No. 669,174. Patented Mar. 5, 1901.

C. LEFFLER.

PACKAGE LABELING MACHINE.

(Application filed Dec. 1, 1899.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.

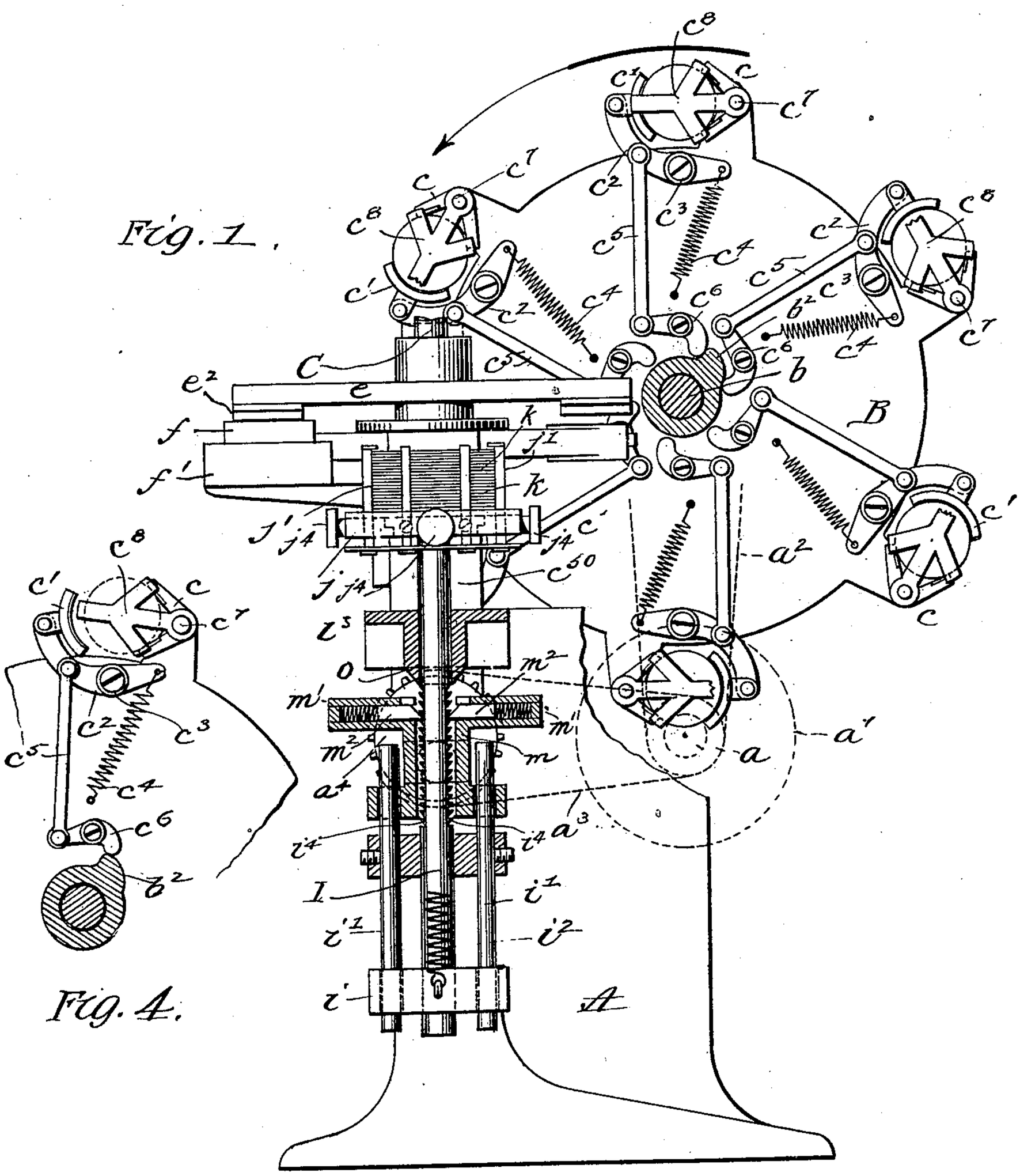

Fig. 4.

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(No Model.) 4 Sheets—Sheet 2.

Fig. 2.

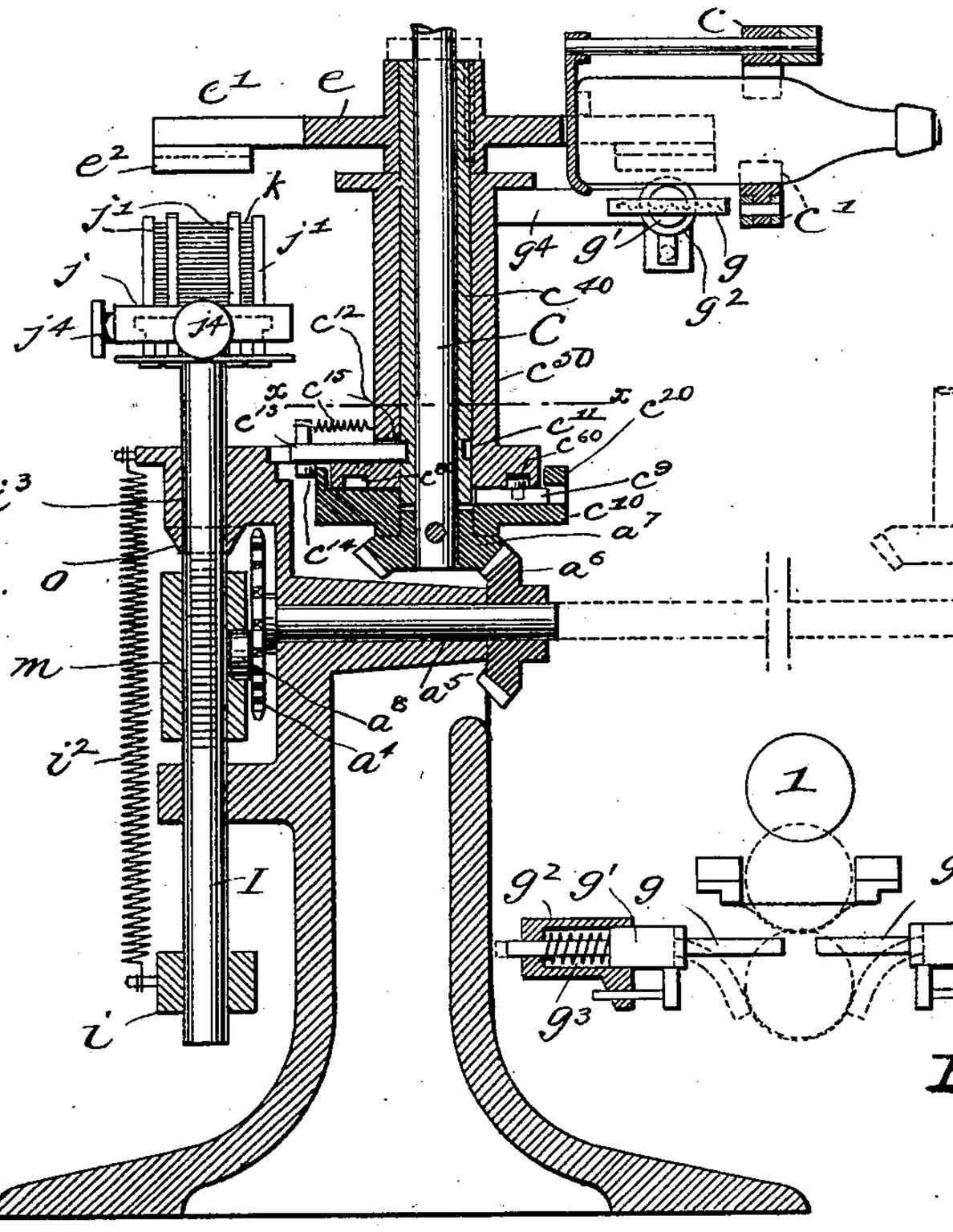


Fig. 10.

Fig. 6.

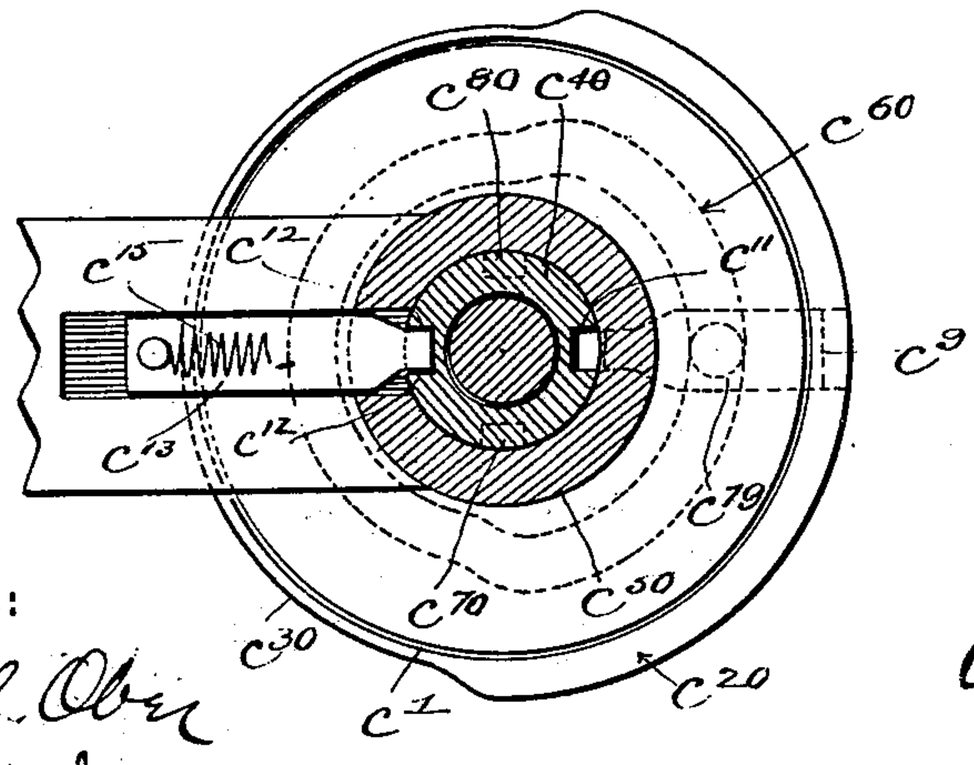
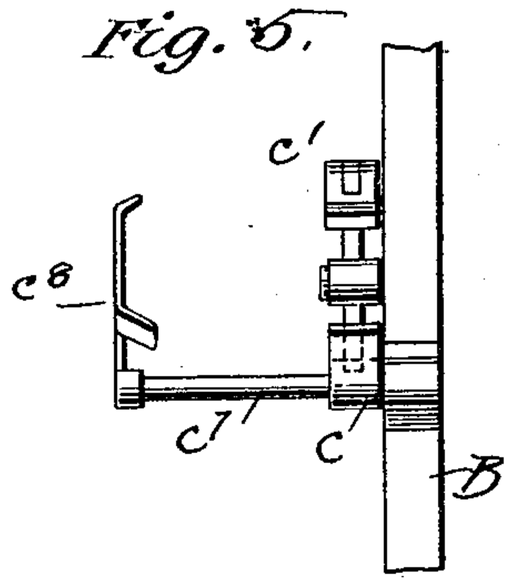


Fig. 5.



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(No Model.) 4 Sheets—Sheet 3.

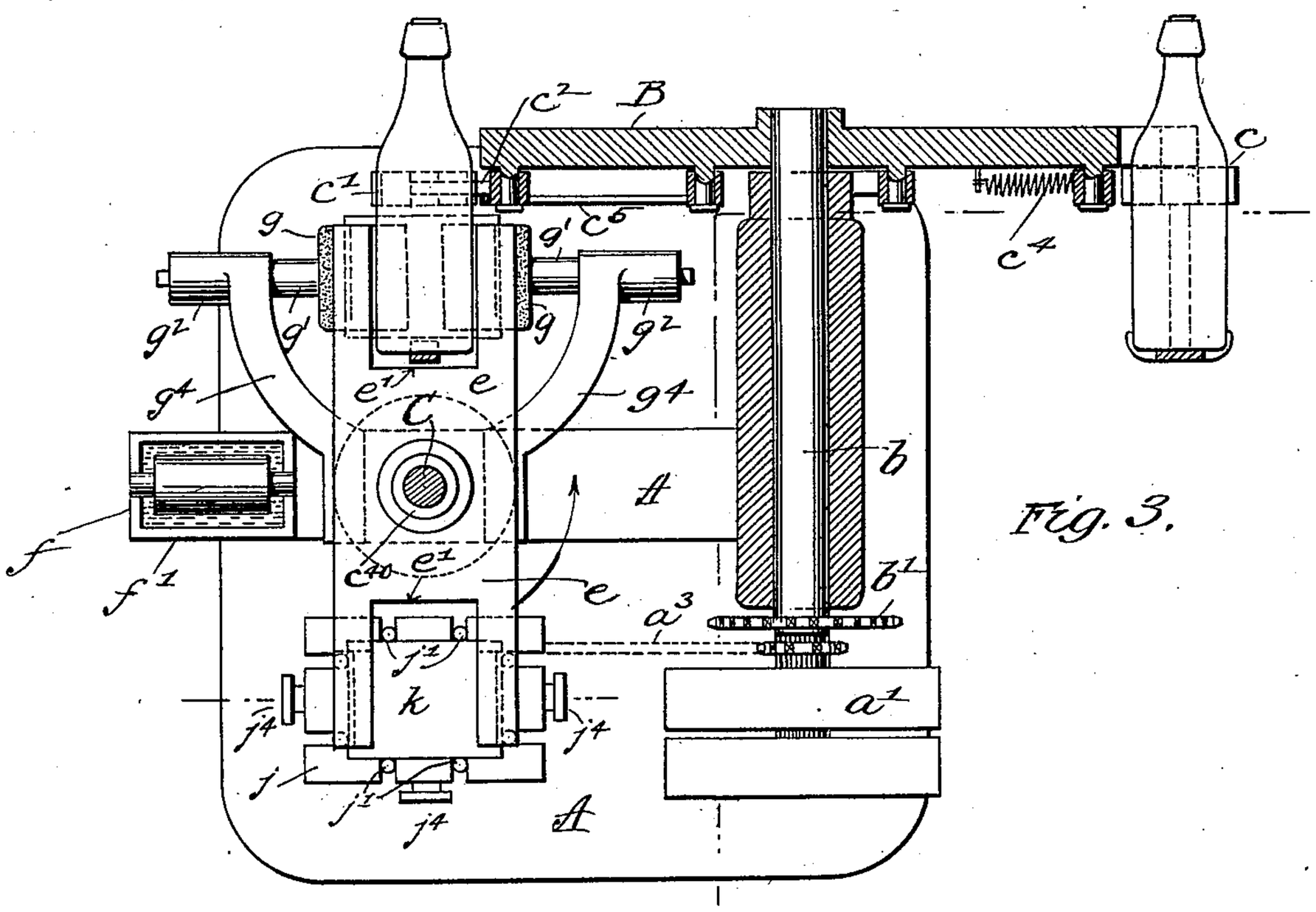


Fig. 3.

Fig. 7.

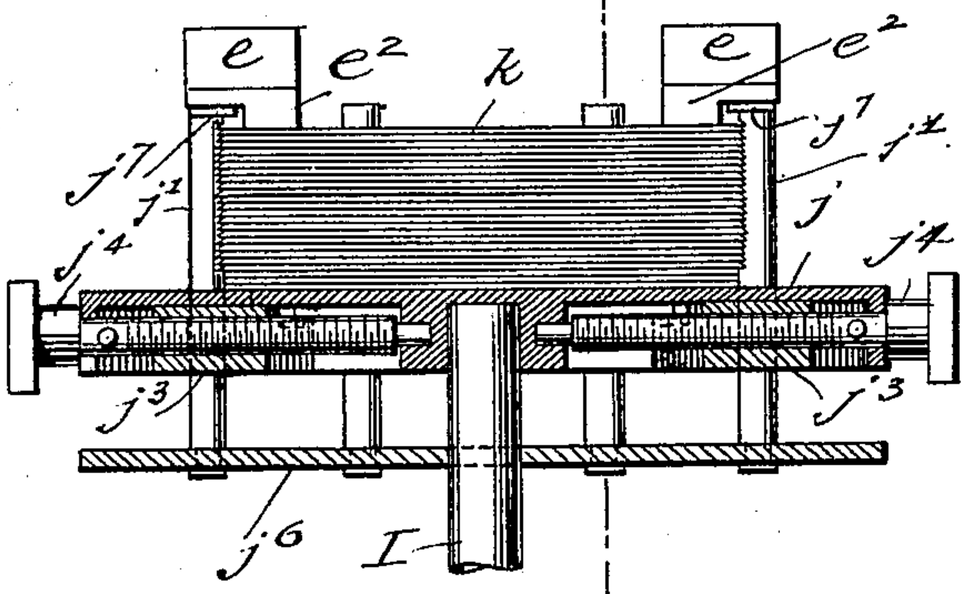


Fig. 9.

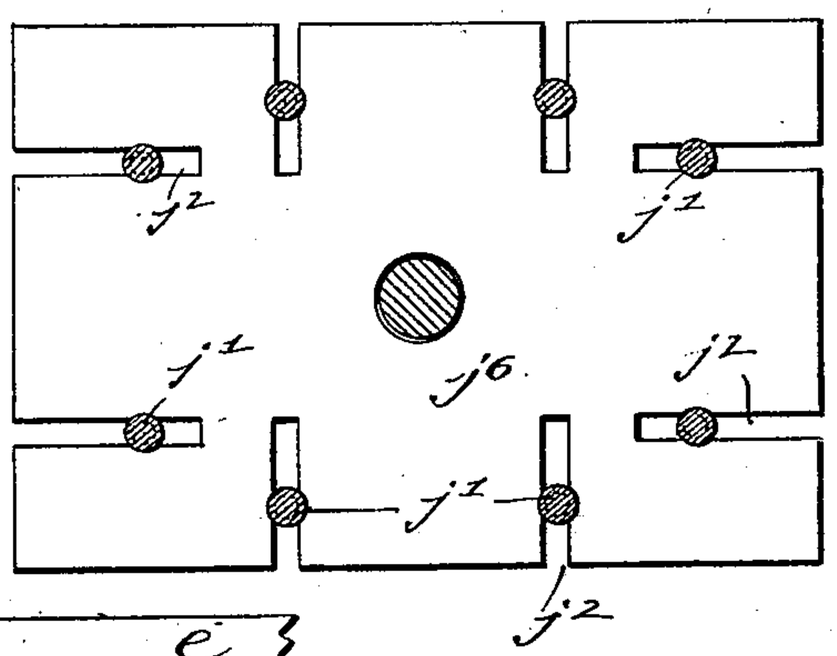
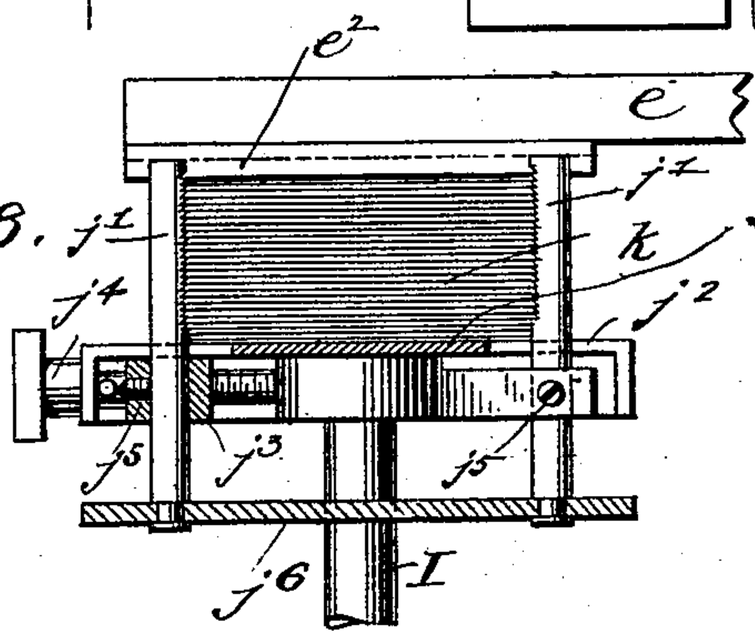


Fig. 8.



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(Application filed Dec. 1, 1899.)

(No Model.) 4 Sheets—Sheet 4.

Fig. 11.

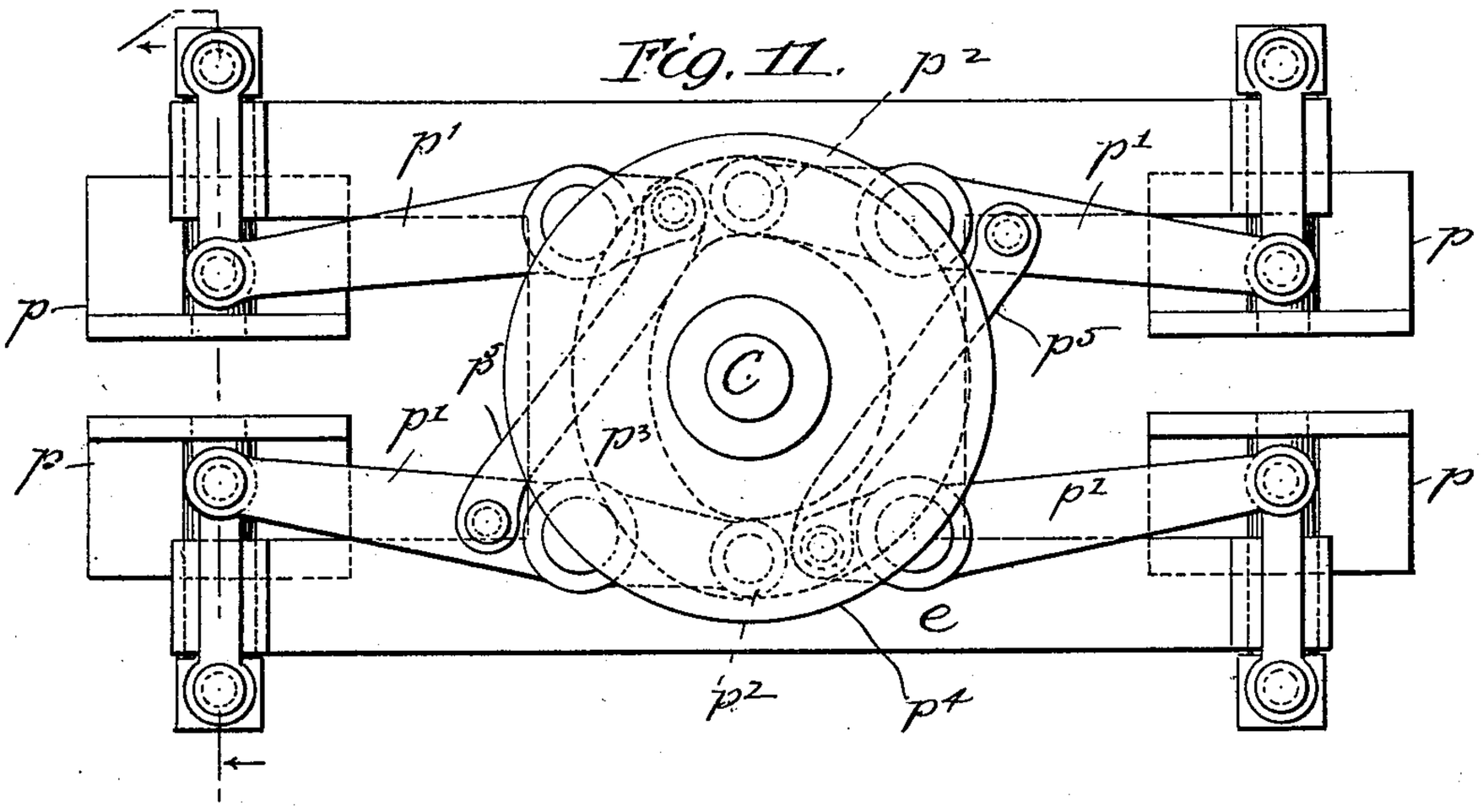


Fig. 12.

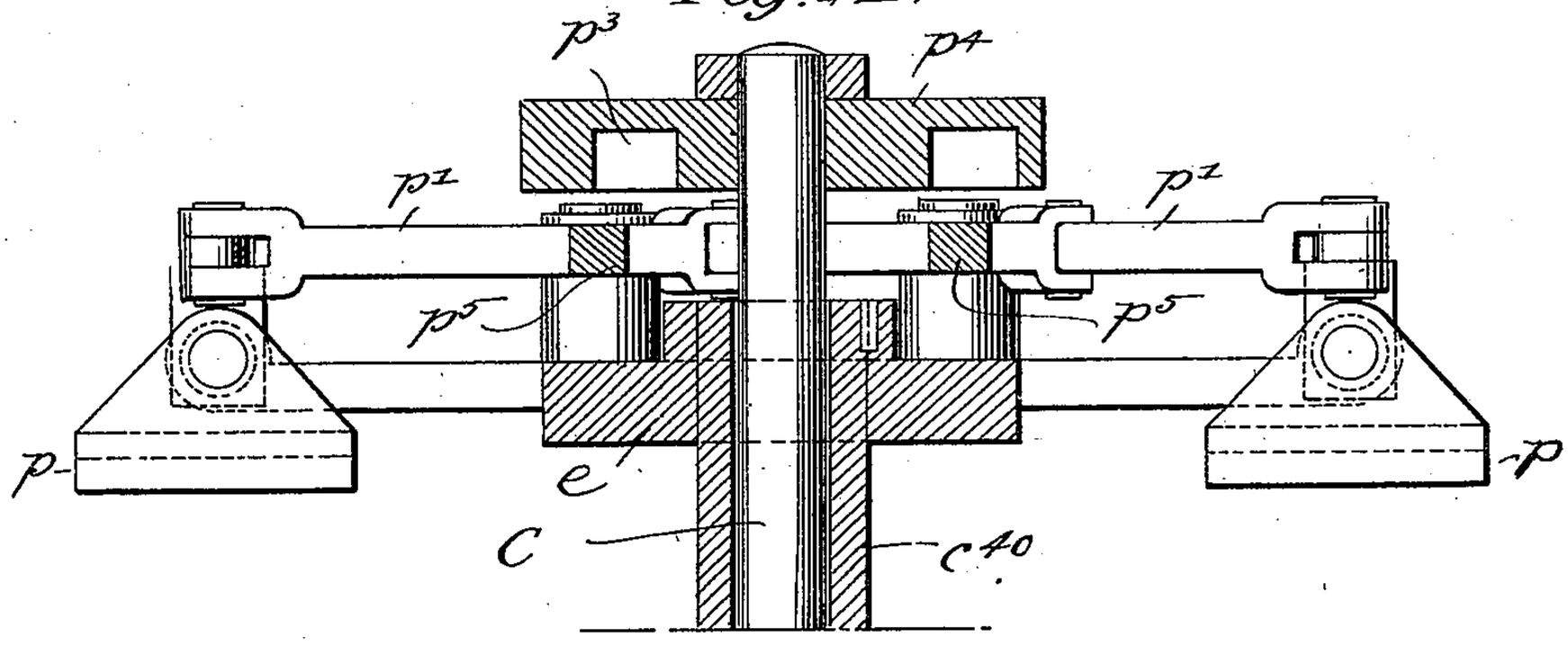
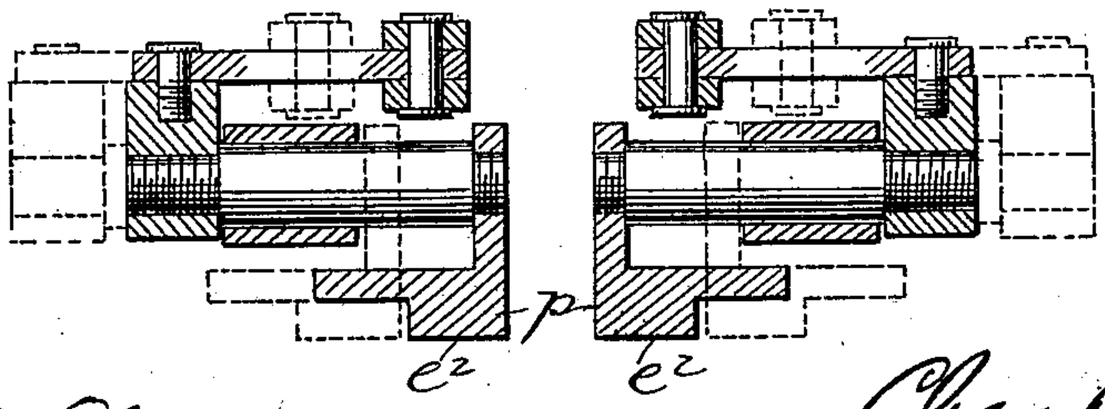


Fig. 13.



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UNITED STATES PATENT OFFICE.

CHARLES LEFFLER, OF BROOKLYN, NEW YORK.

PACKAGE-LABELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 669,174, dated March 5, 1901.

Application filed December 1, 1899. Serial No. 738,758. (No model.)

To all whom it may concern:

Be it known that I, CHARLES LEFFLER, a citizen of the United States, residing at the city of New York, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Package-Labeling Machines, of which the following is a full, clear, and exact description.

This invention relates to machines for applying labels to bottles and other packages, and contemplates several important departures from the usual construction and operation of such machines, whereby a wider range of work, greater speed, and more satisfactory results are obtained and the machine itself much simplified.

My invention consists, primarily, of a continuously-revolving bottle or package carrier, the packages with which it is laden being carried thereby across the path of movement of an intermittently-rotating label-carrier; and the invention also consists of important details of construction and combinations of parts which aid in the production of an efficient machine.

In the accompanying drawings, Figure 1 is a side elevation of my improved machine with parts in section. Fig. 2 is a central vertical section of a portion of the machine, the section being taken at right angles to the sectional part of Fig. 1. Fig. 3 is a plan of the label-manipulating mechanism, with the package-carrier in section. Figs. 4 and 5 are details of the package-carrier. Fig. 6 is a section on line x x of Fig. 2. Figs. 7, 8, and 9 are details of the label-holder. Fig. 10 illustrates a part of the operation, and Figs. 11, 12, and 13 show a modification.

Referring to the drawings by letter, A represents a main frame in the form of a pedestal, in which is mounted the horizontal driving-shaft a, provided with the pulleys a' and with two sprocket-wheels for transmitting power to the two main elements of the machine by means of the chains a^2 a^3. The chain a^2 passes around wheel b' on a horizontal shaft b, while the chain a^3 passes around a wheel a^4 on a horizontal shaft a^5. The shaft b carries a disk B, which stands in a vertical plane at one side of the machine and carries on its periphery a number of package-holders, there being six shown in the drawings. These package-holders each consist of two jaws c c', the former being stationary and the latter movable, the movable jaw being located at the end of a lever c^2, pivoted at c^3 to the disk and having a spring c^4 attached to it, which normally holds the jaw in contact with the package. To remove the jaw from the package, as is necessary in the operation of the machine, there is provided a link c^5, attached at one end to the lever c^2 and at the other end to a lever c^6. The last-mentioned lever is caused to rock and so pull upon the lever c^2 by means of a stationary cam-lug b^2 on the hub of the shaft. As the disk rotates the levers c^6 are carried successively over the lug, and at this point in the rotation the jaws are opened to permit of the removal of a labeled package and the insertion of an unlabeled package. The machine as here shown is adapted for round and long bottles, and the jaws referred to grip the bottle at a point above the center, thus leaving the lower portion of the bottle unobstructed by clamps or other contrivances to receive the label. The label being placed on one side of the bottle renders it possible to use in connection with the bottle-holder a short rod c^7, which extends at right angles from the disk and carries at its outer end a skeleton seat c^8 for the bottom of the bottle, thus holding it steady.

I will now refer to the devices for manipulating the labels.

The shaft a^5 rotates a vertical shaft C through bevel-gears a^6 a^7. The gear a^7 carries a horizontal disk c^{10}, the periphery of which is provided with two circular cam-surfaces c^{20} c^{30} of equal peripheral length, but one of less diameter than the other. Surrounding shaft C is a sleeve c^{40}, loosely mounted thereon, and outside of this is the stationary bearing c^{50}, the latter having a horizontal flange at its lower end, against which the disk c^{10} rests. The flange is provided with a cam-groove c^{60} in its lower surface, which is similar in shape and disposition to the cam-surfaces c^{20} c^{30}. The sleeve c^{40} projects below the end of the bearing c^5 and is provided at that extremity with two notches c^{70} c^{80}, arranged at diametrically opposite points. In the same plane with these notches and resting upon the top of the disk c' is a bolt c^9, carrying a roller c^{19}, which runs in the cam-

groove c^{60}. When one of the notches c^{70} c^{80} is presented to the bolt, the cam-groove shoves the bolt into it, and consequently locks sleeve c^{40} to the rotating disk c^{10} and carries it with it. When a half-rotation has been completed, the roller c^{19} has reached a point in the cam-groove c^{60} where the bolt is again withdrawn from the notch in the sleeve and then allowed to remain stationary. The sleeve is provided with a second set of notches c^{11} c^{12} above the first set and at right angles thereto. These are adapted to engage another bolt c^{13} whenever a notch is presented to it, and this takes place at the moment when the bolt c^{9} becomes disengaged from the sleeve. Since the bolt c^{13} passes through the stationary bearing c^{50}, as shown, the sleeve will be positively locked to the bearing at those intervals when it should not be moved with the disk c^{10}. To disengage the bolt c^{13} and allow the sleeve to again rotate with the disk, I provide the bolt with a roller c^{14}, which bears against the cam-surfaces c^{20} c^{30}. It will be understood that the spring c^{15} throws the bolt in, when the cam permits it to act.

To the upper end of the sleeve c^4 is attached a cross-head e, consisting of a flat plate having a fork or fingers e' at each end formed by a square opening large enough to permit the body of the bottle or package to pass through. This cross-head has an intermittent motion, each movement being a half-turn, and when it stops it presents the forked end to the package-carrier in such position that the bottle or package will be carried between the arms of the fork. The cross-head therefore swings in a horizontal plane, while the package-carrier swings in a vertical plane and causes the packages which it carries to intersect the plane of motion of the cross-head. On the under side of each arm of the forks is a pair of metal surfaces or pieces e^2, against which the label is held just before it is applied to the bottle. The label is held in this position by paste previously applied to the pieces e^2 and stands across the opening of the fork through which the bottle is passed. After a label has been applied to a bottle the cross-head swings a half-turn in the direction of the arrow, Fig. 3, and in doing so causes its surfaces e^2 to make contact with a roller f in a paste-reservoir f' and take a film of paste therefrom. Immediately beneath the cross-head is supported a pair of flexible wipers g, carried by plungers g' in small guiding-cylinders g^2, containing springs g^3 to hold the wipers in their normal position. The cylinders are carried by a yoke-shaped frame g^4, suitably attached to the main frame. The position of the wipers is such that the bottle or package will be forced through them immediately after it has struck the label standing across the fork of the cross-head.

While the cross-head is stationary and a package is receiving its label at one end thereof, a label is being applied to its opposite end. For this purpose there is mounted in the frame a vertical rod directly below the free end of the cross-head. This rod is provided with a perforated guide-piece i, which slides over fixed guide-rods i', attached to the main frame. This rod has a constant tendency to move upward under the action of a spring i^2. At its upper end it passes loosely through a bearing i^3 in the frame and carries a label holder or reservoir consisting of a horizontal plate j, having eight vertical posts j', supported in slots therein. These posts confine between them a pile of labels k, and to adapt the holder for various sizes and shapes of labels some of the posts are adjustable in position by the following means: Two posts adjacent to the axis of the cross-head are fixed, but the others are movable through slots j^2 in the plate and are attached to nuts j^3 in grooves on the under side of the plate. Along these grooves extend screws j^4, which pass through the nuts and are provided with heads by which they may be rotated and move the posts along the slots to such position that the pile of labels when confined between the posts will be touched on all sides by them. The connection between the posts and the nuts is a frictional one, they being attached to the nuts by means of set-screws j^5, as shown in Fig. 8, the amount of friction thus created being such as to yield when the posts are struck or pushed at either end, thus permitting them to slide through the nuts. The lower ends of all of the posts are attached to a common plate j^6, so that when the posts are moved through the nuts the motion of them all will be uniform. The sides of the posts which come into contact with the edges of the labels are serrated or roughened, as shown in Figs. 7 and 8, for the purpose of agitating the pile of labels when the machine is in motion, and thus let air between them and make them easily separable. The tops of the posts, which stand against the ends of the pile of labels, are provided with lips or flanges j^7, against which the edges of the top label are pulled when it is removed from the pile of labels. The pieces e^2 on the under side of the cross-head, to which the labels are temporarily affixed, have recesses into which the upper ends of the posts project when the top label is brought into contact with the surfaces carrying the paste, so that when the label-holder recedes from this position the edges of the top label, which remain sticking against the fork of the cross-head, will be carried against the flanges j^7 on the posts and will be bent downward and dragged over said flanges, and in case a second or third label is attached to the top one by suction the edges thereof will be caught by the flanges j^7 and cause the superfluous labels to drop back into the holder, and thus enable the cross-head to carry away but one label at a time.

The middle portion of the rod I is provided on two opposite sides with a row of teeth i^4, and surrounding this portion of the rod is a loose sleeve m, adapted to slide up and down

on the guide-rods i' and to be given such motion by a crank a^8, attached to the sprocket-wheel a^4 and working in a horizontal groove in the back of the sleeve. The sleeve is provided with two sockets m' m' for bolts m^2, which are adapted to engage, respectively, with the two rows of teeth on the rod and to be held in such engagement by springs behind them, as shown. The shape of the teeth on the rod and of the ends of the bolts is such that the upward tendency of the rod is resisted. At the upper end of the stroke of the sleeve m is located a wedge-shaped portion o of the frame, which enters the top of the sleeve on each side and presses against the bolts, moving them outward and disconnecting them from the teeth on the rod. This permits the spring i^2 to act and lift the rod independently of the sleeve. As soon as the sleeve has been lowered until the projection o is out of the path of the bolts the bolts can take hold of the teeth and carry the rod downward with the sleeve.

The operation is as follows: The main shaft a runs constantly and imparts a constant rotation to the package-carrier B in the direction of the arrow, Fig. 1. An attendant stands back of the package-carrier, and as each package or bottle-clamp is opened, as shown in Fig. 4, he removes the bottle therefrom to which a label has been applied and inserts one without a label. When a bottle reaches the position 1 in Fig. 10, the cross-head, with a label temporarily pasted to the under side of its fork, has come to a stop immediately beneath the bottle, and the bottle moves on through the fork, strikes against the label, and carries it against the wipers g, at the same time pulling it out of contact with the fork. The continued motion carries the bottle through the wipers, which press the edges of the label against the bottle, causing it to adhere thereto by reason of the paste carried by it. The bottle continues on around toward the point where it is removed from the carrier, and another follows it through the label-affixing devices. As soon as a bottle has been carried fairly through the label-affixing devices the cross-head swings around a half-turn and presents another label to the next bottle, and the operation continues in this way, bottle after bottle, as long as the attendant feeds properly. When a fork of the cross-head swings from the label-affixing point, the surfaces e^2 first pass over the paste-roller f and then to a point directly over the label-holder. While a label is being affixed at the other end, the label-holder is permitted to rise under the action of the spring i^2, because at that time the sleeve m, which ordinarily prevents the spring from lifting the rod, is itself lifted by the crank a^8 on the sprocket-wheel; but the engagement between the bolts m^2 and the rod is broken as soon as the sleeve carries the bolts in contact with the wedge projection o. When thus released, the rod is permitted to move freely upward under the action of the spring i^2 until the top label is brought into contact with the pasted surface e^2 on the cross-head. At the same time the tops of the posts j' enter the recesses in the pieces e^2 and on striking against said pieces are forced downward through the plate j until the pasted surfaces of e^2 come into good contact with the top label. It will be seen here that no matter how many labels may have been removed from or added to the pile of labels in the label-holder in the interval during which the cross-head is in motion the rod I will always be lifted until the pieces e^2 come into contact with the top label, and at the same time the receding posts j' will always be in place to hold the pile of labels in its proper position without interfering with the work of the cross-head. Posts or other retaining devices of fixed elevation above the plate j would not serve the purpose here, because in the lateral movement of the cross-head they might be struck when some of the labels had been removed from the top of the pile. Before the cross-head commences to make its lateral swing the crank on the sprocket-wheel a^4 starts downward, and immediately after the bolts n^2 have been carried free of the wedge projection o said bolts reenter the teeth in the rod, but this time at a slightly-different position, perhaps, and the rod and label-holder are lowered with the sleeve. In thus moving out of contact with the cross-head the top label, which adheres thereto, is drawn against the flanges on the tops of the retaining-posts, and in case other labels are attached to the first one, by suction or otherwise, the flanges will catch the edges thereof and draw them back onto the pile of labels, thus insuring that the cross-head shall carry away only one label each time. The vibrations of the label-holder, acting with the roughened surfaces of the posts j', keep sufficient air between the labels to prevent excessive suction between them, and this operation and construction, together with the flanges on the ends of the posts, affords a very efficient control of the labels.

As to the intermittent swinging motion of the cross-head it will be seen that the disk c^{10} rotates continuously, and whenever the bolt c^9 is presented to either of the notches c^{70} c^{80} and is forced therein by the cam-groove c^{60} the cross-head is rotated a half-turn with the disk c^{10}, whereupon the bolt c^9 is released from the sleeve and the bolt c^{13} connected thereto, and this swinging of the cross-head takes place in the period occupied by the package-carrier in moving the space between the packages.

In Fig. 2 I have shown in dotted lines an extension of the shaft a^5 and another set of gears a^6 a^7, driven therefrom, the intention being to indicate that the entire arrangement of the disk c', sleeve c^4, the locking devices, and the cross-head may be duplicated and driven at the same time, if desired, for any purpose.

In Figs. 11, 12, and 13 I have shown a modification of the cross-head and its label-picking forks to be used when the width of the label is considerably less than the diameter of the bottle or package. It will be seen that in the operation of the machine as hereinbefore described the paste-surfaces e^2 of the fork take hold of the label some distance from its edges, so that when the label is pulled off by the bottle the paste on the parts e^2 will be spread from their point of contact across the edges of the label, and therefore cover a larger surface with paste. When the label is narrow, the pieces e^2 have to be set nearer together to get this large paste-surface, and if the bottle happens to be larger than the width of the label provision must be made for separating the pieces e^2 to allow the bottle to pass between them. For this purpose the pieces e^2 are attached to movable jaws p, each of which is moved by a pivoted lever p', the lever being provided with a roller p^2, occupying a cam-groove p^3 in a disk p^4, fixed to the upper end of shaft C. The pair of levers p' on each side of the center are connected by a link p^5 on opposite sides of their pivots, so that only one of the levers p' needs to engage with the grooves p^3. The jaws p are nearest together at the moment when the label is brought into contact with them, and as the bottle is carried between them they are gradually separated by the action of the cam-groove to admit it, and the paste is spread to the edges of the label.

Having described my invention, I claim—

1. In a package-labeling machine, the combination of a continuously-rotating endless package-carrier moving in a fixed plane, and a label-transferring mechanism moving in a different plane but whose path intersects the path of the package-carrier.

2. In a package-labeling machine, the combination of a rotary package-carrier and a fork-shaped label-transferring mechanism across which the label is held and means for causing the carrier to pass the package between the forks of the label-carrier to affix the label.

3. In a package-labeling machine, the combination of a rotary package-carrier, a fork across the arms of which a label is temporarily pasted, the fork being in a position where the package, carried by the package-carrier, will be moved through it to strike and receive the label.

4. In a package-labeling machine, the combination of a rotary package-carrier and a label-transferring mechanism having a plurality of forks across which the label is temporarily pasted, said forks being successively brought into a position where the package-carrier will carry the packages successively through them.

5. In a package-labeling machine, the combination of a package-carrier, a label-transferring mechanism, and a label-holder adapted to carry a pile of loose labels, the label-transferring mechanism having a plurality of forks across which the label is temporarily pasted and means whereby a label is pasted to one fork while another label is being applied to a package by another fork substantially as described.

6. The combination of a continuously-rotating package-carrier, a reciprocating label-holder and an intermittently-moving label-transferring mechanism, the package-carrier acting to remove a label from the transferring mechanism and the label-holder acting to apply one thereto during the periods when the transferring mechanism is stationary.

7. In a labeling-machine, a label-holder adapted to carry a pile of loose labels, lateral retaining devices to hold the labels in position and means for automatically varying the length of the retaining devices as the size of the pile of labels varies.

8. In a labeling-machine, the combination of a label-holder adapted to carry a pile of labels from which the labels are moved one by one, lateral retaining devices to keep the pile of labels in position, a label-transferring mechanism adapted to strike and effectively shorten the retaining devices and simultaneously engage the top label of the pile of labels, substantially as described.

9. In a labeling-machine, the combination of a label-holder adapted to carry a pile of labels, retaining devices consisting of posts laterally arranged around the pile of labels and means for automatically lowering said posts as the pile of labels is consumed.

10. In a labeling-machine, the combination of a label-transferring mechanism against which a label is to be temporarily pasted, a label-holder adapted to carry a pile of labels, a spring tending to lift said holder and carry the top label into contact with the transferring mechanism, a latch and means for releasing it to allow the spring to act, and means whereby said latch will allow the label-holder to travel a distance independent of it, depending upon the consumption of labels in the holder substantially as described.

11. In a labeling-machine, a label-holder in combination with means for giving it a stroke or movement one portion of which is definite and the remainder dependent upon the number of labels contained in the holder.

12. In a labeling-machine, a label-holder, and a spring tending to move it in one direction, in combination with a reciprocating element, a locking device between the reciprocating element and the holder whereby both devices will travel together, and means for releasing the two devices to allow the holder to travel independently of the reciprocating element, substantially as described.

13. In a labeling-machine, a label-holder, a rod carrying the same, a spring tending to move the rod in one direction, a reciprocating sleeve surrounding the rod and provided with

a latch adapted to engage with the rod, and means for releasing said latch to permit the rod to travel independently of the sleeve

14. In a labeling-machine a label-transferrer, a constantly-rotating element adapted to impart motion thereto, a clutch between the rotating element and the transferrer adapted to alternately engage and disengage the two devices, and a locking device adapted to hold the transferrer stationary when the clutch is disengaged.

15. In a labeling-machine a label-transferring mechanism consisting of a rotating cross-head having a fork at each end across the members of which the label is adapted to be temporarily pasted, in combination with means for applying the label to one fork while it is being taken from the other fork by a package.

16. In a labeling-machine a label-transferring mechanism consisting of a cross-head having a pair of jaws at each end across which the label is adapted to be temporarily pasted, and means for moving the members of one pair of jaws with respect to each other while the members of the other remain stationary.

17. In a labeling-machine, the combination of a continuously-rotating package-carrier and an intermittently-rotating label-transferring device, the two rotary devices moving in intersecting planes, the label being applied at the point of intersection.

18. In a labeling-machine, the combination of label-attaching devices, a carrier having a plurality of sets of label-carrying fingers, one set of label-carrying fingers being presented in position to coöperate with the label-attaching devices, while a second set of label-carrying fingers is presented in position to take a label from a pile of labels, a paste-fountain located in the path of movement of the label-carrying fingers for applying paste thereto, and connections for operating the carrier, substantially as described.

19. In a labeling-machine, the combination of label-attaching devices, a carrier mounted to turn in a horizontal plane, and having a plurality of sets of label-carrying fingers, one set of label-carrying fingers being presented in position to coöperate with the label-attaching devices, while a second set of label-carrying fingers is presented in position to coöperate with a pile of labels, means for applying paste to the label-carrying fingers, means for thrusting the pile of labels against the freshly-pasted fingers, so that the top label will adhere thereto, and connections for turning the carrier, substantially as described.

In witness whereof I subscribe my signature in presence of two witnesses.

CHAS. LEFFLER.

Witnesses:
GEO. S. KENNEDY,
FRANK S. OBER.