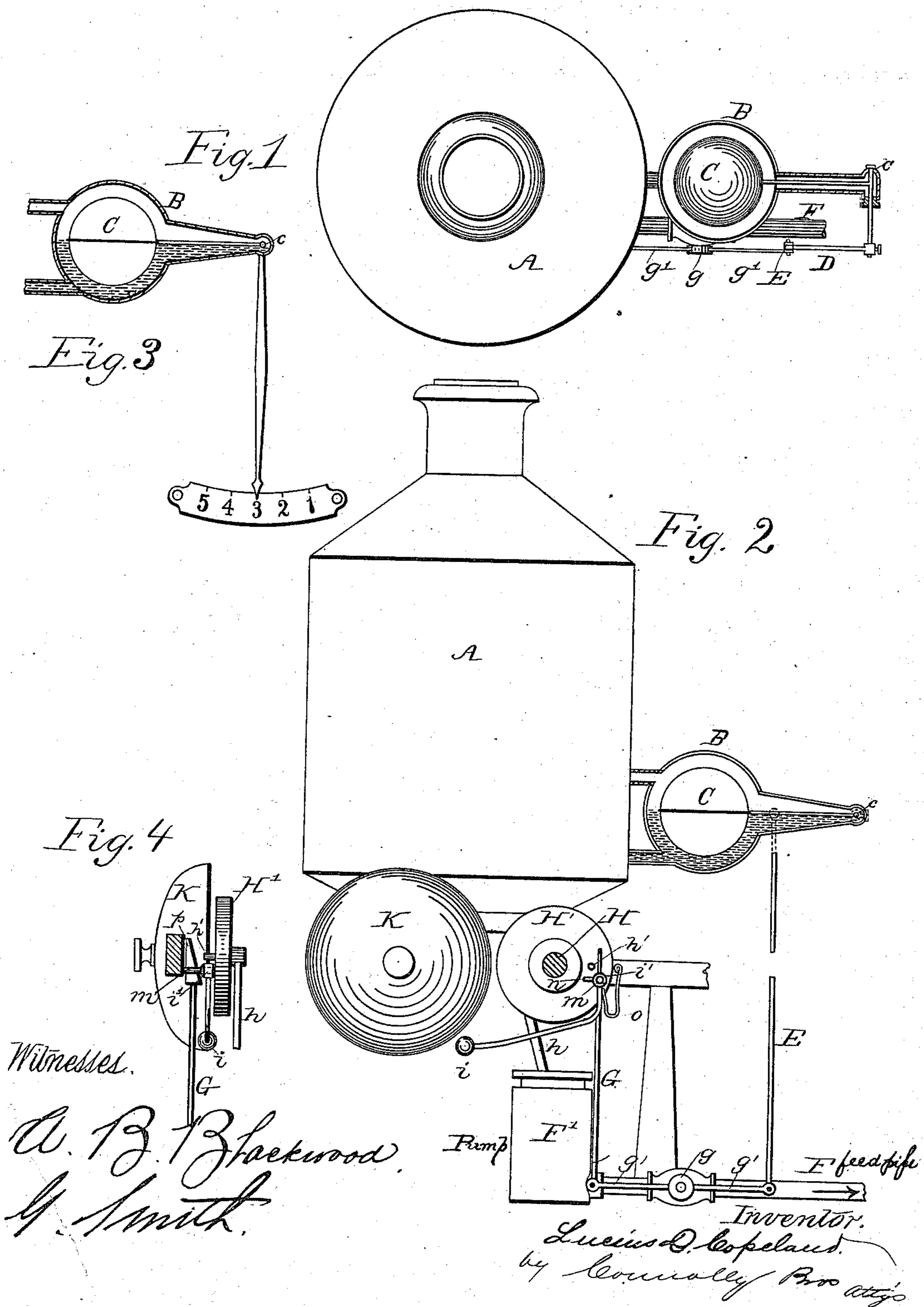


(No Model.)

L. D. COPELAND.  
STEAM BOILER INDICATOR.

No. 382,140.

Patented May 1, 1888.



Witnesses.

A. B. Blackwood.  
G. Smith.

Inventor.  
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# UNITED STATES PATENT OFFICE.

LUCIUS D. COPELAND, OF CAMDEN, NEW JERSEY.

## STEAM-BOILER INDICATOR.

SPECIFICATION forming part of Letters Patent No. 382,140, dated May 1, 1888.

Application filed November 19, 1887. Serial No. 255,634. (No model.)

*To all whom it may concern:*

Be it known that I, LUCIUS D. COPELAND, a citizen of the United States, residing at Camden, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in a Combined Steam-Engine and Steam-Generator; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification.

This invention has relation to steam-boiler indicators, and has for its object the provision of means for automatically feeding the steam-boiler from the water-tank and for indicating by the sounding of an alarm the exhaustion of the water-tank.

The invention consists in the novel construction and combination of devices, hereinafter described and specifically claimed.

In the accompanying drawings, Figure 1 is a plan view of a steam-boiler furnished with appliances pertaining to my invention. Fig. 2 is a side elevation of same, and Figs. 3 and 4 detail views.

In the drawings, A indicates the steam-boiler, to which is attached at a suitable point the tank B, communicating with the water-space of the boiler and furnished with a float, C, which follows the rise and fall of the water. The stem of the float is pivotally supported at one end, as shown at c, and the shaft or spindle extended laterally and connected to a lever, D, which in turn is pivotally attached to a vertical rod, E.

F designates the water-supply tube leading from the water tank or reservoir to a pump, F', which communicates with the boiler and is provided with a cock, g, the valve of which carries two radial arms, g', one of which is coupled to the rod E, while the other is coupled to a vertical rod, G, the purpose of which will be hereinafter described.

H designates a horizontal shaft connected to the piston-rod of the engine and conveniently constituting the main shaft upon which the fly-wheel is fitted. A crank-wheel, H', upon this shaft is connected by a pitman, h, to the suction-rod of the pump and has on one of its faces a projecting pin, h', designed and adapted at periods to operate the hammer or striker i of the bell or gong K. The latter is secured to

the side of the boiler or in any convenient situation, while the stem of the striker is pivoted to a portion of the frame-work of the engine, or otherwise conveniently supported. Ordinarily the striker is out of reach of the bell and is intended to strike only when brought into position by mechanism dependent upon the falling of the float.

The striker-rod i is attached to a collar, i', which slides lengthwise of and upon a horizontal rod, m, and this collar carries a stud, n, which, when it is struck by the pin h', causes the hammer to be retracted and its stem to compress a spring, o. The rod m is slotted, and through this slot passes the wedge-shaped block p on the upper end of the rod G. When the rod G is raised, the block p will press the collar sidewise and bring the stud n into position to be acted on by pin h'. While the engine is running, the pump is being constantly operated, its supplying capacity being governed by the cock g, which is opened more or less, according as the float rises or falls. When the boiler is full of water, the cock is closed. Now, when the water in the supply-tank is exhausted, the float will eventually sink below normal limits in its chamber B, and will therefore turn the cock g wide open. Consequently the rod G will be raised a sufficient distance to cause the wedge-shaped block to throw the hammer into striking position, whereupon an alarm will be sounded indicating the exhaustion of water in the reservoir.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a steam generator and engine, the combination, with an alarm-bell and an adjustable striker, of a rotary shaft receiving motion from the engine and carrying a stud or pin to engage with the striker, a float-chamber connected to the boiler, a float connected to a cock upon a supply-pipe leading to the boiler, and a series of jointed connections whereby when the float descends below the low-water limit the said striker will be brought into operative position, substantially as described.

2. In a combined steam generator and engine, the combination, with a float-chamber and float and a rotary shaft receiving motion from the engine and carrying a stud to engage with a striker, of a bell and striker and a series of jointed connections through which said

striker is brought into operative action or engagement with said stud by the gradual descent of the float.

3. The combination, with the bell and striker  
5 of a low-water alarm and with the rotary shaft of an engine carrying a stud, *h'*, of the shaft or rod upon which said striker is movable, and a vertically-movable rod carrying a wedge by which said striker is adjusted, said rod being  
10 coupled or connected to the float and arranged to move the striker into operative position as the float gradually descends, substantially as described.

4. In a steam generator and engine, the com-

bination, with a float-chamber and float, an 15 automatic striker actuated by the engine, and a water-supply pipe provided with a cock, of connections, substantially as described, coupling said float, striker, and cock, so that the same will act conjointly, as set forth. 20

In testimony that I claim the foregoing I have hereunto set my hand this 14th day of November, 1887.

LUCIUS D. COPELAND.

Witnesses:

JOS. B. CONNOLLY,  
R. DALE SPARHAWK.