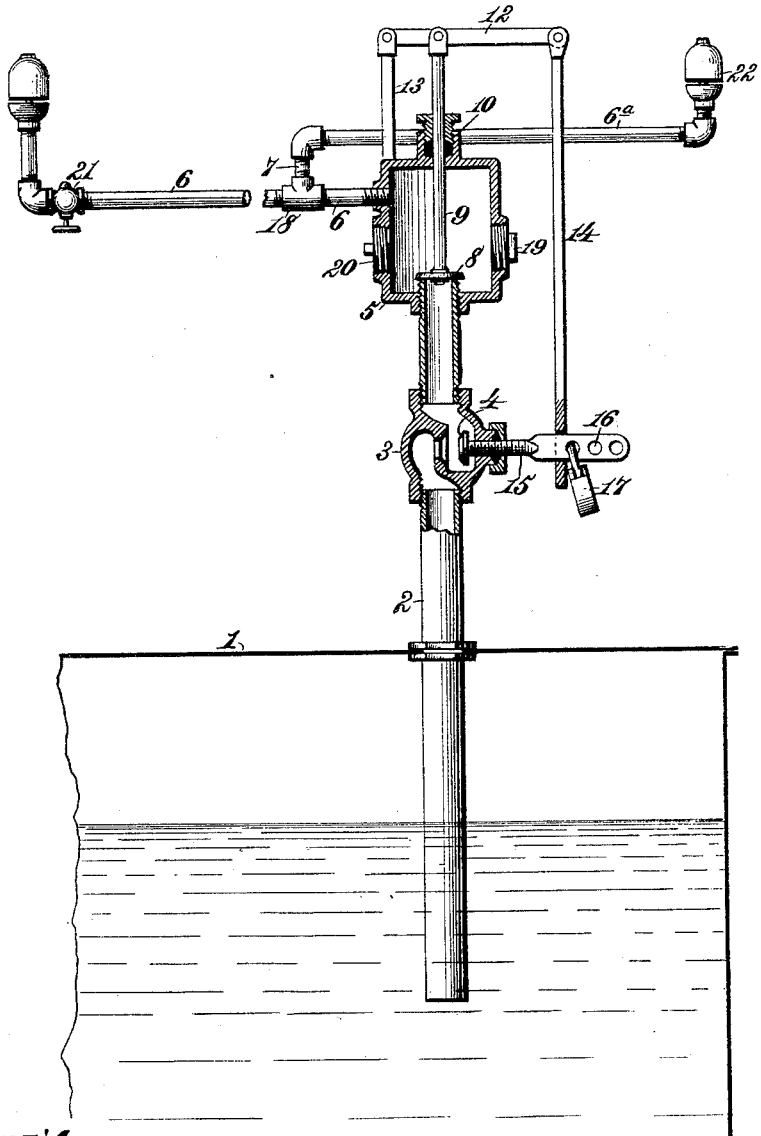
(No Model.)

J. B. FUNK & J. P. ZEIHER.

LOW WATER ALARM FOR BOILERS.

No. 419,038. Patented Jan. 7, 1890.



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UNITED STATES PATENT OFFICE.

JOHN B. FUNK AND JOHN P. ZEIHER, OF CLIFTON, WEST VIRGINIA, ASSIGNORS OF ONE-THIRD TO ALFRED A. HOLLAND, OF SAME PLACE.

LOW-WATER ALARM FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 419,038, dated January 7, 1890.

Application filed October 15, 1889. Serial No. 327,053. (No model.)

To all whom it may concern:

Be it known that we, JOHN B. FUNK and JOHN P. ZEIHER, citizens of the United States, residing at Clifton, in the county of Mason and State of West Virginia, have invented new and useful Improvements in Low-Water Alarms for Boilers, of which the following is a specification.

Our invention relates to that class of devices employed in connection with steam-boilers for indicating the fact that the water therein has fallen to or is approximating a dangerously-low point.

It is the purpose of our invention to provide a simple, reliable, and unfailing low-water alarm having such organization that it cannot be tampered with and in which the difficulty frequently experienced heretofore of the sticking of the valve when the stem rests against it is wholly avoided.

The invention consists in the several novel features of construction and new combinations of parts hereinafter described and claimed, reference being made to the accompanying drawing, in which the figure is a sectional view showing a portion of a steam-boiler to which is connected a low-water alarm organized in accordance with our invention.

In the said drawing, the reference-numeral 1 designates a steam-boiler of any known or desired construction, through the wall of which is packed a pipe 2, having its lower open end arranged at any point, but usually so placed that the level of the water may fall below the open end of said pipe a little before a dangerously-low level is attained. Interposed in this pipe 2, at a suitable point, is a valve-casing 3, in which is arranged a valve 4 of any suitable form, so constructed that the passage may be closed or opened by rotating the valve-stem in one or the other direction.

Mounted upon the pipe 2 and communicating with it is a steam-drum 5, and through the wall of said drum is packed the end of a steam-pipe 6, which conducts steam, when the latter is admitted to the drum, to a whistle or other form of alarm located at a suitable point. If desired, one or more pipes 7 may be connected with the pipe 6, and two or even more separate alarms may be arranged in different places at any required distance apart.

The end of the steam-pipe 2 which penetrates the steam-drum 5 is closed by a leather button 8, which rests upon the open end of the pipe and is held thereon by a stem 9, which passes through a stuffing-box 10 on the drum. This stem is pressed downward with the required degree of force by a lever 12, fulcrumed on a post 13, rising from or mounted on the steam-drum. To the end of this lever is pivotally connected a locking link or bar 14, the end of which is provided with a slot receiving the flattened end of a stem 15, carrying the valve 4. Openings 16 are formed in this stem at intervals adapted to receive a padlock 17, by which the rotation of the valve-stem and the closing of the valve 4 is prevented.

The operation of the invention is as follows: When the water in the boiler falls so far as to expose the lower open end of the pipe 2, live steam rushes up through said pipe against the leather button 8, closing the upper end of the pipe which lies in the steam-drum 5. The steam speedily shrivels the leather to such an extent as to destroy the valve or button, allowing the steam to pass into drum 5, and thence through the pipe or pipes 6 to the whistle or other alarm. A coupling 18 is connected with the pipe 6 to receive the branch pipe if a second alarm is used. A plug 19 is set in the wall of the steam-drum to permit the leather button 8 to be renewed, during which operation the valve 4 is closed. A second plug 20 may also be placed in the opposite wall of the steam-drum 5, if desired, to facilitate the operation, and a valve 21 is placed in the pipe 6.

This invention provides a simple, accurate, and unfailing alarm, in which the action of the steam upon the button closing the boiler-pipe gives a certain and speedy opening of the valve and flow of steam, avoiding all the danger of the valve sticking which is frequently experienced when the steam or hot water stands against a metal valve.

The valve 21 is preferably placed at such a point in the pipe 6 that when said valve is

closed it will not cut off steam from the branch pipe connected to the coupling 18. From this or a similar coupling a pipe 6^a extends to a point where an alarm-whistle 22 is within hearing of the engineer, and this pipe being deprived of a valve by which the steam may be cut off, the engineer or his fireman cannot close it, as they might possibly do if they thought the water was low. By this arrangement the alarm-whistle 22 will sound and continue sounding until the fires are drawn and the pressure diminished, while the alarm on pipe 6 may be mechanically cut off at any instant by means of the valve 21.

It will be understood that the pipe 2, which penetrates the steam-boiler, is always cool at or near the point where it unites with the steam-drum 5, and the water which stands against the leather button 8 is therefore of such temperature as to cause no injury to said button. The latter is only affected after the water-level in the boiler 1 has fallen to such a point that the dry live steam may rush up the pipe 2 and act upon the button, shriveling it in the manner already described.

What we claim is—

1. In a low-water alarm, the combination, with a pipe having its open end inserted in the boiler at the desired point, of a steam-drum mounted on the outer open end of the pipe, a leather button resting on and closing the said pipe, a stem packed through the drum and resting on the button, a steam-pipe leading from the drum to an alarm, and means for holding the stem upon the leather button, substantially as described.

2. In a low-water alarm, the combination, with a pipe having its open end inserted in the boiler below the normal water-level, a normally-open valve arranged in said pipe, a steam-drum mounted on the latter, one or more pipes communicating with the drum and leading to an alarm or alarms, a leather button closing the end of the pipe inserted in the boiler, a stem entering the drum and resting on said button, a locking-bar connected to said lever and engaging the end of the valve-stem in the boiler-pipe and locking the latter in its open position, and means for securing the parts in engagement, substantially as described.

3. In a low-water alarm, the combination, with the boiler, of a pipe 2, entering the same with its lower end below the normal water-level, a valve in said pipe, a steam-drum, with which the latter communicates, a leather button closing the end of said pipe in the drum, a stem passing through a stuffing-box and resting on the button, a lever holding the stem down, a locking-bar connected to said lever and engaging the flat stem of the valve in the boiler-pipe, a lock preserving the engagement, and one or more pipes communicating with the drum and each leading to an alarm, substantially as described.

4. In a low-water alarm, the combination, with a boiler, of a pipe 2, a normally-open valve 4 arranged therein, a steam-drum 5, arranged to communicate with said pipe and having one or more plugs in its walls, a button 8, resting on the end of the pipe in said drum, a stem 9, passed through a stuffing-box 10 and resting on the button, a lever 12, fulcrumed on a post 13 and holding the stem against said button, a locking-bar 14, connected to the end of the lever and having its end engaging the flat stem 19 of the valve 4, a padlock engaging apertures in said valve-stem, and a steam-pipe communicating with the drum 5 and with an alarm and having a coupling 20 for a branch pipe, substantially as described,

5. In a low-water alarm, the combination, with a pipe having its open end inserted in the boiler at the desired point, of a steam-drum mounted on the open end of said pipe, a leather button resting on and closing said open end, a stem packed through the steam-drum and resting on the button, means for holding said stem down upon said button with a suitable pressure, a steam-pipe leading from the steam-drum to an alarm-whistle and provided with a cut-off valve, and an independent or branch pipe also communicating with said drum and leading to the engineer's post, said pipe being always open or without a cut-off, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN B. FUNK.
JOHN P. ZEIHER.

Witnesses:
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ELLA HUTCHINSON.