

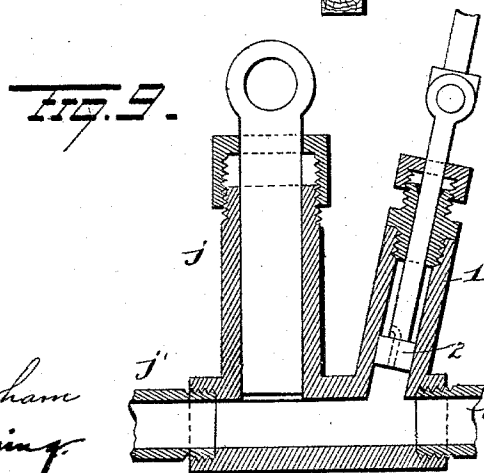
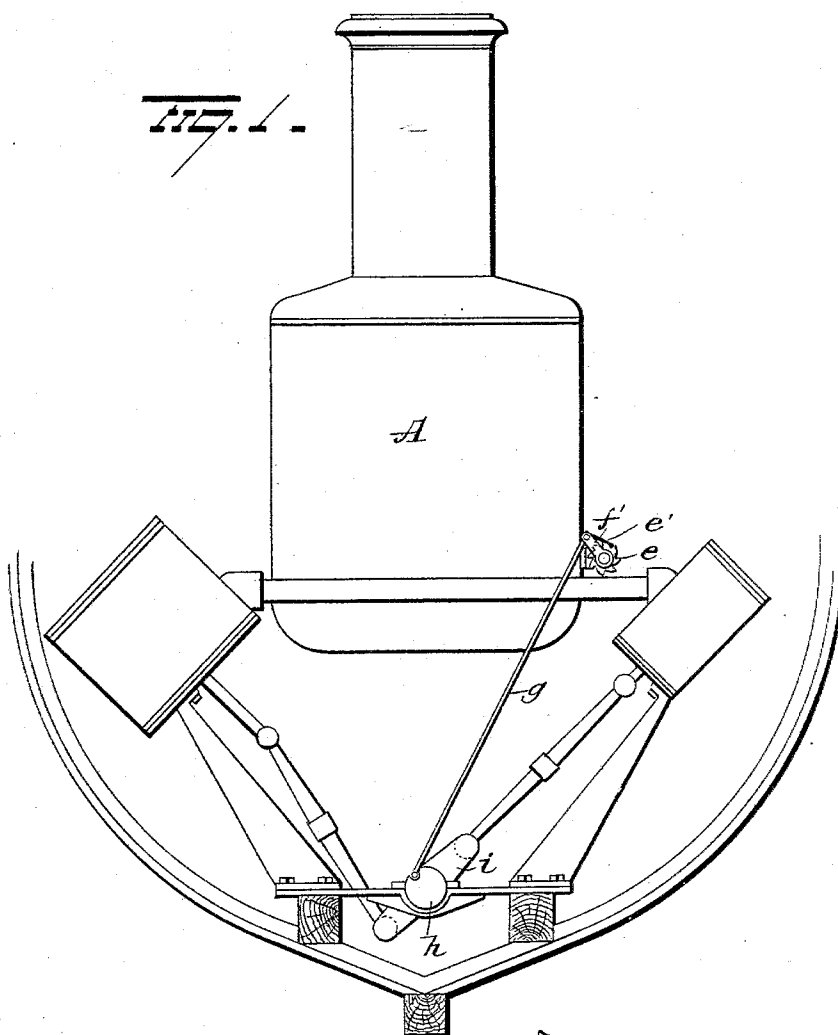
(No Model.)

2 Sheets—Sheet 1.

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FEED MECHANISM FOR BOILERS.

No. 565,119.

Patented Aug. 4, 1896.



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Fig. 5. Fig. 3.

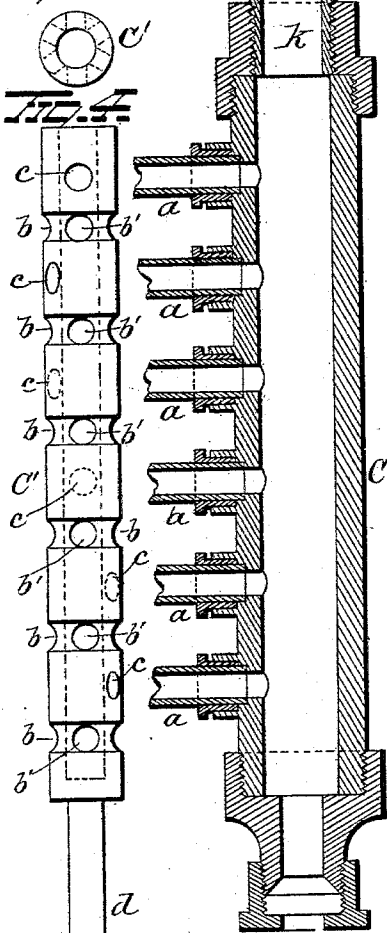


Fig. 2.

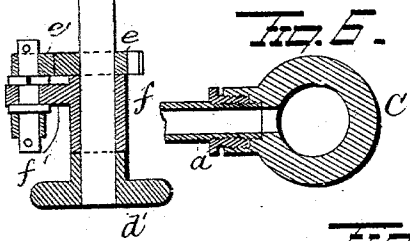
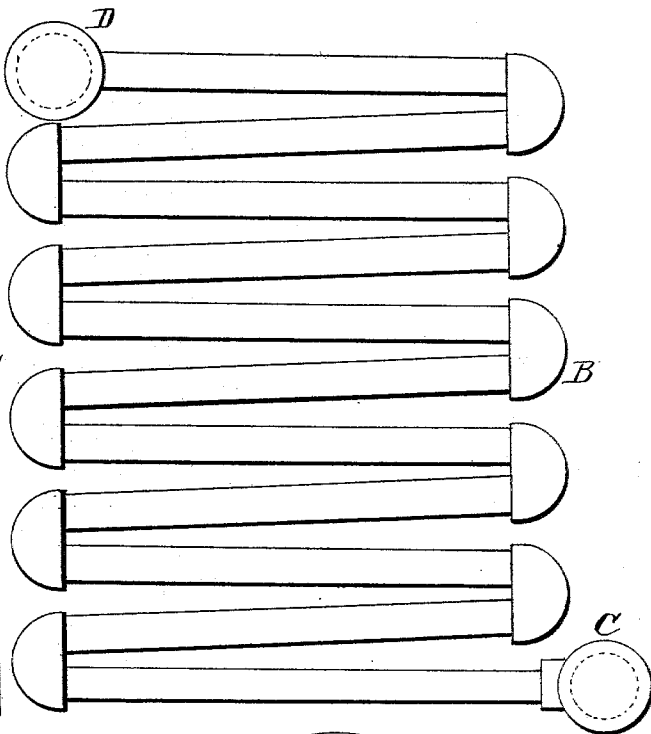


Fig. 6.

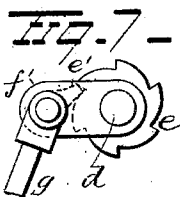


Fig. 7.

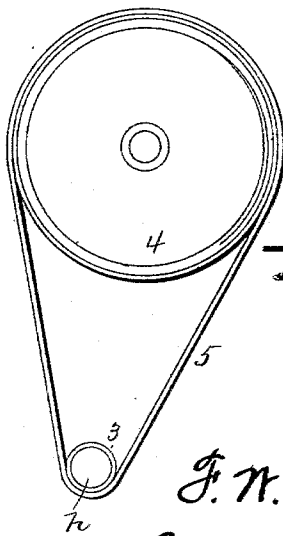


Fig. 8.

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UNITED STATES PATENT OFFICE.

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FEED MECHANISM FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 565,119, dated August 4, 1896.

Application filed April 8, 1896. Serial No. 586,750. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. OFELDT, a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Feed Mechanism for Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in feed mechanism for boilers, and more particularly to means for feeding boilers composed of manifold pipes or retorts with liquid, such as naphtha or other volatile fluid, the object of the invention being to provide a simple and efficient mechanism whereby to insure the positive feeding of the fluid.

A further object is to provide means for separately and successively feeding fluid to a series of manifolds or retorts which constitute an engine-boiler, whereby to prevent said manifolds or retorts from becoming clogged with foreign matter which may be contained in the fluid employed.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents the application of my improvements to an engine. Fig. 2 is a view of a manifold or retort, showing the valve mechanism at one end and a drum at the other end. Figs. 3, 4, 5, 6, 7, and 8 are views illustrating the valve mechanism. Fig. 9 is a view of a pump and a modification of the means for operating the valve mechanism.

In the drawings I have illustrated one form of engine to which my improvements may be applied and have shown said engine located within the hull of a boat.

A represents the shell of the engine-boiler, the boiler *per se* being composed of a number of manifolds or retorts B, all of which communicate at one end with a valve-casing C by means of pipes *a* and at the other end with a drum D.

Within the casing C a hollow valve C' is revolvably mounted, said valve being made

with a series of outlets *c*, (six of such outlets being shown in the drawings,) which are so arranged that they will aline successively with the successive inlets *a* of the series of manifolds or retorts as the valve rotates.

The valve C' is made somewhat shorter than the valve-chamber C, so that it can have a longitudinal movement therein, and said valve is also made with a series of annular grooves *b*, (corresponding in number with the number of manifolds or retorts,) each of which grooves is made to communicate with the interior of the valve by means of a hole or outlet *b'*. The free end of the valve-stem *d* is provided with a knob or handle *d'*, by means of which the valve can be moved longitudinally, so as to cause the grooves *b* to aline with the inlet-pipes *a* or to be moved out of alinement therewith.

A ratchet-wheel *e* is attached to the valve-stem *d*, and adjacent to said ratchet-wheel a sleeve *f* is loosely mounted on said stem and provided with a laterally-projecting arm *f'*, to which a dog *e'* is pivoted and adapted to engage said ratchet-wheel *e*. A rod or pitman *g* is also pivotally connected at one end with the free end of the arm *f'* and at its other end to a crank-disk *h*, secured to the engine-shaft *i*.

The liquid to be employed will be forced into the end *k* of the valve-casing by means of a suitable pump. For this purpose a pump *j*, such as shown in Fig. 9, may be employed, the pipe *j'* being adapted to conduct the liquid to the pump and the pipe *j''* being connected with the end *k* of the valve-casing, a suitable check-valve being, of course, provided at a convenient point between the pump and the course of supply of liquid thereto.

When the engine is first started, the valve will be moved so that the grooves therein will aline with the inlets *a* of the manifolds or retorts. The pump being now started, the liquid will be forced into the valve and will pass therefrom into all the manifolds or retorts simultaneously. When the liquid shall have entered the manifolds or retorts, it will be vaporized by means of an intense heat, preferably furnished by liquid fuel supplied by any suitable burners located under said manifolds or retorts, and the vapor thus created will be

conducted in any suitable manner to the engine-cylinders for driving the pistons therein.

When the pressure within the manifolds or retorts shall have reached a sufficient degree
 5 to start the engine, pressure will also be applied to the valve C' and cause it to move longitudinally, so as to move the grooves b out of line with the inlets a and the outlets c into line with said inlets, whereby to permit
 10 the latter to communicate with said inlets successively as the valve is rotated. The rotation of the valve is accomplished by its connection with the engine-shaft above described, by which arrangement it will be seen
 15 that at each revolution of said shaft the valve will be partially rotated, so as to cause the outlets c to communicate successively (one at a time) with the successive inlets a of the manifolds or retorts. The fluid will thus be
 20 forced positively into said manifolds or retorts one at a time. By this positive feed of the fluid to the manifolds or retorts any sediment that may collect therein will be forced out, whereas if the manifolds were all fed at
 25 once the velocity of the pumped liquid would be considerably less and consequently less liable to force out sediment that may collect. If one manifold should start to clog and the rest remain intact, the clogging in the one
 30 manifold or retort would cause a gradual reduction of supply of liquid through it, and the other manifolds, having a free passage, would allow the liquid to pass through them with much less resistance than the manifold
 35 that was partly clogged. Thus as a manifold clogs so its supply of liquid is gradually reduced. The consequence is that in a short time the supply of liquid will be entirely stopped by clogging and the manifold soon
 40 burns out. With a positive feed in each manifold or retort the sediment will be forced out and clogging effectually prevented.

It is not essential to the successful operation of my invention that the valve be rotated
 45 by devices connected with the engine-shaft. The valve may be rotated step by step in any suitable manner. For instance, a piston, actuated by the pulsations of the pump, may be utilized to impart the necessary motion to
 50 the valve, said piston being connected with the same in any suitable manner. Such an arrangement is shown in Fig. 9, in which a cylinder 1 is shown arranged in an inclined position near the pump-cylinder and made to
 55 communicate with the pipe which supplies the valve with fluid at a point in advance of said pump-cylinder, the piston 2 of said pump being adapted to be connected with the valve C' in any suitable manner.

60 My improvements are simple in construction and effectual in all respects in the performance of their functions.

Various slight changes might be made in the details of construction of my invention
 65 without departing from the spirit thereof or limiting its scope, and hence I do not wish to

limit myself to the precise details of construction herein set forth.

Instead of imparting motion to the valve as above described, motion can be imparted
 70 thereto by means of wheels 3 4 and a belt or chain 5, as shown in Fig. 8, the sizes of the wheels depending on the number of revolutions required. In this case the valve would
 75 revolve once while the engine-shaft makes six revolutions.

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

1. The combination with a boiler consisting
 80 of a series of retorts, and a pump, of devices between said boiler and pump constructed and adapted to cause fluid to be forced into a portion only of said boiler at each stroke of the pump-piston, substantially as set forth. 85

2. The combination with a series of retorts and means for forcing liquid thereinto, of a valve mechanism constructed and adapted to cause said liquid to enter said retorts one at a time, substantially as set forth. 90

3. The combination with a series of retorts, of a valve-casing communicating with all of said retorts, a hollow valve in said casing having a series of outlets corresponding in
 95 number with the number of inlets from the valve-casing to the retorts, means for forcing liquid into said valve and means for rotating said valve, step by step, substantially as set forth.

4. The combination with a series of retorts
 100 and a valve-casing communicating with said retorts, of a hollow valve in said casing so constructed as to have a longitudinal movement therein, said valve also having a series of annular grooves communicating with the
 105 interior of the valve and a series of outlet-openings between the annular grooves also communicating with the interior of the valve, means for rotating said valve and means for forcing liquid into said valve, substantially as set forth. 110

5. The combination with a series of retorts and a pump for forcing liquid thereinto, of a valve-casing with which said pump communicates, said valve-casing also communicating
 115 with all the retorts, a hollow revoluble valve within said valve-casing, and having outlets adapted to communicate with the retorts successively when the valve is rotated, a ratchet-wheel on the stem of said valve, a pivoted
 120 arm, a dog connected to said arm and adapted to engage said ratchet-wheel, an engine-shaft, a crank on said shaft and a pitman connecting the crank and said pivoted arm, substantially as set forth. 125

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANK W. OFELDT

Witnesses:

THEODORE KROMBACH,
 WILLIAM C. JONES.