

No. 747,420.

PATENTED DEC. 22, 1903.

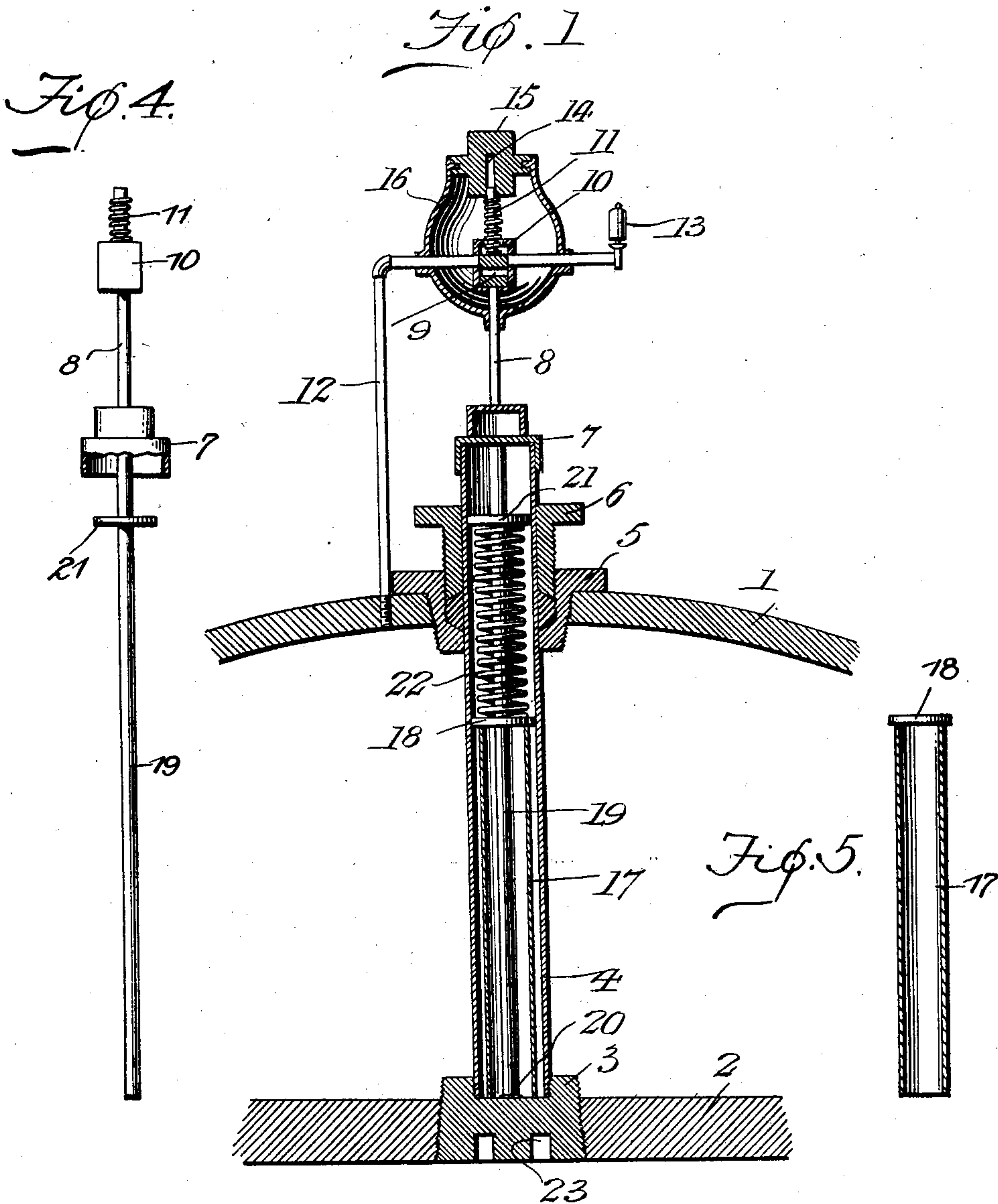
W. S. G. HARRIS.

BOILER ALARM.

APPLICATION FILED APR. 7, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses  
*E. Stewart*  
*J. J. Omore*

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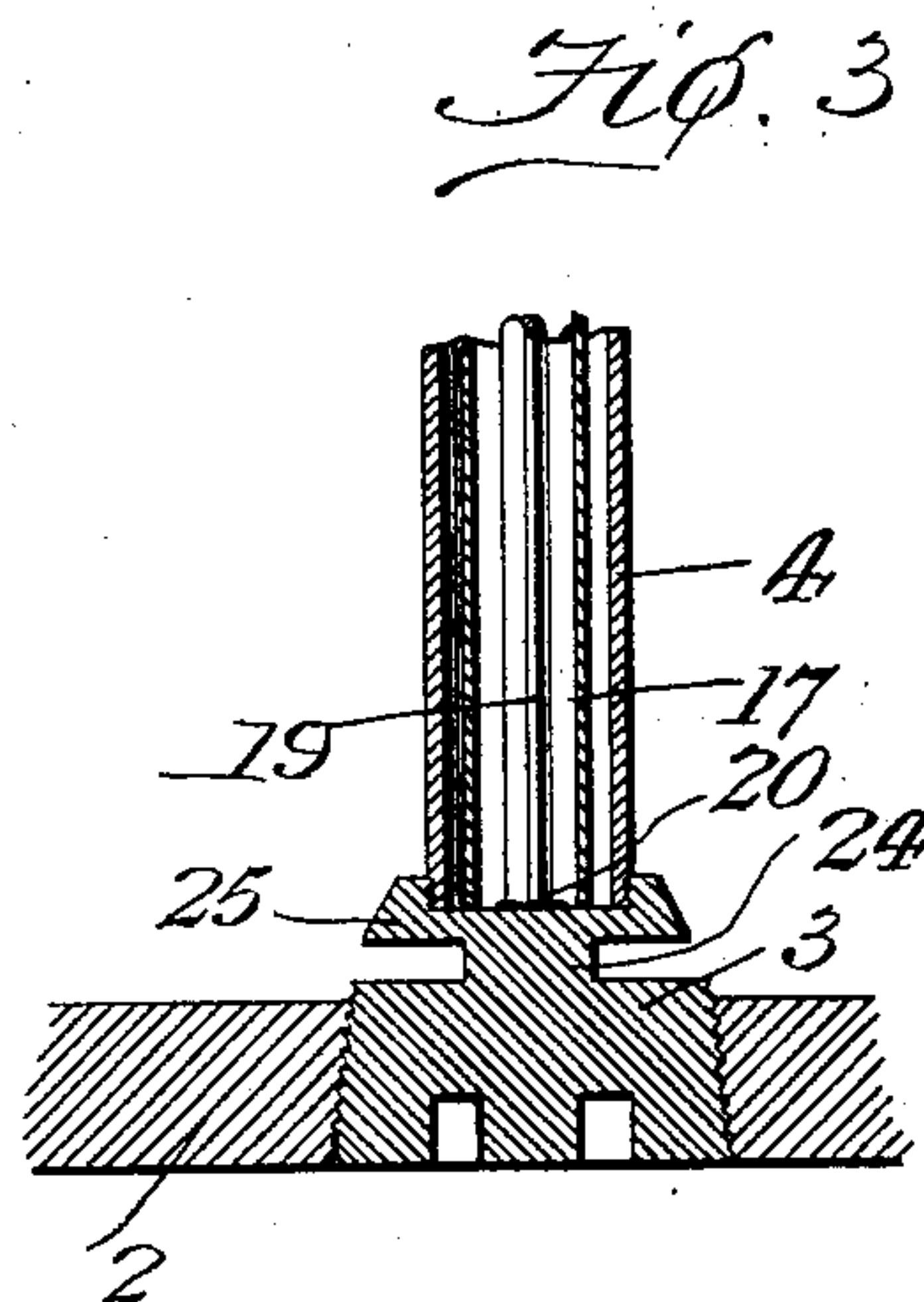
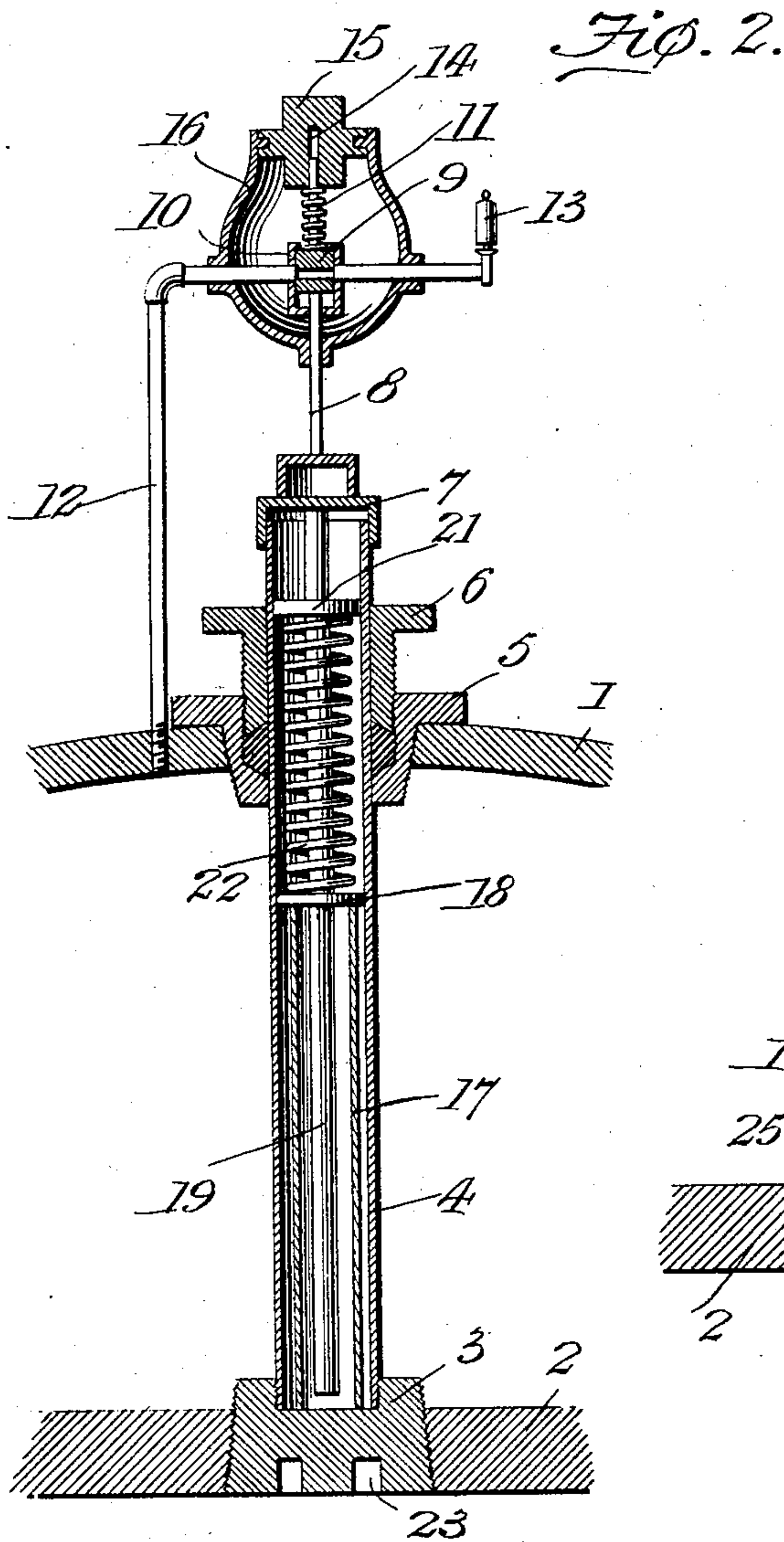
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*E. Stewart*  
*J. D. Emory*

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by *C. A. Snow & Co.*  
Attorneys



# UNITED STATES PATENT OFFICE.

WARNER S. G. HARRIS, OF SAN LUIS OBISPO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO JAMES LEAVITT, OF SAN LUIS OBISPO, CALIFORNIA.

## BOILER-ALARM.

SPECIFICATION forming part of Letters Patent No. 747,420, dated December 22, 1903.

Application filed April 7, 1903. Serial No. 151,494. (No model.)

*To all whom it may concern:*

Be it known that I, WARNER S. G. HARRIS, a citizen of the United States, residing at San Luis Obispo, in the county of San Luis Obispo and State of California, have invented a new and useful Boiler-Alarm, of which the following is a specification.

This invention relates to boiler-alarms, and is especially directed to that class of devices which are designed for audibly indicating the falling of the water in the boiler to a low-water or danger point, and has for its objects to produce a device of this character of comparatively simple construction, one which in practice will efficiently perform its functions and will obviate the liability of prematurely signaling or of failure to operate, or, in other words, a device which will positively sound the alarm when the water arrives at the danger-point, but which cannot operate until such point is reached.

To these ends the invention comprises the novel details of construction and combination of parts more fully hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a sectional elevation of a portion of a boiler, illustrating the invention applied thereto. Fig. 2 is a similar view showing the position of the parts when released for sounding the alarm. Fig. 3 illustrates a similar modified form of the device. Fig. 4 is a detail view of the plunger-rod and the parts which are connected with and movable thereby. Fig. 5 is a similar view of the inner tube which forms a seat for the lower end of the actuating-spring.

Referring to the drawings, 1 indicates the crown-plate of a boiler, and 2 the crown-sheet of the furnace. These parts may be of the usual or any desired construction, inasmuch as they form no part of the present invention.

3 indicates a plug which is tapped through the crown-sheet of the furnace and projects a suitable distance above the same and has tapped centrally into its upper face the lower threaded end of vertical tube 4, which constitutes the main outer protecting-casing of the present device. The tube 4 passes upwardly through a plug 5, tapped into the boiler-crown, and a packing member 6, tapped at its

lower end into the plug. Mounted on the upper end of the tube 4 is a movable cap 7, which has centrally secured to its upper face a vertical valve-rod 8, which carries between its ends a valve 9, slidingly mounted in a casing 10, the rod 8 being extended through the valve-casing and provided at its upper end with a suitable spring 11, which tends normally to force the rod downwardly and maintain the cap 7 securely seated upon the upper end of the tube 4 and further maintains the valve 9 in its normally closed condition.

12 indicates a steam-pipe connected at its lower end to the boiler-crown and at its upper end to the valve-casing 10. This pipe is in free communication with both the boiler and the valve-casing and is adapted for communication with a whistle 13, attached to the casing 10 for communication therewith. The valve 9 normally closes communication between the pipe 12 and the whistle, but is adapted for operation in a manner, presently to be described, to establish communication between the pipe and whistle in order that the latter may be sounded through the medium of steam conducted to the same by the former. The upper end of the rod 8 is movably sustained by a suitable guide 14, formed in the crown-block 15 of a casing 16, sustained by the steam-pipe 12 and adapted to protect the valve-casing, valve-spring, and adjacent mechanism from dust and other foreign matter.

Mounted within the tube 4 is a second tube 17 of a height equal to about one-half of the tube 4 and provided at its upper open end with an annular outwardly-extending flange 18. The lower end of this tube rests upon the upper face of the block 3.

19 indicates a plunger-rod which extends through the tube 17 and is attached at its lower end by solder or other readily-fusible metal 20 to the outer face of the plug. This rod is of a length equal to the length of the tube 4 and bears at its upper end centrally upon the removable cap 7. Mounted on the rod 19 at a suitable point below its upper end is a disk-like head 21, and between the head 21 and the flange 18 of the tube 17 is a spring 22, which is coiled around the rod and bears at its ends against the flange 18 and head 21, respectively. The normal tendency of this



spring is to force the rod 19 upward, which movement of the rod is prevented, owing to its being attached at its lower end to the plug 3, as before stated.

5 The plug 3 has its lower face cored out or channeled at a point beneath the tube 4, as indicated at 23, thus reducing the thickness of the plug at this point.

10 In operation, supposing the parts to be in the position illustrated in Fig. 1, with the rod 19 attached to the plug 3, and that the water in the boiler falls to the low-water or danger point, which is on a line with the upper face of the plug, the heat from the furnace will be quickly communicated to the 15 plug and fuse the solder or like metal 20, thus detaching the lower end of the rod 19 from the plug and permitting the spring 22 to force the same bodily upward. As the rod moves 20 upward it in turn forces the cap 7 upward from the end of the tube 4 and moves rod 8 to open the valve 9 and permit the steam to flow from pipe 12 to the whistle 13 and sounding the same. In this connection it is to be noted 25 that, owing to the coring out of the plug, as at 23, the thickness of the same beneath the tube 4 is reduced, which permits the heat from the furnace to act more rapidly in fusing the metal 20.

30 In the modification shown in Fig. 3 the plug 3 has formed on its outer face a reduced neck 24, which carries at its outer end a platform 25, which receives and sustains the lower ends of tubes 4 17 and rod 19, which latter 35 is attached by fusible metal 20 to the upper face of the platform. This construction is intended for use when the device is attached to boilers whose furnaces are unusually hot and will, as readily understood, permit the water in the boiler to flow beneath 40 the platform 25, and thus prevent premature fusing of the metal 20, or, in other words, will prevent fusing of the metal until the water falls to the proper point below the platform.

45 From the foregoing description it will be seen that I produce a simple and efficient device which in practice will be positive in its operation and will be absolutely free from liability of improper action, and in attaining 50 these ends it is to be understood that I do not limit or confine myself to the details herein shown and described, inasmuch as various minor changes may be made therein without departing from the spirit or scope of 55 the invention.

Having thus described the invention, what I claim is—

60 1. In a device of the class described, the combination with a boiler and its furnace, of an alarm, means for sustaining the same, a conduit for conducting steam from the boiler

to the alarm, a valve, means for maintaining the valve normally closed, said means including a member attached to the furnace crown-sheet by a fusible metal, and means operated 65 by the release of the member for automatically opening the valve.

2. In a device of the class described, the combination with a boiler and its furnace, of an alarm, means for sustaining the same, a 70 conduit for conducting steam from the boiler to the alarm, a valve, means for maintaining the valve normally closed, a casing, a rod mounted in the casing and having its lower end attached to the furnace crown-sheet by 75 a fusible metal, and a spring for actuating the rod when released from the crown-sheet to automatically open the valve.

3. In a device of the class described, the combination with a boiler and its furnace, of 80 an alarm, means for sustaining the same, a conduit for conducting steam from the boiler to the alarm, a valve, means for maintaining the valve normally closed, a tubular casing connected at its lower end with the crown- 85 sheet and extending through the wall of the boiler, an inner tube mounted in the casing and provided at its upper end with a flange, a rod extending through the inner tube and having its lower end associated with the 90 crown-sheet by a readily-fusible metal, a head carried by the rod, a spring mounted on the rod between the flanged end of the inner tube and the head, said spring tending to force the rod upward, and means actuated by the up- 95 ward movement of the rod, when released from the crown-sheet, to open the valve.

4. In a device of the class described, the combination with a boiler and its furnace, of 100 an alarm, means for sustaining the same, a conduit for conducting steam from the boiler to the alarm, a valve for controlling the admission of steam to the alarm, a tubular casing connected at its lower end with the crown- 105 sheet and extending through the wall of the boiler, a cap movably mounted on the outer end of the casing, a rod carried by the cap and connected with the valve, a spring acting upon the rod to maintain the valve normally closed, a rod mounted in the casing and associated at 110 its lower end with the crown-sheet by means of a readily-fusible metal, and a spring adapted to force the rod upward when released from the crown-sheet to cause the same to actuate the valve-rod to open the valve. 115

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

WARNER S. G. HARRIS.

Witnesses:

P. A. H. ARATA,  
JOHN SMITHERS.