No. 821,623. PATENTED MAY 29, 1906.

T. A. EDISON.

STORAGE BATTERY FILLING APPARATUS.

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Fig. 1.

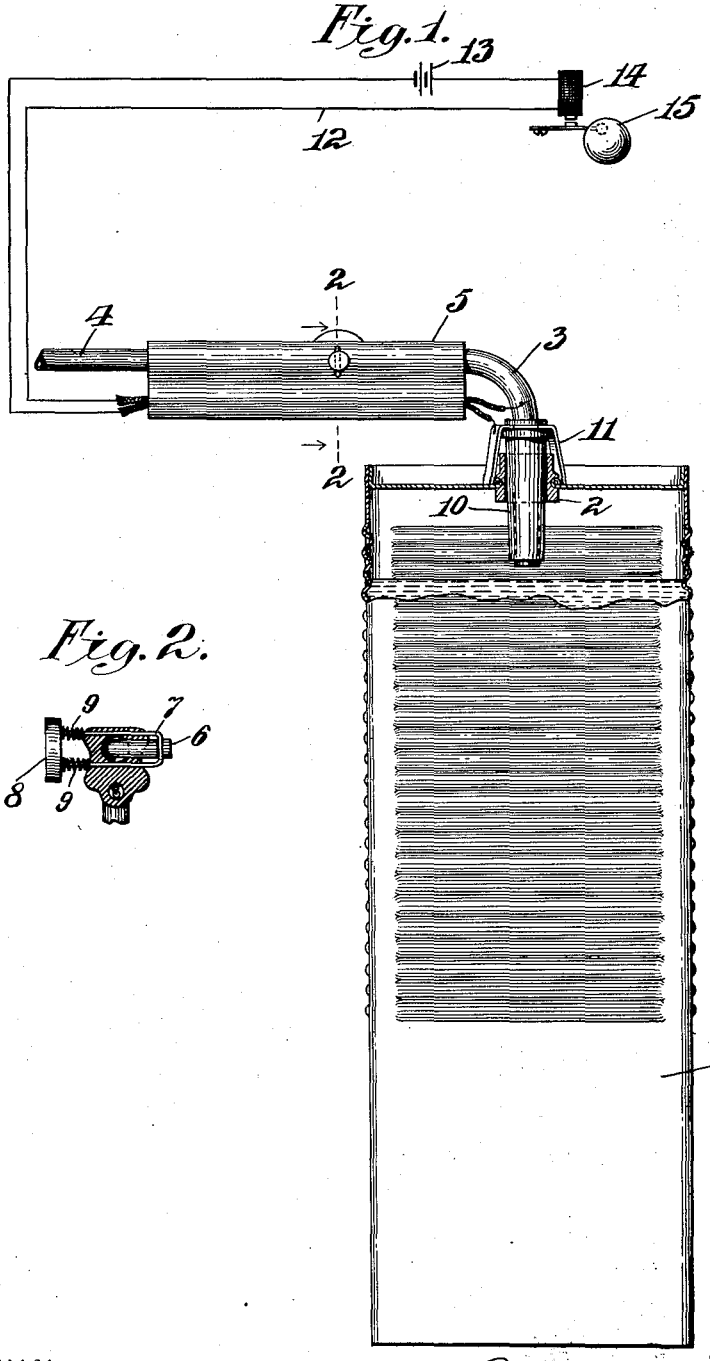

Fig. 2.

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STORAGE-BATTERY-FILLING APPARATUS.

No. 821,623. Specification of Letters Patent. Patented May 29, 1906.

Application filed November 2, 1904. Serial No. 231,063.

To all whom it may concern:

Be it known that I, THOMAS A. EDISON, a citizen of the United States, residing at Llewellyn Park, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Storage-Battery-Filling Apparatus, of which the following is a specification.

My invention relates to a simple and effective apparatus which has been designed for filling the cans or receptacles of my improved storage batteries, the idea being to provide means for giving an indication when the proper level of the solution has been reached. It will be seen, however, that the apparatus can obviously be employed for introducing solutions into batteries of other types, whether secondary or primary, as well as for the filling of other receptacles—such as tanks, boilers, stills, &c.—with more or less conducting solutions.

My objects are to provide a simple, compact, and efficient apparatus for the purpose, arranged to give a positive notification when the solution or other liquid reaches the proper level and of such a character as not to be likely to get out of order.

To this end the invention consists of an electrode depending within the receptacle and arranged in a suitable circuit adapted to be closed through the solution or other liquid when the latter makes contact with said electrode, thereby energizing a controlling-magnet arranged to perform any desired notification, such as the ringing of a bell, the dropping of a shutter, or the operation of a valve, rheostat, switch, or other device. Preferably the electrode in question surrounds or is formed by the filling-tube.

In order that the invention may be better understood, attention is directed to the accompanying drawings, forming part of this specification, and in which—

Figure 1 shows the apparatus in its preferred embodiment in connection with a can or receptacle of one of my improved storage batteries, and Fig. 2 is a section on the line 2 2 of Fig. 1.

1 represents the receptacle into which the solution or other conducting liquid is to be introduced. In the present instance this receptacle is illustrated as one of the metal cans of my improved storage battery, these cans being formed of nickel-plated steel with corrugated sides to make them as stiff as possible. At the top of the can is a hollow plug 2, through which the alkaline solution is introduced. The filling apparatus consists of a curved tube or electrode 3, made of metal and adapted to enter the plug 2 and connected with an extension 4, made, preferably, of rubber, leading to a tank or other source of supply. (Not shown.) A handle 5 is provided, having preferably any suitable arrangement of valve for controlling the flow of liquid. I show a plunger 6, Fig. 2, operating to constrict the flexible tube 4 and actuated by a yoke 7, connected with a thumb-piece 8. Springs 9 surround the legs of the yoke 7 to keep the valve normally closed. Surrounding the lower end of the tube or electrode 3 is an insulating-bushing 10, arranged to fit easily within the plug 2. Carried by this bushing are one or more (preferably three) contact-fingers 11, arranged to make contact with the top of the can and also to limit the distance to which the tube or electrode 3 may be introduced within the can.

Since the lower ends of the fingers 11 make contact with the can below the top of the plug 2, there will be no danger of any spark which may form between said fingers and the can igniting any explosive gases which may be evolved from the electrolyte. A circuit 12, including a battery 13 and a controlling-magnet 14, extends to the contact-fingers 11 and to the metallic tube or electrode 3, as shown, which circuit will be closed when the solution makes contact with the lower end of the tube or electrode 3, as will be obvious. The magnet 14 actuates any desired indicating mechanism—as, for example, a bell 15, as shown. The operation of the device will be readily understood. The tube or electrode 3 is introduced within the can and the valve actuated, allowing solution to enter the can. As soon as the solution reaches the lower end of the tube or electrode 3 to make contact therewith the circuit will be closed through the solution to energize the magnet 14, and thus actuate the indicating mechanism. It would of course be possible to pass a current of sufficient strength to ring the bell 15 through the stream which issues from the tube 3; but in practice a voltage will be used

which is too low to ring the bell until the solution inside the receptacle rises up to or very nearly to the bottom of the said tube 3. The valve will then be closed and the filling-tube 3 withdrawn.

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

1. In a filling apparatus, the combination of a supply-tube, a nozzle connected thereto, a pair of conductors connected to opposite poles of a source of current, one of said conductors being electrically connected with said nozzle and the other conductor being carried by said nozzle but insulated therefrom and being electrically in circuit with the liquid within the receptacle to be filled, and means for controlling the flow of liquid through said supply-tube, substantially as set forth.

2. In a filling apparatus, the combination of a metallic receptacle, a supply-tube, a nozzle connected thereto, a pair of conductors connected to opposite poles of a source of current, one of said conductors being electrically connected with said receptacle and the other with said nozzle, whereby the circuit will be closed through the liquid within the receptacle, substantially as set forth.

3. In a filling apparatus, a handle carrying a pair of rigid electrodes electrically connected to opposite poles of a source of current, one electrode being elongated and extending below the other, whereby the first electrode may be passed through an opening in a receptacle and the other electrode contact with the wall surrounding said opening, substantially as set forth.

4. In a filling apparatus, a handle carrying a pair of rigid electrodes electrically connected to opposite poles of a source of current, one electrode being in the form of a pipe or tube extending below the other electrode, whereby the tubular electrode may be passed through an opening in the receptacle and the other electrode contact with the metal surrounding said opening, substantially as set forth.

5. The combination with a metallic receptacle into which a conducting solution is introduced, of a tubular electrode within the receptacle but insulated therefrom and through which the solution is introduced into the receptacle, a controlling-magnet and a circuit having terminals at said electrode and receptacle respectively, whereby said circuit will be closed when the solution makes contact with said electrode, substantially as set forth.

6. The combination with a metallic receptacle, of a tubular electrode adapted to enter the receptacle but insulated therefrom and through which a conducting solution is introduced into the receptacle, a controlling-magnet and a circuit terminating at said electrode and receptacle respectively adapted to be closed when the solution makes contact with said electrode, substantially as set forth.

7. The combination with a metallic receptacle, of a tubular electrode adapted to enter the same and through which a conducting solution is introduced within the receptacle, an insulating-sleeve surrounding the electrode, contact-fingers carried by said sleeve and making contact with said receptacle, a controlling-magnet and a circuit terminating at said electrode and contact-fingers respectively, substantially as set forth.

8. In a filling apparatus for metallic storage-battery cans, the combination of a tubular electrode, an insulating-bushing surrounding the same, contact-fingers carried by said bushing, a controlling-magnet, and a circuit terminating at the contact-fingers and electrode respectively, substantially as set forth.

9. In a filling apparatus for metallic storage-battery cans, the combination of a tubular electrode, an insulating-bushing surrounding the same, contact-fingers carried by said bushing, a controlling-magnet, a circuit terminating at the contact-fingers and electrode respectively, and a valve controlling the flow of solution through said tubular electrode, substantially as set forth.

10. In a filling apparatus for metallic storage-battery cans, the combination of a handle, a valve in said handle, a tubular electrode carried by said handle, an insulating-bushing surrounding said electrode, contact-fingers carried by said bushing, a controlling-magnet and a circuit terminating at said contact-fingers and electrode respectively, substantially as set forth.

This specification signed and witnessed this 1st day of November, 1904.

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Witnesses:

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