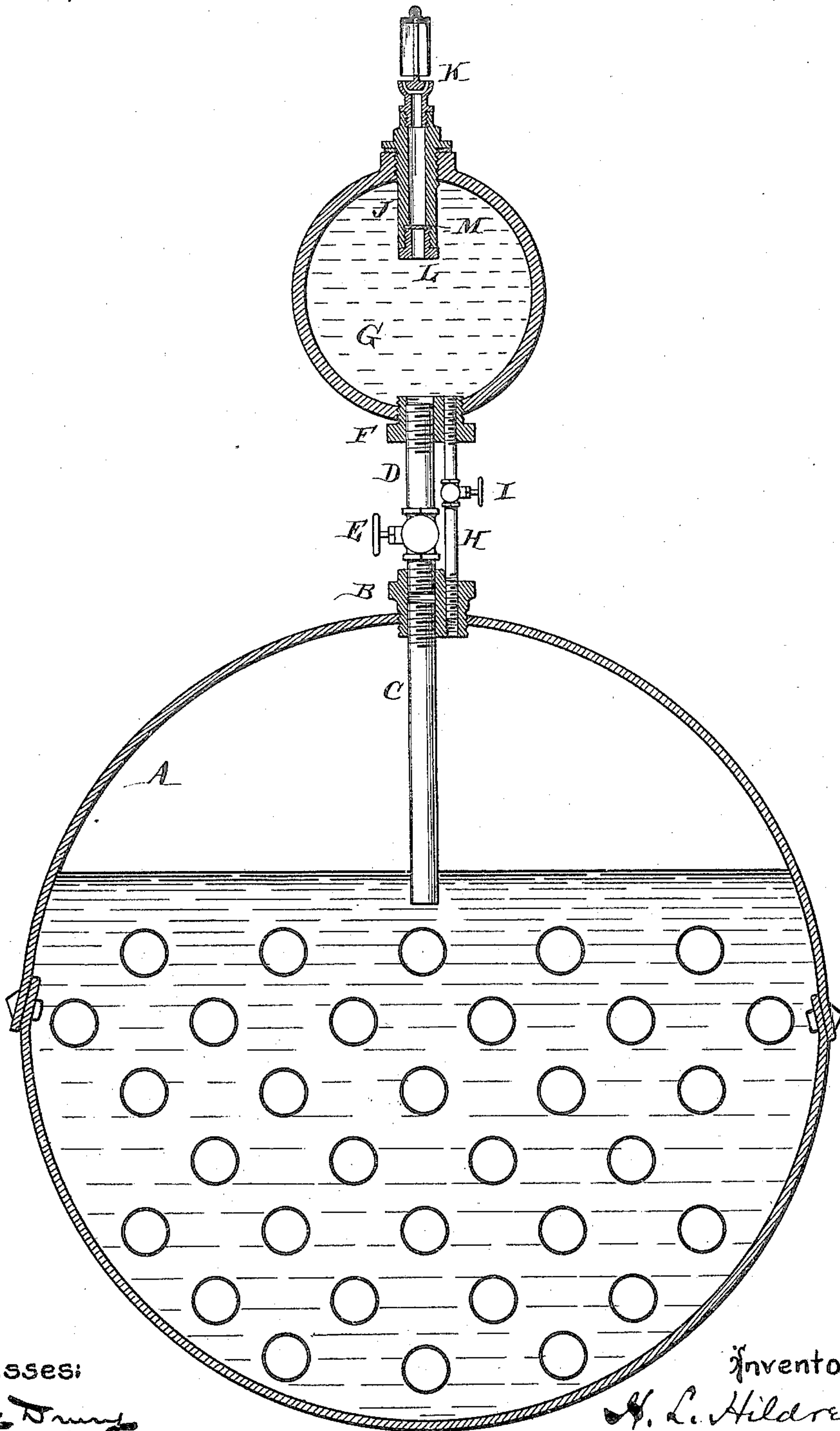


(No Model.)

H. L. HILDRETH.
LOW WATER ALARM.

No. 446,453.

Patented Feb. 17, 1891.



Witnesses:

Henry D. Dwyer
Maurice H. Holmes.

Inventor:

H. L. Hildreth
By his atty

[Signature]

UNITED STATES PATENT OFFICE.

HENRY L. HILDRETH, OF SAGINAW, MICHIGAN.

LOW-WATER ALARM.

SPECIFICATION forming part of Letters Patent No. 446,453, dated February 17, 1891.

Application filed August 16, 1890. Serial No. 362,155. (No model.)

To all whom it may concern:

Be it known that I, HENRY L. HILDRETH, of Saginaw, county of Saginaw, and State of Michigan, have invented an Improvement in Low-Water Alarms, of which the following is a specification.

My invention has reference to low-water alarms for steam-boilers; and it consists of certain improvements, all of which are fully set forth in the following specification and shown in the accompanying drawing, which forms a part thereof.

The object of my invention is to provide a low-water alarm which shall employ a fusible plug capable of being fused by the action of steam, but retaining its solidity when only acted on by water. In so employing a fusible plug I arrange it in a receptacle or vessel arranged independently of the boiler proper, and this vessel I connect with the boiler by means of two pipes or passage-ways, one of which extends down to a point below the normal water-level in the boiler and to the low-water level, and the other of said pipes connects the steam-space of the boiler with the receptacle or vessel. Both of these pipes are provided with valves. Normally the valve in the pipe leading to the low-water level is open and the valve in the other pipe closed. The pressure of the steam in the boiler forces the water through the said pipe and fills the vessel or receptacle above. If the water should fall below the proper level, steam would enter and destroy the fusible plug, and operate an alarm-whistle or other suitable device. By opening the valve in the second or steam pipe steam may be permitted to enter the receptacle holding the fusible plug, and the water may thereby be driven from it and the fusible plug subjected to any given or desired pressure of steam for testing. By closing both of the valves the fusible plug may be withdrawn from the receptacle and a new one inserted, if desired.

Referring to the drawing, I have shown a sectional elevation through a boiler and my improved low-water-alarm mechanism.

A is the boiler. In the top of the boiler is screwed a plug B, into which is secured a pipe C, extending down into the boiler below the normal water-level and to a point corresponding to the low-water level. A continu-

ation of this pipe is found in the part D extending upward and connected with a receptacle or vessel G through a second screw-plug F. This pipe D is provided with a valve E. A pipe H, preferably of smaller diameter, is also connected between the two screw-plugs B and F, so as to connect the steam-space A with the interior of the receptacle or vessel G. This pipe H is provided with a valve I. The receptacle G may be of any shape and formed of cast-iron, if desired, an excellent shape being in the form of a sphere. Screwed into the upper part of this vessel or receptacle G is a tubular piece J, into the lower end of which is a tubular clamping end L, between which and the tubular part J is clamped the fusible-metal disk M. Secured to the upper part of the tubular piece J is the steam or alarm whistle K. Normally the valve I is closed and the valve E is open. The steam in the boiler A forces the water through the pipes C and D into the vessel or receptacle G and maintains it there until the water-level falls below the bottom of the pipe C, when steam enters the receptacle G, fusing the plug or disk M and escaping by the whistle K, giving the alarm of low water.

By arranging the plug M in a vessel G independent of the boiler the said plug may at any time be removed for inspection or repairs by simply closing the valve E and unscrewing the tubular part J from the said receptacle G. If it is desired at any time to force the water from the receptacle G back into the boiler A before the water-level in the latter has been reduced to the bottom of the pipe C, the valve I may be opened. In this case steam enters the receptacle G and the water immediately passes back into the boiler A. If this action is performed when the boiler-pressure is below the normal, the temperature of the steam may be below that necessary to fuse the plug M; but if this test is made when the boiler-pressure is at its normal or in excess of its normal the passage of steam into the receptacle G will instantly fuse the plug M and sound an alarm, unless the plug is defective, in which case it should be instantly removed and a new plug supplied in its place.

By my improved construction I am enabled to not only test the operativeness of the fusible plug, but I am also enabled to supply new

plugs from time to time without interfering with the normal operation of the boiler.

It is evident that the parts shown may be more or less modified without in the least departing from the spirit of my invention.

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

10 A steam-boiler, a vessel or receptacle independent of the steam-boiler, a pipe connecting the receptacle with the steam-boiler below the normal level thereof, a valve in said pipe, a steam-pipe connecting the interior of the receptacle with the steam-space of the
15 boiler, a steam-valve in said steam-pipe, a removable tubular part detachably secured to the receptacle or vessel and projecting into the interior of the same, an alarm or steam

whistle carried upon the outer end of said tubular part, a fusible-metal piece carried 20 upon the inner end of the tubular part and in the opening of the tube, and a detachable clamping-piece adapted to detachably clamp the fusible-metal piece in the tubular piece and expose it to the action of the contents of 25 the receptacle or vessel, whereby the operativeness of said fusible-metal piece may be tested and its holding portions may be readily removed for substituting a new fusible-metal piece in place of a defective one. 30

In testimony of which invention I have hereunto set my hand.

HENRY L. HILDRETH.

Witnesses:

C. G. FOWLER,
I. S. FOOTE.