

No. 715,136.

Patented Dec. 2, 1902.

G. F. PATTERSON.  
DAMPER REGULATOR.

(Application filed June 21, 1902.)

(No Model.)

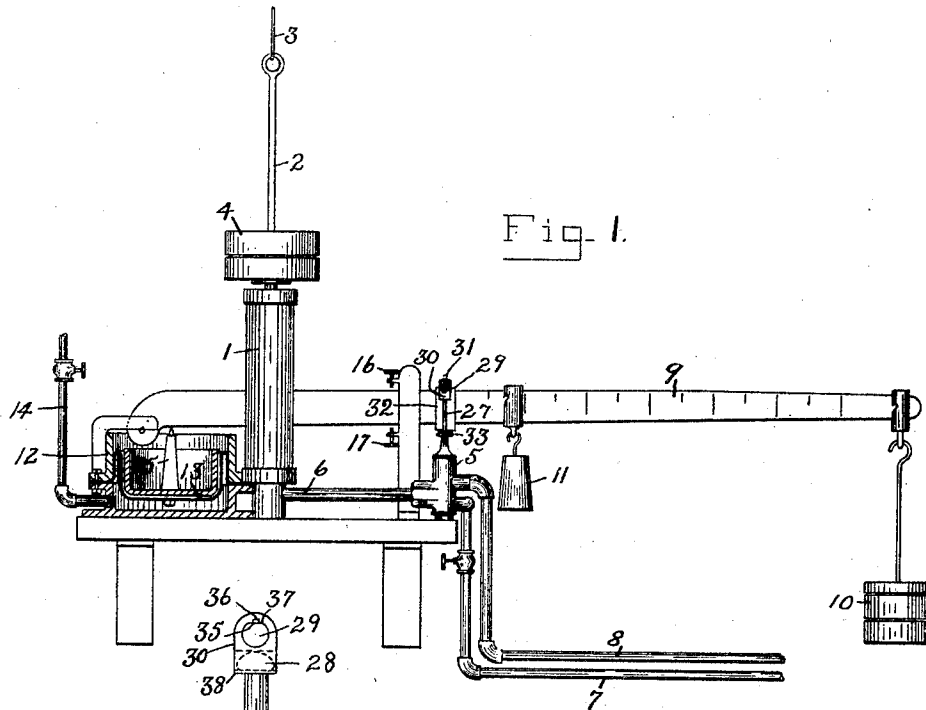


Fig. 1.

Fig. 2.

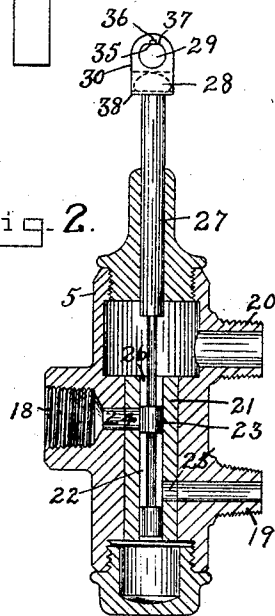
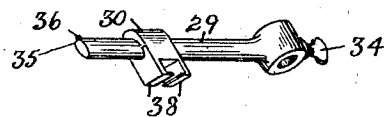


Fig. 3.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## DAMPER-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 715,136, dated December 2, 1902.

Application filed June 21, 1902. Serial No. 112,611. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE F. PATTERSON, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Damper-Regulators, of which the following is a specification.

This invention relates to improvements in automatic damper-regulators for furnaces of steam-boilers, such as shown in Letters Patent No. 600,843, granted to me on the 15th day of March, 1898.

The object of the invention is to provide an improved construction for operating the valve which controls the communication of water to and from the damper-motor.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is an elevation, in which a part is shown in section, of an apparatus embodying my invention. Fig. 2 is a vertical section of the valve device, and Fig. 3 is a detailed view of the improved construction for operating the valve.

Similar reference-numerals designate like parts throughout the several views.

In the accompanying drawings, forming part of this specification, 1 designates a vertical cylinder containing a piston to which a rod 2 is attached, said rod projecting out of the top of the cylinder. This is the ordinary damper-motor. A cord 3, attached to the piston-rod, leads to the arm of the damper. (Not shown.) Tightening the cord serves to open the damper. Slackening the cord closes the damper. A weight 4 on the piston-rod serves to press the latter down when the valve is moved to allow the water in the cylinder 1 to discharge.

The valve-case 5 and the cylinder 1 are connected by a pipe 6, through which water flows both forward and back. A pipe 7 leads from a source of water-pressure to the valve-case 5, and another pipe 8 leads from the valve-case to a drain or waste pipe.

A lever 9, like a scale-beam, has at its end a hanging weight 10, and a sliding weight 11 is movable along the beam. This lever is raised and lowered by the variations of steam-pressure in the boiler acting in a cylinder or motor 12, which is fitted with a diaphragm 13, and a pipe 14 communicates with this cyl-

inder and leads from the steam-boiler. (Not shown.) A stud or prop 15 rests on the diaphragm and has a knife-edge which engages the lever or scale-beam 9. A post has two set-screws 16 and 17, which take, respectively, above and below the said lever 9 and limit the up-and-down movement of the latter.

The parts thus far described are well known in apparatus of this character.

My improvements in the valve and means for operating it are shown in detail in Figs. 2 and 3.

The valve-case 5 has a screw connection 18 for the motor-pipe 6, a screw connection 19 for the water-pressure pipe 7, and another, 20, for the waste-water pipe 8. It also has a central valve-bushing 21 with a cylindric passage 22 for the movement of the piston-valve 23. This valve governs a port 24, which communicates by way of a pipe 6 with the motor-cylinder 1. The cylindric valve-passage 22 has a lower open passage 25 communicating with the connection 19, through which the water-pressure enters on its flow to the motor 1, and an upper open passage 26, communicating with the connection 20, from which the waste-water that has been in the motor discharges. When the piston-valve 23 is in the position shown in Fig. 2, the port 24 is closed. When the piston-valve is lowered, the port 24 is open to establish communication from the motor-cylinder 1 to the waste-water pipe 8. When the valve 23 is moved upward, so as to open the port 24 to the lower passage 25, communication will be established for the water-pressure in pipe 7 to flow to the motor-cylinder.

The piston-valve 23 is attached to a stem 27, and said stem and valve may be drawn upward and entirely out of the valve-case without moving any screw-cap or other part of the valve-case. The upper end of the stem 27 is provided with a head 28.

The means for shifting the valve 23 upward or downward consists of an arm 29, carried on the lever 9 and projecting sidewise therefrom, and a sleeve 30, carried by said arm 29 and connected to the head 28 of the valve-stem 27. When the lever 9 tilts upward, the valve-stem 27 will be raised through the medium of the arm 29 and sleeve 30, which shifts the valve 23, so as to open communica-

tion from the water-pressure pipe 7 to the motor, and thereby slacken the cord 3 and close the damper. When the beam or lever 9 tilts downward, the arm 29 will press the stem and valve 23 downward.

It is to be understood that the details of construction of the parts that compose the valve-case are such as to enable the valve 23 to move either way (up or down) with equal freedom.

The arm 29 has one end attached by a pivot 31 to a clevis 32, which is fitted so as to slide on the lever 9. A set-screw 33 on the bottom of the clevis impinges against the lever and holds the clevis wherever it may be set. A set-screw 34 is on the arm 29, and the end of this screw impinges against the pivot 31 and holds the arm in its proper position. The outer end of the arm 29 is provided with a flat upper surface 35, and a pin 36 projects upward from the said flat surface near the end of the arm 29 to prevent the sleeve 30 from falling off the said arm when not in use. A sleeve 30 fits over the arm 29 and is adapted to move longitudinally on said arm. This sleeve 30 is provided with a flat inner surface 37, which prevents it from turning on the arm 29. The under surface of the sleeve 30 is provided with two downwardly and inwardly projecting flanges 38, which take under the head 28 of the valve-stem 27, whereby when the arm 29 is raised or lowered by the lever 9 the said stem, and consequently the valve 23, will be raised or lowered. By this means of connecting the valve-stem 27 to the arm 29 it will be seen that as the stem 27 is moved vertically the sleeve 30 is free to automatically adjust itself longitudinally on the arm 29.

When it is desired to take the valve-stem out of the case 5, the set-screw 34 must be loosened to allow the arm 29 to swing sideways on its pivot 31 until the sleeve 30 is detached from the head 28, and then the valve-stem 27 may be at once drawn out of the case.

Having thus described my invention, what I claim is—

1. In a damper-regulator, the combination of a lever operated by variations of the steam-pressure in the boiler; a damper-motor operated by water-pressure; a valve controlling the water passing to and from the damper-motor and having a stem which projects from the valve-case; a clevis device which is ca-

pable of sliding on the said lever; an arm attached to said clevis device and projecting sidewise therefrom; and a sleeve loosely mounted on the said arm and connected to the valve-stem, whereby when the latter is raised or lowered the said sleeve will automatically adjust itself longitudinally on the said arm.

2. In a damper-regulator, the combination of a lever operated by variations of the steam-pressure in the boiler; a damper-motor; a valve controlling the water passing to and from the damper-motor and having a stem which projects from the valve-case; an arm secured to the said lever and projecting sidewise therefrom; and a sleeve loosely mounted on the said arm and connected to the valve-stem, whereby when the latter is raised or lowered the said sleeve will automatically adjust itself longitudinally on the said arm.

3. In a damper-regulator, the combination of a lever operated by variations of steam-pressure in the boiler; a damper-motor operated by water-pressure; a valve controlling the water passing to and from the damper-motor and having a stem which projects from the valve-case; an arm secured to the said lever and projecting sidewise therefrom; and a sleeve loosely mounted on the said arm and having two downwardly and inwardly projecting flanges which engage the head of the valve-stem, whereby when the latter is moved up or down the said sleeve will automatically adjust itself longitudinally on the said arm.

4. In a damper-regulator, the combination of a lever operated by variations of steam-pressure in the boiler; a damper-motor operated by water-pressure; a valve controlling the water passing to and from the damper-motor and having a stem which projects from the valve-case; an arm secured to the said lever and projecting sidewise therefrom and having a flat upper surface; a pin projecting from said flat surface; and a sleeve loosely mounted on said arm and connected to the valve-stem; whereby when the latter is raised or lowered the said sleeve will automatically adjust itself longitudinally on said arm.

In testimony whereof I affix my signature in the presence of two witnesses.

GEORGE F. PATTERSON.

Witnesses:

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NORMAN NEWMAN.