

B. BRETT,
Automatic Boiler Feed-Regulators.

No. 139,762.

Patented June 10, 1873.

Fig 1.

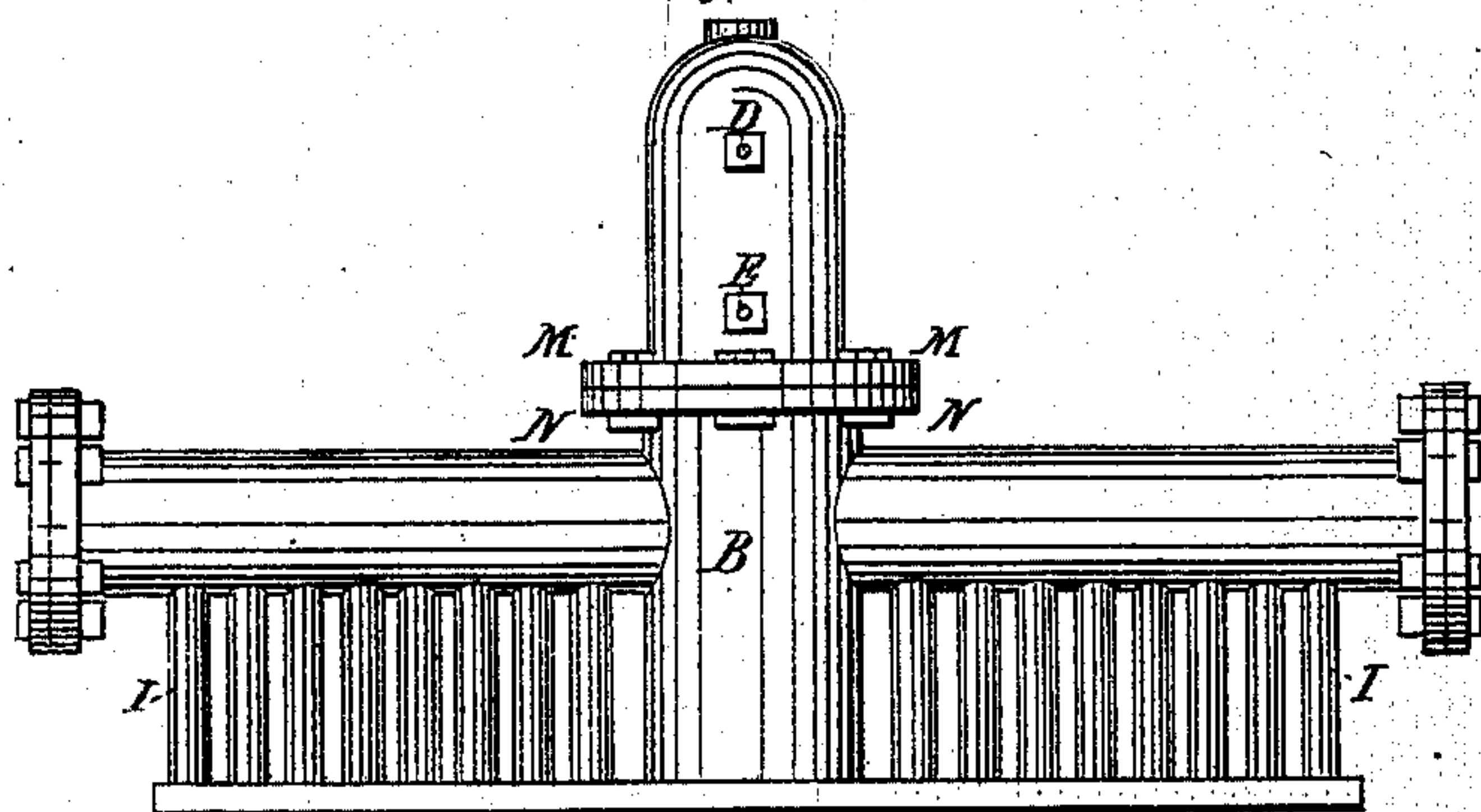


Fig 2.

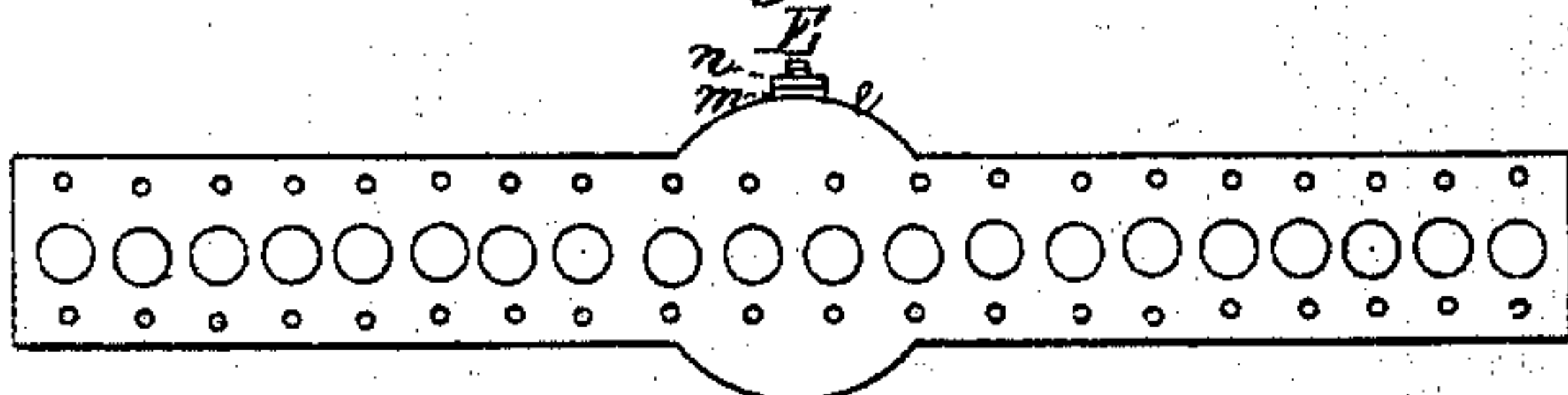


Fig 3.

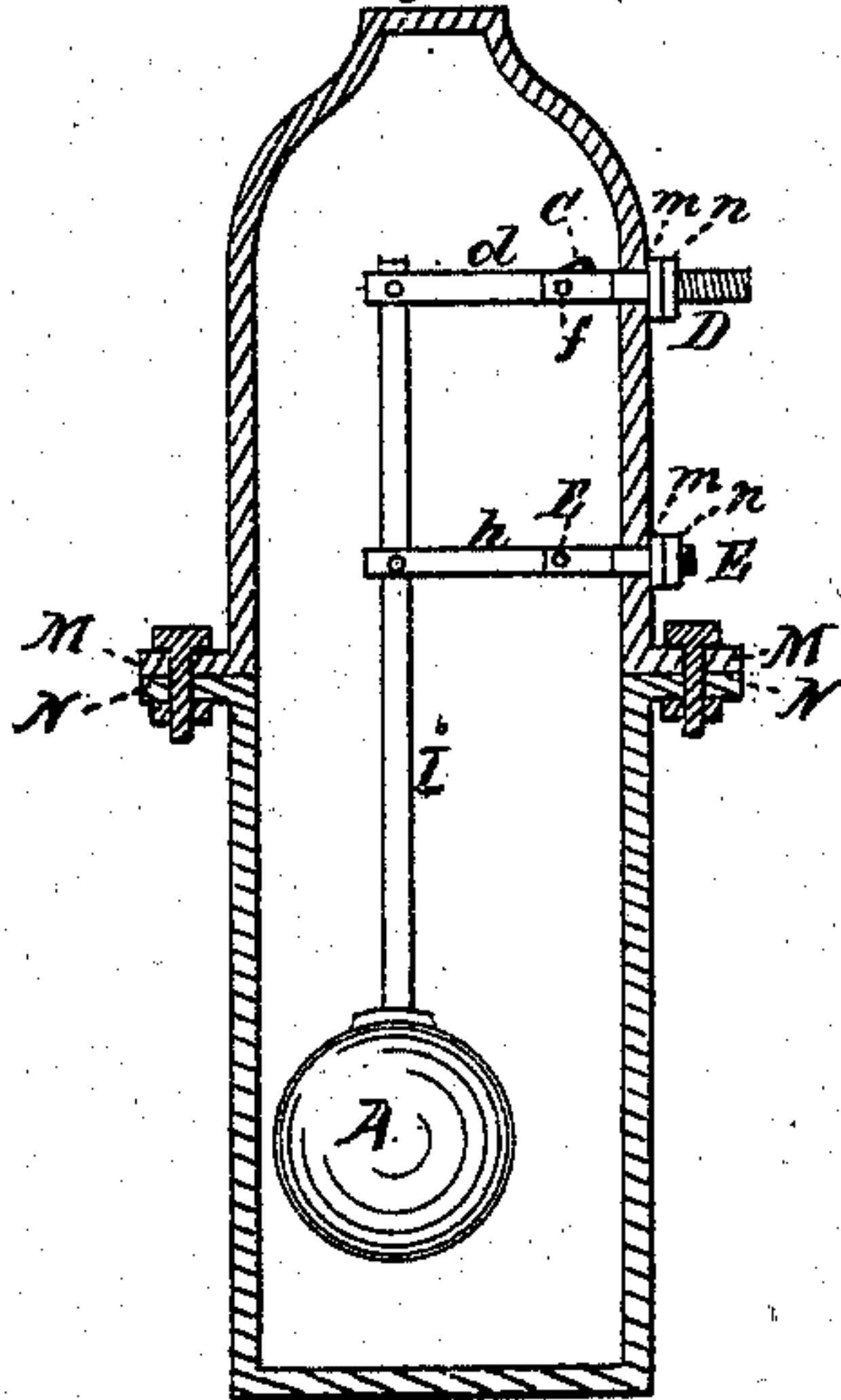
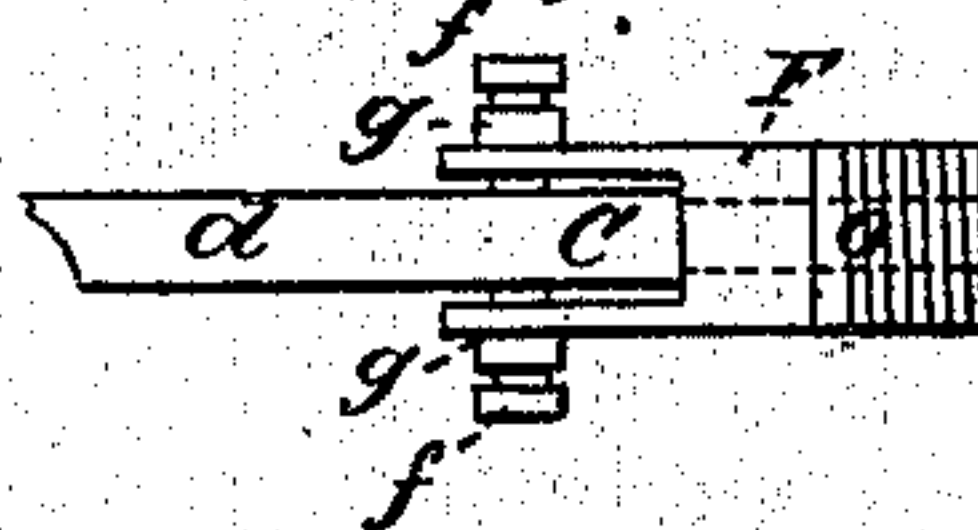


Fig 4.



Fig 5.



Witnesses.

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IMPROVEMENT IN AUTOMATIC BOILER-FEED REGULATORS.

Specification forming part of Letters Patent No. **139,762**, dated June 10, 1873; application filed June 17, 1872.

To all whom it may concern:

Be it known that I, BURT BRETT, of Geneva, Ashtabula county, State of Ohio, have invented certain Improvements in Automatic Boiler-Feed Regulators, of which the following is a specification:

The first part of my invention relates to the construction of a rotary valve for the regulation of the supply of steam from a steam-generator for the operation of a steam pump or injector for feeding steam-boilers with supply-water, in such a manner as to permit each instant an amount of steam to escape from the valve sufficient to supply the steam pump or injector for its operation, and secure such a manner and degree of action as may be necessary to keep a uniform level of water in the boiler, by means of the combination of said valve with a metallic float consisting of a hollow sphere resting in the water in the interior of the boiler, by automatic action resulting from the changes of the level of the water in the boiler; the object of this part of my invention being to furnish supply-water for the boiler by the automatic action of the parts hereinafter described, and to secure a regular and adequate supply of water, and attain security against explosions. The second part of my invention relates to the construction and combination of the chamber of a boiler-feed regulator containing the float and other parts of the machine hereinafter described, with the upper transverse section of Weston and Brett's safety-boiler, patented by the United States, September 27, 1870, and substituting said chamber for a number of the vertical branches of the upper transverse tube of said boiler, and constructing the bottom of the chamber in such a manner as to admit of the connection of the sectional parts of the fire-box with the base of the upper transverse section, as hereby modified, in a convenient manner.

Figure 1 is a side elevation of the upper transverse section of Weston's and Brett's safety-boiler, in combination with the parts embodying my invention. Fig. 2 is a plan of the lower side of the base of the same. Fig. 3 is a sectional elevation of the parts of the machine embodied in my invention, showing those parts in a transverse vertical plane ex-

tending from the center of the front to the center of the rear of the chamber B in Fig. 1. Fig. 4 is an elevation of the valve, and shows the parts enlarged. Fig. 5 is a plan of the valve.

A is a metallic float, consisting of a hollow sphere with a stem, *i*, above the float, connected with the ends of levers *d* and *h*. Lever *d* is also connected by set-screws *f f* with the seat of valve C, and lever *h* is connected with the end of a bolt, E, which extends through the side of the chamber B near the bottom of the dome of the chamber above the flange. Valve C and bolt E are each secured in their places by nuts *m m* screwed firmly down upon packing *l l*, and held by jam-nuts *n n*. B is a chamber elevated from the base of the upper transverse section of Weston and Brett's safety-boiler above mentioned, and intersecting the transverse tube, having flanges M N a little above the transverse section, for the attachment of the upper part, constituting the dome of the chamber. The chamber is of sufficient diameter to include a number of the vertical branches I I of the transverse section, and is substituted for them, and is so constructed as to admit of the connection with the lower side of its base of the sectional parts of the fire-box below the transverse section. The dome of the chamber is adapted to attachment to the upper parts of steam-boilers of ordinary forms, in such a manner as to permit the float A to rest in the water of the boiler. C is the valve and F the seat of the valve for the escape of steam from the chamber for the supply of a steam pump or injector, constructed in such a manner, with set-screws *f f* and jam-nuts *g g*, as to act freely and with security against derangement, and permit a constant supply of steam for the operation of the steam pump or injector, exactly sufficient to preserve a uniform level of water in the boiler.

Valve C is constructed at the end of lever *d*, as shown by the dotted lines in Fig. 4, in a convex form corresponding in curve to the concave form of the valve-seat, which is a curve constituting an arc of a circle having a radius equal to the distance of the concave part of the valve-seat from the axis on which the valve rotates, and the valve is adjusted

from the valve above described to the steam in such a manner that the convex part of the valve is nearly but not in perfect contact with the concave part of the valve-seat. The opening *o* of the valve-seat is enlarged on the lower side, as represented in Fig. 4, in such a manner as to effect a gradual increase of the flow of steam through the valve by the rotation of the valve toward the opening, and thus regulate the escape of the steam, the objects being to secure the constant passage through the valve of steam sufficient to cause a constant moderate action of the steam-pump, and admit an increasing supply of steam and corresponding action of the pump, graduated and regulated automatically by the action of the parts, and also secure a free action of all the parts, avoiding friction which would result from steam-tight contact of parts. The upper side of the valve is also constructed so as to rise above the valve-seat sufficiently to prevent the escape of steam above the valve.

D is the pipe, upon the end of which the valve C and valve-seat F are constructed, as above described, and extends from the interior of the chamber near the top of the dome through the side of the chamber in a line with and above the bolt E, and is secured in its place by a nut, *m*, screwed firmly down upon packing *l*, and held by a jam-nut, *n*, for the purpose of conducting the steam escaping

pump or injector by a pipe continued from pipe D.

The valve C is operated by the vertical action of the float A. As the water in the boiler sinks the float descends and carries with it the end of lever *d* attached to the stem *i* of the float, and opens the valve C so as to permit the escape of a greater amount of steam from the chamber, by which the action of the steam pump or injector is increased, and a larger supply of water afforded to the boiler, in consequence of which the water in the chamber is raised and carries with it the float upward, and tends to close the valve C and check the supply of water to the boiler; the action of the parts will soon find an equilibrium, and continue such as to preserve a uniform level of the water in the boiler.

I claim as my invention—

1. The construction and combination of the valve C with the float A, substantially as and for the purposes hereinbefore set forth.

2. The combination of the valve C, float A, chamber B, and the upper transverse section of Weston and Brett's safety-boiler, above mentioned, substantially as and for the purposes hereinbefore set forth.

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Witnesses:

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