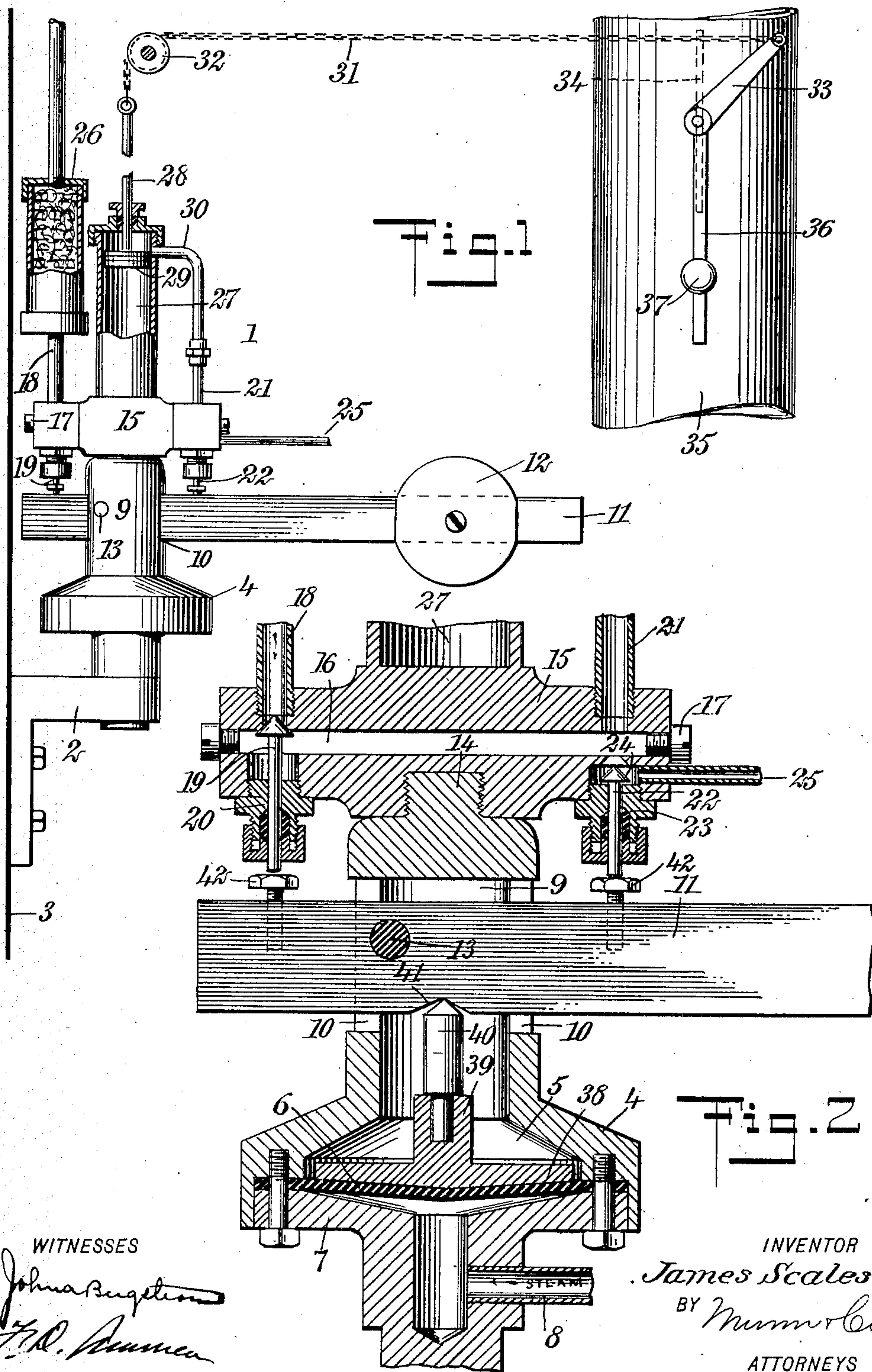


No. 860,413.

PATENTED JULY 16, 1907.

J. SCALES.
DAMPER REGULATOR.
APPLICATION FILED MAY 9, 1906.



UNITED STATES PATENT OFFICE.

JAMES SCALES, OF NEW YORK, N. Y.

DAMPER-REGULATOR.

No. 860,413.

Specification of Letters Patent.

Patented July 16, 1907.

Application filed May 9, 1906. Serial No. 315,947.

To all whom it may concern:

Be it known that I, JAMES SCALES, a citizen of the United States, and a resident of the city of New York, (borough of Brooklyn,) in the county of Kings and State of New York, have invented a new and Improved Damper-Regulator, of which the following is a full, clear, and exact description.

This invention relates to damper regulators such as are used in connection with boilers or furnaces.

10 The object of the invention is to produce a simple mechanism for automatically controlling the position of the damper in the flue leading from the fire-box, the object being to reduce the amount of draft when the boiler or furnace becomes too hot or is supplying too
15 great a quantity of steam.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

20 Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation showing the device, certain parts being broken away and shown in section; and
25 Fig. 2 is a vertical cross-section through the lower portion of the device shown in Fig. 1, but upon an enlarged scale.

Referring more particularly to the parts, 1 represents the device which may be conveniently attached by
30 means of a bracket 2, to the side of a boiler or furnace, indicated by the line 3.

The device comprises a casing 4, in the interior of which there is formed a chamber 5, the said chamber having a transverse diaphragm 6 held in place by a re-
35 movable cover 7. Steam is admitted to the under side of the diaphragm, through a suitable steam inlet 8 as indicated in Fig. 2. The casing 4 is formed with an upwardly extending tubular neck 9, the wall of which is provided with upwardly disposed slots 10 which re-
40 ceive a transversely-disposed lever 11 carrying a suitable counterweight 12 which counterweight is preferably made adjustable in the manner indicated. The lever 11 is pivotally attached to the neck 9 by means of a suitable pin or pivot 13.

45 The upper extremity of the neck 9 is formed with a reduced tip 14 which is provided with screw-threads for the attachment of a double valve 15; the body of this valve has substantially the form of a cross-head comprising oppositely disposed arms, and having a
50 horizontal duct 16 extending longitudinally thereof from end to end, the extremities of the said duct being closed by removable plugs or screws 17. In one end of the valve, an inlet-pipe 18 is disposed, below which a seat is provided for an inlet valve 19, the said inlet
55 valve being arranged to close upon its seat by an upward movement, and having a downwardly-extended

stem guided through a stuffing-box 20, below which the said stem projects as indicated.

At a point opposite the inlet-pipe 18 there is an outlet-pipe 21 which also communicates with the duct 16, 60 and at a point below this outlet-pipe 21 a seat is provided for a drain-valve 22 which closes upon its seat by an upward movement and comprises a stem which projects below a stuffing box 23, through which it is guided as shown. This valve, when in the position 65 shown in Fig. 2, opens communication from the duct 16 into a valve chamber 24 which valve chamber is in communication with a drain-pipe 25. The inlet-pipe 18 receives water under suitable pressure from a filter 26. 70

At a suitable point, which may be above the double valve 15 as shown, I provide a regulating cylinder 27 having a movable piston 29 therein, the rod 28 of which is guided in the upper head of the cylinder, as indicated. The piston 29 is normally-disposed a short dis- 75 tance from the head of the cylinder, so that water may flow into the upper end of the cylinder through a pipe 30, which connects with the pipe 21 aforesaid.

The upper extremity of the rod of the piston 29 is attached to a chain 31 which passes over a suitable 80 guide-pulley 32 and is attached to a lever 33 which is rigidly connected with a damper 34 disposed within a flue 35. This lever, and damper 34 are counterweighted by means of an arm 36 carrying a suitable weight 37, the said arm normally hanging in a vertical 85 position as indicated; when in this position the damper is wide open, as shown.

Within the interior of the chamber 5 and on the upper side of the diaphragm 6 I provide a head 38, which head is provided with an upwardly projecting central 90 boss 39; in this boss there is seated a stem 40 which extends upwardly and is tapered into a point which seats in a notch 41 formed on the under side of the lever 11 as shown.

In the upper edge of the lever 11 I provide adjust- 95 able screws 42 which lie adjacent to the extremities of the stems of the valves 19 and 22, and it should be understood that the arrangement is such that the movement of the lever upon its pivot 13 will operate the said valves. 100

The mode of operation of the apparatus will now be described: The filter 26 having been connected with a water-supply of suitable pressure, the steam from the furnace or boiler—the damper of which is to be regulated—is admitted by the pipe 8. When the steam 105 pressure rises beyond a predetermined point, the diaphragm 6 becomes distended upwardly so that the weighted extremity of the lever 11 becomes raised; in this way the valve 22 is moved upwardly upon its seat, while the valve 19 is allowed to open. Water then 110 enters the duct 16 and passes up the pipes 21 and 30 to the cylinder 27; arriving at the cylinder 27 it actu-

ates the piston so as to pull upon the chain 31, moving the damper 34 into a more or less closed position. In this way the draft from the fire-box of the furnace is checked and the steam pressure will naturally fall somewhat. As soon as the steam pressure has fallen sufficiently, the diaphragm 6 will tend to resume its normal position so that the lever will move back to position shown in Fig. 2. The valve 22 will then open and the valve 19 will close. In this way the water supply to the cylinder 27 is cut off and the water in the cylinder and connected pipes is allowed to drain off through the pipe 25. In one aspect, the casing together with its diaphragm and head 38 may be considered a pressure-gage.

15 Having thus described my invention, I claim as new, and desire to secure by Letters Patent:—

In combination, a gage having a diaphragm therein, and an upwardly projecting tubular neck thereabove, a valve-

case mounted in the upper end of said neck and having a duct passing completely through the same, removable 20 plugs closing the ends of said duct, a cylinder, an inlet valve seating by an upward movement and adapted to admit fluid under pressure to said duct, an outlet, a connection from said duct to said cylinder, a piston in said cylinder, a damper controlled thereby, an outlet valve 25 seating by an upward movement and allowing escape from said duct, said valves having stems projecting downwardly from said case, said tubular neck having oppositely disposed slots therein, a lever passing through said slots having its fulcrum on said neck, and having its upper 30 edge adjacent to said stems, and a member resting on said diaphragm, extending upwardly through said neck and engaging said lever to actuate the same.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses. 35

JAMES SCALES.

Witnesses:

SETH R. BOYDEN,
GEORGE H. PALMATEER.