

No. 686,150.

Patented Nov. 5, 1901.

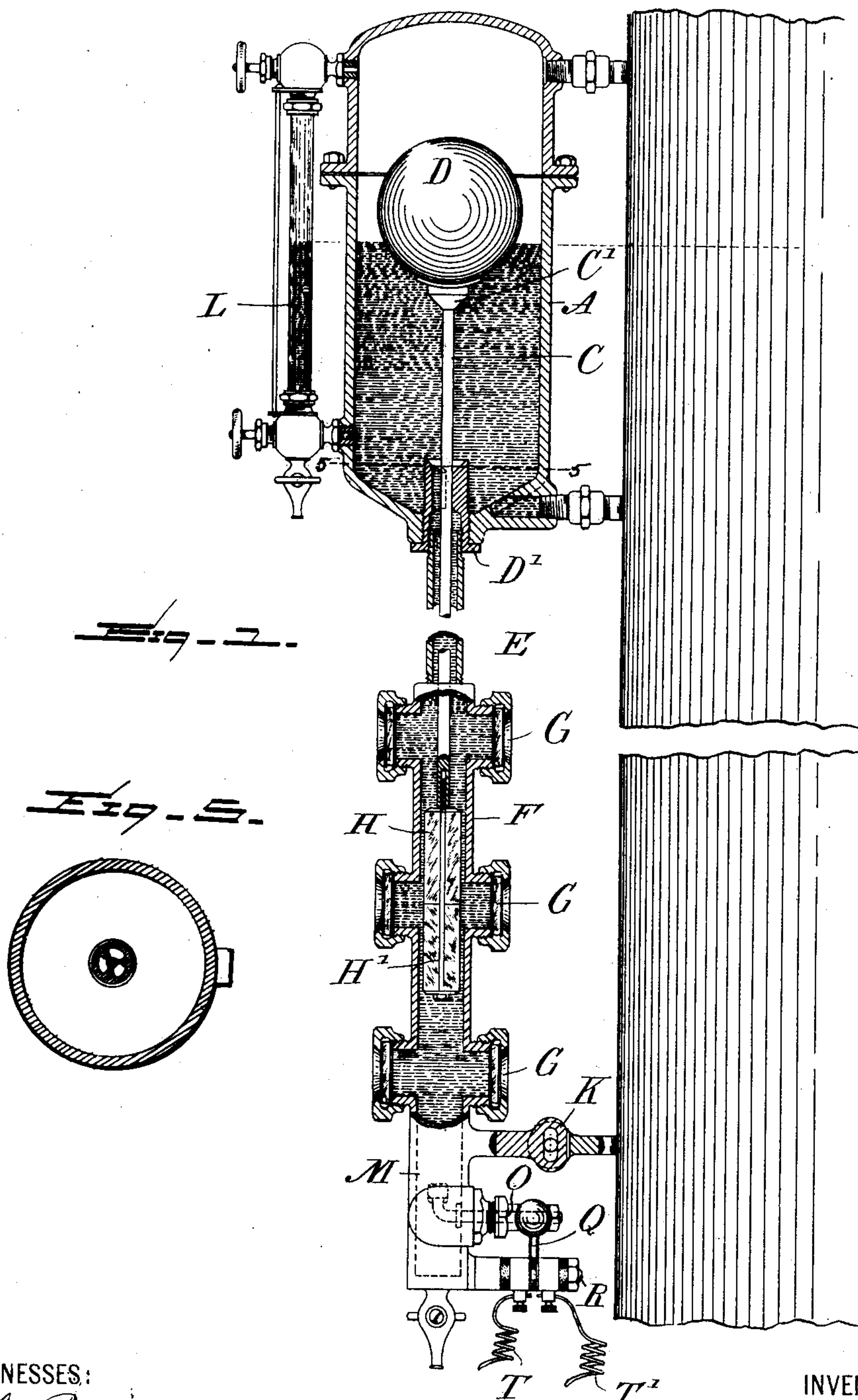
J. G. JONES & H. G. & E. G. SHORTT.

DIFFERENTIAL INDICATOR AND ELECTRICAL ALARM ATTACHMENT.

(Application filed Mar. 11, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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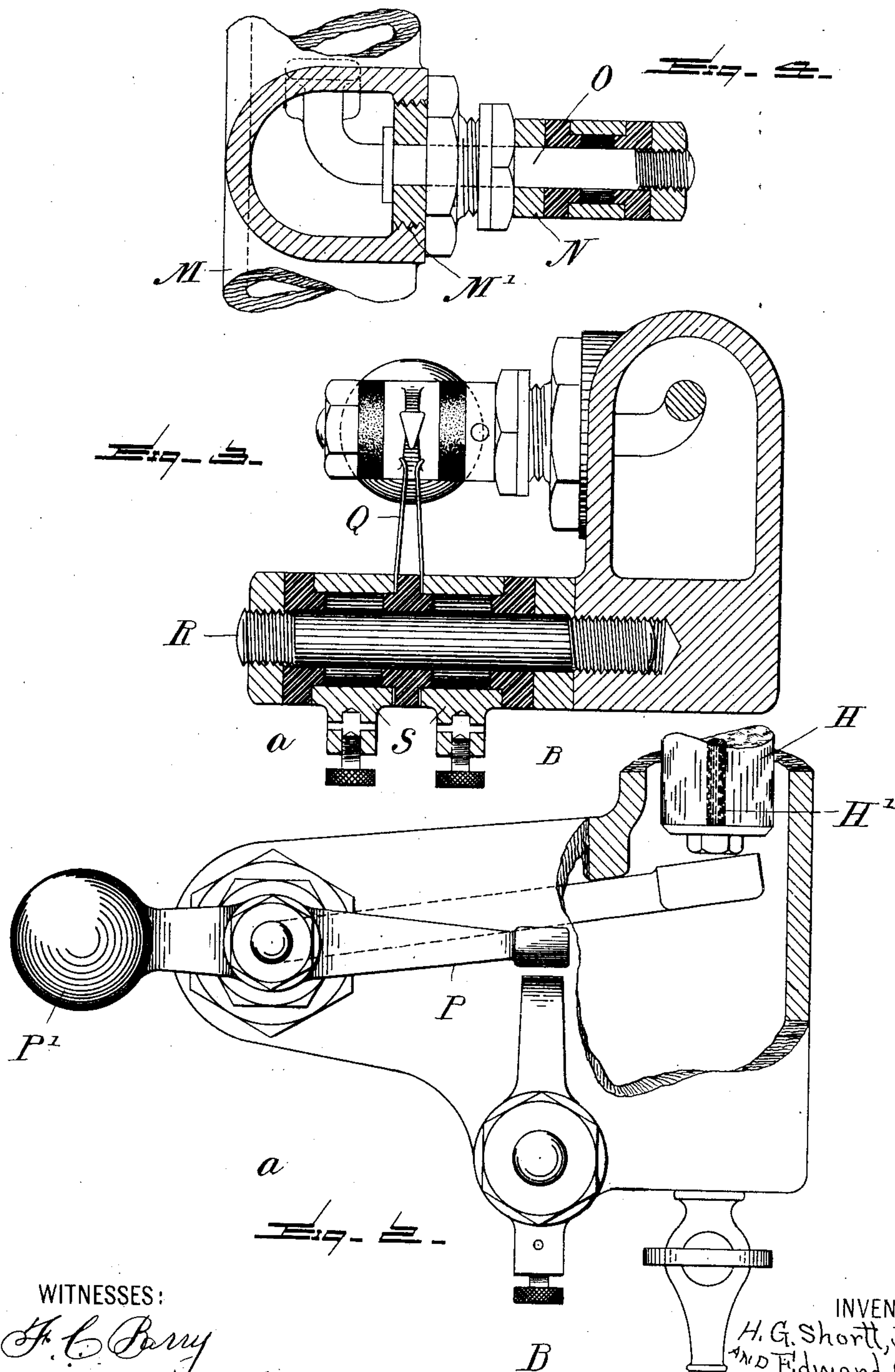
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WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN G. JONES, HOWARD G. SHORTT, AND EDWARD G. SHORTT, OF
CARTHAGE, NEW YORK.

DIFFERENTIAL INDICATOR AND ELECTRICAL ALARM ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 686,150, dated November 5, 1901.

Application filed March 11, 1901. Serial No. 50,630. (No model.)

To all whom it may concern:

Be it known that we, JOHN G. JONES, HOWARD G. SHORTT, and EDWARD G. SHORTT, citizens of the United States, residing at Carthage, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Differential Indicators and Electric Alarm Attachments; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in gages, and especially to a differential indicator and electric alarm attachment whereby when the water or other liquid in the boilers, tanks, vats, or vessels lowers to the danger-point an electric alarm will be sounded.

More specifically, the invention consists in a liquid-gage having a float, the stem of which may be of any desired length and extending through a hermetically-sealed pipe provided at intervals with transparent disks, whereby the quantity of water or other liquid in the boilers, tanks, or vats may be indicated at different locations below or above the boilers, tanks, or vats as may be desired.

Another feature of the present invention resides in the provision of an electric attachment whereby as the water or other liquid in the boilers, tanks, or vats lowers to the danger-point the stem of the float will contact with and depress or raise a lever, which will close an electric circuit and cause an alarm to sound at any desired location, the circuit being adapted to be broken when the water or other liquid in the column rises, lifting the float-stem from the counterbalanced lever.

Our invention will be more fully described hereinafter and is clearly illustrated in the accompanying drawings, which, with the let-

ters of reference marked thereon, form part of this application, and in which drawings—

Figure 1 is a central longitudinal section through our differential water-gage. Fig. 2 is a side elevation of the lower portion of the gage, showing the electric circuit opening and closing attachment. Fig. 3 is an enlarged vertical section through the electric attachment on line B B of Fig. 2. Fig. 4 is a sectional view on line *a a* of Fig. 2, and Fig. 5 is a sectional view on line 5 5 of Fig. 1.

Reference now being had to the details of the drawings by letter, A designates the water-column, and D is a float to which a stem C is attached. In the lower end of the water-column a union D' is screwed, the upper end of which forms a seat for the beveled valve C', formed by a shouldered portion of the stem adjacent to said float. The stem C passes through said union and through a pipe E, to which latter is connected the indicator-tube F, into which water passes from the water-tube A and which is provided at different locations of its length with transparent disks G, whereby the height of the water or other liquid may be indicated at different points at the same time. To the lower end of said stem is connected an indicator H, which is centrally and longitudinally apertured to receive a threaded rod H', which passes through said apertures and with its threaded end engaging in a threaded hole in the bottom of said indicator. The lower end of said rod has a head on which the bottom of the indicator rests. This indicator may be differently colored, if desired, so that a distinct color will appear at each sight-aperture or transparent disk, so that a person may readily see at a glance one or the other color at the sight-apertures, each color adapted to indicate at a particular sight-aperture water at a certain height in the water-tube.

The indicator-tube F is provided with the usual expansion-joint K and the water-column pipe connections having the automatic ball-valves, which shut off water or other liq-

uid from the column or indicator-tube in the water-glass L, which communicates at its ends with the water-column. In case of breakage of any of the transparent disks the stem
 5 which is held in the hermetically-sealed indicator tube and pipe will drop and the valve C' will seat on the upper end of said union, and the escape of water or other liquid from the column will be prevented, and at the same
 10 time the disk may be readily replaced without inconvenience.

The lower end of the indicator-tube has a projecting or enlarged chamber M, having a threaded aperture M' therein in which an exteriorly-threaded plug N is held. This plug
 15 has an integral wrench-engaging portion N', whereby the plug may be secured to or removed from the threaded aperture in said enlarged chamber. This plug is centrally apertured to receive the rounded shank portion of
 20 the rocking lever O, which is suitably packed therein, being allowed to turn freely therein. About the circumference of the outer end of said plug are threads to receive the nut N²,
 25 which coöperates with the nut N³, mounted on the outer threaded end of the shank of lever O to hold the two insulating-rings N⁴ against the collar N⁵, which carries the contact-arm P and which rests on shoulders on
 30 the inner faces of said insulating-rings. Said lever O at a location adjacent to the inner end of the plug N and within said enlarged chamber is bent at right angles to the shank portion passing through the plug, and its free
 35 inner end is flattened, as at O', and positioned directly underneath and in the path of the indicator H, whereby as the lower end of said indicator comes in contact with and rests its weight upon said flattened portion the inner
 40 end of the lever will tilt down, the shank portion of same making a partial revolution within the plug N. As the collar N⁵ and insulating-rings N⁴ are clamped between the nuts N² and N³, they will also rotate with said
 45 shank portion. Integral with the collar N⁵ is a counterbalanced circuit-closing arm P, one end of which is weighted, as at P', while its other end is designed to be held over the contact-points Q. These contact-points Q are
 50 mounted on a pin R, which is held by the wall of the indicator-tube and suitably insulated from said pin. Collars S, provided with binding-posts, are also supported by said pin R, also insulated from all contacting surfaces,
 55 excepting contact being had between each collar and one of the contact-points, the circuit being closed by the free end of the closer P as the latter is depressed by the stem of the float when the water or other liquid in the
 60 boilers, tanks, or vats lowers to a danger-point, said closer coming in contact with the upper ends of the contact-points. To said binding-posts are connected the wires T and T', one of which may be connected to a bat-
 65 tery and the other to a bell. (Not shown.)

In operation when the boilers, tanks, or vats contain water or other liquid above the danger-point, or vice versa, the circuit will be broken by the weighted end of the circuit-closer holding the opposite end of the closer
 70 out of contact with the contact-points. This is the normal position of the parts when there is a sufficient quantity of water or other liquid in the boilers, tanks, or vats. When the water or other liquid lowers to the danger-
 75 point, the lower or upper end of the stem of the float will come into contact with the free end of the lever at the lower or upper end of the indicator-tube, and the float and its stem being heavier than the weighted end of the
 80 closer the latter will be caused to rock upon its axis and the free end of the closer will be thrown against said contact-points, thus closing the circuit and causing an alarm to be sounded. When the water or other liquid is
 85 replenished in the boilers, tanks, or vats, the float will rise, and the weight of the float being relieved from the closer the latter will under the influence of its weighted end resume its normal position and the circuit will
 90 be broken.

Having thus described our invention, what we claim to be new, and desire to secure by Letters Patent, is—

1. A differential water-gage and electric
 alarm attachment, consisting of a water-col-
 95 umn, a float therein, an indicator-tube, a stem to said float passing through said indicator-tube, indicators of different colors secured to said stem, transparent sight-aper-
 100 tures at different locations in said tube, and means for sounding an alarm when the water lowers to a danger-point, as set forth.

2. A differential gage for water or other
 liquid, and electric alarm attachment, con-
 105 sisting of a water-column, a float therein, an indicator-tube and pipe connections with said water-column, a stem secured to said float and passing through said pipe and indi-
 110 cator-tube, an indicator consisting of one or more colored signals or targets, secured to the lower end of said stem, transparent disks in said indicator-tube at different locations, an electric circuit-closer and lever disposed
 115 in the path of said indicator or stem, whereby as the float lowers and the indicator contacts with said lever, the circuit will close and sound an alarm, as set forth.

3. In combination with the water-column, the indicator-tube, the float and stem, a coun-
 120 terbalanced closer and rocking pin on which it is mounted, said pin being journaled in the wall of the indicator-tube, a lever integral with the inner end of said pin, the free end of said lever being located underneath the
 125 stem, whereby as said stem lowers against the lever, the latter will be caused to tilt and the closer to close an electric circuit, as set forth.

4. In combination with a water-column, the indicator-tube, the float in the water-column,
 130

the stem secured to said float, the lower end
of said tube having an extended chamber,
an apertured bushing mounted therein, a
stem journaled with suitable packing in said
5 bushing, a lever integral with the inner end
of said stem and having its free end disposed
underneath said float-stem, a counterbal-
anced circuit-closer rocking with said lever-
stem, a stud secured to the wall of the indi-
10 cator-chamber, contact-points mounted on
said stud and suitably insulated, collars with

binding-posts mounted on the stud and in-
sulated, as shown and described.

In testimony whereof we hereunto affix our
signatures in presence of two witnesses.

JOHN G. JONES.
HOWARD G. SHORTT.
EDWARD G. SHORTT.

Witnesses:

F. E. SHORTT,
A. F. MILLS.