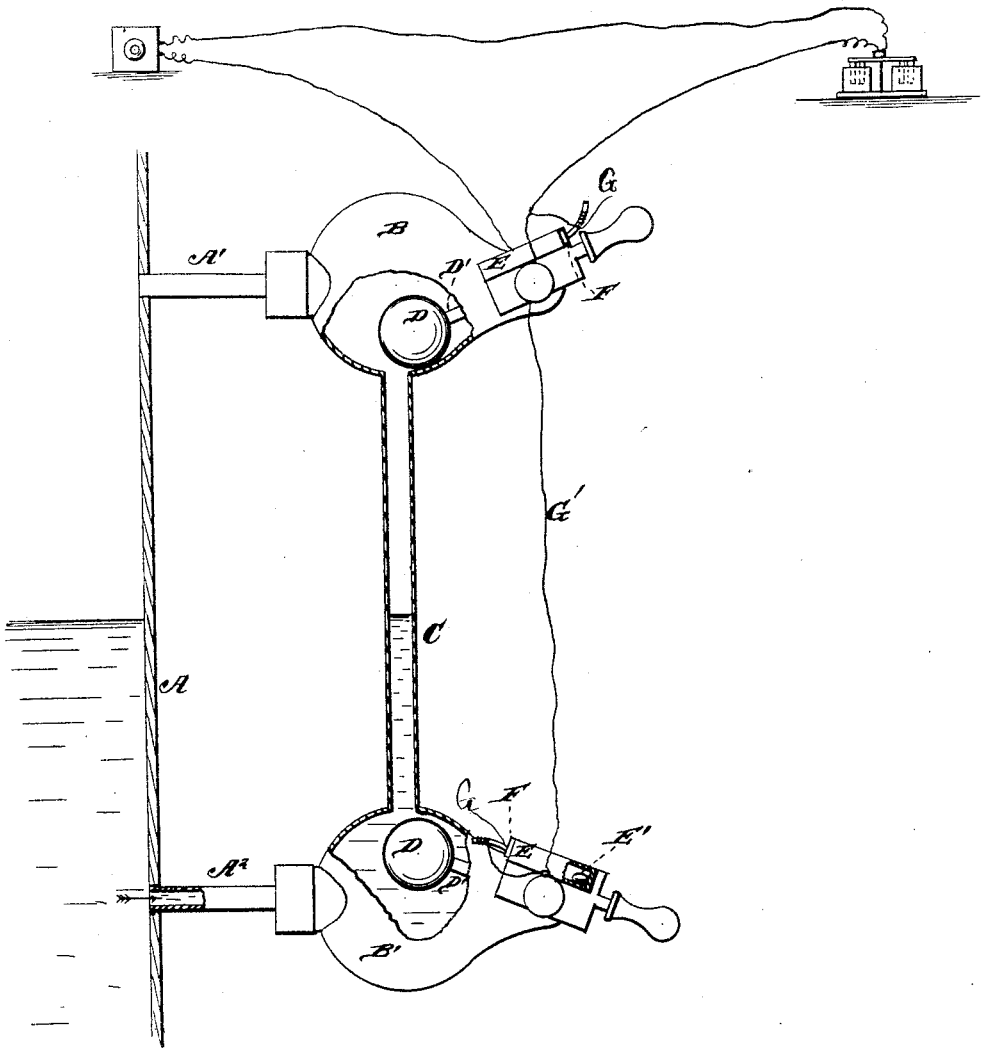
P. GRIMM, W. I. FANCHER & H. K. ROBERTS.

Electric-Alarm for Steam-Boilers.

No. 211,008. Patented Dec. 17, 1878.



WITNESSES

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UNITED STATES PATENT OFFICE.

PAUL GRIMM, WARD I. FANCHER, AND HAMILTON K. ROBERTS, OF GLEN COVE, NEW YORK.

IMPROVEMENT IN ELECTRIC ALARMS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **211,008**, dated December 17, 1878; application filed October 19, 1878.

To all whom it may concern:

Be it known that we, PAUL GRIMM, WARD I. FANCHER, and HAMILTON K. ROBERTS, of Glen Cove, in the county of Queens and State of New York, have invented a new and valuable Improvement in Alarms for Steam-Boilers; and we do hereby declare that thefollowing is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

The figure of the drawings is a representation of a section of our alarm for steam-boilers, showing the same applied to a boiler.

Our invention relates to steam-boilers and the like, the object being to give an electric alarm at high and low water marks; and the novelty consists in the construction of parts, as will be more fully hereinafter set forth.

Our invention is designed to give warning of the state of the water-level in steam-boilers; but besides giving warning to the immediate fireman of such water condition it is so adapted that the alarm may be given at any distance from the boiler, thus affording an additional safeguard against explosion.

In carrying out our invention we employ two hollow castings, one at high and one at low water mark, connected to each other by a vertical pipe, and each connected to the boiler by horizontal branches. Within these castings are floats on rigid pivoted arms, which carry, outside the casting, tubes carrying mercury, the tubes having a metal plug at one end and a non-conducting plug at the other, such latter plug having a copper wire passing through it. The mercury runs downward when the tube is tipped insulated-end down, and makes an electric connection between the wire and tube. The boiler is filled with water until the water reaches and fills the lower casting and connecting-pipe, where it maintains the same level as in the boiler. By this the float in the lower casting is raised, and the mercury-tube on the outside inclined in such a way that the mercury will occupy the opposite end from the insulated wire, and the electric circuit remains open; but if the water should fall so as to let the float come down, the mercury will gravitate to the other end of the tube and establish the circuit, which will sound the alarm wherever it may be placed. A similar result will accrue if the water rises high enough in the boiler to fill the upper casting and raise the float, only that in such case the electric circuit is made by raising the float and gives the alarm, and the circuit is broken when the float falls. This latter result occurs when too much water is in the boiler.

The battery and alarm are of any ordinary proper construction, and are not shown.

Referring to the drawings, A represents the boiler; A^1, the upper branch pipe, and A^2 the lower one, both leading from the boiler, respectively, to the upper casting, B, and lower casting, B′, which are connected by a vertical pipe, C. D D represent metal floats on pivoted arms D′, secured to a shaft journaled within the castings in any suitable manner. E E represent metal tubes, carrying a portion of quicksilver, E′, having each at one end, but in opposite or reverse relation, an insulated wire plug, F, the wire designated at G. G′ represents a wire, which connects the two.

The arrangement of these wires may be of any suitable kind so as to make and break the electric circuit, as described.

What we claim as new, and desire to secure by Letters Patent, is—

1. The tubes E E, carrying mercury E′, and having non-conducting plug F, carrying insulated wires G, in combination with floats D and steam-boiler A, as specified.

2. The tilting tubes E, having means for making and breaking the electric circuit, and actuated by floats D of a steam-boiler, as specified.

In testimony that we claim the above we have hereunto subscribed our names in the presence of two witnesses.

PAUL GRIMM.
WARD I. FANCHER.
HAMILTON K. ROBERTS.

Witnesses:
FREDK. A. CRANDELL,
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