

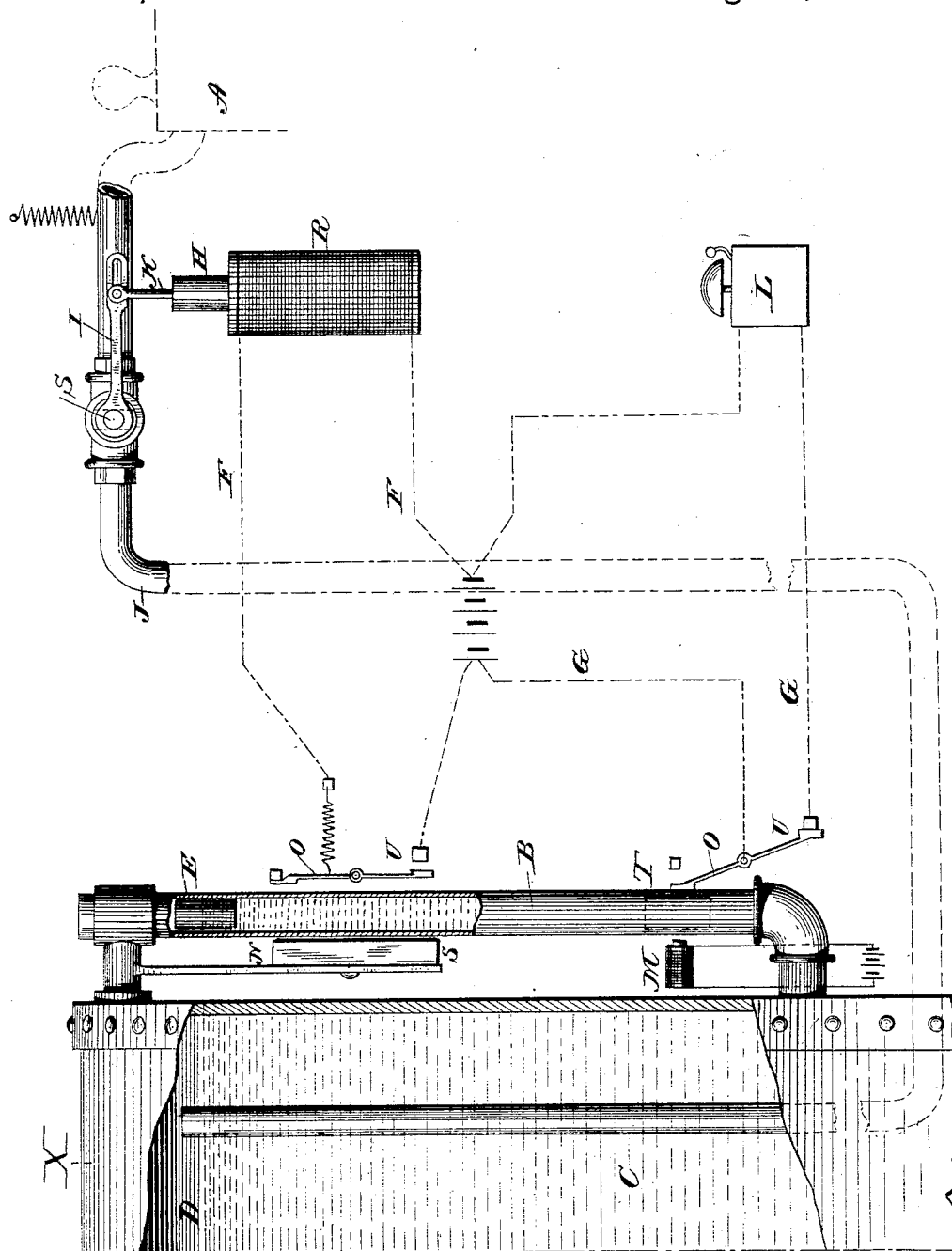
(No Model.)

J. J. GHEGAN.

AUTOMATIC ELECTRIC LIQUID LEVEL INDICATOR AND CONTROLLER.

No. 347,589.

Patented Aug. 17, 1886.



WITNESSES

WITNESSES
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INVENTOR

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UNITED STATES PATENT OFFICE.

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AUTOMATIC ELECTRIC LIQUID-LEVEL INDICATOR AND CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 347,589, dated August 17, 1886.

Application filed March 15, 1886. Serial No. 195,310. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. GHEGAN, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Automatic Electric Liquid-Level Indicators and Controllers Particularly Adapted to Steam-Boiler Water-Gages, of which the following is a complete, clear, and exact description, setting forth in general and in detail my invention.

This invention relates to an electrical device for automatically retaining water in a steam-boiler or other liquid-receptacle at an approximately-constant level, and to an electric alarm which will give warning when the liquid reaches a predetermined level.

My invention consists, chiefly, of an automatic liquid-level indicator in which a float is employed provided with magnetic material, in combination with a magnetic circuit-controlling device.

It also consists of subordinate features used in combination with the above device.

My invention as applied to steam-boilers, with the usual attachments, is illustrated in the accompanying drawings, in which the tube containing the float and the boiler are shown partly in cross-section. The float is represented as resting upon the water within the tube and above the magnetic circuit-controlling device. Dotted lines indicate the position occupied by the float when it causes the controlling devices to operate.

The device illustrated embodying my invention consists of a steam-boiler, X, and pump A, the usual water-gage tube, B, communicating with the water C and steam B. This tube may be made of brass or other non-magnetic material.

E represents a float, composed of or provided with magnetic material, and adapted to rest upon the surface of the water within the tube B.

F and G are electric circuits. The circuit F contains an electro-magnetic device, whose core H has an operative connection with the valve-lever I upon the pipe J, leading to the pump A, by means of the connecting-piece K. The circuit G includes an electric signal, L, and each circuit is provided with an automatic magnetic controlling device, whereby it is opened and closed. These controlling devices consist of a

movable piece of magnetic material, O, placed adjacent to the tube B, and provided with contact-points U, and a spring, V, or other suitable retractile device, and a permanent magnet, N S, or an electro-magnet, M, also adjacent to but on a different side of the tube. When by change of level of the liquid within the tube the float is caused to approach the magnetic circuit-controller, it increases the attractive power between the permanent magnet and the movable piece O of magnetic material, which, by proper adjustment of the retractile device V, produces motion in said movable piece, and when by the same cause the float recedes from the magnetic circuit-controller the attractive power between the parts thereof returns to its normal state, which is less than that of the retractile device. The movable piece of magnetic material is thereupon withdrawn from the position occupied when the greater force acted upon it. It is obvious that the motion thus given to the circuit-controller can be used for opening or closing electric circuits containing bells or other electric devices.

By reference to the drawings it will be seen that when the circuit F becomes closed by the change of the level of the liquid bringing the float in proximity to the circuit-controller of said circuit, the electro-magnet R will open the valve S, and the pump A will thereupon operate and pump more water into the boiler, which will cause the float to rise and recede from the magnetic circuit, and the circuit-controller will thereupon assume its normal position. If by any accident any part of the apparatus gets out of order and the water sinks to a very low level, then a similar operation will take place at the device located at T, but instead of setting the pump working (which may be the part out of order) it closes a circuit which contains an electric bell, L, or other signal, in order to give warning that something is wrong.

The invention is not limited to the precise construction herein described, as it is evident that many modifications may be made therein without departing from the spirit of the invention—as, for instance, an electro-magnet, M, in a constantly-closed circuit may be substituted for the permanent one.

Having now stated the title, object, and nature of the said invention, its practical reali-

zation by reference to the accompanying drawings, and having particularly ascertained the manner in which the same operates to accomplish the said object, what I claim as new, and wish to secure by Letters Patent, is—

- 5 1. In a liquid-level-indicating device, a float provided with magnetic material, in combination with a magnetic circuit-controlling device, substantially as described.
- 10 2. In a liquid-level indicator, the combination of a float in said indicator, an automatic circuit-controlling device influenced by said float, and consisting of a pivoted magnetic bar on one side of the float and provided with circuit-closing contact-points and a permanent
15 magnet upon the other side of the float, substantially as and for the purpose described.
3. The combination, with electric controlling and alarm devices, of an automatic-operating device consisting of a float provided with magnetic material, and adjacent devices consisting of a permanent magnet and a movable magnetic bar, and having operating connection with the circuit which contains said electric controlling and alarm devices, substantially
20 as described.
4. In a liquid-level indicator, the combination of a tube connected with the main liquid-receptacle, a float of magnetic material in said
30 tube, an electric circuit containing suitable translating devices, and a circuit-closer in said circuit consisting of a pivoted magnetic bar having a suitable retractile device, substantially as described.
- 35 5. In a liquid-level indicator, the combination of a float in the indicator carrying magnetic material, an electric circuit containing an electric signal, and an automatic circuit-con-

trolling device under the influence of said float, and consisting of a pivoted magnetic bar, with
40 suitable circuit-closing contact-points upon one side of the float and a permanent magnet upon the other side of the float, said float being between the circuit-closer and said permanent magnet when the water reaches the
45 proper level, substantially as described.

6. In a liquid-level indicator, the combination of a pump, an indicator-tube connected with the liquid-receptacle, a float provided with magnetic material in said indicator, two
50 electric circuits, the first containing an electro-magnetic device whose core has an operating connection with a valve in a pipe leading to said pump, and the second containing an electric signal, and two automatic magnetic circuit-controlling devices under the influence of
55 said float and located in said circuit, substantially as described.

7. The combination, in a liquid-level indicator, of a steam-boiler, X, pump A, the usual
60 water-gage tube, B, communicating with the water and steam, a float, E, provided with magnetic material, circuit-controlling devices, such as described, and electric circuits, one containing an electro-magnetic device having
65 a core which operates a valve in the pipe leading from the pump to the boiler, and the other containing an electric signal, all arranged and adapted to operate, substantially as described.

In testimony whereof I have hereunto signed
70 my name, in the presence of two subscribing witnesses, this 6th day of March, 1886.

JOHN J. GHEGAN.

Witnesses:

EDWARD P. THOMPSON,
PETER B. VERMILYA.