Jan. 1, 1924 **1,479,276**

C. E. BENNETT

CURRENT INTERRUPTER

Original Filed Sept. 2, 1919

Fig. 1.

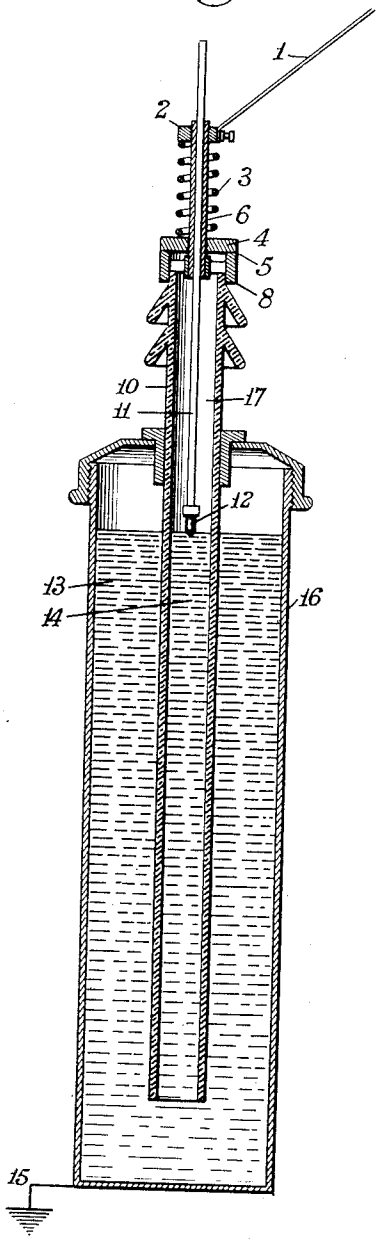


Fig. 3.

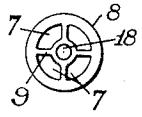
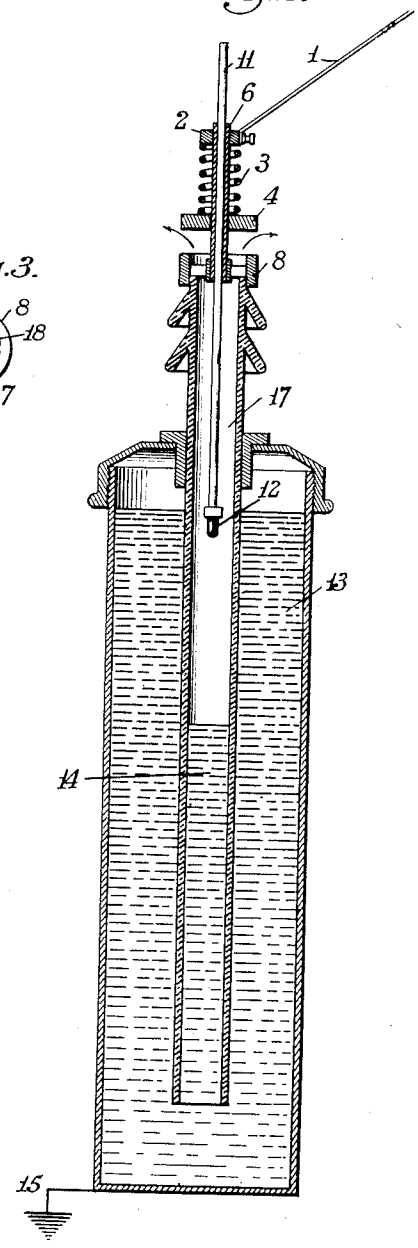


Fig. 2.



INVENTOR

CHARLES E. BENNETT

BY

ATTORNEYS

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UNITED STATES PATENT OFFICE.

CHARLES E. BENNETT, OF ATLANTA, GEORGIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO BALT MANUFACTURING COMPANY, OF ATLANTA, GEORGIA, A CORPORATION OF GEORGIA.

CURRENT INTERRUPTER.

Application filed September 2, 1919, Serial No. 321,245. Renewed March 18, 1922. Serial No. 544,974.

To all whom it may concern:

Be it known that I, CHARLES E. BENNETT, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented certain new and useful Improvements in Current Interrupters, of which the following is a specification.

My invention relates to current interrupters, and particularly to a device of the general type shown in my copending applications Nos. 207,771, filed December 18, 1917; 247,826, filed August 1, 1918, and 298,273, filed May 19, 1919. The object of my present invention is to provide a safety device for protecting against injury the tank which forms the expansion chamber, while at the same time insuring a prompter action of the pressure gases in the chamber during the operation of the interrupter.

In the accompanying more or less diagrammatic drawings—

Figs. 1 and 2 are vertical sections through an interrupter showing the safety device in different positions;

Fig. 3 is a plan of a detail.

The present construction possesses certain general features in common with those described in the applications above mentioned. Thus, the tank 16, grounded at 15, contains an electrolyte 13, into which dips the tube 10 of insulating material. The electrolyte rises at 14 in the tube to a point at which it is normally in contact with the terminal 12 of the conductor rod 11. An air and steam chamber 17 lies above the electrolyte in the tube and is closed at its upper end by a valve disc 4 which rests upon the ground seat 5 at the upper edge of the spider 8, mounted on the head of the insulating tube 10. The openings between the spider arms 9 afford passageways for the air and vapor from the expansion chamber on the operation of the apparatus.

A central tapped hole 18 in the spider receives the threaded end of a sleeve 6 in which the conductor rod 11 is supported, while a collar 2 at the upper end of the sleeve forms an abutment between which and the valve disc 4 a coil spring 3 is arranged under predetermined compression. The lead 1 for the power main or the like to be protected is connected by a set screw or the like to the collar 2 of the sleeve 6, and current is thus led to the apparatus.

When excessive current passes through the apparatus, the heat generated by the arc established between the terminal 12 and the electrolyte 14 in the tube 10 expands the air and steam formed in the chamber 17 with the result that the liquid 14 is forced down in the tube 10, thus lengthening and finally breaking the arc. If excessive pressure occurs, the valve disc 4 lifts against the action of the spring 3 and permits the expanded vapors to escape, thus preventing breakage of the tube 10. Normal conditions are reestablished automatically upon the breaking of the arc, inasmuch as the valve disc is returned to closure position by the spring 3, the vapors cool in chamber 17 and the liquid in 14 rises to a level with that in the tank 16. Sufficient leakage occurs through the sleeve 6 and at the valve seat 5 to take care of any partial vacuum which may be caused by the contraction of the hot vapors in 17 after the valve disc 4 is seated. Or if necessary, a fine channel may be cut across the face of the seat 5 to form a sufficient vent for this purpose, without interfering, however, with the operation of the expansion chamber to draw out the arc between the terminal 12 and the electrolyte 14 to breaking distance.

Various valve devices other than that shown for accomplishing the desired action will readily occur to those dealing with the problem, which do not depart from what I claim as my invention.

I claim—

1. In an electric circuit interrupter, a liquid container, a tube dipping into the liquid and forming an expansion chamber, an electrode arranged in said expansion chamber, and a yieldable closure for the expansion chamber serving by its displacement to relieve excessive vapor pressure incident to the formation of an arc in the chamber.

2. In an electric circuit interrupter, a liquid container, a tube of frangible insulating material dipping into the liquid and forming an expansion chamber, an electrode arranged in said expansion chamber, and a yieldable closure for the expansion chamber serving by its displacement to relieve exces-

sive vapor pressure incident to the formation of an arc in the chamber.

3. In an electric circuit interrupter, a liquid container, a tube dipping into the liquid and forming an expansion chamber, an electrode arranged in said expansion chamber, and a valve normally closing the expansion chamber, but serving by its displacement to relieve excessive vapor pressure incident to the formation of an arc in the chamber.

4. In an electric circuit interrupter, a liquid container, a tube dipping into the liquid and forming an expansion chamber, an electrode extending into the expansion chamber through the head of the tube, and a valve mounted at said head of the tube to normally close the same but serving by its displacement to relieve excessive vapor pressure incident to the formation of an arc in the chamber.

5. In an electric circuit interrupter, a liquid container, a tube dipping into the liquid and forming an expansion chamber, an electrode extending into the expansion chamber through the head of the tube, and a valve surrounding the electrode and bearing against a seat at said head of the tube to normally close the same but serving by its displacement to relieve excessive vapor pressure incident to the formation of an arc in the chamber.

In testimony whereof I have signed my name to this specification.

CHARLES E. BENNETT.