J. SCHNEEWEISS.

DISTRIBUTOR OF LIQUIDS.

APPLICATION FILED SEPT. 3, 1921.

1,431,492.

Patented Oct. 10, 1922.

Fig. 1.

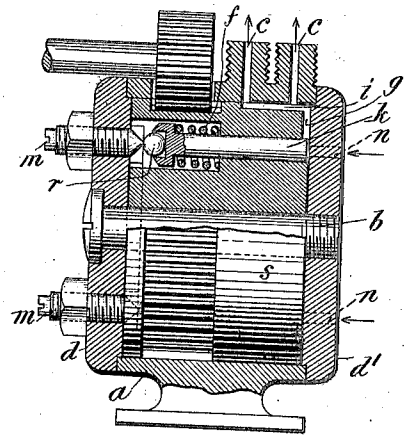


Fig. 2.

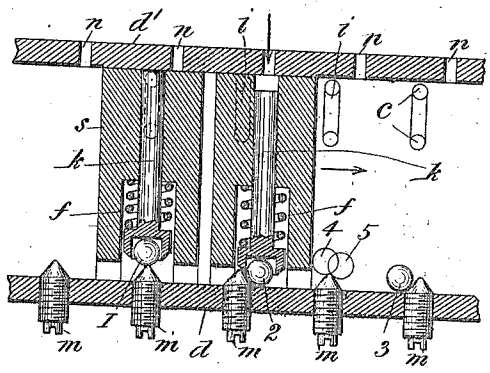


Fig. 3.

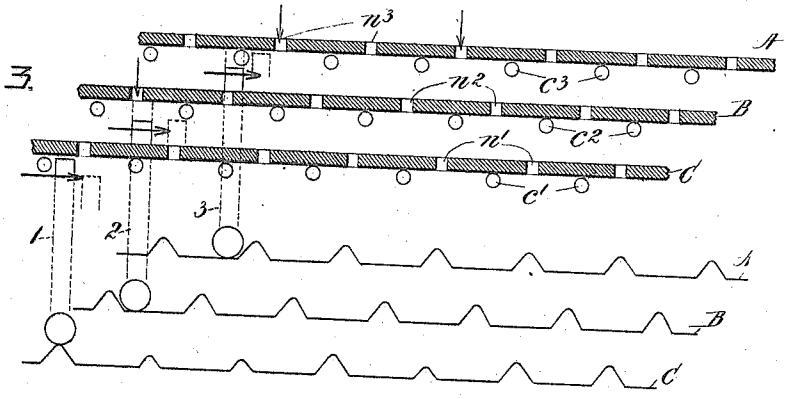


Fig. 4.

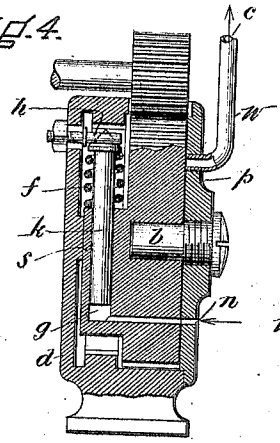
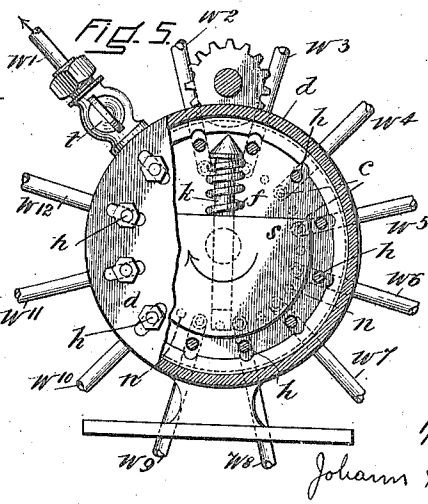


Fig. 5.



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Patented Oct. 10, 1922. 1,431,492.

UNITED STATES PATENT OFFICE.

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DISTRIBUTOR OF LIQUIDS.

Application filed September 3, 1921. Serial No. 498,583.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

To all whom it may concern:

Be it known that I, JOHANN SCHNEEWEISS, of 8 Tristanstrasse, Berlin-Wannsee, Germany, a subject of the German Republic, have invented a new and useful Improvement in Distributors of Liquids (for which I have filed applications as follows: in Germany May 15, 1914, Patent No. 319,724, and in Great Britain July 8, 1914, Patent No. 16,344), of which the following is a specification.

The present invention relates to distributors of liquid of the kind in which a rotatable valve member contained within a casing and rotated by suitable gear is provided with a piston or pistons adapted to effect a stroke in one direction under the action of springs and to make the return stroke by engagement with a cam track which may be formed as a plane surface, such as an end face of the casing, and a series of adjustable pins or screws projecting into the path of the piston or pistons as the rotatable valve member rotates.

The invention has for its object to provide improved and simplified constructions of such a distributor.

According to the invention the distributor comprises, in combination, a casing carrying in one end a number of adjustable cams, screws or the like, a removable end plate in which is secured a centrally disposed shaft or spindle, a cylindrical valve body fitted rotatably within the casing upon the shaft or spindle and provided with gear teeth around the periphery and one or more piston chambers sufficiently long to allow pistons to reciprocate therein, one or more headed pistons disposed in the said piston chambers and each carrying a spring disposed between the head and a shoulder provided in the piston chamber, the heads of the pistons being formed or provided for engagement with the cam studs or the like, a gear slot in the casing in the plane of the gear teeth of the valve body, a gear or like wheel projecting through the said gear slot for engagement with the valve body and carried by a shaft exterior to the casing, inlet ports in the removable end plate and means to effect communication between the piston chambers and the inlet ports and with discharge ports.

Constructions of such a distributor are hereinafter described with reference to the accompanying drawings.

Figure 1 represents in section a construction of the distributor serving for the distribution of one liquid only.

Figure 2 is a development of a diagrammatic cylindrical section taken through the cam screws *m* shown in Figure 1.

Figure 3 is a diagram illustrative of the operation of a distributor adapted, for example, to distribute three different kinds of liquids, the sections being taken on the lines of the suction ports and the developments representing three cylindrical surfaces or sections.

Figures 4 and 5 represent respectively, in cross section and elevation partly in section, a modified construction of the distributor.

The distributor represented in Figure 1 comprises a cylindrical casing *a* in which a rotary valve *s* is rotatably mounted upon the shank of the centrally disposed screw *b*.

The piston *k* is fitted to reciprocate in a bore formed in the rotary valve *s*, and carries at one end, within a portion of the bore of enlarged diameter, a socket adapted to receive a ball, roller or the like *r*. A spring *f* tends to bring the piston always to the beginning of the discharge position or to force it with the ball *r*, held in the socket, against the front wall *d* of the casing *a*. The cam screws *m* are arranged in a circular line in the front-wall *d* and project with their rounded ends inside the casing, according to the desired stroke of the piston, and the ball *r*, being guided on the same circular line, must necessarily pass, during the rotation of the valve *s*, along the cam track formed by the front-wall *d* and the cam screws *m*. The cam track on the one hand and the spring *f* on the other hand are, thus, the means by which the piston *k* is reciprocated. As the cam screws *m* are adjustable, the stroke of the piston can be varied during the operation, for each cam screw. The valve *s* is rotated by a toothed, helicoidal or like pinion, as shown in the drawings.

The operation of the distributor provided with one piston is as follows:—

When the valve *s* is set working, and stands, for instance, according to Fig. 2, with the piston in position I, the piston has

finished the discharge stroke, due to the passage of the ball r to the end of a cam screw m. During the period of discharge the channel i has communicated with one of the discharge openings c, and the liquid has been forced to escape, by reason of the pressure exerted by the piston. Position II of the piston shows the suction stroke completed. As soon as the ball r begins to move towards the front wall d of the casing one of the suction ports n communicates with the suction-chamber g of the valve, and the liquid is free to enter. Before the period of discharge again begins, as in position III of Fig. 2, the suction port has been passed and is shut off. The transition from the discharge stroke to the suction stroke of the piston takes place between the positions IV and V.

According to Fig. 1, the discharge openings are arranged around the whole casing in two rows in which they are alternately placed; they may be distributed over more than two rows, as required.

Fig. 3 illustrates diagrammatically the operation of a distributor, provided with 3 pistons, which may conveniently be arranged at different radial distances from the axis of the casing a, the corresponding cam screws and suction ports being arranged accordingly. The operation in respect to each piston is in details just as hereinbefore described. The suction ports for each kind of liquid, A, B and C, are disposed alternately, just as are the discharge openings.

Figures 4 and 5 show another form of construction; in this case the piston k works in the radial direction of the rotary valve and the adjustable cam track is formed, as is shown here, by way of example, by pins, rollers or the like h, adapted to be adjusted in grooves. The piston k in the position represented in Figure 4 is about to pass from the suction to the discharge stroke. The suction-ports n and the discharge-openings c lead through the front cover or wall p.

Fig. 5 shows the distributing conduit w^1 provided with a control-cock t.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. A liquid distributor comprising, a casing having inlets and outlets, a rotatable valve located in said casing, one or more pistons located to reciprocate in said valve, and means for reciprocating them, said means comprising a cam track having adjustable projections therein located in the path of a piston and adapted to engage it whereby the throw of the piston may be adjusted.

2. A liquid distributor comprising, a casing having inlets and outlets, a rotatable valve located in said casing, one or more pistons located to reciprocate in said valve, and means for reciprocating them, said means comprising a cam track having adjustable projections therein located in the path of said pistons and adapted to engage them whereby the throw of the pistons may be adjusted, and means for holding each piston against said cam track and projections.

3. A liquid distributor comprising, a casing having inlets and outlets, a rotatable valve located in said casing, one or more pistons located to reciprocate in said valve, and means for reciprocating them, said means comprising a cam track having adjustable projections therein located in the path of said pistons and adapted to engage them whereby the throw of the pistons may be adjusted, said projections being located with relation to each outlet whereby the amount of liquid expelled from each outlet may be regulated by adjusting the throw of the pistons.

4. A distributor of the kind described comprising a casing closed at both ends, the inner surface of one closure being camlike and comprising a plurality of screws, a shaft mounted in the other closure, a cylindrical valve fitted within said casing and mounted to turn on said shaft, said valve having gear teeth about its periphery and one or more piston chambers within it, a piston located in each chamber to engage said camlike surface, and yielding means to hold said pistons against said camlike surface, a gear slot in said casing, a pinion mounted outside said casing and located to engage said gear teeth and rotate said valve, said casing being provided with inlet and discharge ports, and means adapted to connect said piston chambers with said inlet and discharge ports alternately.

The foregoing specification signed at Berlin this eighteenth day of August, 1921.

JOHANN SCHNEEWEISS.