H. K. SMITH.

LIQUID DISPENSING APPARATUS.

APPLICATION FILED OCT. 3, 1908.

950,411. **Patented Feb. 22, 1910.**

3 SHEETS—SHEET 1.

Fig. 3.

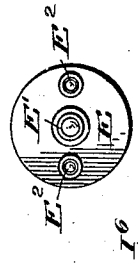
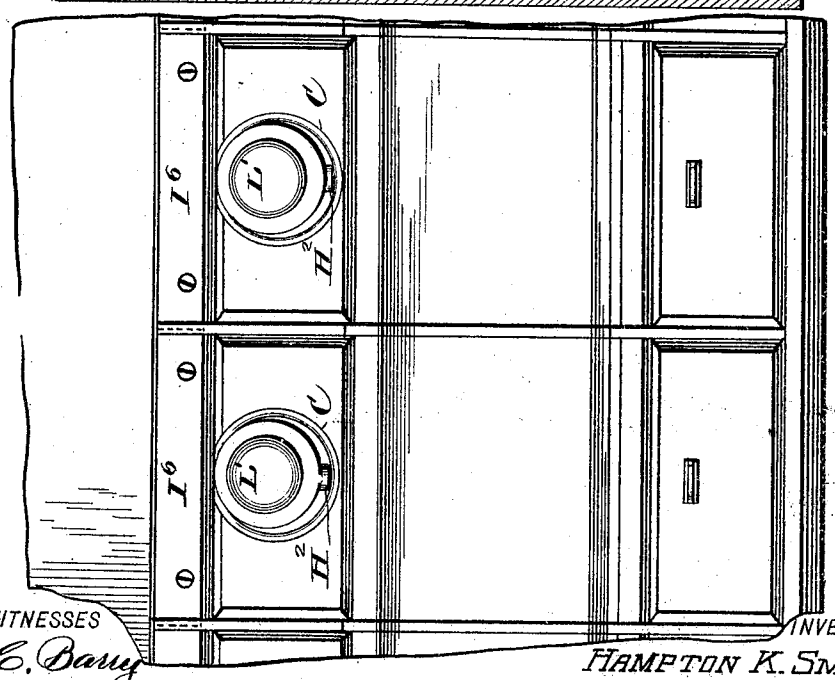


Fig. 2.

Fig. 1.



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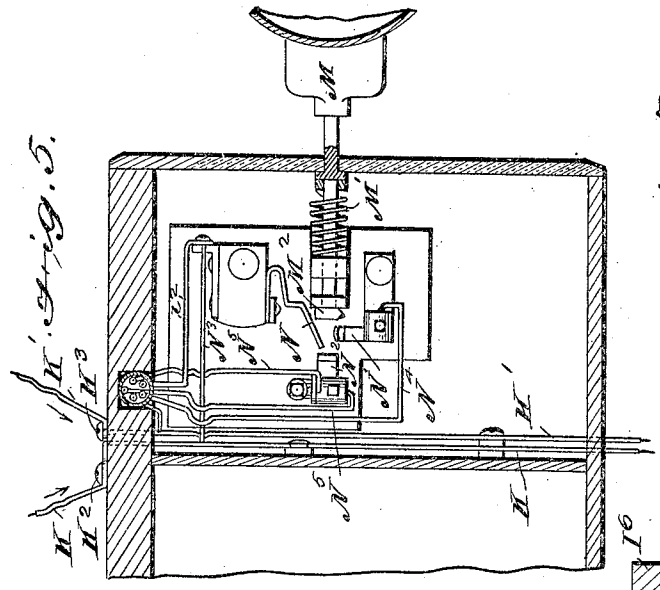

Fig. 5.

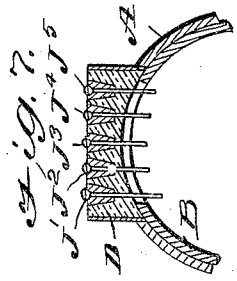

Fig. 7.

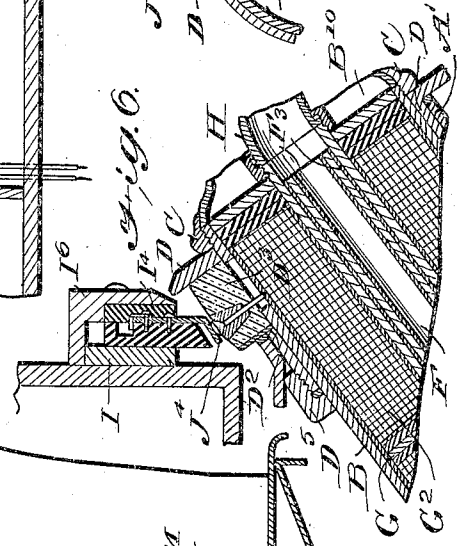

Fig. 6.

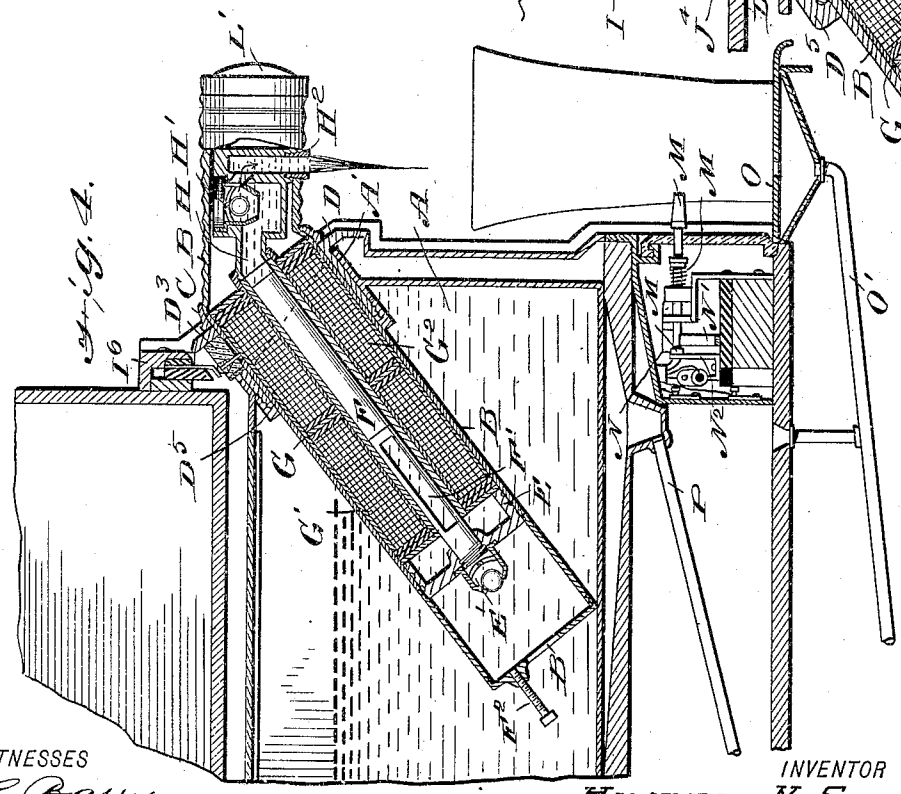

Fig. 4.

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3 SHEETS—SHEET 3.

Fig. 8.

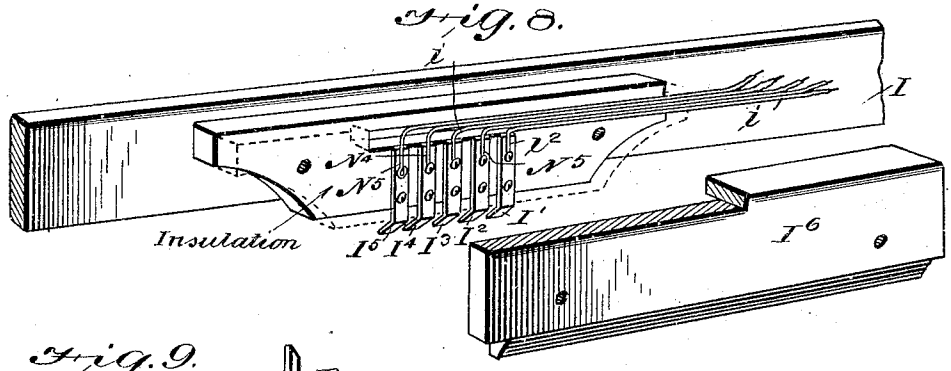


Fig. 9.

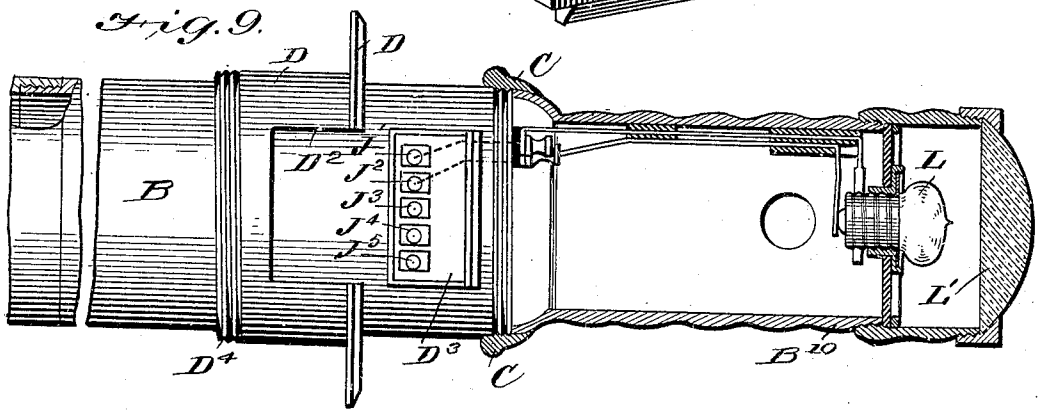
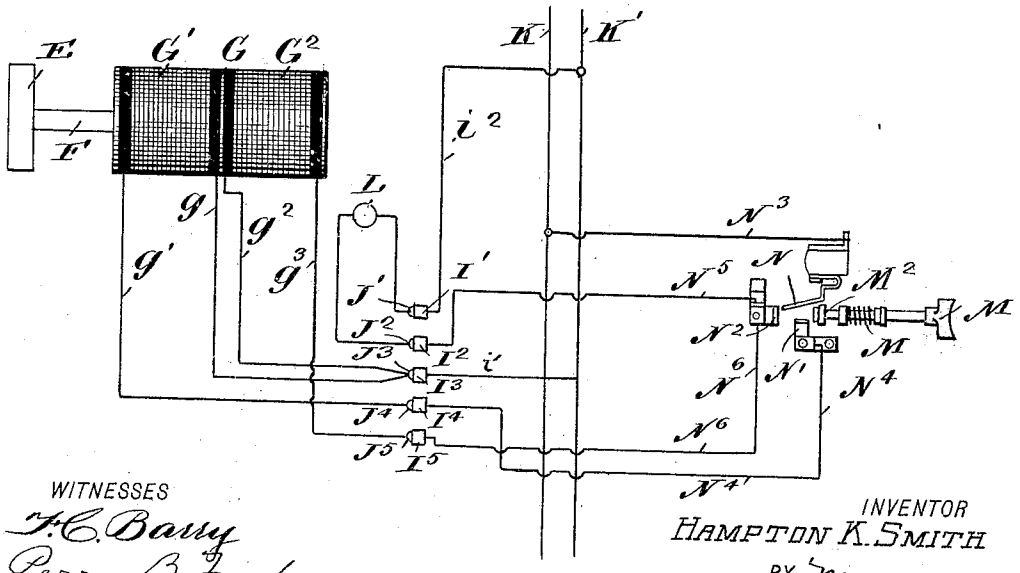


Fig. 10.



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LIQUID-DISPENSING APPARATUS.

950,411. Specification of Letters Patent. Patented Feb. 22, 1910.

Original application filed March 6, 1908, Serial No. 419,556. Divided and this application filed October 3, 1908. Serial No. 455,949.

To all whom it may concern:

Be it known that I, HAMPTON K. SMITH, a citizen of the United States, and a resident of Union, Union county, South Carolina, have made certain new and useful Improvements in Liquid-Dispensing Apparatus, of which the following is a specification.

This is a divisional application of my prior application No. 419,556, field in the United States Patent Office March 6, 1908.

This invention is an improvement in apparatus for dispensing liquids, adapted for use in dispensing soda water syrups and mineral waters and other liquids, and the invention consists in certain novel constructions and combinations of parts as will be hereinafter described and claimed.

In the drawings, Figure 1 is a front elevation of my improved apparatus. Fig. 2 is a vertical longitudinal section thereof, the pumping piston being shown in its lowermost position. Fig. 3 is a detail view of the piston showing the valves thereof. Fig. 4 is a section somewhat similar to Fig. 2, and showing the piston at the end of its pumping stroke. Fig. 5 is a horizontal section showing the circuit closing mechanism. Fig. 6 is an enlarged detail view illustrating the construction at the upper end of the cylinder and the connection between the contacts thereof and the casing. Fig. 7 is a detail partial cross section of the cylinder through the contacts thereof. Fig. 8 is a detail perspective view showing the rail of the casing and the cover plate thereof detached parts being broken away and others shown in section. Fig. 9 is a detail top plan view showing the cylinder partly in section and partly within the face plate, and Fig. 10 is a diagrammatic view illustrating the circuits.

In the construction shown, I illustrate a jar A which may be a syrup jar or other suitable liquid containing vessel and this jar is provided at or near its upper end with a nipple A′ which inclines upwardly toward its outer end. This nipple A′ affords means for the introduction of a cylinder B which extends through the nipple A′ into the jar and preferably to the bottom of the jar resting at its lower end on the jar bottom and receiving at its upper end a ring or band C threaded on the cylinder B and bearing against a face plate D. By this construction the cylinder is supported at its inner lower end upon the bottom of the jar and at its outer end upon the face plate D, thus firmly supporting the cylinder in position for use. At its lower end, the cylinder has an opening B′ through which the liquid may pass from the jar into the lower end of the cylinder and a piston E operates within the cylinder and the lower end of the piston has check valves E′ and E^2 to permit the passage of the liquid through the piston, and the piston has its rod F extending within a solenoid G so the piston may be operated as the magnet is energized. The magnet G is provided in connection with the cylinder, preferably fits within the upper end of the cylinder and is shown as a double magnet, that is to say, having magnet portions G′ and G^2 at its opposite ends. The piston rod F operates within the magnet, is made tubular for the passage of the liquid, is arranged at its upper end to discharge through the bore of the magnet to a tube H leading to the outlet nozzle and near its lower end the rod F is slotted at F′ to permit the liquid to pass through the valves of the piston and thence through the opening F′ into the hollow piston rod whence it may be discharged on the upward stroke of the piston to the tube H and thence to the nozzle.

In the general operation of this construction, when the parts are in the position shown in Fig. 4 that is to say, with the piston E up against the magnet, a circuit is closed to energize the magnet portion G′. This will operate to force the piston to its lowermost position to permit the cylinder to fill above the piston and then a circuit is closed to energize the magnet portion G^2 which will operate upon the core or piston rod F and readjust the piston to the position shown in Fig. 4, such operation forcing the liquid above the piston out through the tube F and connecting tube H, as desired. I thus provide, in connection with the cylinder and the pumping piston operating therein, magnets which can be independently energized to operate the piston first in one direction and then in the other and I construct this magnet in solenoid form so the piston rod may form the core of the magnet and the liquid can be discharged through the said piston rod and through the magnet, thus furnishing a simple and compact construction, as shown.

Feed wires K, and K′ which may lead

from a street service or other source of electrical supply connect with the casing at K^2, K^3 and extend thence as shown in Fig. 5, and in the diagrammatical view Fig. 10. The casing or frame has a bar I carrying the spring contact points I', I^2, I^3, I^4, and I^5. The cylinder is provided with contact points J', J^2, J^3, J^4, and J^5 corresponding respectively with the contacts I', to I^5 and moving into electrical connection with their said respective contacts when the cylinder is moved into position for use as shown in Figs. 2, 4 and 6. The intermediate contact point J^3 is branched by a wire i' on the feed wire K' and the contact point J' is branched by a wire i^2 and wire N^3 on the feed wire K'.

The cylinder B carries a small lamp L which is interposed in an open circuit whose terminals are connected with the contacts J', and J^2. The winding of the solenoid G^2 has its terminals g^2 and g^3 connected with the contact points J^3 and J^5, and the winding of the solenoid G' has its terminals g and g' connected with the contact points J^5 and J^4 respectively. The lamp L and the solenoids as before described are carried by the cylinder and the electrical connections between said lamp and the solenoids and the contact points J' to J^5 inclusive are all carried by the cylinder.

In connection with the described construction I provide means for closing the electrical circuits including the lower magnet G', and also for closing the circuit including the upper magnet G^2, and I close these circuits in succession first closing the circuit of the magnet G' and then closing the circuit of the magnet G^2, and when the circuit including the magnet G^2 is closed I also close the lamp circuit to light the lamp, this being effected simultaneously with the pumping stroke of the piston. To this end I provide a movable circuit closer in the form of a push button M actuated outwardly by a spring M' and having at its inner end a portion M^2 which forms a bridge between the terminals of the two electric circuits presently described. The bridge M^2 operates in connection with terminals N, N' and N^2. The terminal N connects by a wire N^3 with the feed wire K. The terminal N' connects by a wire N^4 with the contact J^4 and the contact N^2 connects by a wire N^5 with the contact J^2 and by a wire N^6 with the contact J^5. The push button M may be curved on its outer side as best shown in Fig. 10, so a glass may be pushed against the button to force the same in to close the circuits. As the button is pushed in, the circuit is first closed at N, N'. This will close the circuit including the magnet G' through the wires N^3 from the feed wire K and wires N^4, g', g, and i' to the feed wire K'. A further inward movement of the push button will close the circuit at N and N^2 such circuit including the magnet G^2 and being closed through the wires N^3 to the feed wire K, and N^6, g^3, g^2 and i' to the feed wire K'. Thus as the button is pushed in I first energize the magnet G' which acting upon the core F will adjust the piston to the bottom of the cylinder as shown in Fig. 2 and then the magnet G^2 will be energized and acting upon the core F will actuate the piston E in its pumping stroke to force the liquid out. An adjustable stop in the form of a screw F^2 is provided at the lower end of the cylinder to limit the downward movement of the piston and thus enable me to regulate the amount of liquid discharged at each operative movement of the piston.

The tubular core F is preferably nickle-plated on its outer and inner sides, as shown at F^3 in Fig. 6, or otherwise provided with a protecting coating to prevent the oxidation of the said tube or other bad effect from the contact of the metal with the liquid being dispensed.

The liquid is discharged in the tube H and thence through a check valve H' to the nozzle H^2 whence it is discharged to a glass placed below it, as shown in Fig. 4.

The face plate D is provided at its upper end with a tubular portion D' which is notched in its upper side at D^2 to receive the insulating block D^3 on the cylinder and carrying the contact points J' to J^5 as shown in Fig. 9, and this insulating block D^3 when fitted in the slot D^2 secures the cylinder from turning within the face plate and properly alines the said contact points from J' to J^5 with their corresponding contact points I' to I^5 mounted on the frame, the said contact points I' to I^5 being guarded and protected by a cover plate I^6 shown detached in Fig. 8 and applied in Figs. 1, 2, 4 and 6. The contact points J' to J^5 are secured firmly within the insulating block D^3 and the electrical connections leading from said contact points to the light L and to the magnets G' and G^2 are within the casing B and the outward extensions B^{10} thereof and thus out of the way so that they cannot be tampered with by meddlers. An extension B^{10} is secured on the outer end of the cylinder and incloses the pipe H and the nozzle H^2 and carries at its outer end the lamp L which is visible through a lens L', as above shown in Figs. 2, 4 and 9 of the drawing.

The glass to receive the liquid dispensed rests upon a shelf O, which may drain through a pipe O' and any leakage from the jar A may discharge through a pipe P as shown in Figs. 2 and 4 of the drawing.

In the operation of my invention, it will be noticed that the liquid is discharged through the solenoid and through the hollow piston rod forming the core of the

solenoid magnet, and the piston is operated positively in both directions by the magnet as before described, and in practice the piston may be made of very light material to avoid its gravity operating to any considerable extent in opposition to the magnets.

Manifestly, the invention can be carried out in connection with the single jar as before described or a plurality of said jars may be operated side by side as illustrated in Fig. 1 and this latter arrangement will be found especially useful in soda water fountains and other apparatus for dispensing various kinds of drinks, such for instance as mineral waters.

The tubular portion D′ of the face plate fits within the inclined nipple A′ of the jar A and projects at its inner end beyond said nipple, as best shown in Figs. 2, 4 and 6, and is threaded at such end at D^4 to receive a band D^5 screwed thereon and operating to secure the tube D′ firmly within the inclined nipple of the jar A.

As best shown in Figs. 4, 6 and 9, the band C secured on the outer end of the cylinder bears against the face plate D and also operates to secure the extension B^{10} to the outer end of the cylinder.

What I claim is:

1. The combination of a jar having an upwardly inclined nipple, and a face plate having a nipple fitting within and reinforcing the jar nipple, a cylinder fitting at its upper end within the face plate nipple, a band on the said cylinder and resting against the face plate, and pumping devices within the cylinder, substantially as set forth.

2. The combination with a jar having at one side above its bottom an inclined nipple, of a cylinder fitting at its upper end within said inclined nipple and resting at its lower end upon the bottom of the jar and extending between its ends at an angle to the vertical, and pumping devices within the cylinder.

3. The combination, in a liquid dispensing apparatus, of a jar, a face plate fitted thereto and having a slot or notch, a frame or casing having contact points and a cylinder fitted to the face plate and having a projection entering the notch of said face plate, contact points carried by the frame or casing and contact points carried by the cylinder whereby they may be alined with those of the frame or casing when the cylinder is fitted to the face plate, substantially as set forth.

4. The combination with a jar and a frame or casing having contact points, of a cylinder having contact points corresponding to those of the frame or casing, and cooperating devices on the cylinder and face plate whereby to aline the contact points of the cylinder with those of the frame or casing.

5. The combination with a jar and the frame or casing having contact points, of a cylinder extending into the jar and having contact points corresponding to those of the frame or casing and means for alining the cylinder relatively to the frame or casing whereby to insure the alinement of their respective contact points.

6. The combination with the jar and the face plate, of the pumping cylinder arranged at an incline and extending into the jar and supported at its inner end upon the jar and its outer end upon the face plate, and pumping devices in the cylinder.

7. The combination of a jar having an upwardly inclined nipple, a face plate having a nipple fitting within the jar nipple and extending at its inner end beyond the same, a retaining ring screwed on the inner end of the nipple of the face plate to abut the inner end of the jar nipple, a cylinder within said nipples, and pumping devices within the cylinder.

8. The combination with a face plate and a jar, of a cylinder fitted to the face plate and extending into the jar, a band threaded on the cylinder and bearing against the face plate, a piston operating in the cylinder, and means for operating the piston.

9. The combination of a jar having a nipple, a face plate having a tubular portion fitting within the nipple of the jar, a cylinder fitting within said tubular portion and nipple, a band threaded on the cylinder and bearing against the face plate, and pumping devices in the cylinder.

10. The combination of a jar having a nipple, a face plate having a tubular portion fitting within the nipple, a cylinder fitting within said tubular portion and nipple, and threaded at its outer end, an extension at the outer end of said cylinder, a band screwed on the cylinder and securing said extension and bearing against the face plate, and pumping devices in the cylinder, substantially as described.

11. The combination in a liquid dispensing apparatus, of a cylinder, contact points carried by the cylinder, a support having contact points corresponding with those of the cylinder, the cylinder being movable relatively to the support, and means for alining the contact points of the support and those of the cylinder when the cylinder is moved into operative connection with the support, substantially as set forth.

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Witnesses:
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PERRY B. TURPIN.