

No. 693,552.

Patented Feb. 18, 1902.

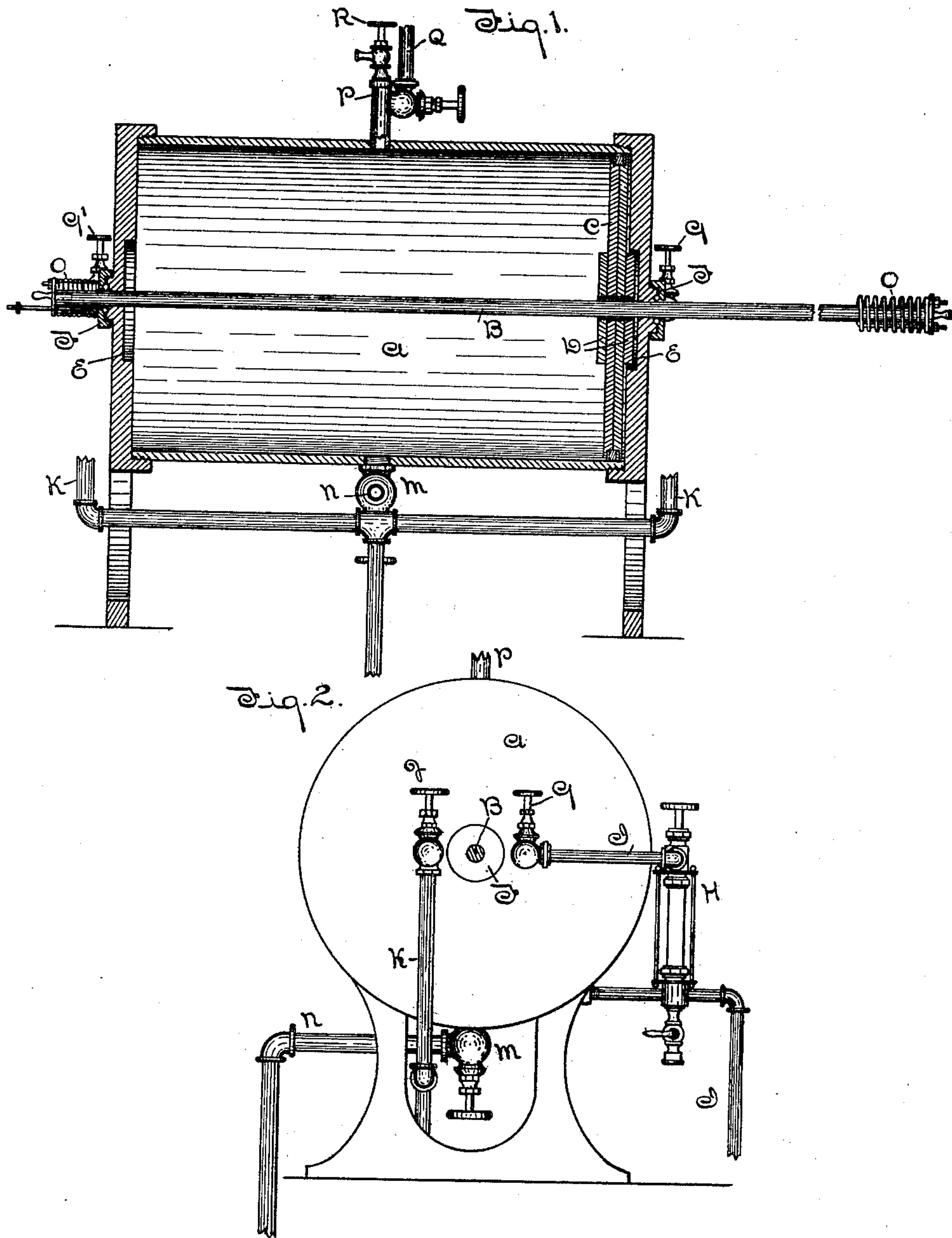
W. D. LABADIE.

COMPOUND FEEDER FOR STEAM BOILERS.

(Application filed Oct. 19, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

George Oltsch
Hugo Oltsch.

William D Labadie
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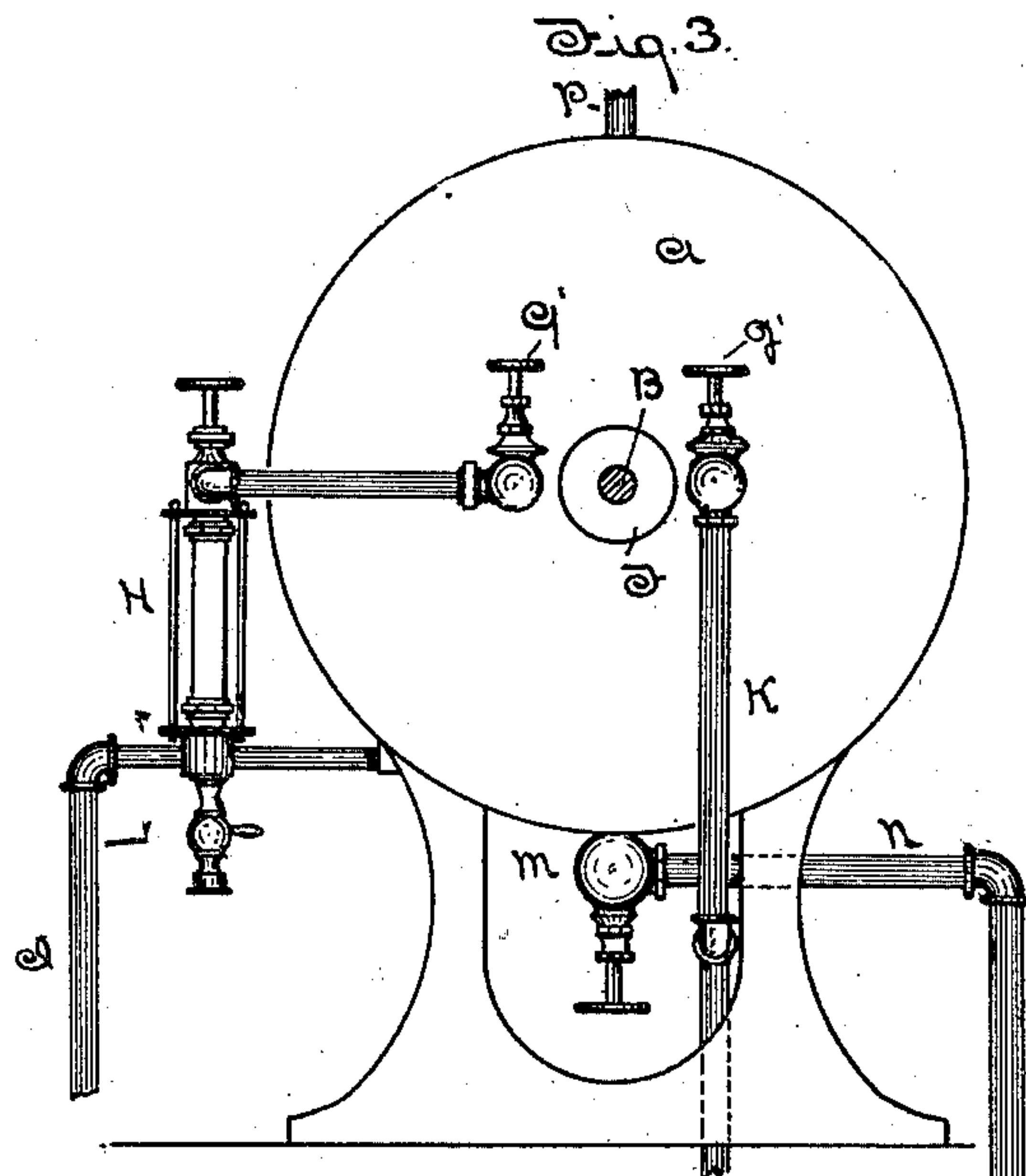
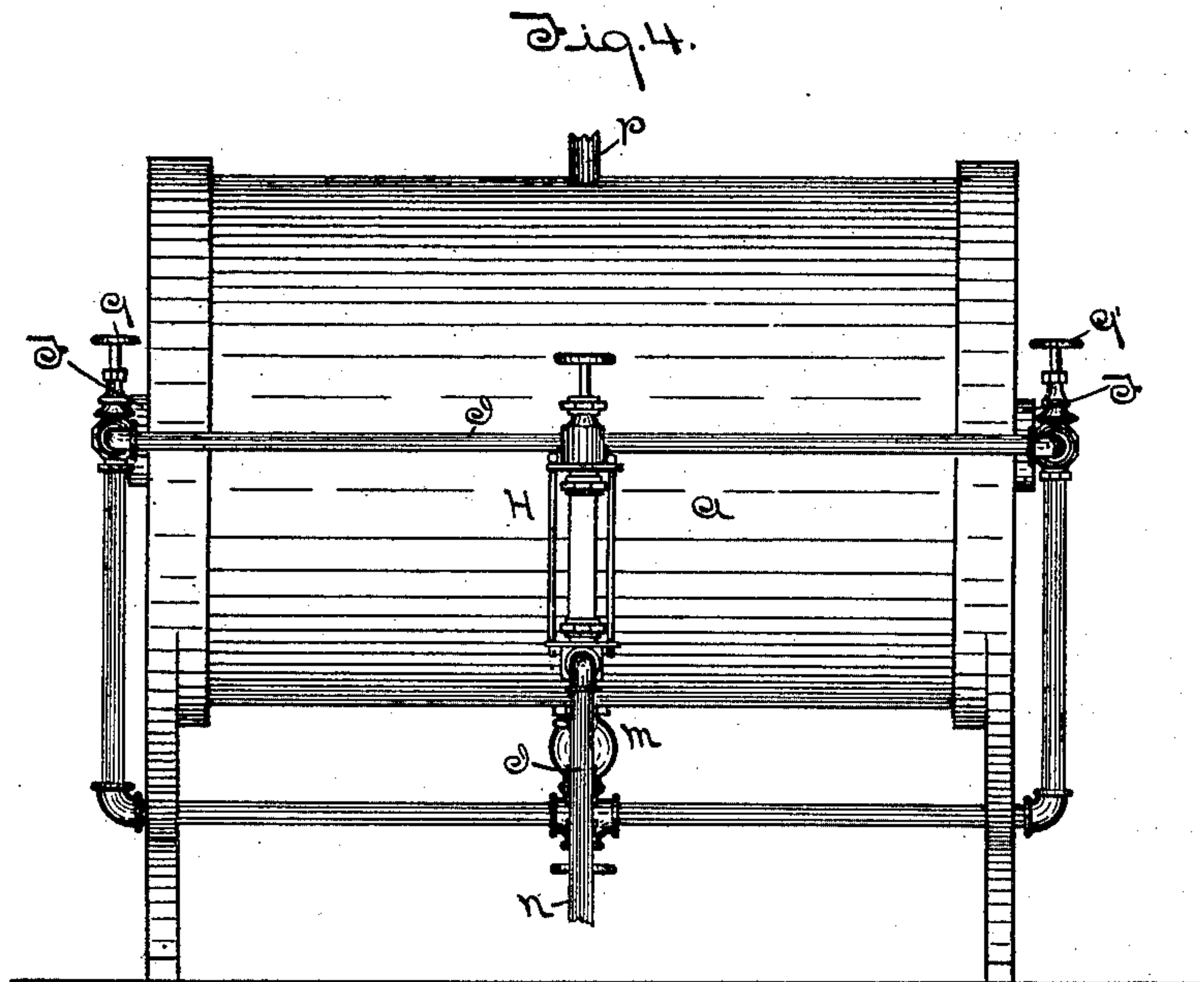
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(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

WILLIAM DARVIN LABADIE, OF SOUTH BEND, INDIANA.

COMPOUND-FEEDER FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 693,552, dated February 18, 1902.

Application filed October 19, 1900. Serial No. 33,572. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM DARVIN LABADIE, a citizen of the United States, residing at South Bend, in the county of St. Joseph and State of Indiana, have invented certain new and useful Improvements in Compound-Feeders 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 compound-feeders for boilers; and its objects are to produce a mechanism by means of which compounds of any suitable composition may be forced into boilers in a cheap and simple manner and to also produce a mechanism which is specially adapted for the purpose and is strong, cheap, and durable and not likely to get out of repair.

My invention consists in a suitable cylinder for holding the compound which is to be forced into the boiler, a guiding piston-rod which extends through both ends of the cylinder and is provided with a buffer at each end, and a piston secured to the piston-rod, combined with suitable supply and outlet pipes provided with the necessary check-valves, by means of which the compound is fed to the cylinder and then forced into the boiler, and the water or steam used in forcing the compound into the boiler is allowed to escape from the cylinder, all of which will be more fully described hereinafter.

In the accompanying drawings, which represent my invention, Figure 1 is a longitudinal vertical section taken through the cylinder. Figs. 2 and 3 are end views of a feeder which embodies my invention, the views being taken from opposite ends. Fig. 4 is a side elevation of the feeder.

A represents a cylinder of any suitable length and diameter and which is raised above the floor by suitable legs or supports. Placed inside of this cylinder A is the piston C, suitably packed, so as to form a tight joint with the sides of the cylinder as it is forced backward and forward, and upon each side of this piston are suitable jam-nuts D of large size, secured to the piston-rod B in any suitable manner, preferably by enlarging the piston-rod at this part and forming screw-threads

thereon, on which the jam-nuts screw and by means of which they are set up against the piston, as shown in Fig. 1. The piston-rod is nearly double the length of the cylinder and projects through both of the cylinder-heads, as shown. This rod has a reciprocating motion with the piston C, which is rigidly secured to it, and upon each end of the piston-rod is secured a suitable buffer O in the shape of a spiral spring, which serves to prevent damage to the ends of the cylinder if the pressure should be accidentally turned on without the cylinder being filled or greater pressure is applied in the cylinder against the piston than is necessary.

Connected to the top of the cylinder at or near its center is the inlet-pipe P, provided with the petcock R, through which the air from the cylinder is allowed to escape while the cylinder is being filled. Also connected to this inlet-pipe is a supply-pipe Q, of smaller diameter than the pipe P, provided with a suitable valve, and through which pipe when the valve is opened the compound to be forced into the boiler is fed into the cylinder, and as the pipe P is of larger diameter than the pipe Q the compound, which is slowly admitted, does not entirely fill the pipe P, and thereby allows the air to escape through the same pipe and out of the petcock R. Through the bottom of the cylinder at or near its center is a discharge-pipe N, provided with a suitable valve M, and through which the water or steam which has been used to force the piston from one end of the cylinder to the other is allowed to escape after having done its work. Connected to each end of the cylinder and within the recess E is a branch of a pipe, through which the steam or water is alternately admitted to opposite ends of the cylinder for the purpose of forcing the piston back and forth therein, and each of these branch pipes is provided with a valve J. When one of these valves is opened for the purpose of admitting water or steam under pressure to one end of the cylinder, the one at the opposite end is closed. Also leading from each end of the cylinder is a discharge-pipe I, through which the compound in the cylinder is forced into the boiler, and which pipe is provided with a valve G at each end. Connected to this pipe, so as to

form a part thereof, is a gage or sight-tube H, through which the compound passes in making its escape from either end of the cylinder, and through which tube H the operator
 5 can see at what rate the compound in the boiler is being discharged and regulate the pressure upon the piston accordingly. When the valve G is opened at one end to permit the discharge as the piston is being forced to-
 10 ward that end of the cylinder, the other valve G is closed.

The operation is as follows: The pipe Q being supplied from a tank in which the boiler compound is mixed, the valve in this pipe is
 15 opened, and when the petcock R is opened the compound will flow through the pipe P into the cylinder A, the air passing up through the pipe P as the compound flows through the same, the difference in the size of the
 20 pipes P and Q being sufficient to allow the air to escape through the pipe P and out of the petcock R without interference, as the inflowing compound is not of sufficient volume to entirely fill the pipe P. After the cyl-
 25 inder has been filled the petcock R and the valve in the cylinder-pipe Q are both closed, and then that valve G which is at the opposite end of the cylinder from the piston is opened and the other valve G is closed. By opening
 30 the valve G at the opposite end of the cylinder from the piston the compound in the cylinder is allowed to escape through that branch of the pipe I, and by closing that valve G which is at the same end of the cylinder as the pis-
 35 ton the steam or water used in forcing the piston toward the opposite end of the cylinder is prevented from escaping through the other branch of the pipe I, and thus mingling with the compound, as well as losing power for driv-
 40 ing the piston. When the valve J in that branch of the pipe K at the same end as the cylinder is opened, the steam or water under pressure is forced into the end of the cylinder and drives the piston toward the opposite end
 45 of the cylinder, and thereby forces the compound with which the cylinder has been filled into the boiler through the supply-pipe I. In order to entirely empty the cylinder, the jam-nuts D enter into the recesses E when the pis-
 50 ton reaches the end of its stroke in either direction, and thus forces every possible part of the compound into the boiler, so that there will be no waste of the compound. After the piston has been forced to the opposite end of
 55 the cylinder, thus emptying the cylinder of all the compound contained therein, the petcock R is opened to admit air, and the valve M is opened to permit the escape of the steam or water which has been used in forcing the
 60 piston to the opposite end of the cylinder. After the steam or water has escaped through

pipe N and the cylinder is empty the valve M is then closed, as are also the valve J at one end of the cylinder and the valve G at the other, when the above described opera- 65
 tion is repeated. It requires about eight hours for the piston to make a full stroke when the compound is being fed to a boiler, so that rapid automatic exhausts and sup-
 70 plies are not necessary.

Having thus described my invention, I claim—

1. In a compound-feeder for boilers, the cylinder having recesses formed in the inner sides of its two heads, a piston placed there- 75
 in and provided with jam-nuts which fit the recesses in the inner sides of the heads, a piston-rod which extends through both heads of the cylinder and to which the said piston is secured, and suitable buffers applied to op- 80
 posite ends of the piston-rod, combined with suitable inlet and outlet pipes provided with valves, and a cock for admitting and discharging air, substantially as described.

2. A compound-feeder for boilers consist- 85
 ing of a cylinder provided with a compound-supply pipe and compound-discharge pipes, a piston-rod extending longitudinally through the cylinder and carrying a piston, cushion-
 90 ing springs mounted on each end of the piston-rod and steam-inlet pipes attached to the cylinder to admit steam for reciprocating the piston and piston-rod, substantially as de-
 scribed.

3. A compound-feeder for boilers consist- 95
 ing of a cylinder, a piston-rod extending through both ends of the cylinder and carrying a piston adapted to reciprocate in the cylinder, pipes connected with the ends of the cylinder to admit steam and reciprocate the 100
 piston, pipes connected with the end of the cylinder for discharging the compound, and a steam-discharge pipe connected to the side of the cylinder at the bottom thereof, sub-
 105 stantially as described.

4. In a compound-feeder for boilers, a cylinder provided with a pipe P which serves to admit the compound; to discharge air from the cylinder, and to admit air after the com- 110
 pound has been discharged from the cylinder; combined with a piston-rod carrying a piston adapted to reciprocate in the cylinder, suitable steam-inlet pipes and compound-dis-
 115 charge pipes, and a steam-discharge pipe, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM DARVIN LABADIE.

Witnesses:

GEORGE OLTSCH,

HUGO OLTSCH.