F. McGUIRE.

Boiler-Feeder.

No. 160,930. Patented March 16, 1875.

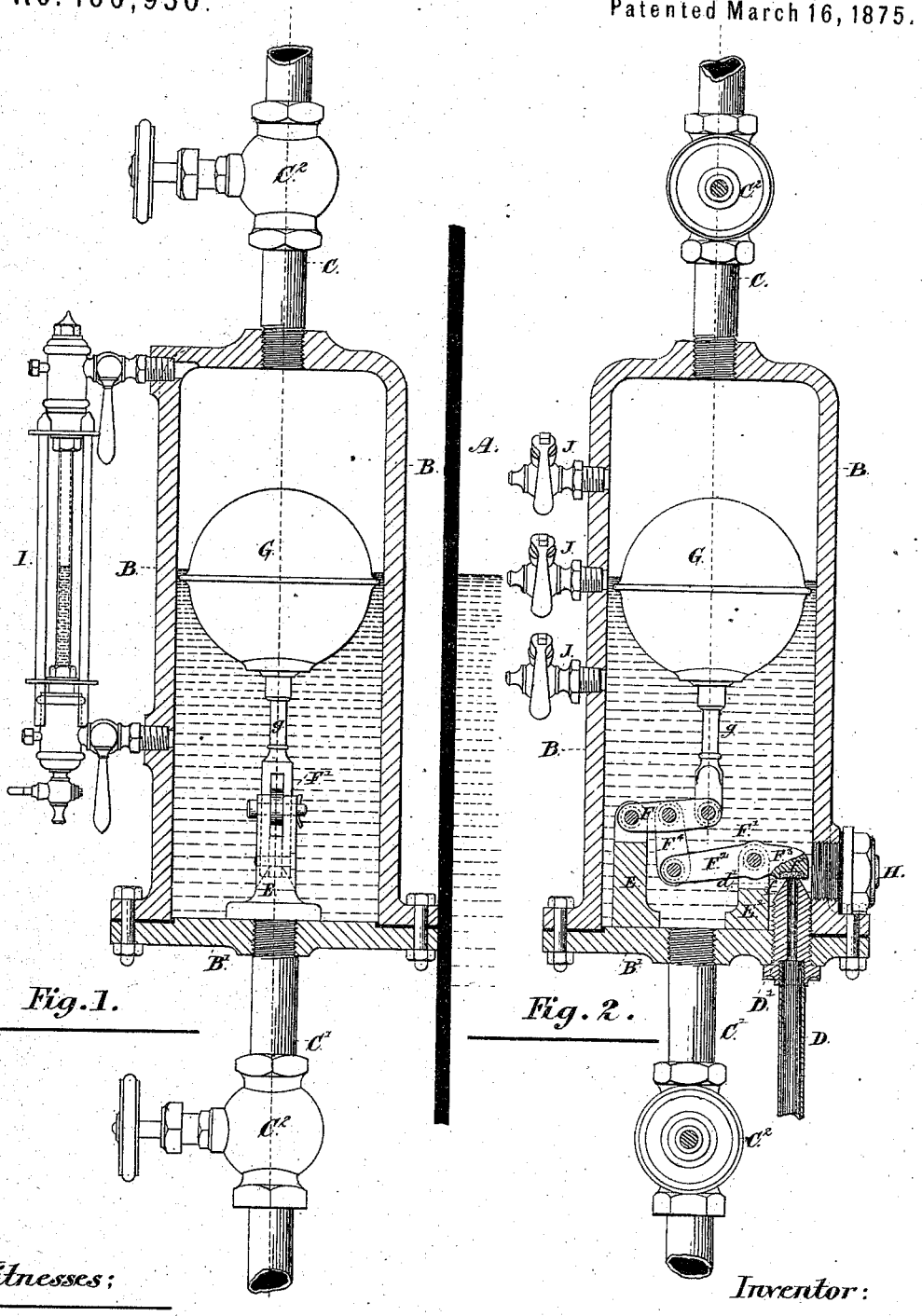

Fig. 1.

Fig. 2.

Witnesses;

Geo. A. Aird

Hugh Aird

Inventor:

Francis McGuire

per D. O'Sullivan & Co.

Atty's

UNITED STATES PATENT OFFICE.

FRANCIS McGUIRE, OF TORONTO, CANADA.

IMPROVEMENT IN BOILER-FEEDERS.

Specification forming part of Letters Patent No. **160,930**, dated March 16, 1875; application filed November 20, 1874.

To all whom it may concern:

Be it known that I, FRANCIS McGUIRE, of the city of Toronto, Province of Ontario, Canada, have invented Improvements in Boiler-Feeders, of which the following is a specification:

My invention relates more particularly to improvements in low-pressure boiler-feeders; and it consists of an upright hollow case, made of cast-iron or other suitable material, attached to the front or other convenient place on the boiler, in such a position that its center is nearly level with the water-line in the boiler.

The case is connected at the top and bottom, by pipes, with the boiler, the pipe leading from the top of the case entering the boiler above the water-level into the steam-space, the pipe leading from the bottom of the case entering the boiler below low-water mark, both pipes being fitted with globe-valves. It will be evident, then, that when both valves are open the water in both boiler and case will be on the same level.

Water under pressure is admitted to the interior of the case through a suitable pipe-connection on the lower part of the case, the aperture of this water-supply pipe being closed by a valve operated by a system of levers connected to a float buoyed on the water contained within the case.

The position and buoyant power of the float is so adjusted that when the water is at or above the ordinary working level it keeps the valve of the water-supply pipe closed; but when the level of the water is lowered by the generation and consumption of steam, or from any other cause, the buoyant or upward-pulling tendency of the float is reduced, allowing the water to enter from the water-supply pipe until it reaches its former level, when the float regains its buoyant power, closing the valve again.

To the feeder are attached the try-cocks and water-gage, which, in the ordinary construction of water-feeders, have to be applied to the boiler.

In the accompanying drawings, Figure 1 is a longitudinal section of a low-pressure boiler-feeder constructed according to my invention. Fig. 2 is a cross-section of the same.

A is the front end of a boiler, against which is placed the case B, in such a position that the line of the working water-level cuts it a little above the middle. The case B is constructed of cast-iron or other suitable material, and is fitted with a detachable bottom, B′. The case is connected to the boiler and supported by the two pipes C and C^1, the former of which connects at the top of the case and leads into the steam-space of the boiler, the latter leading from the bottom of the case to a point below the low-water level of boiler. Both pipes are fitted with globe-valves C^2, for cutting off the connection between the boiler and water-feeder. D is the water-feed pipe, fitted with globe and check valves, and connected to a plug, D′, which enters the feeder at the bottom and extends into the chamber some little distance, the top *d′* being finished conical. Through the center of the plug a hole, *d*, is drilled of smaller diameter than the supply-pipe. The water in the pipe D is supplied under pressure from the city or town main, or from any other source which will give it a sufficient force. On the bottom B′ of the feeder two standards, E and E′, are erected, to the former and higher of which one end of the lever F is hinged. To the latter the lever F^1 is pivoted, so as to form two arms, F^2 and F^3, unequal in length. The lever F is connected from a point at or near the middle to the end of the long arm F^2 of the lever F by the links F^4. The lower lever F^1 is placed in such a position that one end, F^3, is immediately over the top of the supply-pipe plug, and is enlarged to form a disk, *f*, the lower face of which is hollowed out to receive a packing of rubber, *f′*, or other suitable material, which, when the other end of the lever is elevated, presses tightly upon the top of the supply-plug, closing the opening. G is a hollow sphere float, constructed of sheet-copper or other material, of suitable diameter, and made as light as possible, in order that it may have the greatest amount of buoyant power when floating on the water. G is connected to the lever F by a rod, *g*.

In order to insure the perfect working of this mechanism I construct the pins, links, and levers of brass or other suitable material that will not corrode when in contact with the water. H is a large plug screwed into the side of the case at a point immediately opposite the

end F^3 of the lever F^1, for the purpose of conveniently examining the working of the mechanism, and for cleaning out the hole in the supply-plug should it get stopped up. I is the water-gage. J are the try-cocks. In all other feeders these trimmings have to be placed upon the front of the boiler. I claim the centralizing of these trimmings as a special advantage peculiar to my construction, as not only are they more convenient for inspection to the man in charge of the boiler, but they require less labor in fitting, and dispense with holes in the shell. Another advantage is, the fitting is done in the shop before the feeder is attached to the boiler.

For the purpose of describing the working of my feeder we will suppose that the boiler is empty. Water is admitted through the pipe D, and rises steadily in the boiler and case until it reaches the level shown on the drawings, from which level it is prevented rising by the buoyant power of the float increased by the arrangement of the levers F and F^1, to which the float is connected, closing the aperture through which the water is admitted. As the water is evaporated into steam and the steam used, the float is again lowered until the pressure of the water on the end of the lever F^1 overcomes its lifting power and flows into the feeder until it reaches its former level. Thus the water is kept at or near a constant level.

In the low-pressure boiler-feeder at present in general use the case lies horizontally across the boiler, the water-line passing through or near the center. The float contained within the case is attached to the end of a long straight lever pivoted at one end. The objection to this feeder is, that the water-line is usually very little above the top of the inlet-plug, and sometimes below, allowing the hot water and steam to act injuriously on the rubber packing, melting it and causing the lever to stick.

In my feeder the water-level is always from eight to ten inches above the packing, and, indeed, the water within the case is hardly hot enough to boil. Another advantage is, the valve opening and closing the plug-aperture has ample lift to allow the water to flow in freely, while the lift of the ordinary feeder is necessarily small. A further advantage peculiar to my construction is, that all the operating parts, including the inlet-plug, are attached to the detachable bottom, and can be adjusted and tested in the position they are to occupy before they are put within the case.

I claim as my invention—

The float G, with connecting-rod *g*, lever F, hinged to the standard E, connecting-link F^4, and lever F^1, pivoted on the standard E′, and having the shorter arm F^3 enlarged to form a disk, *f*, in combination with the case B B′ and supply-plug D′, arranged and operating substantially as and for the purposes specified.

FRANCIS McGUIRE.

Witnesses:

GEO. A. AIRD,

HUGH AIRD.