(No Model.) 5 Sheets—Sheet 1.

N. B. ABBOTT.

MACHINE FOR WIRING CORKS IN BOTTLES.

No. 369,763. Patented Sept. 13, 1887.

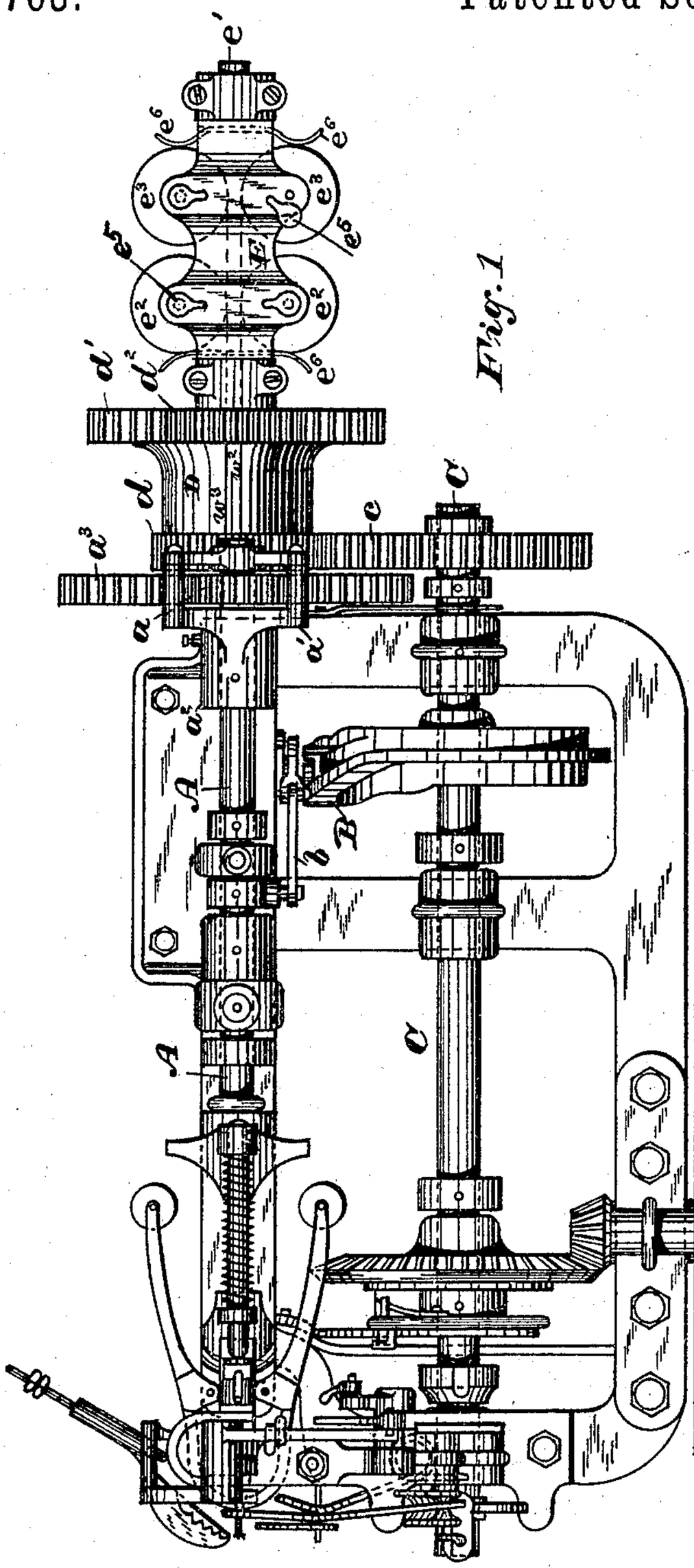

Fig. 1

WITNESSES:

J. L. Bantine.

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Nathaniel B. Abbott

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(No Model.) 5 Sheets—Sheet 2.

N. B. ABBOTT.

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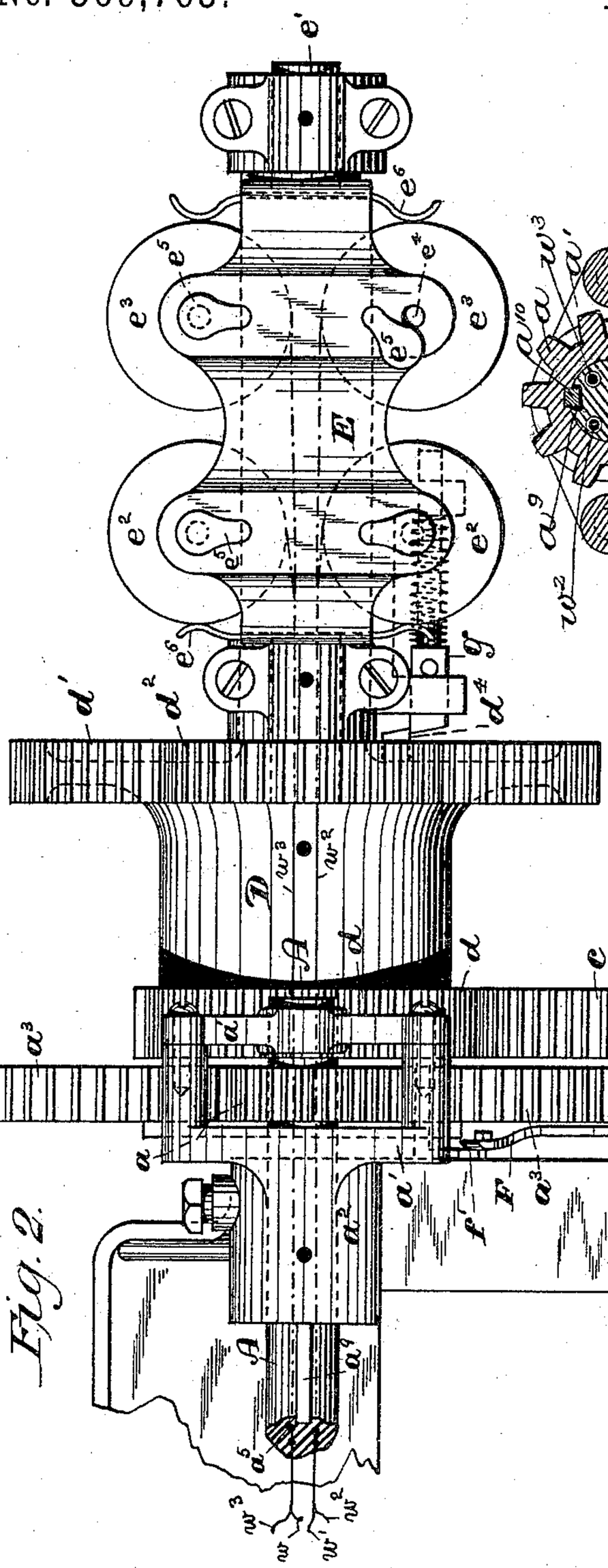

Fig. 2.

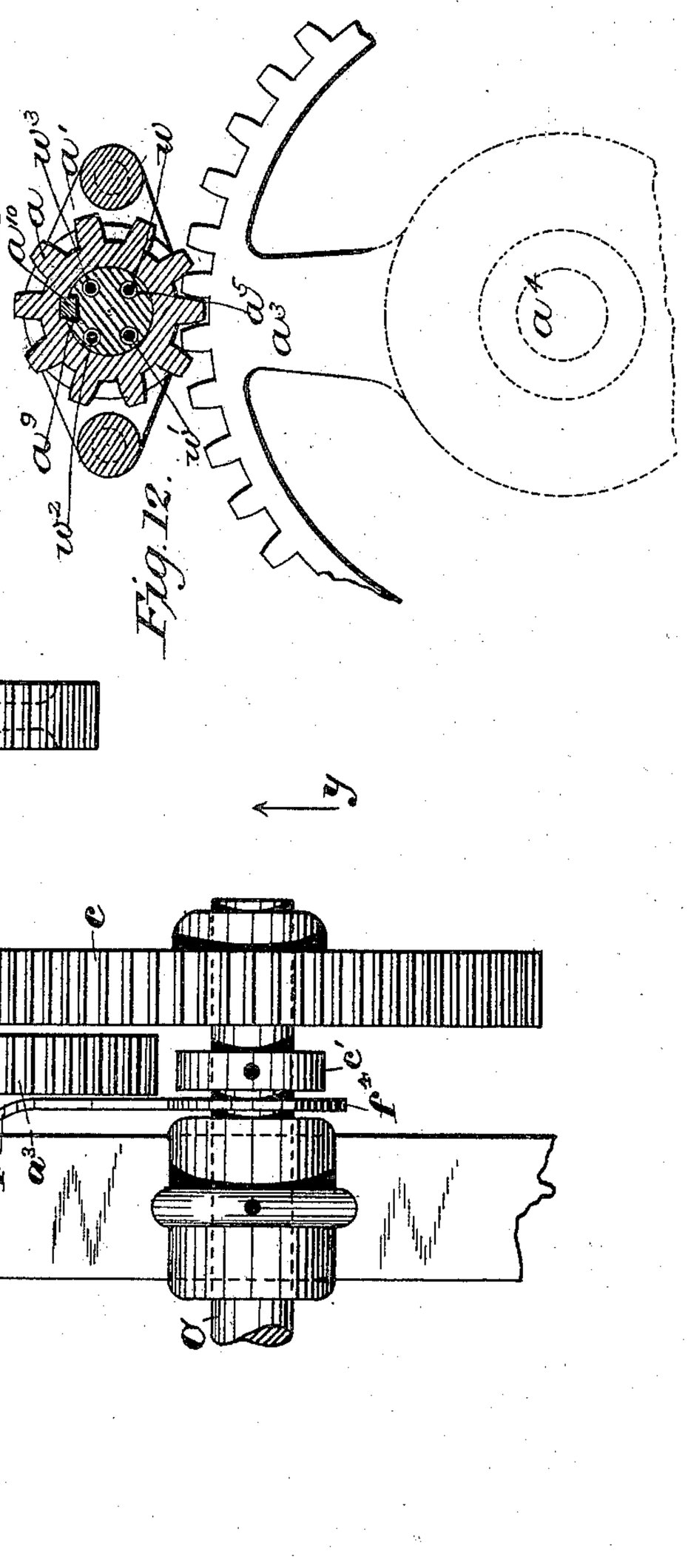

Fig. 12.

WITNESSES:

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(No Model.) 5 Sheets—Sheet 3.

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MACHINE FOR WIRING CORKS IN BOTTLES.

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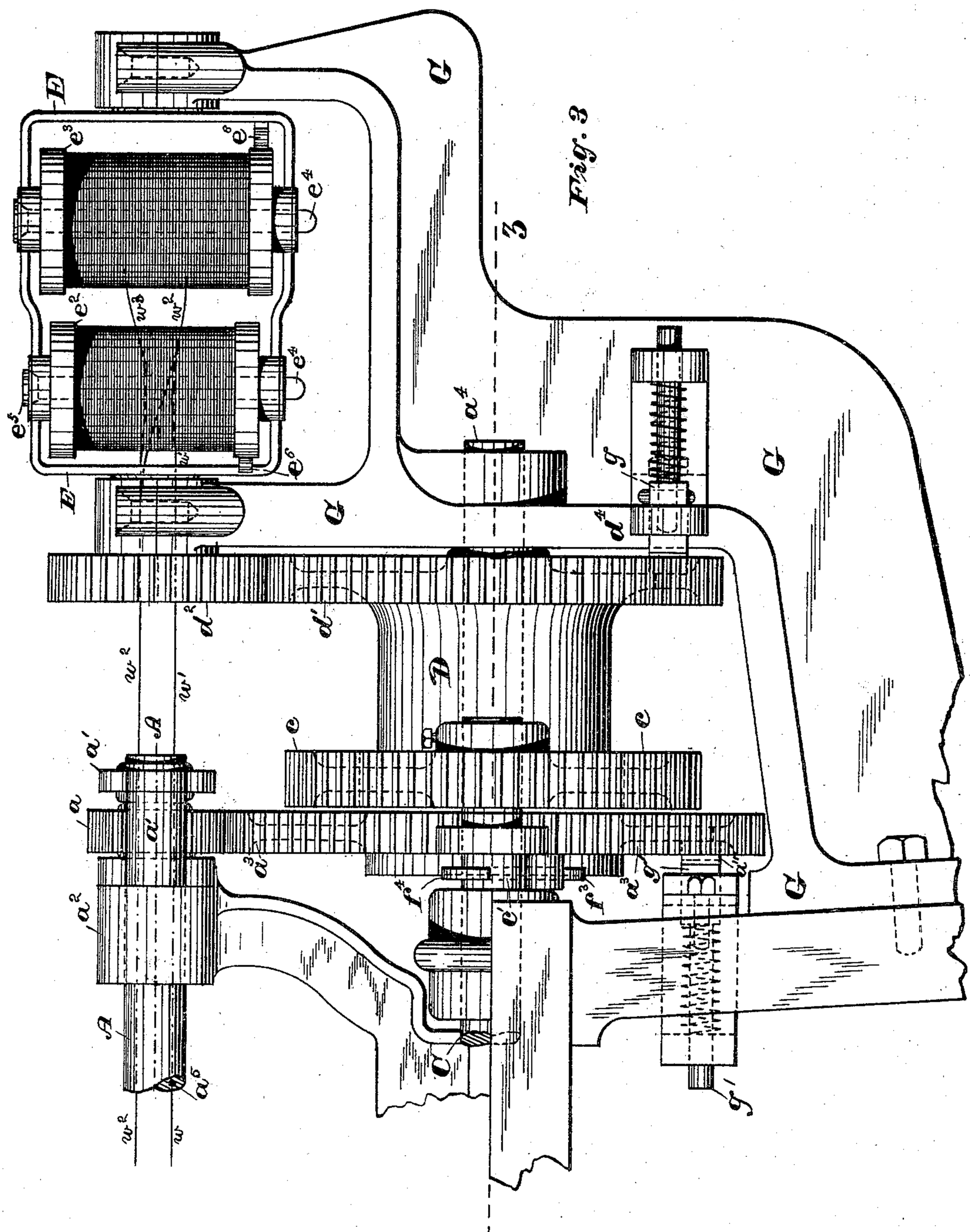

WITNESSES:

J. L. Bartine.

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(No Model.) 5 Sheets—Sheet 4.

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MACHINE FOR WIRING CORKS IN BOTTLES.

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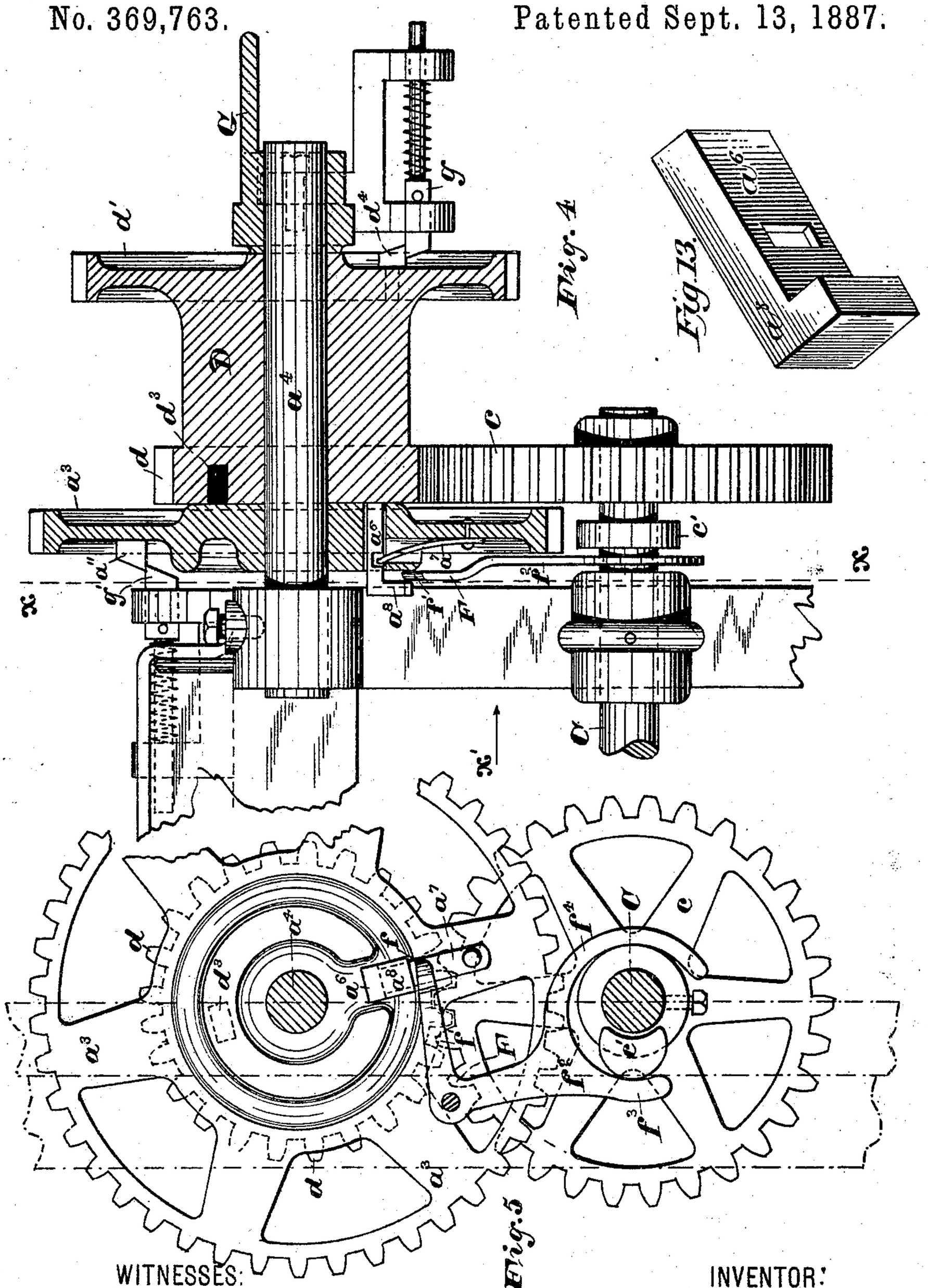

WITNESSES:

J. W. Pentine.

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INVENTOR:

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(No Model.) 5 Sheets—Sheet 5.

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MACHINE FOR WIRING CORKS IN BOTTLES.

No. 369,763. Patented Sept. 13, 1887.

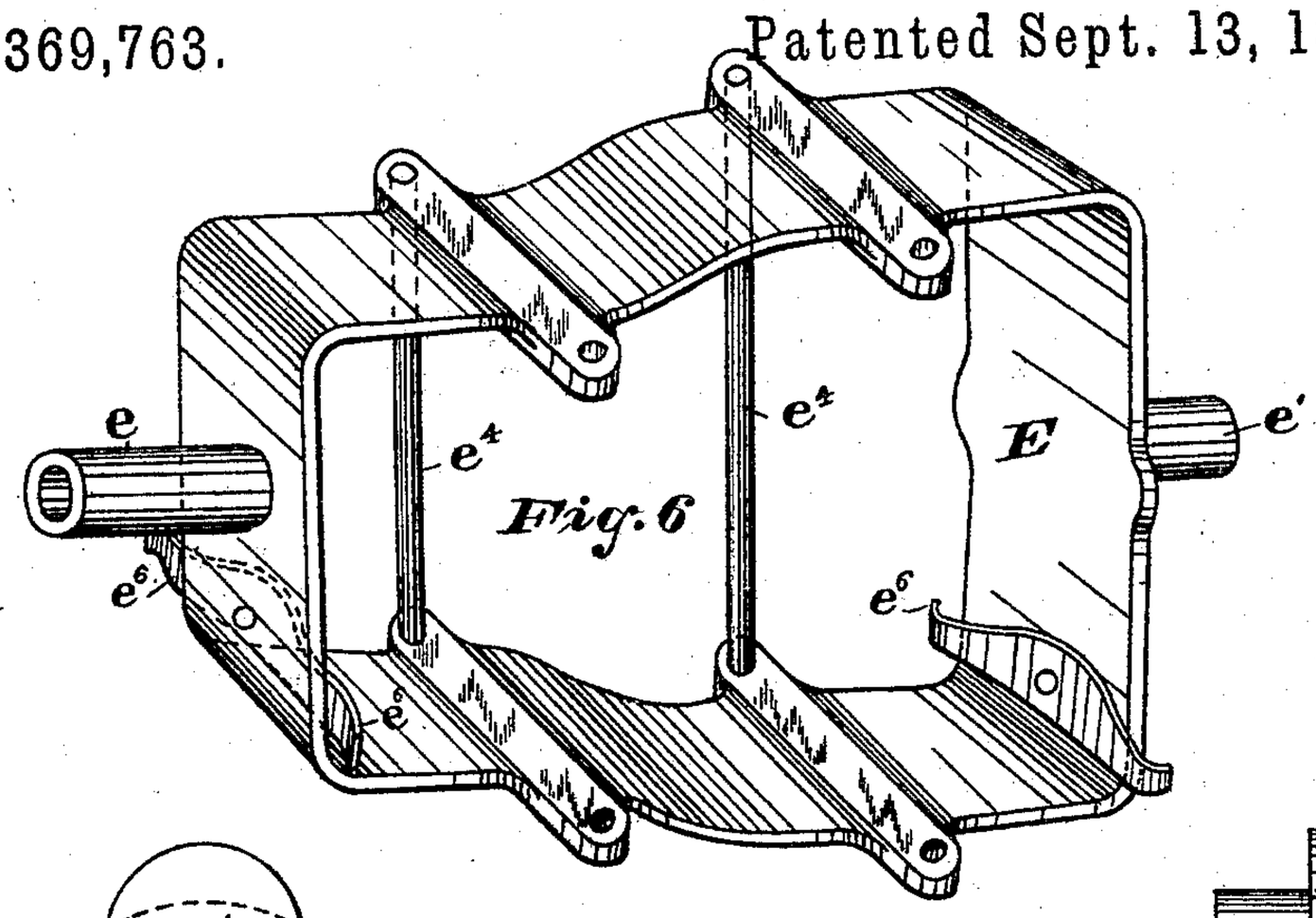


Fig. 6

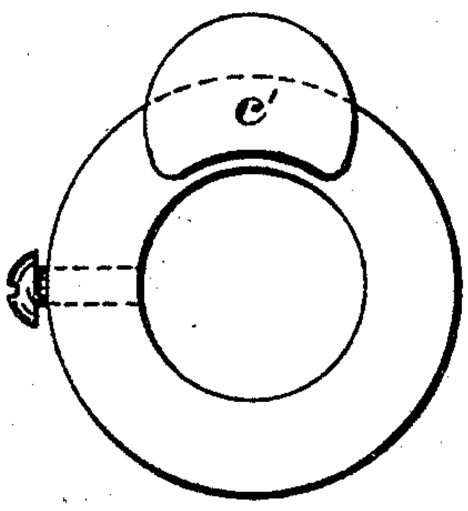
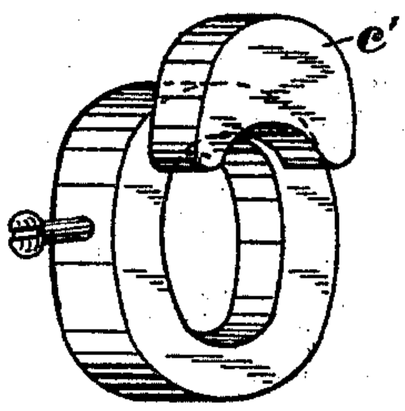


Fig. 8

Fig. 7



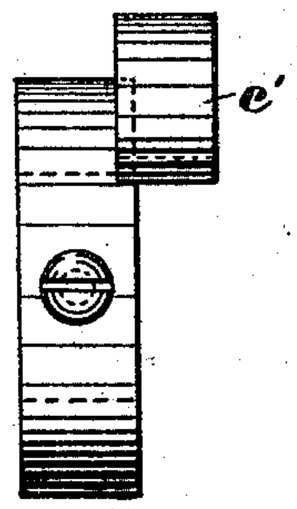


Fig. 9

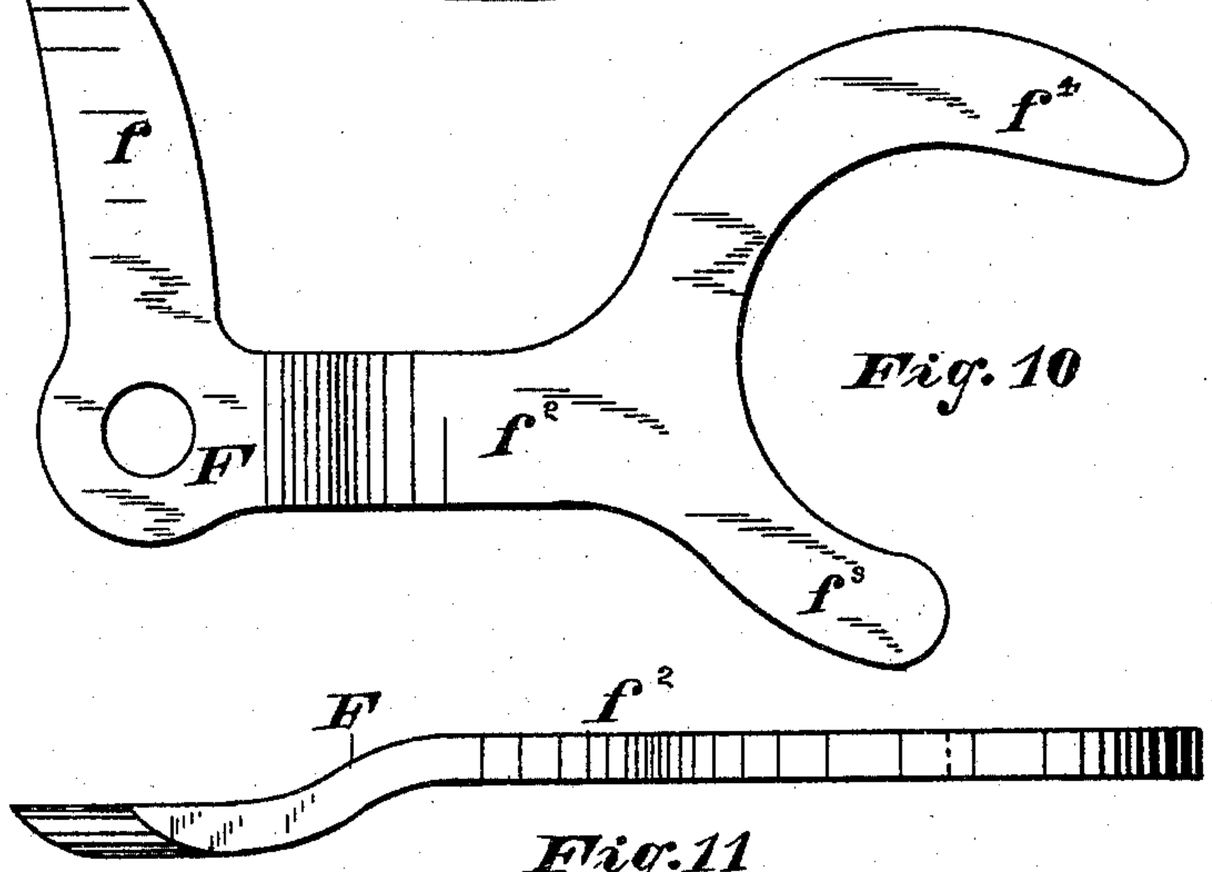


Fig. 10

Fig. 11

WITNESSES:

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UNITED STATES PATENT OFFICE.

NATHANIEL B. ABBOTT, OF BROOKLYN, NEW YORK.

MACHINE FOR WIRING CORKS IN BOTTLES.

SPECIFICATION forming part of Letters Patent No. 369,763, dated September 13, 1887.

Application filed January 22, 1887. Serial No. 225,106. (No model.)

To all whom it may concern:

Be it known that I, NATHANIEL B. ABBOTT, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Machines for Wiring Corks in Bottles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

In patents Nos. 295,735 and 318,955, granted March 25, 1884, and June 2, 1885, to O. C. Carpenter, and No. 352,168, granted to Wm. C. Van Vliet, November 9, 1886, is illustrated a wiring-machine for corked bottles, of which the machine illustrated in the drawings accompanying this specification and described in said specification which forms the subject of my invention is an improvement.

That portion of the machine to which my invention particularly relates is the mechanism for holding the spools of wire from which the binding-wires are drawn at given intervals or as needed to provide the wire necessary in binding the corks.

In all of the machines shown in the above-mentioned patents the spools of wire are attached to and partake of the motion of the sliding and rotating spindle, which by its movement causes the wires which pass around the neck of the bottle to encircle the same, and also twists all of the binding-wires after said wires have been properly placed over the cork and around the neck of the bottle into a single strand, which is afterward severed by the cutting mechanism. These operations of placing and twisting the wires in themselves require but little power to properly effect the same, and hence the mechanism for performing said operations may be made very light, thereby reducing the friction of the parts and increasing the speed and consequently the work of the machine.

In the machines above referred to a great deal of unnecessary work is put upon the mechanism for placing and twisting the wires by arranging the spools of wire upon and causing the same to move with the sliding and rotating spindle, and as the said spools of wire are very heavy the strength of the mechanism must be greatly augmented in order to stand the strain, thereby increasing the cost of the machine, decreasing the speed of the mechanism and consequently the amount of work performed, and also limiting the life of the machine. Another disadvantage resulting from the arrangement of spools upon the spindle is that owing to the necessary reduction in the speed of the mechanism the wiring of the cork is not performed as effectively or satisfactorily as is done by the light and rapidly-moving mechanism. All of these various disadvantages are avoided and the several advantages are attained by arranging the spools of wire separately from the spindle, but in such relation thereto that the wires may be properly conducted to the placing and twisting mechanism, leaving the spindle free to perform the work required of it.

In the accompanying sheets of drawings, in which is illustrated the separate arrangement of the spools, Figure 1 is a plan of a wiring-machine constructed with my improvement thereon. Fig. 2 is an enlarged plan of said improved device broken away from the main part of the machine. Fig. 3 is a side elevation of Fig. 2, looking in the direction of the arrow *y*. Fig. 4 is a sectional view taken through line *z*, Fig. 3. Fig. 5 is a similar view taken through line *x*, Fig. 4, and looking in the direction of the arrow *x'*. On Sheet 5, Fig. 6 is a perspective view of the spool-holding frame. Fig. 7 is a similar view of a cam. Figs. 8 and 9 are front and side elevations, respectively, of said cam; and Figs. 10 and 11 are respectively a side elevation and top view of a lever operated by said cam. Fig. 12, Sheet 2, is a sectional view taken vertically and centrally through the spindle, a pinion secured on the end thereof, and the holding-frame for said pinion; and Fig. 13 is a perspective view of a catching-bolt.

Similar reference-letters indicate corresponding parts in each of said views.

The machine shown in full in Fig. 1 is constructed and arranged to place two of the binding-wires over the top of the cork in the bottle and one on each side of the neck of said bottle and to twist said binding-wires together into a single strand, to sever said strand, and to

press the projecting twisted ends of the binding-wires down close to the neck of the bottle. To accomplish this, particularly the placing and twisting operations to and with which my improvement more closely relates and co-operates, the spindle A is caused to slide reciprocally and to rotate, producing thereby corresponding movements in the devices secured to one end thereof, which place and twist the wires. The mechanism for producing the sliding movement of the spindle consists of a cam, B, on the main shaft C, the movement of said cam being communicated to said spindle through a pivoted lever, *b*, suitably attached to the spindle and so constructed as to properly engage with the cam. However, as these mechanical elements, as well as the mechanism for driving the main shaft, constitute no part of my invention, and as an understanding thereof is not necessary to comprehend that part of the machine to which the invention specifically relates, therefore no detailed description thereof is made, the construction and relation of the parts being shown in Fig. 1.

In Fig. 2, *et sequiter*, is illustrated the construction and arrangement of the devices employed to carry out my invention.

The devices for producing the sliding reciprocatory movement of the spindle A have been hereinbefore mentioned. Those by means of which the rotary movement of the said spindle is effected consist of a gear-wheel or pinion, *a*, arranged in a frame, *a'*, and around the spindle, said frame projecting from the journal-box a^2, and formed integrally therewith or secured thereto, and a large gear-wheel, a^3, meshing with said pinion and turning loosely on a shaft, a^4, Fig. 4. In the end of the spindle which passes through the box a^2 and the pinion is formed a slot, a^9, into which a spline, a^{10}, on the pinion projects, thereby permitting said spindle to slide through the pinion, and also to revolve therewith at the proper time. Extending from the gear a^3 and turning on the shaft a^4 is an elongated collar, D, having cogs *d* and a gear-wheel, *d'*, formed on or secured to opposite ends thereof, a cog-wheel, *c*, keyed on the main shaft, meshing with said cogs *d*, and a pinion, d^2, meshing with said gear *d*.

The spool-holding-frame E, provided with journals *e e'*, one of which, *e*, is hollow, to permit the passage of the binding-wires *w w'* w^2 w^3 from the spools e^2 e^3 therethrough, is journaled in a bracket, G, and within said frame is rotatively arranged the wire-spools e^2 e^3, of which the spools e^3, that hold the wires w^2 w^3, which pass over the top of the cork, are preferably larger than the spools e^2, from which are drawn the wires *w w'*, which extend around the neck of the bottle, since more wire is required to pass over the cork than around the neck of the bottle, and to so arrange the wires that they will become exhausted simultaneously it is necessary that the relative portion of the length of wire on the large and small spools shall be the same as that existing between the wires w^2 w^3, which pass over the cork and those, *w w'*, that encircle the neck of the bottle.

On the hollow journal *e* is keyed the pinion d^2, which, together with the gears *d'*, *d*, and *c*, transmits the motion of the main shaft to the spool-holding frame, said gears and frame rotating continuously during the entire length of the rotation of the shaft, in which time a bottle is completely wired and removed from the wiring mechanism and the said mechanism restored to that position in which it is ready to receive another unwired bottle. The object subserved by the revolution of the frame and the wire-holding spools is the maintenance of the parallelism of the binding-wires, which is essential to enable the same to draw through the tubular spindle, by preventing their entanglement.

During that operation of the machine in which the binding-wires are caused to encircle and pass over or are placed around the neck of the bottle there is no rotation of the spindle, only a backward sliding movement; hence there is no danger of any entangling of the wires, as the said spindle moves over and around them, the said wires extending through four separate holes therein, a^5, Fig. 12; but during that operation which immediately succeeds the placing of the wires, by which said wires are twisted close to the neck of the bottle, the spindle makes several revolutions, varying in number according to length required of the twisted strands. To enable the mechanism to quickly and effectively perform this operation the spindle is caused to rotate quite rapidly, which is readily done with but comparatively little friction and strain upon the parts owing to the light construction thereof, which is made possible by removing the heavy spools of wire from the spindle.

Should the spools remain stationary during the twisting operation of the spindle, it is evident that the length of wire between said spools and spindle would become twisted as many times as the said spindle revolved; hence it is necessary for the spools to revolve and that the aggregate number of revolutions of the said spools shall equal the number of revolutions of the spindle in order to maintain the parallelism of the wires during the sliding movement of the said spindle.

Owing to the weight of the wire-spools it is desirable, in order to reduce the strain and the wear and tear of the machine as much as possible, that the speed of revolution of the spools be much slower than the rate at which the spindle rotates. Therefore, while making in the end the same number of revolutions, the time taken by the spools in their movement is much greater than that occupied by the spindle. For this reason the movement of the spools begins simultaneously with the inition of the placing of the wires and continues during said operation through the twisting and severing of the strands and through and ending with the operation in which the mechanism is restored to that posi-

tion in which it is ready to receive a second bottle; or, in other words, the revolution of the spools is preferably made to continue during the entire act of wiring a bottle. To secure this result the mechanism for transmitting the motion of the main shaft to the spool-frame is so constructed and arranged as to continue to transmit the motion of said shaft during any movement thereof, one form of construction of said mechanism being illustrated in the drawings and described hereinbefore.

To effect the intermittent rotary movement of the spindle which causes the twisting of the wires the mechanism which causes the same is so constructed as to transmit the motion of the shaft, or from the gearing turning therewith, to said spindles at intervals, being connected and disconnected automatically. The mechanism whereby this is attained is illustrated in Figs. 4, 5, &c., and consists of a pinion, a, on the spindle A, a gear, a^3, turning on a shaft, a^4, and meshing with said pinion, as hereinbefore mentioned, and a sliding bolt, a^6, moving reciprocally through the hub of said gear a^3 and operated to cause the locked position thereof by a spring, a^7, as indicated in Fig. 4. In the face of the collar D, next to the gear-wheel a^3, is a recess, d^3, which, by the rotation of said collar, is caused to pass across the end of the sliding bolt, which, by the pressure of the spring a^7, is forced into said recess across the joint between the collar and gear-wheel, thereby causing said gear-wheel to turn with said collar. During the time the sliding bolt projects into the recess d^3 the motion of said collar is communicated to said gear-wheel and from thence to the pinion and spindle, said time depending upon the length of wire to be twisted. To disengage said bolt from the recess a pivoted lever, F, is employed, having an arm, f, the end of which is tapering or provided with an inclined surface, f', which engages with the projection a^8 on the sliding bolt and forces the same from the recess d^3, and an arm, f^2, provided with oppositely-projecting fingers f^3 f^4, which engages a cam, c', on the main shaft, Fig. 5. The relation and operation of said cam and pivoted lever is such that when the spindle has made the requisite number of turns the said lever causes the withdrawal of the sliding bolt from the recess in the collar, and when said recess has, by the revolution of the collar, turned away from the bolt the lever is disengaged from the sliding bolt, leaving the same free to be projected into the recess when it is again brought around to the bolt. The relative proportion of the gearing and collar is such that the said collar makes but one entire revolution during the operation of wiring a bottle.

By reference to Fig. 3 considerable space is seen to intervene between the frame a' and the pinion d^2 of the spool-frame. The purpose of this arrangement is to permit the sliding movement of the spindle which moves backward or toward the spools in the operation of placing the wires around the neck of the bottle. Spring-actuated catches g g', engaging with stops d^4 and a'' on the gears d' and a^3, respectively, are employed to prevent any backward movement of the gear-wheels and the consequent tangling of the wires.

The wire-holding spools are retained in the frame by the removable pins or rods e^4, which are prevented from falling from the frame by the pivoted catching-pieces e^5, as shown in Fig. 2. By means of this construction the spools may readily be taken from the frame and full spools inserted in lieu thereof. Tension springs e^6 are attached to the holding-frame in such a manner that they press against the rotating spools, and by such pressure prevent the wire from unwinding too rapidly from the spools.

Having in this manner described my invention, what I claim is—

1. In a bottle-wiring machine, the combination, with a wire-twisting device or fork and a wire-conducting spindle to which said twisting device is attached, of a wire-holding device having a plurality of wire reels or spools therein from which the wire is conducted to the twisting devices through the rotating spindle, said wire-holding device being arranged separately from and rotating independently of but in the same direction as the wire-conducting spindle, and mechanism constructed and operating whereby said spindle and wire-holding device are caused to rotate simultaneously, but in different times or rates of speed, for the purposes set forth.

2. In a bottle-wiring machine, the combination, with a reciprocally sliding and rotating spindle, of a wire-holding device arranged separately from and rotating independently of but in a line with and at a distance from said spindle, and mechanism arranged so as to leave the space between said wire-holding device and the end of the spindle clear of any obstruction, and constructed and operating to cause the rotating movement of said wire-holding device, for the purposes set forth.

3. In a bottle-wiring machine, the combination of a reciprocally sliding and rotating spindle, means constructed and arranged to cause the sliding movement thereof, a pinion arranged on said spindle and constructed and adapted to turn said spindle and to permit the same to slide therethrough, a gear-wheel meshing with said pinion, a wire-holding device arranged separately from and rotating independently of said spindle, gearing constructed and arranged to cause the rotating movement of said wire-holding device, and clutch mechanism constructed and operating to throw the gearing which rotates the spindle and that which rotates said wire-holding device into holding engagement, for the purposes set forth.

4. In a bottle-wiring machine, the combination of a tubular wire-conducting spindle, a pinion arranged thereon and constructed and adapted to turn said spindle and to permit the same to slide therethrough, a gear-wheel meshing with said pinion, a wire-holding device

arranged separately from and independent of but at a distance from and in a line with the tubular spindle, gearing constructed and arranged to cause the rotary motion of said wire-holding device, clutch mechanism constructed and operating to throw the gearing which rotates the spindle and that which actuates the wire-holding device into operative engagement, and actuating mechanism for said gearing, for the purposes set forth.

5. In a bottle-wiring machine, the combination of a reciprocally sliding and rotating tubular wire-conducting spindle, a pinion arranged thereon and constructed and adapted to turn said spindle and to permit the same to slide therethrough, a gear-wheel meshing with said pinion, a sliding spring-actuated bolt arranged in said gear-wheel, a cam and pivoted lever for operating said bolt, a gear-wheel, *c*, on the driving-shaft, a collar, D, having a recess, d^3, to receive the sliding bolt and gears *d d'* thereon, a wire-holding device provided with suitable journals, one of which is hollow, and a pinion, d^2, thereon, meshing with said gear *d'*, and a spring-actuated catch, *g*, and stop d^4, all said parts being constructed and arranged for the purposes set forth.

6. In a bottle-wiring machine, the combination of a spindle-supporting standard or frame, a rotating and reciprocally-moving wire-conducting tube or spindle journaled in said standard, a pinion arranged on said spindle and constructed and adapted to rotate the said spindle and at the same time to permit the same to slide therethrough, a cog or gear-wheel meshing with said pinion, a curved arm projecting from said standard, whereby the wire-holding device is held at a distance from the fixed pinion of the sliding spindle, a wire-holding frame journaled in said curved arm in a line with the sliding spindle and at a distance from the fixed pinion, and having a hollow journal and adapted to hold a plurality of wire-holding spools, a pinion arranged on said hollow journal, a collar provided with cogs thereon meshing with said pinion of the hollow journal and journaled in said curved arm in the space between the wire-frame and the fixed pinion on the sliding spindle, and clutch mechanism arranged and operating to throw the said collar and the gear-wheel which rotates the sliding spindle into operative engagement, substantially as and for the purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 17th day of January, 1887.

NATHANIEL B. ABBOTT.

Witnesses:
CHAS. J. TRAPSCHUH,
D. E. WACHTER.