

(No Model.)

C. F. MURRAY.
AUTOMATIC BOILER FEED.

No. 594,210.

Patented Nov. 23, 1897.

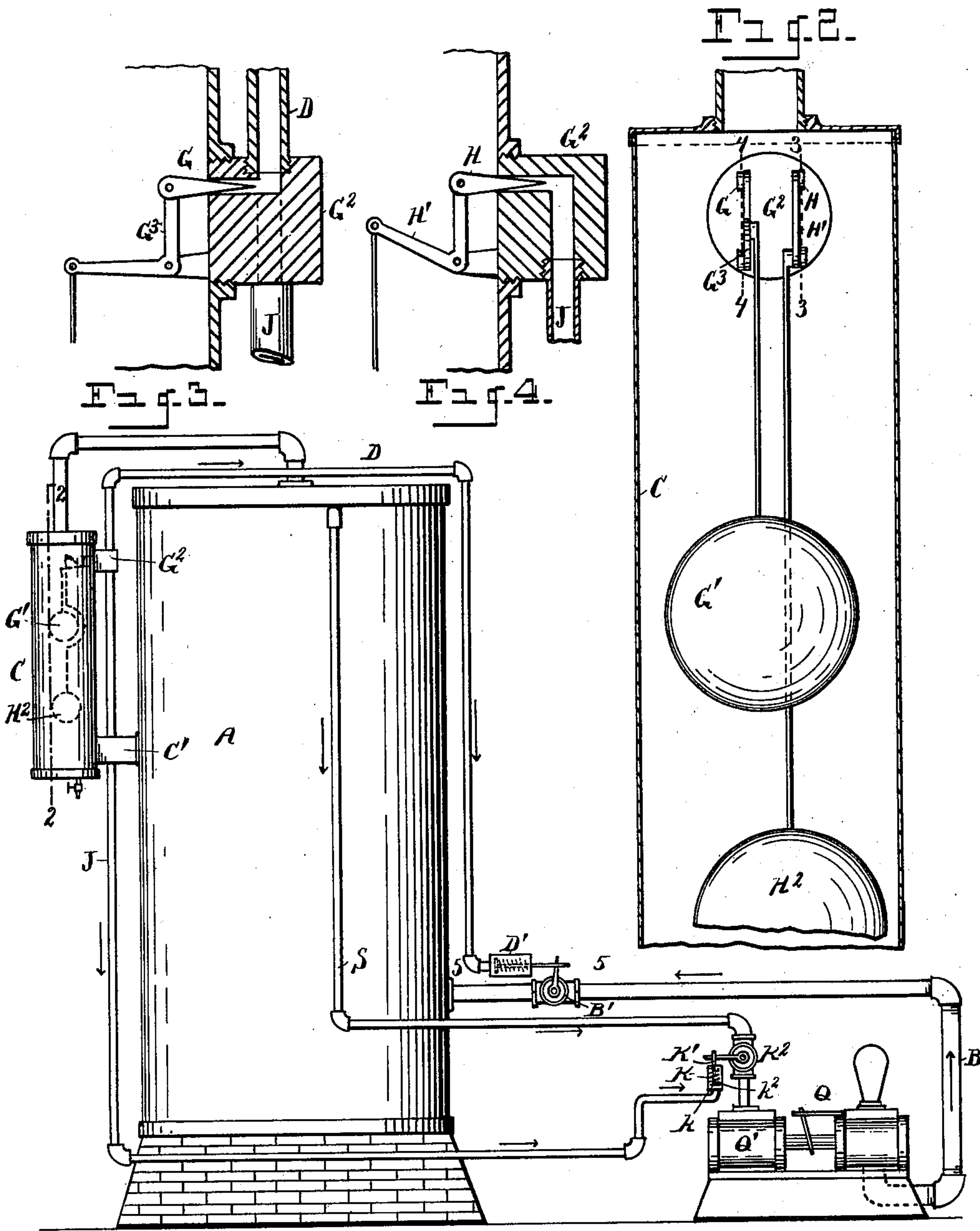


Fig. 1.
WITNESSES
O. B. Baenziger
Mary Lickey.

Fig. 2.
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Charles F. Murray
By *his* Attorney
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UNITED STATES PATENT OFFICE.

CHARLES F. MURRAY, OF WAYNE COUNTY, MICHIGAN.

AUTOMATIC BOILER-FEED.

SPECIFICATION forming part of Letters Patent No. 594,210, dated November 23, 1897.

Application filed April 26, 1897. Serial No. 633,925. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. MURRAY, a citizen of the United States, residing in the county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Automatic Boiler-Feeds; and I 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, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object an automatic boiler-feed; and it consists of the construction, combination, and arrangement of devices and appliances hereinafter specified and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a view in side elevation embodying my invention. Fig. 2 is a vertical section on the line 2 2, Fig. 1. Fig. 3 is a vertical section on the line 3 3, Fig. 2. Fig. 4 is a view in vertical section on the line 4 4, Fig. 2. Fig. 5 is a vertical section through the cylinder D' and valve-case B' on the line 5 5, Fig. 1.

My invention belongs to that class of devices whereby a supply of water is automatically admitted to a boiler when the water-line within the boiler descends below a certain limit, and whereby steam is automatically admitted to a pumping-engine to operate the pump with greater rapidity to pump water faster into the boiler.

I carry out my invention as follows:

A represents any suitable boiler, vertical or otherwise.

B represents a water-supply pipe leading from a suitable pumping-engine Q and into the boiler A. In this supply-pipe B is located any suitable controlling-valve B², seating within a valve-case B'.

C denotes a water-column suitably connected with the boiler, as by a pipe C'.

D is a steam-pipe leading from the water-column C toward the top thereof, said steam-pipe being connected with a piston-cylinder D', within which is located a piston d, the piston-rod d', connected therewith, being also connected with the valve B², whereby when the piston d is actuated by the steam the valve B² will open to let an increased supply

of water into the boiler, a spring d² retracting said valve into normal position.

To govern the admission of steam into the pipe D from the column C, I provide a needle-valve, as at G, or other valve of suitable construction, operated by a float G', said valve seating in a hollow plug G², through which the pipe D communicates with the interior of the column C. The valve G is provided with a bell-crank G³, connected with the float G', the construction being such that when the water lowers sufficiently in the column C the float, descending, will open the valve G and admit steam from the water-column into the pipe D to actuate the piston d and the valve B². The rising of the water within the column C lifts the float and closes the valve G, cutting off the steam from entrance into the pipe D. The plug G² is also connected with an additional steam-pipe J and is provided with an additional valve H, which may be alongside the valve G, the valve H being provided with a bell-crank H', actuated by an additional float H². The steam-pipe J leads to a cylinder K, within which is located a piston k, similar to the piston d, provided with a piston-rod K'.

S is a steam-pipe leading from the boiler into the cylinder Q' of the pumping-engine, in which is interposed a valve K², with which the piston-rod K' is connected. The interior construction of the valve K² is not shown, but may be like the valve B² hereinbefore described. A spring k² in the cylinder K serves a like purpose to the spring d² to retract the piston k. It will be obvious that when the float H² descends within the column C steam is admitted through the pipe J to actuate the valve K² to operate the pump Q. The descent of the water in the column C has also caused, as hereinbefore explained, the opening of the valve B² in the water-supply pipe. The pump Q, it will be understood, may be constantly working with more or less rapidity pumping water into the boiler; but should the pump not be working actively enough the steam admitted thereto through the pipe J will cause it to actuate more rapidly.

The connection of the valves B² and K² with the piston-rods d' and K', respectively, may be made adjustable in any suitable manner. Thus, as shown, the said valves may

each be provided with a crank-arm d^3 , adjustably connected with the corresponding piston-rod, so that the position of the valve may be set as desired, whereby the valve may
 5 be normally open to a desired degree, the steam in the pipes D and J, respectively, serving to open the corresponding valve wider to increase the action of the pump and the water-supply.

10 The two floats G' and H^2 may be constructed of any suitable material, formed into hollow bodies. The two floats may be constructed alike, although I do not limit myself to any definite construction thereof. The upper
 15 float G' descending, when the water lowers sufficiently, opens the valve G, governing the passage of steam from the column C through the pipe D, to actuate the piston in the cylinder D' , and thereby operate the valve in
 20 the case B' , controlling the admission of water from the supply-pipe B into the boiler. The operation of the said valve in the supply-pipe by the admission of steam from the column into the pipe D opens said valve to admit
 25 water into the boiler. When the water in the column C rises, the float G' rises therewith and, when at a proper height, closes the valve G, thereby shutting off the passage of steam into the pipe D. When the steam is
 30 thus shut off, the spring d^2 in the cylinder d' closes the valve in the case B' .

In feeding the boiler or a battery of boilers it will be obvious that the water may continue to descend in the boiler and in the
 35 column C after the float G' has descended sufficiently to open the valve G, and thereby to open the valve in the supply-pipe B to admit water into the boiler. The float H^2 is submerged in the water in the column C when
 40 there is a normal or sufficient supply of water

in the boiler; but should the water in the boiler descend below a desired level the float H^2 would descend, until at a given point it would open the corresponding valve H, thereby admitting steam from said column into the pipe
 45 J to actuate the piston-rod K' in the cylinder K, thereby opening the valve K^2 wider, permitting a larger volume of steam to pass through the pipe S to the pump to set the pump in motion more rapidly.

50 The device is obviously simple and efficient in its operation in automatically feeding the boiler.

What I claim as my invention is—

In a boiler-feeding device, a boiler, a water-
 55 pipe connected thereto at one end, a pump for forcing water into the boiler through the water-pipe, which is provided with a suitable valve; a steam-pipe leading from the boiler to the pump, and which steam-pipe is also
 60 provided with a suitable valve, combined with a water-column secured to the boiler, two floats placed therein, one of which is normally submerged, and the other on top of the water, two valves connected to and operated inde-
 65 pendently by said floats, two steam-pipes extending from the water-column, and each provided with a cylinder upon its end, a spring-actuated piston extending through the end of the cylinder and connecting with the
 70 valves, whereby the rising or falling of the floats operates the valves so as to admit steam to the pipes leading to the valves, substantially as shown and described.

In testimony whereof I sign this specification
 75 tion in the presence of two witnesses.

CHARLES F. MURRAY.

Witnesses:

N. S. WRIGHT,
 MARY HICKEY.