No. 666,451. Patented Jan. 22, 1901.

C. E. ZIMMERMANN.

HIGH AND LOW WATER ALARM.

(Application filed Apr. 6, 1900.)

(No Model.) 2 Sheets—Sheet 1.

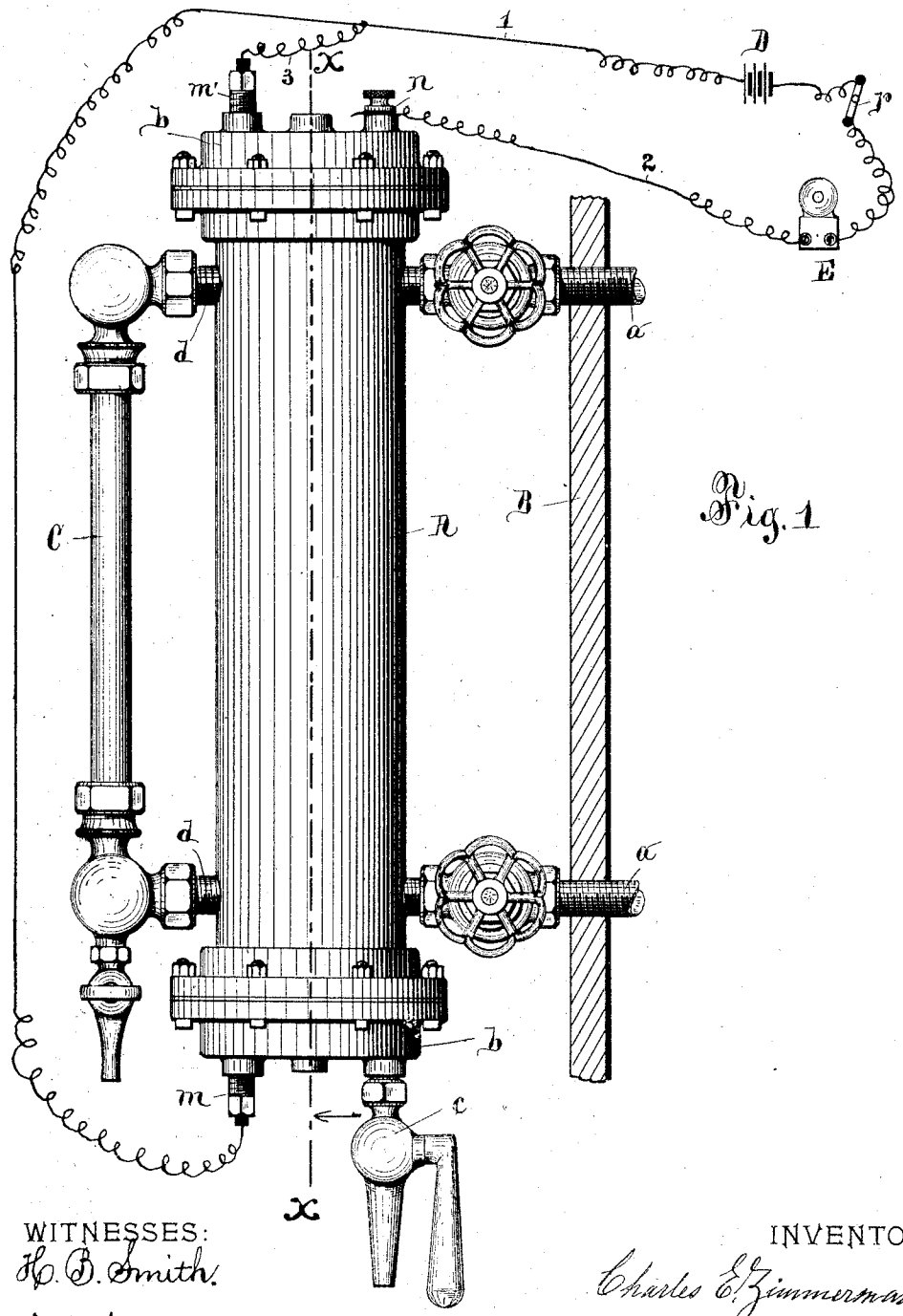


Fig. 1.

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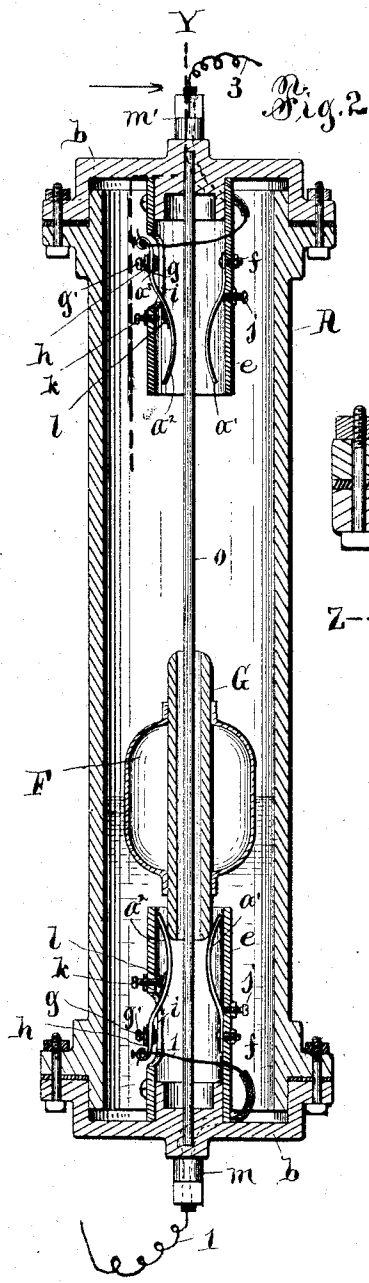


Fig. 2.

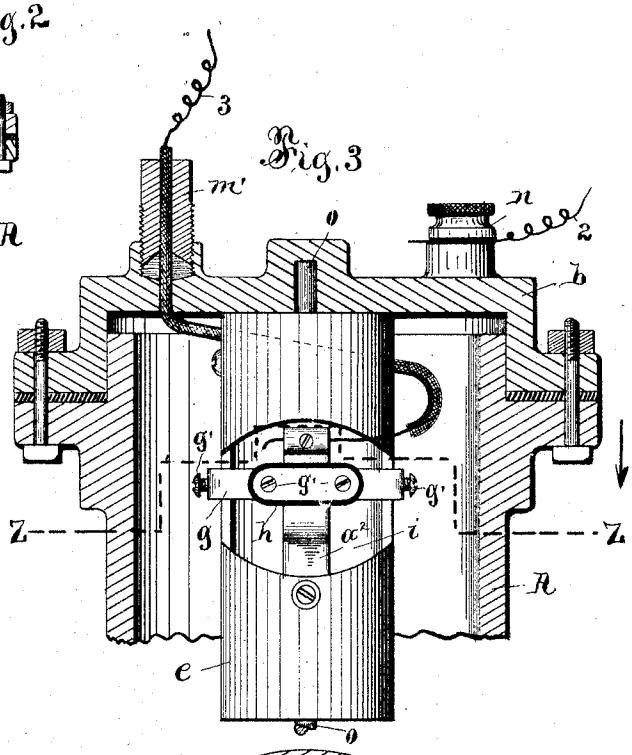


Fig. 3.

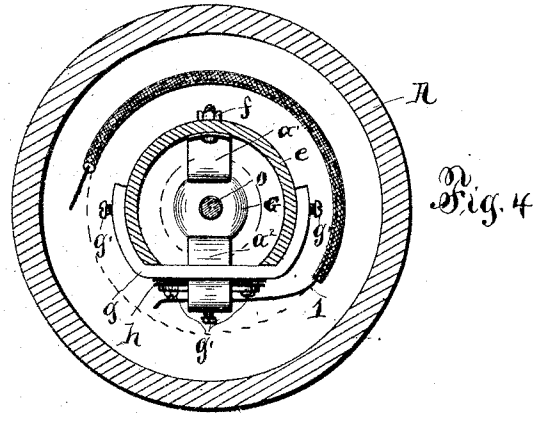


Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES E. ZIMMERMANN, OF SYRACUSE, NEW YORK.

HIGH AND LOW WATER ALARM.

SPECIFICATION forming part of Letters Patent No. 666,451, dated January 22, 1901.

Application filed April 6, 1900. Serial No. 11,808. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. ZIMMERMANN, a citizen of the United States, and a resident of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in High and Low Water Alarms, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to signaling devices employed in connection with engine-boilers, tanks, &c., for the purpose of giving an alarm when the water-line has either risen or dropped to a predetermined mark, which devices are commonly known as "high and low water alarms."

The invention has special reference to the class of high and low water alarms in which an electrically-operated bell is used and the electric circuit is controlled by a float.

The object of the present invention is to provide a signaling device which can be easily attached to any boiler or tank and which shall be simple and inexpensive and at the same time efficient in its operation.

To that end the invention consists in the novel construction and arrangement of parts, as hereinafter fully described, and set forth in the claims.

In the accompanying drawings, Figure 1 is a side view of the chamber and the electric signal connected thereto. Fig. 2 is a vertical longitudinal section on line X X in Fig. 1. Fig. 3 is an enlarged vertical longitudinal section on line Y Y in Fig. 2, and Fig. 4 is a transverse section on line Z Z in Fig. 3.

Referring to the drawings, A represents the upright metallic chamber, which is attached to and communicates with the boiler or tank B by means of pipes a a at points above and below the water-line. Said chamber is provided with removable caps or heads b b for the purpose of cleaning the interior of the chamber and making repairs to the parts therein when required, and to the lower cap is attached a valve c for drawing off the water.

C denotes the usual water-glass, which communicates with the chamber by means of pipes d d.

D represents electric batteries, from which extend the wires 1 and 2, and in the electric circuit is included a bell E.

The chamber A forms part of the electric circuit, and in each end of the chamber is located a pair of terminals a' a^2 of the circuit. Each pair of terminals is arranged diametrically opposite and is disposed within and secured to a tube e. Said tubes are arranged centrally and vertically in the chamber and are attached to the caps or heads b b and are thereby in the electric circuit, and they have their inner ends open. The terminals consist of yielding or spring fingers, and the terminals a' a' are secured to the inner sides of the tubes by means of screws or bolts f f and are in contact therewith. The other terminals a^2 a^2 are insulated from the tubes, as indicated at a^3, and are secured to the outer sides of the tubes by means of clamping-bands g g and screws g' g', and between the bands and terminal fingers a^2 a^2 are interposed insulating-plates h h.

The tubes e e are provided with openings i i, so as to permit the terminal fingers a^2 a^2 to extend into the tube, so as to face the terminal fingers a' a'.

The terminal fingers a' a' are provided with adjusting-screws j j, and the terminal fingers a^2 a^2 are provided with similar adjusting-screws k k, and between said latter fingers and screws k k are provided insulating-pieces l l.

The wire 1 from the electric battery enters the lower cap of the chamber A by means of a screw-threaded plug or binding-post m and is connected to the lower terminal a^2, and by means of a wire 3, passing through a like plug or binding-post m', the upper terminal a^2 is connected to the main wire 1. The other wire 2 from the battery is connected to a binding-post n, provided on the upper cap b. The wire 2 serves for the connection of both the lower and upper terminals a' a' as the current is conducted through the metallic chamber A, its caps or heads, and the tubes e e.

F is the float, located in the chamber A and consisting of the usual hollow air-tight body. Said float is provided with central vertical sleeve G, the ends of which are adapted to enter the aforesaid tubes e e and pass between the terminals a' a^2 and in contact therewith, and thus constitute circuit-closers, as clearly shown in Fig. 2 of the drawings.

o is a vertical guide-rod for the float which extends through the sleeve G and is secured

at its ends to the caps or heads *b b* to insure the entrance of the ends of the sleeve into its tubes and between the terminals a' a^2 to close the circuit.

I prefer to provide the electric circuit with a switch, as indicated at *p* in Fig. 1, in order to break the circuit when desired.

It will be noted that by reason of the ends of the sleeve G rubbing on the terminals all sediment, &c., will be removed therefrom, thus maintaining the same bright and clean to insure a good electrical connection.

What I claim is—

1. A high and low water alarm comprising a chamber communicating with the boiler or tank at points above and below the water-line, a normally open electric circuit including an alarm-signal, and a pair of terminals in each end of said chamber, a guide-rod extending centrally and vertically through the chamber, a sleeve sliding on said rod and adapted to engage said pairs of terminals to close the circuit, and a float in said chamber moving said sleeve substantially as described.

2. A high and low water alarm comprising a chamber communicating with the boiler or tank at points above and below the water-line, a normally open electric circuit including an alarm-signal, and having a pair of terminals in each end of the chamber, a float in said chamber, a sleeve carried on said float and constituting a circuit-closer, and a vertical guide-rod for said sleeve substantially as described.

3. A high and low water alarm comprising a chamber communicating with the boiler or tank at points above and below the water-line, a normally open electric circuit including an alarm-signal and having a pair of yielding terminals in each end of the chamber, each pair being disposed diametrically opposite, vertical tubular supports for said terminals, a float in said chamber, circuit-closers carried on said float, and a vertical guide for said float for the purpose set forth.

4. A high and low water alarm comprising a chamber communicating with the boiler or tank at points above and below the water-line, vertically-disposed tubes secured one in each end of the chamber, a normally open electric circuit including an alarm-signal and having a pair of yielding terminals supported in each of said tubes, vertically-movable circuit-closers adapted to enter said tubes, a vertical guide for said circuit-closers, and a float in said chamber and actuating the circuit-closers substantially as described.

5. A high and low water alarm comprising a normally open electric circuit including an alarm-signal, a metallic chamber forming part of the circuit, a float in said chamber, a pair of electric terminals in each end of the chamber, one of the terminals of each pair being electrically connected to the chamber and the other insulated therefrom, a vertical guide-rod extending through the chamber, and a sleeve carried on the aforesaid float and sliding on said guide-rod and constituting a circuit-closer substantially as described.

6. A high and low water alarm comprising a normally open electric circuit including an alarm-signal, an upright metallic chamber forming part of the circuit, a float in said chamber, tubes secured vertically one in each end of the chamber and electrically connected therewith, a pair of terminals supported in each tube, one of the terminals of each pair being connected directly to the tube and the other insulated therefrom, and circuit-closers carried on the top and bottom of the float substantially as described.

7. A high and low water alarm comprising a normally open electric circuit including an alarm-signal, an upright metallic chamber forming part of the circuit and provided with removable heads or caps, a vertically and centrally disposed tube secured to each head and in electric circuit, a pair of electric terminals located in each tube, one of each pair insulated from the tube and the other in electric contact therewith, a circuit-closer adapted to enter each tube, and a float in said chamber moving said circuit-closers substantially as described.

8. A high and low water alarm comprising a normally open electric circuit including an alarm-signal, an upright metallic chamber forming part of the circuit and provided in each end with a vertically-disposed tube, also in circuit, a pair of electric terminals supported within each tube and arranged diametrically opposite, one terminal of each pair being connected directly to the tube and the other insulated therefrom, a rod extending vertically through the chamber and passing between said pairs of terminals, and a float provided with a central vertical sleeve sliding on said rod and guided thereby, the ends of said sleeve adapted to engage said terminals to close the circuit substantially as described.

9. A high and low water alarm comprising a normally open electric circuit including an alarm-signal, an upright metallic chamber forming part of the circuit and provided with removable heads or caps, a centrally and vertically disposed tube secured to each head and in electric circuit, a pair of yielding electric terminals located in each tube, one of each pair insulated from the tube and the other in electric contact therewith, a rod extending centrally and vertically through the chamber and secured to said heads and passing through the aforesaid tubes, a float sliding on said rod, and circuit-closers projecting from the top and bottom respectively of the float and adapted to enter said tubes substantially as described.

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