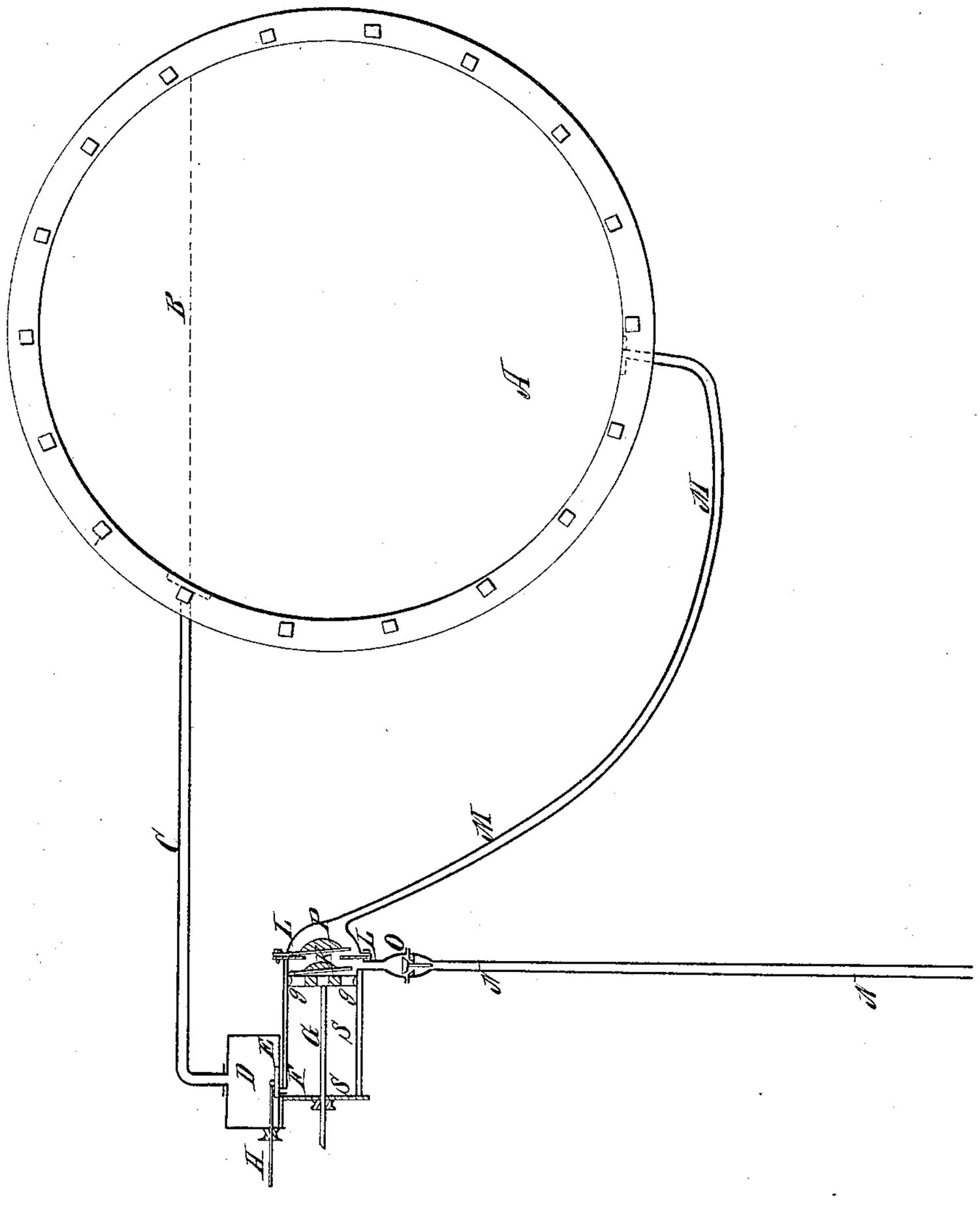
J. Densmore,

Steam-Boiler Water-Feeder,

No. 13,567. Patented Sep. 18, 1855.



UNITED STATES PATENT OFFICE.

JOEL DENSMORE, OF BLOOMING VALLEY, PENNSYLVANIA.

FEED-WATER APPARATUS OF STEAM-BOILERS.

Specification of Letters Patent No. 13,567, dated September 18, 1855.

To all whom it may concern:

Be it known that I, JOEL DENSMORE, of Blooming Valley, in the county of Crawford and State of Pennsylvania, have invented new and useful Improvements in Supplying Water to the Boilers of Steam-Engines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

A is a steam boiler constructed in the usual form. The dotted line B represents the water line.

C is a pipe bolted onto the boiler at the water line.

D is a steam chest.

E is a sliding valve worked by an eccentric, a crank, or any other desired and suitable contrivance attached to the valve-rod H which works through a stuffing box in the usual manner.

F, is a hole from the steam-chest into the pump cylinder S S.

G is a piston-rod also worked by any suitable mechanical contrivance attached to the engine.

I I is a piston-head with a valve K which opens toward the boiler.

L L is the cylinder head with a valve P similar to K and which opens in the same direction.

M M is a pipe bolted onto the cylinder-head and leading into the bottom of the boiler.

N N is a pipe leading into the well or water cistern.

O is a valve to prevent the water pan running down the pipe N N.

Now my machine works as follows, to wit: The sliding valve E and the piston-head I I are so adjusted to each other that the sliding valve E uncovers the hole F just at the time the piston-head I I arrives at the end of its stroke toward F. The pressure of the water in the boiler through the pipe M M closes the valve P. The motion of the piston head I I toward F together with the condensation of the steam in the pump cylinder S S opens the valve O, thereby drawing the water up through the tube N N and filling the pump-cylinder S S. The hole F remains open until the piston-head I I gets to the end of its stroke toward the boiler A, when it closes and remains closed until the piston-head gets back to the end of its stroke toward F. Now as the piston-head I I moves toward the boiler A the cylinder behind it is filled with steam admitted through the hole F and the pipe C while the water with which the cylinder was filled is forced into the boiler through the valve P and the pipe M M. Now if the water should rise any higher in the boiler A than the line B it would be forced by the steam through the pipe C into the steam-chest D and through the hole F into the pump-cylinder S S, (and as the piston-head I I moved toward the hole F) through the valve K, and at the return stroke of the piston-head I I it would be repumped into the boiler A. It is evident by this arrangement that the water line B in the boiler must always remain at the same height.

The well pipe N N may be admitted into the steam-cylinder S S at its top, bottom, side, or at any point desired. If it is admitted at the tip as soon as the piston-head I I moves toward F the water between the valve O and the cylinder will run into the cylinder and held to condense the steam. In the last cast the valve O would have to be placed above the pump-cylinder S S.

What I claim as my invention and desire to secure by Letters Patent of the United States is—

The arrangement of the tube C to enter the boiler at the water line B with the steam chest and pump cylinder constructed and operated in the manner described by which the steam of the boilers assists the pump worked by the engine to force water into the boiler as herein set forth.

JOEL DENSMORE.

Attest:

JOSHUA DOUGLASS,
A. B. RICHMAN.