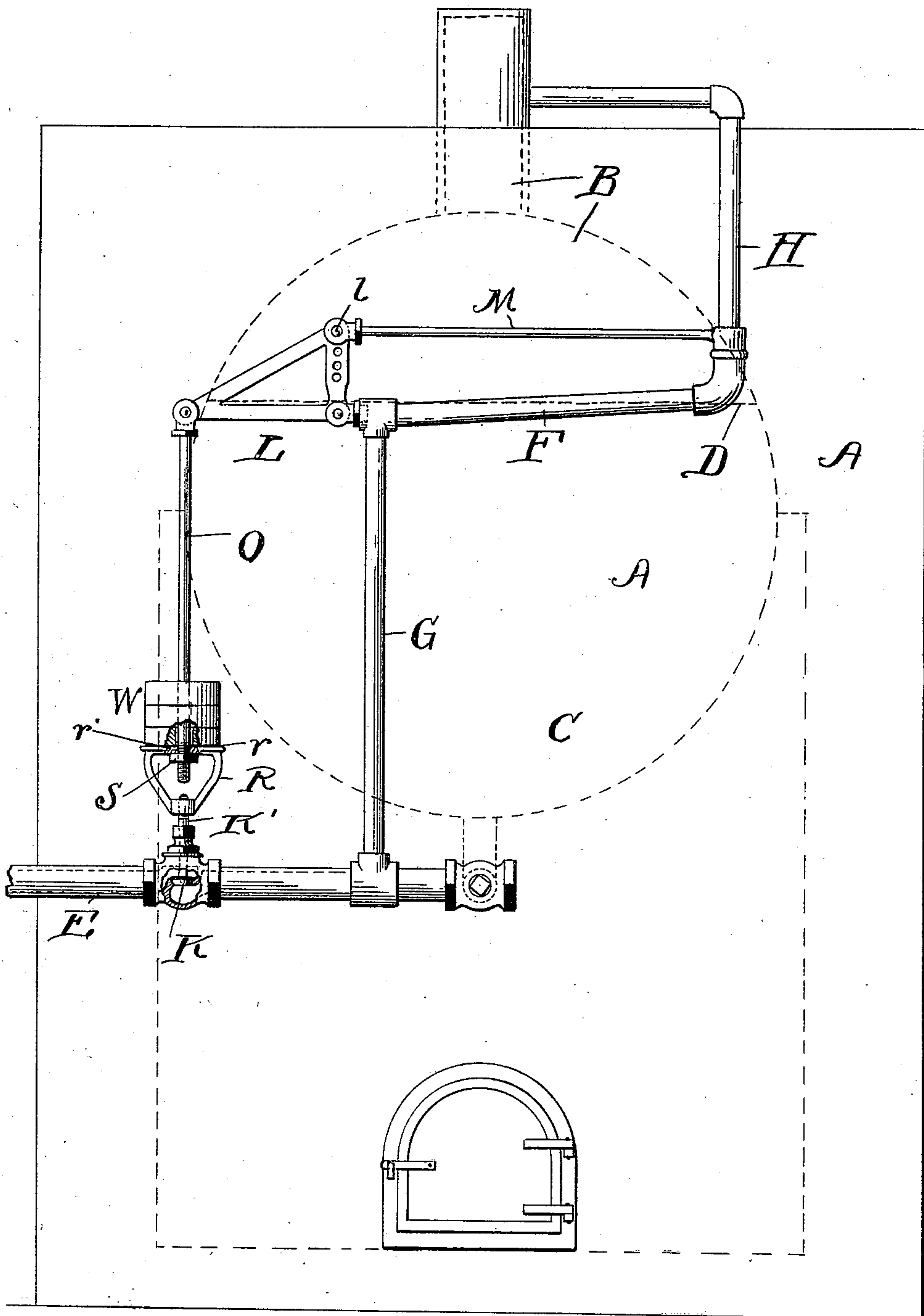


(No Model.)

J. E. CHAFER.
AUTOMATIC FEED WATER REGULATOR.

No. 551,719.

Patented Dec. 17, 1895.



Witnesses.
E. B. Gilchrist
C. W. Wood

Inventor
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UNITED STATES PATENT OFFICE.

JOHN EDMONDSON CHAFER, OF CLEVELAND, OHIO.

AUTOMATIC FEED-WATER REGULATOR.

SPECIFICATION forming part of Letters Patent No. 551,719, dated December 17, 1895.

Application filed January 5, 1895. Serial No. 533,909. (No model.)

To all whom it may concern:

Be it known that I, JOHN EDMONDSON CHAFER, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Automatic Feed-Water Regulators; 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 pertains to make and use the same.

My invention relates to improvements in automatic feed-water regulators.

On the 16th day of January, 1894, United States Letters Patent No. 512,804 were granted to me for an automatic feed-water regulator that has been placed upon the market and operates satisfactorily.

The object of my present invention is to produce an automatic feed-water regulator that is much simpler in construction, and consequently less expensive, than the regulator disclosed in said Letters Patent.

With this object in view my invention consists in certain features of construction and combinations of parts, hereinafter described, and pointed out in the claim.

The accompanying drawing is a rear side elevation of a steam boiler or generator provided with my improved automatic feed-water regulator, portions being broken away and in section to more clearly show the construction.

Referring to the drawing, A represents a steam boiler or generator; B, the steam-space thereof; C, the water-space, and D the water line or level desired to be maintained within the boiler.

E designates the feed-water pipe that leads from the pump (not shown) to and opens into the bottom of the boiler.

F designates an expansible and contractible pipe, shown located rearward of the boiler and in the same or approximately the same horizontal plane with the water-line or water-level desired to be maintained in the boiler. Open relation between said pipe F and the bottom or water space of the boiler is established by means of a pipe G, and a pipe H establishes communication between pipe F and the steam-space of the boiler.

The feed-water pipe is provided with a valve K for regulating or controlling the sup-

ply of water to the boiler. In the case illustrated, the portion of the feed-water pipe that bears the valve is horizontally arranged and the valve is moved vertically in opening and closing the same. The stem K' of valve K is operatively connected with one end of pipe F in such a manner that the valve is actuated to open to admit water to the boiler or actuated to close, according as said pipe is expanded or contracted, the water in said pipe rising or falling according as the water in the boiler rises or lowers relative to the water-level desired to be maintained in the boiler, said pipe expanding by heat transmitted from the steam-space of the boiler when the water in the boiler falls below the desired level and said pipe again contracting when the desired level of water in the boiler is again established.

The mechanism establishing operative connection between pipe F and valve K is exceedingly simple and is shown to be as follows: A right triangular lever L is fulcrumed at *l* at or near the apex of one of its acute angles to a stationary rod M, that is shown arranged approximately parallel with pipe F, and is supported in any approved manner. Lever L, at or near the apex of its right angle, is operatively connected with one end of pipe F, and at or near the apex of its other acute angle is operatively connected with an upright rod O, that is screw-threaded at its lower end and extends downwardly through and engages a correspondingly-threaded hole *r'* in the seat-forming member *r* of a weight-holder R, suitably secured to the stem of valve K. A nut S is mounted upon rod O at the under side of member *r* of the weight-holder and locks said holder in the desired adjustment. The valve shown opens by moving upwardly and again closes by descending upon its seat, and hence one or more weights W are placed upon the weight-bearing seat of the weight-holder, which weight or weights act to retain the valve upon its seat.

The operation of the mechanism just hereinbefore described will be readily understood without further description.

What I claim is—

In combination, steam-boiler or generator, feed-water-pipe E, valve K provided with the upwardly-extending stem K', expansible and

contractible pipe F, pipes G and H, stationary
rod M, triangular lever L, upright rod O,
weight-holder R constituting a coupling be-
tween said upright rod and aforesaid valve-
5 stem, and provided with the seat *r*, and a
weight or weights W, all arranged and oper-
ating substantially as shown, for the purpose
specified.

In testimony whereof I sign this specifica-
tion, in the presence of two witnesses, this 10
24th day of November, 1894.

JOHN EDMONDSON CHAFER.

Witnesses:

C. H. DORER,

L. WARD HOOVER.