

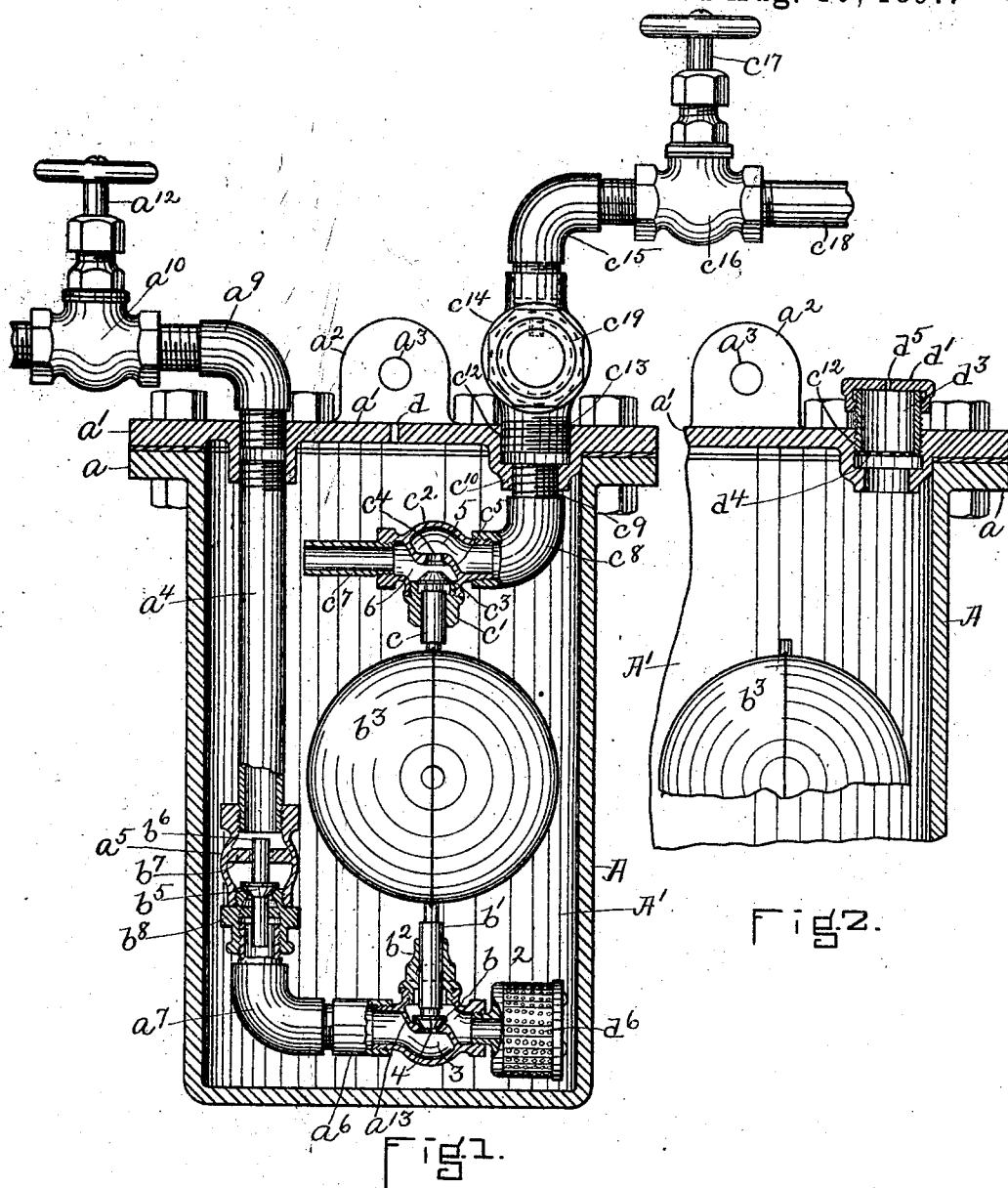
(No Model.)

W. R. PARK.

APPARATUS FOR SUPPLYING OIL TO BOILERS.

No. 587,854.

Patented Aug. 10, 1897.



WITNESSES.

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ATT'Y.

# UNITED STATES PATENT OFFICE.

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## APPARATUS FOR SUPPLYING OIL TO BOILERS.

SPECIFICATION forming part of Letters Patent No. 587,854, dated August 10, 1897.

Application filed April 16, 1895. Serial No. 545,868. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM R. PARK, residing in Taunton, in the county of Bristol and State of Massachusetts, have invented an  
Improvement in Apparatus for Supplying Oil  
to Boilers, of which the following description,  
in connection with the accompanying drawings,  
is a specification, like letters and figures  
on the drawings representing like parts.

This invention relates to an apparatus for  
automatically controlling the supply of liquids;  
and among other uses it is particularly  
designed and adapted for controlling the supply  
or admission of oil to steam generators or  
boilers to avoid or reduce to a minimum incrustation  
of the boiler-shell and to prevent priming.

In accordance with this invention the oil or  
other liquid is supplied to the boiler from a  
receptacle or chamber into which extends a  
pipe or duct leading to the boiler and which  
in practice may be the water-inlet or suction  
pipe of an injector or other suitable suction  
apparatus, the said pipe being provided with  
a valve controlling the admission of oil or  
other liquid from the chamber into said pipe  
and which is automatically governed by the  
quantity of liquid in the said receptacle, as  
by a float connected to the said valve.

The pipe or duct referred to constitutes the  
discharge or outlet pipe for the receptacle or  
chamber, and it is for the best results provided  
with a check-valve intermediate of the main  
valve and the boiler for a purpose as  
will be described.

The liquid-receptacle may be provided with  
an inlet-pipe connected to a suitable source  
of supply and provided with a valve, also  
connected to the float to be automatically operated  
thereby, to control the admission of oil or  
other liquid into the receptacle or chamber.

The apparatus when provided with an inlet-  
pipe having a valve automatically operated  
by the float may be used to advantage with  
a battery of boilers or with a substantially  
large boiler or plant; but, if desired, the inlet-  
pipe for the oil-chamber with its valve connected  
to the float may be dispensed with when the  
apparatus is used with a substantially  
small plant or boiler.

The outlet-pipe for the receptacle may and

preferably will be provided with a suitable  
strainer, as will be described.

In order to render the apparatus convenient  
of access without disturbing the operative  
parts, the casing or shell forming the receptacle  
or chamber may be detachably secured to a cap  
or cover which in practice is designed to be  
stationary or practically permanently fixed to a  
suitable support, and the operative parts for the  
apparatus—namely, the outlet-pipe, its valve and  
float—are supported from or by the said cover,  
thus leaving the casing or shell of the receptacle  
or chamber free to be removed without disturbing  
the said parts.

These and other features of this invention  
will be pointed out in the claims at the end of  
this specification.

Figure 1 represents in section and elevation,  
with parts broken away, an apparatus embodying  
this invention; and Fig. 2 is a sectional detail of  
a modification to be referred to.

Referring to Fig. 1, A represents the casing  
of a receptacle or chamber A' to contain the oil  
or other liquid to be supplied to the boiler or  
boilers. (Not herein shown.)

The casing A may and preferably will be  
of metal, and it may be of any desired shape,  
it being in the present instance represented as  
circular and provided at its upper end with an  
outside annular flange *a*, by which the said casing  
may be attached or secured to a cap or cover *a'*,  
as by bolts, or it may be secured in any other  
desired or suitable manner.

The cover or cap *a'* may be provided with  
a lug or ear *a<sup>2</sup>*, having an opening *a<sup>3</sup>*, by means  
of which the said cover or cap may be secured to  
a suitable support (not shown) to render the  
said cover practically stationary with relation to  
the removable casing A.

The receptacle or chamber A' contains within  
it an outlet-pipe, preferably made in sections,  
as herein shown, it consisting of a substantially  
vertical section *a<sup>4</sup>*, a valve-casing *a<sup>5</sup>* connected  
thereto, a substantially horizontal section *a<sup>6</sup>*,  
and an elbow or coupling *a<sup>7</sup>* connecting the section  
*a<sup>6</sup>* with the valve-casing *a<sup>5</sup>*.

The sectional outlet-pipe is preferably supported  
by or from the cover or cap *a'*, and in the  
present instance the upper end of the

vertical section  $a^4$  is screw-threaded and engages screw-threads on the interior of a hollow boss or tubular projection  $a^8$ , depending from the cover  $a'$ , the latter being provided with an opening extended through it in line with the hollow boss  $a^8$ , into which projects the end of a coupling or elbow  $a^9$ , having its other end, as herein shown, connected to a valve-casing  $a^{10}$ , provided with a suitable valve having the valve-stem  $a^{12}$ , by which communication between the chamber  $A'$  and the pump or injector which supplies the boiler (not shown) may be positively controlled when desired.

The horizontal section  $a^3$  of the liquid-outlet pipe, as herein shown, is provided with a cross-partition  $a^{13}$ , dividing the said pipe-section into an inlet-passage 2 and an outlet-passage 3, adapted to be connected by an opening or port 4 in the partition  $a^{13}$ , the walls of the said opening forming a seat for a valve  $b$ , provided with a stem or rod  $b'$ , extended through a sleeve  $b^2$ , screwed or otherwise secured to the pipe-section  $a^6$ .

The valve  $b$  controls the passage of the oil or other liquid from the receptacle or chamber  $A'$  through the port or opening 4 into the outlet-pipe, and the said valve is automatically governed by means of a float, herein represented as a hollow ball  $b^3$ , which is operatively connected to the valve-stem  $b$ , and in practice this connection may be effected by soldering the said ball to the said valve-stem.

From the above description it will be understood that when the oil or other liquid in the chamber or receptacle reaches a predetermined level the float  $b^3$  will rise and lift the valve  $b$  from its seat, thereby uncovering the port or opening 4 and permitting the oil or other liquid in the chamber to pass through the said port or opening into the passage 3 of the outlet-pipe, from which it is drawn or sucked up through the coupling  $a^7$ , the valve-casing  $a^5$ , and the pipe  $a^4$ , thence passing through the coupling  $a^9$  and valve-casing  $a^{10}$  to the suction apparatus and from thence to the boiler.

The valve-casing  $a^5$  is provided with a valve  $b^5$ , having a stem or rod  $b^6$  movable in a suitable opening in a cross-bar  $b^7$  and in a suitable hole in a coupling sleeve or nut  $b^8$ , connecting the valve-casing  $a^5$  to the pipe-coupling  $a^7$ , the said stem or rod extending from opposite sides of the valve  $b^5$ .

The valve  $b^5$  constitutes a check-valve which is normally seated and is lifted from its seat by the suction applied to the liquid-outlet pipe, but which is again seated in the construction herein shown either by gravity or by back pressure from the boiler to cut off the liquid-chamber from the boiler irrespective of the position of the valve  $b$ .

The liquid chamber or receptacle  $A'$  may be connected with a substantially large plant—as, for instance, a battery of boilers—and when so used I prefer that a substantially continuous supply of oil or other liquid to the

chamber or receptacle  $A'$  should be maintained and to automatically regulate this supply. This result may be accomplished after the manner shown in Fig. 1, wherein the float  $b^3$  is represented as having secured to it, at a point substantially diametrically opposite the junction of the float with the valve-stem  $b'$ , a valve stem or rod  $c$ , extended through a sleeve  $c'$  and into a valve-casing  $c^2$ , the said rod or stem within the said casing being provided with a valve  $c^3$ , which coöperates with a port or opening  $c^4$  in a partition-wall  $c^5$ , dividing the said valve-casing into an inlet-passage 5 and an outlet-passage 6, with which latter communicates, as herein shown, a short section of pipe  $c^7$ .

The valve-casing  $c^2$ , as herein shown, has connected to it an elbow or pipe coupling  $c^8$ , provided, as herein shown, with a screw-threaded end  $c^9$ , which enters a hollow boss or projection  $c^{10}$  on the under side of the cover  $a'$ , the said hollow boss communicating with an opening  $c^{12}$  in the cover, into which is extended the threaded end  $c^{13}$  of a feed-cup or sight-tube  $c^{14}$  of any usual or suitable construction, the opposite end of which is connected by the pipe-coupling  $c^{15}$  to a valve-casing  $c^{16}$ , provided with a valve having a valve-stem  $c^{17}$ , the said valve-casing being connected by pipe  $c^{18}$  to a suitable oil or other liquid supply. (Not shown.)

The sight-tube  $c^{14}$  may be provided with a glass cover  $c^{19}$  after the usual manner.

As represented in Fig. 1, the valve  $c^3$  is unseated and the port  $c^4$  is opened, so that oil or other liquid from the supply-pipe  $c^{18}$  may flow into the passage 5, through the port  $c^4$ , and thence by the passage 6 and pipe  $c^7$  into the receptacle  $A'$ , and when the oil within the receptacle has risen to a predetermined level the float  $b^3$  is lifted and the valve  $c^3$  is carried up to its seat and the port  $c^4$  closed, thereby cutting off further inlet of liquid to the chamber or receptacle  $A'$ .

When the valve  $c^3$  has been lifted so as to close the port or opening  $c^4$ , the valve  $b$  at such time has been lifted from its seat, so as to uncover the port or opening 4 in the outlet-pipe, thereby placing the apparatus in condition to supply oil or other liquid to the boiler when suction is applied to the liquid-outlet pipe, as above described.

When the suction is applied to the liquid-outlet pipe, the volume of oil or other liquid in the receptacle  $A'$  is diminished and the float  $b^3$  falls, thereby opening the port or opening  $c^4$  in the inlet-pipe and permitting an additional supply of oil or other liquid to flow into the receptacle or chamber  $A'$ , so that the amount of liquid in the chamber or receptacle  $A'$  remains substantially at a constant level while the apparatus is in operation.

The flow of oil or other liquid into the receptacle or chamber  $A'$  may be positively regulated by means of the valve in the casing  $c^{16}$ , and the flow of oil out from the chamber or receptacle may be also positively regu-

lated by the valve in the casing  $a^{10}$  in the outlet-pipe.

The cap or cover  $a'$  for the apparatus may be provided with a perforation or small opening  $d$  for the admission of air into the chamber or receptacle  $A'$ .

In some instances it may be deemed sufficient to fill the chamber or receptacle  $A'$  intermittently and by hand rather than continuously, as shown in Fig. 1, and in this case the liquid-inlet pipe, the valve-casing  $c^2$ , and the valve  $c^4$  may be entirely omitted, and the opening  $c^{12}$  in the cover  $a'$  may be closed by a small cap  $d'$ , fitted over a short pipe-section  $d^2$ , inserted into the opening  $c^{12}$ , the said opening  $c^{12}$  being provided with a strainer-plate  $d^4$ , and the cap  $d'$  being provided with a perforation or opening  $d^5$ .

The oil-outlet pipe for the apparatus may and preferably will be provided with strainer, represented in Fig. 1 as a perforated drum  $d^6$  attached to the inlet end of the valve-casing  $a^6$ .

The apparatus shown in Fig. 1 may also be advantageously used in connection with an injector, where the water-supply is taken from a street or other main in which the water is under pressure.

It will be seen that the valve  $b$  is closed when the volume of liquid in the casing  $A$  falls below a predetermined level, and in practice the valve  $b$  is closed before the liquid in the casing  $A$  has fallen sufficiently to uncover the mouth of the outlet-pipe, so that there is present in the casing a volume of liquid which forms a liquid seal for the mouth of the outlet-pipe and thereby avoids any danger of air being drawn into the outlet-pipe by the injector, as would be the case if the valve  $b$  was reversely seated and opened by the descent of the float. This construction of apparatus insures perfect working of the oil-supplying apparatus without interfering with the working of the injector, or of the pump, if one is used, and in the case of the latter prevents it from becoming air-locked.

In practice the oil taken from the casing  $A$  is supplied to the boiler in substantially small quantities, which is sufficient for preventing the formation of scale in the boiler.

I claim—

1. In a liquid-supply apparatus, the following instrumentalities, viz: a casing provided with a cover having means by which said cover may be rendered fixed or stationary and provided with a liquid-inlet for the casing, means to detachably secure the casing to its cover, an outlet-pipe for the casing extended down through the said cover into the said casing and provided with a substantially horizontal extension located below the desired level of the liquid and provided with

a valve, and means within the casing responsive to the variation in the level of the liquid in the casing and operatively connected to said valve to open the same when the volume of liquid in the casing reaches a predetermined amount and to close the same when the volume of liquid diminishes to a predetermined amount, and a check-valve in said outlet intermediate of said valve and cover, the casing being detachable from its cover without disturbing the pipe connections attached to the cover, for the purpose specified.

2. In a liquid-supply apparatus, the following instrumentalities, viz: a casing to contain the liquid, a cover for said casing having means by which said cover may be rendered stationary, means to detachably secure said casing to its cover, an inlet-pipe for the casing extended through the said cover and supported thereby, an outlet-pipe for said casing extended through said cover and supported thereby, a valve in the inlet-pipe within the casing, a valve in said outlet-pipe within the casing, a float within the casing responsive to variation in the level of the liquid and operatively connected to said valves to close the valve in the outlet-pipe and open the valve in the inlet-pipe, when the volume of liquid in the casing diminishes to a predetermined amount, the said casing being removable from its cover without disturbing the operative parts and pipe connections, substantially as and for the purpose specified.

3. In a liquid-supply apparatus, the following instrumentalities, viz: a casing to contain the liquid, a cover for said casing having means by which said cover may be rendered stationary, means to detachably secure said casing to its cover, an inlet-pipe for the casing extended through the said cover and supported thereby, an outlet-pipe for said casing extended through said cover and supported thereby, a valve in the inlet-pipe within the casing, a valve in said outlet-pipe within the casing, a float within the casing responsive to variation in the level of the liquid and operatively connected to said valves to close the valve in the outlet-pipe and open the valve in the inlet-pipe, when the volume of liquid in the casing diminishes to a predetermined amount, a check-valve in said outlet-pipe intermediate of the outlet-valve therein and the said cover, the said casing being removable from its cover without disturbing the operative parts and pipe connections, substantially as and for the purpose specified.

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

WILLIAM R. PARK.

Witnesses:

WILLIAM A. SARGENT,  
JOSEPH WARREN.