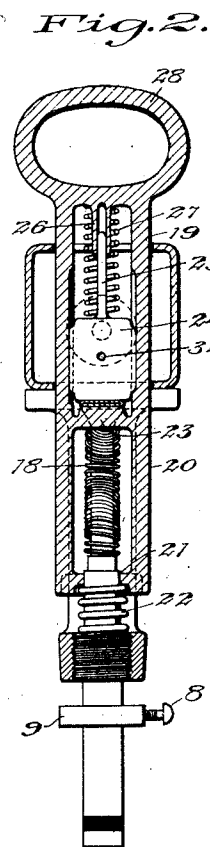
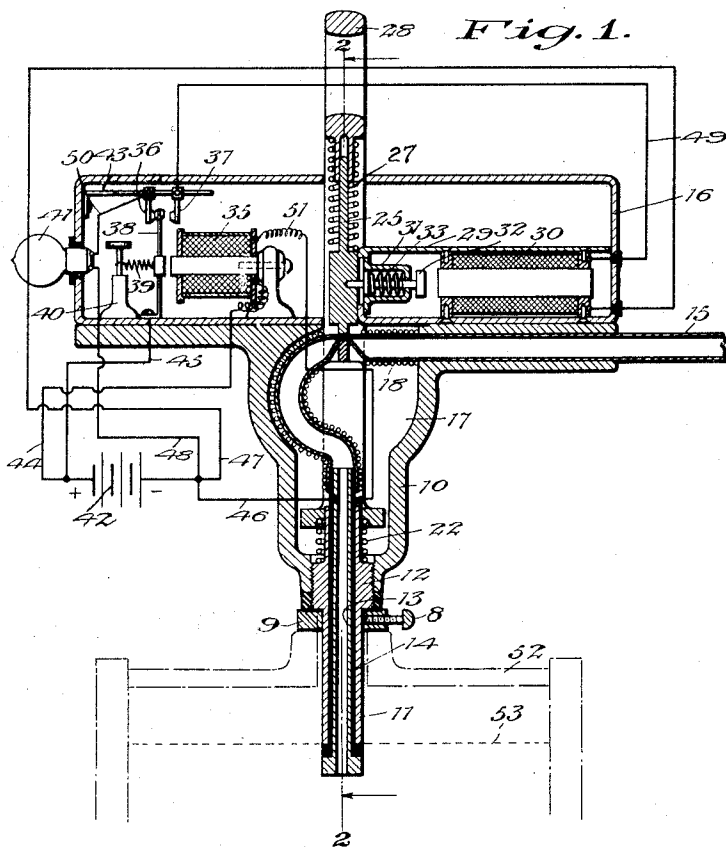


Oct. 16, 1923.

1,471,238

C. BURKHARD
STORAGE BATTERY FILLER

Filed April 20, 1922



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STORAGE-BATTERY FILLER.

Application filed April 20, 1922. Serial No. 555,656.

To all whom it may concern:

Be it known that I, CHARLES BURKHARD, a citizen of Germany, and a resident of the city of New York, borough of the Bronx, in the county of Bronx and State of New York, have invented new and useful Improvements in Storage-Battery Fillers, of which the following is a full, clear, and exact description.

This invention relates to filling devices primarily designed for filling storage batteries.

Many devices have been devised for filling storage batteries and provided with means for warning the operator the instant that the battery has been filled to the desired level. If these devices used introduce the necessity for the operator to show alertness they are unsatisfactory unless the operator is capable of mental alertness. Sometimes with reliable and keen workmen who are disturbed in their work flooding of the batteries or the like is likely to occur.

The general object of this invention is the provision of a simple and efficient portable filler which may be used to fill any container with a fluid which will conduct electricity, or to dilute any conducting fluid, said filling means being provided with means for automatically shutting off the filling device when the fluid in the container has reached a certain level.

A further object is the provision of a filler which automatically shuts off the flow of the filling fluid upon the container being filled to the desired level without requiring the operator to perform any operation.

These objects are accomplished by providing a filling tube and means for normally clamping said tube closed, associating with said clamping means a spring-controlled handle for releasing the clamping means so as to open the tube, and providing in conjunction but independent of said clamping means a second clamping means operated by electrical means upon the rise of the fluid in the container to a certain level to close the tube.

These and other objects of the invention will be more clearly understood from the following detailed description and accompanying drawings.

Figure 1 is a section through the filling device showing the diagram of the electrical connections; and

Figure 2 is a section along the line 2—2, Figure 1.

Referring to the above-mentioned drawings, a lower casing 10 is shown with an upper casing 16 mounted thereon. A metal tube 11 provided with a collar 12 is mounted in the lower end of the casing 10. Located in the tube 11 is another metal tube 13 insulated from the former by an insulating tube 14. The tube 13 is of greater length than the tube 11 and extends beyond both ends of the latter. A hose or flexible filling tube 15 projects through a channel formed in the casing 10 into a chamber 17 and is fitted over the upper end of the tube 13. This filling tube 15 must be made from a material sufficiently flexible to allow the use of clamping means for shutting off the flow of a fluid therethrough and that has sufficient elastic properties to regain its original shape when the clamping means has been removed. An armor 18 may be mounted on the filling tube 15 to prevent distortion of its shape where the construction of the apparatus necessitates the bending of said tube at sharp angles such as in the chamber 17 (see Figure 1). The tube is not armored at the point where engaged by the clamping means. The tube is assisted in regaining its original shape when the clamping means is released by the pressure of the fluid.

A clamping assemblage 19 extends through the upper casing 16 into the lower casing 10. The body 20 of the clamping assemblage is slidably mounted in the casing and provided with an opening 21 in its lower end which fits over the tube 11 and serves to guide the body in its movements. A spring 22 is located between the collar 12 and the body 20 and serves to normally retain the body 20 in a raised position. A fixed jaw 23 is attached to the body 20 and co-operates with a movable jaw 24 slidably mounted in the body 20. The movable jaw 24 is provided with a guide rod 25 which slides in a socket 26 formed in the upper end of the body 20. Located between the upper end of the body 20 and the movable jaw 24 is a spring 27 which tends to force the movable jaw 24 downward. Attached to the upper end of the body 20 is a handle 28 for handling the device and operating the body to release the fixed clamping jaw. Mounted in the upper casing 16 is a frame 29 to which is added an electromagnet 30. Fixed to the front end of the frame 29

is a hollow cylinder 31 in which a pin 32, of such a length that it extends beyond both ends of the hollow cylinder, is slidably mounted. A spring 33 is associated with the pin 32 and normally retains it projected forward into engagement with the movable jaw 24, the jaw being provided with an opening 34 for receiving the pin. This pin 32 is mounted in alignment with the electromagnet 30.

Mounted in the upper casing 16 is a vibrating arm 38, the upper end of which is located between two fixed contact points 36 and 37 suspended from a bracket 43. This vibrating arm 38 is normally held in engagement with the contact point 36 by means of the spring 39 which is attached to an adjustable support 40 mounted in the casing 16. An electromagnet 35 is associated with the vibrating arm 38 and when energized serves to operate the same. Mounted in the wall of the casing 16 and insulated therefrom is an electric light bulb 41. This bulb is for indicating that electric energy is being supplied to operate the various electrically operated parts of the device. A battery 42 is supplied in conjunction with the above described device for providing the necessary electric energy.

The positive terminal of the battery 42 is connected by conductors 44 and 45 to one terminal of the electromagnet 35 and to the vibrating arm 38, respectively. The negative pole of the battery 42 is connected by conductors 46, 47 and 48 to the inner tube 13, one terminal of the electromagnet 30 and one terminal of the bulb 41, respectively. The contact point 37 is connected by means of conductor 49 to the other terminal of the electromagnet 30 while the contact 36 is connected to the feed terminal of the lamp bulb 41 by the conductor 50. The tube 11 is connected to the electromagnet 35 by means of the conductor 51.

Slidably mounted on the tube 11 is a bushing 9 which may be set in any desired position by means of the screw 8. In preparing the filler for use with any set of batteries the distance from the top of the battery container to the desired level to which it should be filled is measured. The bushing 9 is then set that distance from the lower end of the outer tube 11. When the filler is inserted into a battery container, the bushing 9 rests on top of the container and thus retains the tubes in the desired position so that when the electrolyte rises to the predetermined level an electric circuit will be established through the tubes 11 and 13 and the device will be operated to shut off the flow of fluid.

Normally the spring 22 forces the body 20 of the clamping assemblage upward and the fixed jaw 23 engages the flexible filling tube 15, forcing it against the movable jaw 24 which is normally held in a fixed position

by the pin 32. This upward movement of the body 20 and the fixed jaw 23 collapses the filling tube 15, closing the same to the flow of fluid therethrough. When it is desired to use the device for filling a storage battery or other container the tubes 11 and 13 are inserted into the container 52, as shown. The body 20 is forced downward compressing the spring 27 and releasing the filling tube 15. At this stage in the operation the bulb 41 should be lighted, indicating that current is being supplied from the battery 42, the current flowing from the positive pole of the battery 42, through conductor 45, vibrating arm 38, contact 36, conductor 50, bulb 41 and back to the battery through conductor 48. After the fluid in the container rises to the dotted line 53 shown in Figure 1 electric connection is established between the tubes 11 and 13. Electric current then flows from the battery 42, through conductor 44, electromagnetic coil of the electromagnet 35, conductor 51, tube 11, the conducting liquid in the container, tube 13 and back to the battery through the conductor 46. This energizes the electromagnet 35 which operates the vibrating arm 38, drawing it into contact with the contact point 37. Electric current now flows from the battery 42, through conductor 45, vibrating arm 38, contact point 37, conductor 49, the electromagnetic coil of the electromagnet 30, conductor 47 back to the battery 42. The electromagnet 30 energizes and withdraws the pin 32 from engagement with the movable jaw 24. The spring 27 forces the movable jaw down into engagement with the filling tube 15, collapsing the same and closing it to the flow of liquid therethrough. After the container has been thus filled up to the predetermined level it is necessary to release the body 20. The release of the body 20 does not release the filling tube 15. As the spring 22 is stronger than the spring 27 the body is moved upward by the former and the tube is retained collapsed by the action of the two springs. On the removal of the tubes 11 and 13 from the conducting liquid the circuit through the electromagnet 35 is broken and the vibrating arm 38 is released and drawn back to its original position by the spring 39. This breaks the circuit through the electromagnet 30 and the pin 32 is forced into engagement with the movable jaw 24, which is now in its original raised position, by the spring 33. The bulb 41 is again lighted, showing that the device is ready for use in filling another container. As soon as the conducting liquid reached the level 53, establishing electrical connection between the tubes 11 and 13, the bulb circuit was broken and the light disappeared, indicating that sufficient fluid had been fed into the container. During the operation of the device when the container has been filled and an

electric circuit established through the tubes 11 and 13, the electromagnet 35 is energized and draws the vibrating arm 38 away from the contact 36. This breaks the bulb circuit and the operator is left in the darkness. Naturally his first desire is to again obtain light and he promptly removes the filler from the container.

From the above it will be seen that a filler has been provided which does not depend on any human factor for shutting off the flow of fluid when the container has been filled to a predetermined level. Further, means have been provided for stimulating the operator to action, when the container has been filled, so that he will remove the filler.

I would state in conclusion that while the illustrated example constitutes a practical embodiment of my invention I do not limit myself strictly to the exact details herein illustrated since manifestly the same can be considerably varied without departing from the spirit of the invention as defined in the appended claims.

Claims:

1. A device for filling containers with any fluid capable of conducting electricity, comprising a flexible tube, a pair of slidably mounted spring controlled jaws normally clamping the tube closed, means for locking one jaw in a fixed position, manually actuated means for retaining the other jaw spaced from the locked jaw to permit the opening of the tube, and means operated by the rising of the fluid in the container to actuate the locking means to release the locked jaw, permitting it to coact with the other jaw to close the tube.

2. In a filling device including a filling tube, means for closing the filling tube by a pinching action, comprising a pair of aligned spring controlled jaws normally closing the filling tube, means for locking one jaw in a predetermined position, manually actuated means for retaining the other jaw spaced from the locked jaw to release the tube, and means for actuating the locking means to release the locked jaw permitting it to coact with the other jaw to close the tube.

3. A filling device, comprising a filling tube capable of being closed by a pinching action, a pair of jaws slidably mounted pinching the tube, springs provided in conjunction with the jaws and normally compelling the coaction of the jaws to close the tube, means for locking one jaw in a fixed position, manually actuated means for retaining the other jaw spaced from the locked jaw to release the tube, and means for op-

erating the locking means to release the locked jaw permitting one of the springs to force it into coaction with the other jaw, closing the tube.

4. A filling device for filling storage batteries, comprising a flexible tube for conveying fluid, a pair of spring controlled jaw members normally clamping the walls of the tube together, shutting off the flow of fluid, one of said jaw members being locked in position, manually operated means for moving the other jaw away from the locked jaw, releasing the tube, and means for releasing said locked jaw to permit its cooperation with the other jaw to close the tube.

5. A filling device for filling storage batteries with electrolyte, comprising a casing, a tube for conveying the electrolyte into the storage battery, spring-controlled clamping jaws slidably mounted in the casing for normally clamping the walls of the tube together to prevent the flow of electrolyte, means for locking one of said clamping jaws in its normal active position, manually actuated means for moving the other jaw out of co-operation with said locked jaw releasing the tube, and electrically operated means operated upon the rise of electrolyte in the storage battery for releasing said locked jaw to permit it to coact with the other jaw to close the tube.

6. A filling device for filling storage batteries with electrolyte, comprising a casing, a flexible tube for conveying the electrolyte mounted in said casing, a nozzle including a pair of concentric conductor tubes insulated from one another connected with said flexible tube, means for clamping the walls of said flexible tube together to shut off the flow of electrolyte, and electrically controlled means electrically connected to said concentric conductor tubes for operating said clamping means, said electrically controlled means being operated upon the rise of electrolyte immersing the ends of said concentric tubes establishing electrical connection between them.

7. A device for filling containers with a fluid capable of conducting electricity, comprising a flexible tube, movably mounted jaws normally coacting clamping the tube closed, means for locking one jaw in a fixed position, manually actuated means for moving the other jaw out of co-operation with the locked jaw releasing the tube, and means operated by the rise of the conducting fluid in the container to actuate the locking means to release the locked jaw permitting it to coact with the other jaw to close the tube.

CHARLES BURKHARD.