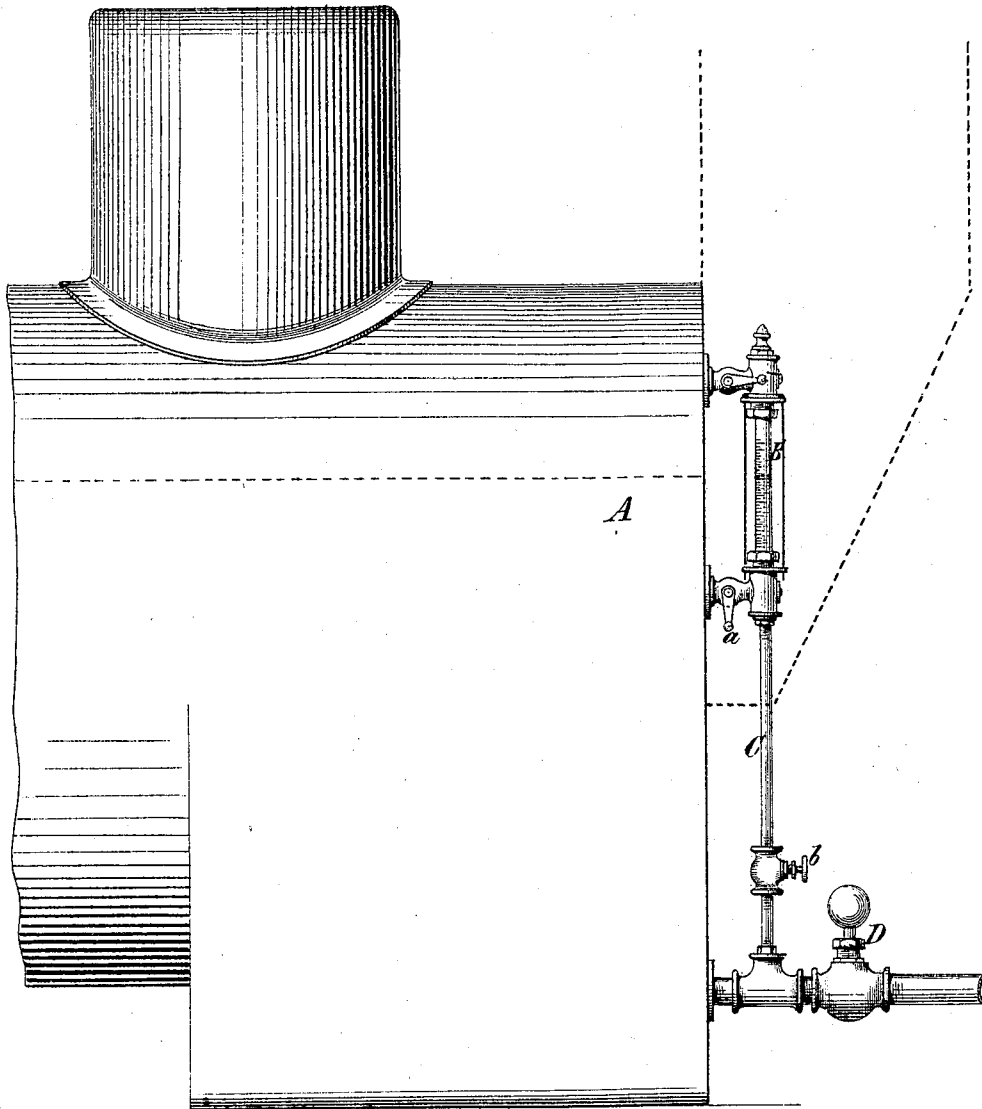


A. S. GOODRICH.

Water-Gages and Feed-Indicators for Steam Boilers.

No. 138,882.

Patented May 13, 1873.



Witnesses
Fred Hames
Eld Cluech

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UNITED STATES PATENT OFFICE.

ANDREW S. GOODRICH, OF NEW YORK, N. Y., ASSIGNOR TO HIMSELF, ALEXANDER POLLOCK, AND GEORGE VAN WAGENEN, OF SAME PLACE.

IMPROVEMENT IN WATER-GAGE AND FEED-INDICATOR FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **138,882**, dated May 13, 1873; application filed January 18, 1873.

To all whom it may concern:

Be it known that I, ANDREW S. GOODRICH, of the city, county, and State of New York, have invented an Improved Feed-Indicator for Boilers, &c., of which the following is a specification:

The object of this invention is to obtain means for inspecting the operation of feed-pumps that supply steam-boilers and other receptacles with water or other fluid, and for observing whether or not such pumps are defective in operation during their successive strokes, and whether or not they supply air in greater or less quantities in place of the liquid to be fed. My invention consists in connecting the feed-pipe of a pump or the pump itself, by means of a pipe, with the water-gage of the steam-boiler, or equivalent receptacle, so that such water-gage will serve as an indicator for the operations of the pump.

In the accompanying drawing, the letter A represents a portion of the steam-boiler or other receptacle. B is the water-gage, applied to the same in ordinary or suitable manner. If this gage is of the customary construction I prefer to close its lower connection *a*, while the upper connection remains in communication with the steam-space of this boiler. C is a pipe, which connects the lower end of the water-gage with the feed-pipe D of the pump, or, if desired, with the pump direct. A valve or cock, *b*, is arranged on the pipe C, so that the same may be opened and closed at will. When opened it will contain, in connection with the gage B, a column of water as high as that in the boiler or receptacle A, and

at every stroke of the pump, the water in the gage B will, owing to the effect of the added supply fluctuate or pulsate in the gage, and by such pulsation indicate that the pump is in operation, and effective.

When, from any cause whatever, any one or more strokes of the pump should, instead of water, supply air—that is to say, when the pump, partly or wholly, ceases to operate in proper manner—the air supplied by it or a portion of it will ascend in the pipe C and into the gage B, where it will indicate its presence in the form of bubbles rising through the water in the gage. When the pump is at rest the water in the gage will cease to fluctuate or pulsate. Thus, by the connection C of the water-gage with the feed-pump or feed-pipe, I am enabled to observe fully the operations of the pump, even if the same should otherwise not be observable.

To engineers of steam-engines this attachment will be of great help, as it will indicate at once whenever any part of the feeding apparatus should be out of order, besides serving as the customary gage for showing the height of water in the boiler.

Claim.

The pipe C, connecting a water-gage, attached to a boiler or other receptacle, with a pump or feed-pipe, as set forth.

ANDREW S. GOODRICH.

Witnesses:

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