

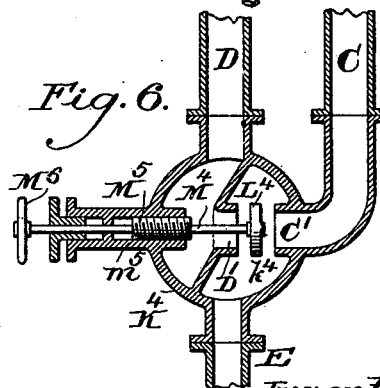
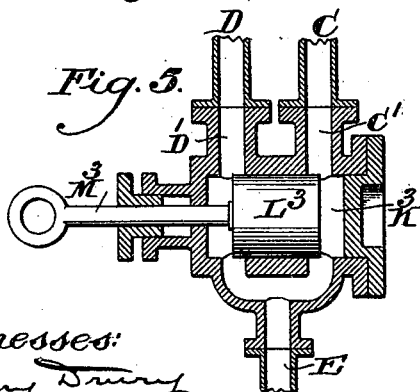
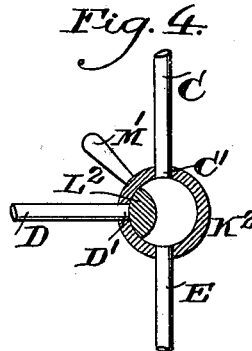
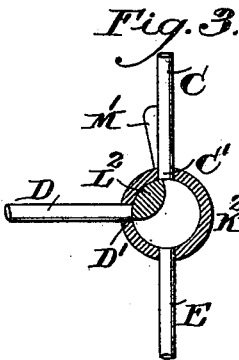
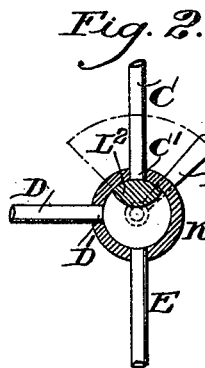
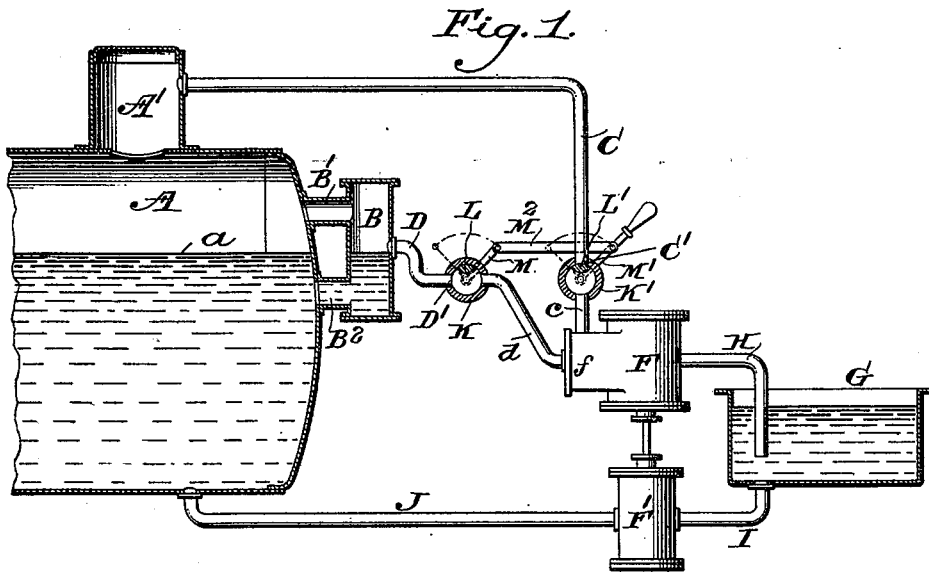
No. 646,062.

Patented Mar. 27, 1900.

F. J. WEISS.
BOILER FEEDING DEVICE.

(Application filed Aug. 8, 1899.)

No Model.)



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UNITED STATES PATENT OFFICE.

FRANZ JOSEPH WEISS, OF BASLE, SWITZERLAND.

BOILER-FEEDING DEVICE.

SPECIFICATION forming part of Letters Patent No. 646,062, dated March 27, 1900.

Application filed August 8, 1899. Serial No. 726,515. (No model.)

To all whom it may concern:

Be it known that I, FRANZ JOSEPH WEISS, a citizen of the Republic of Switzerland, residing in Basle, in the canton of Basle, in the Republic of Switzerland, have invented a certain new and useful Improvement in Boiler-Feeding Devices, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to feed-water pumps for boilers, and particularly to feed-water pumps of the general character described in my former patent, No. 623,229, of April 18, 1899, in which provision is made for automatically maintaining a determined normal water-level in the boiler.

While my feeding mechanism, as described in my said former patent, is thoroughly effective in its automatic working, it is desirable at times to place the charging of the boiler with water under the control of the engineer, so that he can continue the working of the motor-cylinder of the feed-water pump with steam after the water has reached the normal water-line and until such time as he thinks it desirable to discontinue the feed and permit the automatic charging mechanism to resume control. This is provided for in my patented construction by means of a supplemental steam-pipe leading from a point in the boiler above the normal water-line to the motor-cylinder of the pump, said supplemental steam-pipe being provided with a cock, by means of which it is opened or closed at will. In the working of this apparatus, however, it is found that when the cock is open to its full extent the pump under certain conditions is apt to run away, owing to too great a supply of steam, while, on the other hand, if the flow of steam is regulated by means of the stop-cock in the supplemental pipe the pressure in the boiler is apt to exceed that in the delivery end of the pipe leading from the water-line level, so that water will be forced through this pipe into the motor-cylinder. This defect in the apparatus can, it is true, be overcome by providing, by means of regulating-cocks or otherwise, for a resistance to the flow of fluid through the steam and water supply pipe, which will be at all times as great as the back pressure

caused by the throttling of the steam in the supplemental pipe, and such mechanism is shown in and forms the subject-matter of my application for Letters Patent filed August 8, 1899, Serial No. 726,514.

My present application has for its object to provide for the positive closing of the main steam and water supply pipe whenever the supplemental pipe is opened and alternatively the closing of the supplemental pipe whenever the main pipe is open. This of course can be effected by coupling-valves in each of the pipes, so that they will alternately and reciprocally close and open the pipes or by providing a single valve or cock adapted to serve the same purpose. This, however, would be unsatisfactory unless the valve or valves were so constructed and arranged as to make it impossible to simultaneously close both of the supply-pipes leading to the pump; and my invention consists, broadly speaking, in providing one or more valves arranged to alternately and reciprocally close and open the main and supplemental supply-pipes and in so constructing such valve or valves that they will not simultaneously close both pipes.

Reference being now had to the drawings in which my invention is illustrated, Figure 1 is a side and partly-sectional elevation of a boiler feed-water-pump reservoir and connections provided with my improved valve mechanism, which in this case is exhibited in the form of separate valves in the main and supplemental feed-pipes coupled so as to move simultaneously. Figs. 2, 3, and 4 are views illustrating a modification in which a single rotary slide-valve is made to serve the purpose of the two valves shown in Fig. 1, said views showing the valve in the different positions. Fig. 5 is a sectional elevation showing another modification of my invention in which a piston-valve is employed; and Fig. 6 is a sectional elevation showing another and my preferred modification of my invention in which a clack-valve is employed.

A, Fig. 1, indicates the boiler, *a* indicating the normal water-line, and *A'* the steam-dome.

B is a supplemental chamber connected with the boiler above and below the normal water-line by the passages *B'* and *B²*.

C is the supplemental feed-pump pipe, leading from a point in the boiler above the nor-

mal water-line, as shown, from the steam-dome A'.

D is the main boiler feed-pipe, leading, as shown, from the supplemental chamber B and opening on the normal water-line of the boiler.

F is the motor-cylinder of the pump, *f* indicating the steam-chamber of this cylinder, and F' is the pump-cylinder proper.

G is the feed-water reservoir; H, the exhaust-pipe of the cylinder F, preferably leading, as shown, into the feed-water reservoir G.

I is a pipe leading from the feed-water reservoir to the suction side of the cylinder F', and J is a pipe leading from the delivery side of the cylinder F' to the boiler, as shown.

K and K', Fig. 1, are valve-chambers situated in the pipes D and C, said pipes being continued to a connection with the steam-chamber F, as indicated at *d* and *c*.

L and L' are rotary slide-valves working on the cylindrical walls of the chambers K and K' and adapted, in accordance with their position, to close and open the openings of the pipes D and C into the valve-chambers, such openings being indicated at D' and C'. As shown, these valves are actuated by levers M and M', the latter being provided with a handle and both levers connected by a rod M², so that the valves will always move together and to the same degree. The valves are arranged to move through an arc of ninety degrees, and the size of the valve, the size of the cylindrical valve-chambers K and K', and the arrangement of the openings D' and C', leading into the valve-chambers, are such that while in one extreme position (that shown in full lines in Fig. 1) the valve L' closes the opening C' and while in the other extreme position (that indicated in dotted lines) the valve L closes the opening D'. In all intermediate positions either one or both of the openings L' and D' will be opened, so that at no time can the motor-cylinder of the pump be entirely cut off from a supply of fluid from the boiler.

Preferably instead of using two valves, as shown in Fig. 1, I employ a single valve operating in connection with the supplemental and main pipes in the same manner. In doing this I connect the pipes D and C with a single and common valve-chamber, as indicated in Figs. 2, 3, and 4 and also in modified form in Figs. 5 and 6, and I connect this common valve-chamber with the steam-chamber of the motor-cylinder of the pump by what I may call a "common pipe," (indicated at E.)

In the construction illustrated in Figs. 2, 3, and 4 a valve L² takes the place of valves L and L' of Fig. 1, the openings C' and D' are arranged at ninety degrees apart in the valve-chamber K², and the size of the said chamber and of the valves L² is arranged so that said valve in one extreme position will close the opening C', as shown in Fig. 2. In the other extreme position it will close the opening D', as shown in Fig. 4, while in passing from the

one extreme position to the other the valve cannot at any time close, as is clearly indicated in Fig. 3.

In the construction shown in Fig. 5 the valve-chamber (indicated at K³) is cylindrical and has working in it a piston-valve L³, actuated by a stem M³, and which, it is obvious, will work in precisely the same way in connection with the openings C' and D' as the valve L².

In the construction shown in Fig. 6 the valve-casing (indicated at K⁴) is so arranged that the open ends D' and C' of the supply-pipes come opposite to each other in a chamber *k*⁴ in the casing, and a clack-valve (indicated at L⁴) is arranged to work between the two openings, so that in its extreme position it closes them alternately, while in all intermediate positions it leaves them both open. This clack-valve, as shown, is secured to a spindle M⁴, having a threaded portion M⁵ screwing in a stationary threaded support *m*⁵, M⁶ indicating a hand-wheel by means of which the spindle is rotated.

It will be perfectly obvious that by the use of my invention in any of its modifications it is impossible that the connection between the boiler and the motor-cylinder of the pump should ever be entirely severed. In one extreme position the supply is derived entirely from the main pipe D and will be either steam or other fluid in accordance with the relation of the actual water-line to the determined normal water-line. In the other extreme position of the valve or valves the supply will be exclusively steam, while in case the engineer has not shifted his valve or valves to the full extent the worst that can happen is that a mixed supply of steam and water may be delivered to the motor-cylinder of the pump.

It will be obvious that an undue supply of steam, such as would result in the running away of the pump, may be avoided by so restricting the passage through the pipe-sections *c*, *d*, or *E* as to prevent this contingency occurring.

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

1. In combination with a boiler and a feed-water pump adapted to work with either water or steam as a motive fluid, the motor-cylinder of said pump being connected with the boiler through conduits, one opening at or near the normal water-line of the boiler and the other at a point above such water-level, means arranged to alternately open and close said conduits said means being arranged as specified and so as not to close both conduits at the same time.

2. In combination with a boiler and a feed-water pump adapted to work with either water or steam as a motive fluid the motor-cylinder of said pump being connected with the boiler through conduits one opening at or near the normal water-line of the boiler

and the other at a point above such water-level and both merging into a common conduit by which they connect with the pump, a valve-casing arranged at the junction of the
5 conduits aforesaid and a valve working in said casing to alternately and reciprocally close and open the conduits leading to the boiler, said valve being formed and arranged as specified so it will not close both conduits at the same time.

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