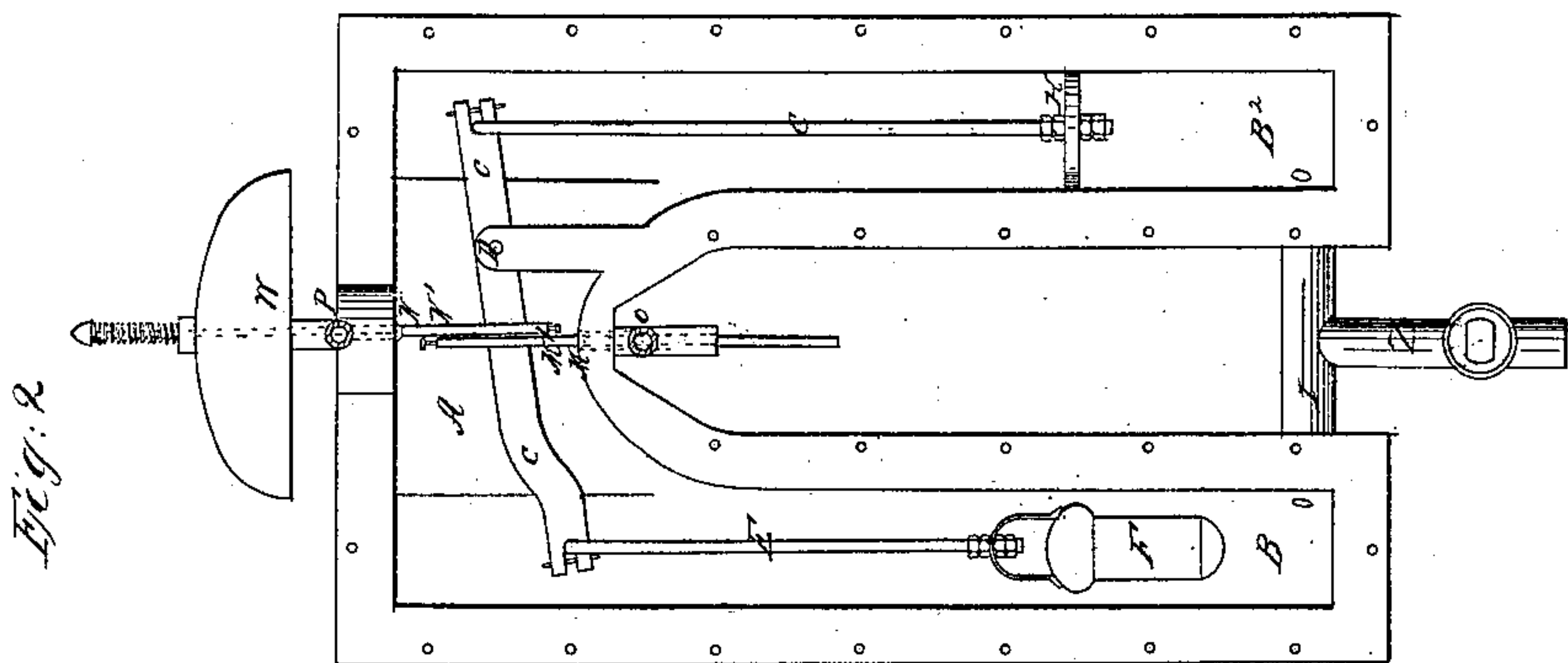
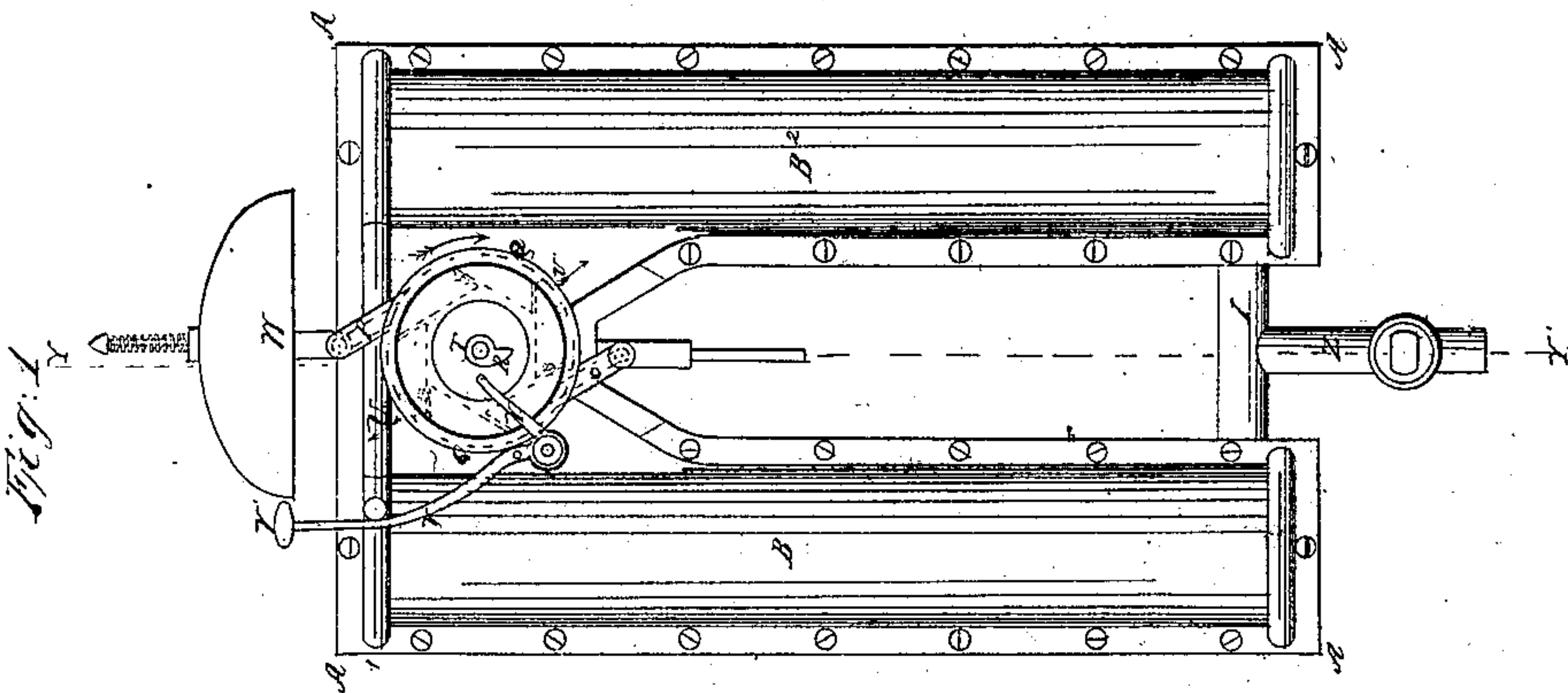
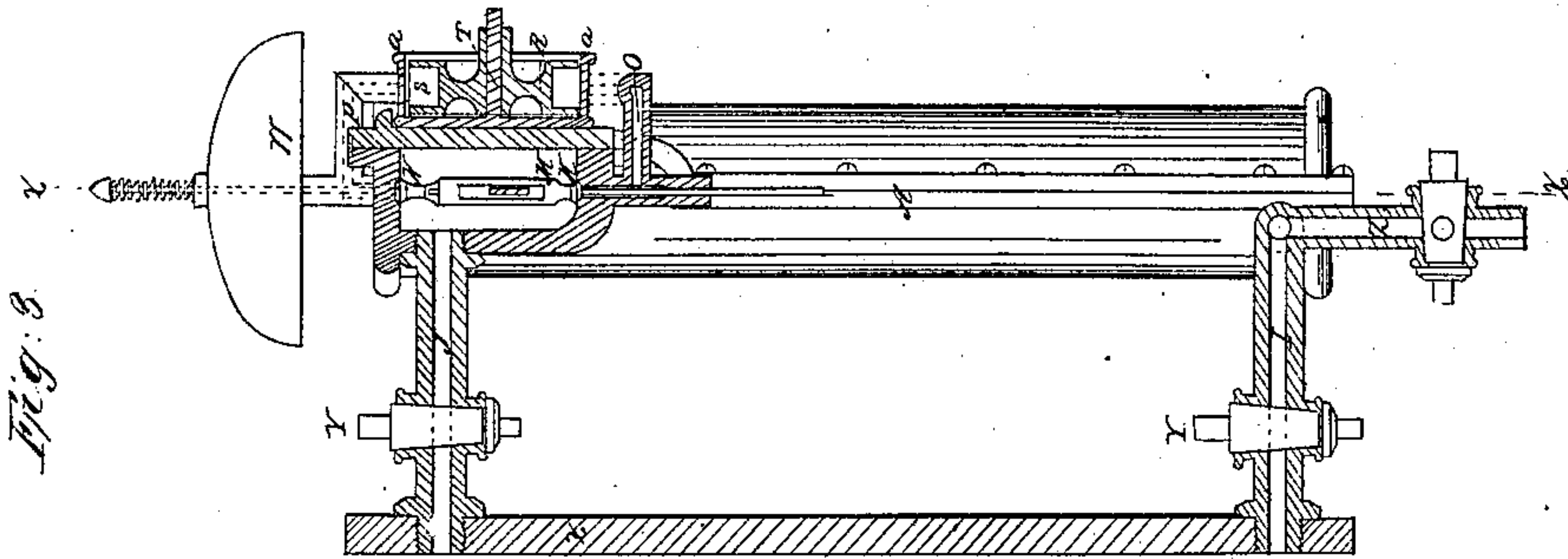


W. Palmer,
Steam-Boiler Indicator.

No 10,481.

Patented Jan. 31, 1854.



UNITED STATES PATENT OFFICE.

WILLIAM PALMER, OF NEW YORK, N. Y.

WATER-GAGE FOR STEAM-BOILERS.

Specification of Letters Patent No. 10,481, dated January 31, 1854.

To all whom it may concern:

Be it known that I, WILLIAM PALMER, of the city, county, and State of New York, have invented a new and useful Improvement in Water-Gages for Steam-Boilers, which I have designated a "Compensating Water-Gage;" and I do hereby declare that the following is a full description of the same.

10 The nature of my invention consists in making a double tubular case or box, which is attached to the head of the boiler by an upper and lower connecting pipe, so that the upper pipe communicates with the boiler
15 above the range of the water line, and the lower pipe with the boiler below the range, so as to admit the water as well, as the steam into the case, where consequently the water will rise and fall with the water in the
20 boiler. Inside of this case, at the head, and about midway between the two tubes I arrange a lever on a pivot, to one end of which I attach a rod having on the lower end of it a float, to rest upon the water in one of the
25 tubes, and rise and fall with it. To the opposite end of the lever is also attached a rod having on its lower end a compensating plate to sink into the water in the tube, in which it works, so as to compensate the sudden rise and fall of the float in the opposite
30 tube in consequence of the ebullition of the water or of the rolling of the vessel, when applied to sea going steamers. When this float sinks below a certain mark, the lever
35 opens a valve in the head of the case and the escaping steam causes a little paddle wheel, outside and in front of the case, to revolve, which by means of a cam and a hammer rings the bell on top of the case.

40 When the water and consequently the float rises too high, the lever opens another valve, and the escaping steam sets the same paddle wheel in motion and rings the same bell, but this time the steam escapes in a
45 different direction from the paddle wheel, and indicates so to the engineer that the water is too high.

The great advantage of this apparatus is, that its external application to the boiler
50 renders it accessible to examination for repairs, if out of order, a matter of great importance where gagers are used. But to describe my invention more particularly I will refer to the accompanying drawings,
55 forming a part of this schedule, the same

letters of reference wherever they occur referring to the same parts.

Figure I is a front elevation of the gage. Fig. II is a cut section of the gage through line x' , x' . Fig. III is a cut section of the
60 gage through line Y' Y' .

Letter A is the case of the gage, which is composed of two halves, having a flange around its edges, so as to admit of being bolted together, to make the case steam
65 tight.

The case consists of two hollow tubes B, B², the bores of which unite at the top, where a lever C is placed on a prop D within the case. This lever is long enough to have
70 its ends vertical over the hollow tubes. To one end of this lever is attached a rod E having a float F on its lower end, and on the opposite end of the lever is another rod G, having on its lower end a compensating
75 plate H. The use of the float is to rest on the water, which flows into the tubes of the case through the connecting pipes I and J, and rise and fall with it, but when it rises too high, it opens, by means of lever C the
80 valve, M which is connected with the lever C by rod M', and when the water falls too low, it opens by means of the same lever C the valve N, connected with the lever C by the rod N. In both cases steam escapes
85 through the valves, passes through the channels O or P in oblique directions into a circuit or case Q and causes the paddle wheel R to revolve. This paddle wheel is composed of two flanges, which form a groove
90 between them, to receive 6 or more paddles S; these paddles may set either square or obliquely, as shown in Fig. I in dotted lines, and the bottom of the groove may be worked
95 straight between each pair of the paddles, as shown plainly in the same figure in dotted lines, so as to secure the most favorable action of the steam against the paddles. This wheel turns freely on pin T, placed in the
100 center of the case Q, which fits all around the wheel, so as to prevent the escape of steam out of the wheel R, without touching anywhere. But in order to give the steam an outlet from the wheel, the surrounding case
105 Q is provided with two openings for exhaust. Consequently, when steam enters into the case Q through channel O in consequence of the water in the boiler being too high, it turns the paddle wheel R in the direction
110 of the arrow, and the steam remains within

the paddles S until they reach the opening U, where it will exhaust. When steam enters into the case Q through channel P in consequence of the water's being too low, it will also put the wheel R in motion, but the steam will exhaust through opening U'. Consequently the direction, in which the steam exhausts, will indicate to the engineer, whether the water in the boiler is too high or too low.

The hub of wheel R is provided with a cam R', which, when in motion, raises the lever V, each revolution, and causes the little hammer V' to strike the bell W.

The use of the compensating plate H is, to prevent the sudden action of the float in consequence of the ebullitions of the water in the boiler, or in consequence of the rolling of a boiler in a sea going vessel. This is done by sinking the plate H in the water in tube B', and as it nearly fits the orifice of the cylinder or tube B', there will always be a weight of water on it, requiring time to escape and consequently acting as a compensator to the tendency of the float, to follow the vibrations of the water, which would without the compensator cause a constant ringing of the bell. Should one compensating plate not be sufficient, two or more may be used as the weight of the float may require.

Letter X is intended to represent the boiler head, to which the connecting pipes are attached. These connecting pipes have

plugs Y Y in them, so that any accident require the gage being removed, it can be done, without any trouble.

Letter Z is a blow off pipe communicating with the connecting pipe of the gage, so as to blow off the water in the gage at any time.

Having now described my invention I will proceed to state what I claim, and desire to secure by Letters Patent of the United States.

What I claim is—

1. The use of the double tubular case in combination with the lever, having a float at one end, working in one of the tubes, and a compensating plate or equivalent device, at the other, working in the opposite tube for the purpose substantially as set forth.

2. I also claim the use of the lever having a float at one end of it and a compensating plate at the other, whether working in a double tubular case or otherwise, in combination with an upper and lower rod valve, for operating a bell by means of the steam escaping through these valves, whether using the paddle wheel, or any equivalent device for that purpose, to indicate the minimum or maximum of the water in the boiler, substantially as set forth.

WILLIAM PALMER.

Witnesses:

A. H. HAAK,
JAMES M. PARKER.