

(No Model.)

A. C. McCONNEL.
ELECTRICAL HIGH AND LOW WATER ALARM.

No. 469,424.

Patented Feb. 23, 1892.

Fig. 1.

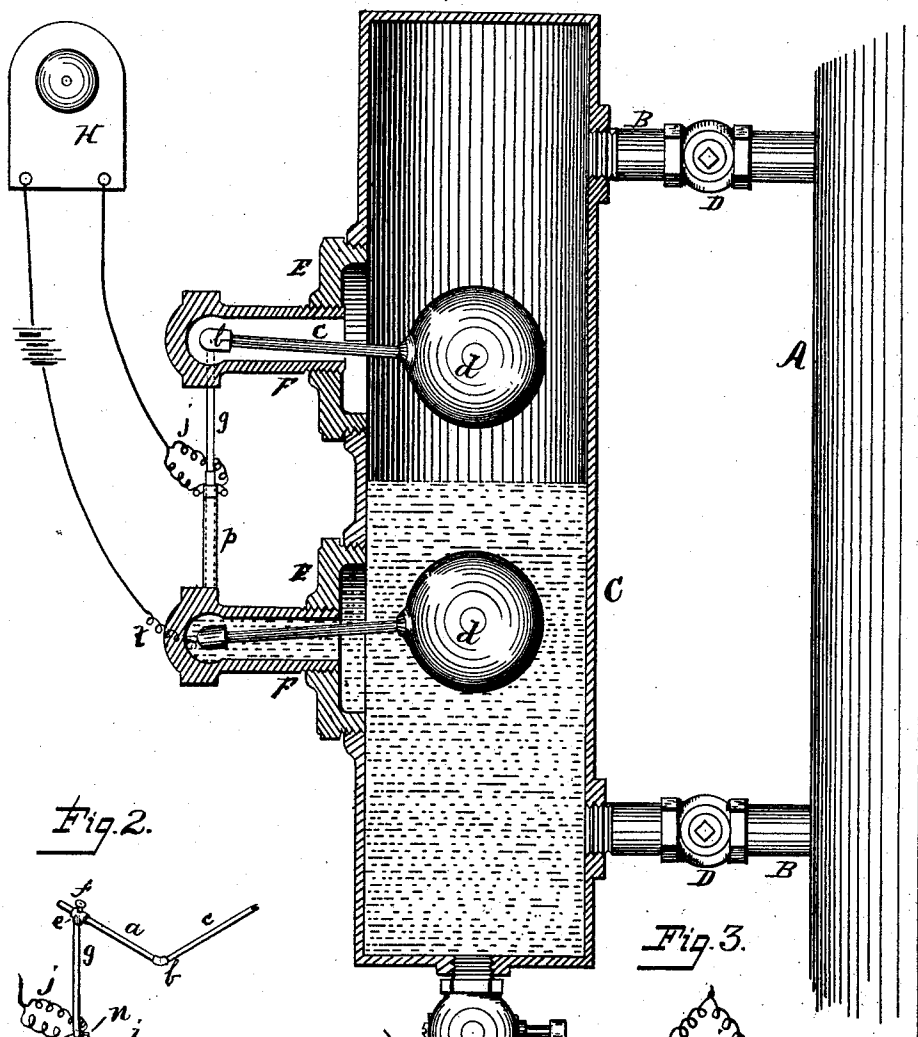


Fig. 2.

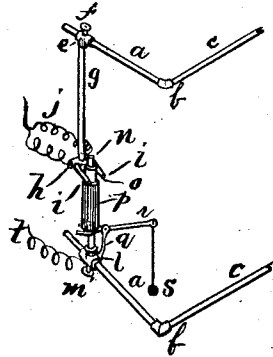


Fig. 3.

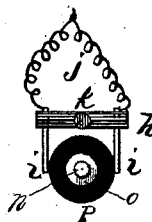
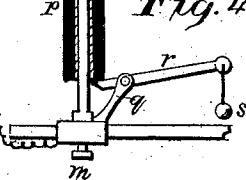


Fig. 4.



Witnesses,

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ALCINUS C. MCCONNEL, OF ALLEGHENY, PENNSYLVANIA.

ELECTRICAL HIGH AND LOW WATER ALARM.

SPECIFICATION forming part of Letters Patent No. 469,424, dated February 23, 1892.

Application filed December 2, 1890. Serial No. 373,381. (No model.)

To all whom it may concern:

Be it known that I, ALCINUS C. MCCONNEL, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electrical High and Low Water Alarms; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention has for its object to provide an electrical high and low water alarm for steam-generators and to be operated when the water in the steam-generator rises above or falls below a given point, all of which is accomplished by an electrical apparatus provided with an alarm-bell or other suitable signaling device located at any desired point outside of said steam-generator, such device being caused to make and break an electrical circuit by the rising and falling of one or more suitable floats arranged in the steam-generator or in a water-chamber connected thereto by means of suitable pipes.

The invention I have made will be readily understood from the following description.

In the accompanying drawings, which form part of my specification, Figure 1 represents a transverse vertical section of my improved electrical high and low water alarm; Figs. 2 and 3, detached detailed portions, respectively, the latter being somewhat enlarged; and Fig. 4, an enlarged vertical section of insulating mechanism.

To put my invention into practice I provide a steam-generator A, of any suitable description, and connect thereto by means of one or more pipes B an outside cylindrical chamber C, having communication with said steam-generator by means of the pipes aforesaid, each of which is provided with a suitable stop-cock D, whereby they may be opened and closed to admit water and steam or exclude the same from the outside chamber, into the opposite side of which, but nearer the middle of the same, are screwed into the wall or shell of the chamber two large-sized annular rings or plugs E, and through the center of each plug is also screwed an outwardly-projecting tube F of suitable length, the outward end of each plug being closed or made steam-tight. Projecting laterally and at right angle from

each of said tubes is a short pipe cast on, screwed in, or otherwise affixed to the same, and through the center of this short arm and in the direction of its length is a rock-shaft *a*, its outer end projecting beyond its bearing in the tube and its inner end being connected by means of an elbow-socket *b* or other suitable means to a long rod *c*, that extends longitudinally through a longer tube F into and about the middle of the chamber C, where it is provided with a hollow globular air-tight vessel or float *d* of suitable size and character adapted to be acted upon by the rise or fall of a body of water within said chamber or steam-generator as the case may be. The outer end of the small tubular projecting arm through which the rock-shaft passes is provided with a screw-cap, within which is placed suitable packing to prevent leakage of steam or water around the rock-shaft at that point. The outer end of the upper rock-shaft is fitted with a tubular T *e*, made adjustable thereon by means of a pinch-screw *f*. This tubular T has affixed thereto a downwardly-extending short arm *g*, the lower extremity of which consists of a two-pronged fork *h*, each tang *i* of which is connected by means of a wire *j* to one element of an electrical battery, and each tang is also electrically separated from the other and from the rod supporting them by means of a suitable insulating material *k*. The lower rock-shaft *a* is also provided with a tubular T *l*, made adjustable therein by means of a pinch-screw *m*, and connected with this tubular T is a short vertical rod *n*, around which is placed a loosely-fitting sleeve *o*, adapted to slide up and down thereon. The upper end of this metallic sleeve is left bare and the lower portion *p* being incased in a covering of hard paper, rubber, or any other non-conductor of electricity. Extending outward from this lower tubular T is an upwardly-projecting short arm *q*, having pivoted thereon in a lever *r*, in the outer end of which is suspended a small weight *s*, which is slightly overcome by the preponderance of the sliding tubular sleeve on the vertical rod attached to the T of the lower rock-shaft, and this vertical rod is connected by means of a wire *t* with one element of an electrical battery, wires *t* and *j* serving to complete an electrical circuit through one or more alarm-bells H

or other signaling device arranged at any convenient place.

The device having been constructed substantially as described, its use and operation are as follows: Water having risen to its usual height in the generator A finds its level in chamber C, and, as shown in Fig. 1, exerts a buoyant force upon the lower float *d* of less specific gravity, retaining it in its extreme uppermost position rod *c*, to which it is connected, bearing hard against the upper inner edge of its tube F, which latter serves as a stop therefor. The relative position of lower rod *c* and rod *n*, located at outer end of the intermediate rock-shaft, is such that when the former is in its uppermost position, as shown, the latter maintains a true vertical position, the proper angle between the two being obtained by the aid of adjustable tubular T *l* and its pinch-screw *m*, while at the same time upper float *d*, being of greater specific gravity than the air or steam in which it is suspended above the water-line, rests normally in its lowest position, as shown, with rod *c* resting upon the lower inner edge of its tube F. Through the medium of tubular T *e* and its pinch-screw *f* the inclination of upper rod *c* with relation to descending rod *g* is made such that when the former is in the position shown and described the latter is plumb. Consequently at this stage of the water tangs *i* of fork *h* on lower extremity of descending rod *g* straddle without touching the upper end of rod *n* and the electrical circuit is broken. When, however, water in generator A begins to fall below a safe point, lower float *d* descends with it, and acting through its rod *c* and rock-shaft *a* tilts or inclines rod *n* from its vertical position sufficiently for the upper end of conducting-sleeve *o* to engage the inner tang *i* of fork *h*, thus completing the electrical circuit and sounding the alarm. On the other hand, if generator A is pumped too full the water ascending raises upper float *d*, which, acting in like manner to the low-water float through rod *c* and rock-shaft *a*, throws descending rod *g* out of plumb sufficiently for the outer tang *i* of fork *h* on lower end thereof to come in contact with the upper end of sleeve *o*, completing the circuit and announcing a dangerous height of water. When it is desired to cut off the electrical alarm while refilling the generator, repairing the apparatus, or for any other reason, a closed circuit is rendered impossible, as follows: By a downward movement of lever *r* sleeve *o*, sliding on rod *n*, may be elevated until its lower insulated portion *p* passes between and above tangs *i* of fork *h*, in which position it is retained by friction of the tangs upon its opposite sides, thus positively insulating said fork from rod *n* until the parts are forcibly replaced.

Having thus fully described my invention, what I claim is—

1. In a steam-generator, the combination of a float, a rock-shaft operated by the rise or fall thereof, an electric-circuit closer moving with the rock-shaft, to which it is secured, and when deflected from a vertical position adapted to communicate with both poles of a battery, an electric signal operated on a closed circuit, and a cylindrical insulator sliding on the circuit-closer adapted to be interposed between the points of contact.

2. In a steam-generator, the combination of a float, a rock-shaft operated by the rise or fall thereof, an electric circuit in which there is a signal, a circuit-closer moving with the shaft, on which it is adjustably secured, a cylindrical insulator surrounding lower portion of the circuit-closer, and a lever fulcrumed on the rock-shaft serving to elevate said insulator, interposing it between the points of contact.

3. In a steam-generator, the combination of a float, a rock-shaft operated by the rise or fall thereof, an electric circuit in which there is a signal, a vertical circuit-closer adjustably secured to the shaft by a hollow T-coupling, a cylindrical insulator sliding on the circuit-closer, and a lever fulcrumed on the T-coupling for elevating said insulator and interposing it between the points of contact.

4. In a steam-generator, the combination of high and low water alarm floats, a rock-shaft operated by the rise or fall of each, an electric-circuit closer secured to and moving with each rock-shaft, one of which descending terminates in a right-angular forked projection and the other ascending is straddled thereby, a cylindrical insulator surrounding and sliding on the latter, adapted to be interposed between the tangs of said forked projection, and an electric signal operated on a closed circuit.

5. In a steam-generator, the combination of high and low water alarm floats contained within said generator or an auxiliary communicating chamber, outwardly-projecting tubes communicating with the generator near the high and low water mark, rods passing through said tubes, each connected at one end to a float and at the other with a rock-shaft, suitable packing for the side of said tubes where penetrated by the rock-shafts, downwardly and upwardly extending electric-circuit closers adjustably secured to the upper and lower rock-shafts, respectively, the former terminating in an insulated forked end and adapted to engage the latter when either is deflected from a plumb position by rise or fall of the floats, and an electric signal operated only on a closed circuit.

In testimony whereof I have hereunto set my hand this 30th day of June, A. D. 1890.

A. C. MCCONNEL.

Witnesses:

A. C. JOHNSTON,
GEO. H. HARVEY.