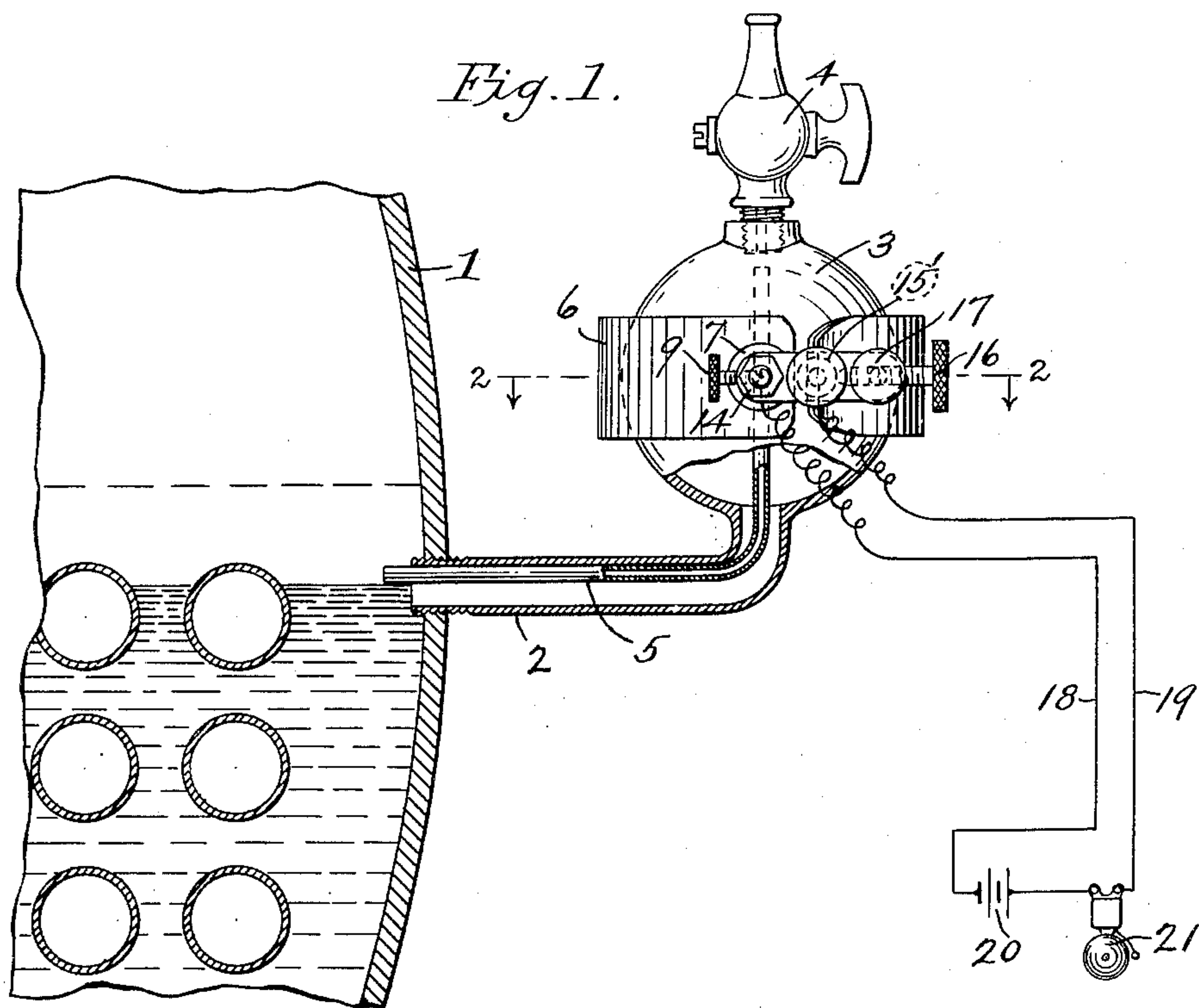
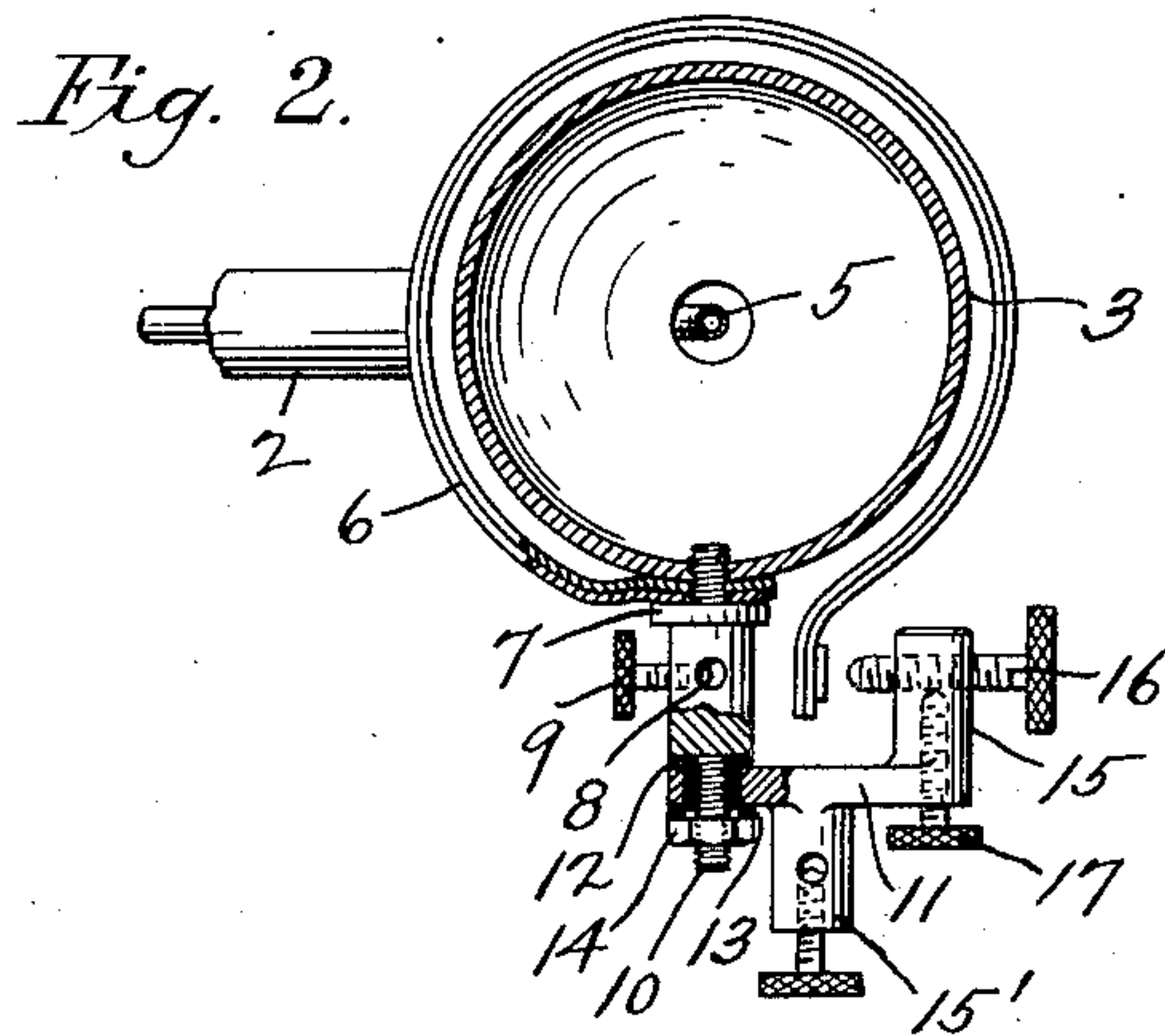


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LOW WATER ALARM FOR STEAM BOILERS.
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Witnesses:

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CHARLES BRENT, OF BRANDON, MANITOBA, CANADA.

LOW-WATER ALARM FOR STEAM-BOILERS.

No. 928,933.

Specification of Letters Patent.

Patented July 27, 1909.

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To all whom it may concern:

Be it known that I, CHARLES BRENT, residing at Brandon, in the Province of Manitoba and Dominion of Canada, have invented a certain new and useful Improvement in Low-Water Alarms for Steam-Boilers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

10 This invention relates to a low water alarm for boilers and is of a type such that when the water sinks below the danger point in the boiler a contact will be made and an electrical circuit of any suitable alarm system will be closed, thus indicating to the engineer the condition of the water in the boiler.

More specifically the invention relates to a suitable head which is normally filled with hot water from the boiler and is capable of being converted into a steam heat automatically, when the water in the boiler reaches a pre-determined low water mark, together with a thermostatic device adapted for operation by the head when it is filled with steam and thereby to make a contact and complete the circuit of an alarm system.

The invention may be further briefly summarized as consisting in construction, and combination of parts, hereinafter set forth in the following description, drawings and claims.

30 In the drawings Figure 1 shows my device applied to a portion of a boiler and Fig. 2 shows a section of the same upon the line 2—2 of Fig. 1.

Any preferred form and construction of boiler may be provided with my device and the device itself may be of any preferred construction. In the drawing, however, I have shown a portion of the boiler 1 provided with a threaded opening for receiving a pipe 2 connected to the lower part of the globe shaped head 3. This head is provided with a pet-cock 4 for the purpose of letting out any air, which may collect in the head 3.

45 A suitable device is provided for admitting steam from the boiler to the top of the head 3 when the water stands below the mouth of the pipe 2 and this device consists of a smaller pipe 5, within and extending from the mouth of the pipe 2, up into the head 3 to a point near the top thereof. This pipe 5 is held in place by securing it, as by soldering, to the upper portion of the pipe 2, as shown in Fig. 1.

55 It will be seen from this construction that

when the water in the boiler stands above the mouth of the pipe 2, the head will be filled with water from the boiler, but when the water in the boiler sinks below the mouth of the pipe 5 steam will pass through such pipe and up to the top of the head 3 with the result that the water in the head will be forced out through the pipe 2 and the head will be converted into what may be termed a steam head and the temperature thereof will be greatly increased. If air is present in the head 3 the pet-cock 4 may be opened and the air released.

A thermally controlled contact is provided upon the outside of the head 3 and it consists of a thermostatic bar 6 surrounding the head and secured at one end to the head 3 by means of a post 7, which may be provided with an opening 8 and a binding screw 9 for one lead of an alarm circuit, and with a threaded shank 10 adapted to receive a bracket 11 which is insulated from the shank 10 by washers 12 and 13 and is held in place by a clamping nut 13. This bracket 11 is provided with a binding post 15 and a contact screw 16 adapted to be held in any adjusted position by a set screw 17. This contact screw 16 is arranged to cooperate with the free end of the bar 6.

85 The bar 6 encircles the head as stated and its free end is arranged normally out of engagement with the contact screw 16.

The device may be used with any suitable electrical alarm and it operates in the following manner. One of the leads of the circuit is connected to the post 7 in the opening 8 and the other is connected to the binding post 15, which is insulated from the post 7. Normally when the water in the boiler stands above the mouth of the pipe 2 the head 3 is filled, any air present in the head having been exhausted through the pet-cock 4, but when the water in the boiler sinks below the mouth of the pipe 2 steam will pass through the pipe 5 to the upper part of the head and force the water therein back into the boiler when the head will be converted into a steam head and the increase in temperature thereof due to the heat of the steam, will cause the bar 6 to expand and bring its free end into engagement with the contact screw 16 whereupon the alarm circuit is closed and the alarm is sounded.

110 In adjusting the device the contact screw 16 is manipulated in a manner such that when the head 3 is filled with water the free

end of the thermostatic bar is out of engagement with it but upon the conversion of the head into a steam head the expansion of the bar due to the increase in temperature, will
5 readily bring the free end thereof into engagement with it.

The device is connected to a suitable alarm system which is preferably of the electrical type and consists of a pair of leads 18 and 19
10 leading from the device to a battery 20 and bell 21, which are connected together in the usual manner. When the thermostatic bar engages a contact screw 16 the circuit is complete and the bell will ring as long as the en-
15 gagement lasts.

Having described my invention, I claim:—

1. In a low water alarm for steam boilers, in combination, with an alarm system, of a head in open communication with the boiler,
20 means for supplying steam from the boiler to said head whereby upon the water in the boiler sinking below a certain point steam will pass into said head and convert the same into a steam head, and a thermostatic device
25 surrounding said head and adapted when said head is converted into a steam head to cause the alarm to operate.

2. In a low water alarm for steam boilers,

the combination with an alarm system, of a head in open communication with the boiler, 30 means for supplying steam from the boiler to said head whereby upon the water in the boiler sinking below a certain point steam will pass into said head and convert the same into a steam head, a thermostatic loop se- 35 cured at one end of said head and extending around the same and a contact adapted to be engaged by the end of said loop upon the conversion of said head into a steam head.

3. In combination with the boiler, a head, 40 a pipe leading from the lower part of said head to the boiler at a point corresponding to the low water mark, a steam pipe mounted in said other pipe and extending to a point near the top of the said head, a thermostatic 45 bar secured at one end to said head, and having a free end, and a contact normally out of engagement with the free end of said bar, and an alarm circuit adapted to be closed by the engagement of said bar with said contact.

In testimony whereof I affix my signature in the presence of two witnesses.

CHARLES BRENT.

Witnesses:

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JOHN M. PROVOOST.