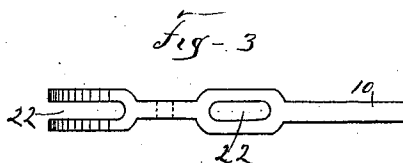
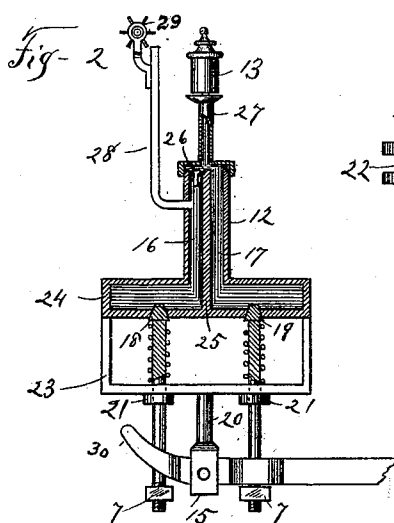
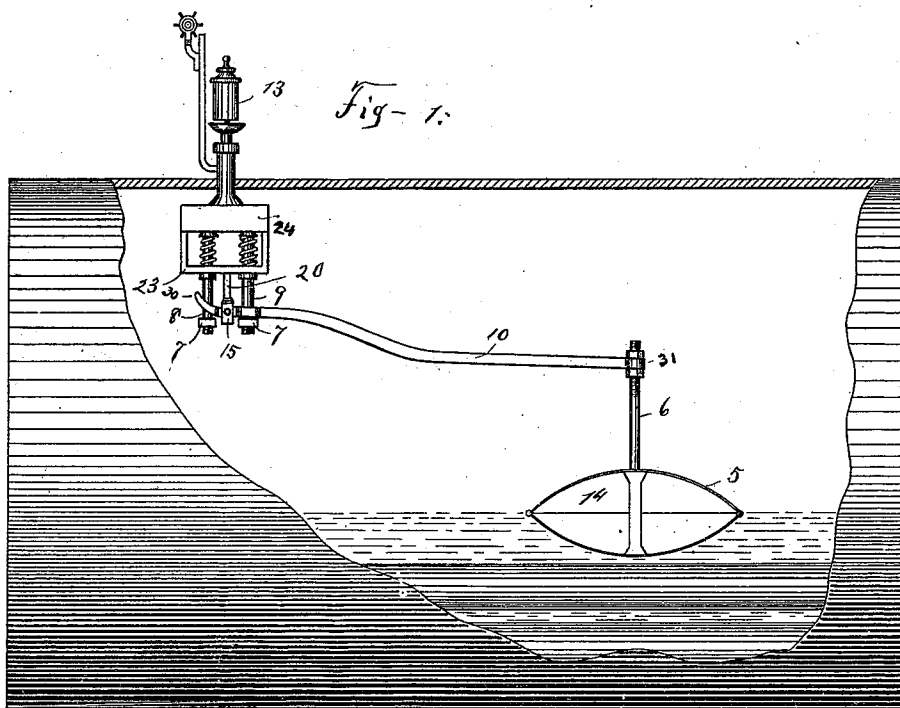


(No Model.)

P. A. KIRCHNER.
WATER ALARM FOR STEAM BOILERS.

No. 511,529.

Patented Dec. 26, 1893.



WITNESSES:
W. L. Burns
Albert Baker

Peter A. Kirchner

INVENTOR

BY
H. C. Hartman

ATTORNEY

UNITED STATES PATENT OFFICE.

PETER A. KIRCHNER, OF FORT WAYNE, INDIANA.

WATER-ALARM FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 511,529, dated December 26, 1893.

Application filed April 3, 1893. Serial No. 468,784. (No model.)

To all whom it may concern:

Be it known that I, PETER A. KIRCHNER, a citizen of the United States, residing at the city of Fort Wayne, in the county of Allen, in the State of Indiana, have invented certain new and useful Improvements in Water-Alarms for Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in water alarms for steam boilers, in which the alarm is operated automatically by a lever attached to a buoy or float; and its objects are to provide an improved buoy or float, improved mechanism whereby the alarm is actuated at both a high and low stage of water in the boiler, and improved means to distinguish which stage of water is indicated when the alarm is operated; and the invention consists in the construction and novel combination of parts hereinafter described, pointed out in the appended claim and illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of my improved device placed in a boiler, parts of which are broken away. Fig. 2 is a vertical sectional view of my preferred form of the operating device of the alarm. Fig. 3 is a top view of the operating lever by which the alarm is actuated with part broken away.

The float (5) may be made of any suitable material adapted to float on the surface of the water in the boiler with sufficient buoyancy to lift the end of the operating lever (10). I prefer the construction shown in Fig. 1, which consists of an air-tight metallic vessel constructed with tapered ends, so that when the waves pass, it will ride upon them like a boat, and not present a surface for the waves to strike against. Where a spherical float or one presenting much surface to the waves is used, the tendency of the current is to force such float back and forth as the waves pass and repass, frequently operating the alarm by a horizontal movement of the float, when the general level of the water remains unchanged. My construction avoids

this difficulty and confines the motion of the float to vertical lines. I brace this air-tight vessel or float (5) in any suitable manner to resist the pressure of the steam and water, preferably by a longitudinal rod or plate (14). A lifting rod (6) is attached to the float (5) preferably near its center and is extended through to the lower side to assist bracing the shell forming the float (5). The upper end of this lifting rod (6) extends to a point on or near a horizontal line with the pivot or fulcrum (15) of the operating lever (10) and is attached to the end of the lever 10.

The construction is as follows: The flues or pipes 16 and 17 and the supporting frame and the alarms are shown in Figs. 1 and 3. A steam tight box 24 is provided with a single pipe 12, extending outside the boiler and a partition 25 divides the pipe 12 and the box 24 into two steam-tight compartments and forms the two flues 16 and 17. On top of the flue 16, I place a drop valve 26 to prevent the entrance of steam, and above this point the two flues 16 and 17 enter a pipe 27 which is provided with a whistle 13 or other alarm adapted to be operated by the passage of steam out of the pipe 27. At one side of the flue 16, I place a small pipe 28 communicating with it and extending up any suitable distance. Over the pipe 28 I suspend any light material 29, adapted to be easily blown about by the steam passing out of the pipe 28. On the bottom of the box 24 I construct two valved openings 18 and 19, communicating respectively to the flues 16 and 17 through the separate compartments of the box 24. The two valves seated in the valved openings 18 and 19 respectively are provided with valve stems 8 and 9, and a supporting frame 23 is attached to the box 24. Bosses 21 are attached to this frame 23, through which the valve stems pass and are held in place, the bosses furnishing larger bearings for the valve stems. Between these two bosses I attach a stud 20 to the frame 23, to the lower end of which the lever 10 is pivotally attached, the pivot 15 forming a fulcrum for the lever. I place spiral springs around the valve stems 8 and 9 above the bosses 21, adapted to keep the valves in place in the valved openings 18

and 19. The lower ends of the valve stems 8 and 9 are provided with nuts or projections 7 against which the lever 10 impinges and by which it operates the valves. The operating lever 10 is provided with two slots 22 adapted to permit the movement of the valve stems 8 and 9 through them, for the purpose of assisting in holding the lever 10 in place, so that it will always be over the nuts or projection 21, and therefore in position to operate the valves. The end 30 of the lever 10 is bent upward slightly, so as to permit a slight motion of the lever without operating the alarms; otherwise the smallest variation of the level of the water in the boiler would operate one or the other of the valves 18 and 19. By this means the water may rise or fall any given short distance without operating the alarms.

The operation is as follows: The device being in place and suitably secured to the boiler—when the water rises, the float 5 is raised thereby and elevates the end 31 of the lever and depresses the other end 30. If the limit of variation is passed, the end 30 depresses the valve stem 8, thereby operating the high water valved opening 18, and the steam passes out lifting the valve 26 and operates the whistle 13. At the same time the steam also passes out of the small side pipe 28 and agitates the light material placed above it. The engineer hearing the whistle looks at it, and seeing the light material moving knows at once that the high water limit in the boiler is passed, and stops the supply of water. This action takes place with certainty even when the water is foaming in the boiler, and it is well known that when the water is foaming the water glass does not indicate correctly the stage of water in the boiler. When the water falls in the boiler the float 5 falls with it and operates the low water valved

opening. The steam passes up through the flue 17 and pipe 27 and operates the whistle calling the engineer's attention to the fact, while the drop valve 26 prevents the steam passing down the flue 16 and out of the small side pipe 28.

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

In a water alarm for steam boilers, the combination of a box placed within the boiler with a pipe extending outside thereof: a partition dividing said pipe and box into two separate flues and compartments, respectively communicating with each other: a drop valve seated over the top of one of said flues: a pipe above both of said flues provided with a whistle: a small side pipe communicating with the flue provided with said drop valve: light material placed over the outlet of said small pipe adapted to be agitated by steam passing out thereof: valved openings in the bottom of each compartment of said box: stems to the valves in said valved openings: a frame adapted to hold said valve stems in place and permit their operation and provided with a stud placed between the valve stems: a lever pivoted to said stud and adapted to operate said valve stems, one by a downward movement and the other by an upward movement of the lever: and a float adapted to operate said lever by its rise and fall with the water in the boiler.

In testimony whereof I hereunto subscribe my name, in the presence of two witnesses, this 27th day of March, A. D. 1893.

PETER A. KIRCHNER.

Witnesses:

ALBERT BAKER,
E. COOLICAN.