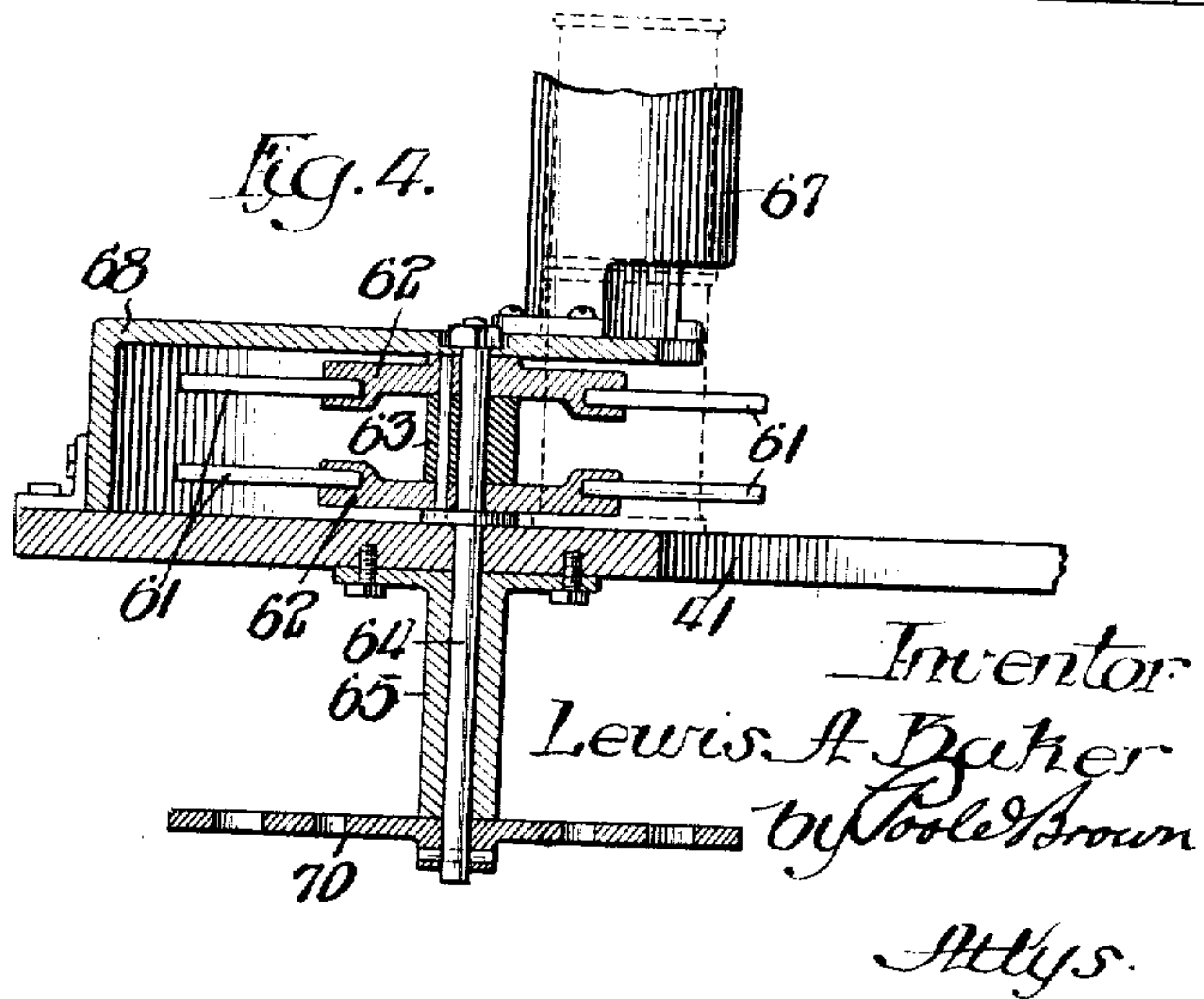
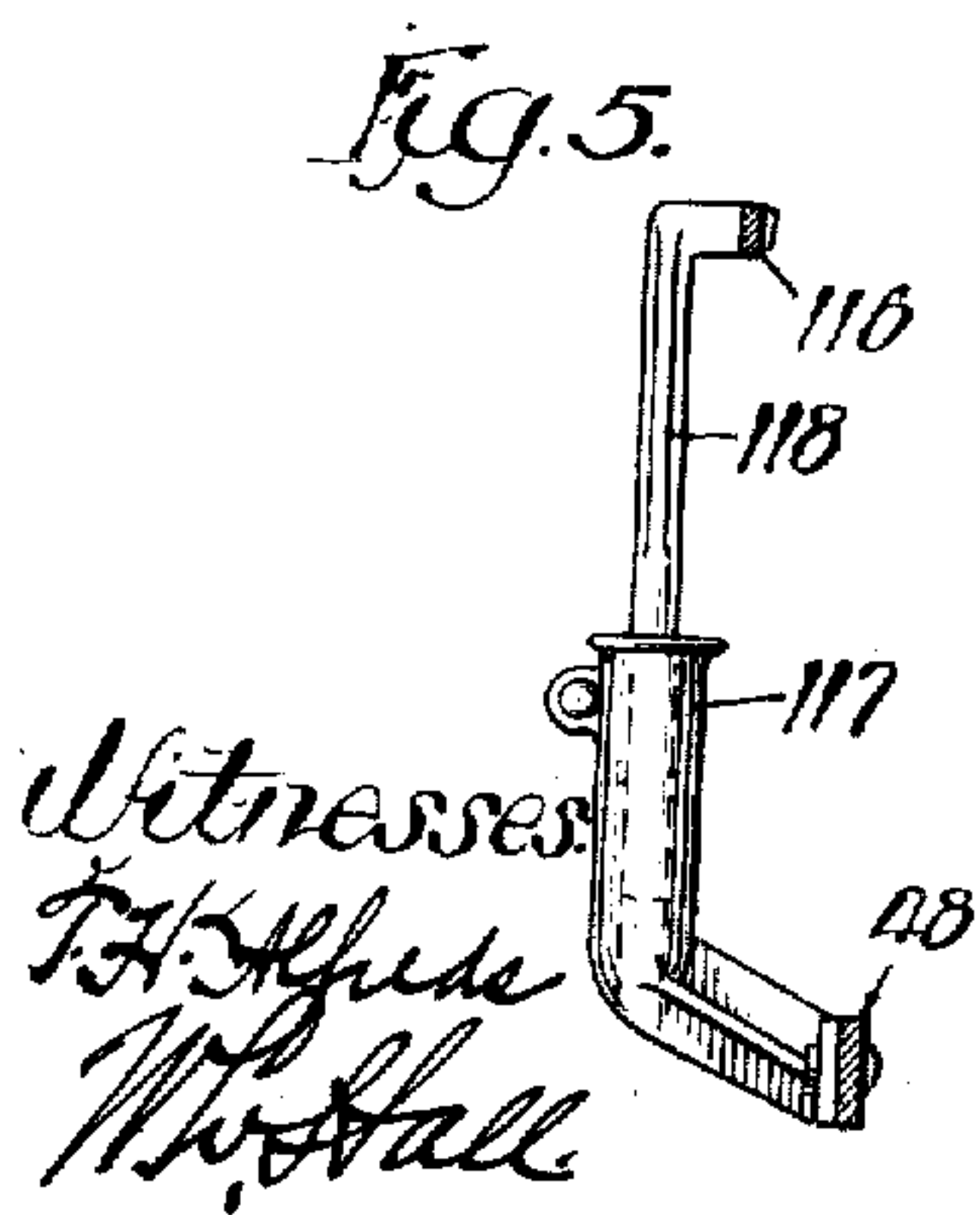
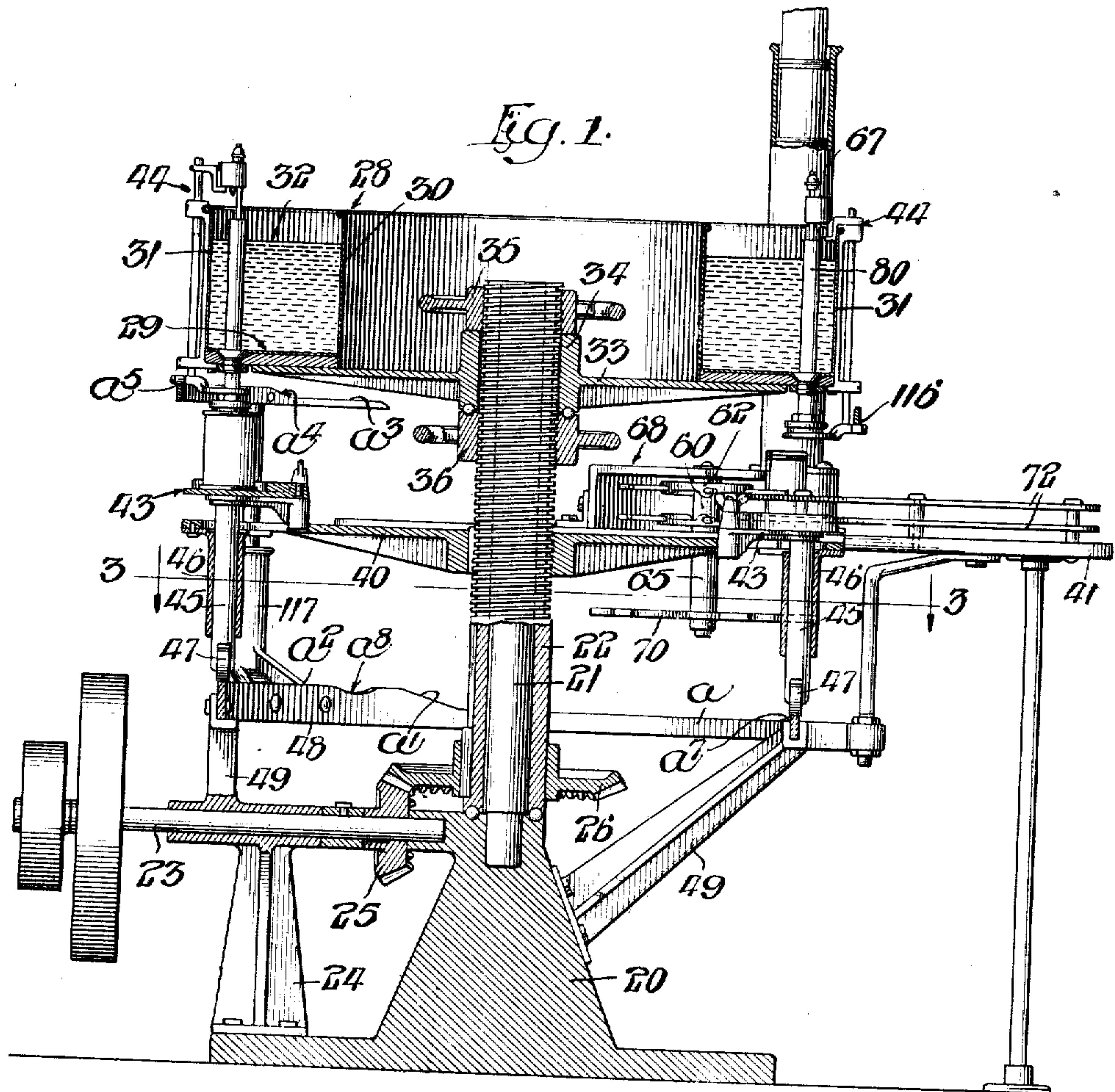


910,265.

L. A. BAKER.
CAN FILLING MACHINE.
APPLICATION FILED JULY 25, 1907.

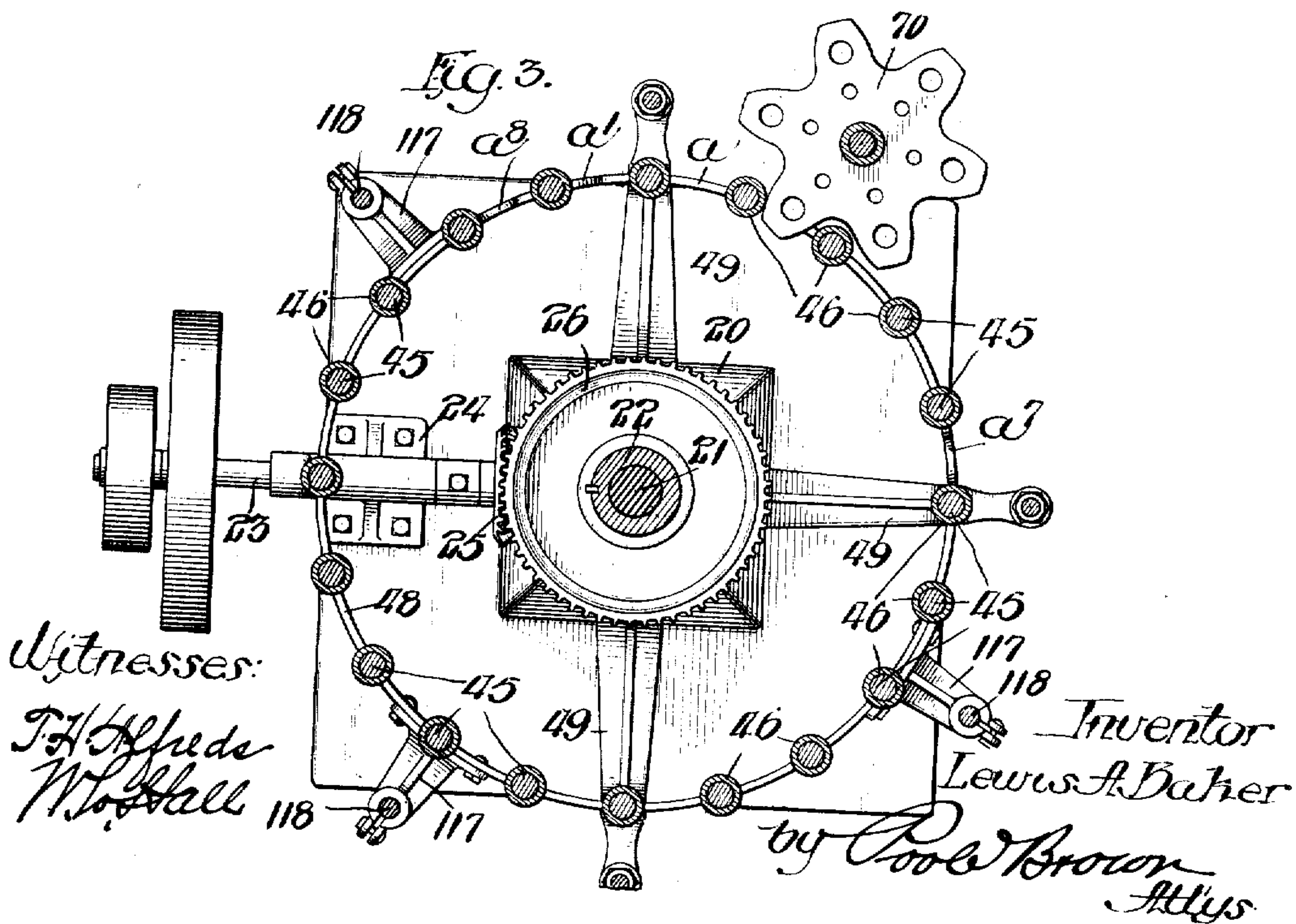
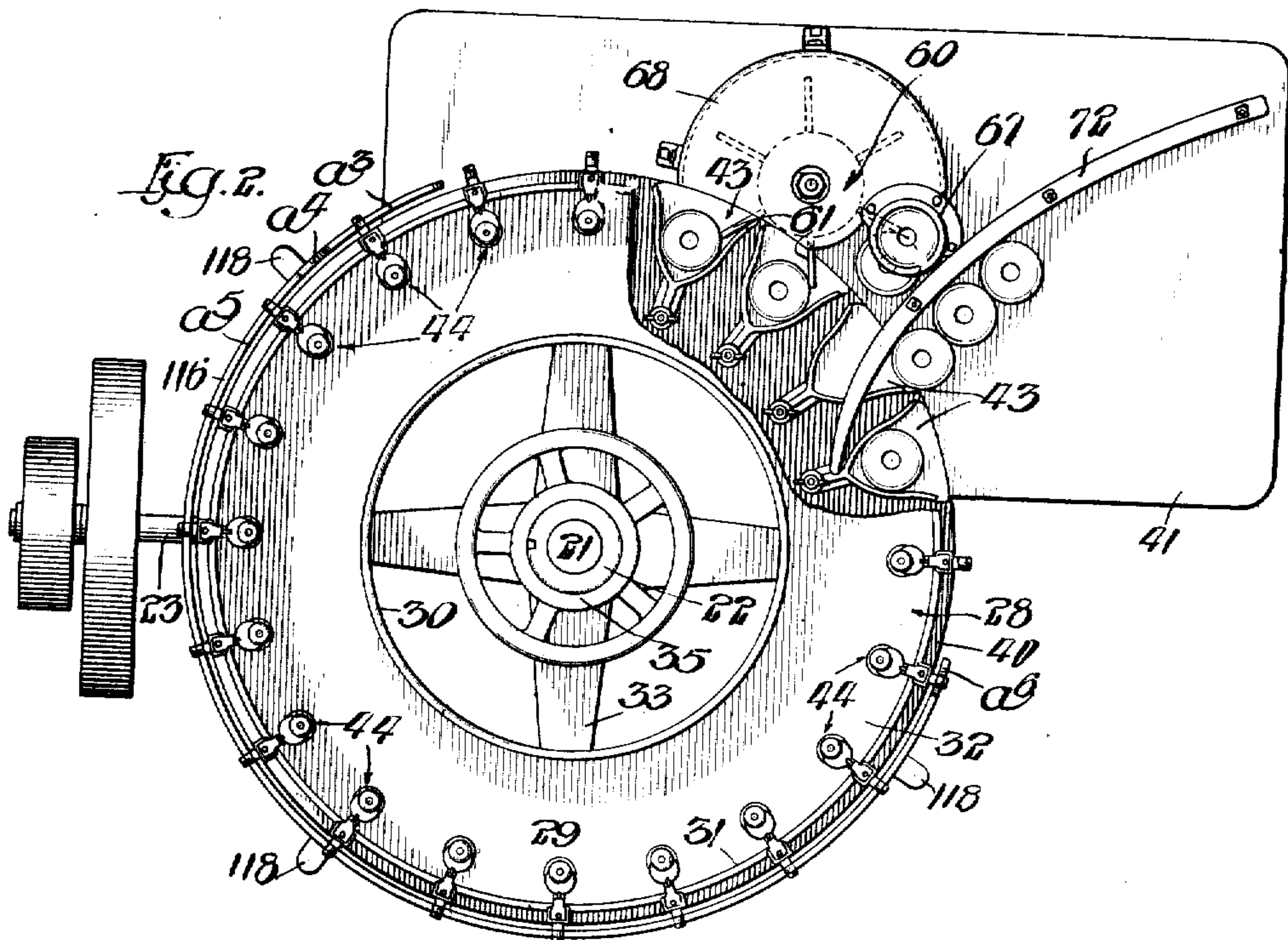
Patented Jan. 19, 1909.
4 SHEETS—SHEET 1.



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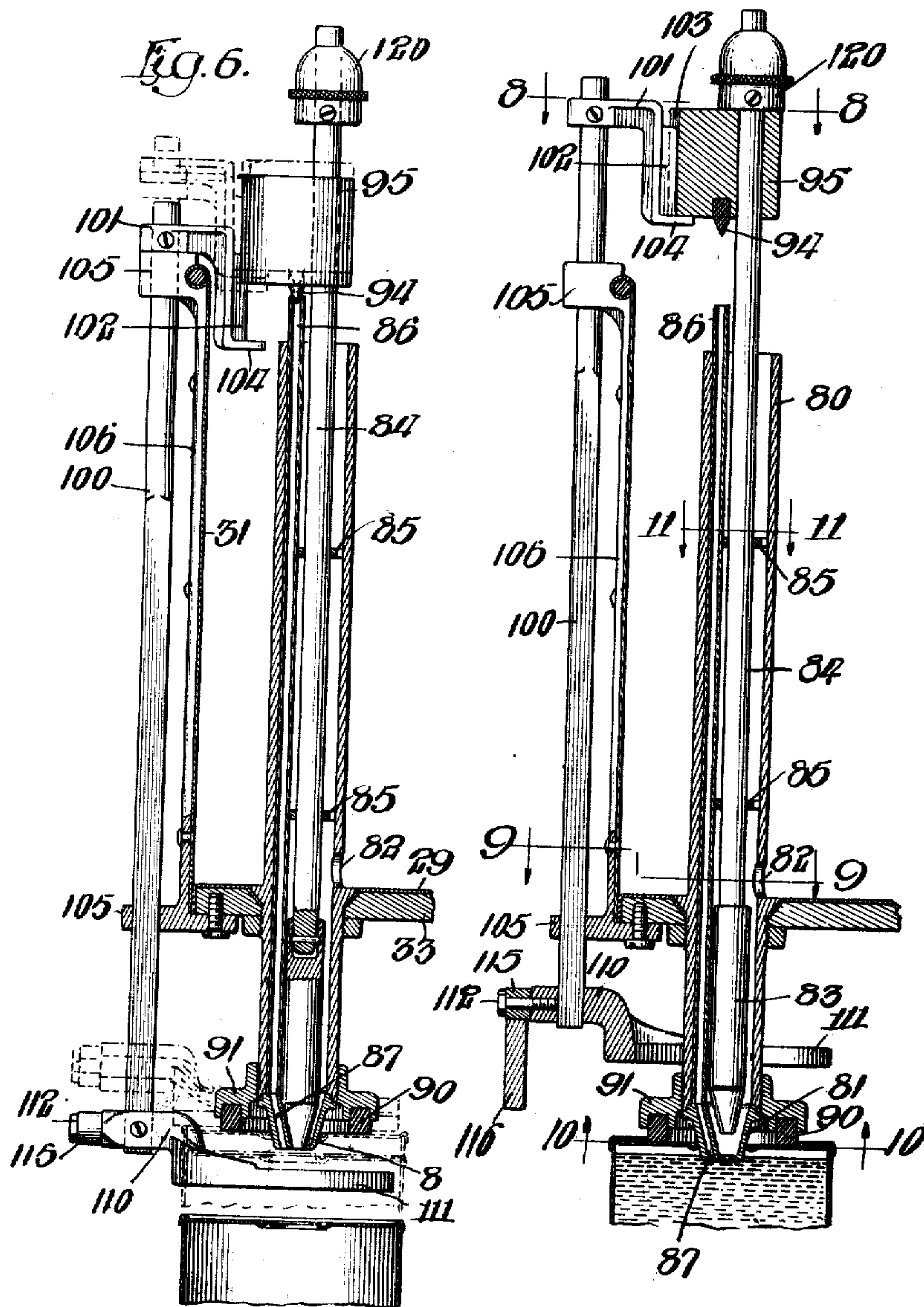
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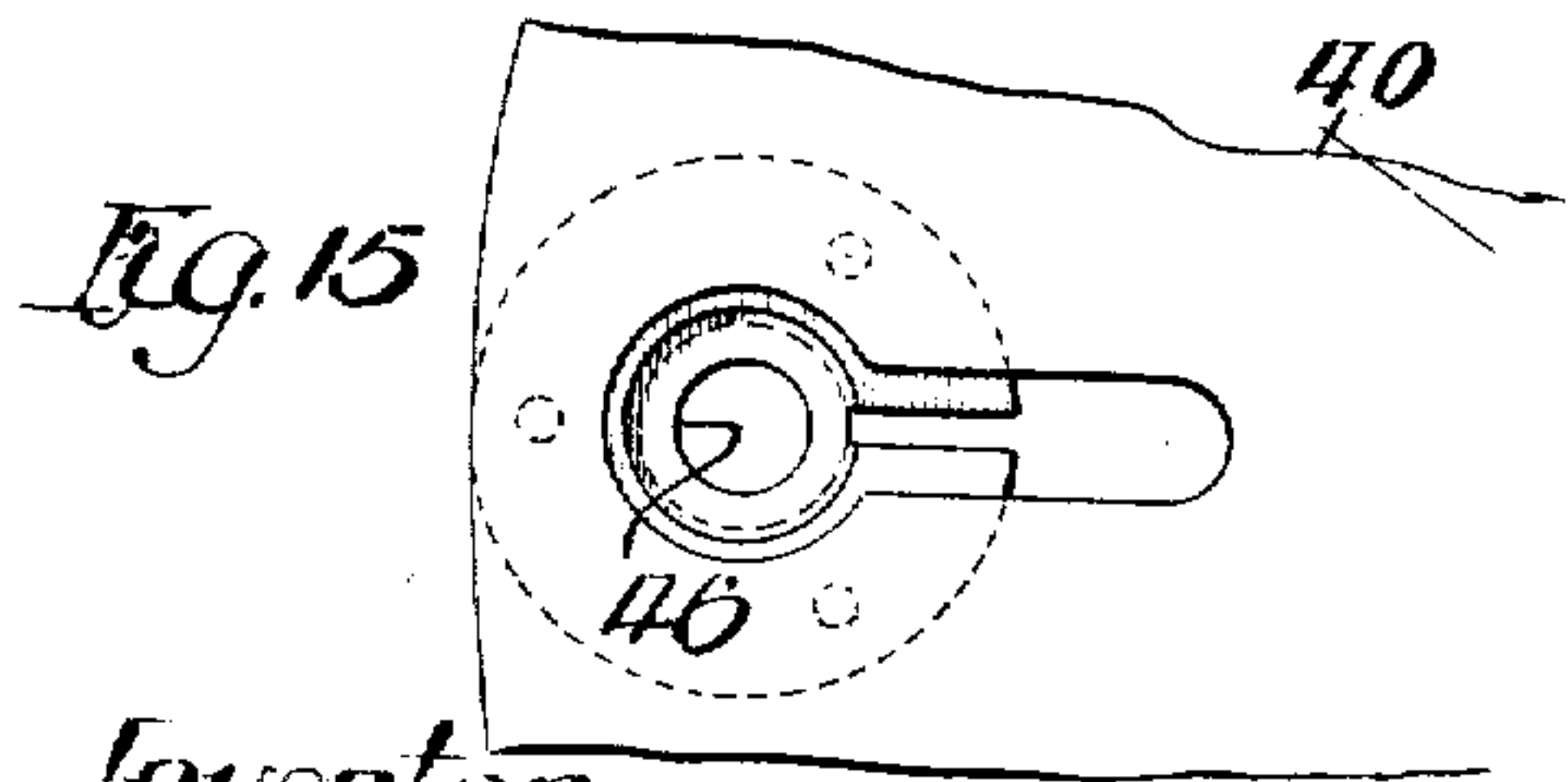
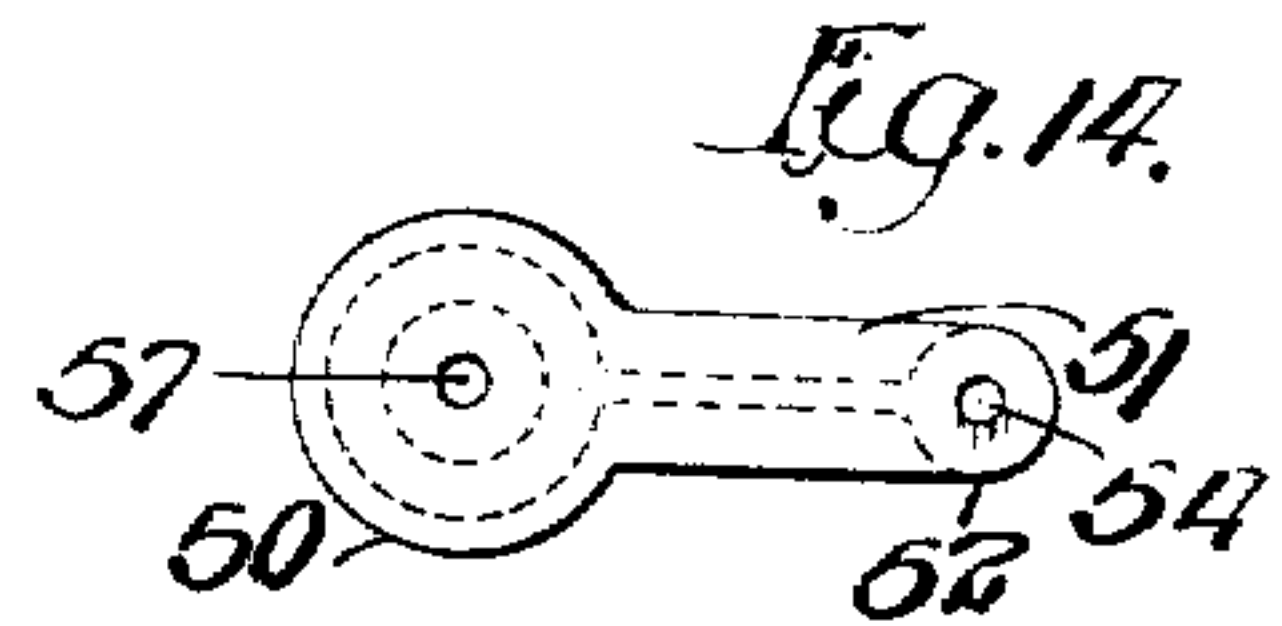
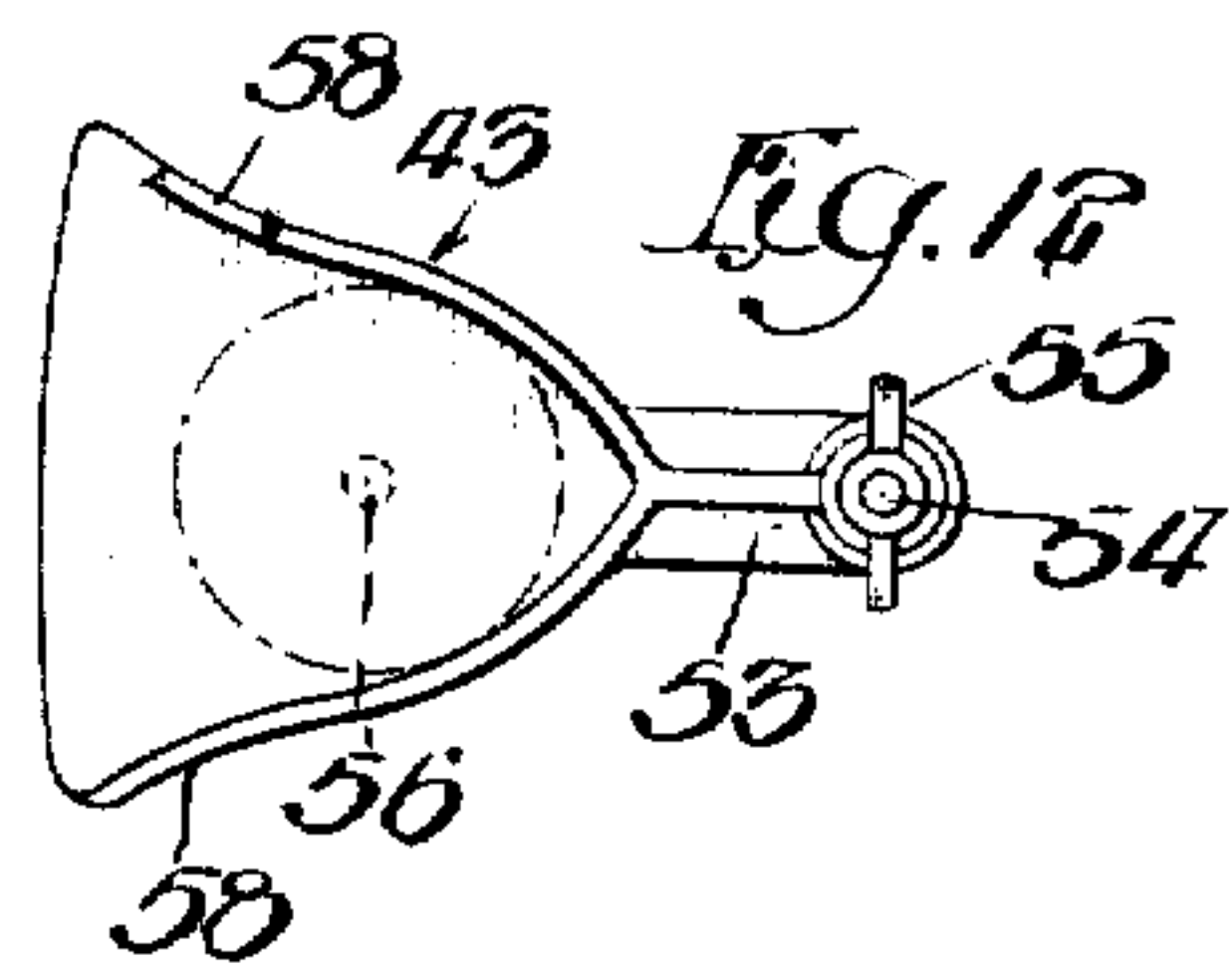
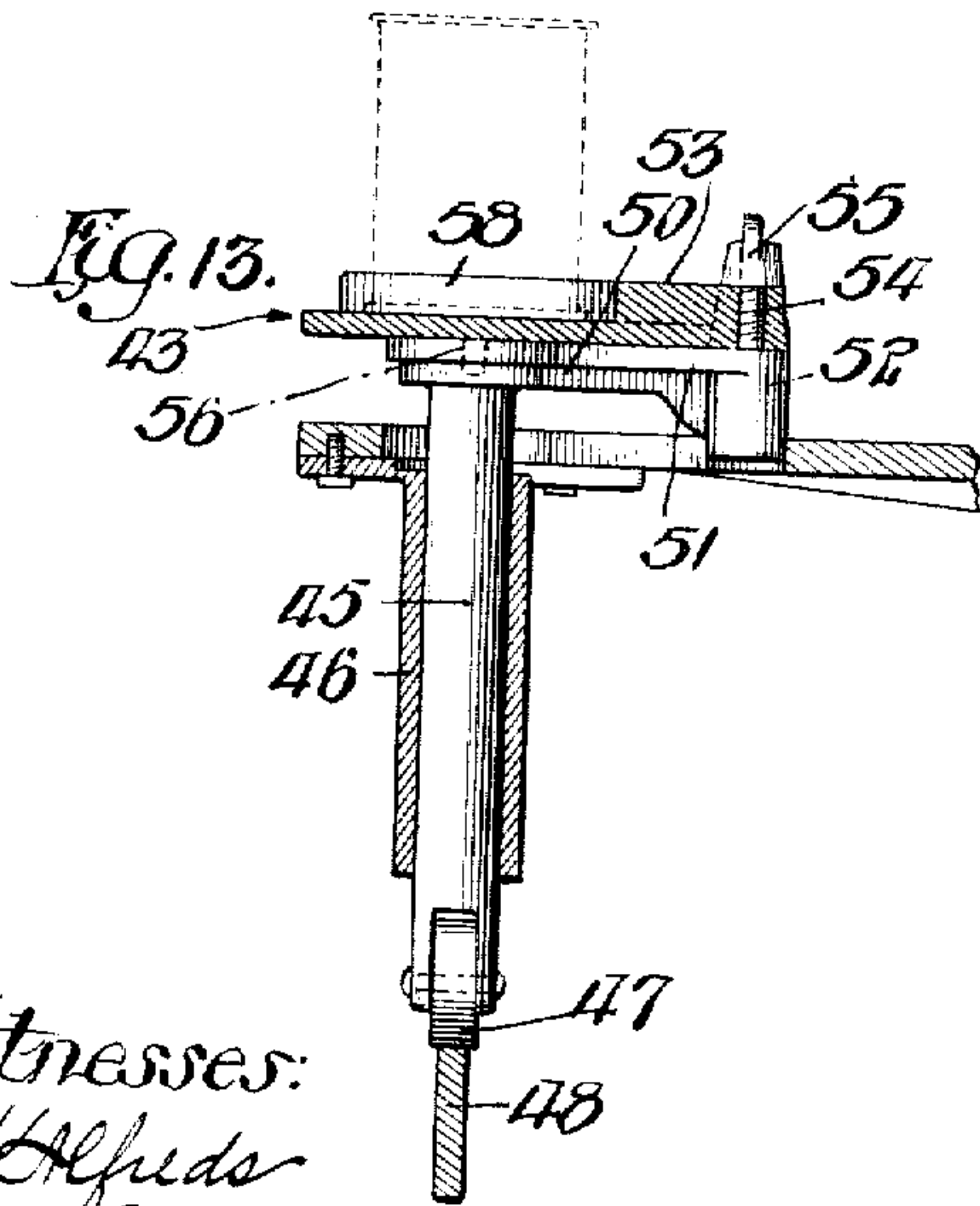
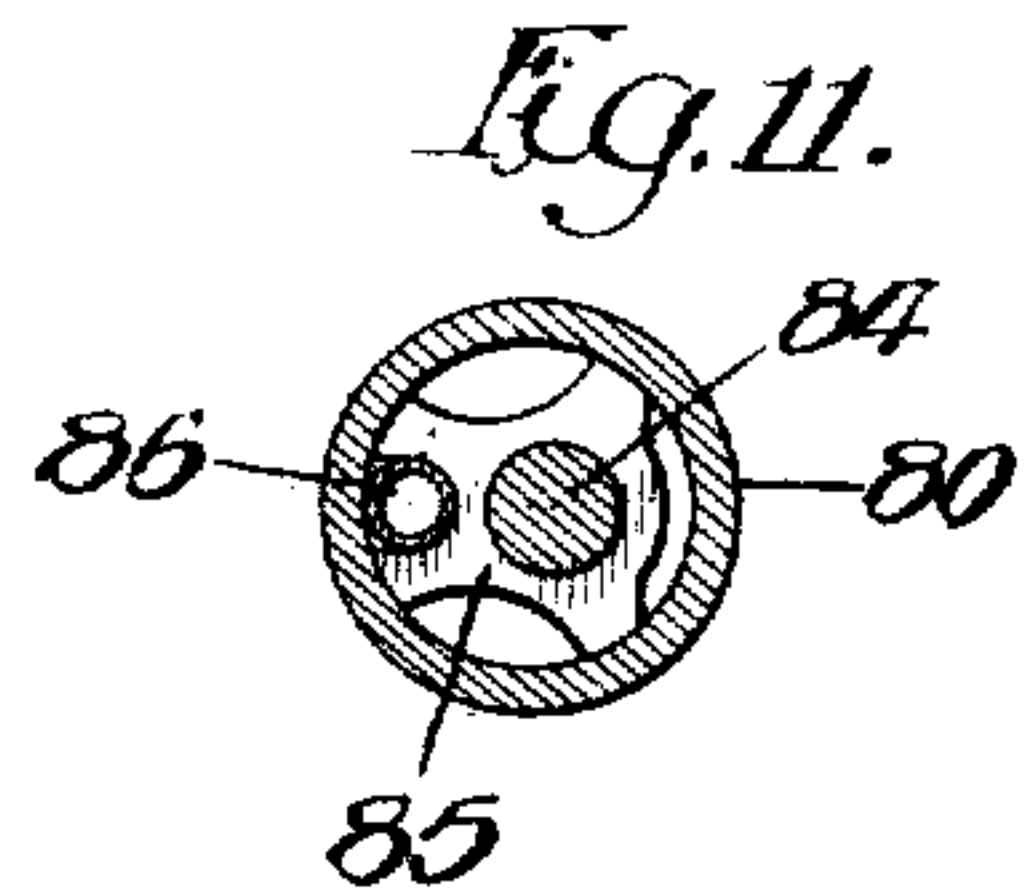
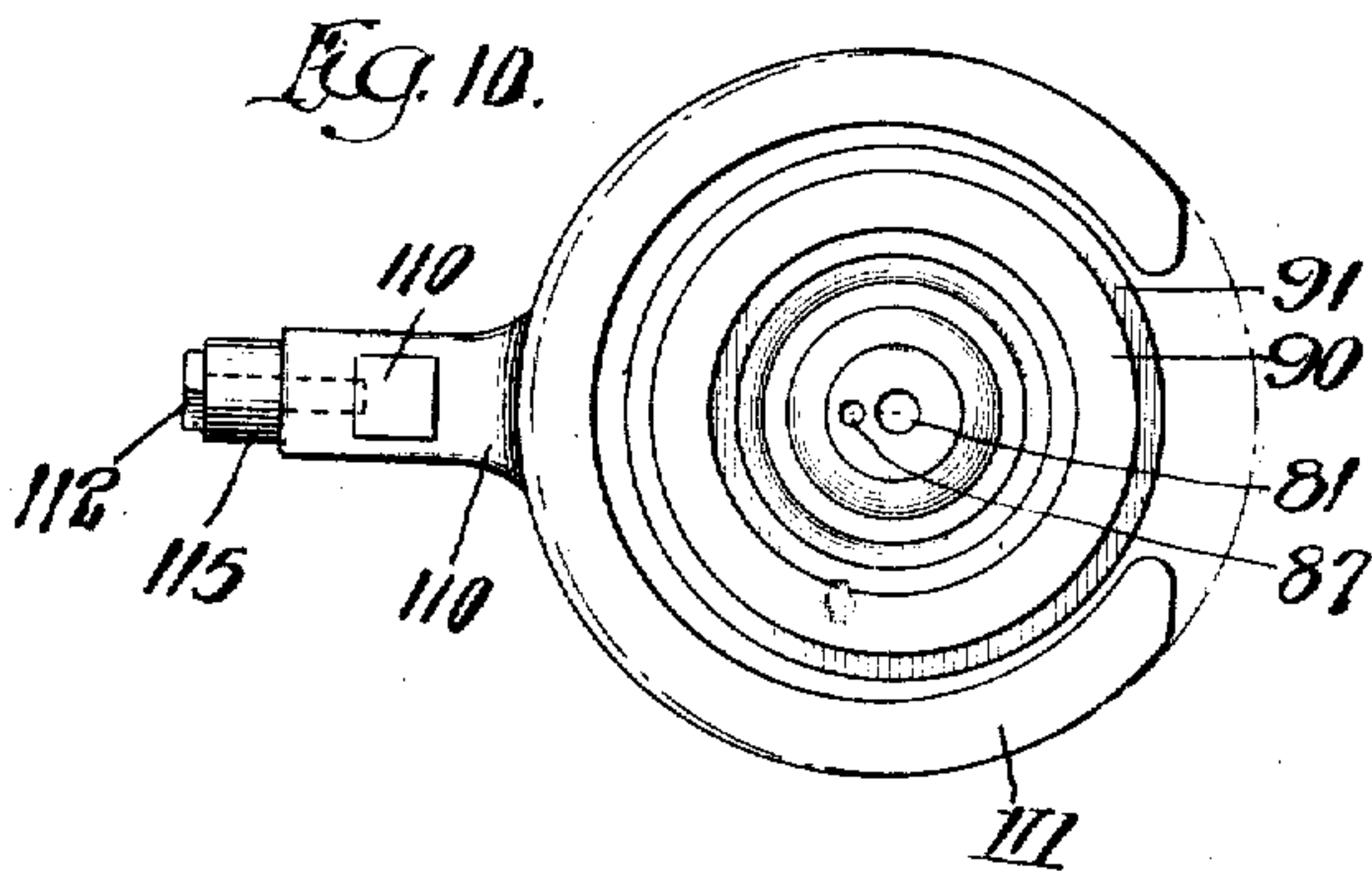
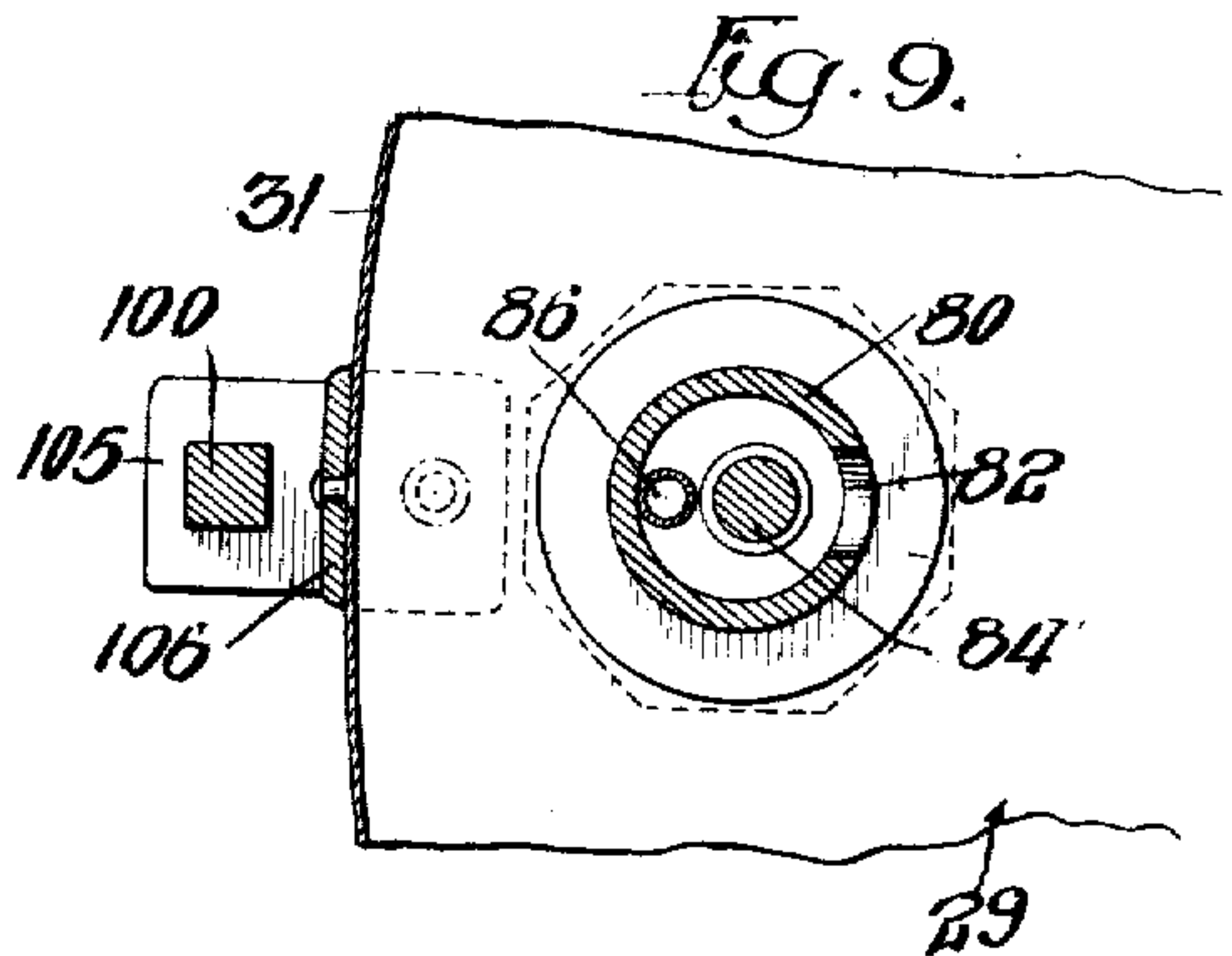
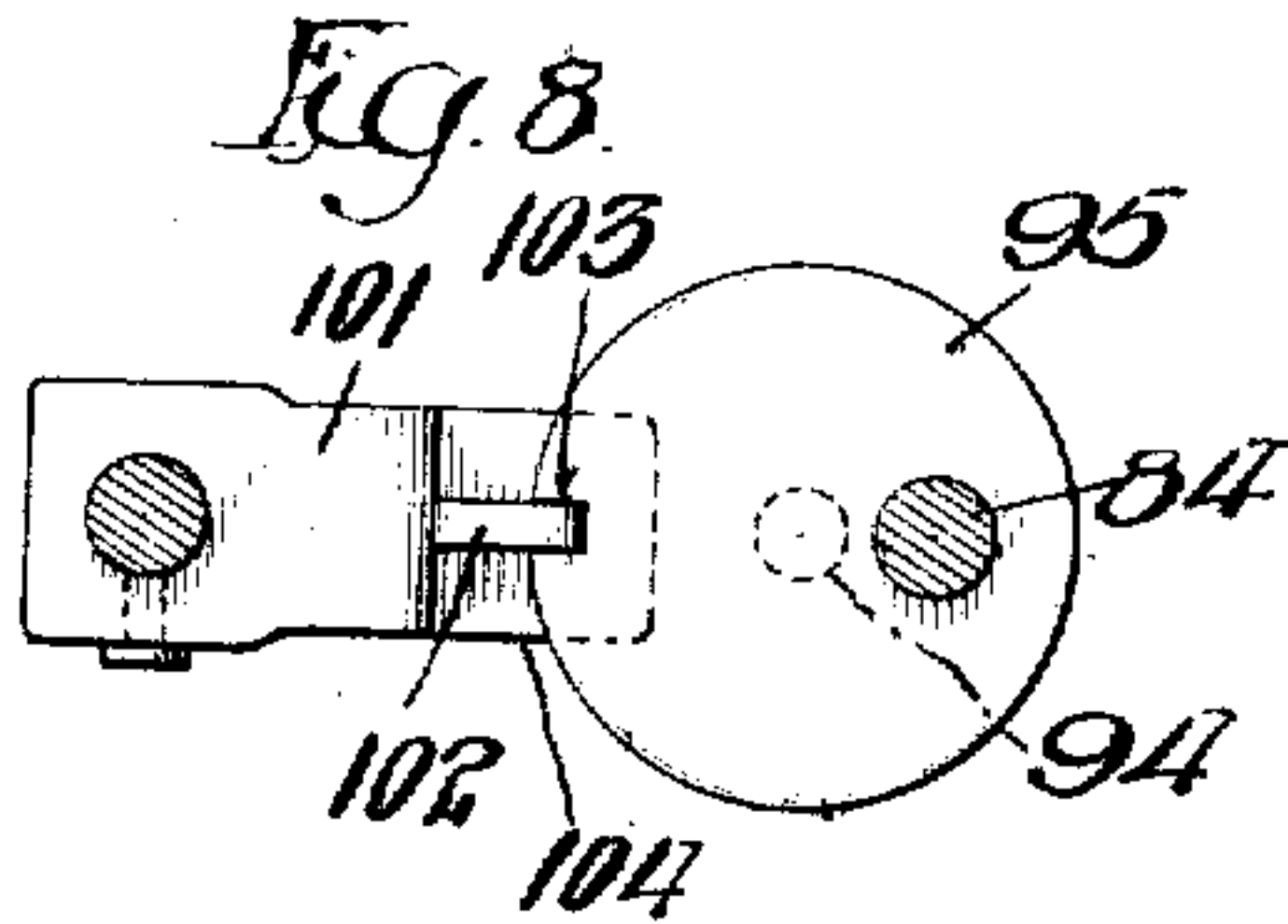
Witnesses
J. H. H. H. H.
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

LEWIS A. BAKER, OF ELGIN, ILLINOIS.

CAN-FILLING MACHINE.

No. 910,265.

Specification of Letters Patent.

Patented Jan. 19, 1909.

Application filed July 25, 1907. Serial No. 385,531.

To all whom it may concern:

Be it known that I, LEWIS A. BAKER, a citizen of the United States, and a resident of Elgin, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Can-Filling Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in that class of filling machines for filling cans or like receptacles from a central liquid tank wherein a number of receptacles are simultaneously filled and are successively delivered to and discharged from the machine.

The invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims.

Among the objects of my invention is to provide an improved valved filling device for machines of this character so constructed and arranged as to insure the prompt flow of the liquid to the receptacle being filled as soon as the receptacle is adjusted to the filling device and which insures the filling of the receptacles to the proper level but prevents overfilling thereof, to provide a filling device of this character so constructed and arranged as to be readily cleaned, and to provide other improvements in machines of this character such as will hereinafter more fully appear.

In the drawings:—Figure 1 is a vertical sectional view of a machine embodying my invention. Fig. 2 is a top plan view thereof, partially broken away, to show the mechanism for feeding the receptacle to the carrier. Fig. 3 is a horizontal section, taken on line 3—3 of Fig. 1. Fig. 4 is a detail illustrating the mechanism for feeding the receptacles from the receptacle chute to the carrier. Fig. 5 is a detail of the means for supporting one of the cam tracks, constructed to adjust the same to adapt the machine to receptacles of various heights. Fig. 6 is a vertical sectional view of one of the valved feeding devices for conveying liquid from the reservoir to the receptacles below. Fig. 7 is a similar view showing the parts in changed positions. Fig. 8 is a transverse section, taken on line 8—8 of Fig. 7. Fig. 9 is a transverse section, taken on line 9—9 of Fig. 7. Fig. 10 is a bottom plan view of

the parts as seen from the position indicated by the dotted line 10—10 on Fig. 7. Fig. 11 is a transverse section, taken on line 11—11 of Fig. 7. Fig. 12 is a top plan view of one of the receptacle gage plates. Fig. 13 is a section taken through said gage-plate, its lifting bar and associated parts. Fig. 14 is a top plan view of the head of one of the gage-plate lift rods. Fig. 15 is a detail top plan view of the carrier, showing a subjacent guide sleeve for one of the gage-plate lift rods.

As shown in the drawings, 20 designates the base of the machine formed with a central raised portion, 21 a standard fixed in the said raised portion of the base, and 22 a sleeve surrounding the standard and rotative thereon. 23 designates the main driving shaft of the machine mounted in said base 20 and a sleeve on the upper end of a standard 24 rising from the base. Said shaft carries at its inner end a pinion 25 meshing with a gear wheel 26 that is non-rotatively fixed to the lower end of the sleeve 22. 28 designates a liquid receptacle supported on said rotative sleeve. It comprises a bottom wall 29 and inner and outer cylindric walls 30 and 31, between which latter is formed an annular liquid receptacle 32 which opens upwardly. The liquid receptacle is mounted on said rotative sleeve through the medium of a plate 33 fixed to the bottom of the receptacle and provided with a central cylindric sleeve or boss 34 that surrounds said sleeve. The said reservoir is locked to the sleeve by means of upper and lower locking nuts 35, 36, respectively, interiorly screw-threaded to engage exterior screw-threads on the sleeve and adapted to bear against the upper and lower ends, respectively, of said boss. This construction is provided in order to enable the reservoir to be raised and lowered relatively to the receptacle carrier beneath the same for the purpose of adjusting the machine to receptacles of varying heights.

40 designates a carrier beneath the reservoir which is mounted on the rotative sleeve 22 to rotate with the reservoir and upon which the receptacles to be filled are delivered from a horizontal feed table 41 suitably supported at the level of the carrier. The carrier embodies a plurality of gage-plates 43 which rotate with the carrier and upon which the receptacles to be filled are directly delivered. The said reservoir is

provided with a plurality of valved feeding devices, designated as a whole by 44, in Figs. 1 and 2, and shown in detail in Figs. 6 to 11, inclusive, and the gage-plates 43 are located one beneath each valved feeding device and hold the receptacles in proper position beneath the feeding devices while said receptacles are being filled. The receptacles are adapted to be fed either automatically or otherwise to the gage-plates and after passing beneath the machine are discharged from the gage-plates upon the table 41, as herein shown.

The gage-plates are mounted on the upper ends of vertically movable lift rods 45 which extend through suitable openings in the carrier plate 40 and have guiding engagement with guide-sleeves 46 depending from the carrier plate (Figs. 1 and 13). The said lift-rods are provided at their lower ends with rollers 47 which ride upon the upper edge of an annular cam track 48 supported on arms 49 of the frame of the machine in the manner shown in Figs. 1 and 3. The upper or active margin of said cam track embraces a lower part a (Fig. 1) which is located under the mechanism for feeding the receptacles to the carrier, whereby the gage-plates are in their lowermost positions when the receptacles are fed thereon, an ascending part a^1 , and a higher part a^2 . The engagement of the bearing rollers 47 with the ascending part of the cam operates during the rotation of the carrier to raise the receptacles in position to receive the liquid from the feeding devices, and the engagement of the rollers 47 with the higher part of the cam track maintains the gage-plates and the receptacles thereon in their uppermost or filling positions. As herein shown said gage-plates are made separate from the lift-rods 45. Said lift-rods are provided at their upper ends with heads 50 (Figs. 13 and 14) having lateral projections 51 extending radially inwardly over the carrier-plate and normally occupying suitably shaped openings in the upper face of said plate. Guide lugs 52 extend downwardly from said projections and have guiding engagement with the inner ends of said openings. The gage-plates are provided with shanks 53 which extend outwardly over the lateral projections 51 of the heads, and the parts are fastened together by screw-studs 54 extending upwardly through apertures in said shanks and nuts 55 engaging in said screw-studs. Preferably also centering pins 56 are provided on the lower faces of the gage-plates which enter openings 57 in the heads of said lift-rods. The gage-plates are provided with flaring side walls or flanges 58 so arranged as to center the receptacles on the gage-plates and to provide wide mouths or approaches to facilitate the reception of the receptacles thereon

and their discharge therefrom. The provision of the removable gage-plates enables gage-plates of varying dimensions to be interchangeably used on the machine, whereby the machine may be adjusted to fill receptacles of varying shapes and diameters.

The receptacles to be filled are fed from the feed table 41 to the gage-plates on the carrier by means of a rotary feeding device designated in Figs. 1 and 2 as 60, and shown in detail in Fig. 4. It is provided with a plurality of vertically separated radial arms 61 and is located on the feed table at the side of the carrier in such position that the arms extend over the carrier in a manner to transfer receptacles brought into the influence of the arms from the feed table to the gage-plates. Said rotary feeding device, as herein shown, comprises upper and lower plates 62, 62, spaced by a spacing sleeve 63 and is fixed to the upper end of a shaft 64 that is mounted in a vertical sleeve 65 depending from the feed table.

The empty receptacles are delivered into the path of the radial arms of the rotary feeding device through a vertical chute 67, which conveniently extends upwardly into a room above that in which the machine is located so that the receptacles are fed downwardly by gravity through said chute as the lowermost receptacle is transferred from the table to the carrier. The said feeding device is partially inclosed by a housing 68, the upper wall of which supports the feed chute 67. For rotating said feeding device the lower end of the shaft 64 is provided with a star-wheel 70 (Figs. 1, 3 and 4) which is located in such relation to the guide-sleeves 46 of the lift-rods of the carrier as to be rotated in a step by step manner by engagement of said sleeves with the teeth or projections of said star-wheel.

The filled receptacles are removed from the gage-plates of the carrier by means of stripper bars 72 fixed to the feed plate 41, in the manner shown in Figs. 1 and 2. Said bars are curved at their inner ends and extend inwardly over said gage-plates to a point beyond the receptacles mounted on the gage-plates. Therefore, when the receptacles are brought against the curved ends of the stripper bars, through rotation of the carrier, they are forced out of the wide or flaring sides of the gage-plates upon the table 41, as shown in Fig. 2.

Referring now to the construction and arrangement of the filling devices whereby the liquid is discharged from the reservoir 28 into the receptacles on the carrier beneath the reservoir, and to the means for raising the empty receptacles towards the filling devices and lowering the filled receptacles therefrom preparatory to discharging the receptacles from the machine, these parts are made as follows: It will be understood that

when the rollers 47 of the gage-plate lift-
 rods are riding on the lowermost part *a* of
 the cam track 48, the gage-plates are in the
 plane of the feed table and, therefore, in
 position to receive the receptacles. The
 ascending part *a'* of said cam track acts
 through the lift-rods to lift the receptacles
 into the position shown in the left-hand side
 of Fig. 1, and shown also in Figs. 7 and 13,
 which is the position the receptacles occupy
 while being filled. All of the filling devices
 are alike and in the following detail descrip-
 tion but one will be referred to. Each of
 said filling devices comprises a tube 80 which
 extends through a suitable opening in the
 lower wall of the reservoir, and is supported
 on said wall by means providing a fluid-
 tight joint, as shown in Figs. 6 and 7. Said
 tube is open at its upper end and is pro-
 vided at its lower end, beneath the reservoir,
 with a conical discharge nipple 81 adapted
 to project into a central opening in the re-
 ceptacle when said receptacle is lifted into
 its filling position (Fig. 7). Said tube is
 provided adjacent to the bottom of the res-
 ervoir with an opening 82 through which the
 fluid is discharged from the reservoir into
 the tube and thence to the receptacle below.
 83 designates a conical valve contained with-
 in the tube and the conical nipple 81, and it
 serves when seated to cut off the flow of
 liquid through said nipple. Said valve is
 mounted on the lower end of a stem 84 by
 means of a flexible joint and the stem rises
 upwardly through the open end of the filling
 tube and is connected at its upper end with
 means for raising the valve from its seat,
 as will hereinafter be described. Said stem
 is provided with radial guides 85 which
 hold the same centrally in the tube. Asso-
 ciated with said filling tube is an air vent
 tube 86, which, as herein shown, is contained
 within the filling tube and extends above the
 same. The lower end of said vent tube 86
 communicates with a passage 87 in the con-
 ical discharge nipple 81 which opens down-
 wardly, whereby air may be vented from the
 receptacle. The said filling tube carries at
 its lower end a sealing ring 90 made of rub-
 ber or like elastic material which surrounds
 the discharge nipple 81, and upwardly
 against which the top wall of the receptacle
 surrounding the central or filling opening
 therein is tightly pressed when the recep-
 tacle is raised to its elevated or filling posi-
 tion. Said sealing ring serves to prevent
 the admission of air to the receptacle around
 the filling tube, whereby, when the lower
 end of the nipple of the filling tube is sealed
 by the rise of liquid above the lower end
 thereof, the flow of liquid to the can will
 cease. As herein shown said packing ring
 is seated in an annular groove in a ring 91
 which surrounds and has screw-threaded

engagement with the lower end of the filling
 tube. 65

After a receptable has been elevated in the
 manner described and sealed by the sealing
 ring 90, it is vented through the vent tube
 86. When the receptable is presented to the
 filling tube, the vent tube is closed by a
 valve or plug 94, preferably made of rubber
 or like yielding material, which, in the pres-
 ent construction, is mounted on a block 95
 that has vertically sliding engagement with
 the upper end of the stem 84 of the valve 83.
 The means for lifting the plug 94 to vent
 the receptacle is made as follows: 100 desig-
 nates a vertically movable lifting bar located
 outside of the outer wall 31 of the reservoir
 and provided at its upper end with a later-
 ally extending arm 101 directed towards the
 block 95 and provided with a vertical mem-
 ber having a rib 102 that has sliding engage-
 ment with a vertical groove 103 in the ad-
 jacent side of the block 95. The said depend-
 ing part of the arm 101 is provided at its
 lower end with a laterally extending lug 104
 that is adapted to engage the lower end
 of said block 95 in a manner to lift the same
 when the lift-bar is raised by the means pro-
 vided therefor. Said lift-bar extends through
 and has guiding engagement with apertured
 guide lugs 105, 105 extending laterally out-
 wardly from the outer wall of the reservoir
 and are connected, as herein shown, by a bar
 106 that is riveted to the outer wall of the
 reservoir. The said lift-bar 100 is provided
 at its lower end with an arm 110 that extends
 toward the lower end of the filling tube. Said
 arm is forked and the fork members 111
 thereof extend on opposite sides of said
 filling tube. The fork arm 110 is herein
 shown as made a part separate from the lift-
 bar. It is provided with an opening through
 which the lift-bar extends and is attached
 to the bar by a set-screw 112. The members
 111 of said arm 110 are curved in the man-
 ner shown in Fig. 11 to correspond to the
 general curvature of the receptable which
 the machine is adapted to fill, as indicated in
 Fig. 10. Said fork-arm normally occupies
 a position entirely below the filling tube, as
 shown in full lines in Fig. 6. The fork
 members are spread such distance apart that
 when raised they clear the ring 91 carrying
 the elastic sealing ring 90, but are engaged
 by the upper end of the receptacle when the
 latter is raised to present the same to the
 lower end of the filling tube. The raising
 of the lift-bar in this manner moves the lift-
 ing lug 104 into contact with the block 95,
 as indicated by the first dotted line position
 in Fig. 6, and further raising of the lift-bar
 raises said block and lifts the plug 94 out of
 engagement with the vent-tube, as indicated
 by the second dotted line position in Fig. 6.
 In the present construction, the raising of

the lift-bar by the lifted receptacle as the latter is raised against the sealing ring 90 does not raise the plug 94 out of engagement with the upper end of the vent-tube, but only raises the arm 110 to a height sufficient to bring a bearing roller 115, extending laterally outwardly therefrom, in position for engagement with the entering end of a curved cam-track 116, (Figs. 1 and 2). Said upper cam track consists of a curved bar less than a complete circle and is concentric with the axis of rotation of the carrier. It is supported, as herein shown, from the lower cam track through the medium of radial brackets 117 on said lower track and bars 118 fixed at their lower ends to said brackets and carrying at their upper ends said upper cam track (Figs. 1, 3 and 5). As the bearing roller 115 of said lift-bar arm rides on the entering end of the cam-track 116 the bar is lifted to raise the block and lift the plug 94 out of engagement with the venting tube, as shown in the second dotted line position in Fig. 6, thus venting the latter and the receptacle below the same. The active parts of the cam track 116 comprise a lower part a^3 (Fig. 1), an ascending part a^4 , and a higher part a^5 . The passing of the bearing roller 115 upon the lower part a^3 effects the venting of the vent-tube 86 in the manner referred to. As said bearing roller rides upon the higher part a^5 of said cam-track, the cam-bar and block 95 are further raised until said block is brought up against a shoulder on the valve stem formed by a collar 120 attached to the upper end of the valve stem, whereupon the valve 83 is raised off its seat and opens communication from the reservoir, through the filling tube 80, to the receptacle below, (Fig. 7). Said parts remain in the positions referred to during the rotation of the carrier until the bearing roller 115 passes off the descending portion a^6 of the upper cam-track (Fig. 2). The said lift-bar bearing roller however passes off the cam-track 116 prior to the lowering of the filled receptacle to its lowermost position, or the position in which it is discharged from the machine. This is made clear from a comparison of Figs. 2 and 3 wherein a^7 (Fig. 3) designates the descending portion of the lower cam-track 48 which is in advance of the descending portion a^6 of the upper curved cam track 116. By reason of the fact that the rise of the liquid in the receptacle above the level of the filling tube nipple and vent tube seals said filling tube and the further fact that the valve is closed before the receptacle drops away from the sealing ring 90, the receptacle cannot become overfilled and danger of wasting the liquid is thus avoided.

In order to avoid tendency of the liquid clinging to the lower end of the vent tube when the plug or valve 94 is lifted from the

upper end of said vent tube, and thus prevent proper venting of the receptacle, means are provided for momentarily lowering the receptacle from the sealing ring 90 after the plug has been lifted from the vent tube. This is effected in the present instance by providing on the upper surface of the lower cam-track 48, below the lower portion a^8 of the upper cam-track, a depression a^8 . When the bearing roller of a lift-rod 45 passes over said depression a^8 of the lower cam-track, the receptacle supported thereon is momentarily lowered, and as the vent tube is open at its upper end, any liquid clinging to the lower end of said vent tube is free to drop therefrom. The receptacle is thereafter raised by the passing of the bearing roller 47 on the higher part of the lower cam track before the valve is opened. This construction and arrangement is especially useful in gravity filling machines wherein but a small liquid head is possible by reason of the construction.

It will be observed, by reference to Fig. 5, that the bars 118 which support the upper cam-track from the lower cam-track have vertical adjustment in the brackets 117, thus providing for accurate adjustment of the upper to the lower cam-tracks. This result is effected in the present instance by making the brackets 117 hollow to receive the lower ends of the bars 118 and clamping said brackets in said bars.

In the operation of the machine the empty receptacles are fed successively to the gage-plates 43 of the carrier, as the latter is rotated about its axis. As the bearing roller of each gage-plate lift-rod 45 strikes the ascending portion a^1 of the cam-track the receptacle is brought with its end wall up against the sealing ring 90. At the same time the receptacle strikes the arm 110 of the lift-bar 100 and raises the bearing roller 115 thereof to the level of the entering end a^3 of the upper cam-track. In the continued movement of the parts the roller bearing of the lift-rod 45 of said gage-plate drops into the depression a^8 of the lower cam-track 48, thus momentarily lowering the receptacle from the sealing ring and permitting any liquid tending to cling to the lower end of the vent tube, which latter tube is now open at both ends, to drip therefrom. The receptacle is again raised with its top end against the sealing ring 90 as the bearing roller of the lift-rod 45 rises out of the depression a^8 , after which, in the continued rotation of the parts, the bearing roller 115 of the lift-bar arm rises to the higher part of the upper cam-track and opens the valve to permit the flow of liquid from the reservoir to the receptacle. The flow continues until the lower ends of the filling tube nipple and vent tube are sealed by the rising of the liquid in the receptacle around the

same. Thereafter, in the continued rotation of the carrier, the lift-bar 100 drops to its lowermost position, thus closing the valve and the vent-tube, which prevents further flow of liquid from the tube regardless of the sealing of the lower end thereof. Finally the gage-plate and filled receptacle supported thereon drop to the level at which they are discharged from the carrier, which latter operation is effected by the stripper bars at the proper point in the cycle of movement of the machine.

The machine is adaptable for filling cans, bottles and the like with milk, filling canned meat and fruit cans with syrup and juices and other analogous purposes. The flow of the liquid takes place entirely by gravity there being no force required to be exerted on the liquid to force it through the filling devices into the receptacles.

By reason of the fact that the liquid valve of each filling device is opened only when a receptacle has been delivered to its corresponding gage-plate and raised to its filling position, it will be apparent that in case of failure to deliver a receptacle to a gage-plate no operation of the associated filling device will occur, thus avoiding waste of liquid which would occur in a like situation if the filling valve be operated independently of the presence of a receptacle on its associated gage-plate.

The machine is simple and economical in construction, is capable of great capacity and may be operated automatically. A feature which greatly commends the machine is the ease by which the various parts, which have contact with the liquid, may be taken apart for the purpose of cleaning the same. It will be observed in this connection that the vertical groove on the block 95 engaged by the rib 102 of the lift-bar arm 101 extends to the top of said block, so that the block, together with the valve and stem, may be removed from the filling tube, thus leaving the filling tube free to be cleaned by the insertion of a brush or like cleaning device therein. It will also be observed that, by reason of the closing of the vent tube by the valve or plug 94, such liquid as is contained in the lower end of the tube will not drip therefrom after the filled receptacle is lowered therefrom, thus avoiding, not only waste of the liquid, but also tendency to uncleanness, due to dripping fluid in the part of the machine adjacent to the receptacle feeding mechanism.

I claim as my invention:—

1. In a filling machine, the combination with a reservoir, of a filling device comprising a tube depending from the reservoir and adapted to extend into the upper end of the receptacle to be filled, a valve for controlling the flow of liquid therethrough, a vent tube terminating at its lower end just

inside the upper end of the receptacle, means for presenting the receptacle to be filled to the filling tube, means for sealing the opening in the receptacle around the filling tube, means for opening and closing the valve of the filling tube, means for opening and closing the vent tube arranged to close it prior to the withdrawal of the receptacle from the filling tube, and means for momentarily unsealing the receptacle around the filling tube after said vent tube has been opened.

2. In a filling machine, the combination with a reservoir, of a filling device comprising a filling tube depending from the reservoir and adapted to extend into the upper end of the receptacle to be filled, a valve for controlling the flow of liquid there-through, a vent tube terminating at its lower end just inside the upper end of the receptacle, means for presenting the receptacle to be filled to the filling tube, means for sealing the opening in the receptacle around the filling tube, means for opening and closing the valve of the filling tube, means for opening and closing the vent tube arranged to close it prior to the withdrawal of the receptacle from the filling tube, and means for momentarily withdrawing the receptacle from its filling position after the vent tube has been opened.

3. In a filling machine, the combination with a reservoir, of a filling device comprising a filling tube depending therefrom and adapted to extend into the receptacle to be filled, a vent tube terminating at its lower end just inside the upper end of the receptacle, means for presenting the receptacle to the filling tube, a sealing ring surrounding the filling tube and upwardly against which the receptacle is pressed, means for closing said vent tube constructed to open the same after the receptacle has been raised into its filling position, and means for momentarily withdrawing the receptacle out of contact with the sealing ring after the vent tube has been opened.

4. In a filling machine, the combination with a reservoir, of a filling device comprising a filling tube extending downwardly from the reservoir and adapted to extend into the upper end of a receptacle to be filled, a lift valve within the lower end of said tube for controlling the flow of liquid through said filling tube, a vent tube open at one end to the atmosphere and terminating at its other end at the discharge end of the filling tube, means for presenting the receptacle to the filling tube, means for sealing the opening in the receptacle around the filling tube, a lift valve for closing said vent tube, and means for opening the filling and vent tube valves, so constructed and arranged that the vent tube valve is opened prior to the opening of the filling tube valve.

5. In a filling machine, the combination

with a reservoir, of a filling device comprising a filling tube depending therefrom and adapted to extend into the receptacle to be filled, a vent tube terminating at its lower end just inside the upper end of the receptacle, means for presenting the receptacle to the filling tube, a sealing ring surrounding the filling tube and upwardly against which the receptacle is pressed, a valve for controlling the flow of liquid through the filling tube, means for closing said vent tube constructed to open the same after the receptacle has been raised into its filling position, and means for momentarily withdrawing the receptacle out of contact with the sealing ring after the vent tube has been opened constructed to raise the receptacle into its filling position before the filling tube valve is opened.

6. In a gravity filling machine, the combination with a reservoir subject to atmospheric pressure, of a filling device comprising a filling tube depending from the reservoir and adapted to extend into the upper end of a receptacle to be filled, a valve engaging a seat within the lower end of said filling tube for controlling the flow of liquid through the filling tube, a vent tube open at its upper end to the atmosphere and terminating at its lower end at the outlet end of the filling tube, means for presenting the receptacle to the filling tube, a valve for opening and closing said vent tube, and a vertically movable lift bar, with respect to which said filling tube and vent tube valves are movable, arranged to first open the vent tube valve and then open the filling tube valve.

7. In a filling machine, the combination with a reservoir, of a filling device comprising a filling tube depending from the reservoir and adapted to extend into the upper end of a receptacle to be filled, a valve for controlling the flow of liquid through the filling tube, a vent tube terminating just inside the upper end of said receptacle, means for presenting the receptacle to the filling tube, a valve for closing said vent tube, and a lift bar for opening said filling tube and vent tube valve, there being a lost motion between said lift bar and said valves whereby the vent tube valve is opened prior to the opening of the filling tube valve.

8. In a filling machine, the combination with a reservoir, of a filling device comprising a filling tube extending downwardly from the reservoir into the filling opening of the receptacle to be filled, a valve for controlling the flow of liquid to the filling tube provided with a stem which extends upwardly through said filling tube, means for presenting the receptacle to be filled to said filling tube, a lift bar, a block sliding on the upper end of the valve stem carrying a valve which closes said vent tube, a shoulder on

the upper end of the valve stem adapted for engagement by said block when the lift bar is raised, and means for raising said lift bar to open the valve.

9. In a filling machine, the combination with a reservoir, of a filling device comprising a filling tube depending from the reservoir and adapted to extend into the upper end of a receptacle to be filled, a valve for controlling the flow of liquid through the filling tube, a vent tube terminating just inside the upper end of said receptacle, means for presenting the receptacle to the filling tube, a valve for closing said vent tube, a lift bar for opening said filling tube and vent tube valves, there being a lost motion between said lift bar and said valves whereby the vent tube valve is opened prior to the opening of the filling tube valve, means for sealing the opening in the receptacle around the filling tube when the receptacle is raised into its filling position, and means for momentarily lowering the receptacle away from its filling position after the vent tube has been opened.

10. In a filling machine, the combination with a reservoir, of a filling device comprising a tube extending through the bottom of the reservoir, and having an upward extension which is open at its upper end and extends above the liquid level in the reservoir, said tube being provided at the bottom of the reservoir with an opening through which liquid flows to said tube, means for presenting the receptacles to be filled to the lower end of said tube, a valve engaging a seat in the lower end of said tube for controlling the flow of liquid therethrough, means for opening said valve, and a vent tube independent of said valve opening at the lower end of the filling tube at the side thereof and provided with a valve, the parts being constructed and arranged whereby the filling tube valve may be lifted upwardly away from its seat in the tube and through said extension whereby the tube and valve may be readily cleansed.

11. In a filling machine, the combination with a reservoir, of a filling device comprising a tube extending downwardly through the bottom of the reservoir, and having an upward extension which is open at its upper end and extends above the liquid level in the reservoir, said tube being provided near the bottom of the reservoir with an opening and with an interior upwardly opening valve seat, a valve engaging said seat, a vent tube, independent of the filling tube valve, opening at the lower end of the filling tube at the side thereof, a valve for controlling said vent tube, the filling tube valve being provided with a stem which extends upwardly through and beyond said extension, and a lift bar operatively connected with the upper end of the filling tube valve stem and with the vent

tube valve by means permitting the filling tube valve stem to be disconnected therefrom whereby said stem and its valve may be removed upwardly through the extension of the filling tube.

12. In a filling machine, the combination with a rotative reservoir, of a plurality of filling devices carried thereby comprising filling tubes extending downwardly through the bottom of the reservoir, means for presenting the receptacles to the lower end of the filling tubes, means for venting said receptacles after they have been presented to the filling tubes, valves in the filling tubes for controlling the flow of liquid there-through, lift bars operatively connected with said valves and venting devices so constructed and arranged that when lifted they first vent the receptacles and thereafter open the liquid valves, a cam acting on the lift bars to successively operate said venting devices and open the liquid valves, and means operated by the raising of the receptacles to their filling positions to bring said lift bars into the influence of said cam, for the purpose set forth.

13. In a filling machine, the combination with a rotative reservoir, a carrier beneath and rotating with said reservoir upon which the empty receptacles are fed and from which the filled receptacles are discharged, and a lower cam track for raising said receptacles into their filling positions, of a plurality of valved filling devices, including means for venting the receptacles after they have been raised to their filling positions, and a stationary cam track above lower cam track arranged to open the filling tube valves and hold open the venting devices independently of said lower cam track.

14. In a filling machine, the combination with a rotative reservoir, a carrier beneath and rotating with the reservoir, including a plurality of vertically movable gage-plates and a lower cam track for raising the gage-plates and the receptacles thereon to the filling positions of the latter, of a plurality of valved filling devices located one over each gage-plate, each comprising a filling tube extending downwardly from the reservoir, a valve controlling the flow of liquid through said tube, and a venting device and an upper cam track for opening said filling tube valves and holding open said venting devices independently of said lower cam track.

15. In a filling machine, the combination with a rotative reservoir, a carrier beneath and rotating with the reservoir, including a plurality of vertically movable gage-plates and a lower cam track for raising the gage-plates and the receptacles thereon to the filling positions of the latter, of a plurality of valved filling devices located one over each gage-plate, each comprising a filling tube extending downwardly from the reser-

voir, a valve controlling the flow of liquid through said tube, and a venting device, and an upper cam track for opening said filling tube valves and for holding open the venting devices independently of the lower cam track, the said upper and lower cam tracks being so arranged and related that the filling tube valves are closed and the venting devices closed before the gage-plates drop to withdraw the receptacles from their filling positions.

16. In a filling machine, the combination with a rotative reservoir, a carrier beneath and rotating with the reservoir, including a plurality of vertically movable gage-plates and a cam track for raising the gage-plates and the receptacles thereon to the filling positions of the latter, of a plurality of valved filling devices located one over each gage-plate, each comprising a filling tube extending downwardly from the reservoir, a valve controlling the flow of liquid through said tube, a vent-tube terminating at the discharge end of the filling tube, a valve for closing said vent tube, a lift bar associated with each filling device and operatively connected with the filling tube and vent tube valves thereof, and an upper cam track for raising said lift bars.

17. In a filling machine, the combination with a rotative reservoir, a carrier beneath and rotating with the reservoir, including a plurality of vertically movable gage-plates and a cam track for raising the gage-plates and the receptacles thereon to the filling positions of the latter, of a plurality of valved filling devices located one over each gage-plate, each comprising a filling tube extending downwardly from the reservoir, a valve controlling the flow of liquid through said tube, a vent tube terminating at the discharge end of the filling tube, a valve for closing said vent tube, a lift bar associated with each filling device and operatively connected with the filling tube and vent tube valves thereof, an upper cam track for raising said lift bars, and means for momentarily lowering the receptacles from their filling positions after the vent tubes have been opened but before the liquid valves are opened.

18. In a filling machine, the combination with a rotative reservoir, a carrier beneath and rotating with the reservoir, including a plurality of vertically movable gage-plates and a cam track for raising the gage-plates and the receptacles thereon to the filling positions of the latter, of a plurality of valved filling devices located one over each gage-plate, each comprising a filling tube extending downwardly from the reservoir, a valve controlling the flow of liquid through said tube, a vent tube terminating at the discharge end of the filling tube, a valve for closing said vent tube, a lift bar associated with each filling device and operatively connected with

the filling tube and vent tube valves, an upper cam track for raising said lift bars, and means whereby the lifting movement of the receptacles raises said lift bars into the path of said upper cam track.

19. In a filling machine, the combination with a rotative reservoir, a carrier beneath and rotating with the reservoir, including a plurality of vertically movable gage-plates upon which the receptacles to be filled are fed and from which they are discharged, and a lower cam track for raising the gage-plates to bring the receptacles into their filling positions, of a plurality of filling devices carried by the reservoir, one above each gage-plate, each comprising a filling tube extending downwardly from the reservoir, a valve controlling the flow of liquid through the tube, a vent tube adapted to terminate just inside the upper end of a receptacle presented to the filling device, a valve for closing said vent tube, an upper cam track, and a lift bar operated by said upper cam track for controlling the filling tube and vent tube

valves, there being a lost motion between said lift bar and said valves whereby the vent tube valve is opened before the filling tube valve is opened.

20. In a filling machine, the combination with a rotative reservoir, a plurality of feeding devices carried thereby, and a carrier beneath and rotating with said reservoir, including a plurality of vertically movable gage-plates located one beneath each of said feeding devices, of a lower cam track for operating said gage-plates, an upper cam track for operating said filling devices, means for adjusting the reservoir towards and from the carrier, and means for correspondingly adjusting the upper cam track.

In testimony, that I claim the foregoing as my invention I affix my signature in the presence of two witnesses, this 22nd day of July A. D. 1907.

LEWIS A. BAKER.

Witnesses:

A. M. BUNN,

T. H. ALFREDS.