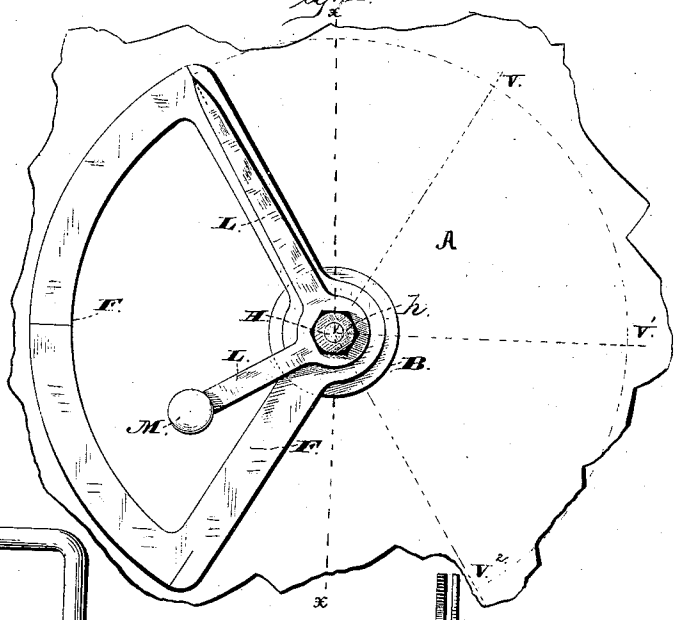
(No Model.)

S. MACFARLANE.

COMBINED GAGE COCK AND INDICATOR.

No. 322,837. Patented July 21, 1885.

Fig. 1.



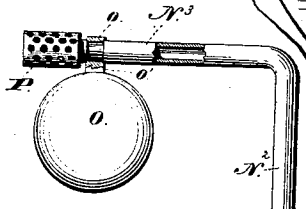


Fig. 2.

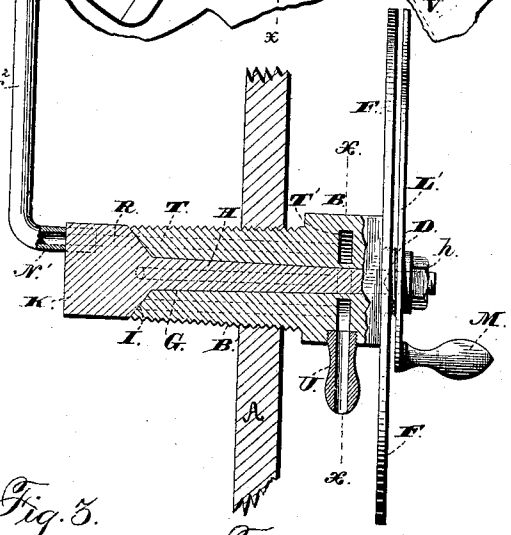


Fig. 5.

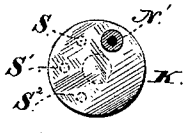
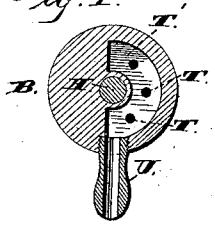


Fig. 4.



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UNITED STATES PATENT OFFICE.

STEWART MACFARLANE, OF DRIFTON, PENNSYLVANIA.

COMBINED GAGE-COCK AND INDICATOR.

SPECIFICATION forming part of Letters Patent No. 322,837, dated July 21, 1885.

Application filed October 14, 1884. (No model.)

To all whom it may concern:

Be it known that I, STEWART MACFARLANE, of Drifton, in the county of Luzerne, and in the State of Pennsylvania, have invented certain new and useful Improvements in a Combined Gage-Cock and Indicator; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 shows a view in elevation of a portion of the boiler-head with my invention applied thereto; Fig. 2, a sectional view of the same on line *x x* of Fig. 1; Fig. 3, a detail view in elevation of the inner end of the gage-cock and indicator, and Fig. 4 a transverse vertical sectional view of the cock and indicator.

Letters of like name and kind refer to like parts in each of the figures.

The object of my invention is to provide an improvement in combined gage-cock and indicator; and to this end it consists in the construction, arrangement, and combination of parts, as hereinafter specified.

In the drawings, A designates the head of the boiler, through which, at or about the height of the mean level of water within the boiler, is tapped the shank B′ of my gage-cock and indicator B. The head or outer portion of the shank is, as shown, preferably enlarged. The outer end of this portion is reduced in size and screw-threaded, as shown at D, to receive the segmental index-scale frame F, which is screwed thereon. The shank B′ is bored axially. The bore G extends throughout the shank, and is made slightly tapering from its inner to its outer end to receive the correspondingly-tapered valve-spindle H, fitting and rotating therein. The inner end of the shank is at I beveled around the end of the axial bore, so as to form a conical seat for the rotary valve-head K, fixed on or made in one piece with the valve-spindle, and on its face made to fit the flaring end of the tubular shank.

On the forward or outer end of the spindle H is carried the indicator arm or pointer L and the handle M, preferably made in one piece with the pointer, so as to stand in the same plane with, but at right angles to it. This right-angled piece forming handle and pointer is held on the spindle H by means of a nut, *h*, which forces and holds such piece against the end of the tubular shank B. I prefer to make the central portion of the inner face of the piece slightly convex or conical to fit a correspondingly-shaped central depression in the end of the shank B′ around its bore. With this construction, by screwing up the nut *h* the valve-head K can be seated firmly and closely.

Tapped into the inner face of the valve-head K, at a point outside of its axial center, is the screw-threaded end of the tube N, which, from the valve-head, is continued inward for a distance parallel to the axail line of the valve and stem or spindle, and is then bent outward at a right angle in the same plane with the axis of the valve and the point of attachment of the tube to the valve-head. The attaching portion N′ and the portion N^2 of the tube then form a right-angled crank by which the valve-head can be turned, if power were applied to it. At the end of the portion N^2 the tube is bent again in the same plane, the end N^3 projecting inward parallel with part N′. On this end portion N^3 of the tube is hung the float O, which can be cylindrical in shape, but which I prefer to make spherical. It is, as shown, swiveled on the arm N^3 of the tube, which passes through an eye or loop, *o*, in the short arm or lug *o′*, extending from the float.

The extreme end of the tubular arm N^3 is, as shown, provided with a strainer, P, to prevent any clogging matter from getting into the tube N. The right-angled piece formed of the crank-shaped handle M and the pointer is fixed on the valve-spindle, so as to be in the same plane with respect to the axis of the spindle and valve as the tubular crank carrying the float, and the radial length of the pointer is equal to that of said tubular crank. With this construction the pointer, as it travels over the curved graduated index-plate of the fixed segmental frame F, will indicate the height to which the float-carrying arm N^3 within the boiler is raised by the water. As the water rises or falls the float and arm will be carried up or down, and the indicator-hand will be correspondingly raised or depressed.

It can then be seen at a glance how much water is in the boiler.

Ordinarily boilers are provided with several separate gage-cocks to enable the true height of water in the boiler to be ascertained by drawing off at different heights. I do away with these separate cocks and make one valve perform the duty of three of them.

An opening, R, is made through the valve-head to form a continuation of the bore of tube N.

As the cranked tube is swung up and down by the buoyancy of the float on the water to turn the valve-head, spindle, and indicator, this opening R is always opposite the solid part of the shank B′, and is closed thereby.

The possible movement of the tubular crank and the valve-spindle by the action of the water on the float is less than a half-revolution, and is always on one side of a vertical plane or line through the axis of the valve and spindle. On the other side of this line are three springs, S S′ S², in the end of the shank. These openings are arranged in the arc of a circle described from the axial center of the tube, with a radius equal to the distance of the opening R from the axis of the valve-head. One, S′, is situated on a level with the valve and spindle-axis, and the others are placed one above and one below this. Each opening is one end of a longitudinal passage, T, in the wall of the tubular shank B′, and extending outward into the annular chamber T′, connecting the three passages T T T.

A short discharge-nozzle, U, is tapped through the lower side of shank B′ into the recess or chamber T′.

The operation of my invention is as follows: As the water rises or falls in the boiler the float is carried up or down and the arm N³ is raised or lowered, turning through the tubular crank the valve, valve-spindle, and pointer to indicate by the position of the end of such pointer the height of the water. During these automatic movements of the indicator obviously no water or steam can escape, for the opening in the valve-head is closed by the solid portion of the shank end. If, now, it is desired to test, as by the ordinary gage-cocks, by drawing off at different heights by means of the crank-handle M, the spindle and valve are turned over until the end of the pointer is at V. The passage through the valve-head is then in line with opening S. There is then a clear passage from the end of the tubular crank to the discharge-nozzle. If there is no water at the height at which such end stands, of course only steam escapes. The handle M is then turned further until the pointer reaches V′, and if no water then escapes, down to V². As the pointer indicates the position of the arm N³ within the boiler, the position of the pointer end when water escapes will obviously show the level of the water.

As the valve is made conical on its face, and the end of the shank B′ is correspondingly shaped, the valve can, by means of the tapering spindle and nut thereon, be drawn closely against its seat. The pressure of the contents of the boiler upon the end of the valve-head also aids to insure the proper seating of the valve.

Having thus described my invention, what I claim is—

1. In combination with the spindle turning in a suitable bearing extending through the boiler-head, the indicator-hand on the outer end of the spindle, and the valve-head on the other end thereof, provided with an eccentric opening, the crank-shaped tube attached at one end to the valve-head, with its bore coinciding with the opening therein, and carrying on its outer end the float, and the discharge-passages in the spindle-bearing, so situated that if the spindle and valve be turned over beyond the extent to which it is moved by the float the opening in the valve-head can be brought to coincide successively with the discharge-openings in the bearing, substantially as shown and described.

2. In combination with the spindle or shaft turning in a suitable bearing in the boiler-head and carrying on its outer end an indicator-hand and a suitable handle for turning the shaft, and on its inner end a tubular crank-shaped piece standing with reference to the axis of the shaft in the same plane with the indicator-hand and carrying a float, means, substantially as described, for preventing any escape of the contents of the boiler through the tube as the tubular crank is raised or lowered by the float, and for allowing such escape at different points as the shaft is turned to complete the circle of revolution, substantially as shown and described.

3. In combination with the rotary spindle, the valve-head carried on the inner end thereof provided with an eccentric opening, the tube tapped into the head, its bore connecting with such opening, said tube being bent outward in a plane with the axis of the shaft made open at its outer end, and carrying near such end a float, the valve-seat provided on the side opposite to that over which the opening in the valve moves as the valve is turned by the action of the water on the float, with a series of discharge-openings with which the opening in the valve-head can be brought into coincidence by rotating the shaft and valve, and a suitable indicator to show the position of the tube end within the boiler, substantially as shown and described.

4. The tubular shank provided on its inner end with several openings around its central bore, situated on one side of a vertical plane through the axis of the shank, and with passages from these openings communicating with a suitable discharge nozzle or opening, the spindle fitting within the central bore of the shank, carrying on its inner end a valve-head seated against the shank end and provided with an opening at the same distance from the axis of the spindle and valve as the openings in the tubular shank, the tube tapped into

the valve-head, with its bore connecting with the opening therein bent outward substantially at a right angle in a plane through the axis of the valve, and carrying on its outer open end a float, and a suitable index-hand and handle on the outer end of the valve-spindle, substantially as shown and described.

5. In combination with the tubular shank or bushing adapted to be tapped through the boiler-head, having its central bore made tapering toward its outer end, the spindle and shaft fitting and rotating therein, the handle and index-hand carried on the outer end of the shaft, the valve-head on the inner end thereof, provided with an eccentric opening, the valve-seat on the end of the tubular shank, provided with a series of openings on one side communicating with passages in the shank connected with a suitable discharge-opening, and the tubular crank attached to the valve-head, with its bore communicating with the opening therein, carrying at or near its outer open end the float, substantially as and for the purpose described.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of September, A. D. 1884.

STEWART MACFARLANE.

Witnesses:
JOHN J. JOHNSON,
JOHN J. MILLER.