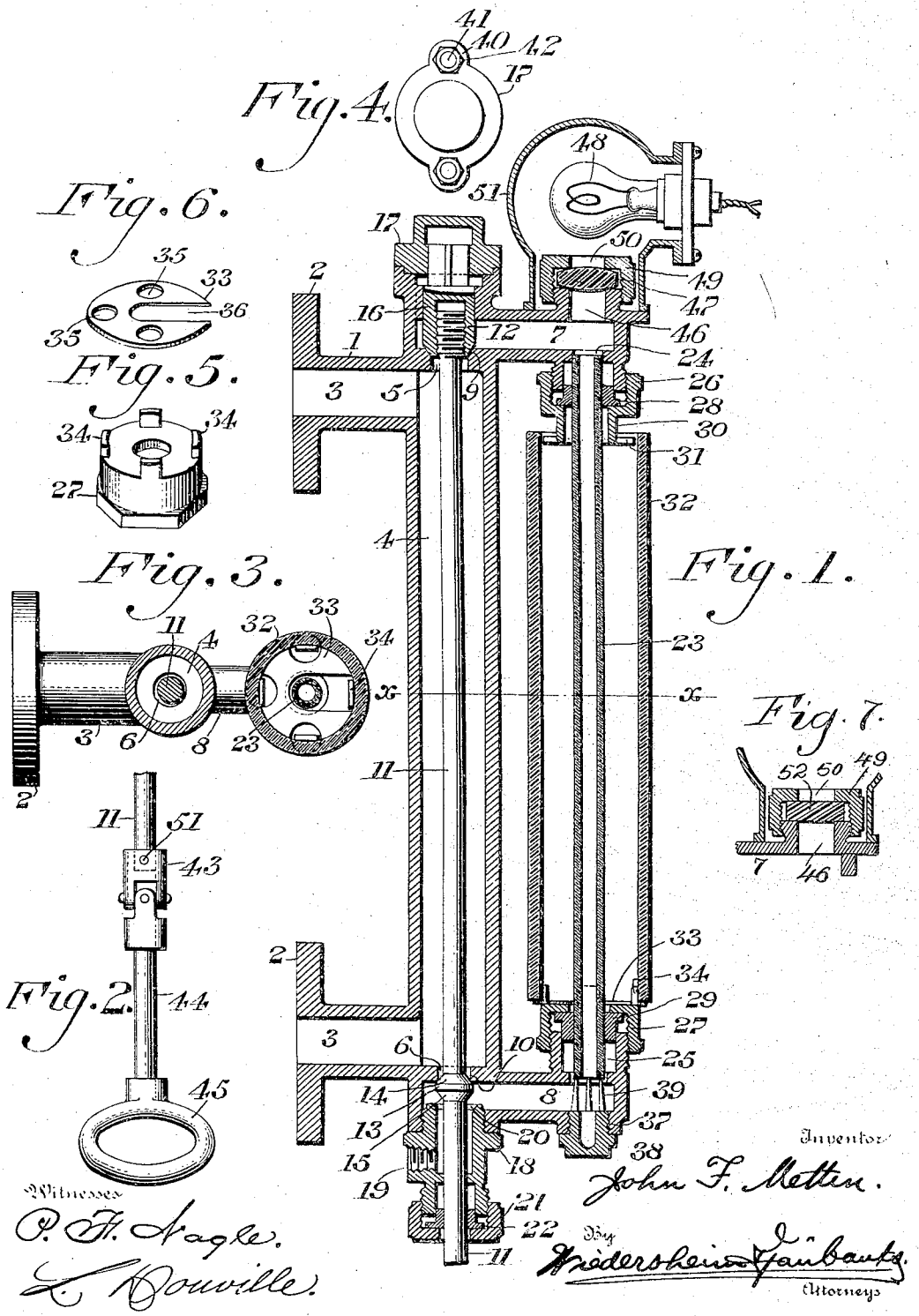
No. 767,486. PATENTED AUG. 16, 1904.

J. F. METTEN.

FLUID INDICATOR.

APPLICATION FILED MAR. 9, 1904.

NO MODEL.



No. 767,486. Patented August 16, 1904.

UNITED STATES PATENT OFFICE.

JOHN F. METTEN, OF PHILADELPHIA, PENNSYLVANIA.

FLUID INDICATOR.

SPECIFICATION forming part of Letters Patent No. 767,486, dated August 16, 1904.

Application filed March 9, 1904. Serial No. 197,316. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. METTEN, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Fluid Indicators, of which the following is a specification.

My invention relates to a novel construction of a fluid indicator.

The object of my invention is to provide a water-glass which is more convenient and more safe than those at present in use.

A further object of my invention is to provide means for supplying the water and steam to the glass and blowing off the same regulated from a common point and by a common handle.

A further object of my invention is to provide for inspection of the glass at greater distances than before and from any direction.

A further object of the invention is to illuminate the glass from such a direction that the surface-level of the water shall be readily seen.

A further object of my invention is to provide for the blowing off of the steam in case of breakage of the glass in such a manner as not to endanger the persons of those near from flying glass or scalding steam.

A further object of my invention is to protect a water-glass from drafts of cold air.

A further object of my invention is to protect the water-glass from internal strains due to the method of maintaining it in position.

A further object of my invention is to support the water-glass positively in such a manner that it may readily be removed or inserted.

A further object of my invention is to facilitate the cleaning of the operative parts of the apparatus.

A further object of my invention is to provide for the automatic draining of the glass and parts at all times when the steam and water are not directly applied to the glass.

The invention further consists of other novel features of construction, all as will hereinafter appear in the specification and claims.

Figure 1 represents a vertical longitudinal cross-section of my device through the center of the valve and the center of the glass embodying my invention, the valve-operating rod being broken away in the lower part of this view. Fig. 2 represents an elevation of the continuation of this part and the universal coupling and handle attached thereto. Fig. 3 represents a cross-section of Fig. 1 upon line *x x*. Fig. 4 represents a top plan view of a bonnet guiding the upper valve in my device. Fig. 5 represents a perspective view of a nut for retaining the packing in place at the lower end of the water-glass. Fig. 6 represents a perspective view of a disk which supports the auxiliary glass. Fig. 7 represents a partial cross-section of that portion of Fig. 1 carrying the lens, in which the place of the lens is taken by a plane glass water seal.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, 1 designates a frame having flanges 2 2 for attachment to the boiler and openings 3 3, by which the interior vertical passage 4 of the frame is made to communicate constantly with the boiler at the points desired. At opposite ends of this passage 4 are passages 5 and 6, leading to horizontal passages 7 and 8, which are in constant communication with the top and bottom, respectively, of the water-glass 23.

In the upper end of the passage 5 and the lower end of the passage 6 are formed valve-seats 9 and 10, respectively, which are adapted to be closed at substantially the same time by valves, as hereinafter described. Within the passage 4 is placed a rod 11, at the upper end of which is a threaded portion 12. Intermediate the length of the rod 11 and in proper position to engage with the valve-seat 10 is located an enlargement 13, constituting valves 14 and 15. Engaging with the threaded portion 12 is a nut 16, whose lower end is adapted to engage valve-seat 10 and whose upper end is formed of cross, rectangular, or other non-circular shape. This top engages with a corresponding recess in the bonnet 17, which thus closes the opening by which the nut 16 is inserted and prevents turning of the latter. The bonnet 17 is fastened by means of ears 40 and studs and nuts 41 and 42.

Within the lower end of the frame is se-

cured a fitting 18, providing the threaded drip-outlet 19 to passage 8, said drip being connected to suitable drain-pipe. The valve-opening 20 of fitting 18 is adapted to be closed by the valve 15 upon the downward movement of the rod. The rod 11 passes through the fitting 18, the lower end of which is provided with a nut 21 and packing-gland 22 for the purpose of sealing the same against passage of water or steam when the drip is opened.

The water-glass 23 is secured in communication with passages 7 and 8, respectively, and leakage prevented at these points by nuts 26 and 27 and packing-glands 28 and 29, respectively, the nuts being of smaller diameter than the inside of the glass 32. A tubular extension 30 of the nut 26 is provided at its lower ends with the outwardly-extending arms 31, forming a star, also of less diameter than the inside of the auxiliary glass tube 32 and resting therein. It will be seen that these arms 31 prevent lateral movement of the top of the glass tube 32, while at the same time steam and water within this outer tube are permitted to flow out between the arms 31.

The glass tube 32 rests upon the disk 33, which is in turn supported by nut 27. The projections 34 of the nut 27 extend parallel to the axis of the same and fit within the glass tube 32, preventing side movement of the same. These projections 34 pass through openings 35 and 36 in the disk 33. The opening 36 of the disk 33 permits the removal of the same from about glass 23 when glass 32 is raised sufficiently to permit the disk 33 to clear the projections 34. The threaded opening 37, communicating with the passage 8 and directly below the glass 23, permits withdrawal or insertion of the latter through this opening and is closed by hollow plug 38, which is provided with fingers 39. These fingers support the water-glass positively, yet permit free passage of water therethrough.

At its lower end the rod 11 is provided with a universal joint 43, to which is attached by rod 44 the handle 45, which is placed at a convenient point in the boiler-room. An opening 46 directly opposite opening 24 likewise communicates with passage 7 and is closed at its upper end by glass 47, which is here shown in the form of a lens, but may be of plane disk or other lens form for the purpose of transmitting the rays of lamp 48 with or without convergence or divergence of rays, as may at any time be desired.

The glass 47 is held in place by nut 49, having an opening 50 in line with the opening 46. A casing 51, surrounding the glass 48, protects the same from injury and at the same time forms a reflector to render available a maximum of the light from the lamp 48.

In the modification shown in Fig. 7 the place of the lens 47 is taken by the plane glass disk 52.

The thick outer glass 32 protects the glass 23 from mechanical injury and also from quick variations in temperature due to cold drafts of air. In case of breakage of the glass 23 the broken glass is restrained within the outer stronger glass 32 and the water and steam released are guided harmlessly out through the openings at the top of the tube 32 between the arms 31 of nut 26, yet the glass 32 does not obscure the view of the water in the glass 23 during the proper operation of the device.

The openings and passages herein shown and described, with the exception of that one acting as a guide for valve 16, are preferably of circular cross-section; but it is evident that they may be of any other suitable cross-section.

The device is assembled as follows: Valve 16 is inserted within the frame 1, the upper end of rod 11 is inserted through passages 6, 4, and 5, and its threaded portion is screwed into the valve. The fitting 18, with its nut and gland, are slipped over rod 11 and screwed to place. The handle is then attached by pin 51. The cap 17 is next secured, as shown in Figs. 1 and 4. Nut 26, carrying gland 28, is inserted within the glass 32, which is then placed in line with its final position, permitting nut 26 to be started upon the threads where it belongs. Glass 32 is raised sufficiently upon nut 26 to permit nut 27 and gland 29 to be brought in line and the water-glass is inserted from the bottom, after which opening 37 is closed by plug 38, which at the same time supports the glass. Nuts 27 and 26 are next screwed home in the order stated. Disk 33 is now placed over projections 34, and glass 33 is allowed to rest upon it.

It will be evident that with water and steam freely admitted to passage 4 through openings 3 with the parts in position shown the water and steam cannot pass beyond this passage. Valve 15 is meantime free from its seat 20, allowing any water or steam remaining in the glass 23 to drip out through passage 8, valve 20, and opening 19. When rod 11 is turned by the handle in such a manner as to release screw 12 from valve-nut 16, the first result will be the dropping of the rod and valve 15 upon its seat 20, closing the drain and allowing steam or water to enter the water-glass by the valve 10 and passage 8. Almost immediately thereafter the valve 16 will be raised from its seat 9 by continued turning of rod 11 and will admit steam to the upper end of the water-glass through opening 7, the rod being turned until the valve 16 strikes the shoulder or bonnet 17 and valve 15 is jammed firmly on its seat 20. This will be the normal position of the parts when it is desired to have water and steam within tube 23 to indicate the water-level.

If it be desired to blow out the tube, this may be done by raising rod 11 bodily when it

has been turned but part way for the admission of water and steam to the water-glass. This opens valves 16 and 20 and closes valve 14. The steam and water will then be blown out through drip-opening 19.

When it is desired to shut off the water and steam from the water-glass, the rod 11 is turned in the opposite direction, drawing down the valve 16 upon its seat 9 first and thereafter almost immediately closing valve 10. The remaining water and steam in passage 7, glass 23, and passage 8 then pass out through valve 20 and drip-opening 19, the latter being open at all times. When it is desired to clean the parts and remove any sediment from passage 8 or the water-glass, this may be done very readily upon removal of plug 38.

The lamp 48 and reflector 51 throw light through the lens or glass 47 upon the surface of the water in glass 23, causing the surface of the water to appear as a dark disk readily seen at great distances. The walls of the water-glass tend to confine the rays of light within this tube, and the walls of the auxiliary glass restrict any light which escapes in its projection from the water-glass, making the space between the two glass tubes a zone of light within which and against the farther light wall of which the black disk of the surface of the water shows in strong contrast.

It is evident that various changes may be made by those skilled in the art which will come within the scope of my invention, and I do not, therefore, desire to be limited in every instance to the exact construction herein shown and described.

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

1. In an indicator, a water-glass and a source of illumination substantially within the axis of the glass but outside of the water-column the light from which source is thrown directly upon the surface of the water.

2. In a fluid indicator, in combination a water-glass whose visible interior is entirely accessible to water or steam, a source of illumination exterior to the water-glass, a reflector and a lens approximately within the axis of the water-glass whereby the rays of light from the source of illumination are directed upon the surface of the water within the glass.

3. In an indicator, a water-glass, a source of illumination and a lens directing the rays from the said source and forming a fluid seal against the boiler-pressure within the indicator.

4. In a fluid indicator, a water-glass, an auxiliary glass exterior thereto and means whereby light is projected longitudinally thereof upon the surface of the water and a limited space about the axis of the water-glass is illuminated.

5. In a fluid indicator, a water-glass, means for admitting fluid thereto, means for projecting light upon the surface of the water substantially along the axis of the water-glass and transparent means for limiting the space of direct illumination.

6. In a fluid indicator, a valve, and a valve-rod having both circular and longitudinal movement and operating the valve by either movement in either direction.

7. In a fluid indicator, a water-glass, a frame therefor having an opening, and a part provided with fingers fitting within said opening and removable therefrom, which part when in position supports the glass upon the fingers and when removed permits cleaning of the same.

8. In a fluid indicator, a water-glass, an auxiliary surrounding glass open at the top, means for supporting both glasses and means for separating the glasses positively at both ends.

9. In a fluid indicator, a water-glass, an auxiliary glass movable upwardly and open at the top in combination with means for preventing lateral movement at the top and bottom and for supporting said auxiliary glass.

10. In a fluid indicator, a water-glass, a support therefor, an auxiliary glass and an open spider whereby said auxiliary glass is prevented from lateral movement at the top.

11. In a fluid indicator, a water-glass, an auxiliary glass movable longitudinally and removable internal means for supporting the same against lateral movement.

12. In a fluid indicator in combination a water-glass, means for retaining the same, an auxiliary glass and means connecting with said retaining means but separable therefrom for supporting said auxiliary glass at the bottom from lateral movement.

13. In a fluid indicator, in combination, a water-glass, a stuffing-box therefor, an auxiliary glass, means connected with said stuffing-box for preventing lateral movement of the auxiliary glass, and means also connected with said stuffing-box for supporting the auxiliary glass against longitudinal movement in one direction.

14. In a fluid indicator a longitudinally-movable and revoluble rod, a frame having valve-seats, valves upon said rod, and means connected with said rod for automatically draining the indicator when fluid-pressure is shut off from the same.

15. In an indicator, a water-glass, two valves movable longitudinally for admission of fluid to the same and a drip-valve facing one of said valves, all said valves being located substantially in line.

16. In a fluid indicator, an inlet-valve, a combined inlet and drip valve in line therewith, and common means whereby one of the inlet-valves is opened, the drip-valve closed and the other inlet-valve opened successively.

17. In a fluid indicator, the combination of a valve and a guide therefor, a rod operating

said valve and a double valve upon said rod engaging opposite seats with opposite movement of said rod.

18. In a fluid indicator, a frame having valve-seats, a valve-rod movable angularly and longitudinally, steam and water valves thereon, a handle and a universal joint connecting said rod and handle.

19. In a fluid indicator, a source of illumination and means for directing the light therefrom in a substantially axial direction upon the surface of the fluid.

20. In a fluid indicator, a frame having valve-seats, a rod movable longitudinally and angularly, valves thereon, a handle and a universal joint connecting said rod and handle.

JOHN F. METTEN.

Witnesses:
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C. D. MCVAY.