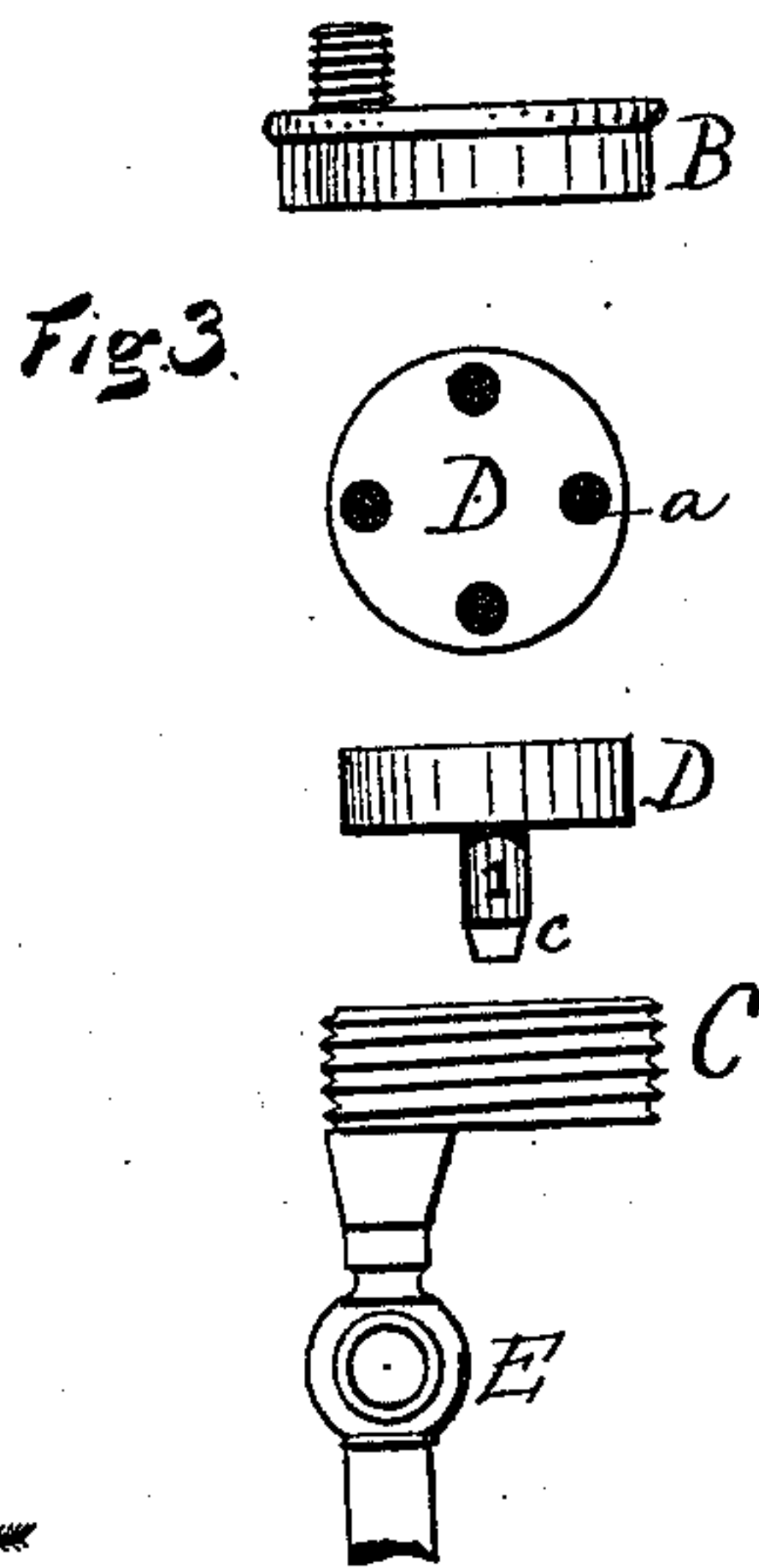
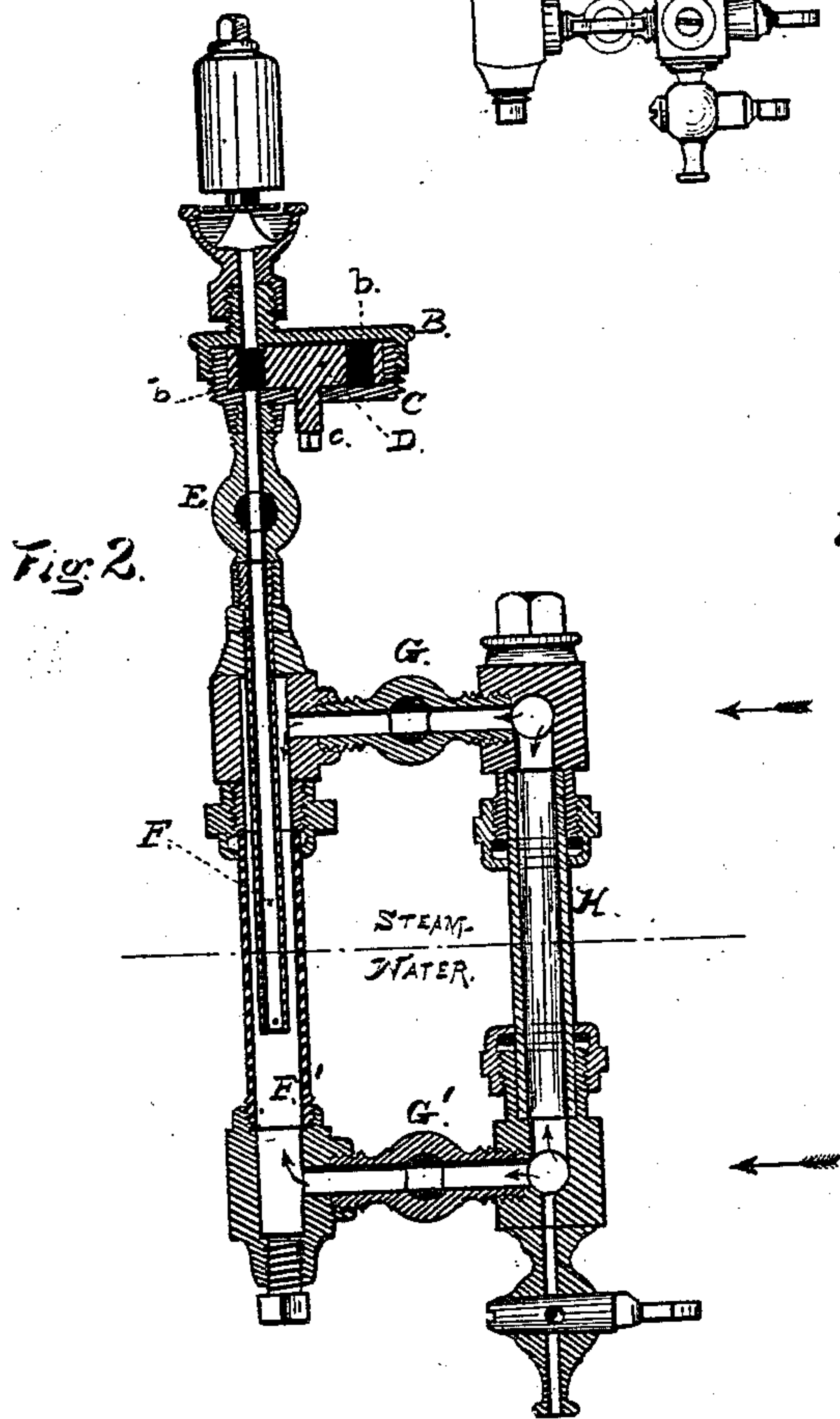
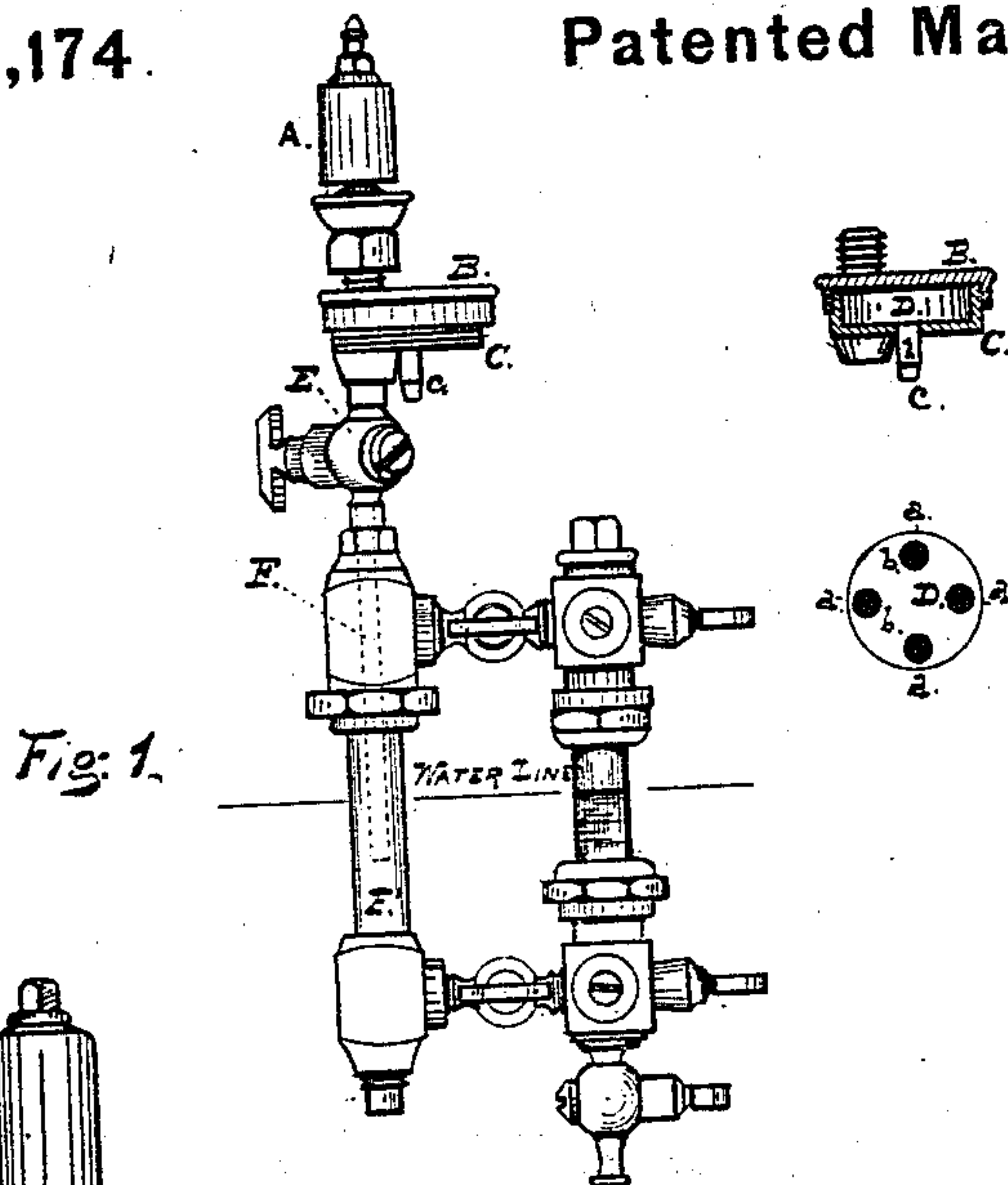


O. COLLIER.
Water Gage and Alarm.

No. 213,174.

Patented Mar. 11, 1879.



Witnesses:
Edward Osborn
E. M. Fletcher

Inventor:
Orrin Collier
E. W. Smith
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UNITED STATES PATENT OFFICE.

ORRIN COLLIER, OF SACRAMENTO, CALIFORNIA.

IMPROVEMENT IN WATER GAGE AND ALARM.

Specification forming part of Letters Patent No. **213,174**, dated March 11, 1879; application filed November 23, 1878.

To all whom it may concern:

Be it known that I, ORRIN COLLIER, of Sacramento, in the county of Sacramento and State of California, have invented certain new and useful Improvements in Water-Gages and Automatic Low-Water Alarms, which invention is fully set forth in the following specification and accompanying drawings.

My invention has for its object to construct a sure and perfect working water-gage and low-water alarm, and one that will work in an automatic manner, and so that low water can be readily detected in steam-boilers, and an instantaneous alarm be given.

My invention consists in the peculiar construction and arrangement of the means for holding a soft-metal plug in the course of the steam, so that when the water is low the steam will force the plug out of its way and sound the alarm.

Referring to the accompanying drawings for a better understanding of my invention, Figure 1 is a front elevation of my improved indicator and alarm. Fig. 2 is a vertical section, enlarged. Fig. 3 is a detail view of the parts of the fusible-plug case.

A represents a steam-whistle, which is connected to a metal cap, B, and this, by a screw-coupling, to a case, C, in which is fitted a metallic piston, D, which is perforated with holes *a a*, to receive the soft-metal plugs *b*.

To the piston D is connected a pin or stem, *c*, which passes through the bottom of the case C, the end of which is fitted to receive a wrench, so as to turn that portion of the piston having the soft-metal plug *b* in a line with the opening of the vertical pipe. Corresponding figures 1 2 3 are made on the stem and bottom of the cylinder or case, so as to indicate and insure the position of the soft-metal plug over the opening in the steam-pipes connecting with the whistle. A suitable cock, E, is attached beneath this piston for shutting off steam when necessary, and below the cock is connected a hollow perforated plug, F, which extends down the pipe F', between the low-water and steam-pressure cocks G and G', to a point near the line of the former, which connects with the boiler, so that when the water in the tube F'

settles below the perforations in the hollow plug or pipe F, steam will escape from the boiler up through the hollow plug F, and force out the soft-metal plug, which sounds an alarm through the medium of the steam-whistle at the top of the gage.

A glass indicator, H, is placed in a separate stem between the low-water and steam-pressure cocks, as an additional means for observing the state of the water in the boiler; and when the boiler is again supplied with water it will assume its natural level in the glass gage and tube, and cover up the holes in the metal plug F, so that no steam can escape until, through inadvertence or negligence on the part of the engineer, the water in the boiler is permitted to become exhausted below the line of the low-water cock.

The holes or openings in the piston may be filled with the soft-metal plugs, or each one may be put in as occasion requires; and the engineer is required to turn the piston so as to present that portion of it supplied with the plug in line with the opening in the gage connecting with the steam-whistle. This is easily accomplished by observing the numerals on the stem and bottom of the case, which correspond, as 1 1 2 2, &c., so that no mistake can be made.

The piston may be stationary and have but one opening, in which case a soft-metal plug would have to be supplied each time it was removed by the pressure of steam through the gage.

By the use of my invention a sure and safe automatic alarm and indicator is had, and one which is verily believed will prevent explosions when neglect is suffered in supplying steam-boilers with sufficient water.

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

1. The perforated piston D, movable in a case, C, connecting with a steam-outlet pipe from a boiler, when situated between the said steam-boiler and the outlet end of said steam-pipe, substantially in the manner herein set forth and specified.

2. The combination, with a steam-whistle,

of a cap, B, connected to a case or box, C, in which is a movable perforated piston for receiving soft-metal plugs, substantially as and for the purpose herein set forth and specified.

3. In a low-water alarm, a case, C, having numerals or letters upon its face, and provided with a movable perforated piston, also having numerals or letters on its stem to correspond with the numerals or letters on the case, sub-

stantially as and for the purposes herein set forth and specified.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 27th day of September, 1878.

ORRIN COLLIER. [L. S.]

Witnesses:

PHILIP MAHLER,

EDWARD E. OSBORN.