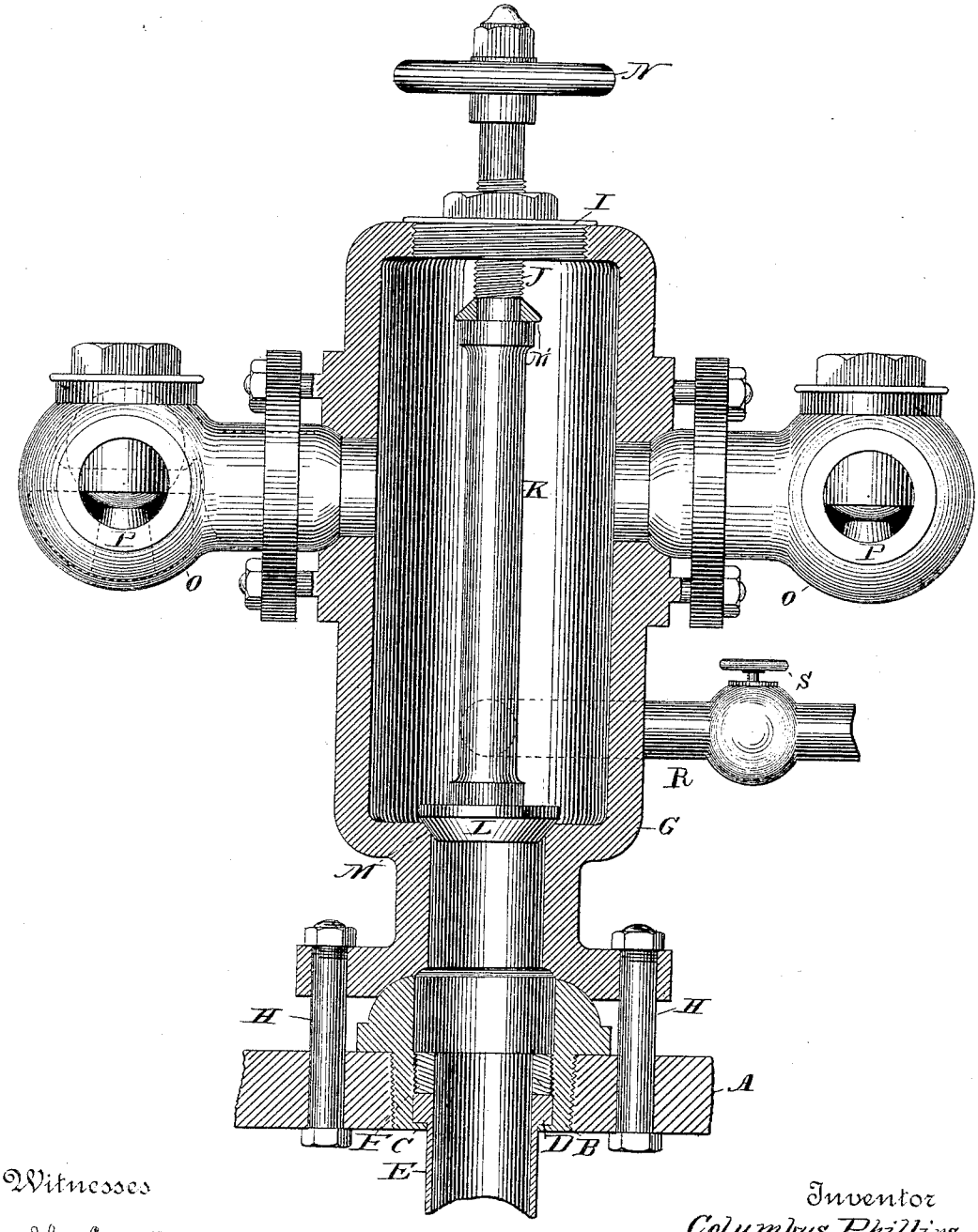
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C. PHILLIPS.

ATTACHMENT FOR FEED WATER INJECTORS.

No. 433,028. Patented July 29, 1890.

Fig. 1.



Witnesses

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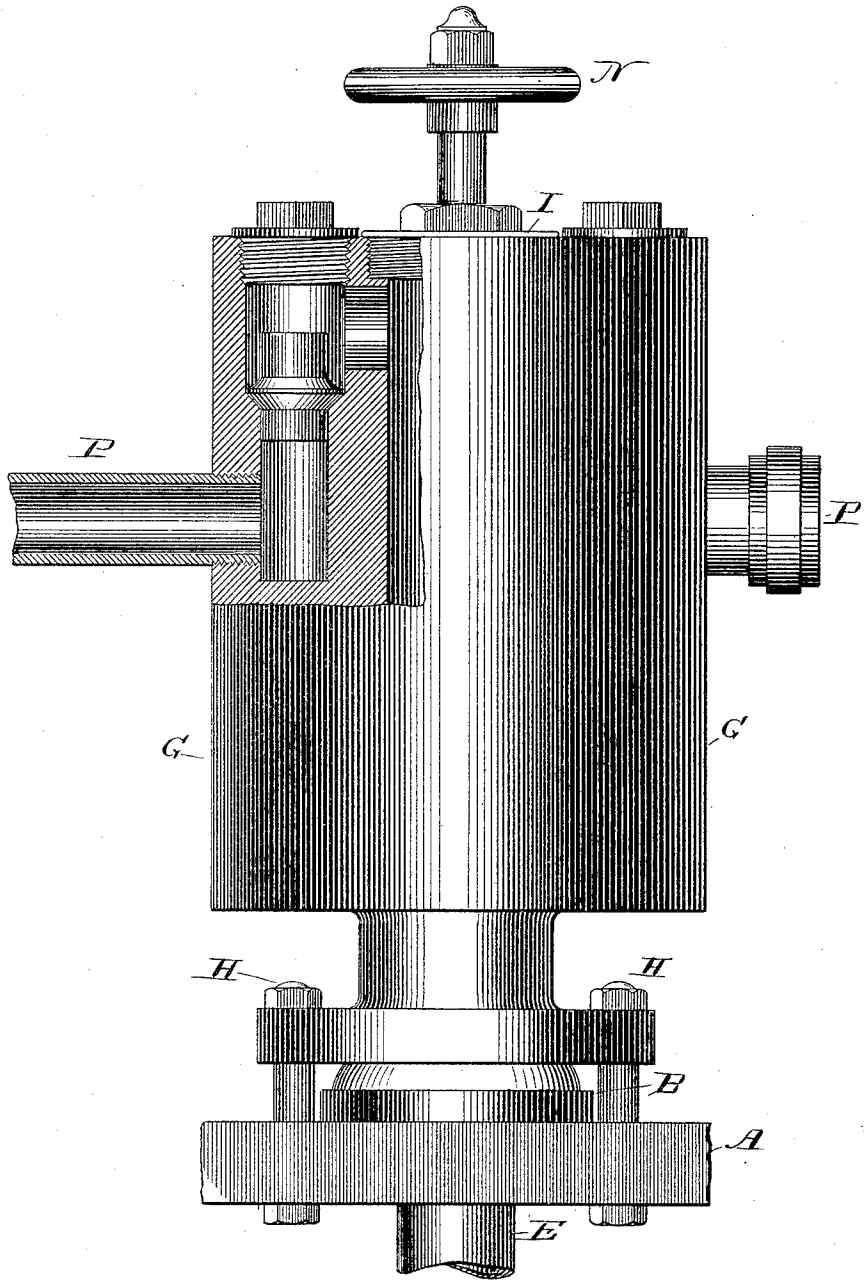
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ATTACHMENT FOR FEED WATER INJECTORS.

No. 433,028. Patented July 29, 1890.

Fig. 2.



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UNITED STATES PATENT OFFICE.

COLUMBUS PHILLIPS, OF BIRMINGHAM, ALABAMA, ASSIGNOR OF ONE-HALF TO WILLIAM B. ALEXANDER AND IRA Y. SAGE, OF SAME PLACE.

ATTACHMENT FOR FEED-WATER INJECTORS.

SPECIFICATION forming part of Letters Patent No. 433,028, dated July 29, 1890.

Application filed January 4, 1890. Serial No. 335,871. (No model.)

To all whom it may concern:

Be it known that I, COLUMBUS PHILLIPS, of the city of Birmingham, county of Jefferson and State of Alabama, have invented certain new and useful Improvements in Attachments for Feed-Water Injectors, of which the following is a specification, reference being had to the accompanying drawings.

My invention consists in a device for establishing communication between a boiler and its feed-water injector whereby the check-valves of the injector are rendered less liable to become clogged, and in independent means for positively shutting off communication between the boiler and the check-valves whereby the check-valves or the injector, or both, may be detached, cleaned, or repaired, and replaced either in the shop or on the road without lowering the steam-pressure in the boiler. It has been hitherto customary to connect the check-valves below the water-line so that the water in the boiler would be driven against the valves after each operation of the injector. The consequence has generally been, especially where there were many impurities in the water, that the check-valve would become inoperative and would stick up after a short time. In order to take out the valves it has been necessary to blow off the steam and put out the fire, which is in all cases very expensive. There is no means of knowing whether the check-valves are perfectly operative or not. If an engineer discovers that his injector apparatus is not operating properly he cannot tell whether his valves are sticking up or whether the injector is out of order, and the only thing to be done therefore has been to blow off the steam, put out the fire, and take the whole thing apart, because if he assumes that the check-valves were all right and that the fault was in the injector, and should be mistaken when he had disconnected the injector from the check-valve, the hot water in the boiler would be blown out and might cause serious injuries to the workmen. In fact, it is such a common thing for the check-valves to get out of order that discreet engineers are always afraid to adopt any other means than the one described.

By my invention I locate the checks above the water-line, and when an injector is discovered to be out of order it is only necessary to close the main valve, when all communication with the injector is shut off and the boiler made perfectly tight and safe. Afterward the parts of the injector and its checks may be examined without danger and without extra cost or loss of time. Besides this I locate the mouths of the checks opposite to each other so that a portion of the water from each is discharged into the other, and the checks thereby made less liable to become fouled. They are never exposed to the action of the water in the boiler, because they are altogether removed away from it. I also connect the spark-blower with the chamber, and thus obviate the necessity of piercing the boiler at more than one place, it being always desirable for the sake of strength to make as few openings as possible into the boiler.

In the accompanying drawings, Figure 1 represents a vertical central section, partly in elevation, of my invention. I do not show the injector, because that may be of any ordinary kind and be operated in any well-known way. Fig. 2 indicates an elevation, partly in section, of a modification of the check-valves used in connection with my invention.

Referring to the letters on the drawings, A indicates a section of a boiler, into which is screwed a threaded bushing B, provided with an internally-projecting annular flange C, upon which is carried by means of the shoulder D the discharge-pipe E.

F indicates a cylindrical cap, which is screwed into the bushing B and down upon the shoulder D to hold the discharge-pipe E in place.

The upper part of the bushing B is rounded to form a conical bearing for the bottom of the chamber G, which is secured firmly in place by bolts H passing through its base and the shell of the boiler. Into the top of the chamber G is screwed a threaded cap I, which carries, by means of the screw J, the stem K. On the lower end of this stem is carried the valve L, and at the upper end a conical shoulder or metal packing m', which forms a tight

joint with the cap I when the stem is screwed up.

M indicates the valve-seat in the bottom of the chamber G.

N indicates a handle secured to the top of the stem K, by which it may be turned for raising and depressing it. Upon the side, or preferably each side, of the chamber G is secured a joint or joints O, to which are connected a pipe or pipes P, adapted to communicate with the injector, which, as above stated, is not shown in the drawings. Within each of these joints is located a check-valve of any ordinary construction. The pipes P may be connected, as shown in Fig. 2, directly with the chamber G, and the check-valves may be carried in the chamber, as illustrated in that figure.

R indicates the spark-blower pipe, which is adapted to communicate with the extension-head of the boiler. (Not shown in the drawings.)

S indicates a valve for opening or closing the pipe R.

I do not limit myself to the details of construction hereinbefore described, because it is evident that in many respects they may be varied without departing from the scope of my invention.

The operation of my device is as follows: The stem K is screwed up and the passage from the chamber to the boiler is open. The injector is then set to work and, as demonstrated in practice, discharges into the chamber G, whence the water falls by gravity into the boiler. It will be observed that the check-valves are entirely out of reach of the water in the boiler, and that their discharge-outlets, when two or more are used, are located opposite each other. This in practice secures a certain cleansing operation, which is found to be a practical gain. If the injector becomes disabled or the check-valve refuses to operate, the stem K is screwed down until the valve L shuts upon the valve-seat in the bottom of the chamber, when the boiler is completely closed, and the parts connected with the injector may be removed.

If it is desired to use the spark-blowers, the operation of the injector is arrested and the valve S opened, whereupon the blast of steam is passed through the pipe R, as in the ordinary way.

What I claim is—

1. The combination, with a boiler, of a chamber G, adapted to receive feed-water from an injector secured to the boiler above the water-line and opening through its bottom directly into the boiler and provided with check-valves between it and the injector, a valve within said chamber adapted to fit into the opening between the chamber and the boiler to shut off the steam from the boiler, and means for operating said valve from the outside, substantially as set forth.

2. The combination, with a boiler, of a chamber G, adapted to receive feed-water from an injector secured to the boiler above the water-line and provided with check-valves discharging against each other, as and for the purpose specified.

3. The combination, with the boiler, of a chamber communicating directly through its bottom with the steam-space in the boiler secured thereto and provided with check-valves through which said chambers are adapted to communicate with an injector, and a spark-blower connected with the chamber, substantially as described.

In testimony of all which I have hereunto subscribed my name.

COLUMBUS PHILLIPS.

Witnesses:
O. D. UNDERWOOD,
H. D. LONG.