G. STRANDT.

MILK BOTTLING MACHINE.

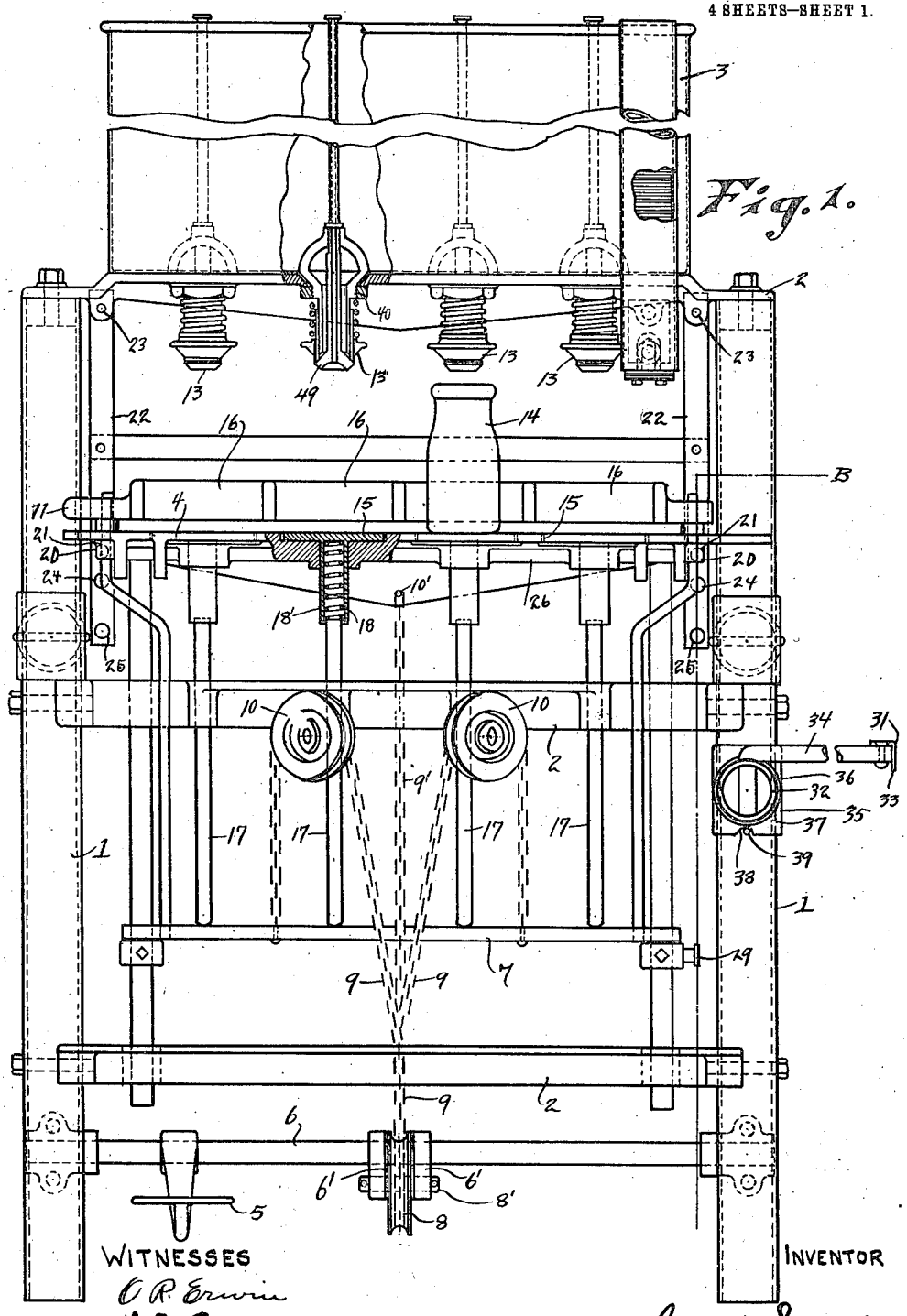
APPLICATION FILED APR. 3, 1909.

1,011,263.

Patented Dec. 12, 1911.

4 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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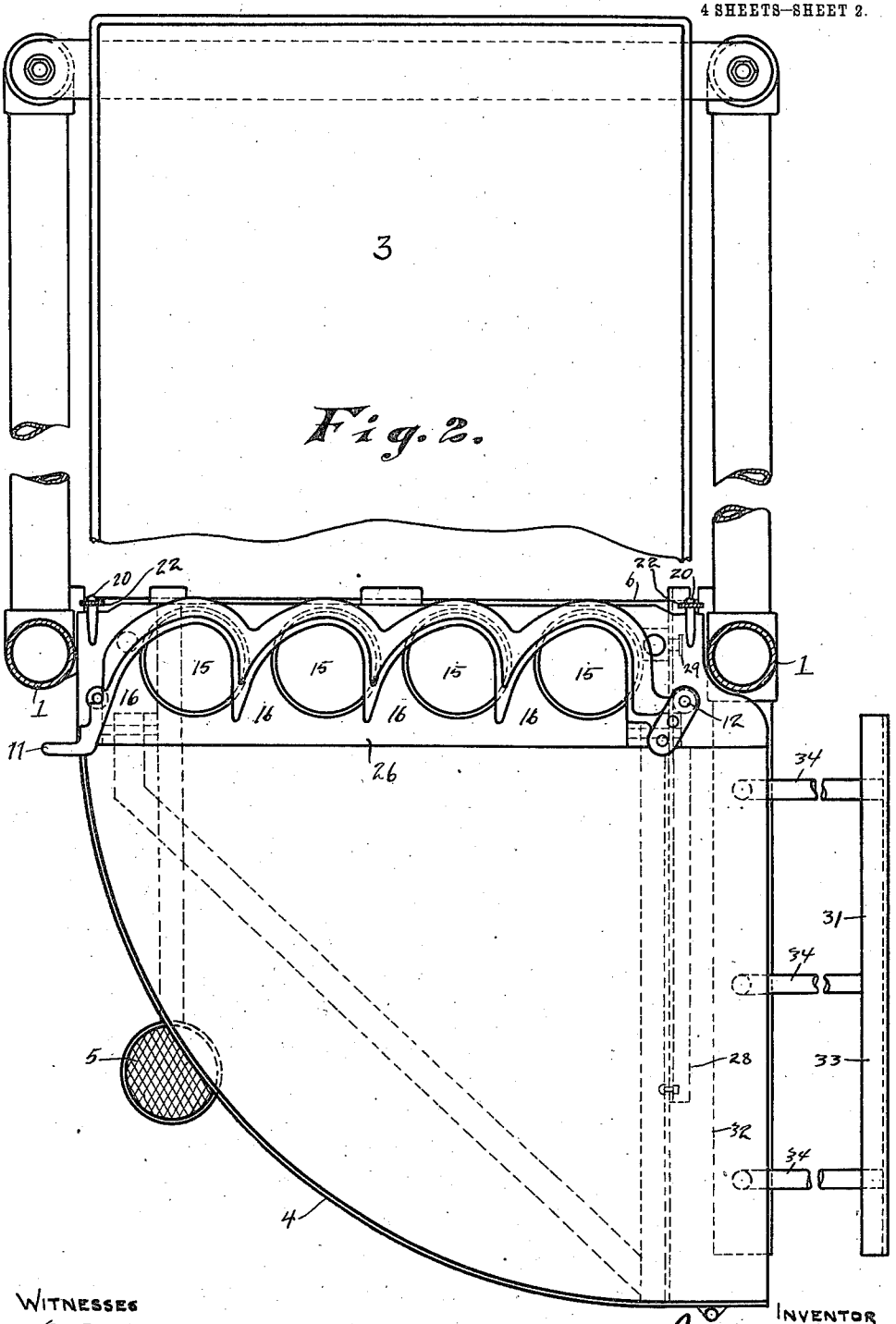

Fig. 2.

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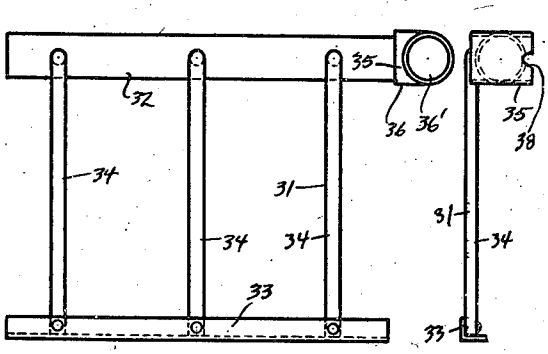

Fig. 4.

Fig. 5.

Fig. 3.

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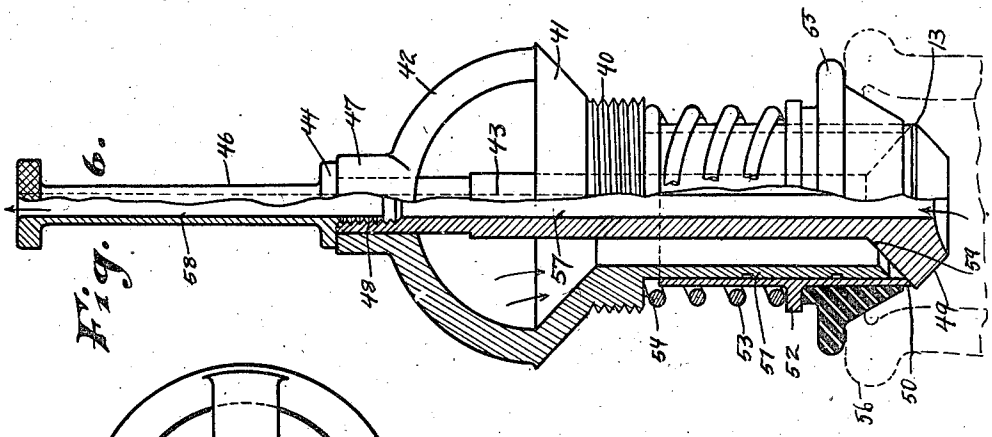

Fig. 6.

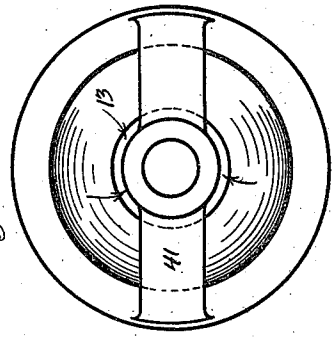

Fig. 7.

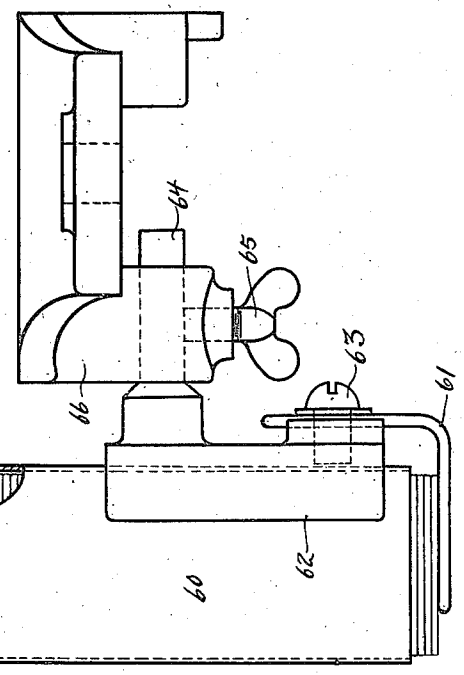

Fig. 8.

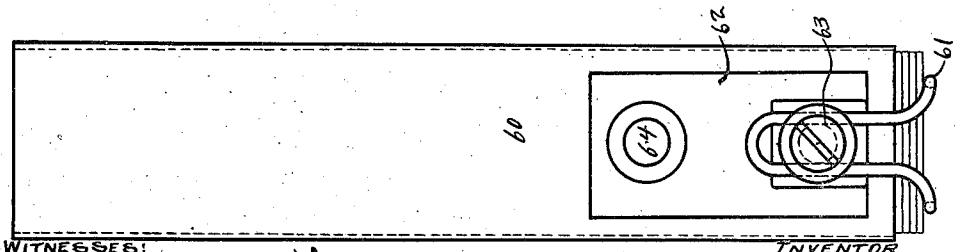

Fig. 9.

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UNITED STATES PATENT OFFICE.

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MILK-BOTTLING MACHINE.

1,011,263. Specification of Letters Patent. Patented Dec. 12, 1911.

Application filed April 3, 1909. Serial No. 487,736.

To all whom it may concern:

Be it known that I, GUSTAV STRANDT, a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Milk-Bottling Machines, of which the following is a specification.

My invention relates to improvements in a certain milk bottling machine, for which an application for Letters Patent of the United States, Serial No. 412259, was filed by myself and August H. Niemann, on the 23d day of January, 1908, and since duly allowed, and it pertains more especially to certain specific improvements which have since been made by me not shown or disclosed in said prior application.

The construction of the machine embodying by present improvements is explained by reference to the accompanying drawings in which—

Figure 1 is a front view. Fig. 2 is a plan view. Fig. 3 is a side view, part in section. Fig. 4 is a top and Fig. 5 is an end view of a swinging bottle supporting rack connected with said machine. Fig. 6 is a side view, part in section, of a bottle filling nozzle. Fig. 7 is a top view of the device shown in Fig. 6. Fig. 8 is a front view, and Fig. 9 is a side view of the paper disk retaining receptacle, which disks are used for closing the mouths of the bottles as they are being filled.

Like parts are identified by the same reference numerals throughout the several views.

The frame of the machine comprising the vertical standards 1 and transversely arranged members 2, the milk tank 3, the adjustable bottle supporting table 4, the pedal 5 which is pivotally supported from the standards 1 by the shaft 6, the vertically moving frame 7, the means for communicating motion from the shaft 6 to the vertically moving frame 7 including the pulley 8, chains 9, 9 and 9′, and rollers 10, 10, and the swinging arm 11 which is adjustably connected at one end with the stationary part of the machine by the pivotal bolt 12 and adapted, as it is swung in a circular course a partial revolution, around said pivotal connection 12, to remove the several bottles connected therewith from beneath the filling nozzles to one side of the supporting table, are all constructed and arranged substantially as shown and described in my previous application.

My present invention consists more especially in the several details of construction hereinafter more fully set forth and pointed out in the claims.

The tank 3 having been supplied with milk, the same is discharged in the bottles through the discharge nozzles 13. While the number of bottles simultaneously filled may be increased or diminished, the present invention is limited to the mechanism for simultaneously filling four bottles only. 14 represents one of the bottles in position to be filled. In operating the device, a bottle is placed upon each of the vertically moving plates 15 within the semicircular recesses 16 of the arm 11. When the several bottles are in place, they are simultaneously raised by a downward pressure upon the pedal 5, motion being communicated from the pedal 5 to the bottles 14, through the shaft 6, pulley supporting arms 6′, 6′, pulley 8, revolubly supported from said arms on the pin 8′, chain 9′, the upper end of which is connected at a fixed point to the frame by the pin 10′, branch chains 9, 9, operating over the pulleys 10, vertically moving frame 7, vertically moving standards 17, spiral springs 18 operating in the sleeves 18′, and bottle supporting plates 15. The springs are interposed between the upper ends of the standards 17 and the lower sides of the plates 15, whereby a yielding movement will be given to the plates as they are forced upward by the treadle. The object of this is to accommodate the movement of the several bottle supporting plates to bottles of different heights, whereby in case any one of the series of bottles being filled is a little longer or higher than the others, the spring beneath such bottle will yield sufficiently after the bottle has been brought into contact with the nozzle to permit all other bottles in the series to be brought in close contact with the other discharge nozzles, whereby the mouths of all the bottles will be raised a given height and brought into close contact with the several discharge nozzles regardless of their height.

The machine is adapted to be adjusted for filling bottles of different capacities. For example, for ordinary purposes, the machine is made for filling bottles containing half pints, pints and quarts and for this

reason, it becomes necessary to change the adjustment of the table 4, table supporting member 26 and the bottle supporting plates 15, together with the swinging arm 11 to conform to the height of the bottles which are about to be filled.

The machine as illustrated in Fig. 1, is shown as adjusted for half pint bottles and the swinging arm and bottle supporting plates are supported at the highest point of adjustment, preparatory to filling the bottles and such parts are retained at the point of adjustment shown by the vertically moving supporting lugs 20, 20, which are respectively adapted to engage in the apertures 21, 21, formed in the resilient bars or hangers 22. The hangers 22 are rigidly connected at their upper ends to the vertical frame members 1 by the bolts 23 and extend down past the supporting members 20 and are provided with a plurality of apertures 21, 24 and 25, arranged in a vertical series one above another at such distances apart as correspond with the heights of the different bottles to be filled. When adjusting said vertically moving parts to a lower level, the lower ends of the spring hangers 22 are thrown outwardly and disengaged from the supporting lugs 20, when said vertically moving parts are moved downwardly until the supporting lugs 20 are brought into the lower apertures of said hanger, whereby the bottle supporting plates are retained at the proper elevation for larger sized bottles, and when desirous to adjust the vertically moving members, including said bottle supporting plates for smaller bottles, said vertically moving parts are elevated, when the resilient hangers will be thrown out of engagement with the lugs 20 automatically by contact of the curved upward surface of the lugs therewith, whereby when raising said pedal and bottle supporting plates, said resilient hangers will be thrown out of engagement therewith by contact with such angular surface, and when the table and cooperating parts have been brought to the required elevation, said hangers 22 will be thrown back to their normal vertical position by their own resiliency, whereby the table and bottle supporting plates, together with the swinging arm are readily and quickly adjusted to conform to the heights of the various sizes of the bottles which are being filled.

The table 4 is pivotally supported at its rear edge from the horizontal plate 26, by the bolts 27 and it is adapted to be supported at its front edge from the vertical standards 1 of the frame by the brace member 28, pin 29 and pivotal bolt 30, whereby when said machine is not in use, the front edge of the table 4 may be dropped to the vertical by disengaging the lower ends of the brace member 28 from the pin 29.

31 is a swinging bottle supporting rack, which comprises the horizontal tubular member 32, parallel bar 33, series of transversely arranged connecting members 34, tubular T member 35, the central member 36 of which is rigidly affixed to one end of said member 32, as shown in Fig. 4, while the vertical standards 1 extend through the aperture 36′ of the sleeve 37, as shown in Fig. 1, said sleeve being revolubly supported upon said vertical standards 1, whereby the rack 31 is free to perform a partial revolution around said vertical standard, and said rack is thus adapted to be adjusted nearer to or farther from the table 4, as desired. The object of the rack 31 is to support a bottle crate in close proximity to the table of the machine to facilitate placing the bottles in and removing them from the crate. To prevent the crate from being accidentally turned out of place, the lower side of the crate supporting sleeve 37 is provided with a semicircular recess 38 and the sleeve 37 is revolubly supported on the pin 39, which pin is in turn supported from the standard 1, whereby as the rack is brought to the desired place, the sleeve 37 moves down slightly when the pin 39 is brought into said recess 38 and thereby yieldingly retains said rack in place, as shown in Fig. 1. It will be understood that as the sleeve 37 is turned a partial revolution in a horizontal plane on said standard 1, as the rack is being moved, said sleeve will be caused to rise slightly as it passes over the pin 39, whereby the pin is brought out of the semicircular recess 38, said sleeve being yieldingly retained in contact with said pin by the gravity of the sleeve and rack. While Fig. 1 shows but one recess 38 for the reception of the pin 39, additional recesses may, if desired, be formed in the lower side of said sleeve 37, whereby said sleeve and rack may be retained at additional points of adjustment.

The several milk discharge nozzles, an enlarged view of one of which is shown in Fig. 6, comprise the screw threaded collar 40, which is supported from the bottom of the milk tank 3 as shown in Fig. 1, an outwardly diverging collar 41, the semicircular bracket 42, vertical sleeve 51 and annular collar 47, all of which parts are formed integrally, a vertical air duct 43, is centrally supported in said nozzle from the upper side of said bracket 42 by the annular flange 44, which annular flange 44 is formed integrally with the tubular member 46 and rests upon the upper end of the sleeve 47, which sleeve is formed integrally with said bracket 42. The tubular member 46 has screw threaded bearings 48 with the upper end of the air duct 43. Formed integrally with the lower end of the air duct 43 is a downwardly and outwardly annular diverging flange 49, the up-

per side of which forms a seat for the annular valve 50. The annular valve 50 is slidably supported from the exterior surface of the annular sleeve 51.

52 is an annular flange formed integrally with the valve 50 and serves as a bearing for the spiral spring 53, which spring 53 is interposed between said radial flange 52 and the annular shoulder 54 formed on the lower side of the collar 40. The spiral spring 53 is compressed, preparatory to being inserted between the bearings 52 and 54 and its object and function is to force the annular valve 50 down firmly against the upper surface of the collar 49, which forms a seat to said valve.

55 is an annular elastic cushion, which is supported on the exterior surface of the annular valve 50 and is adapted when the valve is placed in the neck of the bottle 56, as shown in Fig. 6, to hermetically close the mouth of the bottle, while the milk is being discharged therein.

It will be understood that when the bottle is placed beneath the nozzle and in contact with the elastic flange 55 and pressed upwardly, motion will be communicated from said bottle, through the elastic cushion 55 to the annular valve 50, whereby the lower end of said valve will be raised from its seat, when the milk in the tank above the screw threaded collar 40 will flow from thence down and around the air duct 43 and out between the valve 50 and the valve seat 49, while the air which is displaced by the milk as it enters the bottle, will pass from thence up through the aperture 57 in said air duct escaping to the exterior through the duct passage 58 of the tubular member 46.

To provide for regulating the discharge of milk from the annular sleeve 51, the annular collar 49 is adjustable relatively to the seat at the lower end of said sleeve by the screw threaded bearings 48, by which the duct 43 is adjustably connected to the lower end of the tubular member 46. It will be understood that by turning the tubular member 46 upwardly or downwardly in the threaded bearings of the duct 43, said duct 43 will be raised or lowered, whereby the angular bearing 59 formed on the upper side of the collar 49 is adjusted nearer to or farther from the lower end of said sleeve 51, as may be required for thick and thin milk.

The operation of the nozzle is as follows: The several bottles 56 being in place with the mouth against the elastic flange 55, they are all simultaneously raised by a downward pressure upon the pedal 5, as hereinbefore described, whereby the spring 53 will be compressed and the annular valve 50 will be raised from its seat, when the milk from the tank will be free to pass into the bottle until the bottle is filled, when by lowering the bottles, the valve 50 will be thrown to its seat before the mouth of the bottle is withdrawn from the valve, whereby the valve will be closed and the milk will be entirely cut off before the bottle is withdrawn from the nozzle, and whereby the possibility of milk escaping over the mouth of the bottle is entirely overcome. As the bottles are filled with milk, the mouths are closed with disks of paper or other similar material, which, for convenience are stored in the tubular receptacle 60 in close proximity to the table, whereby said disks are conveniently reached. In view of the fact that four bottles are simultaneously filled, I have provided a means for withdrawing four of the disks at a time only and to accomplish this object, a disk supporting bracket 61 is adjustably supported beneath the lower end of the receptacle 60 at a distance corresponding with the thickness of the four disks to be removed, as shown in Figs. 8 and 9. The disk supporting bracket 61 is adjustably supported from the receptacle 60 by and between the bracket 62, which is rigidly affixed to the side of the receptacle and the head of the screw 63, and the bracket 62 is supported from the main frame of the machine by an arm 64, hand screw 65 and bracket 66, which bracket 66 is connected with the top of the standard 1 by the bolt 67, as shown in Fig. 3. It will of course be understood that in case a greater or less number of disks are required at a time, the bracket 61 will be adjusted higher or lower accordingly.

In the nozzles as heretofore constructed, no provision was made for raising the lower discharge member 49, whereby in case it should be brought in contact with the top of the bottle, it was liable to become broken. By my present improvement, however, the member 49 is free to move upward together with the air tube 43 and vertical member 46 a slight distance, together with the valve 50 resting thereon, whereby the liability of such parts becoming broken as heretofore is avoided.

In view of the fact that milk under some conditions is liable if admitted into the bottles too rapidly, to foam and fill the bottle before a sufficient quantity has been supplied, it becomes necessary to so set the valve mechanism that the valves can only be opened a certain pre-determined distance, whereby the milk may be admitted faster or slower at any desired speed according to the quality or condition of the same.

By milk bottling machines as heretofore constructed, the valves have been opened more or less widely according to the heights of the bottles, it follows that in case one bottle is a little higher than another, such bottle, when in contact with the milk controlling valve, will raise such valve an additional height above the others, corresponding with the additional height of such bot-

tle. One of the primary objects of my device is therefore, to provide means for limiting and controlling the movement of the milk controlling valves, so that they will all open a certain pre-determined distance. Also to provide means for changing the valve mechanism so that the movement of the valves may be increased or diminished as the various conditions of the milk may require.

By referring to Fig. 6, it will be seen that the movement of the tubular valve 50 is limited to the distance between the annular collar 49 and the shoulder 54, and that such valve can be raised a slight distance only before its upper end is brought in contact with the annular shoulder 54. It therefore follows that in case a bottle slightly taller than the normal, is being filled, the valve 50 will be first raised only until it contacts with the shoulder 54, whereby the further movement of the bottle is stopped, when the bottle supporting spring 18 will yield under the action of the treadle until the latter is brought to rest, whereby all valves will be opened the same distance only regardless of the height of the bottles which are being filled. When, however, the condition of the milk is such that it becomes desirable to change the movement of the valve 50 so as to open more or less widely, this important object is accomplished by raising or lowering the annular collar 49. For example, to open the valve more widely, the tubular member 43 is turned down in the threaded bearing 48, whereby the valve 50, when open, will be raised a greater distance from the collar 49 and the valve thereby more widely opened, while by a reverse movement of the member 43, the movement of the valve 50 will be diminished. Thus it is obvious that by turning the member 43 upward or downward upon the threaded member 48, the valve 50 may be adjusted to open any pre-determined distance to correspond with the condition of the milk which is being bottled.

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

1. In a machine of the described class, the combination of a milk tank, a milk duct suspended from said tank, an air duct suspended from said milk duct, an annular collar forming a valve seat connected with said air duct, a tubular valve slidably supported upon said milk duct and adapted to close against the upper side of said annular collar, an annular elastic cushion carried by said tubular valve, means for yieldingly supporting said tubular valve and air duct from said milk duct, and means for adjustably suspending the annular collar which forms the seat of said tubular valve at a greater or less distance from the lower end of said milk duct.

2. In a machine for bottling milk, a milk duct, a tubular valve slidably supported on said duct, in combination with an air outlet duct comprising two separable members adjustably connected together, and an annular collar connected with the lower end of said air duct forming a seat for said tubular valve.

3. In a machine of the described class, the combination with a plurality of milk ducts suspended at their upper ends from a milk tank, of a table located beneath said ducts, a plurality of bottle supporting plates movably supported in the plane of said table, foot actuated means for raising said bottle supporting plates, and means for holding said table and bottle supporting plates at various points of adjustment relatively to said ducts, consisting in two resilient bars rigidly affixed at their upper ends to the table supporting frame and provided near their lower ends with a series of apertures, said table being provided with supporting lugs adapted to engage in the apertures of said resilient bars, as said table is raised and lowered and thereby retain the bottle supporting plates at any desired point of adjustment corresponding with the height of the bottles which are being filled, substantially as set forth.

4. The combination with the frame of a bottle supporting machine of the described class, of a crate supporting rack revolubly supported from one of the posts of said frame, means for retaining said rack at the desired point relatively to the table of said machine, substantially as specified.

5. The combination with the frame of a bottle filling machine, of a tubular receptacle for holding the covers with which the bottles are closed as they are being filled in close proximity to the filling nozzles of the machine, and a vertically adjustable bracket connected with the sides of said receptacle for supporting one or more covers at a time below the lower end of said receptacle, preparatory to being removed, substantially as and for the purpose specified.

In testimony whereof I affix my signature in the presence of two witnesses.

GUSTAV STRANDT.

Witnesses:
JAS. B. ERWIN,
O. R. ERWIN.