



No. 687,180.

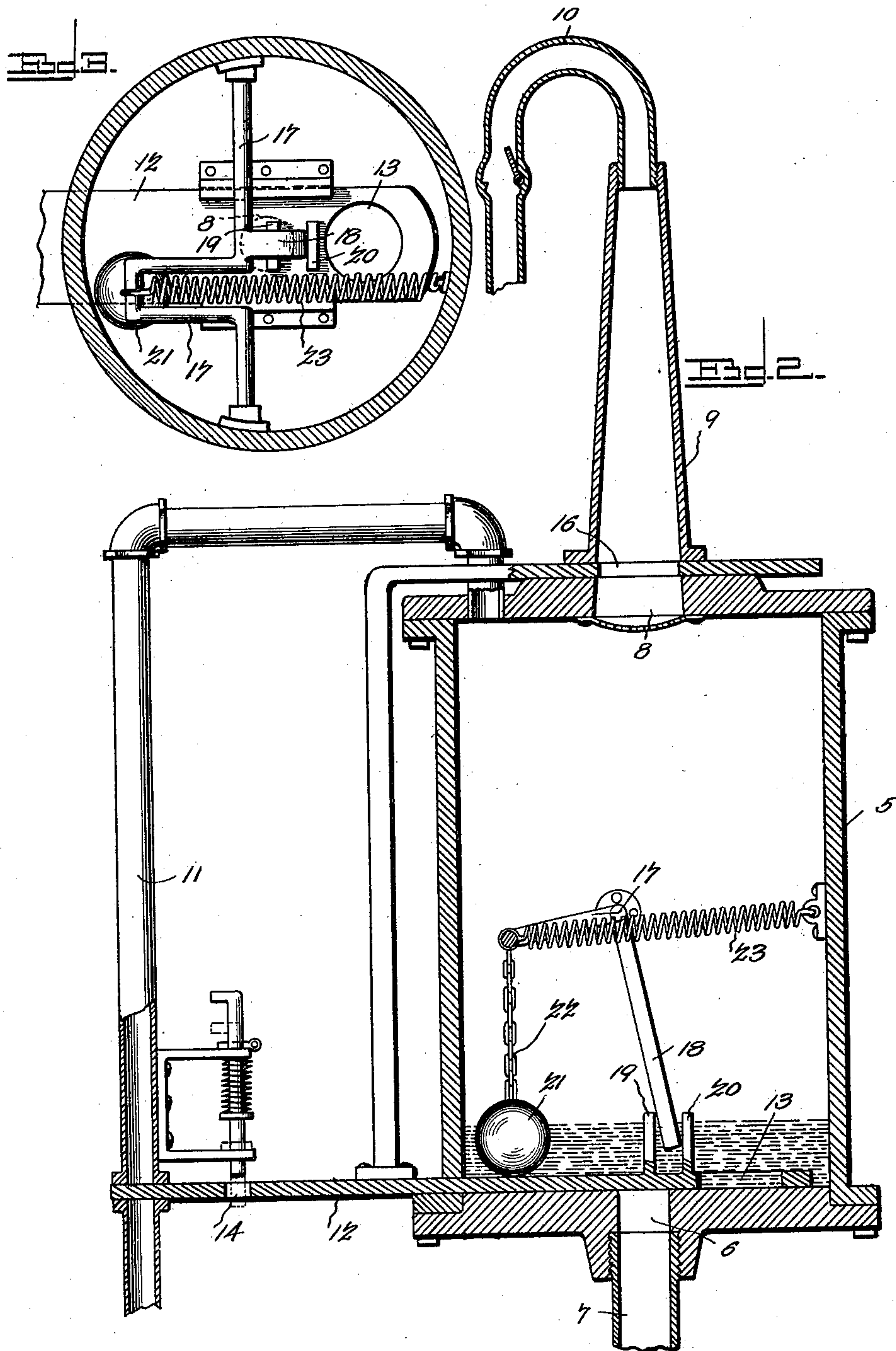
Patented Nov. 19, 1901.

J. H. DAVIS.  
BOILER FEEDER.

(Application filed June 18, 1901.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses

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# UNITED STATES PATENT OFFICE.

JOSEPH H. DAVIS, OF THE UNITED STATES ARMY.

## BOILER-FEEDER.

SPECIFICATION forming part of Letters Patent No. 687,180, dated November 19, 1901.

Application filed June 18, 1901. Serial No. 65,066. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH H. DAVIS, a citizen of the United States, residing at Manila, Philippine Islands, have invented a new and useful Improvement in Boiler-Feeders, of which the following is a specification.

This invention has for its principal object to provide a device for feeding boilers without the use of the usual pump, a further object of the invention being to provide a mechanism which will be positively operated so long as steam is fed thereto, the shifting of the valves thereof being automatic.

In the drawings forming a portion of this specification, and in which like numerals of reference indicate similar parts in the several views, Figure 1 is a vertical central section of the apparatus with the chamber thereof filled with water and the outlet just opened to permit the water to run to the boiler. Fig. 2 is a view similar to Fig. 1 and showing the parts in the position assumed just after the valves have been shifted to cut off the supply of steam and the communication with the outlet-pipe. Fig. 3 is a transverse section through the water-chamber and showing the positions of the slide-valve and the float mechanism for operating it.

Referring now to the drawings, the ram consists of a preferably cylindrical chamber 5, having a central outlet-opening 6 in its lower end, with which is connected a feed-pipe 7, leading to the boiler, while in the upper end of the chamber is an opening 8, with which connects a supply-pipe 9 of considerable diameter directly adjacent to the chamber and having a strainer at its lower end, the upper portion of the pipe being curved, as shown at 10, and provided with an outwardly-opening check-valve. A steam feed-pipe or supply-pipe 11 connects also with the chamber through the upper end thereof and extends downwardly and parallel with the axis of the chamber.

Passed inwardly through the side of the chamber 5 and at the bottom thereof is a slide 12, having an opening 13 therein, which in one position of the slide communicates with the outlet-opening 6 of the chamber to communicate the chamber with the feed-pipe 7, while when in a different position said slide acts to close the feed-pipe by covering the out-

let-opening. This slide also extends through the pipe 11 and has an opening 14 therein, which when the opening 13 is in registry with the opening 6 is out of the pipe, the slide then closing the pipe; but when the slide is moved outwardly to close the opening 6, then this opening 14 lies within the pipe 11 to open the pipe and communicates the chamber with the boiler to which the pipe 11 is connected. A second slide 15 is provided and extends through the pipe 9, this slide having its outer end bent downwardly and connected with the slide 12 for operation thereby, and the slide 15 has an opening 16 therein so positioned that when the slide 12 is in position to close the opening 6 this opening 16 will lie within the pipe 9 to communicate it with the chamber 5, while when said slide 15 is moved outwardly with slide 12 to open pipe 7 the pipe 9 will be closed. To thus shift the two slides, a crank-shaft 17 is provided and is journaled within the chamber 5, and this crank-shaft has a finger 18, which extends downwardly and between the upwardly-directed lugs 19 and 20 on the slide 12, so that when the crank-shaft is rotated in one direction this finger will strike lug 19 and move the slides in one direction, and when the crank-shaft is reversely rotated the finger will strike the other lug and will move the slides in an opposite direction. This movement of the finger is accomplished by rocking the crank-shaft, and to rock it a float 21 is provided and is connected with the crank of the crank-shaft by means of a chain or other flexible connection 22, and this connection is of such length that the float does not act upon the crank-shaft in either direction until the chamber is nearly filled and nearly emptied. A helical spring 23 is attached to the crank of the crank-shaft and is then taken rearwardly and beyond the axis of the shaft and attached to the chamber, the operation of the apparatus being then as follows: The parts being in the positions shown in Fig. 1 of the drawings, steam enters through the pipe 11, and the steam-pressure being the same at both sides of the body of water in the chamber 5 the water drops by gravity and flows through the pipe 7 and into the boiler. As the level of the water drops the float sinks until the chain connecting it to



the crank-shaft becomes taut, when the shaft is rocked until the crank has passed the dead-center with respect to the helical spring, at which time the spring acts to draw the crank quickly beyond the dead-center, and in consequence the finger 18 is engaged with the lug 20 and the slides are moved to the positions shown in Fig. 2. The steam-supply is then cut off and the water-outlet is closed; but the water-supply is opened when water falls into the chamber, condensing whatever steam may remain therein and fills the chamber. As the chamber fills the float rises until its chain is again taut, when the crank-shaft is rocked to a point above its dead-center and the spring again acts to move it violently and to move the slide again to the position shown in Fig. 1 to open the steam-supply and water-outlet and close the water-supply. Thus so long as water and steam are present the apparatus will continue to work.

In practice modifications of the specific construction shown may be made, and any suitable materials and proportions may be made without departing from the spirit of the invention.

What is claimed is—

1. A device of the class described, comprising a chamber having water and steam supply pipes leading thereto and having a water-outlet, a slide common to the steam-inlet and the water-outlet and having openings for registration with the steam-inlet and the water-outlet alternately, a slide for the water-inlet and having an opening for registration therewith, said slides being connected for simultaneous operation, spaced lugs upon the first slide within the chamber, a crank-shaft having a finger disposed between the lugs for engagement therewith alternately to reciprocate the slides, and a float having connection with

the crank of the crank-shaft for operating it to actuate the finger.

2. A device of the class described, comprising a chamber having steam and water inlets and a water-outlet, a slide having openings therein and disposed to register its openings with the steam-inlet and water-outlet respectively, alternately a second slide having an opening for registration with the water-inlet and connected with the first slide for operation thereby, the first slide having spaced lugs within the chamber, and a crank-shaft rockingly mounted in the chamber, and having a float connected therewith by a flexible connection and having a spring attached to its crank and to the chamber beyond the axis of the crank-shaft to throw it when moved beyond its dead-center.

3. A device of the class described, comprising a chamber having water and steam inlets and a water-outlet, a slide having openings therein and disposed to register its openings with the steam-inlet and water-outlet respectively, a second slide having an opening for registration with the water-inlet and connected with the first slide for operation thereby, the first slide having spaced lugs within the chamber, and a float mechanism within the chamber for operating the valves, said mechanism including a crank-shaft, a float, a flexible connection between the float and crank, and a spring attached to the crank and to the chamber beyond the axis of the crank, said shaft having a finger disposed between spaced lugs operatively connected with the valves.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOSEPH H. DAVIS.

Witnesses:

JESSE RUTLEDGE,  
FULTON B. WILLIAMSON.