

J. J. OGILVIE & F. F. DIER.  
 WATER LEVEL INDICATOR.  
 APPLICATION FILED APR. 10, 1914.

1,127,084.

Patented Feb. 2, 1915.  
 2 SHEETS—SHEET 1.

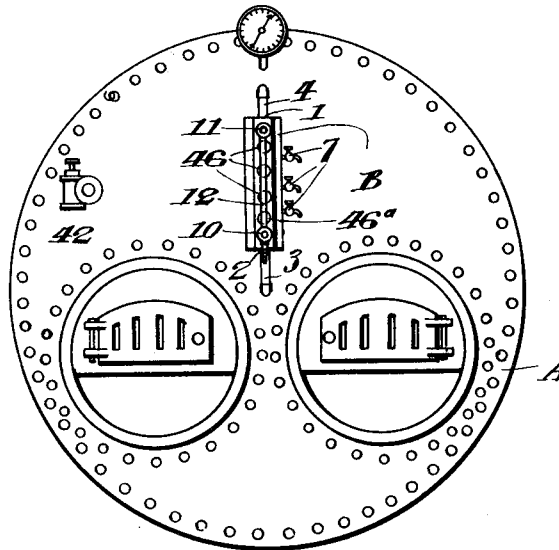


Fig. 1.

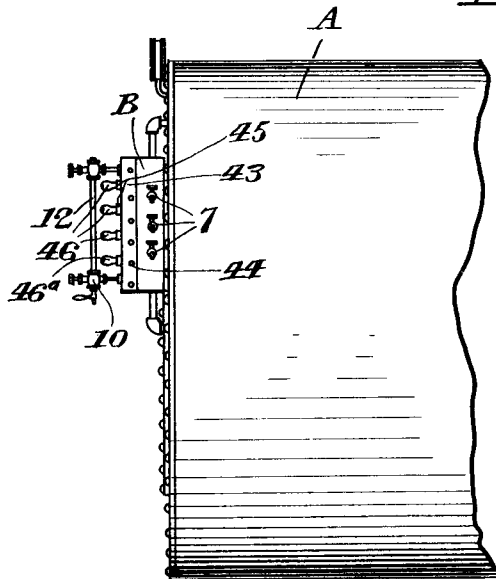


Fig. 2.

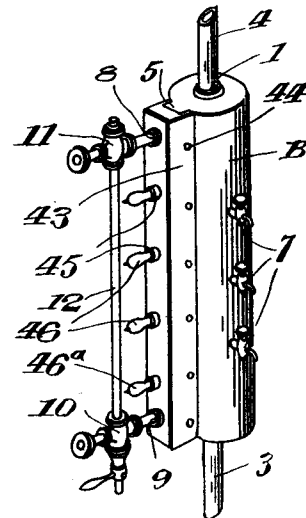


Fig. 3.

WITNESSES

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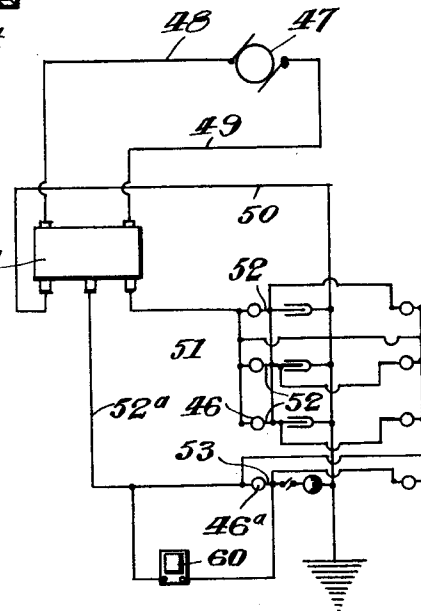
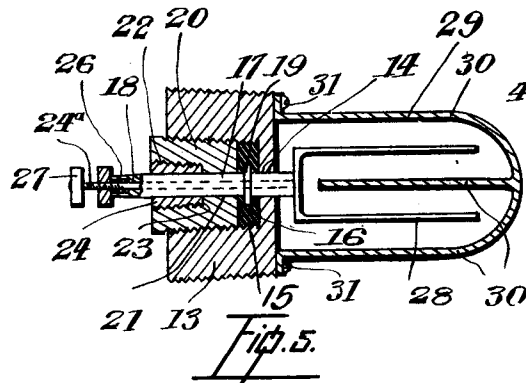
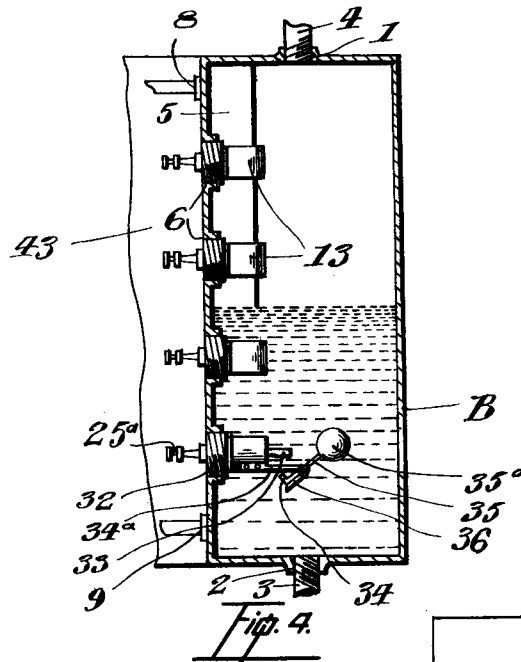


Fig. 6.

WITNESSES

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# UNITED STATES PATENT OFFICE.

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## WATER-LEVEL INDICATOR.

1,127,084.

Specification of Letters Patent.

Patented Feb. 2, 1915.

Application filed April 10, 1914. Serial No. 830,978.

*To all whom it may concern:*

Be it known that we, JAMES JOHN OGILVIE and FREDERICK FRANKLIN DIER, both subjects of the King of Great Britain, and residents of the city of Ottawa, Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in Water-Level Indicators, of which the following is the specification.

This invention relates to water level indicators which, in conjunction with gage glasses, are adapted to be utilized on boilers, feed water tanks, reservoirs and the like, and the objects of the invention are to automatically indicate the level of the water in such boiler and notify the boiler attendant by a suitable alarm when the water has reached the lowest permissible level, to simultaneously notify in the superintendent's office the water level of such boilers, to automatically replenish the water and other objects which will be made clear hereafter and it consists essentially of the improved construction of water column particularly described in the following specification and accompanying drawings forming part of the same.

In the drawings, Figure 1 is a front elevation of a boiler showing the improved water level indicator attached thereto. Fig. 2 is a side elevation of the same. Fig. 3 is a perspective view of the improved water level indicator. Fig. 4 is a vertical section of the same. Fig. 5 is a section of one of the plugs carrying the terminals located in the water level indicator. Fig. 6 is a diagrammatic view of the main wiring.

Like characters of reference refer to like parts in the several drawings.

Referring to the drawings, A represents a boiler of any usual or well known construction with the improved water level indicator B attached thereto.

This level indicator comprises a substantially cylindrically hollow column provided with threaded orifices 1 and 2 in the top and bottom ends thereof, with which the pipes 3 and 4 are adapted to make threaded engagement, such pipes being adapted to be secured to the front plate of the boiler in proximity to the normal water level. This column is provided with a rectangular projection 5 extending vertically along the outer periphery thereof, which is provided with a plurality of threaded orifices 6, the

object of which will be made clear hereafter, and is further provided with a plurality of pet or try cocks 7 mounted on the lateral side of the column and located on the same levels as the said orifices.

8 and 9 represent threaded orifices which are located at the upper and lower end of the rectangular projection 5 with which the cocks 10 and 11 are designed to make threaded engagement, such cocks being in turn adapted to carry the gage glass 12.

13 represents a circular plug which is provided with a thread extending around its outer periphery and adapted to engage with the threaded orifices 6, such plug having a concentric orifice 14 through the longitudinal axis thereof and being further provided with a second concentric orifice 15, which forms with the first said orifice a suitable shoulder 16, the second said orifice being provided with a thread on the inner periphery.

17 represents a porcelain tube provided with an orifice 18 through the longitudinal axis thereof and is provided near its inner end with a collar 19 extending around its outer periphery, the said inner end being adapted to engage with the orifice 14, the collar engaging with the packing located in the orifice 15.

The circular packing plug 20 is designed to make threaded engagement with the orifice 15, and is provided with a concentric orifice 21 extending through the longitudinal axis thereof, such plug being adapted to engage with the porcelain tube 17, and being further provided with a second threaded concentric orifice 22 which is adapted to form with the first said orifice a suitable shoulder 23.

A ring or collar 24 is provided adapted to make threaded engagement with the orifice 22, such ring having a longitudinally extending slot in its outer periphery so that as the said ring is being tightened in the said orifice it will close to a limited extent and engage with the porcelain tube 17.

24<sup>a</sup> represents a copper rod which passes through the porcelain tube 17 and is secured to the upper end thereof by means of the stuffing gland 26, such rod projecting slightly beyond the said stuffing gland and being provided with a nut 27 with which it makes threaded engagement, the other end of the said copper rod projecting slightly

beyond the bottom of the said porcelain tube and being rigidly secured to the U-shaped terminal 28.

29 represents a terminal comprising three parallel members 30 which are suitably connected at one end, the said terminal being rigidly secured to the plug 13 by means of the screws 31 and being so placed with respect to the terminal 28 that the parallel arms of the terminal 28 are located between the parallel members 30 of the terminal 29 and equidistant therefrom.

32 represents a plug adapted to engage with the lowest of the threaded orifices 6, this plug only differing from the plugs 13 in that the copper rod 25<sup>a</sup> is provided at its lower end with an enlarged head 33 with which the terminal 34 is adapted to engage.

This terminal 34 is mounted at one end of the lever 35 which is mounted intermediate of its ends to the bracket 34<sup>a</sup> carried by the plug 32, the other end of the said lever being provided with a hollow ball 35<sup>a</sup>, the upward motion of which is limited by means of the balance plate 36 which is designed to engage with the lever 35.

The column B is provided with a cover or casing 43 which is secured to the rectangular projection 5 by screws 44, such casing being provided with a plurality of sockets 45 with which the lamps 46 and 46<sup>a</sup> are designed to engage, such sockets being connected to the copper rods 24<sup>a</sup> and 25<sup>a</sup> carried by the plugs 13 and 32 in a manner now to be described.

Referring to Fig. 6, which shows a diagrammatic view of the wiring, 47 represents a source of electric supply which is connected by the wires 48 and 49 to a step down transformer 49<sup>a</sup>, such transformer being connected through the wire 50 to the water column B, and through the wire 51 to the lamps 46 which are connected to the copper rods 24 carried by the plugs 13, by means of the wires 52. This transformer is also connected to the lamp 46<sup>a</sup> through the wire 52<sup>a</sup>, such lamp being further connected to the copper rod 25<sup>a</sup> carried by the plug 32 by means of the wire 53, the said lamp being connected in parallel with the buzzer 60. The current from the transformer from the source of supply is 110 volts which is stepped down to 7, 14 and 21 volts, the current from the transformer through the wires 50 and 51 being normally 21 volts which by passing through the water is reduced to six volts before reaching the lamps 46 which are essentially 6 volt lamps while the current passing through the wires 50 and 52<sup>a</sup> is only 7 volts.

In the operation of the device the water level in the column is ordinarily seen in the gage glass 12 but this level is rendered more marked by the lamps 46 which glow when the terminals attached to the plugs 13

are submerged in the water, the current passing through the wire 48, the transformer 49<sup>a</sup>, the wire 50, the wire 52 the lamps 46 and the wire 51, the circuit being completed by the water located between the terminals 29 and 28. As the water level in the column B falls the several lamps 46 go out in succession while when the water falls slightly below the level of the center of the plug 32 the ball 35<sup>a</sup> descends with the water, causing the terminal 34 to contact with enlarged head 33 carried by the copper rod 25<sup>a</sup> thereby closing the circuit comprising the wire 48, the transformers 49<sup>a</sup>, the wire 50, the wire 53, the wire 52<sup>a</sup> and the wire 49 so causing the lamp 46<sup>a</sup> to glow and causing the buzzer 60 which is connected in parallel to the lamp 46<sup>a</sup> to be actuated.

To render the rise and fall of the water more marked different colored lamps are used. The lamps 46 and 46<sup>a</sup> are connected in parallel with a similar set of lamps C located in the boiler superintendent's office where it is possible to tell at a glance the state of the boilers and if the necessary attention is being given to the same. In the event of the electric current failing and the gage glass 12 being broken the pet or try cocks 7 can be operated to show the level of the water in the boiler.

As many changes could be made in the above construction and many apparently widely different embodiments of our invention, within the scope of the claims, constructed without departing from the spirit or scope thereof, it is intended that all matter contained in the accompanying specification and drawings shall be interpreted as illustrative and not in a limiting sense.

What we claim as our invention is:

1. A water level indicator comprising a hollow column provided with a plurality of threaded orifices in the front thereof, threaded plugs engaging therewith having concentric orifices through the longitudinal axis thereof, insulating tubes engaging with the said orifices, conducting members in the said tubes, one of the said plugs being designed to carry a low water indicating means thereon, U-shaped terminals rigidly mounted on the inner ends of the said conducting members of the remaining plugs, terminals comprising parallel members suitably connected at the outer end and rigidly mounted on the plugs, the said U-shaped terminals being located between and equidistant from the parallel members of the said second terminals, a plurality of lamps carried by the said column, and means associated with the terminals and lamps adapted to operate the said lamps as the water level in the column fluctuates.

2. A water level indicator comprising a hollow column having a plurality of thread-

ed orifices in the front thereof, a threaded plug engaging with the lowest of the said orifices provided with a concentric orifice through the longitudinal axis thereof, an  
 5 insulating tube located in the said orifice a conducting member in the said tube provided at its inner end with an enlarged head, a pivotally mounted lever having a terminal at one end designed to engage with  
 10 the said enlarged head of the conducting member, a hollow ball mounted on the other end of the said lever, means for limiting the motion of the said lever, a plurality of plugs engaging the remaining orifices in the column, terminals on the last said plugs, lamps  
 15 on the column and an electric circuit adapted to operate said lamps as the water in the column fluctuates.

3. A water level indicator comprising a  
 20 hollow column provided with a plurality of threaded orifices in the front thereof, a threaded plug engaging with the lowest of said orifices having a concentric orifice through the longitudinal axis thereof, an  
 25 insulating tube in the said orifice, a conducting member in the said tube provided at its inner end with an enlarged head, a bracket mounted on the said plug, a lever mounted intermediate of its ends to the  
 30 said bracket, a terminal at one end of the said lever adapted to make and break contact with the said enlarged head of the conducting member, a hollow ball mounted on the other end of the said lever, a balance  
 35 plate carried by the said bracket adapted to limit the movement of the said lever, a plurality of plugs engaging the remaining orifices in the column, terminals on the said

plugs, lamps on the column, and an electric circuit adapted to operate the lamps as the  
 40 water level in the column fluctuates.

4. A water level indicator comprising a hollow column having orifices therein, plugs making engagement therewith provided with concentric orifices therethrough, con-  
 45 ducting members located in said orifices carrying terminals on the inner ends thereof, terminals on the plugs embracing the first said terminals, a plurality of lamps on the column adapted to be operated as the water  
 50 level fluctuates in the column, an electric circuit including a transformer and a second set of lamps coöperating with the first said lamps and designed to form a distance signal, as and for the purpose specified.  
 55

5. A water level indicator comprising a hollow column having threaded orifices therein, threaded plugs engaging therewith provided with concentric orifices there-  
 60 through, conducting members located in the said orifices carrying terminals on the inner end thereof, terminals on the plugs embracing the first said terminals, a plurality of lamps on the column, means associated with the said lamps designed to operate the  
 65 same as the water level fluctuates, a second set of lamps coöperating with the first said lamps adapted to form a distance signal, and a buzzer, substantially as described.

In witness whereof we have hereunto set  
 70 our hands in the presence of two witnesses.

JOHN JAMES OGILVIE.

FREDERICK FRANKLIN DIER.

Witnesses:

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B. A. LEAMY.