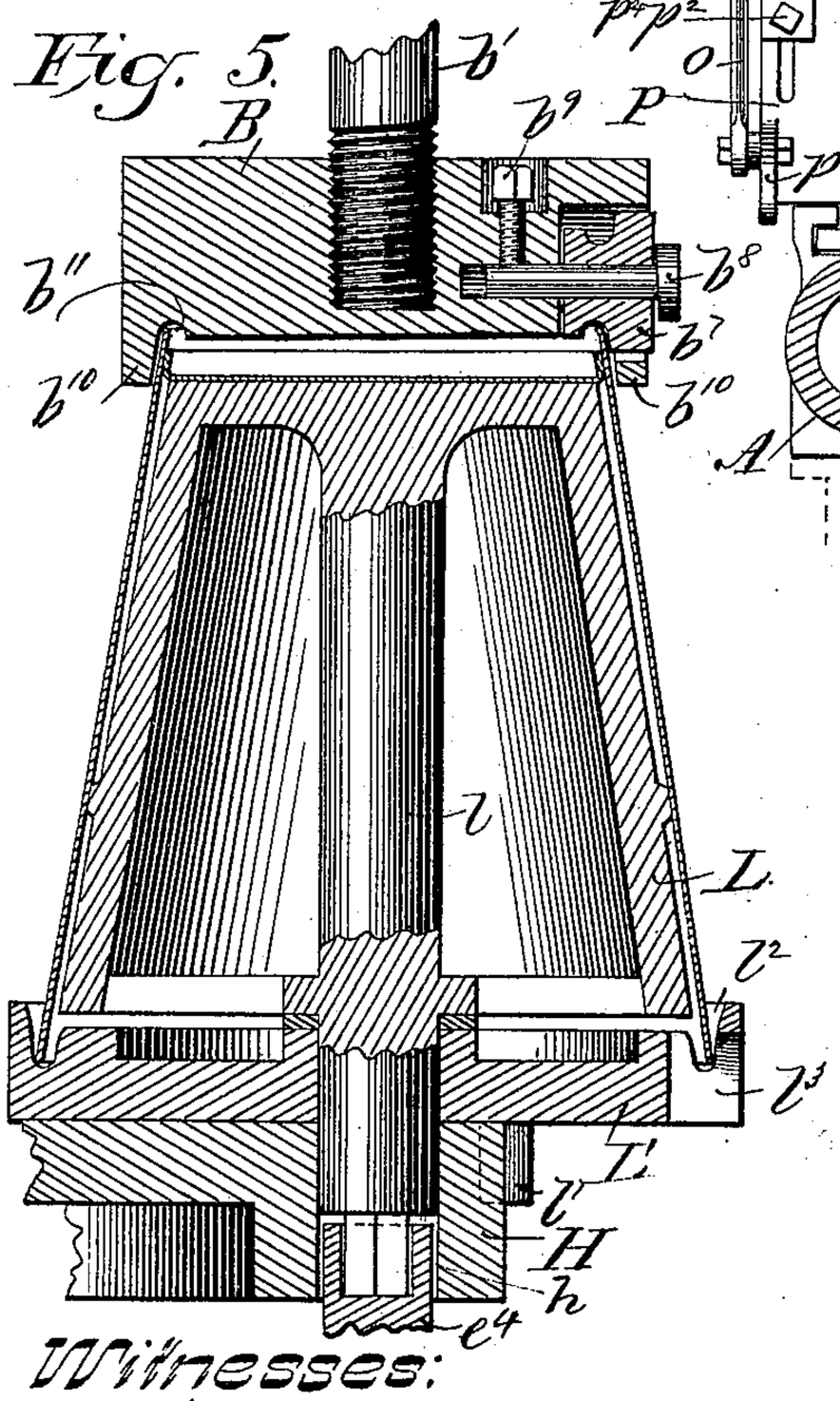
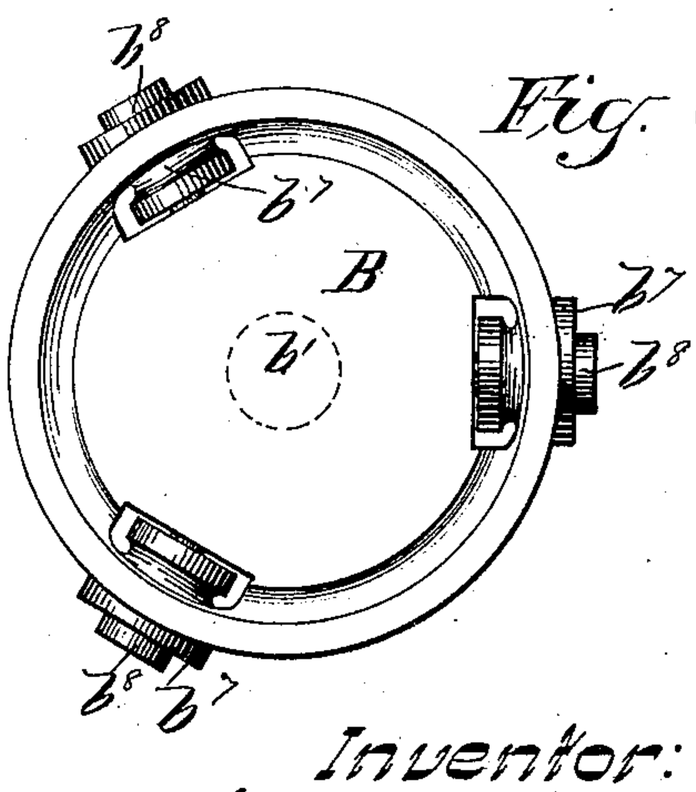


Fig. 6.



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(No Model.) 6 Sheets—Sheet 5.

F. A. WALSH.

CAN HEADING MACHINE.

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Fig. 7.

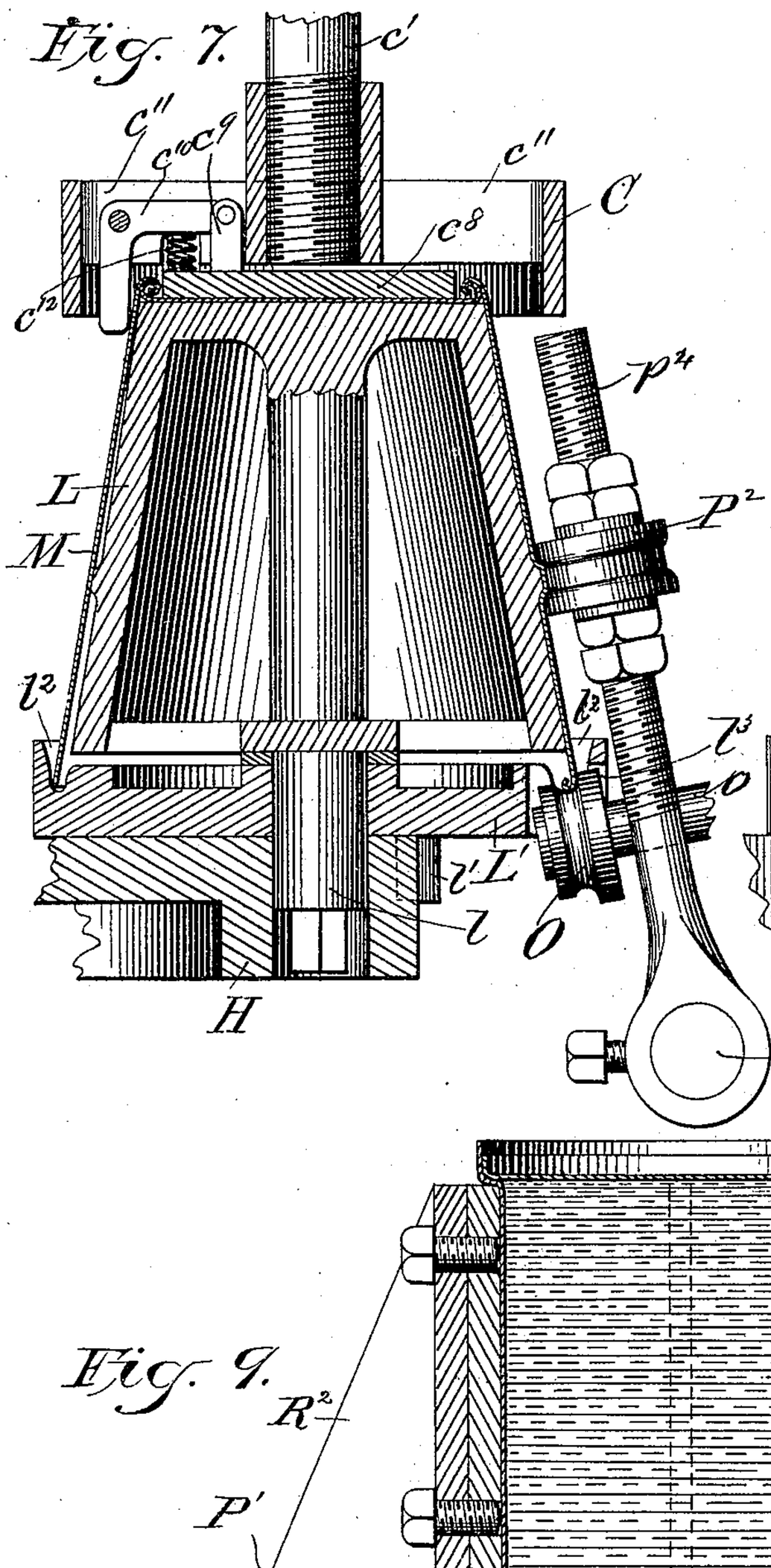


Fig. 8.

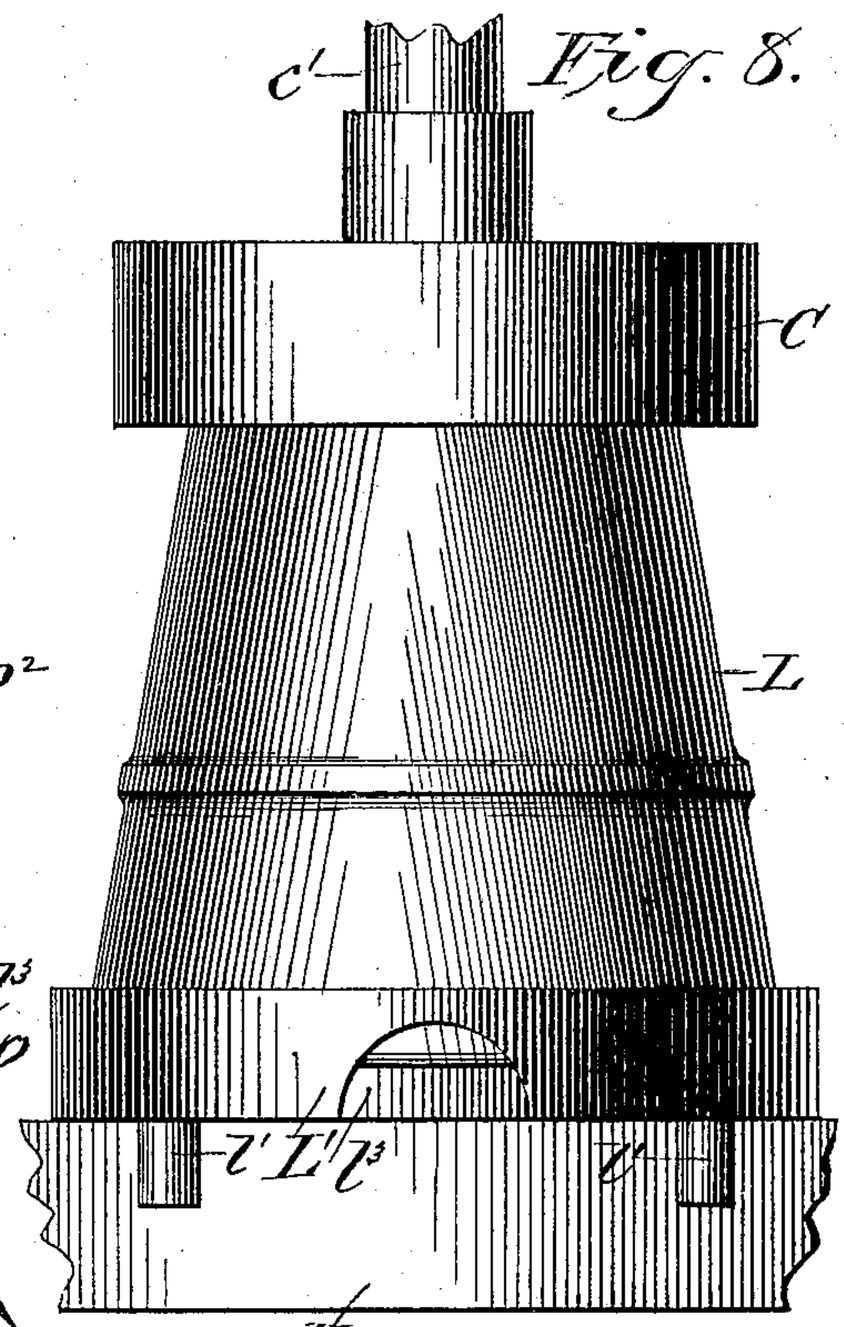
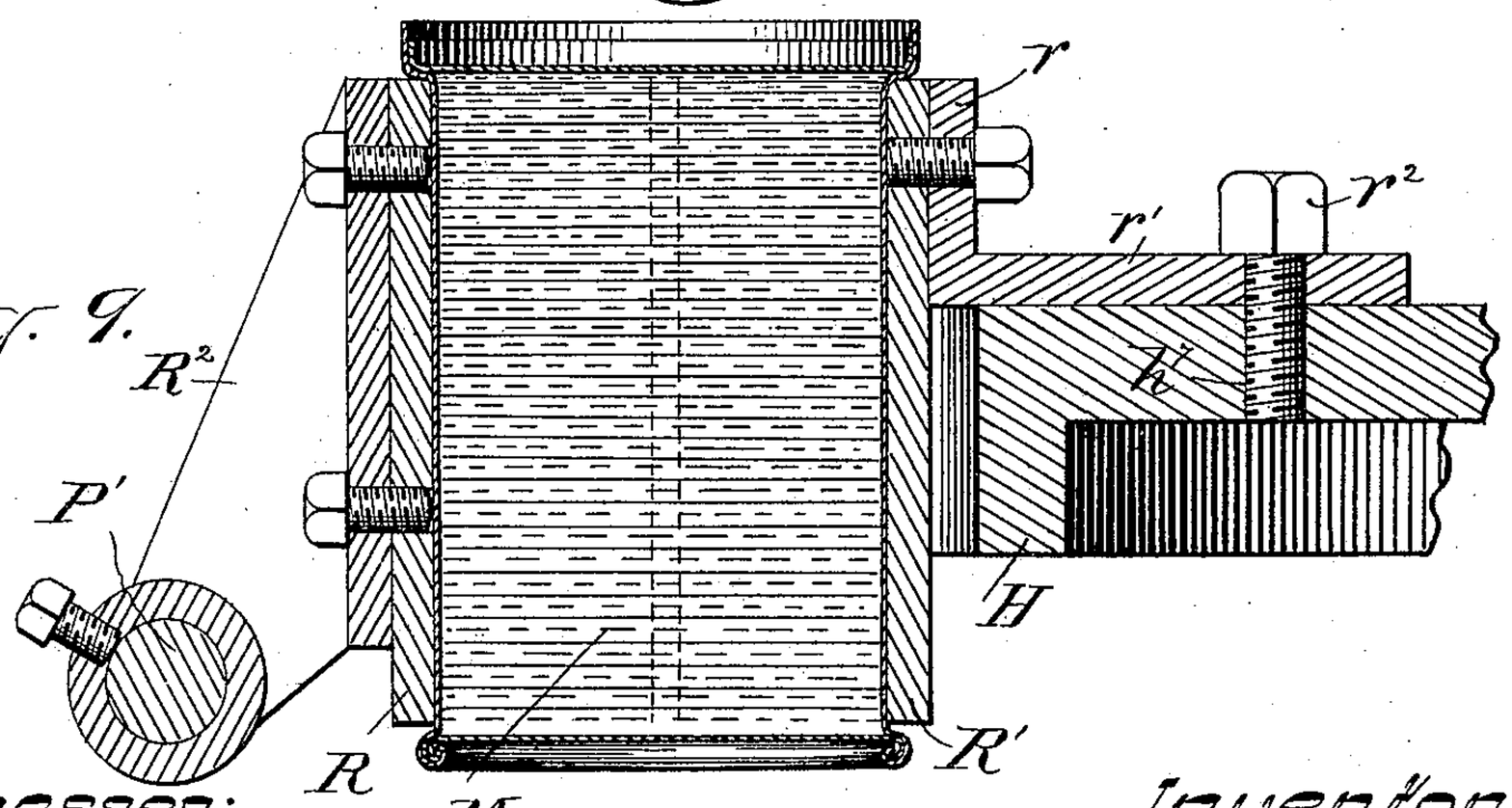


Fig. 9.



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(No Model.) 6 Sheets—Sheet 6.

F. A. WALSH.

CAN HEADING MACHINE.

No. 321,263. Patented June 30, 1885.

Fig. 10.

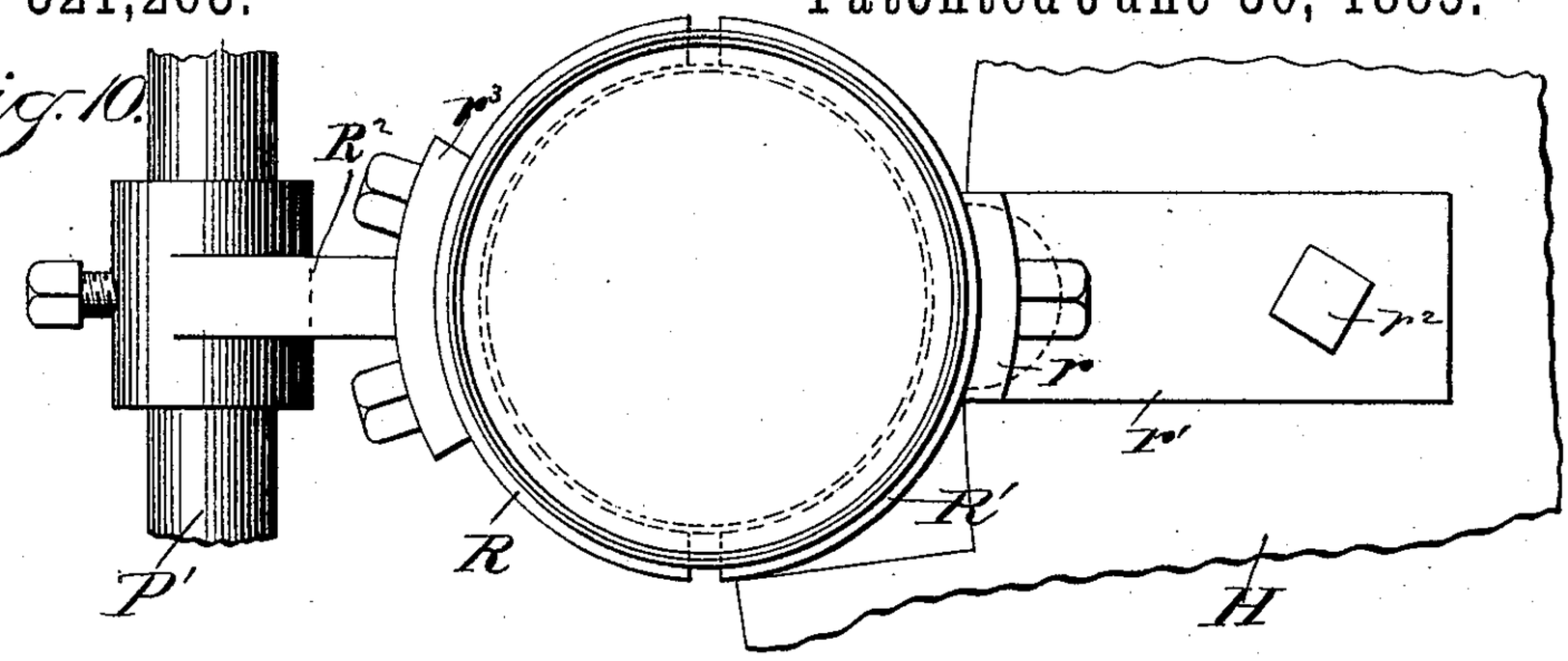


Fig. 12.

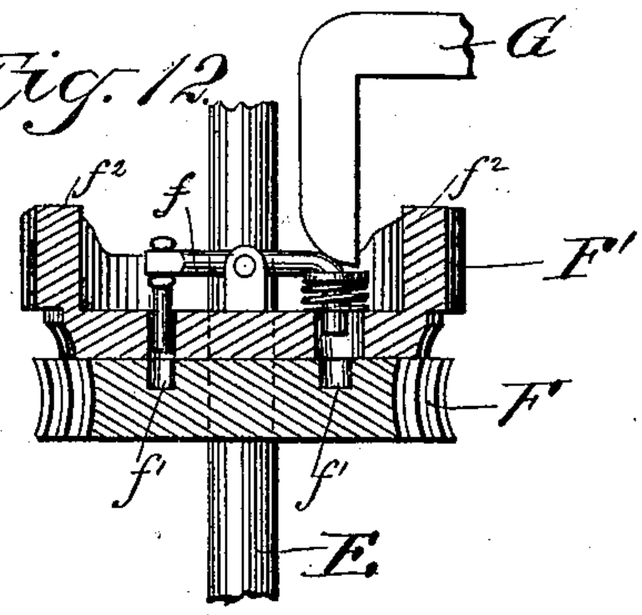


Fig. 14.

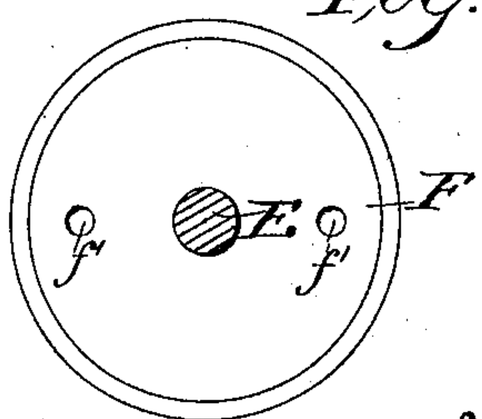


Fig. 11.

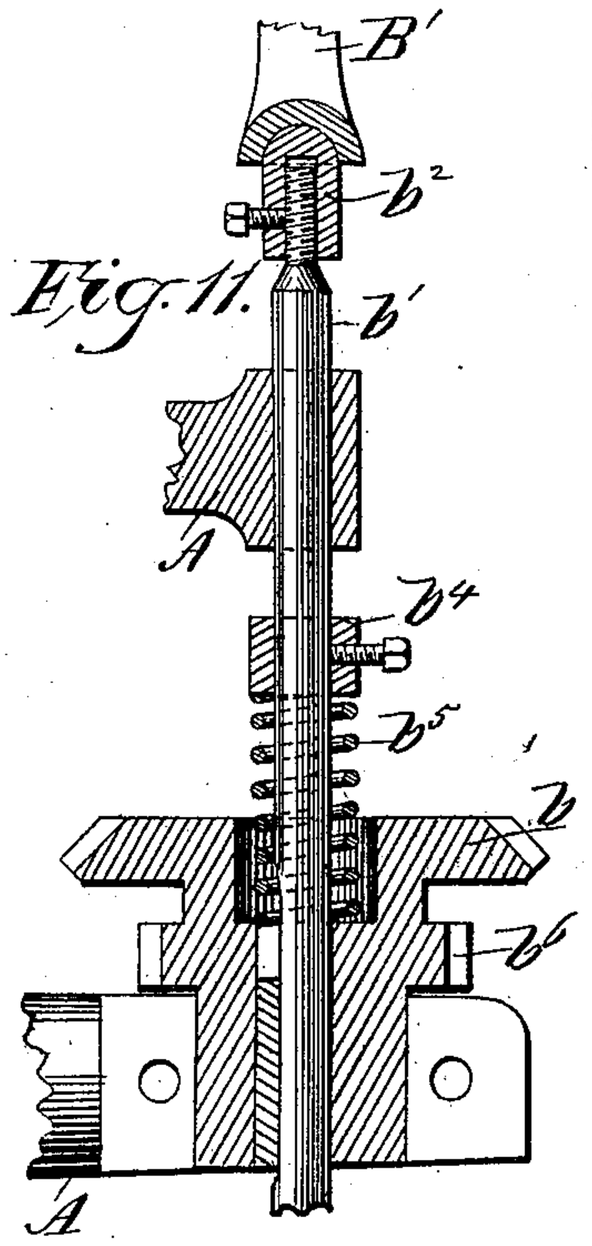


Fig. 13.

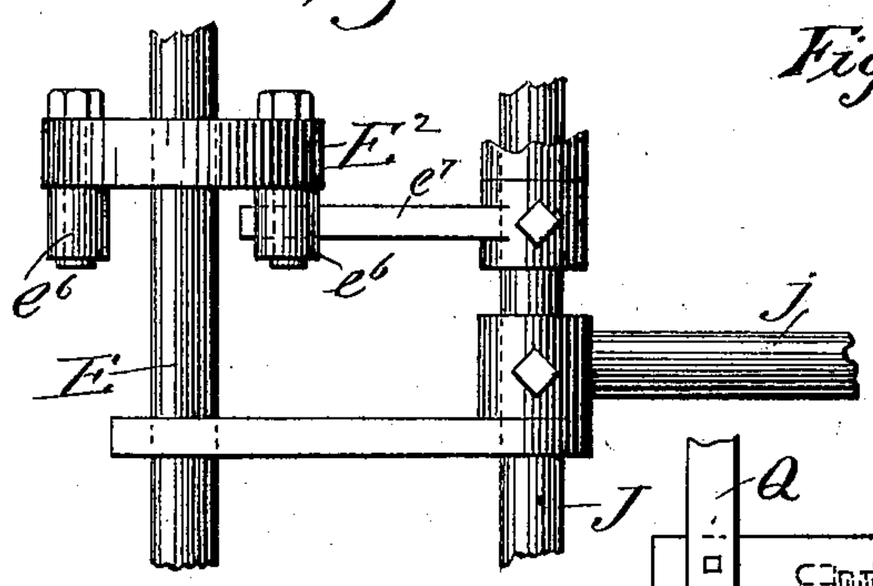


Fig. 16.

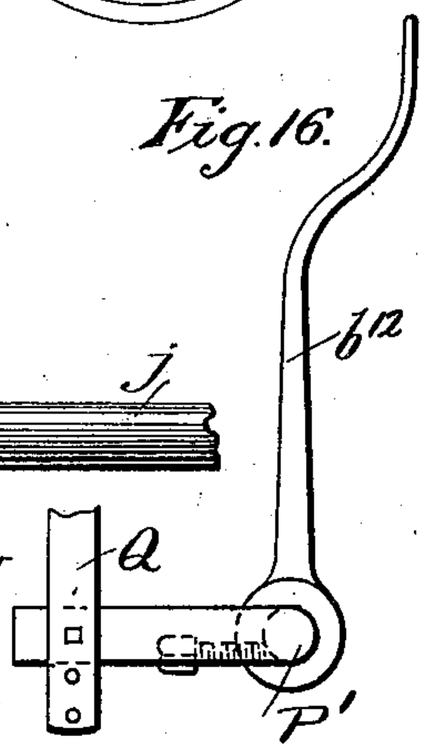
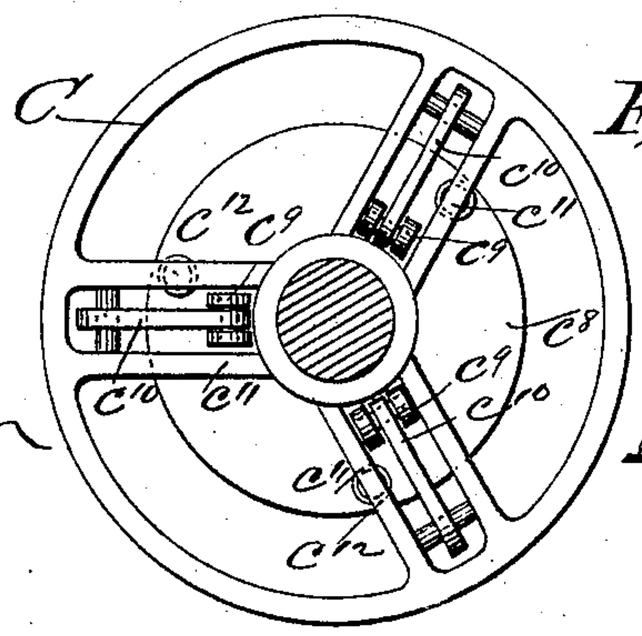


Fig. 15.



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UNITED STATES PATENT OFFICE.

FRANCIS A. WALSH, OF MILWAUKEE, WISCONSIN.

CAN-HEADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 321,263, dated June 30, 1885.

Application filed July 21, 1884. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS A. WALSH, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Can-Heading Machines; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to improvements in machines for heading, beading, and closing cans, and will be fully described hereinafter.

In the drawings, Figure 1 is a side elevation of my improved device. Fig. 2 is a like view on the opposite side of the same. Fig. 3 is a top view of the machine. Fig. 4 is a horizontal section on line *x x* of Fig. 1, showing the mechanism by means of which the revolving table is operated. Fig. 5 is a vertical section showing a can in position between the forming-head and the supporting-chuck. Fig. 6 is an under side view of the forming-head. Fig. 7 is a vertical central section showing a can in position while being finished. Fig. 8 is an elevation of the mandrel and chucks. Fig. 9 is a vertical section showing the holder used in heading cans and the manner of its attachment to the revolving table. Fig. 10 is a top view of the same. Fig. 11 is a vertical section showing the construction of the heading-shaft. Fig. 12 is a detail. Fig. 13 is a broken elevation of the device used to give the intermittent motion to the revolving table. Fig. 14 is a top view of the worm-wheel driving the said device, and Fig. 15 is a like view of the clasping-head.

A is the stand of my machine, which is firmly bolted to a suitable base, and in one side of this stand, near its base, one end of a driving-shaft, *a*, has a bearing, while its other end has a bearing in a standard, A^2. The shaft *a* carries the driving-pulleys, and these are belted to like pulleys, *a'*, on a shaft, a^2, that is journaled in the upper portion of the stand A, a branch of which, A^3, forms a bearing for its outer end, while its inner portions have bearings in the standard at a^3 a^3. (See Fig. 1.)

Between the bearings a^3 a^3 the shaft has a worm-wheel, a^4, keyed to it, and on its end opposite the pulleys *a'* the shaft a^2 also carries a bevel-wheel, a^5, which latter meshes with another beveled wheel, *b*, that is keyed onto a shaft, *b'*, so that the shaft may slide up and down in its hub. A rounded head, b^2, is screwed on the upper end of shaft *b'*, and is held in adjustment by a set-screw. A collar, b^4, is fastened onto the shaft by a set-screw, and between the collar and the wheel *b* is coiled a spring, b^5, the resilient action of which serves to keep the upper end of the shaft *b'* up against the concave bearing end of the arm B'. This arm B' is suitably hinged in the upper end of the stand, and its said end is connected by a loose joint with the upper end of the post B^2, fastened in the yoke D. This yoke is vertically perforated to fit and slide up and down over the upper ends of the shafts E and E', suitably journaled in the stand A.

Keyed onto the shaft E is a worm-wheel, F, which meshes with another worm-wheel, a^4, on shaft a^2. Supported on the upper face of the wheel F, and having its bearing on the shaft E, is the cam-wheel F'. This latter is provided with a spring-clutch, *f*, suitably mounted in its cup-shaped upper face, and which is adapted to take in either one of the sockets *f' f'* cut into the upper face of the worm-wheel F, as the inner end of the lever G, suitably fulcrumed in the stand A, is raised against its spring *g'*, to free the clutch by pressing downward on the handle G. The wheel F' has two cam-projections, f^2 f^2, formed in its upper face, and these projections are designed to come in contact at every revolution of said wheel with an anti-friction roller, *d*, suitably mounted on the lower face of the yoke B. This is raised accordingly, and with it the rear end of the lever B'. The opposite end of this latter is depressed against the upper end of the shaft *b'*, which is lowered thereby against its spring b^5, and with the former B, fastened on the lower end of the same.

Projecting on the lower rim of the wheel F', midway between the cam-projections f^2 f^2 are the cams f^3 f^3, and these are designed to alternately come in contact with the anti-friction roll *e*, suitably mounted in the bifurcated upper end of the arm *e'*, fastened onto the shaft or rod E'. This latter, which is fitted to slide in bearings of the stand at e^2 e^2, is rigidly connected toward its lower end to a sleeved bar, e^3, the opposite end of which is suitably connected to the vertical rod e^4. A coiled spring, e^5, fitted over said rod between the bar e^3 and the portion of the bracket A^4

through which said rod slides, serves to hold the same up in either one of the perforations *h h* of the revolving table H when the shaft *b'* is depressed with the former B. The table is thus held firmly in place with the can as the former is rotated around it. As soon as this latter has returned to its normal position with its spring b^4 the anti-friction roller *e* passes on under one of the cams f^3 f^3, and the rod E' is depressed, lowering the rod e^4 against its spring e^5, and leaving the revolving table unlocked. As soon as this is produced, and before the anti-friction roller *d* comes in contact with the other cam f^2, another anti-friction roller, e^6, mounted on each end of the double arm E^2, fastened onto the rod or shaft E, comes in contact also with an arm, e^7, suitably mounted on the shaft J. This latter has its bearings in convenient portions of the stand A, and carries an arm, *j*, to which is suitably attached the U-shaped piece *j'*. Hinged between the ends of this piece is the lever j^2, the opposite end of which is loosely held between the upper and lower plates of the pawl-carrier H', suitably mounted with the ratchet-wheel *h'* on shaft H^2, in the upper end of which the revolving table H is fastened. A spring-pawl, h^2, is pivoted between the said plates, so as to take into the teeth of the ratchet. As either one of the anti-friction rollers e^6 e^6 strikes the arm e^7, the ratchet is rotated one step with the table H and the shaft H^2. A spring, j^3, one end of which is attached to the lever j^2, while the other end is fastened to the bracket A^4 of the stand A, serves to bring the arm back in its normal position and to carry the carrier H' rearward, to allow of the pawl h^2 coming into engagement with a new tooth of the ratchet.

L indicates a can-holder or chuck. The stem *l* of this chuck is received in either one of the perforations *h h h* of revolving table H. After being passed through the center of the bottom chuck, L', the lower end of the stem *l* is squared to fit in the socketed upper end of the locking-rod e^4. The bottom chuck, L', is provided with the dowel-pins *l' l'*, which project downward from its lower face, in line with the outer edge of the table H, and will prevent said chuck from turning on the stem *l*. The upper face is grooved at l^2 to receive the lower edge of the can M, and a semicircular notch, l^3, is cut at a suitable point in the outer edge of its lower face, as shown in Figs. 5, 7, and 8.

Secured to or forming part of the bracket A^4 is a frame, P, having an arm, *p*, which is slotted to receive the wrist of the arm *o*, on the end of which is suitably mounted the curving-former O. A rock-shaft, P', is journaled in bearing-boxes *p' p'*, which are adjustable in the slotted edges of the frame P by means of the bolts p^2 p^2. This rock-shaft is connected through its crank p^3 to the lower end of the rod Q, the upper end of which is loosely attached to the side of the yoke D, described above.

Fastened onto the free end of the rock-shaft P' is the arm p^4, which is screw-threaded in most of its length to support between adjustable fastening-nuts the beading-former P^2. The rock-shaft has also the short arm p^5 keyed onto it opposite the arm *o*, and designed to raise this latter, with the former O, against the can-edge by the same motion which will bring the arm p^4 up against the side of the can.

As the beading and curving obtained by means of the respective formers O and P^2 necessitate the revolving of the can-chuck, I provide for that purpose a clasping-head, C, the construction of which is detailed in Fig. 7. This clasping-head may be used either in place of the forming-head B, or may be mounted on a separate shaft, *c'*, as shown in Fig. 2. This shaft is mounted parallel with the shaft *b'* in suitable bearing-brackets, C' C^2, attached to the front portions of the stand A. It receives its rotary motion through the pinion c^2, keyed onto it at a point sufficiently above the bearing C' to allow of its downward vertical motion with the clasping-head C. The pinion c^2 meshes with the pinion b^6, formed in the under side of the beveled pinion *b*, mounted on shaft *b'* of the forming-head B. The upper end of the shaft *c'* is screw-threaded to receive the nut c^3, against the under side of which bears the ring or collar c^4. The outer faces of this collar are hollowed at diametrically-opposite points, to receive the bearing ends of the screw-bolts c^5 c^5, working in the bifurcated ends of the lever C^3. This lever is suitably slotted at about its center to receive the upper end of an arm, C^4, projecting from the stand A, and on which it is hinged. The inner end of the said lever C^3 is connected loosely to the upper end of the post C^5, fastened in the yoke D close to the post B^2, being moved simultaneously with this latter through the cam-wheel F', described above. The motion thus imparted to the lever C^3 is transmitted to the vertical shaft *c'* through the spring c^6, coiled around said shaft between the loose collar c^4, bearing against the lower face of the nut c^3, and the collar c^7, fastened to the said shaft *c'* slightly above the bearing C^2.

The clasping-head C, fastened onto the lower end of the shaft *c'*, a top view of which is shown in Fig. 15, is provided with the central movable plate, c^8, in the upper face of which are the bifurcated studs c^9. In the upper ends of these latter are hinged the inner ends of the bell-crank levers c^{10} c^{10}, fulcrumed in the arms c^{11} c^{11} of the head. A spring, c^{12}, suitably mounted between the upper face of the central plate, c^8, and the arms c^{11} c^{11}, serves to depress the plate downward, and keep the free ends of the bell-crank levers c^{10} c^{10} outward, so that when the clasping-head C is brought down against the upper end of the can, the movable central plate being forced up against the springs, the edges of the can are tightly clasped by the levers.

The forming-head B, carried on the screw-threaded lower end of the shaft *b'*, is fitted to

receive in its suitably-socketed outer rim the heading-formers b^7 b^7, mounted on the headed stems b^8 b^8, fastened in said head by the set-screws b^9 b^9. A flange, b^{10}, is formed around the outer lower edge of the said forming-head B, and the inner face of this flange is shaped so as to fit squarely, or nearly so, against the can-edge, which is received in the bottom of the groove b^{11} cut in the lower face of the same, inside of the flange b^{10}. As the strain of the formers b^7 b^7 when revolving around the edge of the can has a tendency to turn this latter on its chuck, I provide the flat spring b^{12}, (shown in dotted lines in Figs. 1 and 2,) and mounted in any suitable manner on the rock-shaft P′, the motion of which, through its connection with the yoke D, is coincident with that of the forming-head against the can, and, as it presses against the periphery of the said can, keeps it from turning with the forming-head.

In Figs. 9 and 10 is shown on an enlarged scale the device I have designed to support cans when being headed or closed after filling. This device consists of the semicircular supports R R′, by means of which the can is firmly embraced below the upper head or offset formed to receive the edges of the cover or head, and against which the upper edges of both can and cover are curved down together. In order to adapt the revolving table for use with these semicircular supports, its outer rim is notched from the center of the perforations h h, wherein the stem of the can-chuck is received for ordinary work, the pieces h^4 h^4 being held in position in the notches, in this case by means of the screw-bolts h^5 h^5. In either one of these notches h^6 h^6 is received the semicircular support R′, which is bolted onto the segmental flange r of the fastening-piece r'. This last is in turn firmly held in place by a bolt, r^2, screwing in the threaded perforations h^7 h^7 made in the table H radially opposite the center of the notches h^6 h^6.

The semicircular support R is fastened to the segmental plate r^3, formed on the outer end of the arm R^2, which in turn is fastened in any suitable manner to the rock-shaft P′, described above, and in place of the spring c^{12}. These semicircular supports may also be used when it is desirable to put in both heads of the can at once, and when these are used I dispense with the locking-bolt e^4, or adjust it on some other part of the machine, and for it substitute a similar shaft to b', with a similar forming-head and connections with the driving mechanism.

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

1. In a can-heading machine, an intermittently-rotating work-table having removable blocks let into its circumference, in combination with interchangeable can-holders, as set forth.

2. The intermittently-rotating work-table, in combination with removable blocks h^4, as set forth.

3. A circular forming-chuck having an annular groove on its upper face for receiving the edge of a can-body, in combination with a can-support, means, substantially as described, for revolving the can, and a forming-roller projected through an opening in said forming-chuck, substantially as set forth.

4. The combination of a can-support, a clasping-head secured on a revolving shaft and provided with a central movable plate, and with bell-crank levers pivoted thereto, adapted to grip the can automatically when depressed, and a beading-roll running on a pivoted spindle provided with a cam for pressing the said roll against the edge of the can, substantially as set forth.

5. The combination of a can-support, a clasping-head secured to a revolving shaft and provided with a central movable plate, and with bell-crank levers pivoted thereto, adapted to grip the can automatically when depressed, and a rock-shaft provided with formers, and with levers connecting it with the working parts of the machine, so that the said formers are pressed against the edge of the can as it revolves, substantially as set forth.

6. The combination of a vertically-sliding shaft having a former secured thereon and provided with mechanism for revolving it, a revolving cam-wheel, and a lever pivoted in the framing of the machine, so that the motion of the said cam-wheel is communicated through the lever to the said sliding shaft, and the former depressed and brought in contact with the can at the proper time, substantially as set forth.

7. The combination of a vertical shaft geared to the driving-shaft and carrying a revolving cam-wheel, a vertical shaft provided with an anti-friction roller receiving reciprocating movement from said cam-wheel, a vertical spring-bolt provided with a square socket, and a can-holder provided with a square-ended shank for engaging with said socket, substantially as described and shown.

8. The combination of the revolving shaft E, carrying trip-rollers e^6, the rock-shaft J, having arms e^7 and j, the double plate H′, having the spring-pawl h^2, an adjustable connecting-link, and a ratchet-wheel for revolving the table, substantially as described and shown.

9. In a can-heading machine, the combination, with the rock-shaft P′, of the clamp-section carried thereby, and a like section secured to the table, as set forth.

10. In a machine for heading and beading cans, in combination with the stand having suitable bearings and supports, the horizontal driving-shaft and its pulleys, wheel a^4, and bevel-pinion a^5, the vertical shaft E, carrying the worm-wheel F, with sockets f' f', and cam-wheel F′, having cams f^2 f^2 and f^3 f^3, and spring-clutch f, the shaft E′, having roller e for reciprocating the table-locking pin, and the

yoke D, having anti-friction roller *d*, substantially as shown and described, and for the purpose set forth.

11. In a machine for heading and beading cans, in combination with the stand having suitable bearings and supports, substantially as described, the shaft a^2, having worm-wheel a^4, and vertical shaft E, having cam-wheel F′, with cams f^2 f^2 and f^3 f^3, worm-wheel F, the shaft E′, having roller *e*, for reciprocating the table-locking pin, yoke D, having anti-friction roller *d* and post B^2, the lever B′, vertical shaft *b*′, having adjustable head b^2, collar b^4, spring b^5, pinion *b*, suitably feathered, and the heading-former B, substantially as shown and described, and for the purpose set forth.

12. In a machine for heading and beading cans, the vertical shaft E, having cam-wheel F′, with cams f^2 f^2 and f^3 f^3, yoke D, having anti-friction roller *d* and post B^2, and shaft *b*′ carrying the adjustable head b^2, in combination with the vertical rod E′, suitably mounted in the stand and carrying the anti-friction roller *e* on upper end of arm *e*′, and arm e^3 on lower end of the said rod, carrying the locking bolt or rod e^4, with spring e^5, substantially as shown and described, and for the purpose set forth.

13. In a machine for heading and beading cans, the shaft E, having cam-wheel F′ and worm-wheel F, connected, substantially as described, with the driving mechanism, the arm E^2, carrying the anti-friction rollers e^6 e^6, in combination with the shaft J, having horizontal arms *j* and e^7, slotted supporting-piece *j*′, lever j^2, double plate H′, with spring-pawl h^2, ratchet-wheel *h*′, and work-table H, keyed onto the upper end of shaft H^2, substantially as shown and described, and for the purpose set forth.

14. In a machine for heading and beading cans, the shaft E, having cam-wheel F′ and driving connection, substantially as described, yoke D, having anti-friction roller *d*, in combination with the rod Q, the crank-lever P′, with adjustable bearings *p*′ *p*′ and arm p^5, the rod *o*, carrying the former O, and stem p^4, carrying the former P^2, substantially as shown and described, and for the purpose set forth.

15. In a machine for heading and beading cans, in combination with the work-table H, having suitable notches h^6 h^6 and perforations h^7 h^7, the semicircular can-support R′, having suitable fastening *r r*′ r^2, the semicircular can-support R, having sleeved stem R^2, and crank-lever P′, having suitable bearings, *p*′ *p*′, and crank p^3, connected to rod Q and operated by the intermittent vertical movement of the yoke D, substantially as shown and described, and for the purpose set forth.

16. In a machine for heading cans, in combination with the revolving work-table H, having perforations *h h*, the chuck L′, working on stem *l*, dowel-pins *l*′ *l*′, groove l^2, and semicircular opening l^3, substantially as shown and described, and for the purpose set forth.

17. In a machine for heading and beading cans, in combination with the work-table H, having perforations *h h*, the can-holder L and can-chuck L′, the forming-head B, attached to the vertical shaft *b*′, and having flange b^{10} and groove b^{11}, and carrying the heading-formers in suitable recesses around its rim, substantially as shown and described, and for the purpose set forth.

18. In a machine for heading and beading cans, in combination with the work-table H, having perforations *h h h*, and the crank-lever P′, actuating the former O on the arm *o* through the arm p^5, and having the stem p^4, to carry the former P^2, the can-holder L, having stem *l*, and the supporting-chuck L′, having dowel-pins *l*′ *l*′, groove l^2, and semicircular opening l^3, substantially as shown and described, and for the purpose set forth.

19. In a machine for heading and beading cans, in combination with the shaft E, having cam-wheel F′, with cams f^2 f^2 and f^3 f^3, yoke D, having anti-friction roller *d*, and posts B^2 and C^5, and the shaft *b*′, having bevel-pinion *b*, with pinion b^6, the lever C^3, vertical shaft *c*′, having nut c^3, loose collar c^4, with pivoting-bolts c^5 c^5, spring c^6, collar c^7, and clasping-head C, with clasping-levers c^{10}, central plate c^8, spring c^{12}, and pinion c^2, substantially as shown and described, and for the purpose set forth.

20. In a machine for heading and beading cans, in combination with the driving mechanism, substantially as described, and the rock-shaft P′, having adjustable bearings *p*′ *p*′, crank p^3, and arm p^5, the rod *o*, suitably-pivoted in the frame and carrying the former O, substantially as shown and described, and for the purpose set forth.

21. In a machine for heading and beading cans, in combination with the driving mechanism, substantially as described, and the rock-shaft P′, having adjustable bearings *p*′ *p*′, crank p^3, and stem p^4, the adjustable former P^2, substantially as shown and described, and for the purpose set forth.

22. In a machine for heading and beading cans, in combination with the driving mechanism, substantially as described, and the lever P′, having suitable bearings, *p*′ *p*′, and crank p^3, the spring b^{12}, fastened in any suitable manner onto the said lever P′, substantially as shown and described, and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

FRANCIS A. WALSH.

Witnesses:
H. G. UNDERWOOD,
H. J. FORSYTHE.