

A. SCHNEIDER.  
BOTTLE FILLING MACHINE.  
APPLICATION FILED JUNE 21, 1910.

998.266.

Patented July 18, 1911.

8 SHEETS—SHEET 1.

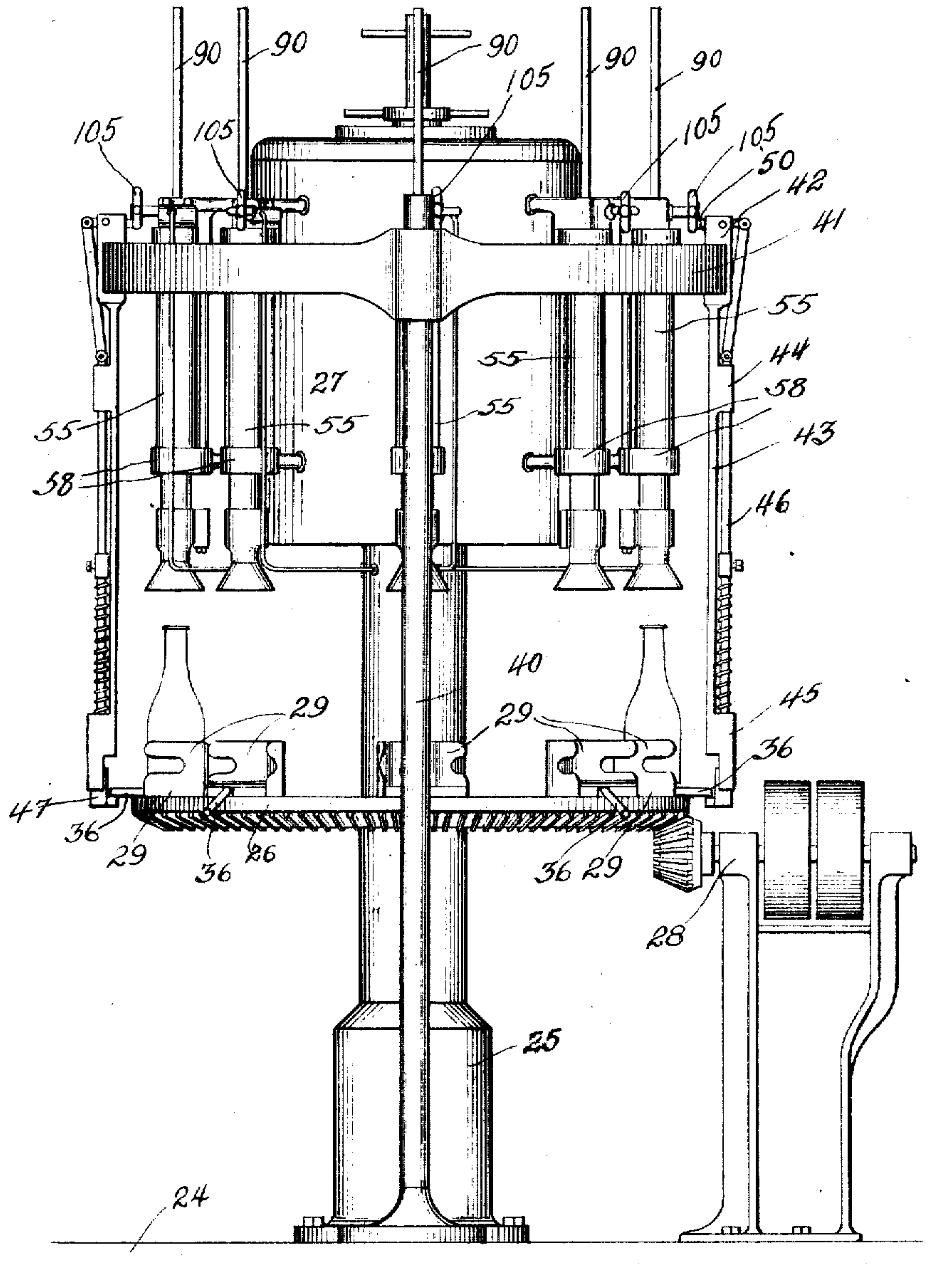


Fig 1.

Witnesses:  
Ephraim Banning  
Wm P Bond

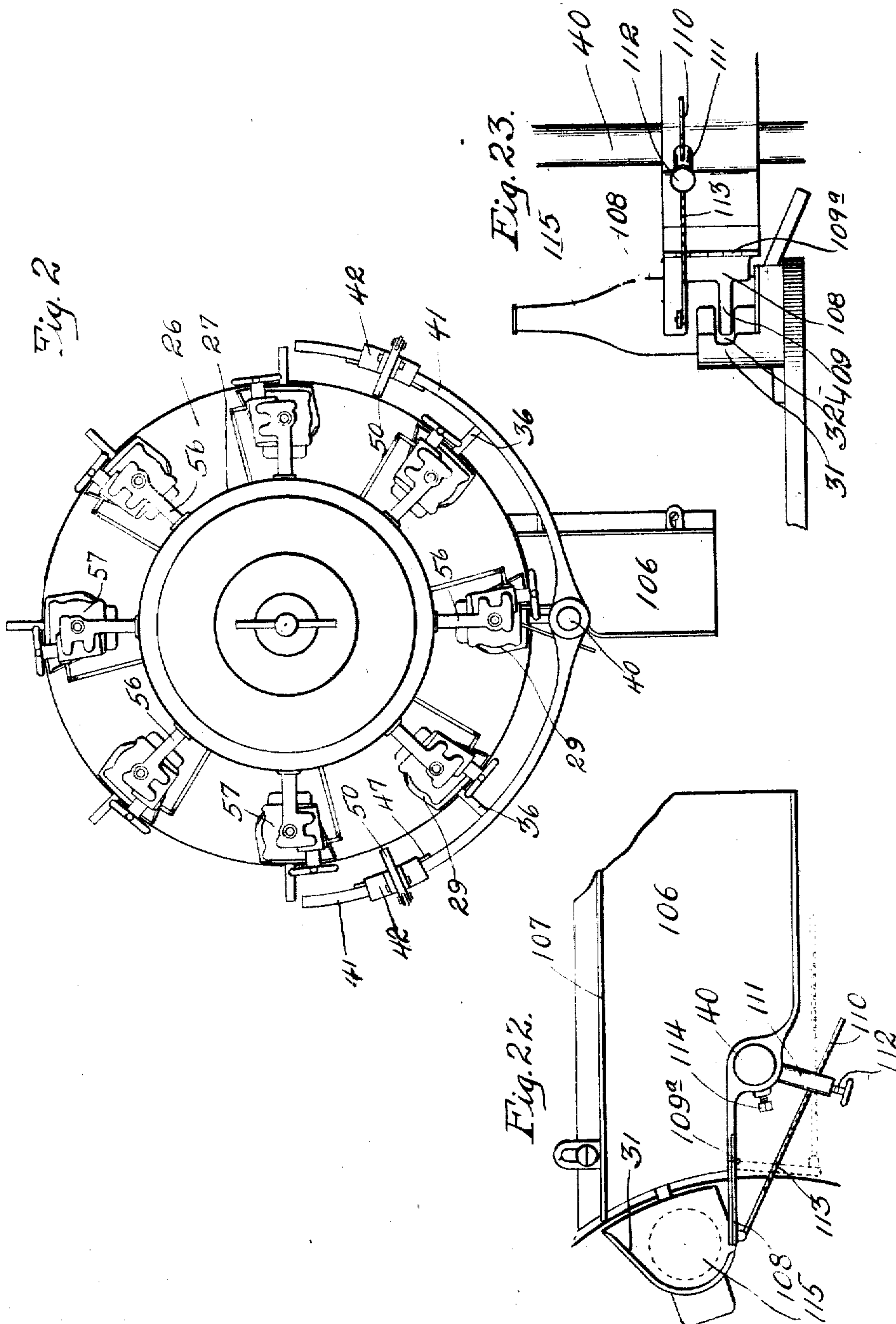
Inventor:  
Adolph Schneider  
by Banning & Banning  
Attorneys.

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Witnesses:  
*Ephraim Banning*  
*Wm. H. Bond*

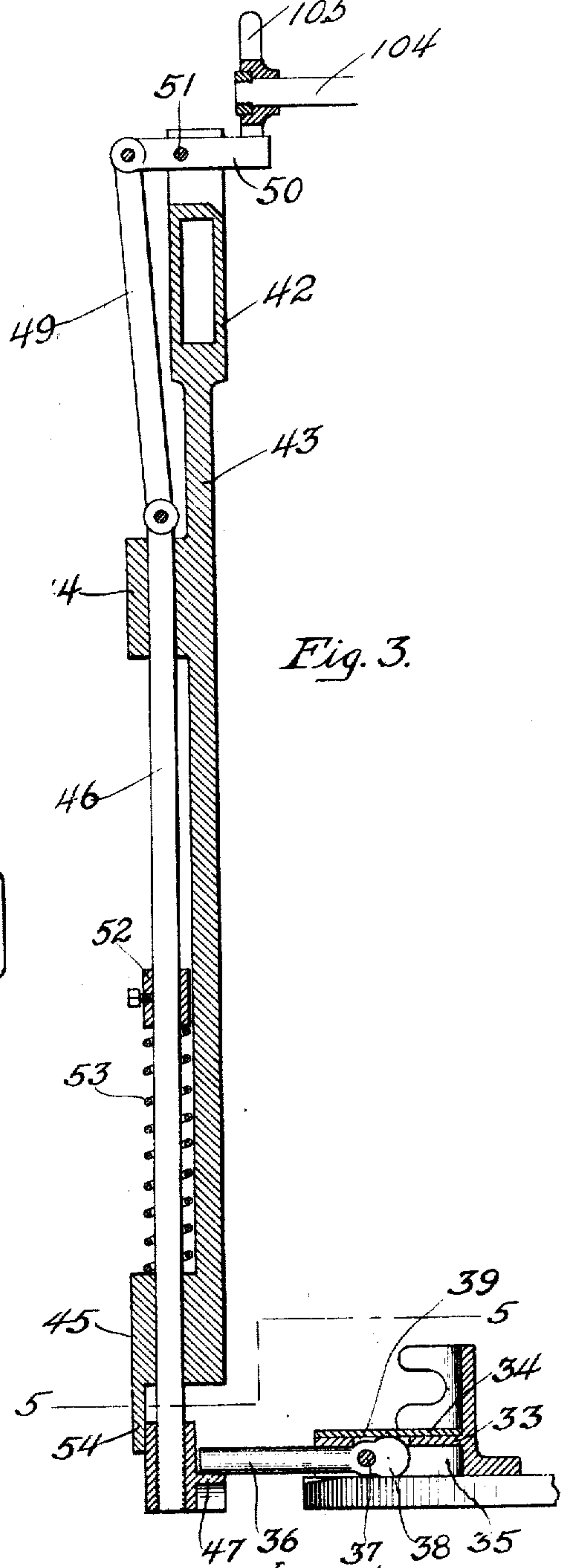
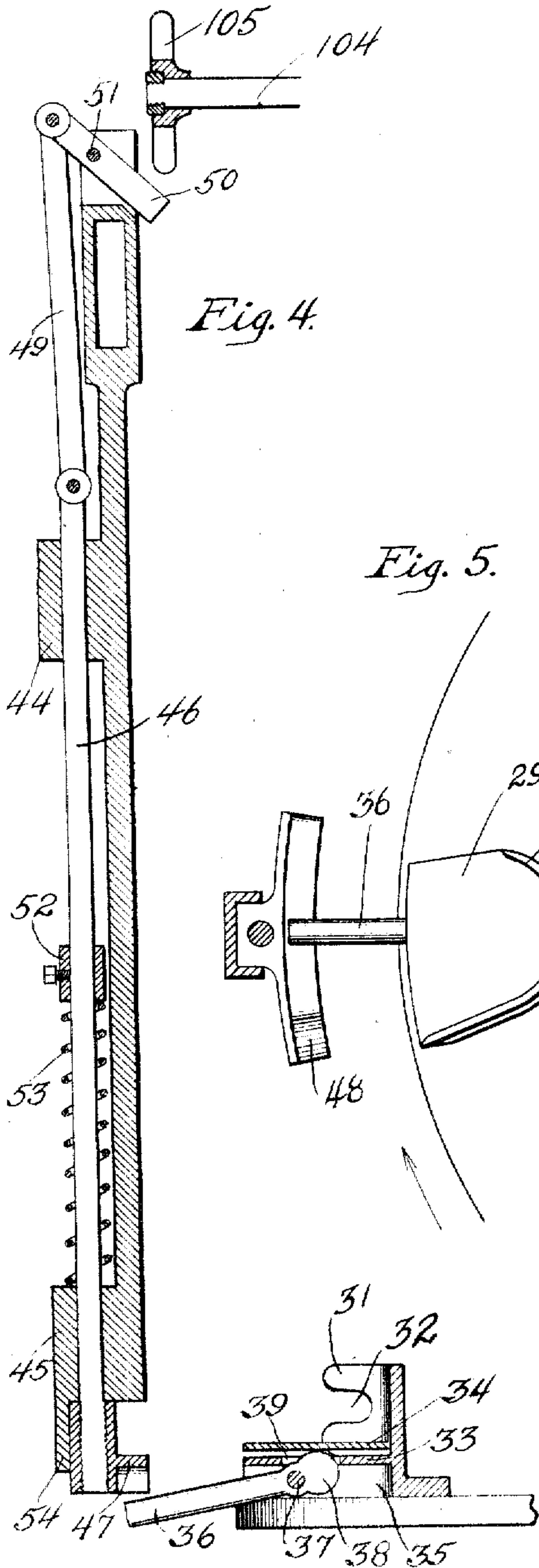
Inventor:  
Adolph Schneider,  
By *Banning & Banning*  
Attorneys.

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8 SHEETS—SHEET 3



Witnesses:

Ephraim Banning.  
Wm. R. Bond

Inventor:

Adolph Schneider.  
BY Banning & Banning  
Attorneys.



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8 SHEETS—SHEET 4.

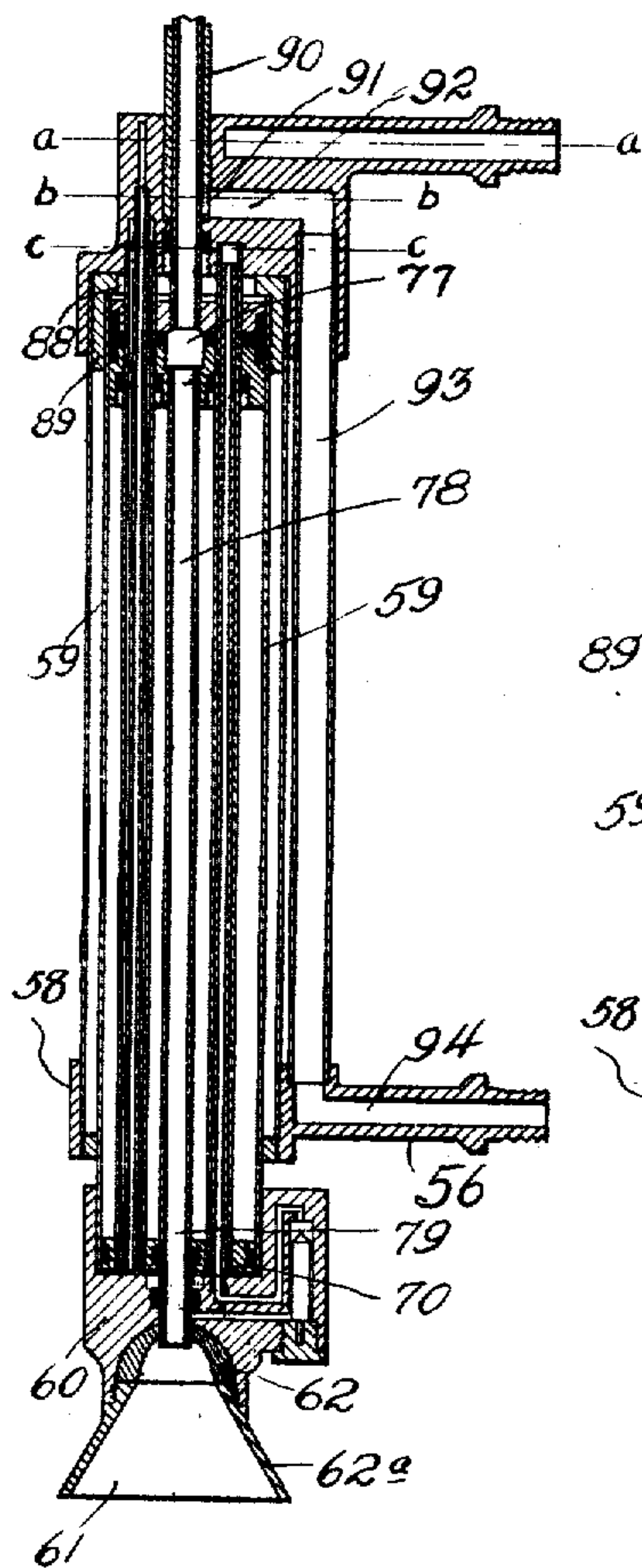


Fig. 6.

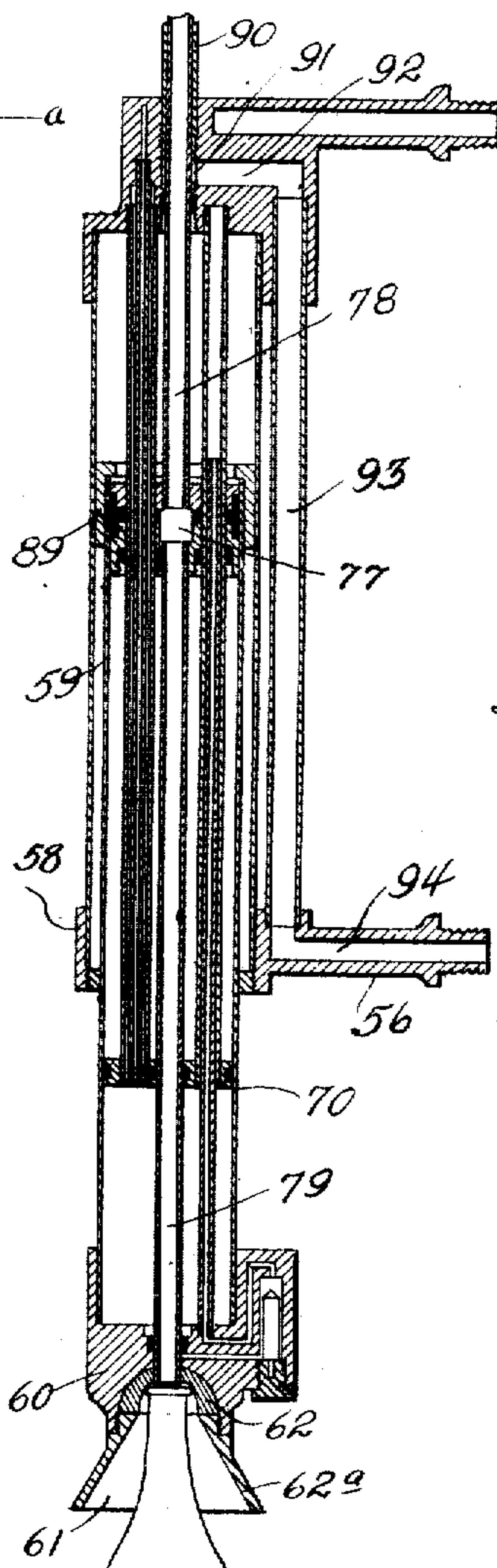


Fig. 7.

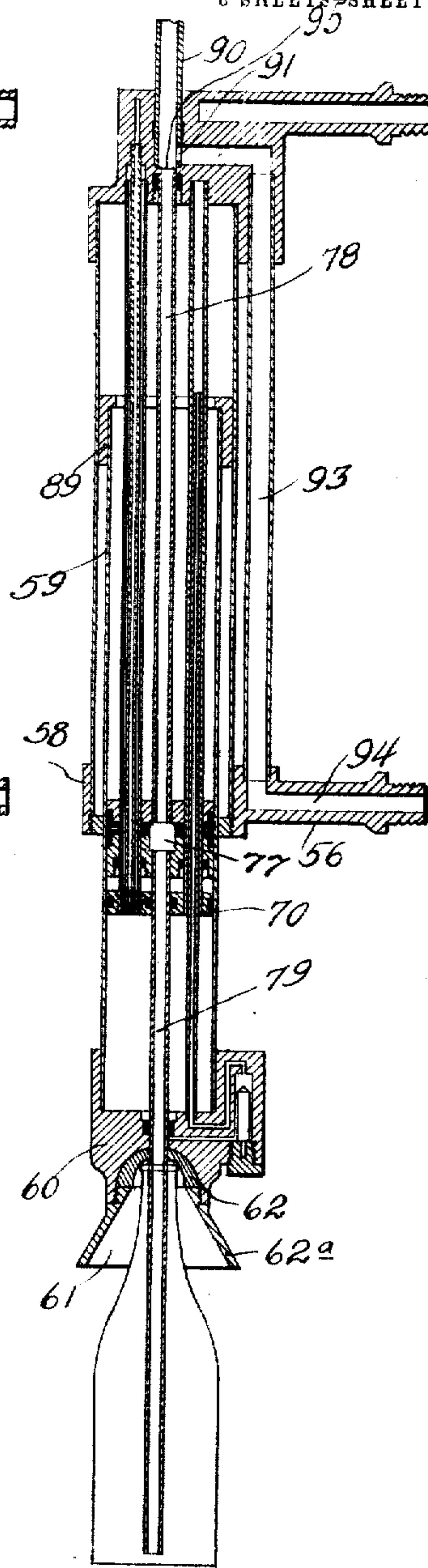


Fig. 8.

Witnesses:

Ephraim Banning  
Wm. Bond

Inventor:

Adolph Schneider.

BY Banning & Banning  
Attorneys.

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8 SHEETS—SHEET 5.

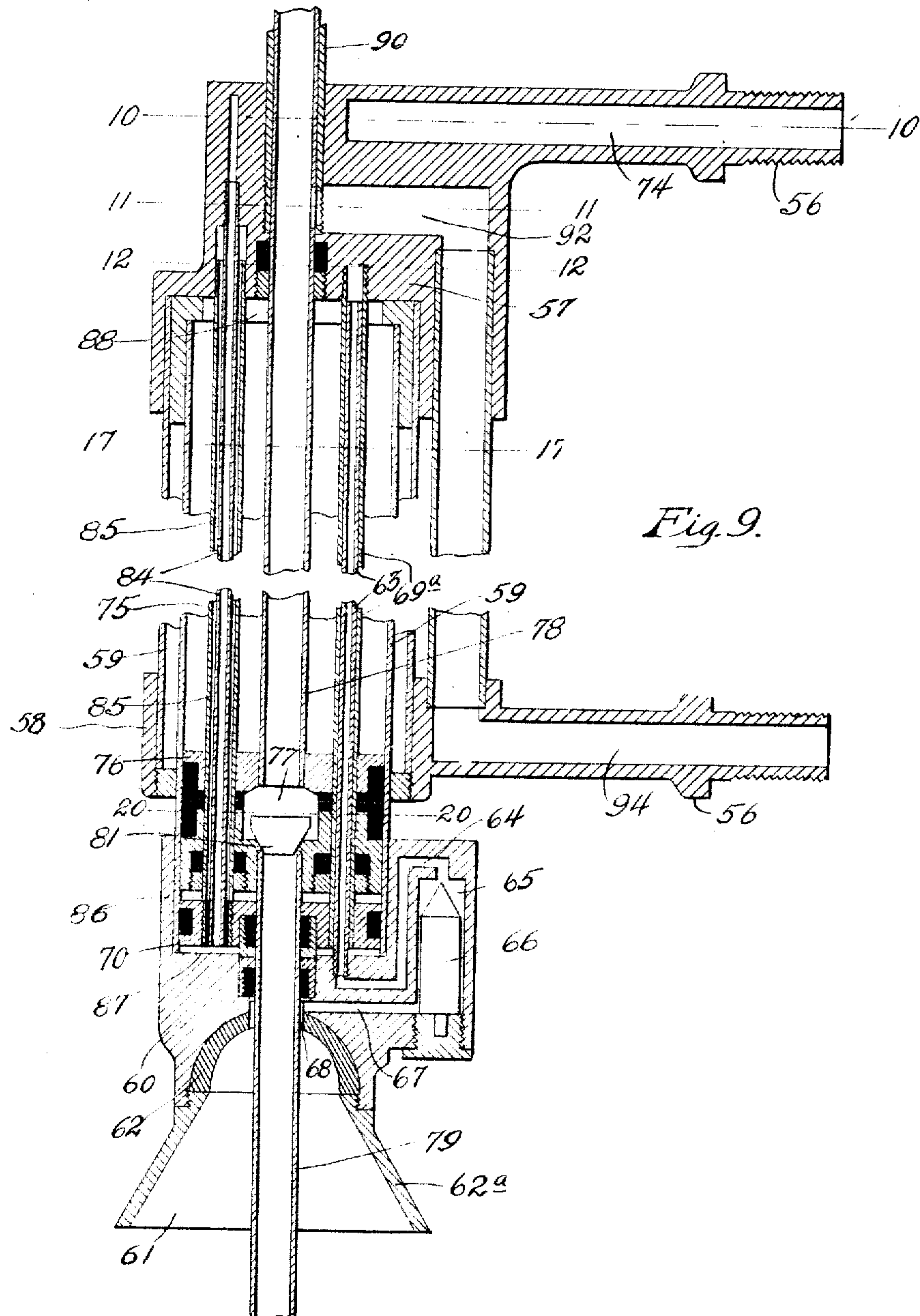


Fig. 9.

Witnesses:

Ephraim Banning  
J. M. Bond

Inventor:

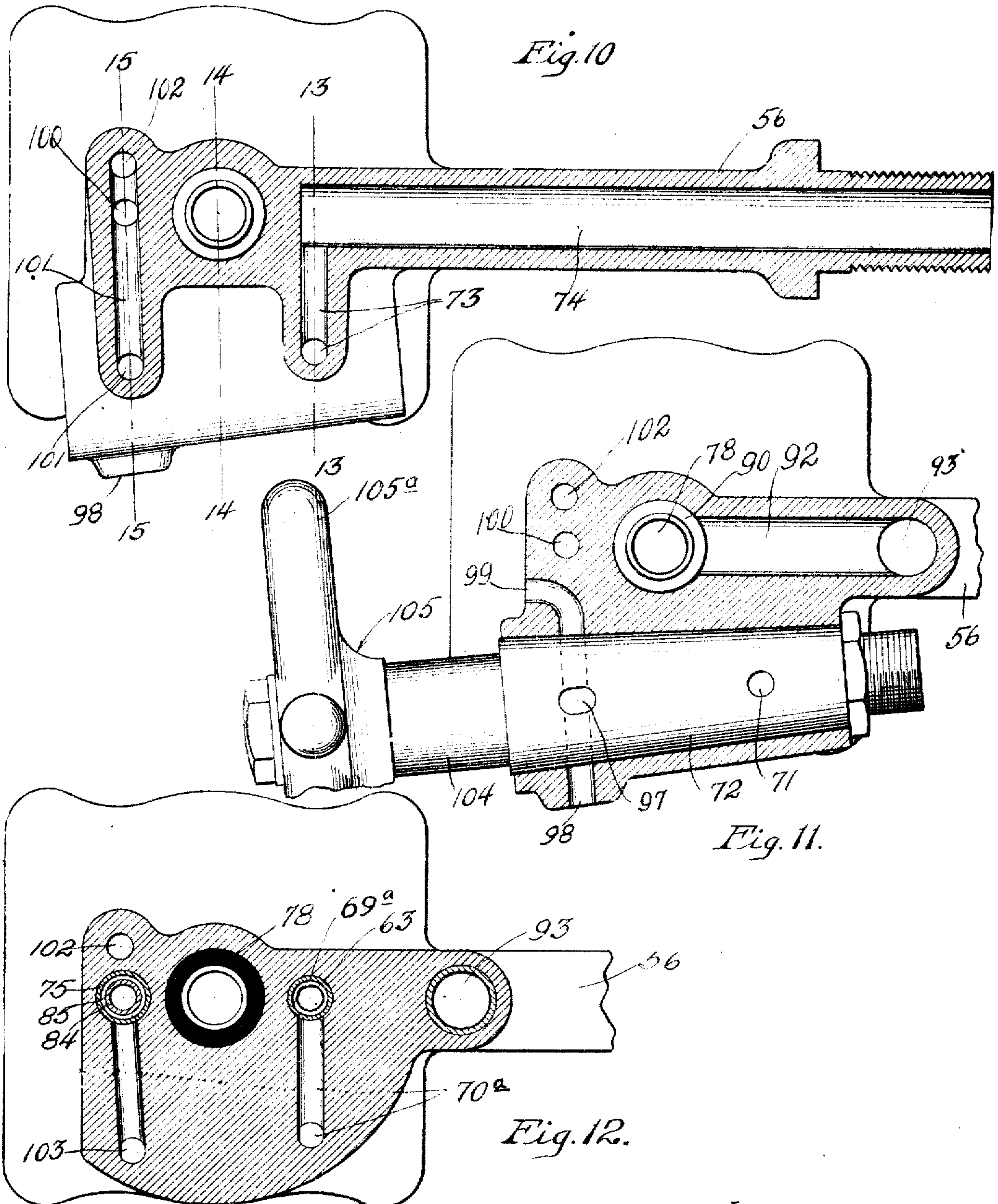
Adolph Schneider.  
By Banning & Banning  
Attorneys.



998,266.

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8 SHEETS—SHEET 6.



Witnesses:  
Ephraim Raming  
Wm. P. Bond

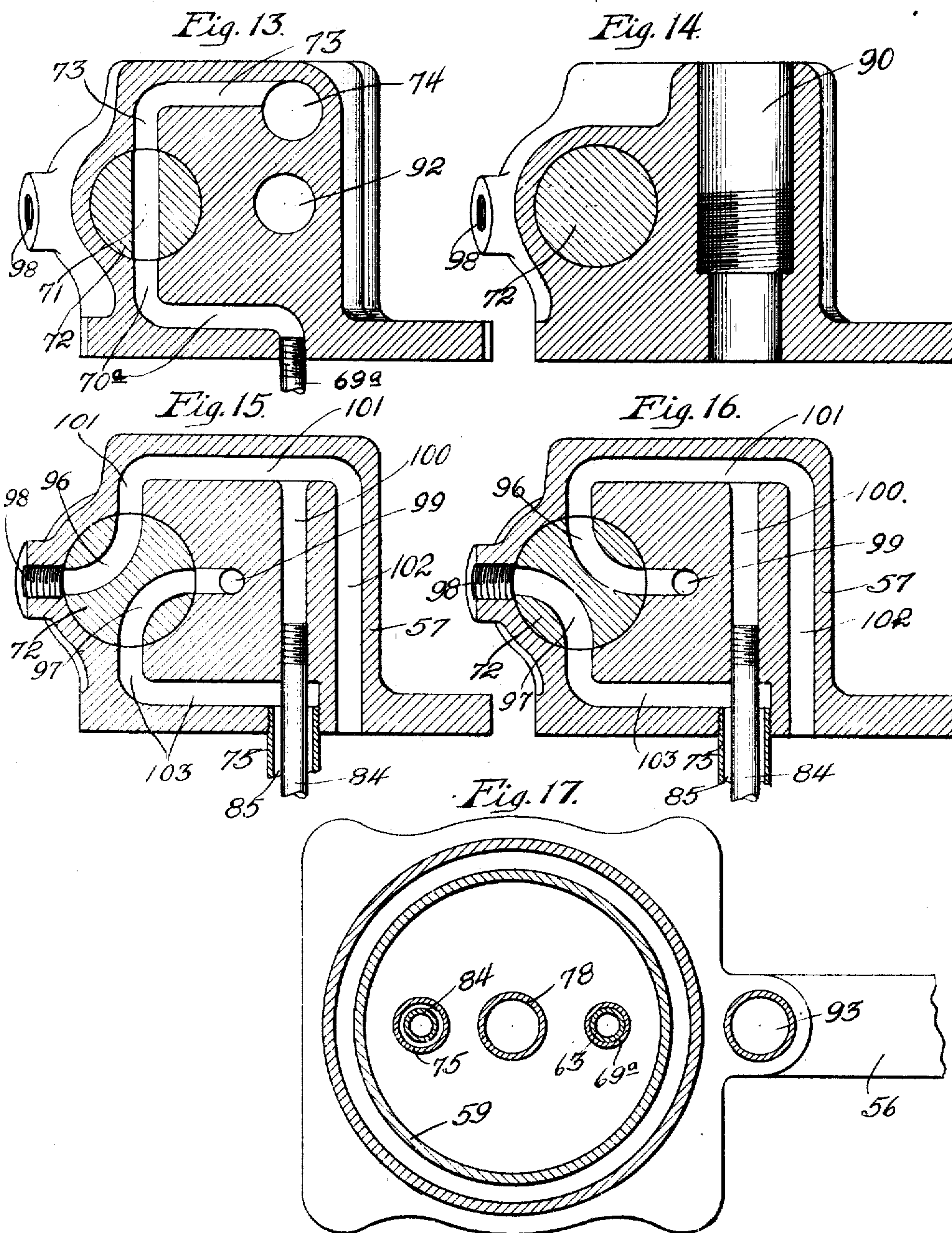
Inventor:  
Adolph Schneider.  
By Raming & Raming  
Attorneys.

998,266.

A. SCHNEIDER.  
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Patented July 18, 1911.

8 SHEETS—SHEET 7.



Witnesses:

Ephraim Banning.  
Wm. H. Bond

Inventor.

Adolph Schneider.

By Banning & Banning  
Attorneys.



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8 SHEETS-SHEET 8.

Fig. 18.

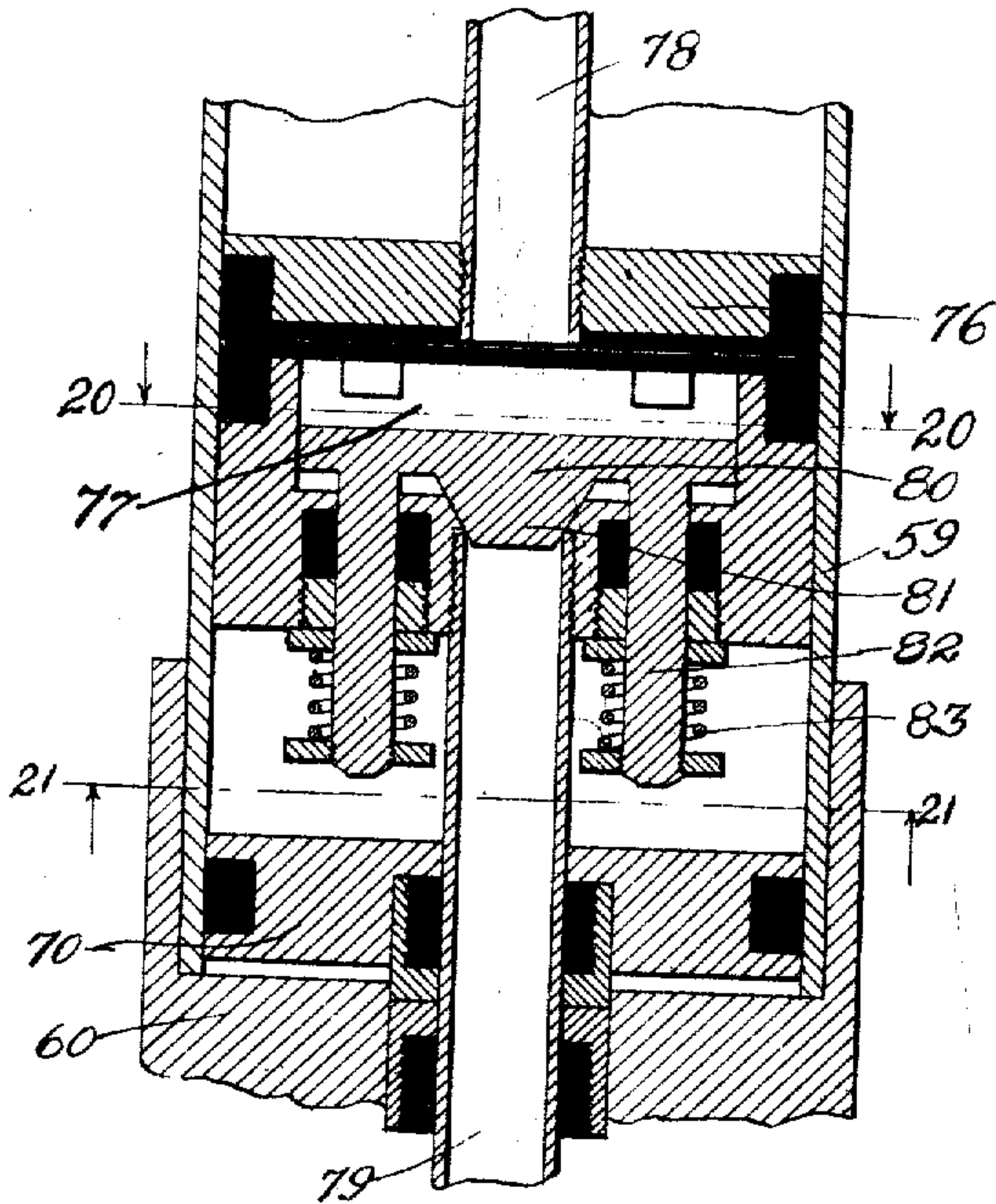


Fig. 20.

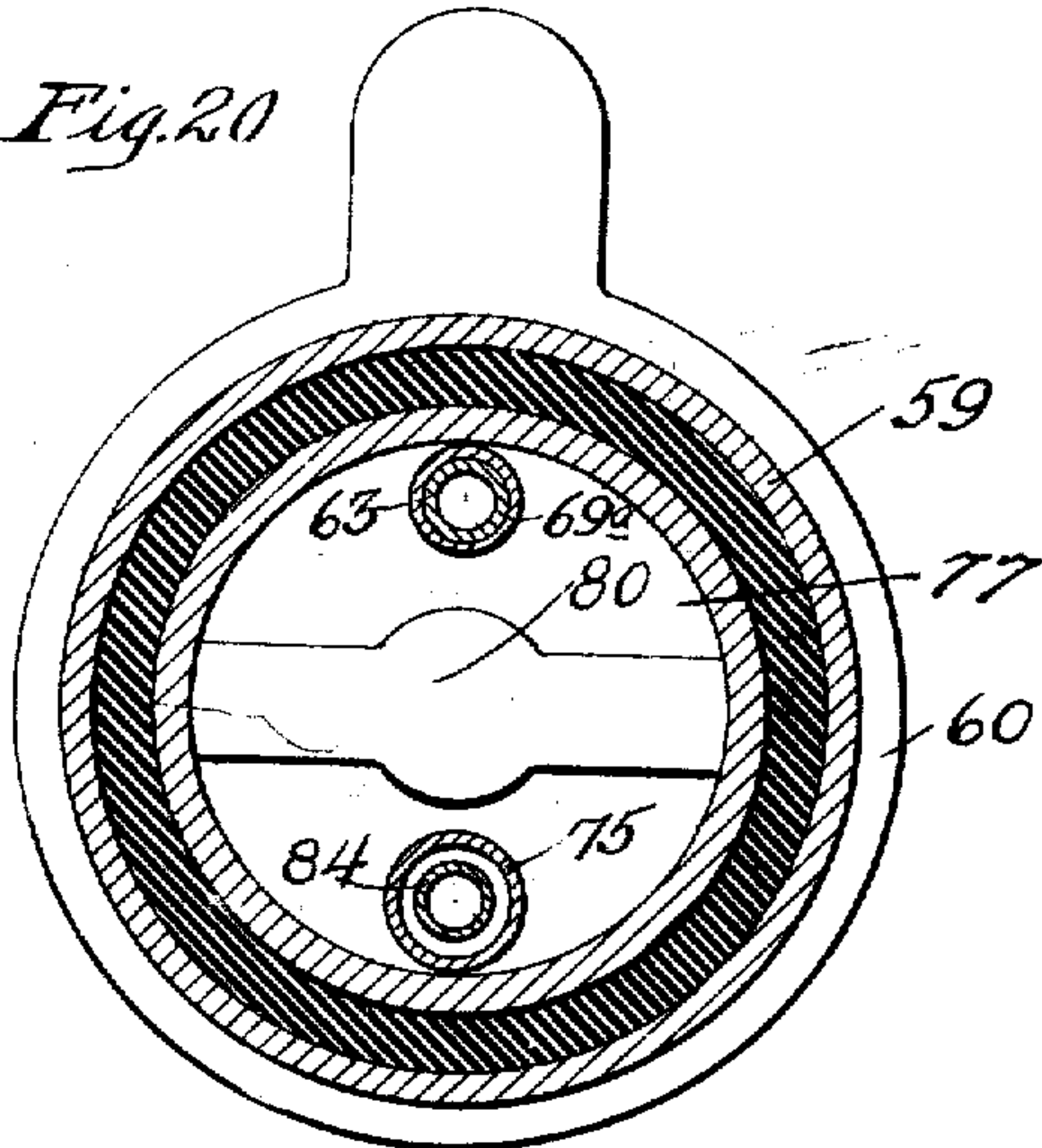


Fig. 21.

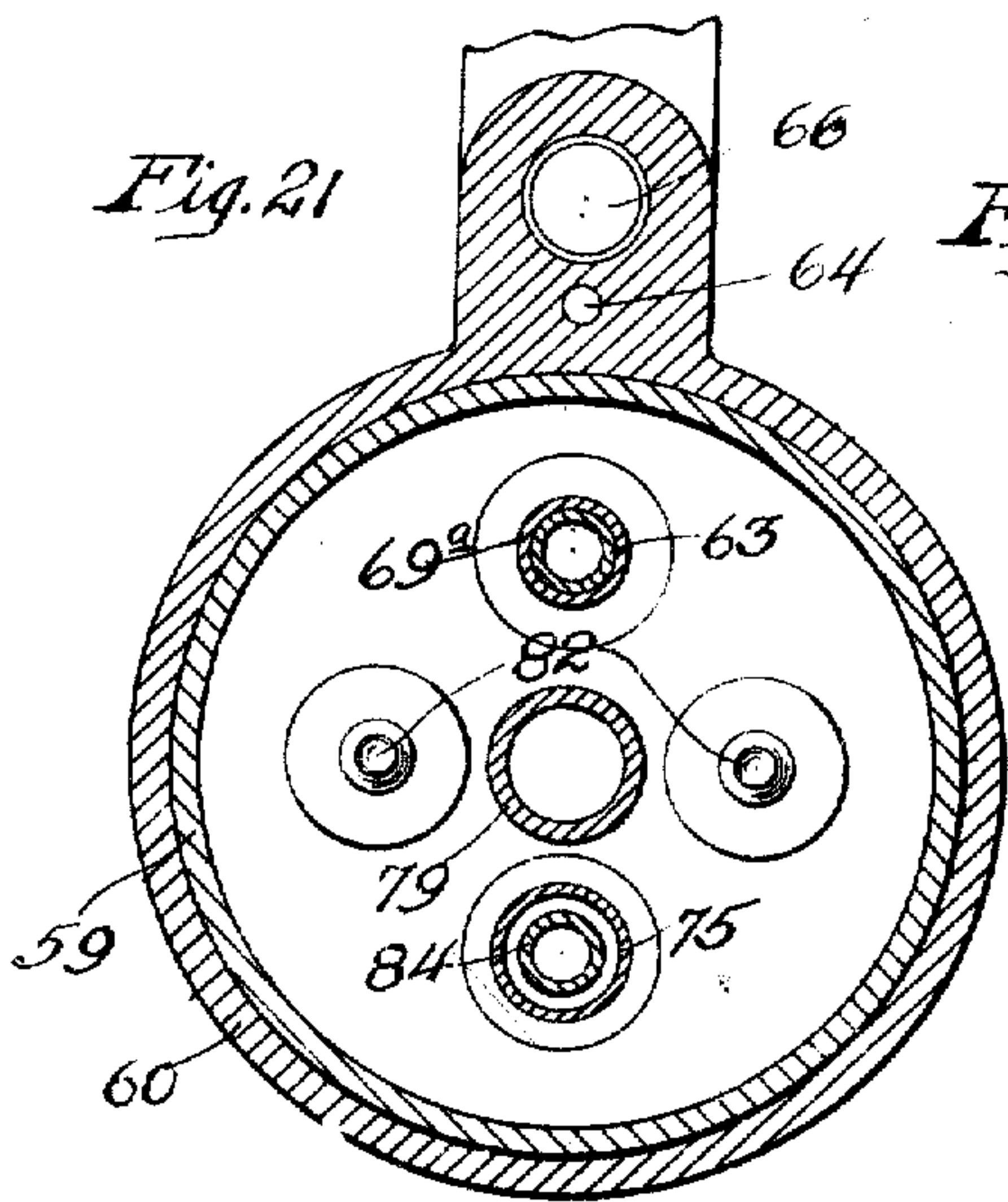
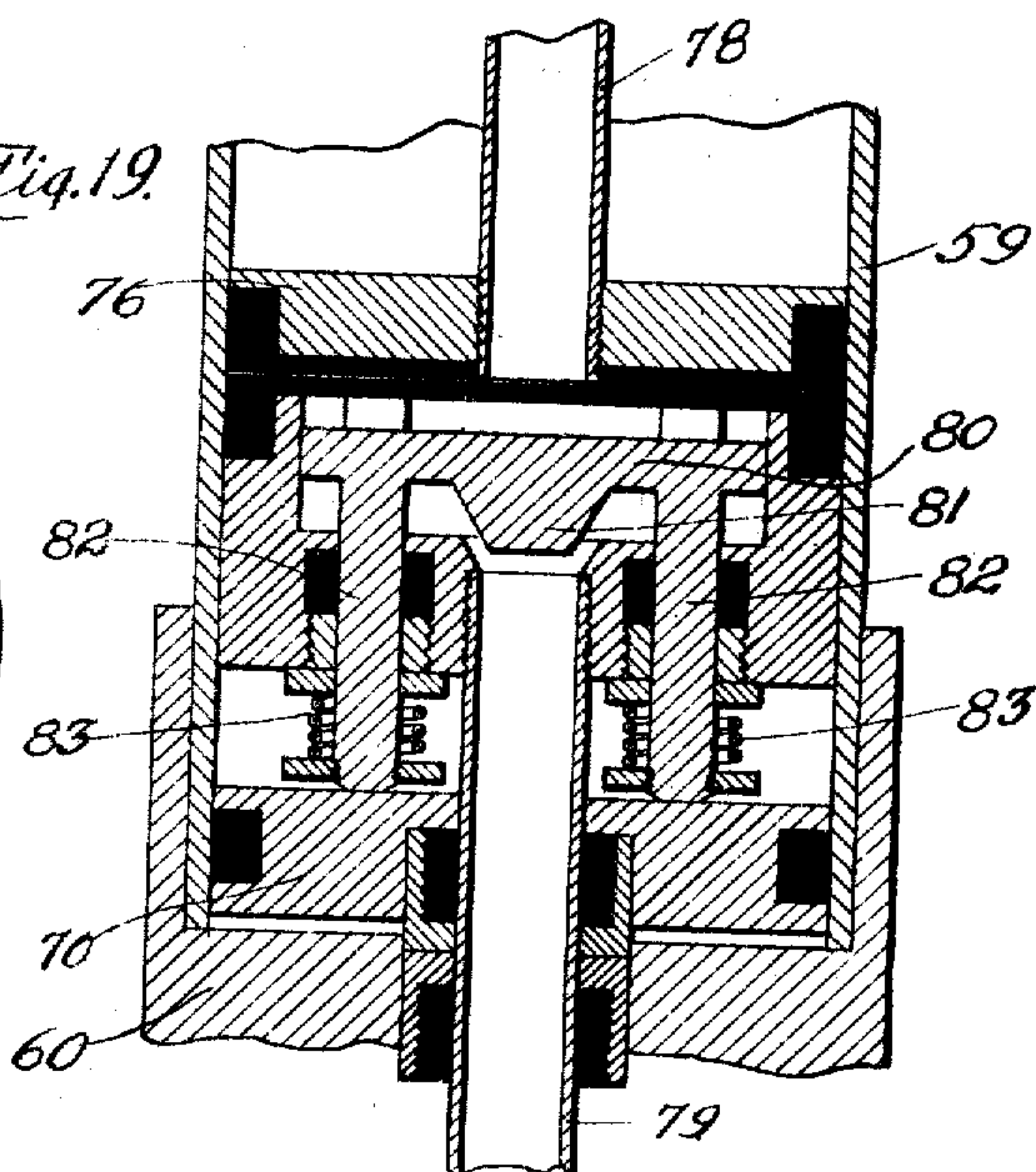


Fig. 19.



Witnesses:

Ephraim Banning.  
J. M. Bond

Inventor:

Adolph Schneider.  
By Banning & Banning  
Attorneys.



# UNITED STATES PATENT OFFICE.

ADOLPH SCHNEIDER, OF CHICAGO, ILLINOIS.

## BOTTLE-FILLING MACHINE.

998,266.

Specification of Letters Patent.

Patented July 18, 1911.

Application filed June 21, 1910. Serial No. 568,174.

*To all whom it may concern:*

Be it known that I, ADOLPH SCHNEIDER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Bottle-Filling Machines, of which the following is a specification.

The present invention relates to a machine for bottling carbonated waters and other beverages which it is necessary to bottle under pressure; and the objects of the present invention are, to provide means whereby the placing of a bottle upon the bottle support will actuate the filling mechanism, so that in case the operator fails to place a bottle upon the support no actuation of the filling mechanism corresponding to this particular support is possible; to provide a shiftable member which is adapted to be operated by the placing of a bottle on the support to bring it into position to contact and operate the valve mechanism for actuating the sealing head and filling tube into filling position; to provide means for automatically retracting the sealing head and filling tube from engagement with the bottle after the table has been rotated a predetermined distance; to provide means for adjusting the position of the shiftable member, so that the lowering and raising of the filling tube and sealing head may occur at any time desired with respect to the rotation of the table upon which the bottles are supported; to provide means for automatically returning the shiftable member to normal position; to construct passageways from a valve for controlling a medium under pressure to raise and lower the sealing head and filling tube; to locate a fixed head within the cylinder which will serve as a backing for the medium under pressure to act against, to lower the sealing head and raise the piston; to provide a series of tubes interior of the cylinder for conducting the medium into the cylinder, to raise the piston and lower the sealing head; to provide a connection between the piston and the sealing head, whereby the upward movement of the piston will impart an upward movement to the sealing head; to provide means for automatically establishing communication between the liquid in the tank and filling tube when the filling tube shall have descended

a predetermined distance; to construct telescoping tubes which provide a passageway through the cylinder to permit air to flow from the tank to the bottle, or vice versa; to establish an equalization of pressure between the tank and the bottle; to construct a cap upon the upper end of the cylinder, which is provided with passageways to conduct air from the bottle into a passageway leading to the tank, said cap being also provided with a passageway to permit liquid to enter into the interior of the cap from a passage exterior of the cylinder leading from the tank to a member having a passage for liquid therein, located exterior of the tank, for conducting liquid from the tank to a passageway leading to the filling tube; to provide valve mechanism which is carried by the cap, which will serve to control the passage of medium into and out of the cylinder for raising and lowering the sealing head, and which will also control the passageway for air between the bottle and the tank; to utilize the sealing tube as a valve member for preventing passage of liquid thereinto before the tube has reached the proper position within the bottle; to provide means for automatically deflecting the bottle from the table onto a bottle chute; and to means for retracting said deflecting means and locking it in inoperative position.

The invention further consists in the features of construction and combination of parts hereinafter described and claimed.

In certain bottle-filling mechanism heretofore constructed it has been the practice to operate the filling mechanism at a predetermined period with respect to the rotation of the table upon which the bottles are carried. This operation of the filling mechanism would take place irrespective of whether a bottle were in position beneath the filling mechanism or not; hence, if through inadvertence the operator should neglect to place the bottle in proper position, the filling mechanism would descend and a waste of liquid would ensue, owing to the absence of the bottle from its proper position.

In the structure of the present invention, the placing of the bottle upon its support on the rotatable table moves a shiftable member into position where it contacts valve mechanism and actuates the filling mechanism.



nism; hence, if the bottle is not placed in position, the shiftable member is not moved and the valve mechanism is not actuated, so that no operation of the filling mechanism results and no waste of liquid occurs through the operation of the filling mechanism at times when a bottle is not in the proper position to receive the liquid. It has also been the practice in bottle-filling mechanism to move the bottle up into position to contact the sealing head. This upward movement of the bottle in some instances caused the bottle to tip during the movement, hence it was not brought into register with the sealing head and no filling operation took place. It was furthermore necessary in devices operated on that principle to employ an air pump or some other suitable mechanism for raising the bottle, and to also employ mechanism for lowering the filling tube into the bottle. In the present structure, the bottle remains stationary and the filling tube and sealing head descend to meet the bottle; thus any danger of tipping the bottle is avoided; and, furthermore, the mechanism necessarily employed for raising the bottle is entirely eliminated, thus materially reducing the complexity of the machine and the cost of construction and operation.

In the drawings, Figure 1 is a front elevation of the completed machine; Fig. 2, a plan view; Fig. 3, a detail sectional elevation of the bottle support, the shiftable member for actuating the valve controlling the filling mechanism, and the connection between the bottle support and the shiftable member, and showing the shiftable member in operative position; Fig. 4, a view similar to Fig. 3, showing the shiftable member in non-operative position; Fig. 5, a detail plan view showing the bottle support and the shoe which is contacted by the arm on the bottle support to operate the shiftable member; Fig. 6, a sectional elevation of the cylinder and its interior mechanism, and showing the piston and sealing head in raised position; Fig. 7, a view similar to Fig. 6, showing the sealing head in its lowered position and the cylinder and filling tube partially lowered; Fig. 8, a view similar to Fig. 7, showing the piston and filling tube in its lowermost position; Fig. 9, an enlarged sectional elevation of the parts shown in Fig. 6; Fig. 10, a section on line 10—10 of Fig. 9; Fig. 11, a section on line 11—11 of Fig. 9; Fig. 12, a section on line 12—12 of Fig. 9; Fig. 13, a section on line 13—13 of Fig. 10; Fig. 14, a section on line 14—14 of Fig. 10; Fig. 15, a section on line 15—15 of Fig. 10; Fig. 16, a view similar to Fig. 15, showing the valve in its reversed position; Fig. 17, a section on line 17—17 of Fig. 9; Fig. 18, an enlarged detail showing the valve between the adjacent ends of

the filling tube in the piston; Fig. 19, a view similar to Fig. 18, showing the valve in raised position; Fig. 20, a section on line 20—20 of Fig. 18; Fig. 21, a section on line 21—21 of Fig. 19; Fig. 22, a detail plan view of the arm for deflecting the bottle from the bottle support onto the bottle chute, and showing in dotted lines the arm in its retracted or non-operative position; and Fig. 23, a side elevation of the parts shown in Fig. 22.

The device comprises a base 24, extending upwardly from which is a tubular support 25, upon which is mounted a table 26 and a tank 27. The construction of the tubular support 25 and the manner of connecting the same to the table and tank, as well as the manner of conducting pressure and liquid through the support, are all shown and described in Letters Patent No. 863,884, issued to me August 20, 1907, and the table 26 is rotated by means of suitable mechanism 28. Mounted upon the table 26 are a plurality of bottle supports 29, each comprising a member 30 of shoe-like formation, which is provided along one side and at its rear with an upwardly extending wall 31, provided with a slot 32, the other side and the front of the support being unobstructed to permit of the passing of the bottle out therefrom and in thereto, as will be more fully hereinafter explained.

Resting above the floor 33 of the bottle support is a plate 34; and positioned in the space 35 between the floor of the support and the lower edge of the support is an outwardly extending contact stem or arm 36, which is pivoted at 37 and is formed with a head 38 adapted to project through a slot 39 in the floor of the support. As shown in Fig. 4, under normal conditions, the weight of the arm 36 will tend to hold it in the downward position shown in Fig. 4, whereby the head will be projected through the slot 39 and raise the plate 34 somewhat above the floor 33; but when a bottle is placed upon the plate 34, it will be moved into the position shown in Fig. 3, and the head 38 will be forced through the slot 39, thus swinging the outer end of the arm 36 into the position shown in Fig. 3, where it will strike a contact and operate the shiftable member to actuate the filling mechanism. The operation, however, will be more fully set forth hereinafter.

Positioned adjacent to the structure is an upright post 40, which terminates at its upper end in outwardly extending, diverging arms 41. The arms 41 are adapted to receive a structure 42, which extends downwardly therefrom and comprises an elongated stem or shank 43, with which are formed sleeves 44 and 45, which serve as a mounting and guide for the slidable rod 46. The rod 46 has secured to its lower end a



shoe 47, which is provided with a sloping surface 48, and the sloping surface 48 lies within the path of travel of the arm 36 when said arm is raised to the position shown in Fig. 3. Hence, the arm will strike the sloping surface 48, and, since the arm is held in fixed position by the weight of the bottle, it will force the shoe 47 downward, thus lowering the rod 46.

Attached to the upper end of the rod 46 is a link 49, which is attached to a finger 50 pivoted to the structure 42 at 51, the finger 50 forming in fact a shiftable member which is thrown by the movements of the rod 46 into and out of position to contact the valve and operate the filling mechanism. Secured to the rod 46 is a collar 52, interposed between which and the sleeve 45 is a spring 53 for forcing the rod 46 upward to normal position after the arm 36 has passed across the surface of the shoe 47. As shown in Figs. 3 and 4, the sleeve 45 is formed with a downwardly projecting lug 54, which serves as a backing for the shoe 47, to prevent its swinging out of position during its upward and downward movements.

Secured to the tank 27 are a plurality of cylinders 55, each secured by means of stems 56 to the tank 27. The interior formation of the tank may be of the kind described and shown in my pending application Serial No. 560,111, filed May 9, 1909, or any other well known and suitable form of structure. Positioned upon the upper end of the cylinder is a cap 57, and upon the lower end of the cylinder is a cap 58; and the stems 56 are formed integral with the cap and serve to connect the cylinders rigidly to the tank, and also serve for the conduction of air and liquid into the interior of the cylinder, as will be more fully hereinafter explained.

It will be understood that a plurality of bottle supports are used and that a cylinder is positioned in vertical alinement with each bottle support; but since each of the bottle supports and cylinders and the mechanism interior of the cylinders are alike in every respect, detailed description of but one bottle support and one cylinder is all that is deemed necessary at this time. The cylinder has positioned in its interior an enlarged tube 59, secured to the lower end of which is a sealing head 60, which is formed with a funnel-shaped mouth 61, positioned in which is a semi-circular ring of sealing material 62. The general construction and arrangement of the centering guide, 62<sup>a</sup>, however, are well known in the art and detailed description thereof is not deemed necessary in describing the present invention.

Carried by the sealing head 60 is a tube 63, which is in communication with a passage 64, communicating with a chamber 65,

in which is positioned a float 66, and the chamber communicates at its opposite end with a passage 67, which is in communication with a passage 68 merging into the mouth 61. The tube 63 is adapted to telescope within a tube 69<sup>a</sup>, one end of which is secured within a fixed head 70, located in the interior of the enlarged tube 59, but held against vertical movement with respect to said tube. The opposite end of the tube 69<sup>a</sup> is secured to the upper cap 57, and communicating with the upper end of the tube 69<sup>a</sup> is a passageway 70<sup>a</sup> which extends forward, as shown in Fig. 12, and thence upwardly to communicate with a passage 71 in a valve plug 72; and extending within the cap 57 and above the valve plug 72 is a passageway 73, which extends parallel to the passage 70<sup>a</sup>; and the passage 73 communicates with a passageway 74 in the stem 56 extending from the cap 57.

The passageway 74 communicates with the interior of the tank 27 and serves to conduct air from the bottle into the tank or out of the tank to the bottle, as the case may be, in order to secure an equalization of pressure between the tank and bottle. The air passes through the passage 74 into the passage 73, thence through the passage 71 of the valve member 72 when said valve member is in proper position to the passages 71 and 73; and after passing through the passage 71 the air passes through the passage 70<sup>a</sup> and into the tube 69<sup>a</sup>; thence through the tube 63 into the passage 64 and through the chamber 65 into the passage 67; and thence through the passage 68 into the bottle. Thus, when the valve 72 is turned into proper position, a free passage is established between the bottle and the interior of the tank for the conduction of air from the tank to the bottle, or from the bottle to the tank; and the float is provided so that after the filling operation liquid will not be forced through the chamber 65 and up into the passages 64 and into the tube 63, the float rising when liquid is forced into the chamber 67 and seating itself to close the passage 64.

Oppositely disposed with respect to the tube 69<sup>a</sup> is a tube 75, which has one end secured to the fixed head 70 and the other end secured to the cap 57, the two tubes 69<sup>a</sup> and 75 cooperating to form a support for the head 70, and also cooperating to form guide members for a piston 76. The piston 76 is provided centrally thereof with a chamber 77, into which are entered the adjacent ends of an upper filling tube 78 and a lower filling tube 79; and positioned within the chamber 77 is a plate 80, which is provided centrally thereof with a depending tapered lug 81, which is adapted to enter into the upper end of the lower filling tube 79 and close the same, thus preventing the passage of liquid from the upper to the lower filling



tube at all times save when the valve member 81 is unseated from the upper end of the lower filling tube 79.

The plate 80 is provided with oppositely disposed, downwardly depending stems 82, which extend below the lower edge of the piston and are adapted to contact the fixed head 70 when the piston has reached a point adjacent its lowermost position and unseat the valve member 81 in the manner shown in Fig. 19; and coil springs 83 are provided for returning the stems 82 to their normal position after the piston has been raised to draw the ends of the stems free of the fixed head 70. Thus, when the piston has descended to a point approximately its farthest position downward, the valve between the upper and lower filling tubes will become unseated, thus permitting liquid to flow from the upper tube into the lower tube and thence into the bottle. In this manner, leakage of liquid is prevented and the flow thereof permitted only at a time when the lower filling tube shall have been inserted in proper position within the bottle.

Positioned within the tube 75 and secured within the cap 57 is a tube 84, which, as shown in Figs. 6, 7, 8 and 9, is of a smaller diameter than the tube 75, whereby a space 85 is provided between the two tubes. The tube 75 is provided with openings 86 located adjacent to and above the fixed head 70, and the tube 84 extends through the fixed head and is in communication with the space below said head. Hence, when pressure is admitted to the interior of the tube 84, it will pass down and enter into the space below the fixed head 70, and will thus act against the upper surface 87 of the sealing head to force the sealing head downward. At the same time that pressure is admitted to the tube 84, pressure will be admitted to the space 88 between the lower face of the cap 57 and the upper face of the piston 76, thus forcing the piston downward simultaneously with the forcing of the sealing head downward. The sealing head will continue downward until the ring 62 is seated around the mouth of the bottle. This will serve to check any further descent of the sealing head, but the piston will continue to descend until the stems 82 contact the fixed head 70, at which time the lower filling tube shall have entered into the bottle the proper distance to permit the flowing of liquid thereinto.

Carried by the tube 59, upon the upper end thereof, as shown more clearly in Fig. 7, is a flanged ring 89, which serves as a connection between the piston and sealing head, so that upward movement of the piston draws the sealing head upward simultaneously therewith. When an upward movement of the piston is desired, pressure is admitted into the space 85 between the

tubes 84 and 75, and this pressure emerges through the openings 86 into the space between the piston and fixed head, as shown in Fig. 9, and thus acts upon the lower face of the piston to drive the piston upward; and when the piston has been driven upward a sufficient distance it contacts the flanged ring 89 and draws the tube 59 and sealing head 60 upward simultaneously therewith.

The upper filling tube 78 telescopes within a fixed tube 90 upwardly extending from the cap 57; and the tube 90 is provided, adjacent its lower end, with an opening 91, which is in communication with a passage 92 formed in the cap 57, which passage communicates with a tube 93 extending upon the outside of the cylinder, said tube being in communication at its lower end with a passage 94 formed in the stem 56. The stem 56 enters the tank 27 at a point so that the liquid contained in said tank will flow through the passage 94 and tube 93 into the passage 92, the forcing upward of the liquid in this manner being easily accomplished by reason of the pressure which is constantly on the liquid in the tank.

The upper filling tube 78 also forms a closure to prevent the passage of liquid through the opening 91 into the interior of the filling tube at all times save when the filling tube has been lowered to the proper position within the bottle. When such position has been reached, the upper edge of the filling tube will be clear of the opening 91, so that liquid can flow through said opening into the filling tube, and thence downward and through the chamber 77 in the piston, into the lower filling tube 79, and thence into the bottle. The filling tube itself thus serves as a valve to prevent the passage of liquid thereinto at all times, save the proper one.

It is, of course, evident that during the filling operation there will be a column of liquid extending from the opening 91 to the bottom of the filling tube, but when the piston starts upon its upward movement the valve 81 will seat itself, thus checking the flow of liquid from the upper tube to the lower tube and trapping a certain amount of liquid in the upper tube. Thus, the initial portion of the liquid entering the bottle will fall only from the chamber 77 to the lower end of the tube and will not enter the bottle with the violent rush that would occur if it were to fall the whole distance through the upper and lower filling tubes. Furthermore, the liquid will not continue to descend for any great length of time after the piston has started its upward movement.

Pressure is admitted to the tube 84 and to the space 85, between the tube 84 and 75, through passageways formed in the head 57.



The passageways are controlled by the valve 72, which is provided in addition to the passage 71 with passages 96 and 97, adapted by different manipulations of the valve to be brought into communication with a supply port 98 and an exhaust port 99. Communication to the tube 84 is provided through the medium of a passage 100 communicating with a passage 101 adapted to be brought into communication with the supply port 98, through the medium of the passage 96 when the valve is turned into the position shown in Fig. 15. Also, in communication with the passage 101 is a passageway 102 leading to the space between the bottom of the cap 57 and the piston 76. Hence, when the valve is turned into the position shown in Fig. 15, pressure is admitted through the passages 101 and 102 above the piston 76, to drive the piston downward, so that pressure is admitted simultaneously to the tube 84 to drive the sealing head downward, and to the space above the piston to drive the piston downward. But when the valve has been moved to the position shown in Fig. 16, the the passageway 101 is brought into communication with the exhaust port 99 through the medium of the passage 96 in the valve member; and the passage 97 is then brought into communication with the supply port 98 and a passage 103, which communicates with the interior of the tube 75, and thus pressure is admitted through the space between the tube 75 and tube 84, from whence it passes out through the openings 86 to act upon the lower face of the piston and force the piston upward.

As will be noted in Figs. 15 and 16, the valve is located to one side of the center of the cylinder, and the passages enter into the cylinder at a point approximately the center thereof. Thus the valve is in a position where it does not in any way interfere with the passage of the filling tube up and down through the center of the cap. The valve is provided with a stem 104, to which is attached a wheel 105 comprised of a plurality of fingers 105<sup>a</sup>; and these fingers are adapted to be contacted by the finger 50 when it is raised into proper position by the placing of a bottle upon the bottle support.

As shown in Fig. 1, the fingers or shiftable members 50 and the mechanism for operating said fingers are placed upon either side of the post 40, one of the fingers of the pair of fingers serving to throw the valve into the position shown in Fig. 15 to admit pressure to lower the sealing head and piston, and the other of said fingers serving to throw the valve into the position shown in Fig. 16, where pressure is admitted to raise the piston. And since each of the fingers 50 and the mechanism for operating the same are exactly alike in every particular, a detailed description of but one is all that has

been deemed necessary. The supply port 98 may be connected in any suitable manner to a suitable source of pressure supply, as, for instance, an ordinary air pump; and this connection may be made through the interior of the tubular support 25, as is shown and described in Letters Patent No. 863,884, granted to me August 20, 1907, or in any other suitable manner.

As shown in Figs. 22 and 24, a chute 106, comprising an adjustable wall 107 and an arm 108, is provided with a forked end 109 adapted to register with the slot 32 in the wall 31 of the bottle support. The arm 108 is hinged at 109<sup>a</sup>, and attached to said arm is a rod 110, which passes through a lug 111; and the lug is provided with a locking member 112 adapted to enter into recesses 113 in the rod 110, to hold the arm 108 in a restricted or extended position, where it is brought into and out of the path of travel of the bottle lying upon the bottle support; and the chute 106 is held against rotation about the post 40 by means of a set screw 114, or other similar locking device.

When the arm 108 is in the position shown in Fig. 22, it will contact the bottle 115 resting upon the bottle support and force it against the wall 31 of the bottle support; and, as shown, this wall is positioned at an angle so that the bottle when caught between the arm and the wall will be forced outward along the wall and onto the chute 106, since the support is rotating and the arm remains fixed. But when the arm is drawn back into the position shown in dotted lines in Fig. 22, it will then lie out of the path of travel of the bottle upon the support, so that the bottle will pass thereby and will not be forced onto the chute 106.

The operation will be understood from the foregoing, but briefly is as follows: When a bottle is placed upon the plate 34, the plate is forced downwardly, as shown in Fig. 3, swinging the arm 36 upward into position where its path of travel will cause it to contact the sloping surface 48 of the shoe 47, thus depressing the shoe and drawing the rod 46 downward, lowering the link 49, swinging the finger 50 upward into position to contact the wheel 105, and operating the valve 72 into the position shown in Fig. 15, where pressure is admitted to the interior of the cylinder to lower the piston and sealing head; and the sealing head continues its descent until the ring 62 seats itself around the head of the bottle, after which further descent of the sealing head is checked. The piston will continue to move downward until the stems 82 contact the fixed head, as shown in Fig. 19. When this point has been reached, the filling tube will be in the position shown in Fig. 8, where the top of the tube lies below the opening 91, and liquid will enter from the passage



92 into the upper filling tube 78. The contacting of the stems 82 with the head 70 will unseat the valve 81 and permit liquid to flow from the upper tube 78 into the lower tube 79 and thence into the bottle. The mechanism will remain in this position until the table has been rotated sufficiently to bring the arms 36 into engagement with the oppositely disposed shoe 47, to depress said shoe and move the oppositely disposed finger 50 into position to actuate the valve into the position shown in Fig. 16, at which time pressure acting against the upper face of the piston and the upper face of the sealing head will be exhausted through the exhaust port 99; and the supply port 98 will be brought into communication with the passage 103 and pressure admitted to the space 85 between the tube 84 and the tube 75, from whence it will pass through the opening 36 to act against the lower face of the piston and force the piston upward. And the piston, after moving upward a predetermined distance, will contact the flanged ring 89 and move the tube 59 upward, thus carrying the sealing head 60 upward until the flanged ring 89 contacts the cap 57, when the device will be in the position shown in Fig. 6, which is the normal position.

When the valve 72 is turned into position to admit pressure to lower the piston and sealing head, the passage 71 will be brought into register with the passages 73 and 70<sup>a</sup>, thus establishing communication between the tube 69 and the passage 74, and permitting air to flow, to equalize the pressure between the bottle and tank. And this equalization will be maintained until the valve 72 is turned into position to admit pressure to the cylinder to raise the filling tube, at which time the passage 71 in the valve will be brought out of communication with the passages 73 and 70<sup>a</sup> and communication between the tank and the bottle broken.

The filled bottle will be carried by the rotatable table until the arm 108 strikes thereagainst, which striking will force the arm against the side wall 81 of the support, and from the side wall it will be forced onto the chute 106, from whence it will be taken and placed in the corking machine.

The liquid which remains in the lower filling tube, after its retraction from the bottle, is held from flowing out therefrom by the pressure of air upon the lower end thereof, under the old and well known principle of sustaining a column of liquid within the tube by means of the air pressure on the lower end, the upper end, of course, being hermetically sealed.

I claim:

1. In a bottle-filling machine, the combination of bottle-filling mechanism, means

for operating the same, a shiftable member 65 for actuating the operating means, a bottle support comprising a fixed shoe having a movable plate therein, a connection between the shiftable member and the plate, whereby the weight of a bottle placed on said 70 plate moves the shiftable member into position to actuate the operating means for the filling mechanism, substantially as described.

2. In a bottle-filling machine, the combination of bottle-filling mechanism, means 75 for operating the same, a rotatable table, bottle supports carried by said table, a shiftable member for actuating the operating means and held against movement with respect to the rotation of the table, a movable 80 plate within such support, a connection between the shiftable member and the movable plate, whereby the weight of a bottle placed on the plate moves the shiftable member into position to actuate the operating 85 means for the filling mechanism, substantially as described.

3. In a bottle-filling machine, the combination of bottle-filling mechanism, means for operating the same, a shiftable member 90 for actuating the operating means, a bottle support, a stem extending out from beneath the flow of the support and moved by the weight of a bottle placed on the floor, a contact lying within the path of travel of 95 the stem when the stem is moved by the bottle, a connection between the shiftable member and the contact, whereby the placing of a bottle on the support moves the stem to engage the contact and moves the shiftable 100 member into position to actuate the operating means for the filling mechanism, substantially as described.

4. In a bottle-filling machine, the combination of bottle-filling mechanism, means 105 for operating the same, a shiftable member for actuating the operating means, a bottle support, a stem extending out from beneath the support and moved by the weight of a bottle placed on the support, a shoe provided with a sloping contact surface lying within the path of travel of the stem when the stem is moved by the bottle, a connection between the shiftable member and the shoe, whereby the placing of a bottle on the 115 support moves the stem to engage the shoe and actuate the shiftable member into position to actuate the operating means for the filling mechanism, substantially as described.

5. In a bottle-filling machine, the combination of bottle-filling mechanism, means 120 for operating the same, a shiftable member for actuating the operating means, a bottle support comprising a fixed shoe, a plate above the floor of the support, upon which 125 the bottle is placed, a movable member adapted to normally hold the plate in raised position, a contact, a connection between the



contact and the shiftable member, whereby the placing of the bottle upon the plate lowers the plate and actuates the movable member into position to engage the contact and moves the shiftable member into position to actuate the operating means for the filling mechanism, substantially as described.

6. In a bottle-filling machine, the combination of bottle-filling mechanism, means for operating the same, a shiftable member for actuating the operating means, a contact, a connection between the shiftable member and the contact, a bottle support, a plate above the floor of the support, upon which the bottle is placed, a movable member extending outwardly from beneath the plate and adapted to hold the plate in raised position, the lowering of the plate by the placing of a bottle thereon shifting the movable member into position to engage the contact and moving the shiftable member into position to actuate the operating means for the bottle-filling mechanism, substantially as described.

7. In a bottle-filling machine, the combination of bottle-filling mechanism, means for operating the same, a bottle support, a plate above the floor of the support, upon which the bottle rests, a stem pivotally mounted below the floor of the support, a head on the stem, said floor having a slot through which said head normally projects, said plate being held normally upward by the head, the placing of a bottle on said plate forcing the head downward and bringing the stem into position to engage the contact and move the shiftable member into position to actuate the operating means for the bottle-filling mechanism, substantially as described.

8. In a bottle-filling machine, the combination of bottle-filling mechanism, means for operating the same, a shiftable member for actuating the operating means, a bottle support comprising a fixed shoe having therein a movable plate, a connection between the shiftable member and the plate, whereby the weight of a bottle placed on the plate moves the shiftable member into position to actuate the operating means for the filling mechanism, and means for returning the connection to normal position, substantially as described.

9. In a bottle-filling machine, the combination of bottle-filling mechanism, means for operating the same, a rotatable table, bottle supports carried by said table a contact shoe, a rod carried by the shoe, a link attached to the rod, a finger attached to the link, a support upon which the finger is pivoted, said shoe, rod, link, finger and support therefor being fixed with respect to the movement of the table, a plate above the floor of each support, upon which the bot-

tle rests, a movable member adapted to normally hold the plate in raised position, the lowering of the plate by the placing of a bottle thereon shifting the movable member into position to engage the shoe and actuate the rod and link to move the finger into position to operate the valve, whereby the bottle-filling mechanism is actuated, substantially as described.

10. In a bottle-filling machine, the combination of bottle-filling mechanism, means for operating the same, a rotatable table, bottle supports carried by said table a contact shoe, a rod carrying the shoe, a link attached to the rod, a guide member for the rod, a finger attached to the link and pivoted to the guide member, said shoe, rod, link, finger and support therefor being fixed with respect to the rotation of said table, a plate above the floor of each support, upon which the bottle rests, a movable member adapted to normally hold the plate in raised position, the placing of a bottle on said plate lowering the plate and bringing the movable member into position to engage the shoe and actuate the rod and link to swing the finger into position to actuate the operating means of the bottle-filling mechanism, substantially as described.

11. In a bottle-filling machine, the combination of bottle-filling mechanism, means for operating the same, a rotatable table, bottle supports carried by said table a contact shoe, a rod carried by the shoe, a link attached to the rod, a finger attached to the link, a support upon which the finger is pivoted, said shoe, rod, link, finger and support therefor being fixed with respect to the rotation of said table, a plate above the floor of each support, upon which the bottle rests, a movable member adapted to normally hold the plate in raised position, the lowering of the plate by the placing of a bottle thereon shifting the movable member into position to engage the shoe and actuate the rod and link to move the finger into position to operate the valve, whereby the bottle-filling mechanism is actuated, a collar on the rod, and a spring interposed between the collar and guide member for returning the rod, link and finger to normal position, substantially as described.

12. In a bottle-filling machine, the combination of bottle-filling mechanism, means for operating the same, a rotatable table, bottle supports carried by said table a shiftable member for actuating said bottle filling operating means, said shiftable member being fixed with respect to said rotatable table, a connection between the shiftable member and the bottle support, whereby the weight of a bottle placed on the support moves the shiftable member into position to actuate the operating means for the filling mechanism, a



mounting for the shiftable member and its connection, and means for adjusting the shiftable member and connection with respect to each other, substantially as described.

13. In a bottle-filling machine, the combination of bottle-filling mechanism, means for operating the same, a rotatable table carrying bottle supports, a contact shoe, a rod carried by the shoe, a link attached to the rod, a finger attached to the link, a support upon which the finger is pivoted, said shoe, rod, link, finger and support therefor being fixed with respect to said rotatable table, a plate above the floor of each support, upon which the bottle rests, a movable member adapted to normally hold the plate in raised position, the lowering of the plate by the placing of a bottle thereon shifting the movable member into position to engage the shoe and actuate the rod and link to move the finger into position to operate the valve, whereby the bottle-filling mechanism is actuated, a fixed upright post, arms outwardly extending from the upright post and serving as a mounting for the guide member, and means for adjusting the guide member to different positions upon the arms, whereby they are brought into adjusted position with respect to the bottle support, substantially as described.

14. In a bottle filling machine, the combination of bottle filling mechanism, means for operating the same, a rotatable table, bottle supports carried by said table, a shiftable member for actuating the bottle filling operating means, said member being fixed with respect to the rotation of said table, a connection between the shiftable member and bottle support, whereby the weight of a bottle placed on said support moves the shiftable member into position to actuate the operating means for the filling mechanism, substantially as described.

15. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a filling tube carried by the piston, a sealing head actuated by the piston, means for controlling a medium under pressure to raise and lower the piston at predetermined periods with respect to the rotation of the table, means for establishing communication between the air in the tank and the bottle, a tube exterior of the cylinder and longitudinally thereof for conducting liquid, and means for establishing communication between the exterior tube and filling tube when the piston has reached a point adjacent the limit of its downward movement,

said communications being established at predetermined periods with respect to the raising and lowering of the piston, substantially as described.

16. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a filling tube carried by the piston, a sealing head actuated by the piston, means for controlling a medium under pressure to raise and lower the piston at predetermined periods with respect to the rotation of the table, means for establishing communication between the air in the tank and the bottle, a tube exterior of the cylinder and longitudinally thereof for conducting liquid, a connection between the upper end of the exterior tube and the upper end of the interior of the cylinder, said connection having a passage therein, the filling tube serving as a valve to prevent passage of liquid thereinto during the downward movement thereof, the upper edge of the filling tube being clear of the passage in the connection when the piston has reached a point adjacent the limit of its downward movement, whereby communication is established between the filling tube and exterior tube, said communications being established at predetermined periods with respect to the raising and lowering of the piston, substantially as described.

17. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a filling tube carried by the piston, a sealing head actuated by the piston, means for controlling a medium under pressure to raise and lower the piston at predetermined periods with respect to the rotation of the table, means for establishing communication between the air in the tank and the bottle, a tube exterior of the cylinder for conducting liquid, a connection between the exterior tube and the interior of the cylinder, having a passage therein, the filling tube serving as a valve to prevent passage of liquid thereinto during the downward movement thereof, the upper edge of the filling tube being clear of the passage in the connection when the piston has reached a point adjacent the limit of its downward movement, whereby communication is established between the filling tube and exterior tube, said communications being established at



predetermined periods with respect to the raising and lowering of the piston, and a fixed tube in the upper end of the cylinder, serving as a guide for the filling tube, substantially as described.

18. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a filling tube carried by the piston, said filling tube comprising upper and lower sections joined to the piston, said piston having a chamber formed therein between the adjacent ends of the tubes, a valve for preventing the flow of liquid from the upper to the lower tube, means for shifting said valve when the piston has reached a point adjacent the end of its downward movement to permit the passage of liquid from the upper to the lower tube, a sealing head actuated by the piston, means for controlling a medium under pressure to raise and lower the piston at predetermined periods with respect to the rotation of the table, means for establishing communication between the air in the tank and the bottle, and means for establishing communication between the liquid in the tank and the upper filling tube, said communications being established at predetermined periods with respect to the raising and lowering of the piston, substantially as described.

19. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, said piston having a chamber formed therein between the adjacent ends of the tubes, a plate within said chamber, a protuberance on said plate adapted to enter the upper end of the lower tube and serving to prevent the flow of liquid from the upper to the lower tube, stems depending upon the plate, a fixed contact against which the stems strike, whereby the plate is raised, moving the protuberance out of engagement with the upper end of the lower tube, and establishing communication between the two tubes for the passage of liquid therethrough, means for returning the plate to normal position, a sealing head actuated by the piston, means for controlling a medium under pressure to raise and lower the piston at predetermined periods with respect to the rotation of the table, means for establishing communication between the air in the tank and the bottle, and means for establishing communication

between the liquid in the tank and the upper filling tube, said communications being established at predetermined periods with respect to the raising and lowering of the piston, substantially as described.

20. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a filling tube and sealing head actuated by the piston, means for controlling a medium under pressure to raise and lower the piston at predetermined periods with respect to the rotation of the table, fixed tubes in the interior of the cylinder, one of the tubes serving as a means for conducting through the piston air passing between the bottle and tank, means for controlling said passage, and means for establishing communication between the liquid in the tank and the bottle, said communications being established at predetermined periods with respect to the raising and lowering of the piston, substantially as described.

21. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a filling tube and sealing head actuated by the piston, means for controlling a medium under pressure to raise and lower the piston at predetermined periods with respect to the rotation of the table, fixed tubes in the interior of the cylinder, one of the tubes serving as a means for conducting through the piston air passing between the bottle and tank, means for controlling said passage, and the other tube serving as a means for conducting pressure into the interior of the cylinder and lowering the sealing head, means for establishing communication between the liquid in the tank and the bottle, said communications being established at predetermined periods with respect to the raising and lowering of the piston, substantially as described.

22. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a filling tube and sealing head actuated by the piston, means for controlling a medium under pressure to raise and lower the piston



at predetermined periods with respect to the rotation of the table, fixed tubes in the interior of the cylinder, a tube carried by the sealing head, adapted to telescope within one of the fixed tubes, the sealing head having a passage therein in communication with the tube carried by the head, a connection between the fixed tube and the air portion of the tank for the passage of air therebetween, means operated at a predetermined interval with respect to the movement of the piston to permit and prevent the passage of air between the fixed tube and tank, and means for establishing communication between the liquid in the tank and the bottle, said communications being established at predetermined intervals with respect to the movement of the piston, substantially as described.

23. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a filling tube and sealing head actuated by the piston, means for controlling a medium under pressure to raise and lower the piston at predetermined periods with respect to the rotation of the table, fixed tubes in the interior of the cylinder, a tube carried by the sealing head, adapted to telescope within one of the fixed tubes, the sealing head having a passage therein in communication with the tube carried by the head, a connection between the fixed tube and the air portion of the tank for the passage of air therebetween, means operated at a predetermined interval with respect to the movement of the piston to permit and prevent the passage of air between the fixed tube and tank, a valve to prevent the passing of liquid into the tube carried by the sealing head, and means for establishing communication between the liquid in the tank and the bottle, said communications being established at predetermined intervals with respect to the movement of the piston, substantially as described.

24. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a fixed head within each cylinder below the piston, a sealing head below the fixed head, means for admitting pressure between the fixed head and sealing head to drive the sealing head downward, means for simulta-

neously admitting pressure above the piston to drive it downward, means for admitting pressure to return the piston and sealing head to normal position, a filling tube carried by the piston, means for establishing communication between the air in the tank and the bottle, and means for establishing communication between the liquid in the tank and the bottle, said communications being established at predetermined periods with respect to the raising and lowering of the piston, substantially as described.

25. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a fixed head within each cylinder below the piston, a sealing head below the fixed head, means for admitting pressure between the fixed head and sealing head to drive the sealing head downward, means for simultaneously admitting pressure above the piston to drive it downward, means for admitting pressure to return the piston to normal position, a connection between the sealing head and piston whereby the upward movement of the piston imparts an upward movement to the sealing head, a filling tube carried by the piston, means for establishing communication between the air in the tank and the bottle, and means for establishing communication between the liquid in the tank and the bottle, said communications being established at predetermined periods with respect to the raising and lowering of the piston, substantially as described.

26. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a fixed head within each cylinder below the piston, a sealing head below the fixed head, inner and outer tubes connected to the fixed head, the inner tube extending through the head and serving to admit pressure above the sealing head to drive it downward, the outer tube having an opening above the fixed head and serving to conduct air to force the piston upward, means for admitting air above the piston to drive it downward, means for admitting pressure to return the piston and sealing head to normal position, a filling tube carried by the piston, means for establishing communication between the air in the tank and the bottle, and means for establishing communication between the



liquid in the tank and the bottle, said communications being established at predetermined periods with respect to the raising and lowering of the piston, substantially as described.

27. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a fixed head within each cylinder below the piston, a sealing head below the fixed head, inner and outer tubes connected to the fixed head, the inner tube extending through the head and serving to admit pressure above the sealing head to drive it downward, the outer tube having an opening above the fixed head, serving to conduct air to force the piston upward, means for admitting pressure to return the piston to normal position, a connection between the sealing head and piston, whereby the upward movement of the piston imparts an upward movement to the sealing head, a filling tube carried by the piston, means for establishing communication between the air in the tank and the bottle, and means for establishing communication between the liquid in the tank and the bottle, said communications being established at predetermined periods with respect to the raising and lowering of the piston, substantially as described.

28. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a fixed head within each cylinder below the piston, a sealing head below the fixed head, means for admitting pressure between the fixed head and sealing head to drive the sealing head downward, means for simultaneously admitting pressure above the piston to drive it downward, means for admitting pressure to return the piston and sealing head to normal position, a filling tube carried by the piston, means for establishing communication between the air in the tank and the bottle, a tube exterior of the cylinder for conducting liquid, and means for establishing communication between the exterior tube and filling tube when the filling head has reached a point adjacent the limit of its downward movement, said communications being established at predetermined periods with respect to the raising and lowering of the piston, substantially as described.

29. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a fixed head within each cylinder below the piston, a sealing head below the fixed head, inner and outer tubes connected to the fixed head, the inner tube extending through the head and serving to admit pressure above the sealing head to drive it downward, the outer tube having an opening above the fixed head and serving to conduct air to force the piston upward, means for admitting air above the piston to drive it downward, means for admitting pressure to return the piston and sealing head to normal position, a filling tube carried by the piston, means for establishing communication between the air in the tank and the bottle, a tube exterior of the cylinder for conducting liquid, and means for establishing communication between the exterior tube and filling tube when the filling head has reached a point adjacent the limit of its downward movement, said communications being established at predetermined periods with respect to the raising and lowering of the piston, substantially as described.

30. In a bottle-filling machine, the combination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a filling tube carried by the piston, said filling tube comprising upper and lower sections joined to the piston, said piston having a chamber formed therein between the adjacent ends of the tubes, a valve for preventing the flow of liquid from the upper to the lower tube, means for shifting said valve when the piston has reached a point adjacent the end of its downward movement to permit the passage of liquid from the upper to the lower tube, a sealing head actuated by the piston, a fixed head within each cylinder below the piston, a sealing head below the fixed head, means for admitting pressure between the fixed head and sealing head to drive the sealing head downward, means for simultaneously admitting pressure above the piston to drive it downward, means for admitting pressure to return the piston and sealing head to normal position, and means for establishing communication between the air in the tank and the bottle, substantially as described.

31. In a bottle-filling machine, the com-



bination of a rotatable tank adapted to contain liquid and air, a rotatable table, bottle supports on said table fixed with respect to said table, means for rotating the tank and  
 5 table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a piston within each cylinder, a filling tube carried by the piston, said filling tube comprising upper and lower sections joined to the piston, said piston having  
 10 a chamber formed therein between the adjacent ends of the tubes, a valve for preventing the flow of liquid from the upper to the lower tube, means for shifting said valve  
 15 when the piston has reached a point adjacent the end of its downward movement to permit the passage of liquid from the upper to the lower tube, a sealing head actuated by the piston, a fixed head within each cylinder below the piston, a sealing head below  
 20 the fixed head, inner and outer tubes connected to the fixed head, the inner tube extending through the head and serving to admit pressure above the sealing head to drive it downward, the outer tube having  
 25 an opening above the fixed head and serving to conduct air to force the piston upward, means for admitting air above the piston to drive it downward, means for admitting  
 30 pressure to return the piston and sealing head to normal position, and means for establishing communication between the air in the tank and the bottle, substantially as described.  
 35 32. In a bottle-filling machine, the combination of a rotatable table and a rotatable tank, mechanism operatively connected for rotating the table and tank, said tank being adapted to contain air and liquid, bottle  
 40 supports upon the table fixed with respect to the table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a cap closing the upper end of the cylinder, a piston within the cylinder, a filling tube and sealing head actuated by the movements of the piston, said  
 45 cap having a passageway therethrough in communication with the interior of the cylinder for the conduction of pressure into the cylinder to raise and lower the piston, means for controlling the flow of pressure through  
 50 said passage, means for establishing communication between the bottle and air in the tank, and means for establishing communication between the filling tube and liquid in the tank, said communications being established at predetermined intervals with respect to the raising and lowering of the piston, substantially as described.  
 55 33. In a bottle-filling machine, the combination of a rotatable table and a rotatable tank, mechanism operatively connected for rotating the table and tank, said tank being adapted to contain air and liquid, bottle  
 60 supports upon the table fixed with respect

to the table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a cap closing the upper end of the cylinder, a piston within the cylinder, a filling tube and sealing head actuated by the movements of the piston, said  
 70 cap having a passageway therethrough in communication with the interior of the cylinder for the conduction of pressure into the cylinder to raise and lower the piston, means for controlling the flow of pressure through said passage, a hollow connecting member between the cap and air portion of the tank, the cap having a passage communicating therewith, a hollow member in the  
 75 piston for conducting air therethrough and in communication with the passage in the head, means for establishing and cutting off the flow of air through said passage, and means for establishing communication between the filling tube and liquid in the tank, said communications being established at predetermined intervals with respect to the raising and lowering of the piston, substantially as described.  
 80 85 90

34. In a bottle-filling machine, the combination of a rotatable table and a rotatable tank, mechanism operatively connected for rotating the table and tank, said tank being adapted to contain air and liquid, bottle  
 95 supports upon the table fixed with respect to the table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a cap closing the upper end of the cylinder, a piston within the cylinder, a filling tube and sealing head actuated by the movements of the piston, said  
 100 cap having a passageway therethrough in communication with the interior of the cylinder for the conduction of pressure into the cylinder to raise and lower the piston, means for establishing communication between the bottle and air in the tank, a valve carried by said cap and adapted to control the flow of pressure into and out of the cylinder, and adapted to control communication between the air in the tank and the bottle, and means for establishing communication between the filling tube and liquid in the tank, substantially as described.  
 105 110 115

35. In a bottle-filling machine, the combination of a rotatable table and a rotatable tank, mechanism operatively connected for rotating the table and tank, said tank being adapted to contain air and liquid, bottle supports upon the table fixed with respect to the table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a cap closing the upper end of the cylinder, a piston within the cylinder, a filling tube and sealing head actuated by the movements of the piston, said cap having a passageway therethrough in communication with the interior of the cylinder for the conduction of  
 120 125 130



pressure into the cylinder to raise and lower the piston, means for controlling the flow of pressure through said passage, means for establishing communication between the bottle and air in the tank, said cap having a liquid passage therein, a communication between said liquid passage and tank to permit of the flow of liquid therethrough, and means for establishing communication between the passage and filling tube, said communications being established at predetermined intervals with respect to the raising and lowering of the piston, substantially as described.

36. In a bottle-filling machine, the combination of a rotatable table and a rotatable tank, mechanism operatively connected for rotating the table and tank, said tank being adapted to contain air and liquid, bottle supports upon the table fixed with respect to the table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a cap closing the upper end of the cylinder, a piston within the cylinder, a filling tube and sealing head actuated by the movements of the piston, said cap having a passage therethrough in communication with the interior of the cylinder for the conduction of pressure into the cylinder to raise and lower the piston, means for controlling the flow of pressure through said passage, means for establishing communication between the bottle and air in the tank, said cap having a liquid passage therein, a cap upon the lower end of said cylinder, a hollow stem outwardly extending from the lower cap and entered into the tank, serving to conduct liquid from the tank, a tube in communication with said stem and with the liquid passage in the upper cap, and means for establishing communication between the last named passage and filling tube, substantially as described.

37. In a bottle-filling machine, the combination of a rotatable table and a rotatable tank, mechanism operatively connected for rotating the table and tank, said tank being adapted to contain air and liquid, bottle supports upon the table fixed with respect to the table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a cap closing the upper end of the cylinder, a piston within the cylinder, a filling tube and sealing head actuated by the movements of the piston, said cap having a passageway therethrough in communication with the interior of the cylinder for the conduction of pressure into the cylinder to raise and lower the piston, means for controlling the flow of pressure through said passage, a fixed tube within the cylinder, a tube carried by the sealing head, adapted to telescope into the fixed tube, the sealing head having a passage therein in communication with the tube carried by the head, the

fixed tube being in communication with a passage in the head, adapted to conduct air from the tank, whereby a passage between the tank and bottle is provided for the equalization of pressure therebetween, means for controlling said communication between the bottle and tank, and means for establishing communication between the filling tube and liquid in the tank, substantially as described.

38. In a bottle-filling machine, the combination of a rotatable table and a rotatable tank, mechanism operatively connected for rotating the table and tank, said tank being adapted to contain air and liquid, bottle supports upon the table fixed with respect to the table, cylinders carried by the tank and positioned in vertical alinement with the bottle supports, a cap closing the upper end of the cylinder, a piston within the cylinder, a sealing head actuated by the piston, a filling tube comprising an upper tube and a lower tube, each secured to the piston, said piston having a chamber intermediate the adjacent ends of the two tubes, means within said chamber operated when the piston has reached a point adjacent its lowermost position to permit liquid to pass from the upper to the lower tube, said cap having a passageway therethrough in communication with the interior of the cylinder for the conduction of pressure into the cylinder to raise and lower the piston, means for controlling the flow of pressure through said passage, and means for establishing communication between the bottle and air in the tank, substantially as described.

39. In a bottle-filling machine, the combination of a rotatable tank and a rotatable table, bottle-filling mechanism carried by the tank, bottle supports on the table comprising side walls, at least one of which is provided with a slot extending to the outer edge thereof, means for operating the bottle-filling mechanism at predetermined periods with respect to the movement of the table, a chute for the bottle, an arm extending out from the chute having a forked end, said forked end passing through the slots in the side wall and engaging the bottles and serving to deflect the bottle from the support onto the chute, and means for moving and maintaining the arm out of and into the path of travel of the bottle, substantially as described.

40. In a bottle-filling machine, the combination of a rotatable tank and a rotatable table, bottle-filling mechanism carried by the tank, bottle supports on the table comprising side walls, at least one of which is provided with a slot extending to the outer edge thereof, means for operating the bottle-filling mechanism at predetermined periods with respect to the movement of the table, a chute for the bottle, a forked arm extending out from the chute having



a forked end, said forked end passing through the slots in the side wall and engaging the bottles and serving to deflect the bottle from the support onto the chute, a  
5 rod on the arm, a lug through which the rod passes, and a locking device carried by the lug to lock the rod and maintain the arm

into and out of the path of travel of the bottle, substantially as described.

ADOLPH SCHNEIDER.

Witnesses:

WM. P. BOND,  
MARY R. FROST.