

(No Model.)

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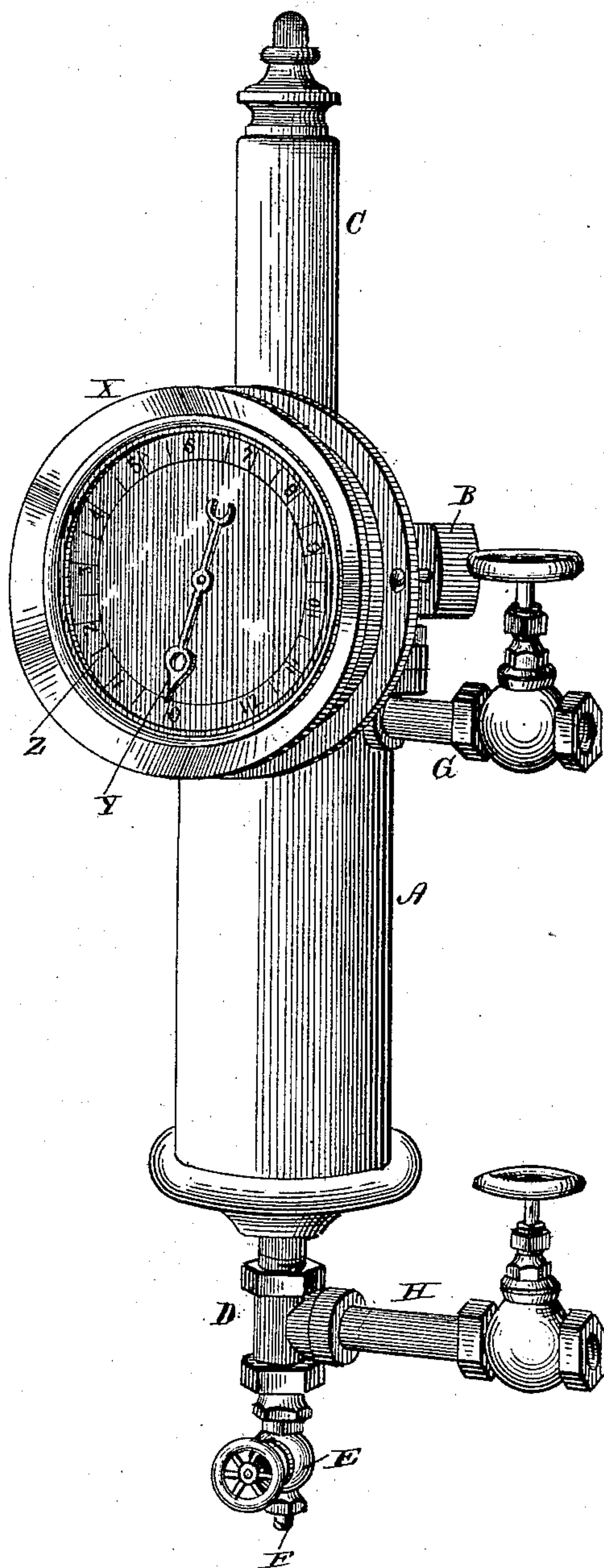
E. J. COFFIN.

INDICATOR AND ALARM FOR STEAM BOILERS.

No. 285,798.

Patented Oct. 2, 1883.

Fig. 1.



WITNESSES  
*Frank L. Durand*  
*Edw. G. Siggers.*

*Edward J. Coffin*  
INVENTOR  
*by C. A. Snow & Co*  
Attorneys

(No Model.)

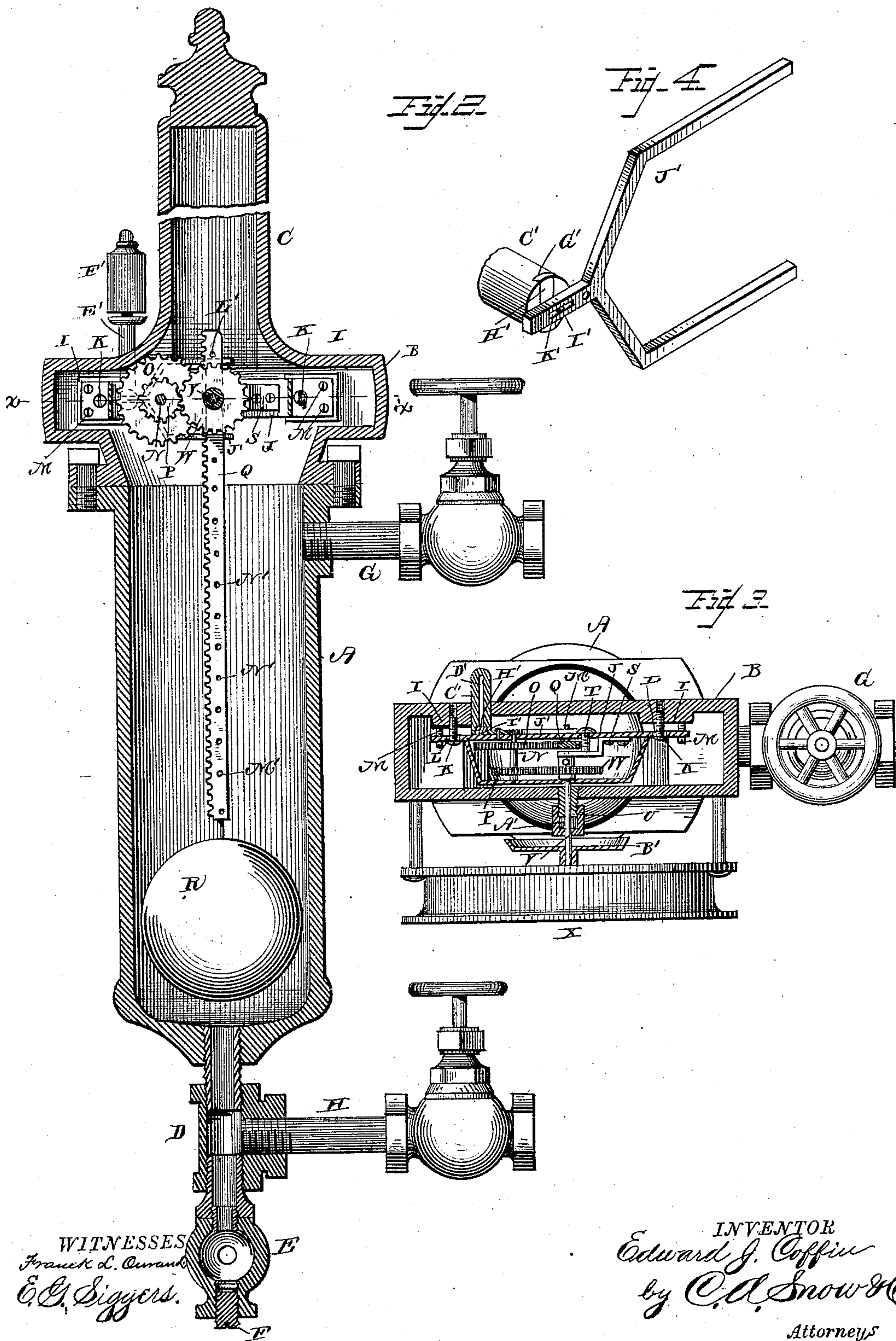
2 Sheets—Sheet 2.

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WITNESSES  
Frank L. Curran  
E. J. Siggers.

INVENTOR  
Edward J. Coffin  
by C. A. Snow & Co.  
Attorneys



# UNITED STATES PATENT OFFICE.

EDWARD J. COFFIN, OF LITTLE FALLS, NEW YORK.

## INDICATOR AND ALARM FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 285,798, dated October 2, 1883.

Application filed August 15, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD J. COFFIN, a citizen of the United States, residing at Little Falls, in the county of Herkimer and State of New York, have invented a new and useful Indicator and Alarm for Steam-Boilers, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to high and low water indicators and alarms for steam-boilers, and has for its object to produce a device which shall possess superior advantages in point of simplicity, delicacy, and certainty of action, and general efficiency.

To this end my invention consists in certain improvements in the construction of the said devices, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a perspective view of my improved indicator. Fig. 2 is a vertical transverse sectional view. Fig. 3 is a horizontal sectional view on the line *xx* in Fig. 2, and Fig. 4 is a detail view of the alarm mechanism.

The same letters refer to the same parts in all the figures.

A in the drawings designates a cylindrical or tubular casing having a swelled portion, B, which forms the "steam-chest," and an upward extension, C, of reduced diameter, the object of which is simply to provide room for the working parts, as will be presently described.

The casing A has a downward extension, D, provided with a blow-off cock, E, and with a nipple, F, which may be raised or lowered, so as to come fair with the taps in the boiler. The casing A and its extension D are provided with pipes G H, connected, respectively, with the steam-space and the water-space of the boiler upon which the device is to be used. The casing and its attachments are by preference to be made up of several parts or sections bolted together or otherwise suitably connected, in order that access may be had to the interior, either in the course of construction or when, for any reason, it should be necessary.

The interior of the steam-chest is provided

with shoulders I, forming seats for the cross-bar or bridge J, which supports the gearing of the device. The said bridge is connected to the shoulders by means of screws K K, working in slots L in the ends of the bridge. The four corners of the latter are also provided with set-screws M M, bearing against the seats I, thereby enabling the position of the bridge to be accurately plumbed and regulated. By this construction the gear-frame or bridge is also thrown out some distance in front of the seats, to enable the operation of the alarm mechanism to take place, as will be hereinafter described.

Journaled in the bridge J, and in a bracket secured to the front side of the same, is a shaft or spindle, N, carrying near its inner end a spur-wheel, O, and near its outer end a pinion, P. The spur-wheel O engages a rack, Q, which is attached to and projects upwardly from a float, R, which moves vertically in the casing A. To the front side of the bridge J is attached a bracket, S, against which presses a screw or stud, T, that serves to confine the rack and hold it in engagement with the spur-wheel O, without interfering in the least with its vertical movement.

The front side of the casing A is provided with a packing-box, U, through which projects a shaft or spindle, V, the inner end of which is journaled in the bracket S. Said spindle carries a spur-wheel, W, engaging the pinion P, from which it receives a rotary motion. The front end of the spindle V extends into the dial-case X, which is arranged upon the front side of the casing A, and carries a hand or pointer, Y. The case X contains the dial Z, which is laid out in suitable degrees, as shown.

The packing in the box U is composed of tin-foil A', cut in strips, and folded and wound around the spindle, around which it is firmly compressed by tightening the gland. This packing is found to be durable and efficient, rarely needing renewal, and avoiding rust, which would otherwise be liable to form and accumulate upon the spindle.

Upon the spindle V, between the casing A and the dial-case, is secured a concave or dish-shaped disk, B'. Any steam which shall escape



through the packing-box of the casing A will strike this disk, condense, and escape, and I thereby escape an annoyance which is very common in this class of devices—viz., the steam passing into the dial-case and condensing upon the glass face of the latter, which is thereby obscured and a clear view of the hand or pointer interfered with.

C' is a plug extending through the rear side of the casing A and through one of the seats or shoulders I, and terminating a short distance in front of the latter. Said plug has a small perforation, D', connecting with a pipe, E', upon which the steam-whistle F' is mounted. The front end of the plug has a vertical dovetailed recess, G', in which is fitted a slide-valve, H', having a forwardly-projecting pin, I'.

J' is a forked lever fulcrumed to the bridge-piece J. The short arm of said lever has a slot, K', working upon the pin I' of the slide-valve H'. The forks of the lever J' extend in rear of the rack Q, as shown.

L' and M' are small pins placed adjustably in the float-rack Q, which is provided with a series of recesses, N', for the reception of said pins, which are adapted to engage the arms of the forked lever J'.

The operation of my invention will be readily understood. The device being connected with the boiler, steam and water will enter the casing A, in which the water will rise to the same level as in the boiler, the rack of which, through the gearing herein described, operates the dial-hand, thus indicating upon the dial-face the depth of water in the boiler. The mechanism is so sensitive that the slightest variation will be instantly indicated upon the face of the dial. If the water should fall below a given point in the boiler, the pin L' in rack Q, coming in contact with the upper arm of the forked lever, operates the latter so as to raise the slide-valve H', thus uncovering the opening of the perforation D' and causing the whistle to be sounded. The same result is attained should the water rise above a given point in the boiler. Then the pin M' in the rack Q, coming in contact with the lower arm of the forked lever, will operate the latter, so as to lower the valve H' and cause the whistle to be sounded. In order to stop the whistle, if the alarm is caused by low water, close the steam-pipe leading from the boiler until the

water rising in the casing A raises the float until the pin M' shall operate the forked lever J', so as to carry the valve H' over the steam-port, and the whistle stops sounding. Then close the water-pipe H and replenish the boiler. When the alarm is caused by high water, open the blow-off cock E until the float falls, so that the pin L' shall operate the lever J' until valve H' closes the steam-port and the whistle stops sounding. Then close both pipes G and H, and blow off water from the boiler.

I claim as my invention and desire to secure by Letters Patent of the United States—

1. In an indicator for steam-boilers, the combination of the casing, the seats or shoulders formed interiorly in the same, the bridge-piece or gear-frame having slots to receive the screws, whereby it is secured to the said seats, and set-screws arranged at the corners of the said bridge-piece and bearing against the seats or shoulders, substantially as herein set forth.

2. In a steam-boiler indicator of the class described, the combination, with the dial-hand spindle, of a concave or dishing disk secured upon the same between the steam-casing and the dial-case, whereby the passage of escape-steam into the dial-case is obviated, substantially as set forth.

3. The combination of the casing, the bridge-piece or gear-frame, the vertically-movable float, the upwardly-extending rack secured to the same, pins secured adjustably near the upper and lower ends of said rack, a forked lever fulcrumed to the rear side of the gear-frame and having its arms extended behind the rack, so as to be capable of engaging the pins in the same, a plug entering the rear side of the steam-casing and having a perforation communicating with a pipe leading to the steam alarm-whistle, a slide-valve dovetailed vertically in the front end of the said plug, covering the steam-port of the same, and having a forwardly-extending pin, and a slot in the short arm of the forked lever working upon the said pin, the whole arranged and operating substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

EDWARD J. COFFIN.

Witnesses:

F. E. EASTON,  
EDWARD A. BROWN.