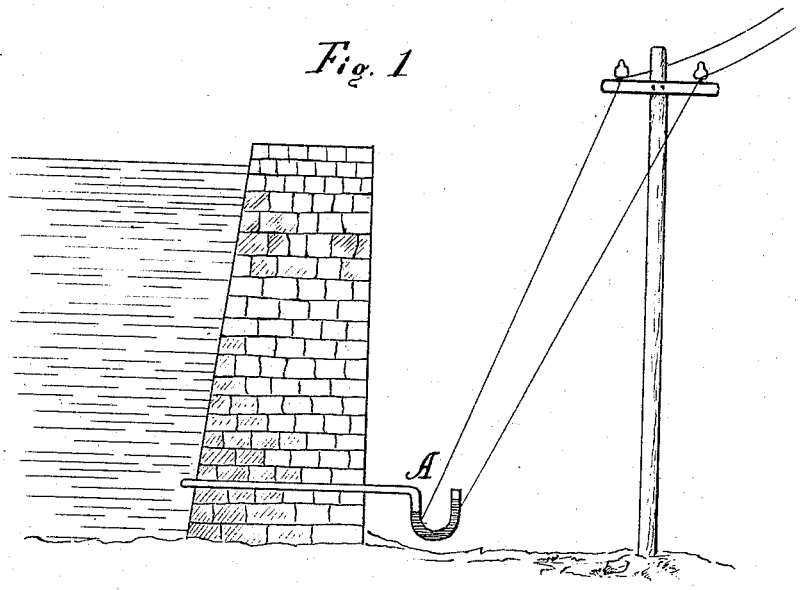
2 Sheets—Sheet 1.

C. E. BUELL.

PRESSURE ALARM AND SIGNAL TELEGRAPH.

No. 169,954. Patented Nov. 16, 1875.

Fig. 1



Witnesses
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2 Sheets—Sheet 2.

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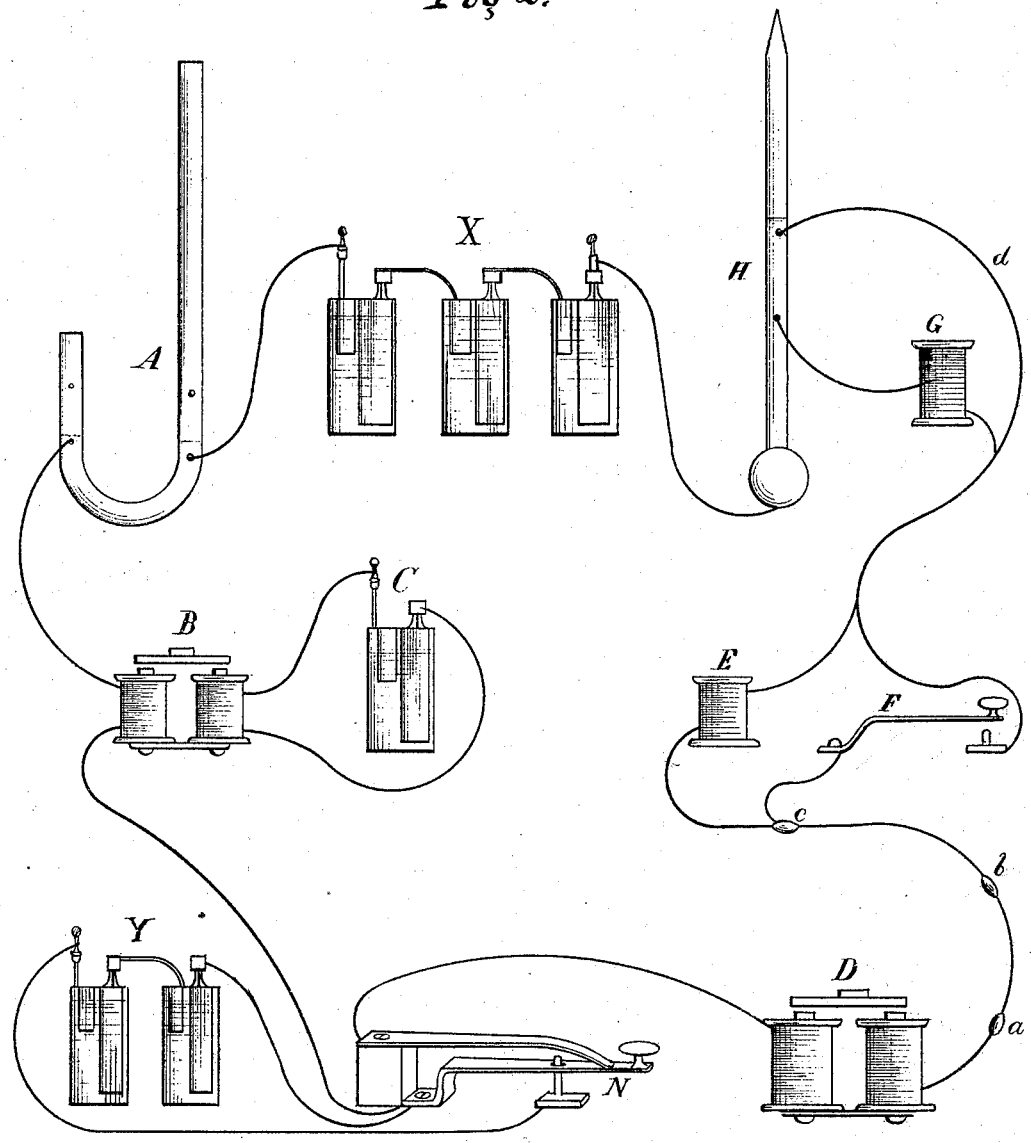
PRESSURE ALARM AND SIGNAL TELEGRAPH.

No. 169,954. Patented Nov. 16, 1875.

Fig 2.



WITNESSES
Roger M Sherman
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UNITED STATES PATENT OFFICE.

CHARLES E. BUELL, OF NEW HAVEN, CONN., ASSIGNOR OF ONE-HALF HIS RIGHT TO GEORGE C. BUELL, OF WEST SPRINGFIELD, MASS.

IMPROVEMENT IN PRESSURE, ALARM, AND SIGNAL TELEGRAPHS.

Specification forming part of Letters Patent No. **169,954**, dated November 16, 1875; application filed August 5, 1874.

To all whom it may concern:

Be it known that I, CHARLES E. BUELL, of the city and county of New Haven, State of Connecticut, have invented certain new and useful improvements in the transmission upon one and the same normally-closed telegraphic circuit of both messages and automatic alarms, in such a manner that the messages do not interfere with the transmission of the alarms, of which the following is a specification:

The object of my invention is to add to alarm-telegraphs a communicating or message telegraph, or, more properly, to unite both kinds of telegraphs in one and the same normally-closed telegraphic circuit, or, when a message-telegraph is not wanted, to unite two systems of alarms in one and the same normally-closed telegraphic circuit.

In the drawings, Figure 1 shows the application of the water-barometer to a reservoir or dam; and Fig. 2 gives a diagram of a telegraphic circuit, in which the elements, hereinafter referred to by letters and described, are situated.

My invention relates to the application to a reservoir of water of the means for sounding an alarm upon the variance of the pressure of the water; and consists in the application, to a circuit containing a water-barometer and thermostatic arrangements, of means whereby the circuit can be used for either alarms or signal purposes, without interfering with the circuit, by means of devices by which the tension can be varied, as is hereinafter more fully set forth.

The mercurial electric-circuit controller, (shown in Fig. 1,) or water-barometer A, consists of a bent tube of glass or other insulating material, having its bent end downward, and having the circuit-wires penetrating to mercury placed in the bent end. One arm of the barometer extends through the dam to the water of a reservoir, with the mercury so arranged as to be affected by the pressure of the water, and to break the circuit in case of the breaking away of the dam. It can also be arranged in the hold of a vessel in such a manner as to break the circuit in case of leakage.

The differential magnet B is a magnet with one coil inserted in the main circuit and the other coil in the local circuit, so arranged as to neutralize each other and leave the magnet open. The electro-magnet D, the local battery C, the key F, the coils of resistance E and G, the key N, and the auxiliary battery Y are all well-known elements to those skilled in the art, and need no description.

The soldered joints *a b c* are breaks in the circuit-wire, connected together by a metallic alloy, or held in connection by a fusible material that melts between 110° and 160° Fahrenheit. The thermometer H is made in the usual way, having the circuit-wires penetrating through its sides to the mercury within, and also having the shunting wire *d*.

By the use of two barometers like A, having wires passing from the mercury of one to the mercury of the other, a series of alarms or indications may be had. The soldered joints are made at suitable intervals in the circuit-wire passing through a building in which it is desired to locate a fire alarm, and in case either of the joints becomes heated between 150° or 160° Fahrenheit, it will melt, and thus break the circuit, and an alarm will be given by the action of the electro-magnet D upon any suitable apparatus which may be used to announce or record the same.

The transmission of messages upon this normally-closed circuit without interfering with the alarms can be made by depressing the key F, and thus shunting the resistance-coil E, and thereby increasing the electric force in the circuit. This increased force closes the differential magnet B, held neutralized by the battery C.

The key N and the auxiliary battery Y is another mode of increasing the electric force of the circuit and effecting the same result.

The interposition of resistance can be used as a reduction of the electric force in the circuit, and would have the effect to close the differential magnet B by the then superior force of the battery C. When the earth is used to complete the circuit, a bridge or differential magnet can be used at terminal stations—a division of the main battery being substituted for the local. The thermometer H can be placed in any place where it is desired to indicate the variations of temperature. When the mercury falls below the point where the

shunting-wire *d* is inserted, the wire *d* is withdrawn from the circuit, and the coil of resistance G is interposed in the circuit, and by the increased resistance closes the differential magnet B.

By inserting other wires and adding coils of varied resistance, the thermometer H can be made to announce or indicate different degrees of temperature upon a differential magnet, or other differential apparatus, or even upon an ordinary galvanometer.

I claim as my invention—

1. The combination, with a confined body of water, of the mercurial electric-circuit controller, described herein as a water-barometer, an electric circuit, and a suitable alarm, substantially as set forth.

2. The combination, with a differential relay or magnet, of a constantly-closed electric circuit through one coil thereof, a normally-closed signaling electric circuit, including the other coil thereof, and means, included in the latter circuit, for signaling by varying the tension or electro-motive force of the current therein, substantially as set forth.

3. The combination, in one main and normally-closed electric circuit, of the water-barometer, thermostat, the differential magnet, and means for signaling, independently of the water-barometer, by varying the tension of the closed circuit, substantially as described.

4. The combination, with one main and normally-closed electric circuit, of the water-barometer and the fusible-alloy joints, whereby the circuit may be completely broken open by a variation of the pressure of water, or a dangerous rise of temperature, substantially as set forth.

CHARLES E. BUELL.

Witnesses:

GEORGE TERRY,

SYLVANUS BUTLER.