No. 752,991. PATENTED FEB. 23, 1904.

S. C. MILLER.

AUTOMATIC INDUCTION VALVE FOR BOTTLE FILLING MACHINES.

APPLICATION FILED OCT. 4, 1902.

NO MODEL.

Fig. 1

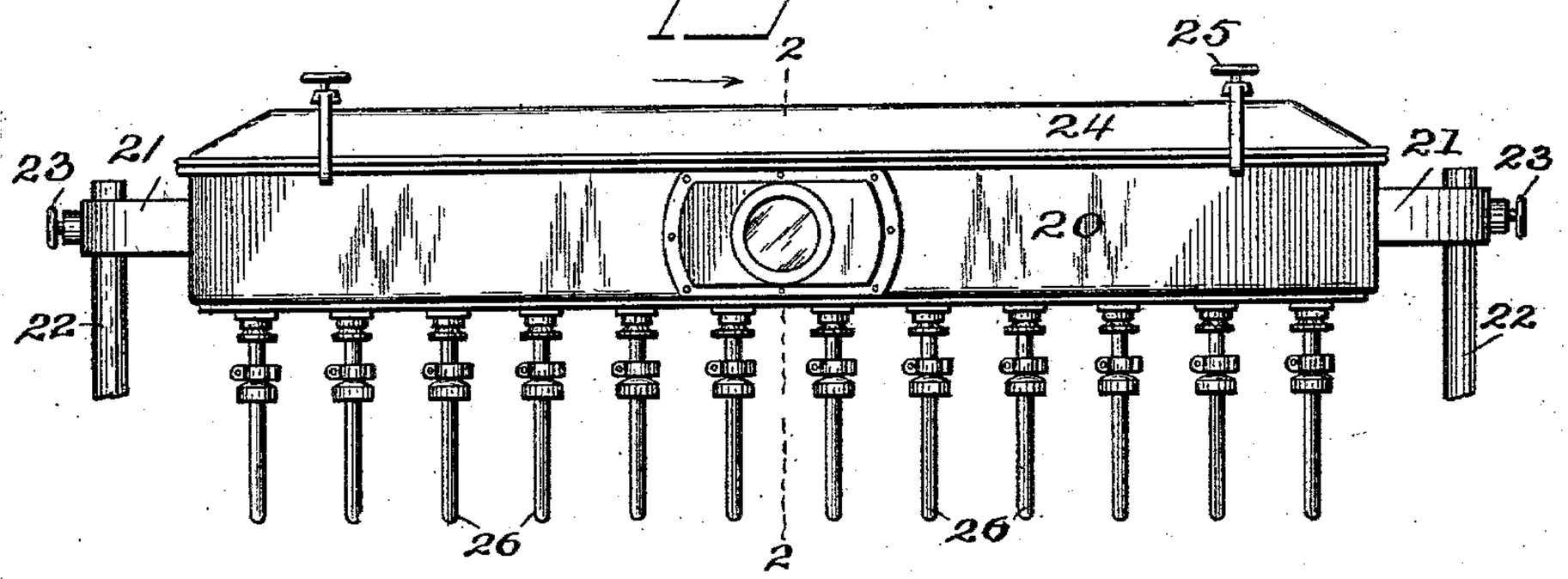


Fig. 2

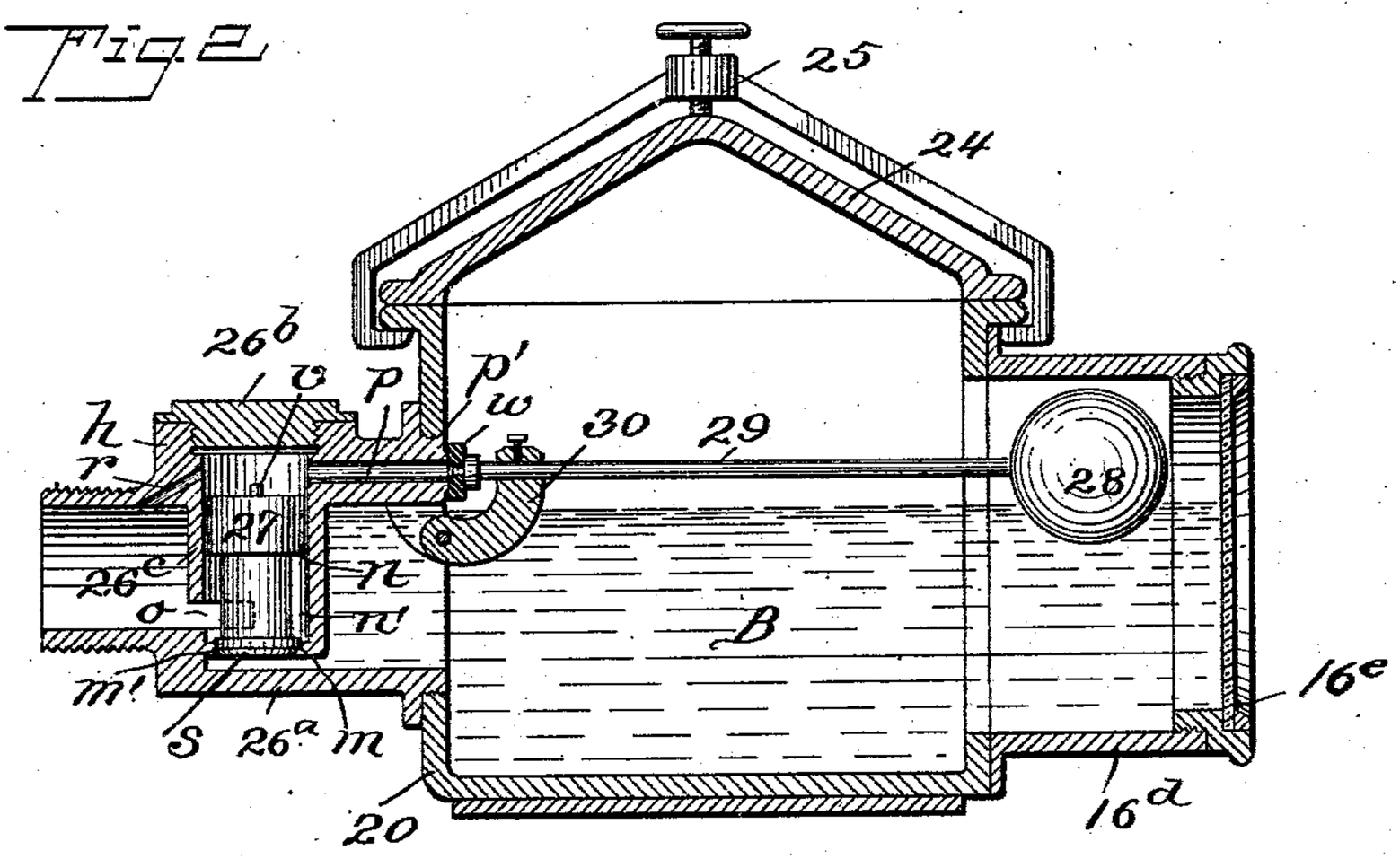
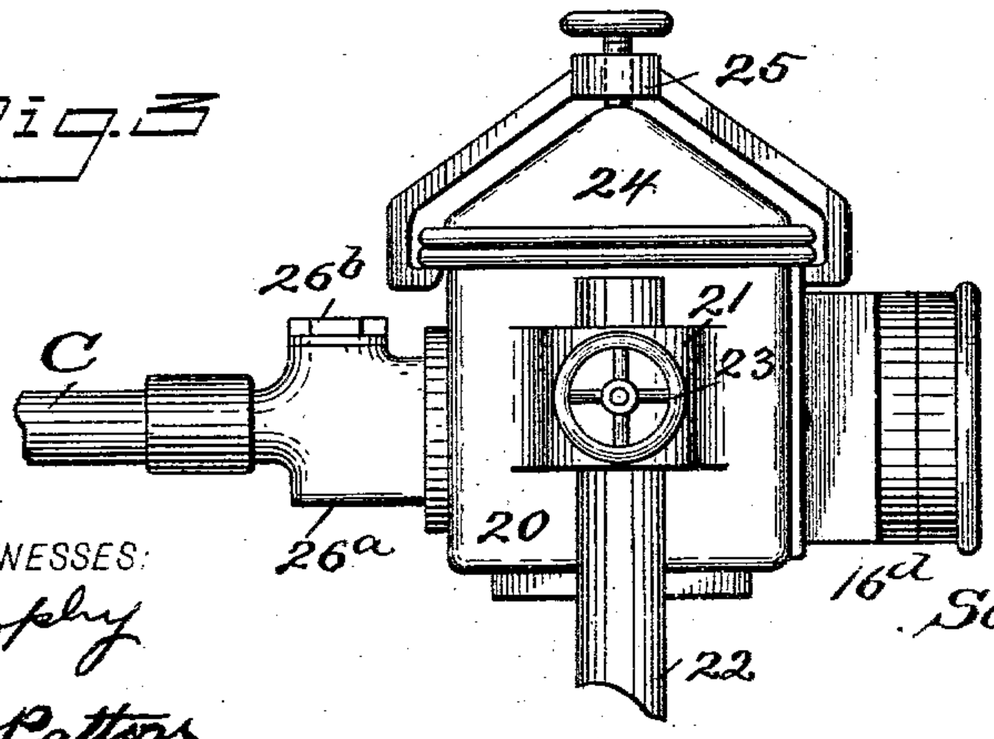


Fig. 3



WITNESSES:

J. H. Brophy

Wm. L. Patton

INVENTOR

Samuel C. Miller:

BY Munn & Co

ATTORNEYS.

No. 752,991. Patented February 23, 1904.

UNITED STATES PATENT OFFICE.

SAMUEL C. MILLER, OF LOUISVILLE, KENTUCKY.

AUTOMATIC INDUCTION-VALVE FOR BOTTLE-FILLING MACHINES.

SPECIFICATION forming part of Letters Patent No. 752,991, dated February 23, 1904.

Application filed October 4, 1902. Serial No. 125,958. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL C. MILLER, a citizen of the United States, and a resident of Louisville, in the county of Jefferson and State of Kentucky, have invented new and useful Improvements in Automatic Induction-Valves for Bottle-Filling Machines, of which the following is a full, clear, and exact description.

The invention relates to bottle-filling machines, and has for its object to provide an induction-valvefor the filling-tank thereof which will render the feeding of a supply of liquid to said tank automatic in operation.

The invention consists in the novel construction and combination of parts as is hereinafter described, and defined in the appended claims.

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

Figure 1 is a front view of a filling-tank of a bottle-filling machine having the improvement applied. Fig. 2 is an enlarged transverse sectional view of the filling-tank and a longitudinal sectional view of an automatically-operative liquid-induction valve thereon, substantially on the line 2 2 in Fig. 1; and Fig. 3 is an end view of the filling-tank seen in the direction of arrow x in Fig. 1.

Referring to the drawings, 20 is a filling-tank of a bottle-filling machine; 21, apertured arms projecting from the tank; 22, supports; 23, screws for adjustably-securing the arms to the supports; 24, the cover of the tank; 25, clamps for securing the cover in position, and 26 filling-tubes depending from the bottom of the tank.

The induction-valve is secured to the filling-tank, as shown, and the hollow body 26^a of the induction-valve is represented in the form of a cylinder apertured in two diameters, the outer end portion being the smallest in the bore. At the end of the body 26^a, where it is joined with the forward side of the feeding-tank 20, near its longitudinal center, a thread is formed which screws into a threaded aperture in the side wall of the tank. A short boss h is formed on the normal upper side of the body 26^a and is circularly perforated, and the perforation therein is closed by a screw-cap 26^b.

An upright cylindrical valve-case 26^c is formed in the body 26^a, its longitudinal axis being coincident with the center of the cap 26^b, and, as shown, the bottom wall of said valve-case extends to within a suitable distance from the lower surface of the bore in the body 26^a, the valve-case being positioned within the portion of the bore in the body 26^a that is of the greatest diameter.

It will be seen that a cupped orifice is formed in the bottom wall of the valve-case 26^c, which is, in effect, a valve-seat m, and at the forward edge of said seat a web m' joins it to the shoulder formed where the smaller diameter of the bore in the body 26^a merges into the larger diameter thereof.

A transverse slot or opening o is formed in the front of the valve-case 26^c, this opening being located flush with the lower side of the smaller bore in the body 26^a and communicates with the bore of the valve-case 26^c just above the valve-seat m.

As shown in Fig. 2, the upper portion of the defining-wall of the body 26^a, from which the boss h projects, is thickened to permit the formation therein of a horizontal duct p and also a smaller passage r, directly opposite the duct and inclining downwardly from a point in the wall of the valve-case 26^c near the cap 26^b to cut through the upper side of the forward portion of the body 26^a, thus forming a small by-pass for liquid entering the body at its forward end. The duct p extends from the bore of the valve-case 26^c through the end wall of the body 26^a, that screws into the side of the filling-tank 20 and intersects a valve-seat p' on said end wall.

In the valve-case 26^c a preferably hollow valve-body 27 is loosely fitted having a coniform valve-head s formed on the lower end thereof, which will seat upon and hermetically seal the valve-seat m, as shown in Fig. 2.

It will be seen that the rounded body of the cylindrical valve is reduced in diameter near its longitudinal center, so as to produce an annular shoulder n, which is at the junction of the valve portion of smallest diameter with

the upper portion that slidably engages the valve-case 26^c, the reduced portion of the valve 27 affording an annular space n' between its side surface and the inner surface of the wall of the valve-case 26^c.

It is essential for the proper action of the induction-valve that there shall at all times be communication between the duct p and by-pass r across the interior of the valve-case 26^c. For this purpose a small stud v is formed or secured centrally on the flat upper end of the valve-body 27, which stud will limit the upward sliding movement of said valve-body when the free end of the stud connects with the cap 26^b.

A float 28, of any suitable material and form which will adapt it to quickly rise to the surface of the liquid B that may be introduced at various heights within the tank 20, is provided. A valve-rod 29, whereon at one end a valve-disk w is affixed, is secured at the opposite end to the float 28. The valve-rod 29 near the valve-disk w is mounted and secured upon an end of a bent arm 30, that at its other extremity is hinged to rock in a vertical plane on the adjacent end of the body 26. To accommodate the float 28 and the outer end portion of the valve-rod 29, whereon the float is affixed, an extension-box 16^d is secured upon the side wall of the feeding-tank 20 opposite that whereon the body 26^a is secured, and preferably a glass cover 16^e is removably secured upon the free end of the extension-box to permit inspection of the interior of the tank to ascertain by looking through the transparent wall of the cover the depth of liquid within the tank.

In service, assuming that the outer end of the valve-body 26^a is connected by a pipe C or the like with a source of liquid-supply under pressure, so that the liquid will freely flow into the body 26^a, it will be seen that the valve-head s will be seated on the valve-seat m when the water in the tank 20 is on a level with or below the lower side of the body 26^a; but upon an influx of the liquid under pressure in the direction of the arrow x' the liquid will of course enter the annular space n' and fill it. The liquid will also pass in limited quantity through the by-pass r, the space above the valve 27, and the duct p into the feeding-tank 20. As there is no material resistance above the valve-body 27, it will be apparent that the liquid will press against the shoulder n and slide the valve-body upward until the stud v contacts with the cap 26^b, and this will remove the valve-head s from the valve-seat m, permitting a free inflow of liquid through the valve-seat into the tank 16. In the filling operation the float 28 will be raised, the valve-rod 29 moved endwise, and the disk-valve w eventually seated over the seat p', thus closing the duct p. As the area of the top of the valve-body 27 exceeds that of the shoulder n, it will be evident that the pressure of liquid over the valve-body 27, due to entrance of the liquid into the space above the valve-body 27 through the by-pass r, will soon press the valve-head s down upon the seat m, which will arrest the passage of liquid into the tank 16. Obviously the removal of the liquid from the tank during the bottle-filling operation will quickly lower the level of liquid in the tank 20, which will correspondingly lower the float 28 and incline the valve-rod 29, so as to unseat the valve w, permitting the free escape of the liquid in the case 26^c that is above the valve-body 27. This will permit the pressure of the liquid upon the shoulder n to slide said valve-body upward, unseating the valve-head s, so as to again permit liquid in quantity to pass through the opening encircled by the valve-seat m into the tank 20.

The induction-valve, from the construction and arrangement of parts as described, is adapted for such rapid changes in adjustment as will fully compensate for unequal removals of liquid from the filling-tank 20 and automatically maintain a desired level of the liquid within said tank while the machine is in use, thus insuring a proper quantity of liquid therein for the filling of bottles of large or small dimensions.

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

1. The combination with a filling-tank, of an automatic liquid-controlling valve thereon, comprising a body bored in two diameters and secured to the tank, said body being provided with an upright valve-case having an open bottom and arranged in the larger bore with its lower end a short distance above the bottom of said bore, the body also having two oppositely-arranged passages leading into the upper part of the valve-case, a floatable valve in the valve-case, and provided with an annular shoulder and a head at its lower end adapted to close the opening in the bottom of the valve-case, and a rod held to rock in the tank and having a float at one end and a valve at the other for closing one of the passages of the valve-body, as set forth.

2. The combination with a tank, of an automatic liquid-controlling induction-valve thereon, comprising a body having a bore in two diameters, and secured by one end in a side of the tank, a valve-case held upright in the horizontal body at right angles with its bore, said valve-case having an opening in its bottom forming a valve-seat, the valve-casing being transversely slotted at one side above and near said valve-seat, a by-pass passage leading from the front portion of the bore in the body into the valve-case above the valve therein, a duct formed in the thickened upper side of the body and extending from the valve-case above the valve into the tank, a floatable valve shouldered between its ends and adapted to slide

in the valve-case, a valve-head on the lower end of the valve-body adapted to close the opening in the bottom wall of the valve-case, a rockable arm on the inner end of the body, a valve-rod carried by said rock-arm, a valve on one end of the rod, that will close the duct, and a float on the other end of said rod.

3. In a bottle-filling machine, an automatic liquid-controlling valve, comprising a body bored in two diameters and provided with a valve-case arranged in the larger bore with its lower end a short distance above the bottom of said bore, the lower end of the valve-case being open and provided with an inlet above said bottom, the said body being also provided with two passages of unequal size leading into the upper end of the valve-case, a floatable valve in the valve-case and having a valve-head and an annular shoulder above the said head, a rod mounted to swing, a float on one end of the rod, and a valve on the other end of the rod for closing the larger passage leading from the upper end of the valve-case, as set forth.

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

SAMUEL C. MILLER.

Witnesses:
JOHN J. STINE,
CHAS. MORRIS.