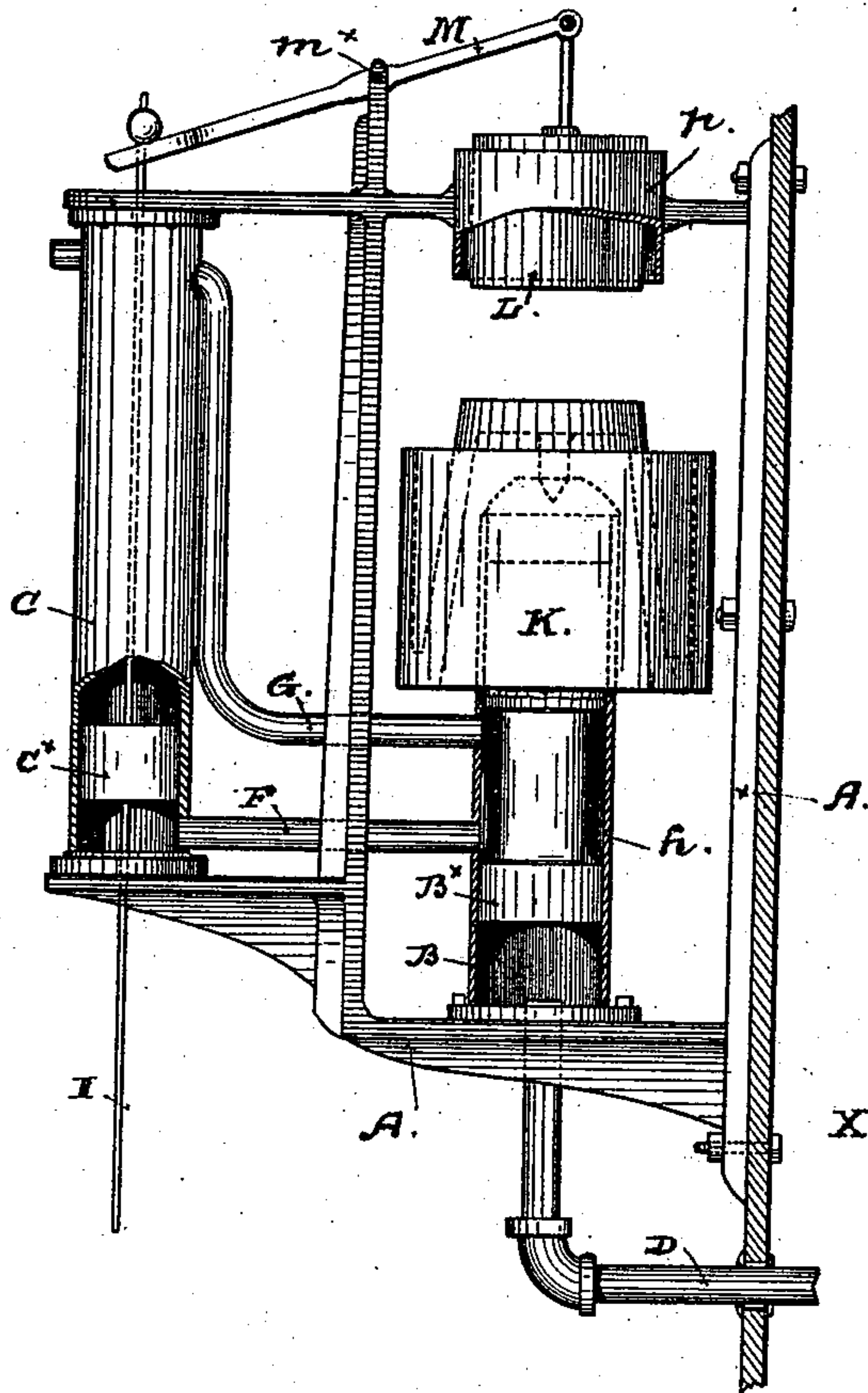


(No Model.)

J. ST. MARY.
DAMPER REGULATOR.

No. 377,785.

Patented Feb. 14, 1888.



Witnesses:

Joseph E. Ford,
E. Collins,

Inventor

Joseph St. Mary.
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UNITED STATES PATENT OFFICE.

JOSEPH ST. MARY, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO PETER ST. MARY, OF SAME PLACE.

DAMPER-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 377,785, dated February 14, 1888.

Application filed July 7, 1887. Serial No. 243,700. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ST. MARY, a citizen of the United States, residing in the city and county of San Francisco, and State of California, have invented certain new and useful Improvements in Damper-Regulators; and I do hereby declare that the following is a full, clear, and exact description of my said invention, reference being had to the drawing that accompanies and forms part of this specification.

My invention relates to an improved damper-regulator of the kind heretofore produced by me, upon which an application for Letters Patent filed March 21, 1887, (Serial No. 232,337,) was allowed on May 10, 1887.

The present regulator differs from the device embraced in that invention in having an auxiliary weight arranged to act in conjunction with the principal weight, instead of a single constant one to act on the regulating-piston, and in using the steam-pressure upon one side only of the piston.

The present improvements consist in certain novel construction and combination of regulating-piston and weights acting contrary to the steam-pressure, and controlled in its turn by or from the movements of the damper-actuating piston, all as hereinafter described.

The accompanying drawing, forming a part of this specification, represents the improvements combined for operation, and shows the regulator in general vertical section.

A is a bracket fixed to the boiler in suitable position to afford support for the two cylinders B C and the connecting steam pipes or tubes from the boiler-space X to the cylinders. The space of cylinder B below its piston or plunger B^x is connected directly with the boiler-space by pipe D. The cylinder C below its piston C^x communicates with the cylinder B through the tube F, while the space above the piston is open to the atmosphere at g. The space below this piston C^x is also open to the atmosphere through the exhaust-tube G, the annular space h in the cylinder B, and the tube F under certain positions of the piston C^x and the plunger B^x. The head of the plunger below this space h is steam-tight, and the length of its stroke is regulated to uncover the steam-pipe F, but not to rise above the

outlet of the pipe G. Piston C^x is connected with the damper-shaft by the piston-rod I, by which the damper-shaft is turned and the dampers operated.

The steam-pressure against the plunger B^x is counterbalanced by the weighted cap K on the top; but instead of using a constant weight I now apply and bring into action with it an auxiliary weight, L, which is added to the principal weight at its highest point of elevation, but is taken off and held out of action as soon as the plunger reaches that point and is to descend. Such action of the auxiliary weight is readily produced by attaching it to the end of a lever, M, and connecting the piston-rod I to the end of the lever. The fulcrum of this lever is fixed at m^x on the bracket A, and the weight is set in a guide-tube, p.

In the descent of the piston C^x the lever is raised and the weight is held up as long as the piston remains in the lower part of its cylinder; but as the upward movement lifts the piston-rod it brings down the weight L to meet the cap or principal weight K, which at such time is being raised up by the movements of the plunger. Under such conditions the weight L is added to the cap to overcome resistance due to friction of parts and start the plunger downward when the steam-pressure falls; but after this movement is begun the weight of the plunger and its cap and the momentum of the parts are sufficient to complete it, and the augmenting weight L is therefore removed. The normal weight of the cap being thus reduced, the plunger will respond more delicately to the fluctuations of the steam-pressure, and will rise more readily under increase of pressure.

As thus constructed the device operates upon the damper-shaft through variations in the steam-pressure of the boiler. As this rises the plunger B^x is forced up, and the steam admitted to the cylinder C by the pipe F raises the piston C^x, and through it, acting on the damper-shaft, closes or reduces the draft. This continues until the cap meets and is augmented by the weight L, and then as soon as the steam-pressure falls off the plunger begins to descend in its cylinder until it passes below the port F^x, when the two passages E G are put in communication. The space in the cyl-

inder C below the piston thereupon exhausts through these passages, and the piston C^x, descending, permits the damper to open.

5 In constructing this regulator the size of the piston C^x will be determined by the number of dampers to be worked, the diameter being increased as greater power is required of the piston.

10 Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

15 1. In a damper-regulator, the combination, with the plunger of the main cylinder B, having steam-pressure from the boiler beneath it, and adapted by its movements to control the admission of steam beneath the piston of the auxiliary cylinder C and is discharged therefrom, of the weighted cap K and the auxiliary weight L, and suitable rods and levers, I and
20 M, connecting the piston of the auxiliary cylinder with the said weight, all arranged substantially as described.

2. In a damper-regulator, the combination of the main cylinder B, plunger B^x, auxiliary

cylinder C, with piston C^x, adapted by its 25 movements to operate a damper, the connecting-pipe, the exhaust-passages, and principal weight K and auxiliary weight L, applied to the plunger B^x, and suitable rods and levers connecting the rod of the contrary piston with 30 the weights, substantially as described.

3. In a damper-regulator, a main piston or plunger, B^x, adapted by its movements to control the inlet and exhaust of steam-pressure to and from an auxiliary piston, C^x, in combina- 35 tion with suitable rods and levers connecting the auxiliary piston with a damper-operating shaft, and weight K and auxiliary weight L, acting upon the main piston, and suitable means connecting the auxiliary piston with the 40 weight, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

JOSEPH ST. MARY. [L. S.]

Witnesses:

CHAS. E. KELLY,
C. WOODWORTH.