No. 831,905. PATENTED SEPT. 25, 1906.

J. C. THOM.

CAN MACHINE.

APPLICATION FILED APR. 22, 1905.

6 SHEETS—SHEET 1.

Fig. 1.

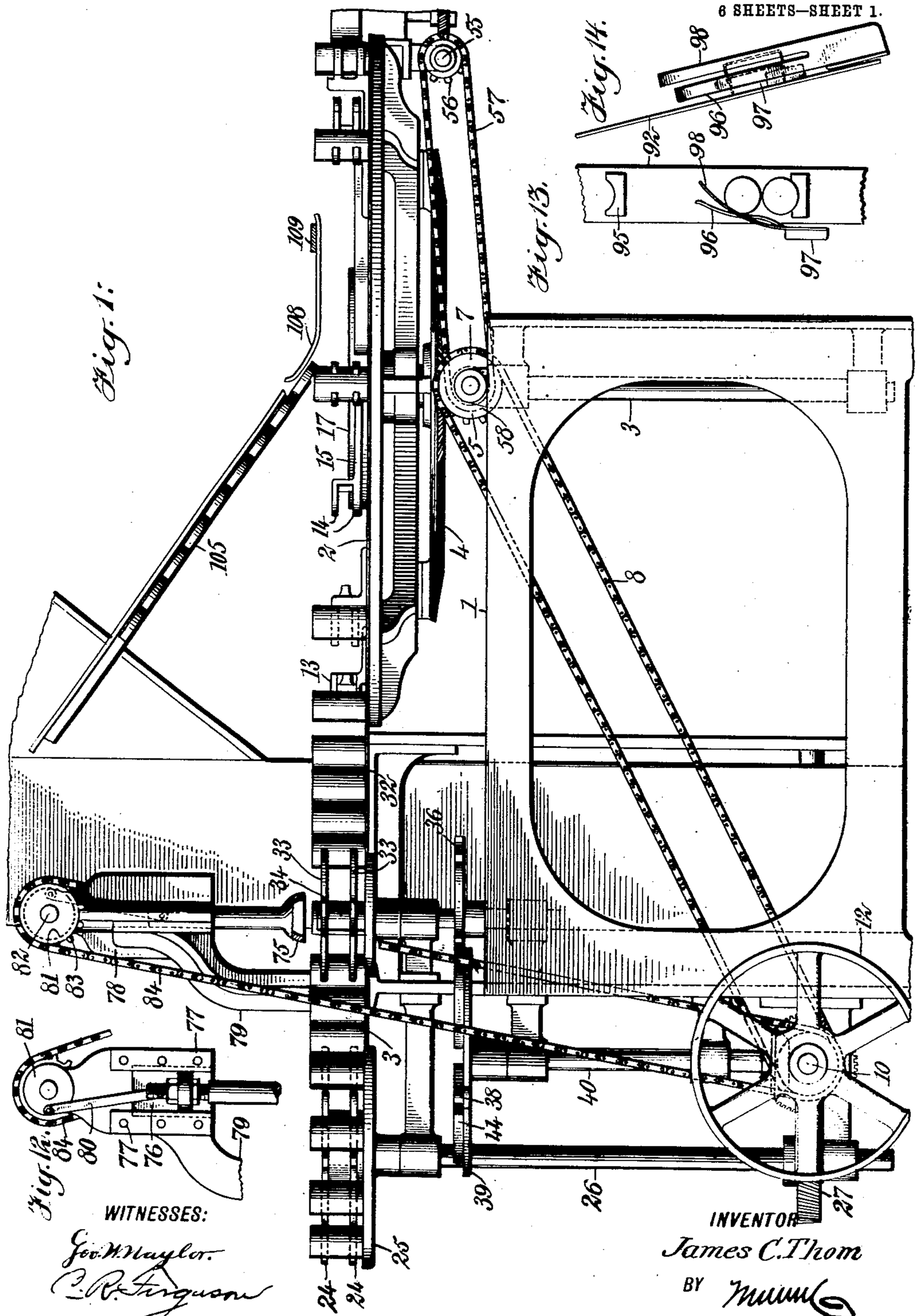

Fig. 14.

Fig. 13.

Fig. 12.

WITNESSES:

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6 SHEETS—SHEET 2.

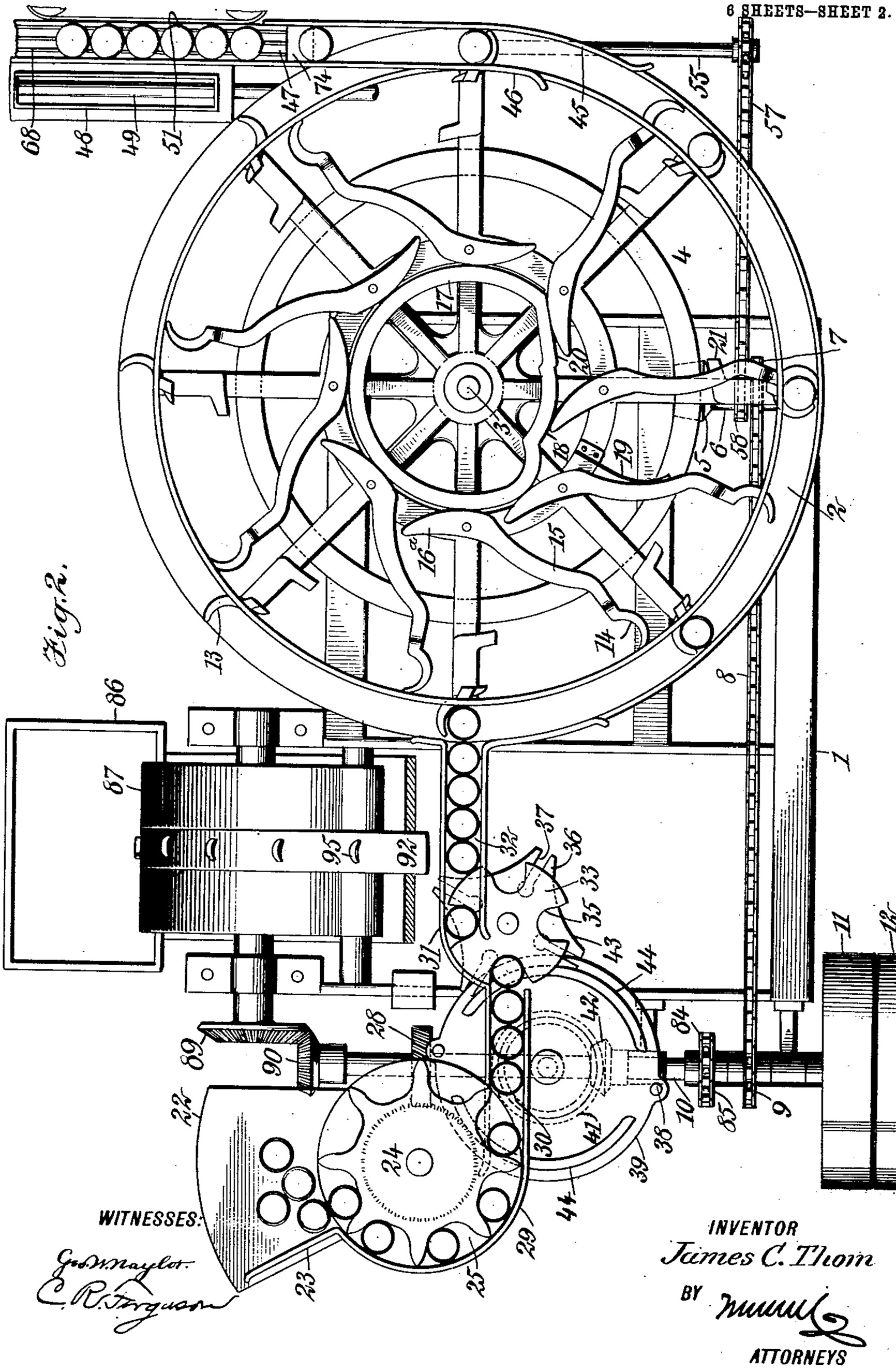

Fig. 2.

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6 SHEETS—SHEET 3.

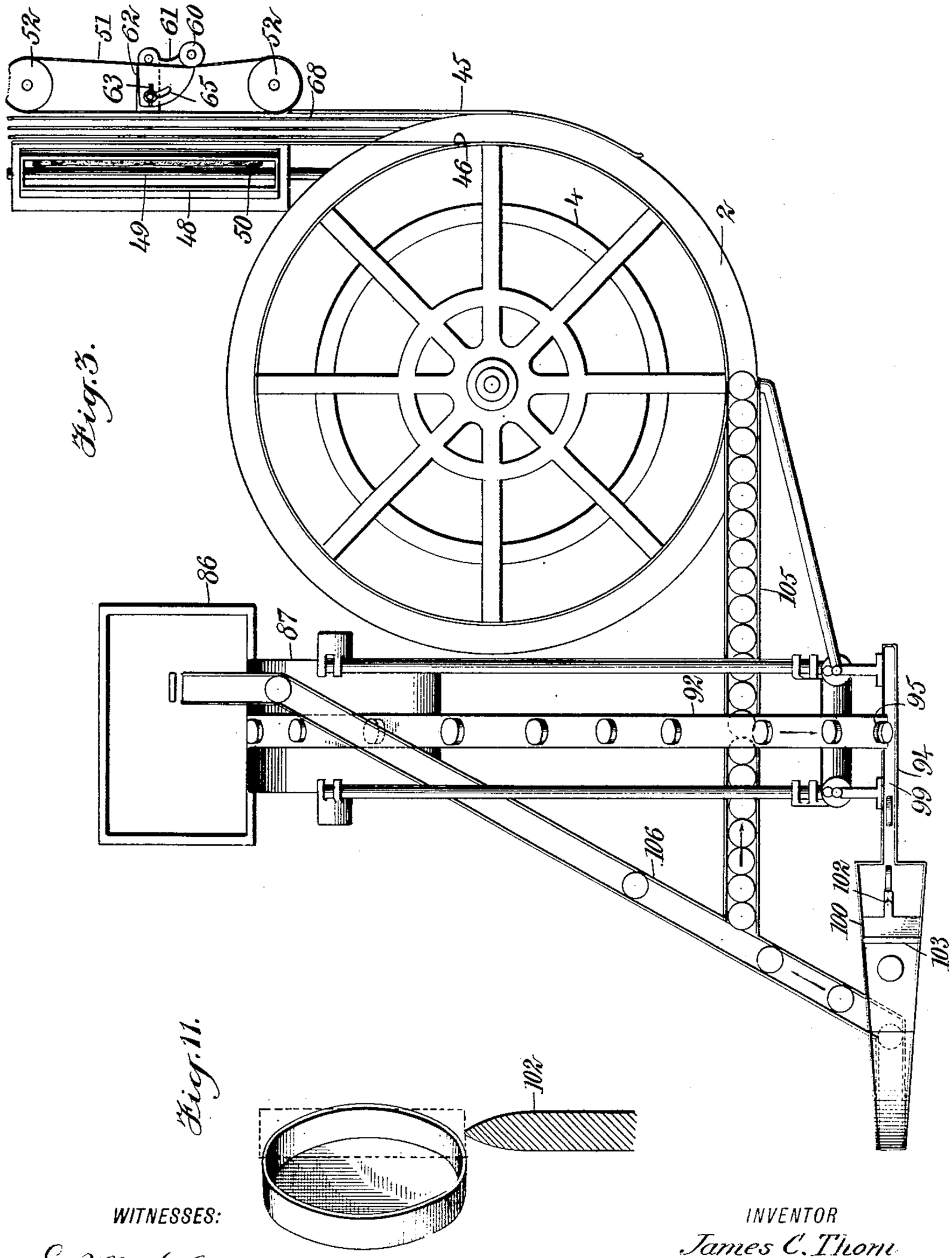

Fig. 3.

Fig. 11.

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6 SHEETS—SHEET 4.

Fig. 4.

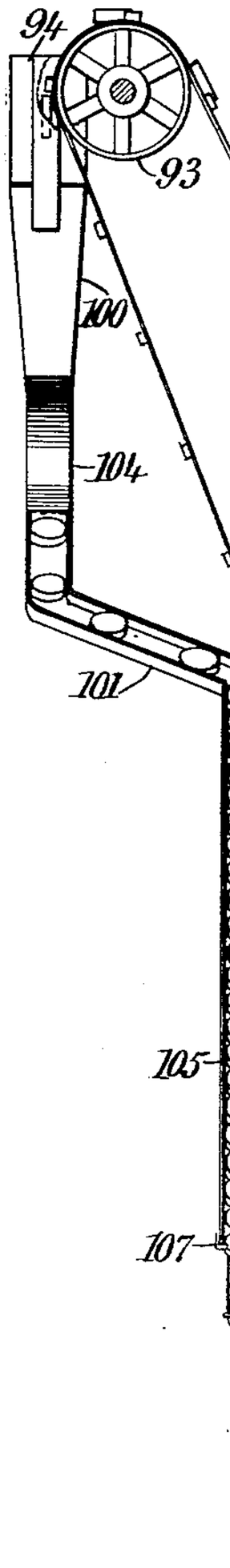
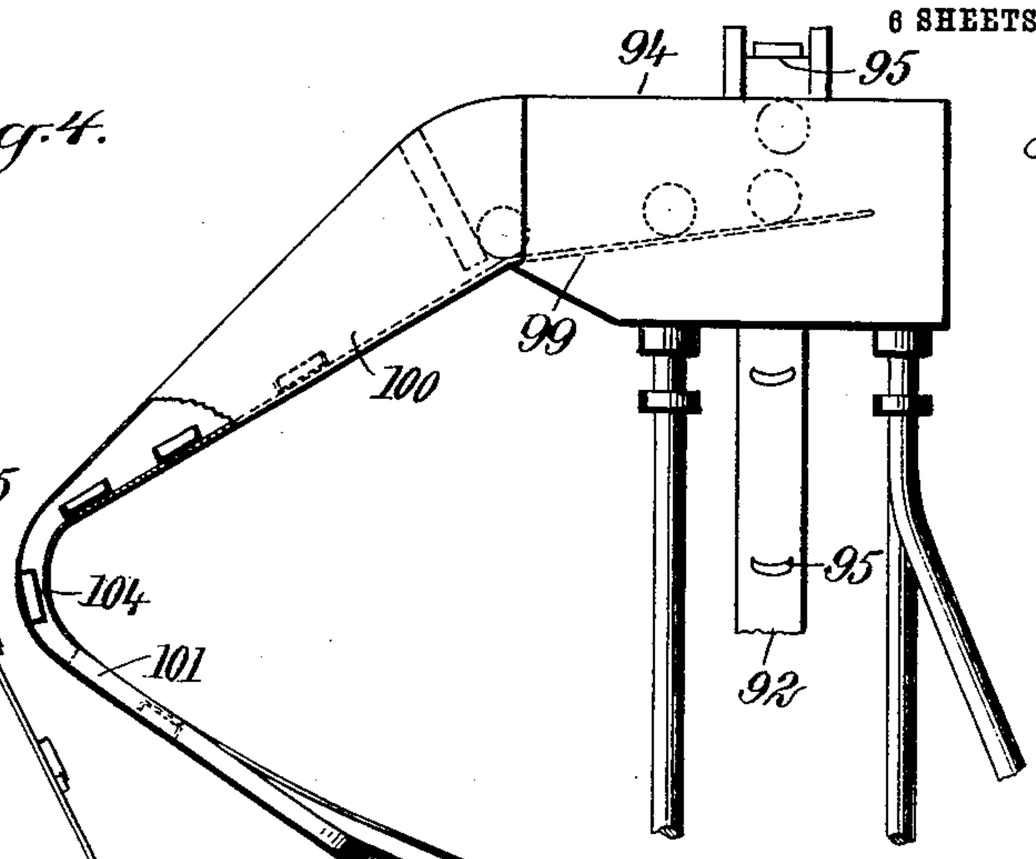
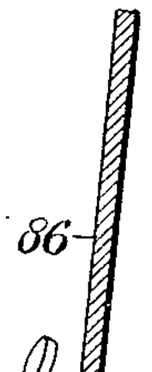


Fig. 5.





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6 SHEETS—SHEET 5.

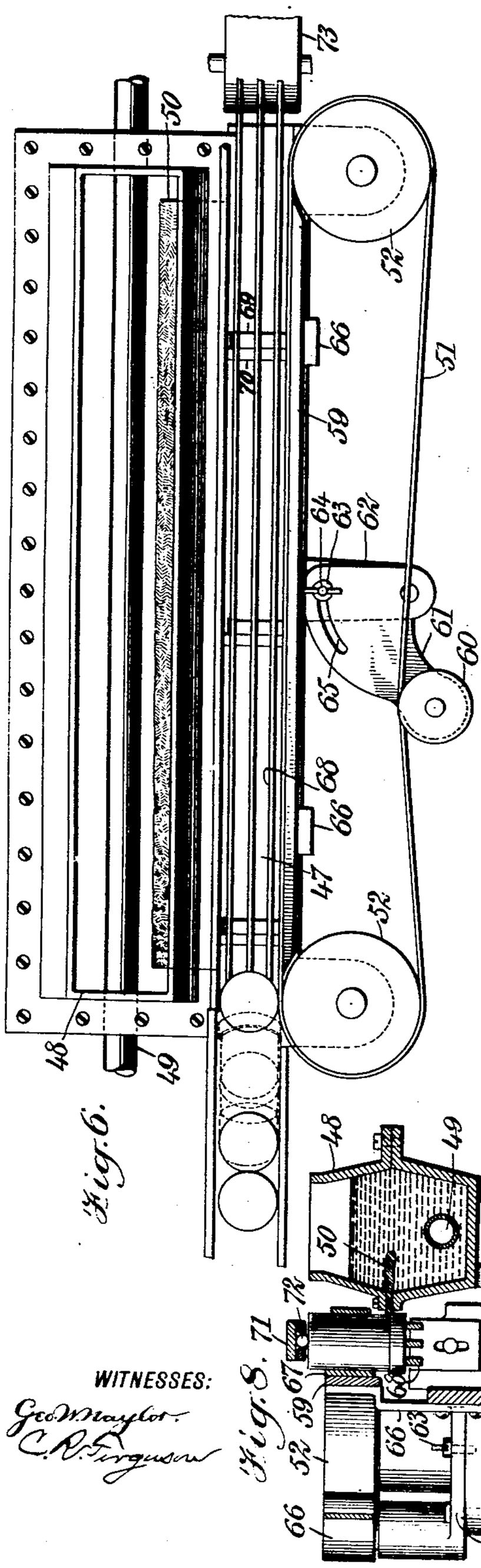

Fig. 6.

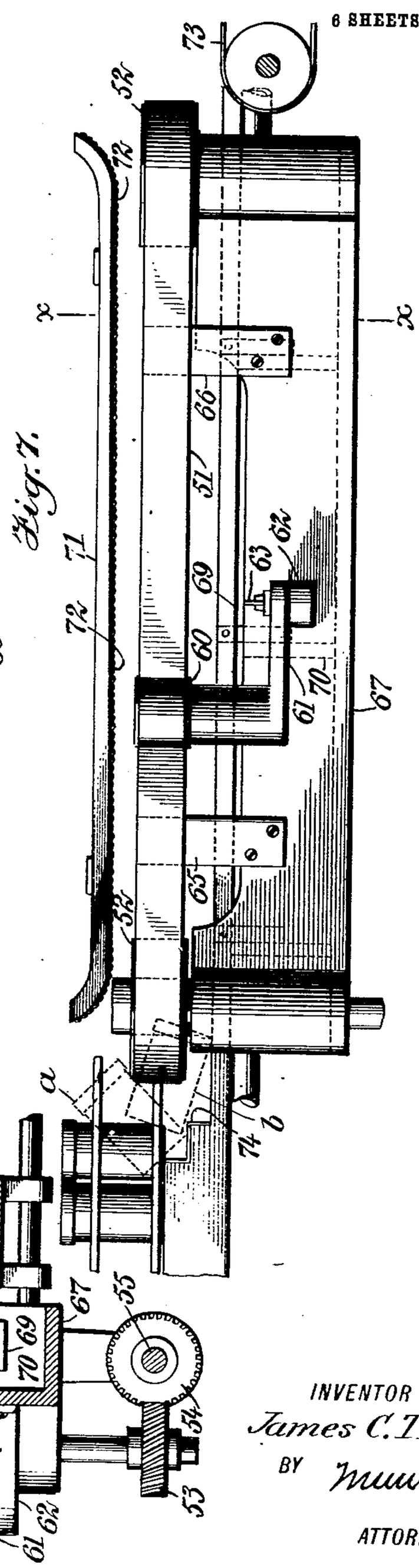

Fig. 7.

Fig. 8.

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J. C. THOM.

CAN MACHINE.

APPLICATION FILED APR. 22, 1905.

6 SHEETS—SHEET 6.

Fig. 10.

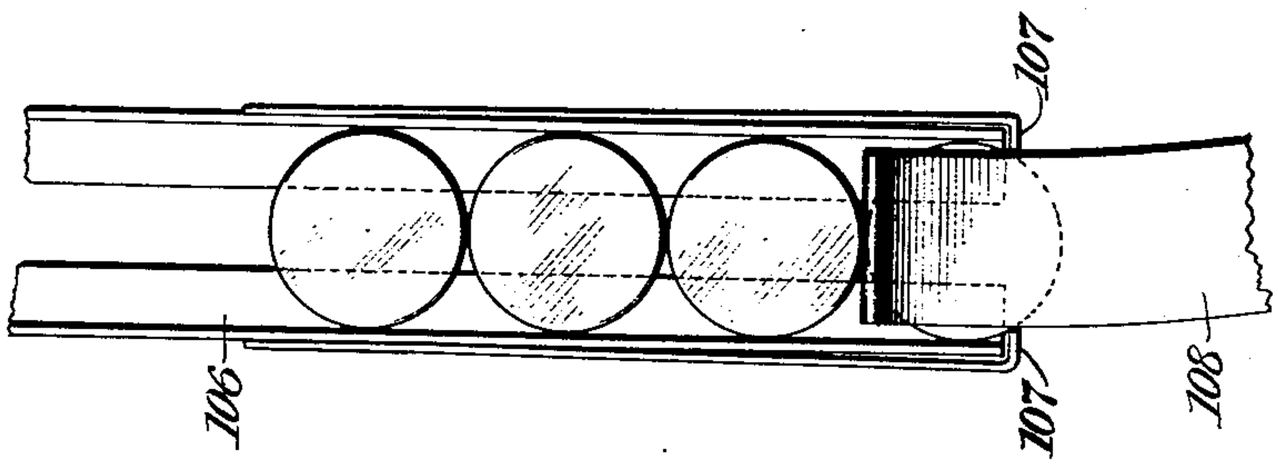
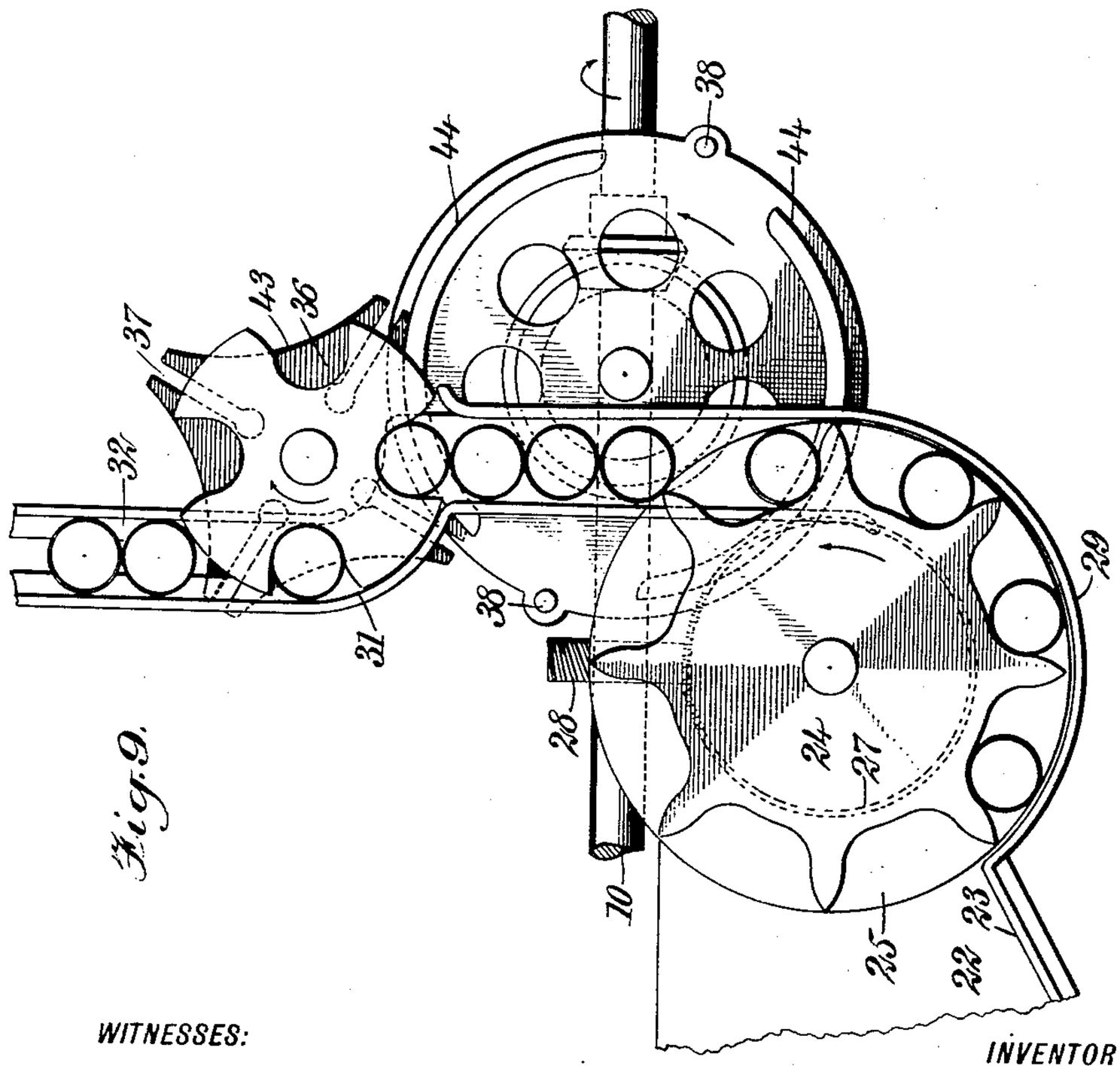


Fig. 9.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES CRAWFORD THOM, OF HELMETTA, NEW JERSEY.

CAN-MACHINE.

No. 831,905. Specification of Letters Patent. Patented Sept. 25, 1906.

Application filed April 22, 1905. Serial No. 256,875.

To all whom it may concern:

Be it known that I, JAMES CRAWFORD THOM, a citizen of the United States, and a resident of Helmetta, in the county of Middlesex and State of New Jersey, have invented a new and Improved Can-Machine, of which the following is a full, clear, and exact description.

This invention relates particularly to improvements in machines for placing the ends, covers, or bottoms on tin or fiber cans and sealing the same, an object being to provide a machine of this character by means of which the work may be rapidly carried on, especially the capping or covering and sealing of filled cans.

Other objects of the invention will appear in the general description.

I will describe a can-machine embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a can-machine embodying my invention. Fig. 2 is a plan thereof. Fig. 3 is a plan showing certain feeding mechanism employed. Fig. 4 is a front view of said feeding mechanism. Fig. 5 is a side view thereof, partly in section. Fig. 6 is a plan showing a device for applying a sealing medium. Fig. 7 is a side view thereof. Fig. 8 is a section on the line $x\,x$ of Fig. 7. Fig. 9 is a detail plan illustrating the can-transferring mechanism employed. Fig. 10 is a detail plan indicating the outlet of the end or cover feeding chute. Fig. 11 is a detail showing a cover in the act of falling to the correct position at the inlet end of the chute. Fig. 12 is a detail showing a reamer-operating device, and Figs. 13 and 14 are details showing a part of the feeding mechanism.

Referring to the drawings, 1 designates the frame of the machine, on which is mounted a rotary can-carrier wheel 2. This wheel is mounted to rotate on a rod 3, extended upward through the frame of the machine, and attached to the lower side of the carrier is a bevel gear-wheel 4, meshing with a bevel-pinion 5 on a shaft 6, to which a sprocket-wheel 7, engaged by a sprocket-chain 8, is attached, the said sprocket-chain 8 also engaging with a sprocket-pinion 9 on a shaft 10, provided with fast and loose drive-pulleys 11 12.

The carrier 2 is designed to transfer cans filled with material to a device for applying the covers and then transferring the cans to a mechanism for applying a sealing medium. Mounted on the carrier 2 at equidistant points are curved fingers 13, which are designed to engage with the cans fed thereto, and coacting at a certain time with the fingers 13 are clamping-fingers 14, designed to engage the sides of the can at the opposite side of that engaged by the fingers 13, so as to hold the can in position while a cover is being placed.

The fingers 14 are formed on arms 15, mounted to swing on the spokes 16 of the carrier, and inward of the pivotal point of the arms 15 are curved or cam-like projections 16^a for engaging with a peripheral cam 17, rigidly attached to a hub on the upright or rod 3. This cam 17 for the greater portion of its length has its periphery concentric with its center; but at the side in the direction of the cover-attaching device the periphery of the cam is depressed, as indicated at 18, permitting the arms 15 to swing to engage the fingers 14 with the cans, the arms being swung to clamping position, as here shown, by means of springs 19. Upon the projection 16 engaging with a straight portion 20 on the periphery of the cam the arms will be swung out of engagement with the cans and will be swung to their extreme open position when said projections engage with the concentric portion of the cams. When the arm 15 is moved to engage its finger with a can, the said arm will ride upon a guide-plate 21, projected from a spoke of the carrier 2. In other words, this plate 21 will guide the arm should it become weak or too loose at its pivotal point.

I will now describe a means for transferring the filled cans to the carrier 2.

As clearly indicated in the plan Fig. 2 a platform 22 is arranged at the feed end of the machine, and extended upward from one edge of the platform 22 is a guide-plate 23, along which the filled boxes may be pushed to pass between the teeth of a pair of transferring-wheels 24, spaced apart and supported on a rotary table 25, mounted on a vertical shaft 26, on the lower end of which is a worm-wheel 27, meshing with a worm-gear 28, mounted on the counter-shaft 10. Extend-

ing around a portion of the table 25 is a flange 29, which is continued to form one wall of a chute 30, through which cans are passed to the carrier. The other wall of said chute 30 is indicated at 31. From the chute 30 the cans are transferred to a chute 32, which communicates directly with the carrier 2, and as a means for transferring the cans intermittently and one at a time to the chute-section 32 I employ transferring-wheels consisting of disks 33, mounted to rotate with a shaft 34, these disks being spaced apart and provided with recesses 35, which open outward and are designed to receive the cams from the chute-section 30. Attached to the lower end of the shaft, which has its bearing in the bed-plate of the machine, is an escapement-wheel 36, having outwardly-opening slots 37, corresponding in number to the number of recesses 35 in the disks 33. These slots 37 are designed to receive ends 38, arranged on opposite sides and extended upward from a shifting wheel 39, mounted on a shaft 40 on the lower end of said shaft, there being secured a bevel-gear 41, engaging with a bevel-pinion 42 on the shaft 10. Between the openings or slots 37 of the wheel 36 the periphery of said wheel is concaved, as indicated at 43, so as to engage with frictional bearing against segmental plates 44, attached to the upper side of the shifting wheel 39, so as to hold the transferring devices 33 stationary at certain times—that is, when a segment device 44 engages with a concave wall of the wheel 36, as indicated in Fig. 2, the transferring device will be held stationary until one of the pins 38 engages in a slot 37 of the wheel 36, which will cause a rotary movement of said wheel 36, so that the transferring device 33 will move a can into the chute-section 32. After the covers are placed on the cans, as will be hereinafter described, the cans are moved by the carrier 2 between guide-rails 45 46 to a chute 47, which passes along the front of a tank 48, containing a sealing medium—such, for instance, as paraffin or the like—which is kept in a liquid state by any suitable means. As a means for this purpose I have here indicated a steam-pipe 49 as leading through the tank. The side of the tank 48 adjacent to the chute 47 is provided with a slot through which a wicking 50 passes or any suitable absorbent material that will conduct the sealing medium to the cans to be sealed. As the cans pass along the transferring devices for the sealing medium a rotary motion is given to them. This rotary motion is imparted by means of a belt 51, engaging around rollers 52, on the shaft of one of which is a worm-wheel 53, meshing with a worm-wheel 54 on a counter-shaft 55, attached to which is a sprocket-pinion 56, engaged by a sprocket-chain 57, which also engages with a sprocket-pinion 58 on the shaft 6. This belt 51 passes along the inner side of the outer side board 59 and the chute 47, and it is held in the proper tension by means of a tension-roller 60, mounted on an arm 61, mounted to swing on a support 62 and held as adjusted by means of a set-nut 63, engaging with a plate 64, which passes from the support 62 through an arc slot 65 in said arm 61.

It will be noted that the outer side board 59 is supported by standards 66, extended upward from a frame 67, in which the shafts for the rollers 52 have their bearings. The bottom of the chute 47 consists of bars 68, attached to plates 69, which are adjustably connected to plates 70 on the inner side of the frame 67. By thus adjusting the bottom portion the device may be regulated for different sizes of cans or for different depths of flanges on the covers.

Arranged over the chute 47 is a device for holding the cans sufficiently tight against the bars 68 so that the belt 51 may rotate the can. This device consists of a channeled rail 71, in which bearing-balls 72 are arranged, and the ends of this rail are curved upward, as clearly indicated in Fig. 7. From the bars 68 of the chute 47 the sealed cans pass to a conveyer 73 and discharge at any suitable point. Before reaching the belt 51 the boxes are inverted or turned with their covers downward. To cause this turning movement, I provide at the inlet end of the chute 47 a step or riser 74, it being understood that the bars forming the bottom of the chute 47 are at a lower plane than the receiving end of the chute. As the cans move along one behind the other and engaging therewith the first can upon reaching the highest portion of the entrance end of the chute 47 and upon passing slightly beyond the same will tilt over, as indicated by dotted lines *a* in Fig. 7, striking upon the horizontal portion of the riser 74, and will continue to fall to the position indicated by the dotted lines *b* in Fig. 7 and by its momentum will be righted—that is, turned to vertical position. It is to be understood, however, that this inverting mechanism is to be dispensed with without departing from the spirit of my invention. I prefer to employ it, however, because by inverting the cans the sealing medium will flow down between the body of the can and the cover-flange.

Can-bodies made of fiber or similar material often vary somewhat is size or circumference, and therefore in order to use covers of a uniform size the cover-engaging ends of the fiber cans must be reduced in certain instances to a size to receive the cover. For this purpose I arrange over the transferring mechanism 33, and under which the cans momentarily stop, a reducing device or reamer consisting of a cup-shaped head 75, the stem of which has screw or adjustable connection with a plate 76, movable in guides 77, attached to a plate 78 on an upwardly-extended arm 79. A link 80 connects the

plate 76 with the wrist-pin of a crank-wheel 81 on a shaft 82, and on this shaft 82 is a sprocket-pinion 83, from which a chain 84 extends to a sprocket-wheel 85 on the shaft 10. The device 75 is only to be used in connection with fiber-body cans, and therefore is to be thrown out of gear when the machine is used with metal cans. Obviously by means of the link-and-crank mechanism the head 75 will be forced down upon the upper end of a can that may be beneath it, reducing the diameter thereof if such reducing is necessary.

I will now describe the means for carrying covers from a supply-hopper to the point where they are to be placed upon the cans.

Referring particularly to Fig. 4, 86 indicates a hopper for receiving the loose caps or covers, and the front wall of this hopper consists of an endless apron 87, which passes around a drum 88, on the shaft of which is a bevel-gear 89, meshing with a bevel-pinion 90 on the end of the shaft 10. This endless apron 87 passes at its upper portion around a drum 91. The feeder comprises an endless carrier 92, which passes around and is driven by the drum 88 and at the upper end passes around a pulley 93, arranged at one side of a receiving-box 94. At suitable intervals on the outer sides the endless carrier 92 is provided with blocks 95, which are concave on their upper sides to receive the covers and prevent the covers from rolling off the blocks. Should one or more covers accidentally rest upon the cover supported in a block 95, the surplus cover or covers will be discharged by means of a curved plate-spring 96, which extends partly across the line of movement of the covers and is connected to a fixed block 97. As the belt moves upward a cover or covers that may rest upon the cover designed to be carried upward will be forced off by the spring 96, and as the cover resting in the block 95 reaches the spring the said spring will be engaged by the end of the block and moved out of the path of movement of the cover. This arrangement is clearly shown in Figs. 13 and 14. Also I show in these figures a means for separating two covers that may be slightly telescoped one with the other. This means consists of a curved plate 98, extended from the block 97, and is so spaced from the belt or carrier 92 as to permit the cover engaging directly with a block 95 to pass along the inner side of said plate; but the plate will engage with the cover that may extend outward from the cover on the block, and thus separate the outer cover from the one on the block. The receiver 94 is but slightly thicker than the depth of a cover, and therefore the covers drop in the same edge, wise and roll down the inclined bottom 99 into a hopper 100, which is considerably wider than the receiver 94, and the side walls of this hopper converge to their engaging point with a chute 101. Arranged at the upper portion of the hopper 100 and at the center thereof is a trip-finger 102, extended downward from a plate 103, attached to the side walls of the hopper, but spaced above the bottom thereof. This trip-finger is designed to hold a cover momentarily or until the cover falls by gravity flatwise with its rim extending upward—that is, as the cover passes out of the receiver 94 its flange will engage against the finger 102, and then the cover will fall by gravity to one side or the other of the finger and pass underneath the plate 103. For instance, the cover will fall in the direction of its heaviest part, which, of course, is the cover proper from which the flange extends. As before stated, the covers at this time will have their flanges extended upward. It is therefore necessary to reverse them for the purpose of seating the covers on the cans. This reversing is done as the covers pass through a reversed curve portion 104 at the junction of the hopper 100 and the chute or guideway 101. The chute or guideway 101 is inclined downward to its discharging-point over the machine. When more covers are fed into the chute than are required, the portion 105 of the chute will be filled with covers, as indicated in Fig. 4, and then the covers that may pass from the receiver will roll or slide over the uppermost cover in the chute-section 105 into a branch chute 106 and dischrage back into the hopper 86.

Extended slightly across the open lower end of the chute-section 105 are spring-fingers 107, the space between these fingers being less than the diameter of the covers, but permitting a portion of the covers to project, as indicated by dotted lines in Fig. 10 and in full lines in Fig. 1, this projected portion being designed to be engaged by the upper end of a can, as indicated in Fig. 1, so that when the can is moved around with the carrier the cover will be drawn out from between the spring-fingers and will be pressed upon the can by a spring presser-plate 108, attached to a fixed bar 109, the free end of said plate being curved upward, as indicated in Fig. 1.

The general operation of the machine is as follows: The ends, caps, or covers are agitated in the hopper 86 by the endless apron 87. The covers or the like are carried upon the blocks 95, any surplus covers being ejected, as before mentioned, and the covers thus carried up are discharged into the receiver 94, from which they pass to the hopper 100, where they fall flatwise with the flanges extending upward, and upon going around the turn or bend 104 they are reversed, and the lowermost one slightly projects beyond the end of the chute-section 105, as clearly indicated in Fig. 1. An attendant feeds the filled cans from the platform 22 onto the table 25, and the cans are carried around by

the device 24 to the chute 30, from which they are transferred intermittently to the chute-section 32, and as each new can passes into the chute 32 the forward can is forced by the other cans in the chute onto the carrier 2 and against the fingers 13. Upon reaching a certain point the clamping-fingers 14 engage with the cans and move the same into engagement with the projecting portion of a cover, and by continued movement the cover is drawn out from between the spring-fingers, and the device 108 will press the covers tightly onto the cans. The cans are then moved to the sealing device and from the sealing device discharged onto the carrier 73, from which they may be removed by an attendant or discharged into a suitable receptacle.

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

1. A machine for placing covers on cans, comprising a rotary carrier, a receiver for covers into which the covers are disposed edgewise, a hopper with which the receiver communicates, a stop-finger arranged in said hopper adjacent to the receiver, a chute leading from the hopper to the carrier, the said chute having a curve or bend, and means for forcing covers on the cans, as received from the chute.

2. A machine for placing covers on cans comprising a carrier, a hopper for covers, an endless conveyer extending from said hopper upward, a receiver into which the covers are discharged from the conveyer, a hopper with which the receiver communicates, a stop-finger in said hopper, a chute having a curved portion and leading to the carrier, a branch chute for discharging surplus covers into the hopper, and means for pressing the covers on the cans as received from the first-named chute.

3. In a machine for placing covers on cans, a carrier, a receptacle for covers, an agitator forming a wall of said receptacle, a conveyer leading upward from the receptacle, a receiver into which covers are discharged from the conveyer, a hopper with which the receiver communicates, the end of said hopper connecting with the receiver being wider than the space between the walls of the receiver, a stop-finger arranged in said hopper whereby the covers are momentarily held to permit them to drop by gravity with their flanges upward, a chute leading from the hopper to the carrier and having a bend or curve in which the covers are reversed, spring-fingers at the outlet end of the chute, the space between said fingers being sufficient to permit the covers to slightly project beyond the end of the chute, and a presser adjacent to the end of the chute for forcing the covers on the cans during movement of the carrier.

4. In a machine for placing covers on cans, a carrier, means for directing cans to the carrier, a hopper, a receptacle for covers, an endless conveyer leading upward from said receptacle, blocks on said conveyer, concave on their upper sides, means for ejecting surplus covers on the conveyer, a receiver into which the covers are discharged from the conveyer, means for directing the covers from the receiver to the carrier, and means for pressing the covers on the cans during movement of the carrier.

5. In a machine for placing covers on cans, a rotary carrier, curved fingers on said carrier, means for directing cans onto the carrier and into engagement with said fingers, arms mounted to swing on the carrier, clamping-fingers on said arms for engaging with the cans, means for moving said arms for causing the fingers to clamp the cans, means for swinging the arms to cause the fingers to release the cans, means for directing covers to cans on the carrier, said means comprising devices for reversing the covers and means for forcing the covers onto the cans during the movement of the carrier.

6. In a machine for placing covers on cans, a rotary carrier, a rotary receiving-table, disks carried on said table and having recesses for receiving cans, a transferring device to which cans are directed from said rotary receiving-table, a chute leading from said transferring device to the carrier, means for imparting intermittent motion to said transferring device, a chute for directing the covers to cans on the carrier, and means for forcing the covers onto the cans during the movement of the carrier.

7. In a machine for placing covers on cans, a carrier, means for directing covers to cans on the carrier, means for forcing covers onto the cans during movement of the carrier, a device for transferring cans to the carrier, and a vertically-movable can-end-reducing device arranged over said transferring device.

8. In a machine for placing covers on cans, a carrier for the cans, means for directing covers to the cans on the carrier, means for forcing the covers onto the cans, means for applying a sealing medium to the cans received from the carrier, and means for inverting the cans before passing to said sealing device.

9. In a machine for placing covers on cans, a rotary carrier, means for transferring cans to the carrier, means for directing covers to the cans on the carrier, means for pressing the covers onto the cans, a receptacle for a sealing medium having a slot in its front wall, a chute leading from the carrier to said receptacle, a wick in the slot, a chute-section forward of the receptacle, the bottom thereof being vertically adjustable, an endless belt forward of the receptacle for rotating the cans passing along the wick, and means for heating the material in the receptacle.

10. In a machine for placing covers on cans, a carrier for the cans, a receptacle for the covers, a chute for directing the covers to the cans, a conveyer consisting of an endless belt carrying covers from the receptacle to be discharged into the chute, a curved spring at one side of the conveyer, and a curved plate extended across the conveyer but spaced therefrom.

11. In a machine for placing the covers on cans, means for directing covers to cans on the machine, the said means having devices for causing covers to fall by gravity with their flanges upward, and means for reversing the covers to turn the flanges downward.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES CRAWFORD THOM.

Witnesses:

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JOHN G. J. JOHNSON.