

No. 620,380.

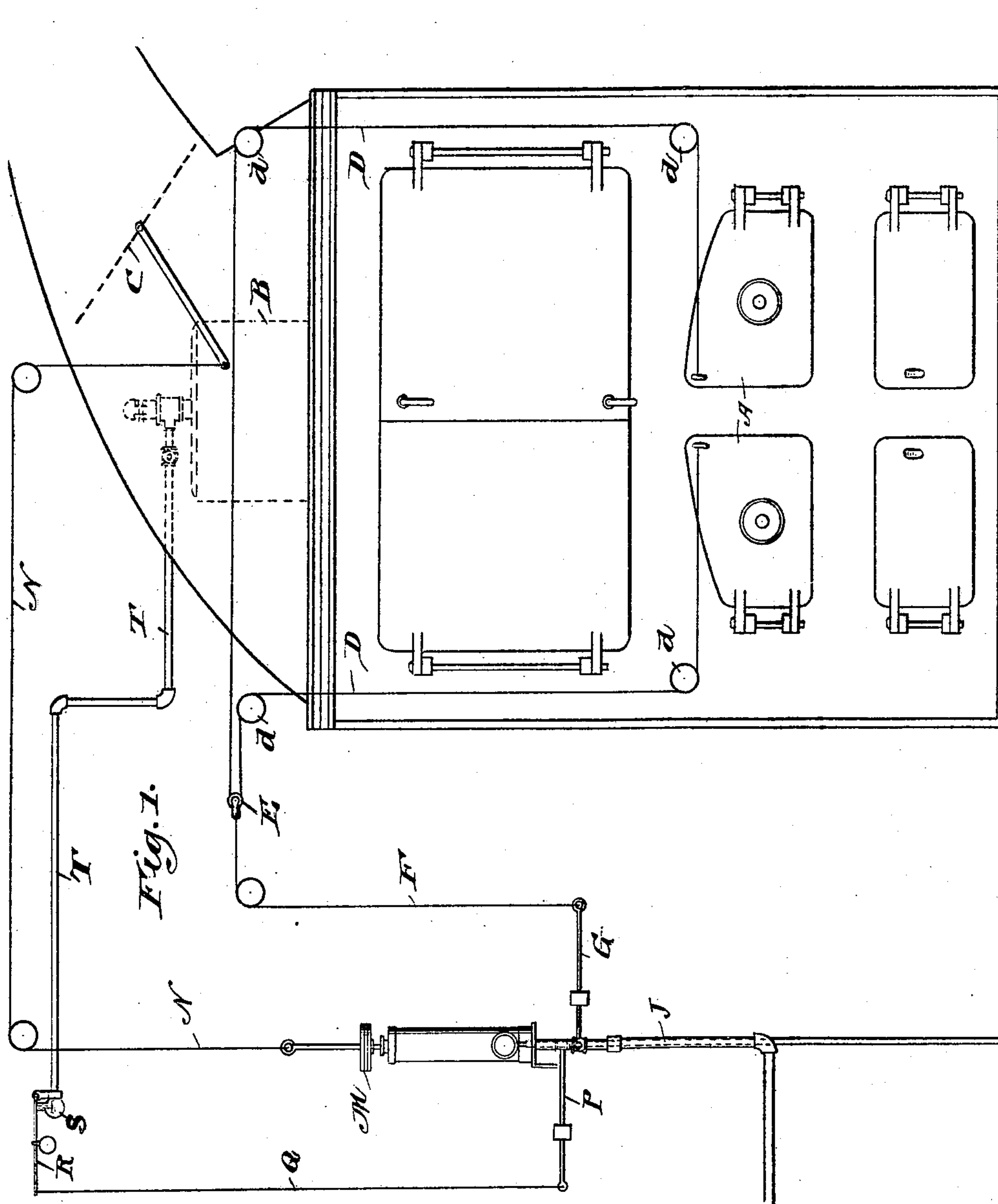
Patented Feb. 28, 1899.

J. C. TOOMEY.
DAMPER REGULATOR.

(Application filed Dec. 4, 1896.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses,

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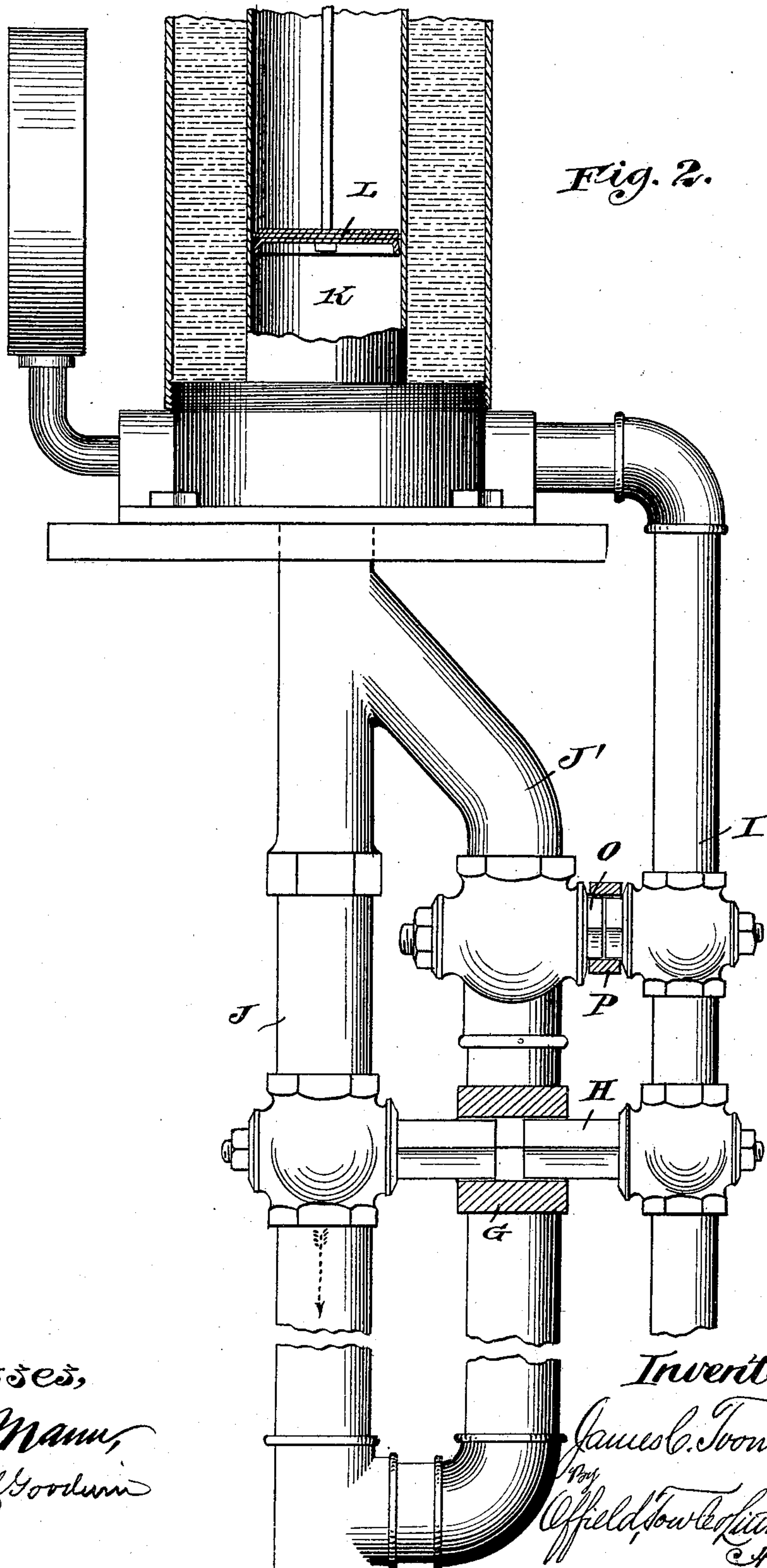
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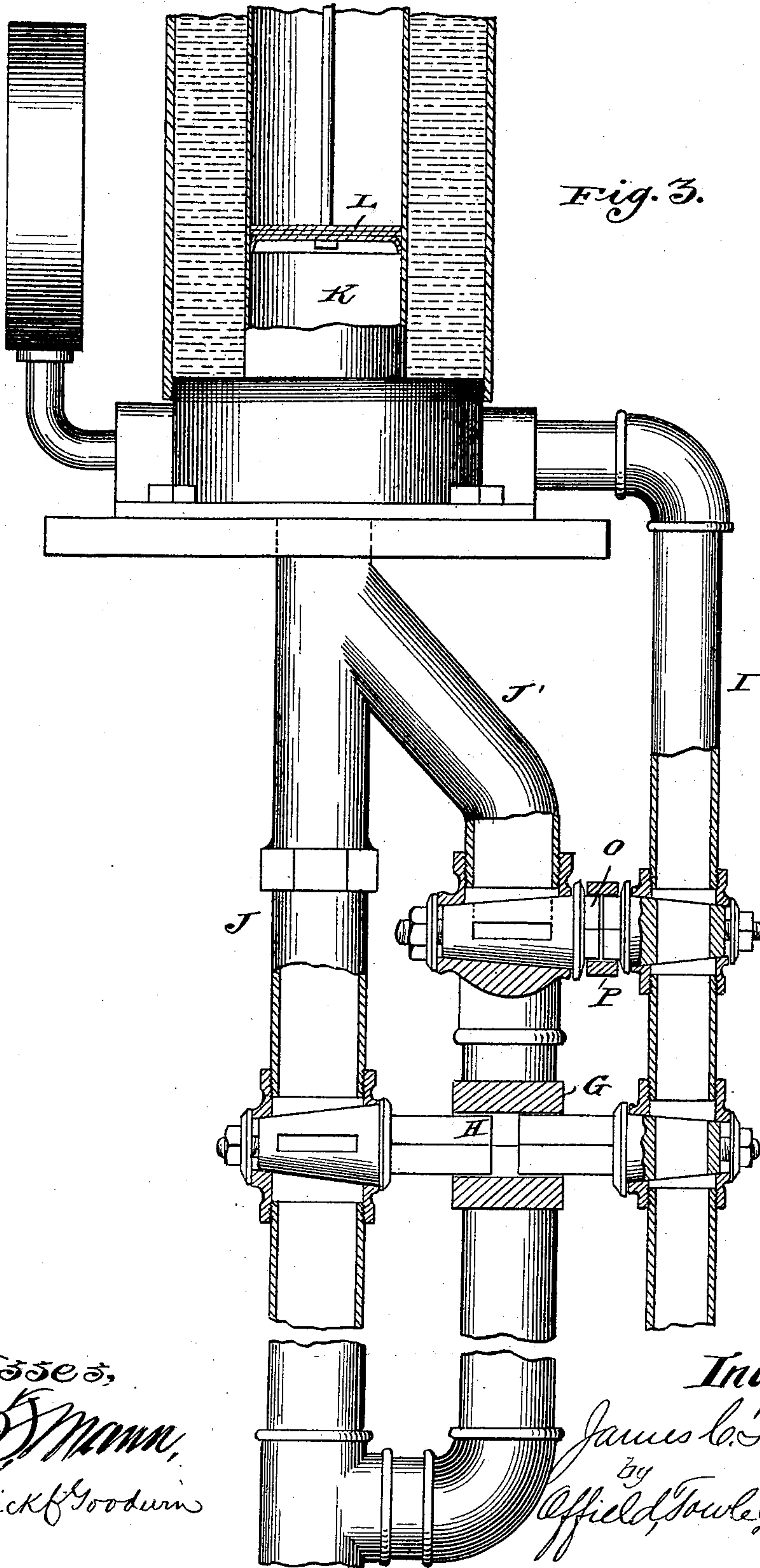
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

JAMES C. TOOMEY, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-THIRD TO
WILLIAM IRVING, OF SAME PLACE.

DAMPER-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 620,380, dated February 28, 1899.

Application filed December 4, 1896. Serial No. 614,441. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. TOOMEY, of Chicago, Illinois, have invented certain new and useful Improvements in Damper-Regulators, of which the following is a specification.

This invention relates to an improvement in damper-regulators particularly adapted for use in connection with steam-boilers; and the invention has for its object to provide a means whereby the draft will be closed when the steam attains a certain pressure.

A further object of the invention is to so construct the regulator that the damper in the furnace-stack will be closed when the furnace-door is opened for the admission of fuel.

The invention consists in the novel construction and combination of the parts, as hereinafter described, and more particularly pointed out in the claim.

In the accompanying drawings, Figure 1 is a diagram showing the boiler-front in elevation with the regulating appliances connected to the furnace-doors and the damper. Fig. 2 is an enlarged detail view, partly in elevation and partly in section, of portions of the regulator. Fig. 3 is a view similar to Fig. 2, showing the valve-casings in section and the valves in their normal position.

In the drawings let A represent the fuel-doors of the steam-boiler furnace, B the dome, and C the damper. The fuel-doors are connected to the cable D, running over the guide-pulleys *d* and over a traveling pulley-block E, the latter being connected by a cable F to lever G. Said lever is rigidly connected to a valve-stem H, and the valve-stem has two valves, one of which controls the passage through a pressure-supply pipe I and the other of which controls the passage in a discharge-pipe J. The pressure-supply pipe I leads to the interior of a pressure-cylinder K, within which a piston L reciprocates. The piston-rod has a weight M and is connected by the cable N with the damper C. The discharge-pipe J has a branch or by-pass J', controlled by a valve upon the valve-stem O, which valve-stem carries a second valve interposed in the supply-pipe I between the valve controlled by the lever G and the pressure-cylinder. The valve-stem O has a lever

P, connected by a cable Q with a weighted lever R, said lever being pivoted at its opposite end and intermediately acted upon by a plunger or piston acting within the chamber S. To this chamber steam is admitted below the piston through the pipe T, leading from the dome B. When the steam attains a certain pressure, it will raise the lever R, operating through the cable Q upon lever P, which will open the valve in the by-pass J' and close the valve in the power-supply pipe I. The pressure fluid, which has maintained the piston L in an elevated position and the damper C opened, will now discharge through the by-pass and the piston will descend, closing the damper, and thereby checking the fire. When the pressure of the steam falls, the lever R will descend and a corresponding movement of lever P will take place, thus opening the pressure-supply valve and closing the valve in the by-pass. The pressure fluid, which may be water from a city main, will then pass into the cylinder beneath the piston and raising it will open the damper.

It is desirable to close the damper whenever the fuel-doors are opened to prevent strong drafts of air blowing across the top of the fire and thereby deadening it. It is for this reason that I employ the cable and valves connected with the fuel-doors. When either of said doors is opened, the lever G will be raised and the raising of said lever will operate to open the valve in the main discharge-pipe and close the valve on the valve-stem connected with said lever in the pressure-fluid-supply pipe. The pressure fluid will be discharged from the cylinder through the main discharge-pipe, the piston will descend, and the damper will be closed, but as soon as the fuel-door is closed the reverse of these operations will take place. The cylinder will fill with the pressure fluid, the piston will rise, and the damper will again be opened.

From the foregoing description it will be seen that I have by simple and mechanical devices provided means whereby the damper may be automatically controlled with the variations of the steam-pressure and also means whereby the damper is automatically closed by the opening of either of the fuel-doors,

and while I prefer to combine this damper-actuating means still it is obvious that my steam-actuated damper-regulator might be used if the manually-actuated connections
5 were omitted; but I prefer in all cases to use both, because with a single pressure-chamber and a reciprocating piston I am enabled to control the damper by the steam-pressure and also by the movements of the fuel-doors.

10 I claim—

A damper-regulator comprising in combination with a steam-boiler, a steam-boiler furnace, its dampers and its fuel-doors of a pressure-cylinder a piston reciprocating
15 therein, a pressure-fluid-supply pipe leading thereto, a discharge-pipe having a branch or by-pass, two valves in the pressure-fluid-supply pipe, a valve in the discharge-pipe and a

valve in the branch thereof, a steam-actuated pressure device adapted to actuate one of the
20 valves in the supply-pipe and one of the discharge-valves a connection between the piston and the damper and a connection between the fuel-doors the second valve in the pressure-fluid-supply pipe and the second dis-
25 charge-valve, whereby the rising of the steam or the opening of the fuel-door will move the damper in one direction and the lowering of steam-pressure or the closing of the fuel-door will operate to move said damper in the op-
30 posite direction, substantially as described.

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