No. 897,420. PATENTED SEPT. 1, 1908.

C. T. SMALL.

CAN FILLING MACHINE.

APPLICATION FILED NOV. 25, 1905.

3 SHEETS—SHEET 1.

Fig. 1.

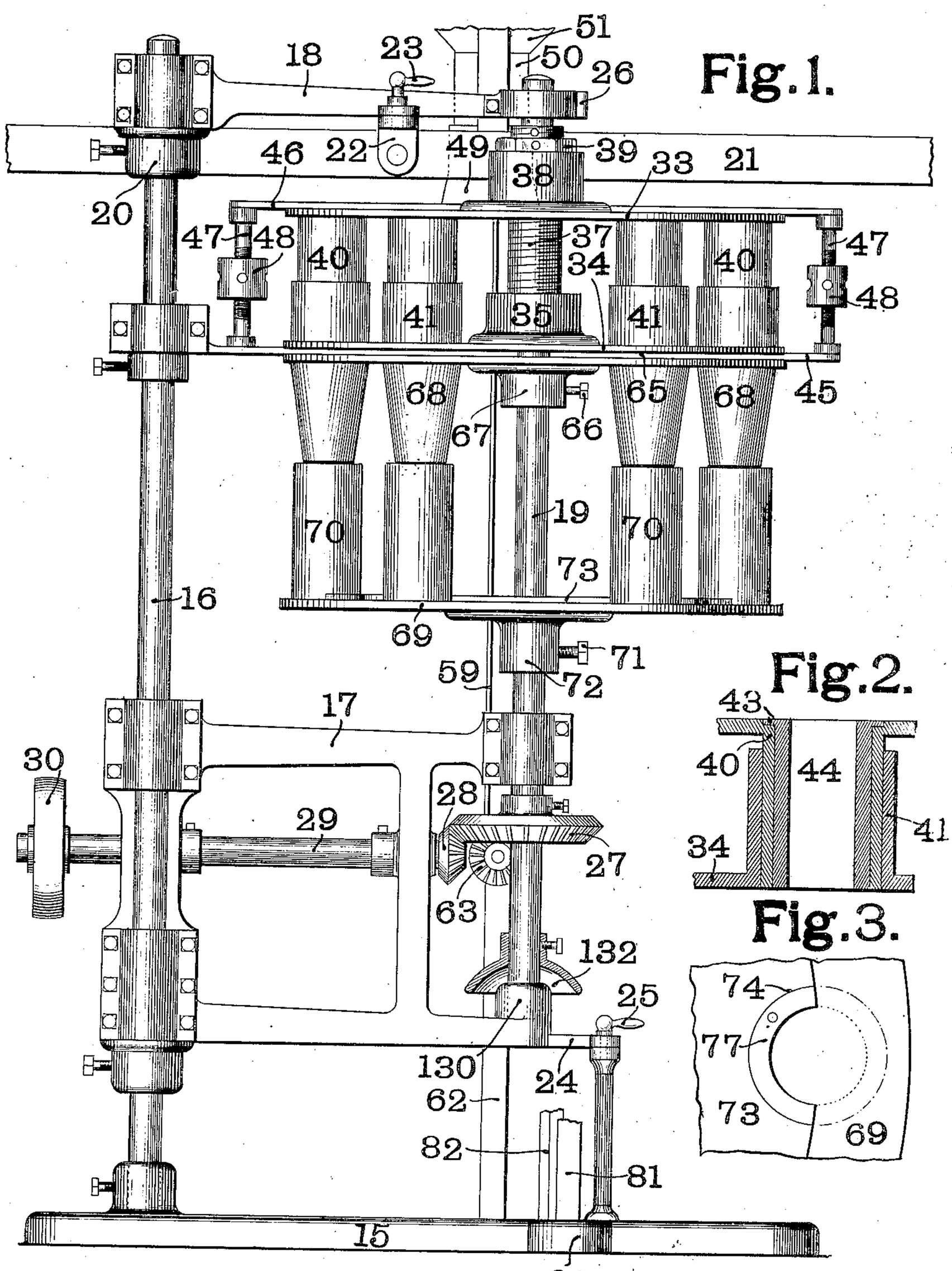

Fig. 2.

Fig. 3.

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3 SHEETS—SHEET 2.

Fig.4.

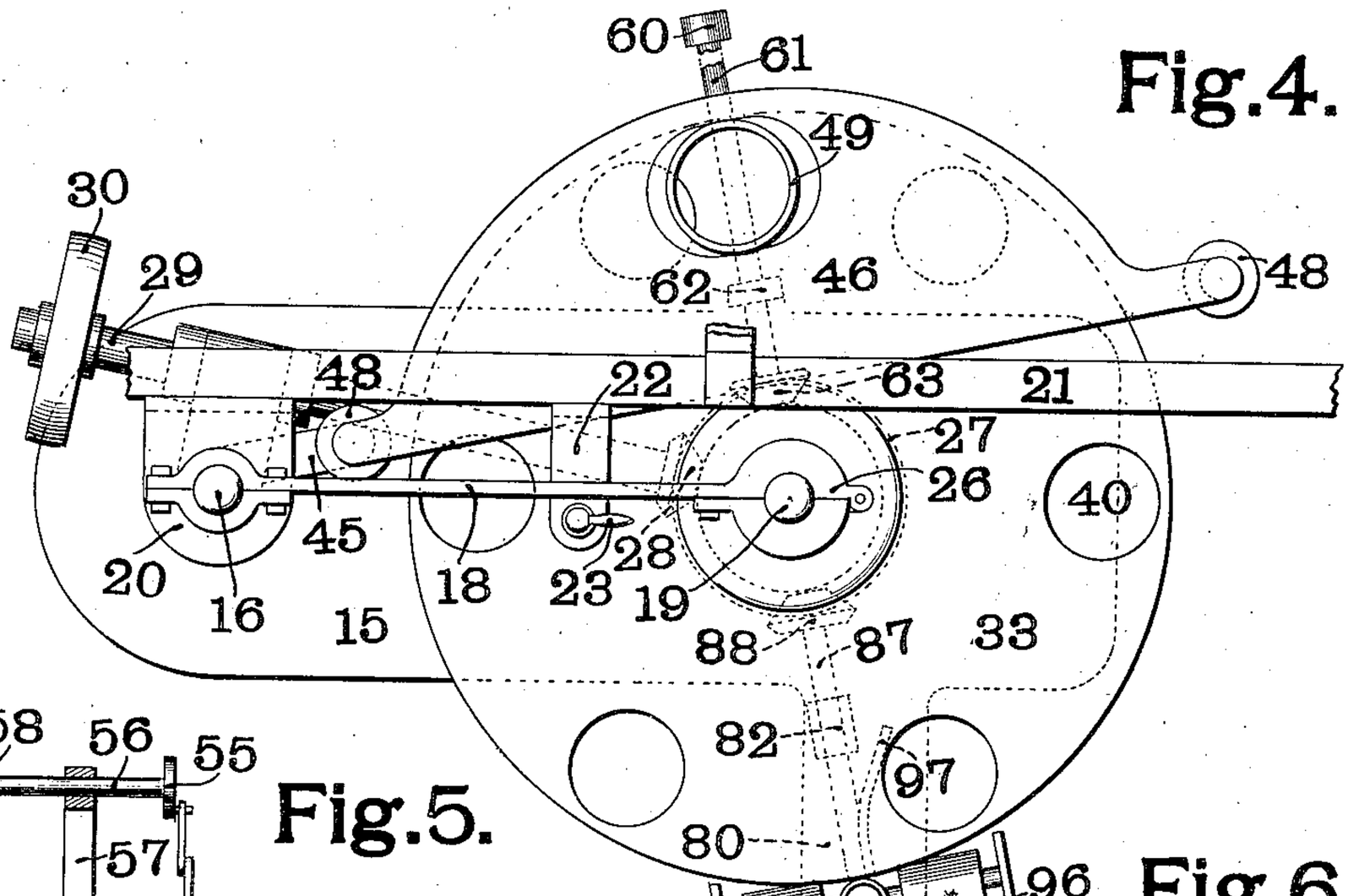


Fig.5.

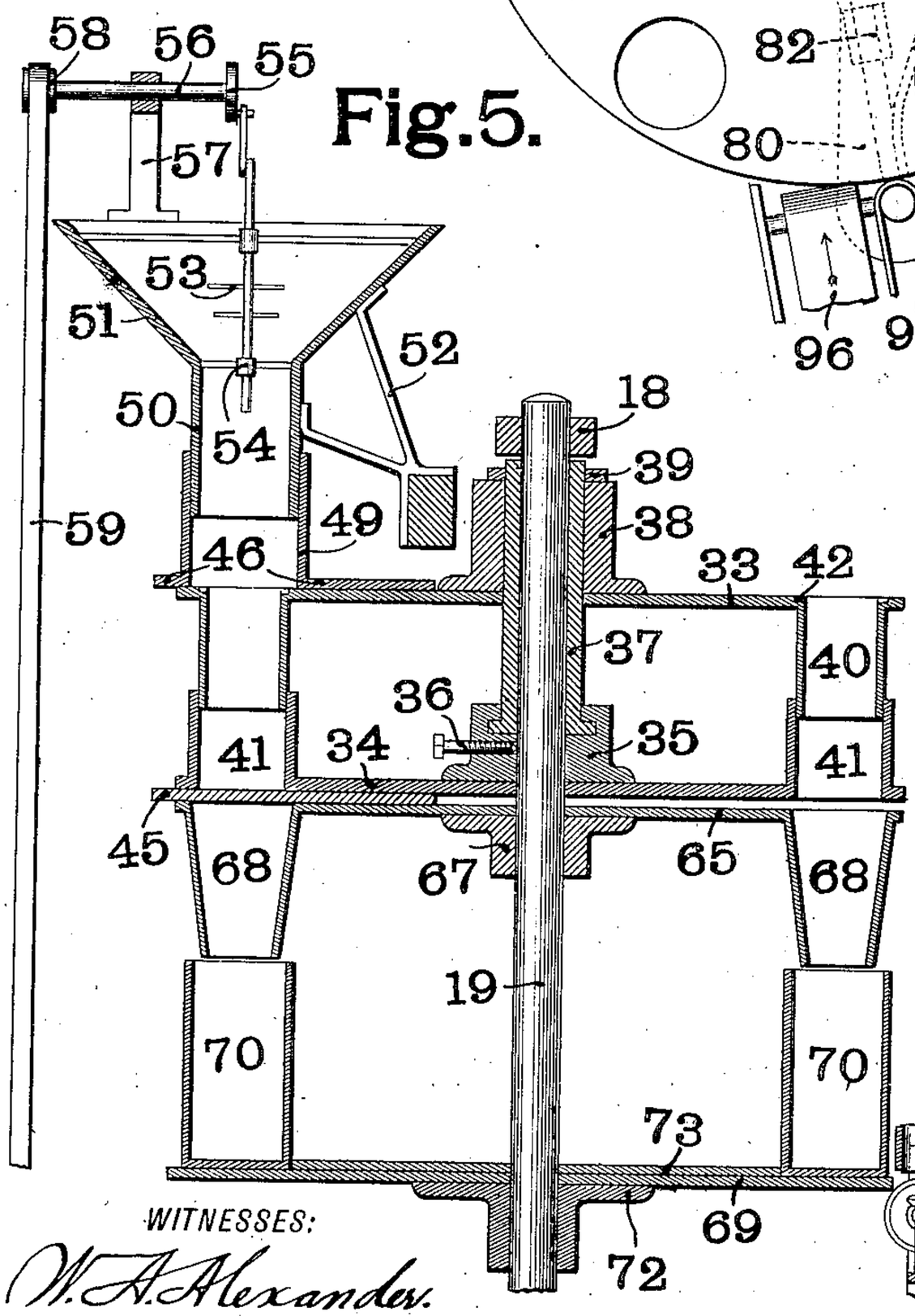
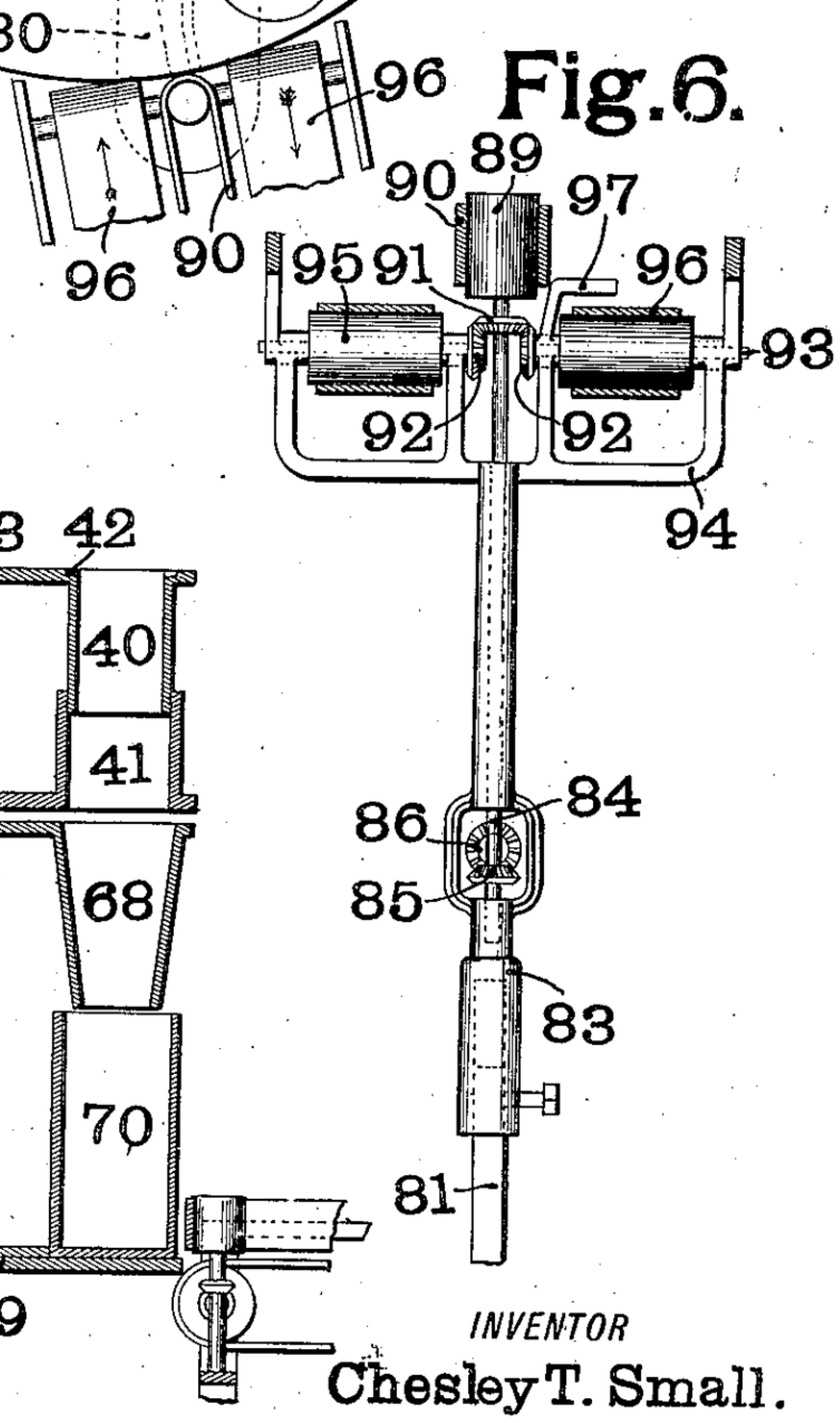


Fig.6.



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APPLICATION FILED NOV. 25, 1905.

3 SHEETS—SHEET 3.

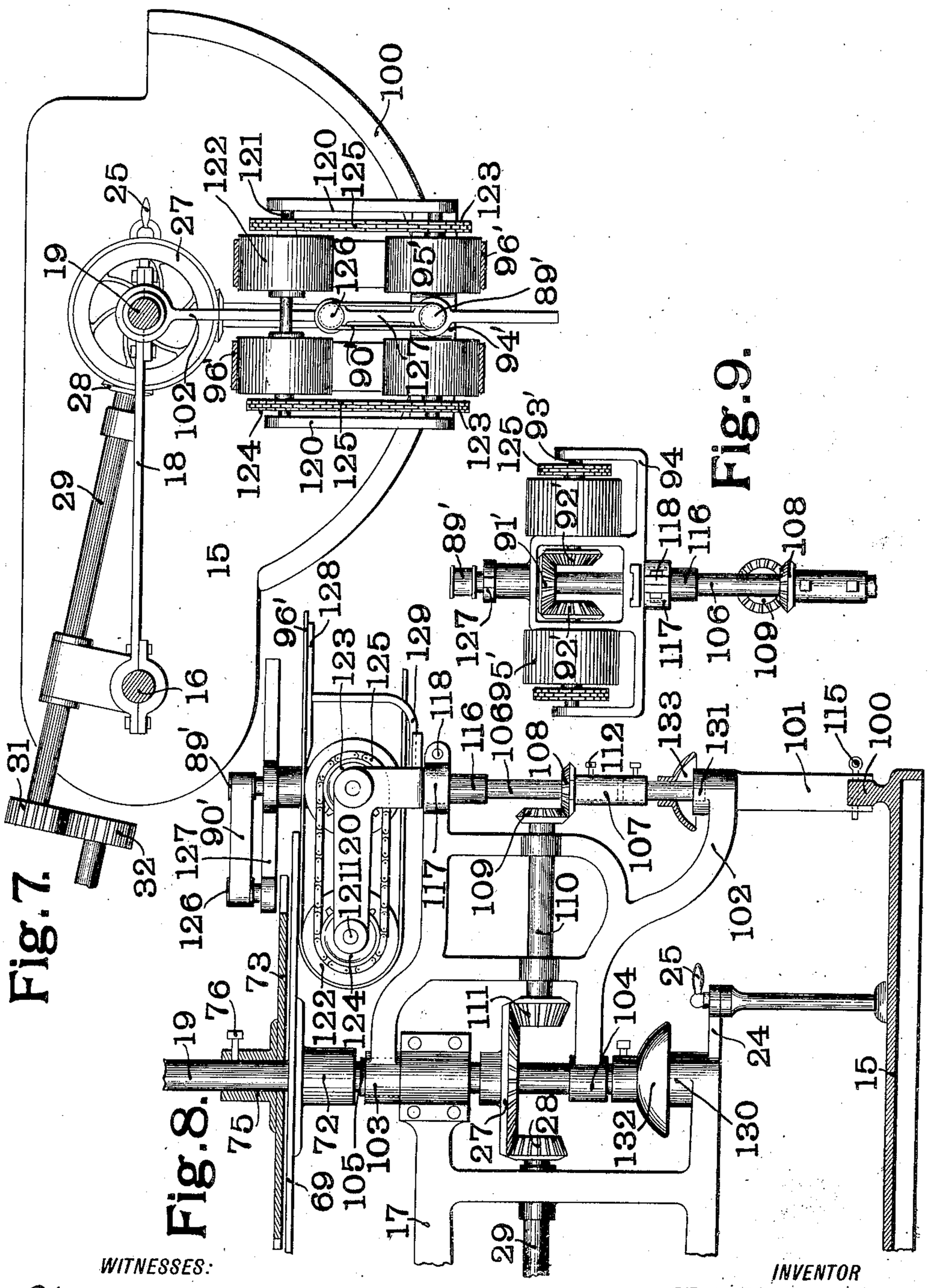

Fig. 7.

Fig. 8.

Fig. 9.

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UNITED STATES PATENT OFFICE.

CHESLEY T. SMALL, OF ST. LOUIS, MISSOURI, ASSIGNOR TO SMALL, TOWNSEND MANUFACTURING COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

CAN-FILLING MACHINE.

No. 897,420. Specification of Letters Patent. Patented Sept. 1, 1908.

Application filed November 25, 1905. Serial No. 289,045.

To all whom it may concern:

Be it known that I, CHESLEY T. SMALL, a citizen of the United States, residing at the city of St. Louis, State of Missouri, have invented a certain new and useful Can-Filling Machine, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

My invention relates more particularly to a machine for filling cans with powder or granular material, but it may be adapted for filling various kinds of material and for filling receptacles of any kind.

In the accompanying drawings, which illustrate a machine made in accordance with my invention, Figure 1 is a front elevation, the device for feeding the cans to and carrying them away from the machine being removed; Figs. 2 and 3 are slightly enlarged detail views showing means for adapting the machine for small sized cans; Fig. 4 is a top plan view; Fig. 5 is a vertical central section through a portion of the machine; Fig. 6 is a detail view of the mechanism for feeding cans to and carrying them away from the machine; Fig. 7 is a horizontal section showing a slight modification; and Figs. 8 and 9 are detail views illustrating the modification shown in Fig. 7.

Like marks of reference indicate similar parts in the several views of the drawings.

15 is the base of the machine carrying an upright 16. The upright 16 has secured to it the main frame of the machine consisting of a lower part 17 and an upper part 18, both pivotally connected to the shaft 16. These parts 17 and 18 carry the main shaft 19. The upper end of the upright 16 is connected by means of a bracket 20 to a cross-beam 21. This cross-beam 21 is also detachably connected with the part 18 of the main frame by means of a bracket 22 and draw bolt 23. In like manner the lower part 17 of the main frame is connected to the base 15 by means of a lug 24 and draw bolt 25. The object of this detachable connection between the main frame and the supporting parts is to allow said main frame to be swung on the upright 16 for purposes which will be hereinafter more fully described. The frame 18 is connected to the main shaft 19 by a hinged bearing 26 so that the said frame may be readily disconnected from the shaft.

Carried on the main shaft 19 is a beveled gear wheel 27, which meshes with a beveled gear wheel 28 on a shaft 29 journaled in bearings carried by the lower part 17 of the main shaft. The shaft 29 is provided with a driving pulley 30, as shown in Figs. 1 and 4, or it may be provided with a spur wheel 31 meshing with a second spur wheel 32, as shown in Fig. 7. Surrounding the upper end of the main shaft 19 are two disks 33 and 34. The lower disk 34 is adjustably secured to the main shaft by means of a hub 35, having a set screw 36. Rotatably mounted in this hub 35 is a threaded sleeve 37, the upper end of which passes through an internally threaded hub 38 on the upper disk 33.

39 is a lock nut for locking the parts in position after they have been adjusted, as will be hereinafter described.

The upper disk 33 is provided with tubular members 40 and the lower member 34 with tubular members 41 in which the first members telescope, the two members 40 and 41 together forming an adjustable measure. It will be evident that by adjusting the disks 33 and 34 toward or away from each other by means of the threaded sleeve 37, the size of the measure will be changed owing to the telescoping of the two parts of the measure. In order to reduce the size of the measure still further after they have been completely telescoped, as shown in Fig. 2, I provide the upper ends of the parts 40 with notches 42 adapted to receive lugs 43 upon removable bushings 44. By placing these bushings in the measures they may be still further reduced after being completely telescoped. Below the disk 34 is a cut-off plate 45 rotatably mounted upon the upright 16. Above the disk 33 is a feed plate 46 similar in form to the cut-off plate 45 and carried by said cut-off plate, the two plates being connected by rods 47 provided with right and left hand threads and joined by means of turn buckles 48 so that when the disks 33 and 34 are adjusted toward or away from each other by means of the threaded sleeve 37 the plates 45 and 46 can be correspondingly adjusted by means of the turn buckles 48. The feed plate 46 has in it a suitable feed opening surrounded by a flange 49 in which telescopes the lower end 50 of a feed hopper 51. The

lower end of the flange 49 is shown slightly enlarged in Fig. 4 so as to allow sufficient time for the material to feed. This enlargement may be made still more pronounced in case the machine is intended for material which does not feed readily. This feed hopper 51 is preferably carried from the beam 21 by means of a bracket 52, as shown in Fig. 5. In order to prevent the material from packing in the feed hopper 51, I prefer to provide it with agitators 53 sliding in guides 54 carried by said hopper. This agitator 53 is actuated from a wrist pin carried upon a disk 55 on a shaft 56, said shaft 56 being supported by a bearing 57 carried on the hopper 51. The shaft 56 is provided with a pulley 58 around which passes a belt 59 also passing around a pulley 60 on a shaft 61. This shaft 61 is preferably carried by an upright 62 on the base plate 15. The shaft 61 is provided with a beveled gear wheel 63 meshing with the beveled gear wheel 27 on the main shaft.

Below the cut-off plate 45 is a disk 65 similar to the disks 33 and 34 and adjustably secured to said main shaft by means of a set screw 66 passing through the hub 67 of said disk. This disk 65 is provided with openings arranged opposite to the measures carried by the disks 33 and 34, and projecting below these openings are funnels 68 adapted to guide the material into the cans or other receptacles to be filled. Below the disks 65 is a disk 69 adapted to receive the cans 70 or other receptacles. This disk 69 is adjustably secured to the main shaft 19 by means of a set screw 71 passing through a hub 72 on said disk. In order properly to locate the cans upon the disk 69, it has upon its upper surface a second disk 73 having in its periphery cylindrical recesses 74 adapted to receive the lower ends of the cans 70. The disk 73 may be carried directly by the disk 69, as shown in Figs. 1 and 5, or it may be made separate therefrom, as shown in Fig. 8, and be provided with a hub 75 and set screw 76, so that it may be adjusted independently of the disk 69. In order to adapt the machines for cans smaller in diameter, I provide filling pieces 77, as shown in Fig. 3, which may be placed in the recesses 74 so as to reduce their size.

In order to feed the cans to the machine and carry them away therefrom, I prefer to provide some automatic device. One form of this device is shown in Figs. 4, 5 and 6. As shown in these figures and in Fig. 1, the base 15 is provided with a forward extension 80 carrying uprights 81 and 82. Carried by the upright 81 is an adjustable sleeve 83 in which is mounted a shaft 84. This shaft 84 is provided with a beveled gear wheel 85 meshing with a second beveled gear wheel 86 on a shaft 87 journaled in the upright 82. The opposite end of the shaft 87 is provided with a beveled gear wheel 88 meshing with the beveled gear wheel 27 on the main shaft of the machine. The upper end of the shaft 84 is provided with a pulley 89 around which passes a belt 90. Below the pulley 89 is a beveled gear wheel 91 meshing with a pair of beveled gearwheels 92 each mounted upon a shaft 93 journaled in a frame 94 carried at the upper end of the adjustable sleeve 83. Upon each of the shafts 93 is a pulley 95 around which passes a belt 96. The belt 96 upon the right hand side carries the cans away from the machine while that on the left hand side carries the cans to the machine. In order to remove the cans from the machine and deliver them to the right hand belt 96 I provide a deflecting finger 97, said finger being carried by the frame 94. The belt 90 assists both of the carrying belts 96, as one side runs adjacent to the right hand belt 96 and moves in the same direction as said belt, while the other side is adjacent to the left hand belt 96 and also moves in the same direction as said second belt.

The form of device for feeding and removing the cans from the machine above described interferes somewhat with the movement of the main frame of the machine upon its shaft in order to facilitate cleaning and is not readily adjusted vertically, and for these reasons I prefer to use the form shown in Figs. 7, 8 and 9. In this form the base 15 in place of being provided with a projection 80 is provided with a semicircular track 100, upon which moves a downward extension 101 of a frame 102 pivoted around the main shaft 19. The frame 102 may be secured in various positions around the main shaft 19 by means of a cotter pin 115 passing through the extension 101 and the track 100. The frame 102 is provided with two bearings 103 and 104. The lower bearing 104 may directly surround the shaft 19, but I prefer to have the upper bearing 103 mounted upon a collar or bushing 105 carried on the lower part 17 of the main frame so as to avoid friction. The frame 102 has mounted in it a shaft 106. The lower end of this shaft 106 is slidingly mounted in a sleeve 107 carrying a bevel gear wheel 108. This bevel gear wheel 108 meshes with a beveled gear wheel 109 on a shaft 110 mounted in the frame 102. The opposite end of the shaft 110 is provided with a beveled gear wheel 111 meshing with the beveled gear wheel 27 on the main shaft. The shaft 106, as above stated, is slidingly mounted in the sleeve 107 so that the can feeding apparatus can be adjusted up or down to correspond to the adjustment of the disk 69. The shaft is secured in its proper position by means of a set screw 112. In this construction the frame 94′ is pivoted with a sleeve or bushing 116 surrounding the shaft 106 and passing through a bearing 117 carried by the frame 102, the said bearing 117 being provided with a clamping device 118 so as to clamp the frame in desired position.

It will be seen that by this construction the frame 94′ can either be swung on the shaft 106 as a pivot or can be suitably raised or lowered to correspond with the adjustment of the disk 69. In this construction the frame 94′ is also provided with rearwardly projecting arms 120 carrying a shaft 121 on which are mounted pulleys 122, the belts 96′ passing around the pulleys 122 in addition to the pulleys 95′. In this construction the belts 96′ may pass to a distance or may simply pass around the two pulleys, as shown in Fig. 7. In order to drive the rear pulleys 122 I provide the front pulleys 95′ with sprockets 123 and the rear pulleys 122 with sprockets 124, around which sprockets pass sprocket chains 125. These may, however, be omitted in case the belts 96′ pass only around the two pulleys, as shown in Fig. 7, as the belts themselves will then serve to drive the rear pulleys. In this construction the belt 90′ in place of passing forward from the pulley 89′ is carried to the rear and passes around a second pulley 126 carried by a rearwardly projecting arm 127. The belt 90′ thus performs the same function as the finger 97 in the previously described construction. In order to support the cans when passing from the disk 69 I prefer to provide a table 128, as shown in Fig. 8, which table may lie directly under the belt 96′, or in case the short belts are used, as shown in Fig. 7, it may receive the cans directly. This table 128 is removably carried on a lug 129 on the frame 94′. In order to protect the step bearings 130 and 131 at the lower ends of the shafts, 19 and 106 respectively, I provide the said shafts with guards 132 and 133. These guards will prevent the entrance of the material handled by the machine into the said step bearings.

In the operation of my machine the material to be filled is fed into the hopper 51 and is stirred by the agitator 53. The material passes down through the opening in the feed plate 46 and when one of the measures passes beneath said opening it is filled with material, the cut-off plate 45 closing the lower end of the measure. After this the measure passes around in a right hand direction until it moves out of contact with the cut-off plate 45. As soon as it has passed the cut-off plate the contents of the measure will drop down through the openings in the disk 65 into the cans 70 being guided by the funnels 68. The cans are removed either by the finger 97, as shown in Fig. 4, or by the belt 90 shown in Figs. 7 and 8. The cans are fed away from the disk 69 by the right hand belt 96. In order to change the size of the measures it is only necessary to properly adjust the disks 33 and 34 by means of the sleeve 37 and after the measures have been completely telescoped the bushings 44 may be resorted to to further decrease the size of the measures. When a difference in size of the cans is obtained by reducing their height only the disk 69 can be adjusted upwardly upon the main shaft 19, and when the cans are reduced in diameter, also the filling pieces 77 may be resorted to to bring the cans into the proper position under the funnels 68. It will be seen that the device for feeding the cans to the machine and removing the same therefrom shown in Figs. 7, 8 and 9, is completely adjustable to the machine. It may be moved circumferentially as a whole around the central shaft 19 running upon the track 100 and be secured in any suitable position by means of the cotter pin 115. In addition to this the device may be rotated upon its own shaft 106 to place it in any suitable angle to the radial line through the said shaft and the shaft 19. The device may also be adjusted vertically to correspond to any adjustment of the disk 69. The object of swinging the main frame of the machine upon the shaft 16 is to facilitate cleaning the machine. It will be seen that by the construction shown the main frame may be swung around the shaft 16 by removing the draw bolt 25 and at the same time the feed plate 46 and the cut-off plate 45 may be independently swung upon the said shaft 16 and the upper part 18 of the main frame may be disconnected from the shaft 16 by means of the hinged bearing 26, so that the machine is completely accessible for cleaning. When the main frame is swung upon the shaft 16, if the shaft 29 is provided with a pulley 30, as shown in Fig. 1, it will be necessary to remove the belt. If, however, the gearing shown in Fig. 7 is used, the gear wheel 31 will simply be swung out of mesh with the wheel 32.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is—

1. In a machine for filling cans or the like the combination with a rotary member provided with a plurality of measures, of a second rotary member for holding the cans or the like, a normally stationary cut-off plate between said rotary members, means whereby said first named rotary member and cut-off plate are movable laterally out of engagement with each other, and means for feeding material to said measures.

2. In a machine for filling cans or the like, the combination with a rotary member provided with a plurality of measures, of a second rotary member for holding cans or the like, a normally stationary cut-off plate between said rotary members, said cut-off plate being less than a circle, means whereby said first named rotary member and said cut off plate are movable laterally out of engagement with each other, and means for feeding material to said measures.

3. In a machine for filling cans or the like, the combination with a rotary member provided with a plurality of measures, of a second rotary member for holding the cans or the like, a normally stationary and substantially semi-circular cut-off plate between said rotary members, means whereby said first named rotary member and cut-off plate are movable laterally out of engagement with each other, and means for feeding material to said measures.

4. In a machine for filling cans or the like, the combination with a rotary member provided with a plurality of measures, of a second rotary member for holding the cans or the like, a normally stationary cut-off plate between said rotary members, a feed-plate arranged above said first named rotary member and attached to said cut-off plate, means whereby said first named rotary member and said plates are movable laterally out of engagement with each other, and means for feeding material to said measures.

5. In a machine for filling cans or the like, the combination with a rotary member provided with a plurality of adjustable measures, of a second rotary member for holding the cans or the like, a normally stationary cut-off plate between said rotary members, a feed-plate arranged above said first rotary member and adjustably attached to said cut-off plate, means whereby said first named rotary member and said plates are movable laterally out of engagement with each other, and means for feeding material to said measures.

6. In a machine for filling cans or the like, the combination with a rotary member provided with a plurality of measures, of a second rotary member for holding the cans or the like, a normally stationary and substantially semi-circular cut-off plate between said rotary members, a substantially semi-circular feed-plate arranged above said first rotary member and attached to said cut-off plate, means whereby said first named rotary member and said plates are movable laterally out of engagement with each other, and means for feeding material to said measures.

7. In a machine for filling cans or the like, the combination with a rotary member provided with a plurality of adjustable measures, of a second rotary member for holding the cans or the like, a normally stationary and substantially semi-circular cut-off plate between said rotary members, a substantially semi-circular feed-plate arranged above said first named rotary member and adjustably connected to said cut-off plate, means whereby said first named rotary member and said plates are movable laterally out of engagement with each other, and means for feeding material to said measures.

8. In a machine for filling cans or the like, the combination with a rotary member provided with a plurality of measures, of a second rotary member for holding the cans or the like, a normally stationary cut-off plate between said rotary members, a pivotal frame carrying said first named rotary member and adapted to swing the same out of engagement with said cut-off plate, and means for feeding material to said measures.

9. In a machine for filling cans or the like, the combination with a rotary member provided with a plurality of measures, of a second rotary member for holding the cans or the like, a normally stationary and substantially semi-circular cut-off plate between said rotary members, a pivotal frame carrying said first named rotary member and adapted to swing the same out of engagement with said cut-off plate, and means for feeding material to said measures.

10. In a machine for filling cans or the like, the combination with a rotary member provided with a plurality of measures, of a second rotary member for holding cans or the like, a normally stationary cut-off plate between said rotary members, a feed-plate arranged above said first named rotary member and attached to said cut-off plate, a pivotal frame carrying said first named rotary member and adapted to swing the same out of engagement with said plates, and means for feeding material to said measures.

11. In a machine for filling cans or the like, the combination with a rotary member provided with a plurality of adjustable measures, of a second rotary member for holding the cans or the like, a normally stationary cut-off plate between said members, a feed-plate arranged above said first named rotary member and adjustably attached to said cut-off plate, a frame carrying said first named rotary member and adapted to swing the same out of engagement with said plates, and means for feeding material to said measures.

12. In a machine for filling cans or the like, the combination with a rotary member provided with a plurality of measures, of a second rotary member for holding the cans or the like, a normally stationary and substantially semi-circular cut-off plate between said rotary members, a substantially semi-circular feed-plate arranged above said first rotary member and attached to said cut-off plate and a pivotal frame carrying said first named rotary member and adapted to swing the same out of engagement with said plates, and means for feeding material to said measures.

13. In a machine for filling cans or the like, the combination with a rotary member provided with a plurality of measures, of a second rotary member for holding the cans or the like, a normally stationary and substantially semi-circular cut-off plate between said rotary members, a substantially semi-circular feed-plate arranged above said first named

rotary member and adjustably attached to said cut-off plate, a frame carrying said first named rotary member and adapted to swing the same out of engagement with said plates, and means for feeding material to said measures.

14. In a machine for filling cans or the like, the combination with a rotary member consisting of a pair of disks, of telescoping measures carried by said disks, a sleeve rotatably connected to one of said disks but immovable longitudinally with respect thereto and having a screw connection with the other of said disks, and means for feeding material to said measures.

15. In a machine for filling cans or the like, the combination with a rotary member consisting of a pair of disks, of telescoping measures carried by said disks, a shaft, means for securing one of said disks at different points on said shaft, a sleeve rotatably secured to one of said disks but immovable longitudinally with respect thereto and having a screw connection to the other of said disks, and means for feeding material to said measures.

16. In a machine for filling cans or the like, the combination with a rotary member consisting of a pair of disks, of telescoping measures carried by said disks, a shaft, means for securing one of said disks at different points on said shaft, a sleeve rotatably connected to one of said disks but immovable longitudinally with respect thereto and having a screw connection to the other of said disks, means for locking said sleeve to said latter named disk, and means for feeding material to said measures.

17. In a machine for filling cans or the like, the combination with a feed-hopper, of a frame pivot to swing towards and away from said hopper, a rotary member carried by said frame and provided with a plurality of measures, a second rotary member for holding the cans or the like also carried by said frame, and a cut-off plate between said rotary members.

18. In a machine for filling cans or the like, the combination with a feed-hopper, of a frame pivot to swing towards and away from said hopper, a rotary member carried by said frame and provided with a plurality of measures, a second rotary member for holding the cans or the like also carried by said frame, a cut-off plate between said rotary members, and a feed-plate attached to said cut-off plate and connected with said hopper.

19. In a machine for filling cans or the like, the combination with a pivoted frame, of a rotary member provided with a plurality of measures and carried by said frame, a second rotary member carried by said frame for holding the cans or the like, a second pivoted frame, a cut-off plate between said rotary members and carried by said second frame, and means for feeding material to said measures.

20. In a machine for filling cans or the like, the combination with a pivoted frame, of a rotary member provided with a plurality of adjustable measures and carried by said frame, a second rotary member for holding the cans or the like also carried by said frame, a second pivoted frame, a cut-off plate interposed between said rotary members and carried by said second frame, and means for feeding material to said measures.

21. In a machine for filling cans or the like, the combination with a pivoted frame, of a rotary member provided with a plurality of measures and carried by said frame, a second rotary member for holding the cans or the like and also carried by said frame, a third rotary member interposed between said first and second members and provided with funnels, said third rotary member being also carried by said frame, a second pivoted frame, and a cut-off plate interposed between said first and third rotary members and carried by said second frame.

22. In a machine for filling cans or the like, the combination with a pivoted frame, of a rotary member provided with a plurality of measures and carried by said frame, a second rotary member for holding the cans or the like also carried by said frame, a second pivoted frame, a cut-off plate between said rotary members and carried by said second frame, a feed plate above said first rotary member and also carried by said second frame, and means for feeding material to said measures.

23. In a machine for filling cans or the like, the combination with a pivoted frame, of a rotary member provided with a plurality of adjustable measures and carried by said frame, a second rotary member for holding the cans or the like and also carried by said frame, a second pivoted frame, a cut-off plate between said rotary members and carried by said second frame, a feed plate above said first rotary member and also carried by said second frame, and means for feeding material to said measures.

24. In a machine for filling cans or the like, the combination with a pivoted frame, of a rotary member provided with a plurality of measures and carried by said frame, a second rotary member for holding the cans or the like also carried by said frame, a third rotary member interposed between said first and second members and provided with funnels, said third rotary member being also carried by said frame, a second pivoted frame, a cut-off plate interposed between said first and third rotary members and carried by said second frame, and a feed plate above said first rotary member and carried by said second frame.

25. In a machine for filling cans or the like, the combination with a rotary can holding device, of a can filling device, a feeding device for feeding cans to and removing cans from said rotary can holding device, and means for circumferentially adjusting said can feeding device with reference to said rotary can holding device.

26. In a machine for filling cans or the like, the combination with a rotary can holding device, of a can filling device, a feeding device for feeding cans to and removing cans from said rotary can holding device, means for circumferentially adjusting said can feeding device with reference to said rotary can holding device and independent means for varying the angle of said can feeding device.

27. In a machine for filling cans or the like, the combination with a rotary member adapted to hold the cans, of means for feeding material to the cans while carried by said rotary member, a conveyer traveling in a substantially horizontal plane for feeding the cans directly to said rotary member, said conveyer being adjustable around said rotary member, and means permanently in operation during the action of the machine for driving said rotary member and conveyer from a common source of power, whereby the same relative speed is maintained between said rotary member and conveyer.

28. In a machine for filling cans or the like, the combination with a rotary member adapted to hold the cans, of means for feeding material to the cans while carried by said rotary member, a conveyer traveling in a substantially horizontal plane for carrying the cans directly from said rotary member, said conveyer being adjustable around said rotary member, and means permanently in operation during the action of the machine for driving said rotary member and conveyer from a common source of power, whereby the same relative speed is maintained between said rotary member and conveyer.

29. In a machine for filling cans or the like, the combination with a main shaft, of a can holding device carried by said main shaft, a can filling device also carried by said shaft, a frame pivoted to said main shaft, and a can feeding device carried by said frame.

30. In a machine for filling cans or the like, the combination with a main shaft, of a can holding device carried by said shaft, a can feeding device also carried by said shaft, a frame pivotally mounted to said shaft, a second shaft carried by said frame and driven from said first named shaft, a pair of feeding belts carried by said frame and driven in opposite directions from said second shaft, and a third belt arranged between said first named belts and also driven by said second shaft.

In testimony whereof, I have hereunto set my hand and affixed my seal in the presence of the two subscribing witnesses.

CHESLEY T. SMALL. [L. S.]

Witnesses:

THOS. K. WILLOUGHBY,

J. D. QUILLIN.