

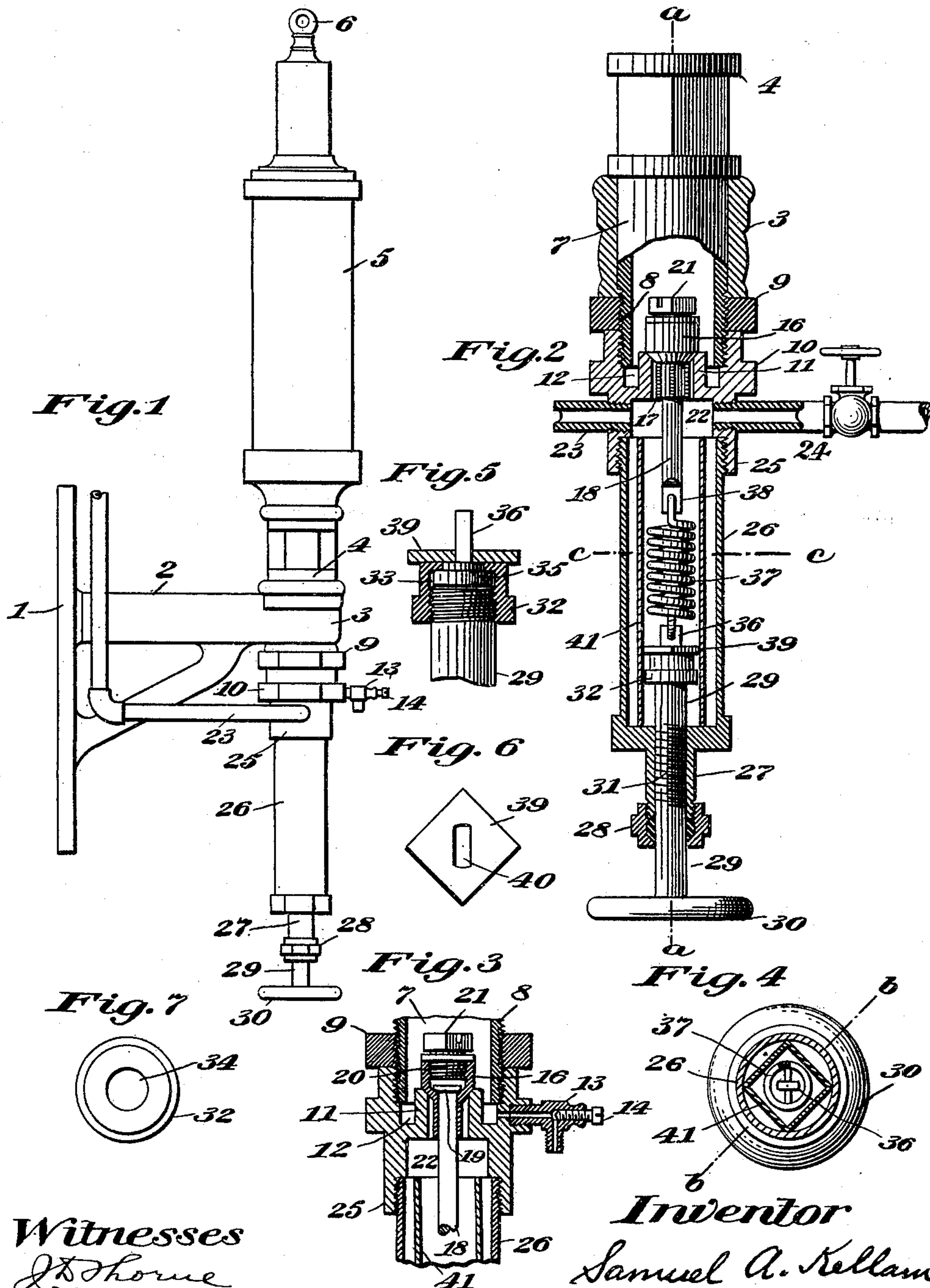
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Patented Apr. 16, 1901.

S. A. KELLAM.
DAMPER REGULATOR.

(Application filed Sept. 17, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

SAMUEL A. KELLAM, OF NORWOOD, OHIO.

DAMPER-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 672,378, dated April 16, 1901.

Application filed September 17, 1900. Serial No. 30,256. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL A. KELLAM, a citizen of the United States of America, and a resident of Norwood, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Damper-Regulators, of which the following is a specification.

This invention relates to certain improvements in that class of damper-regulators of which the device set forth and claimed in the United States Letters Patent No. 637,125, granted November 14, 1899, to S. A. Kellam and J. B. Bischoff, is a type; and the object of the invention is to provide a device of this character of an improved and simplified construction having improved means for controlling the operation of the valve by means of which steam is supplied to the operative parts of the device.

The invention consists in certain novel features of the construction, combination, and arrangement of the several parts of the improved regulator, whereby certain important advantages are attained and the device is made simpler, cheaper, and otherwise better adapted and more convenient for use, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claims.

In the accompanying drawings, which serve to illustrate the invention, Figure 1 is a side elevation showing a damper-regulator constructed according to my invention, and Fig. 2 is a vertical sectional view taken axially through the lower part of the device in the plane indicated by the line *b b* in Fig. 4. Fig. 3 is a partial section taken axially through the central part of the device in a plane at right angles to Fig. 2, as indicated by the line *a a* in said figure. Fig. 4 is a transverse section taken through the lower part of the device in the plane indicated by the line *c c* in Fig. 2. Fig. 5 is an enlarged sectional detail view showing the connection between the spring and its adjusting-rod. Fig. 6 is an enlarged detail view showing the means for guiding the lower end of the spring to prevent turning or twisting thereof in the spring barrel or casing. Fig. 7 is an enlarged detail view showing the cap for holding the swivel

connection for the lower end of the spring to the adjusting-rod.

As shown in the drawings, the improved damper-regulator is supported upon a bracket-plate 1, adapted for attachment in any convenient position and having an arm 2 extended at right angles from it, the extremity of said arm having a bearing 3 for the device, the upper part of which comprises a hollow piston 4, supported above arm 2 and carrying an inclosing cylinder 5, the upper end 6 of which is adapted for connection with the damper to be regulated in a well-known way. These devices form no part of my present invention, and I have not, therefore, illustrated them in detail herein. The construction of these parts is clearly shown and described in the above-named patent to Kellam and Bischoff.

The lower end of the piston 4 has a plain portion 7, which is extended through the opening of the bearing 3 of arm 2 and is of a length to extend somewhat below the under side of said bearing. The lower end portion of said plain part 7 is externally screw-threaded, as shown at 8, to receive a nut 9, screwed thereon, and below said nut said threaded portion 8 serves to receive a valve-casing 10, having a central raised annular valve-seat 11, whereby an annular chamber 12 is formed in the casing surrounding said seat 11 and adapted for communication with the bore of the piston 4, as will be readily understood. The wall of the valve-casing 10 is perforated at its front side, as shown at the right in Figs. 1 and 3, for the passage of a drip-cock 13 for the escape of water of condensation from the valve-chamber and from the piston 4 and cylinder 5. The passage through said cock 13 is controlled by a screw 14, as clearly shown in Fig. 3.

16 indicates the valve seated upon the seat 11 of the valve-casing 10 and provided at its lower part with guides 17, adapted to play in the port of said casing 10, so as to guide the valve in its vertical movements. The valve is provided with an axial passage through which is extended a valve-rod 18, provided at its upper end with a rounded head or enlargement 19, held in an enlarged part of the opening in the body of the valve and adapted

to stand when the valve is seated, as shown in Fig. 3, directly in line with the valve-seat. This arrangement of the parts affords sufficient movement of the valve upon the valve-rod to permit the valve to properly seat itself when drawn down and at the same time prevents the valve from being lifted or tilted from its seat from any slight movement imparted by the valve-rod 18. The chamber in the valve through which the rod 18 is inserted is open at the top of the valve and serves to receive a screw-plug 20, having a head 21, provided with a kerf or cut to receive a screw-driver or the like in order that the valve may be conveniently removed for the purpose of grinding.

The casing 10 is provided in its lower part with a chamber 22, separated from the chamber 12 by a transverse partition through which the steam-port is extended, and to said chamber 22 steam is admitted at one side by way of a pipe 23. At the opposite side of the chamber another pipe 24, provided with a valve, affords a drip-outlet for water condensing below the valve 16 and also for condensation from the steam-pipe 23. The lower end of casing 10 is interiorly screw-threaded, as shown at 25, to receive the upper end of a spring barrel or casing 26, made in tubular form and having at its lower end a reduced neck 27; carrying a stuffing-box 28, through which is passed the lower end of an adjusting-rod 29, the lower extremity of which has, as shown in Figs. 1 and 2, a hand-wheel 30, so that the rod may be conveniently turned to adjust the tension upon the valve 16. The central part of the adjusting-rod is screw-threaded, as shown at 31 in Fig. 2, and has engagement with threads in the neck 27 in such a way that when the adjusting-rod 29 is turned by means of its hand-wheel 30 longitudinal movement is imparted to said rod. The upper end of the rod is also screw-threaded to receive a screw-cap 32, screwed thereon, as shown in Figs. 2 and 5, said cap having a chamber 33, in which is held to turn the enlarged or headed lower end 35 of a swivel connection, the upper part of which is made flattened, as shown at 36, and is extended through the upper end of the cap 32, which is provided with a circular opening 34, as clearly shown in Fig. 7, through which opening the part 36 passes and may turn relatively to the cap.

A squared block 39 is held on the flattened end 36 of the swivel connection, said block having the form shown in Figs. 2, 5, and 6 and being provided with a central elongated opening 40 for the passage of the said flattened end 36, so that said squared block is thereby securely held against turning movement on the swivel. The block 39 is adapted for sliding vertical movement in a guide-sleeve 41 of rectangular cross-section and arranged within the bore or chamber of the casing 26, with the axis of which it is alined. 37

indicates a helical spring, also arranged within the guide-sleeve 41, having its upper end connected to the lower end of the valve-rod 18, as shown at 38, by a detachable connection and its lower end connected to the flattened end 36 of the swivel, by means of which said spring is coupled to the upper end of the adjusting-rod 29; but said adjusting-rod is permitted to turn relatively to the spring, while the spring itself is held securely against turning movement in the guide-sleeve by reason of the engagement therewith of the squared block 39, carried by the swivel.

In operation the steam being admitted to the chamber 22 exerts its pressure beneath the valve 16 and tends to raise the same from its seat, the tension of the spring 37 opposing the lifting movement of the valve until the steam-pressure rises sufficiently to overcome the tension of the spring, whereupon the valve 16 is lifted and the steam flows from the chamber 22 through the port to the valve-chamber of casing 10 and thence passes up into the bore of the piston 4 to exert its pressure for lifting the cylinder 5, the movement of said cylinder being communicated to the damper in a well-known way to actuate said damper to control the furnace drafts. The chamber of the casing 26, wherein the spring 37 is located, is in communication with the steam-chamber 22, so that no extraneous resistance more than the tension of the spring, such as would be caused by packing for the valve-rod 18 or equivalent part, is exerted upon the valve, and consequently the device may be set to permit the valve to lift exactly at the desired pressure. The screw-threaded adjusting-rod 29 also affords an extremely simple and convenient means for adjusting the tension exerted upon the valve by the spring 37, and the swivel connection, together with the block 39 and guide 41, affords a very convenient means for preventing twisting of the spring or turning and consequent derangement of the valve when the rod 29 is turned to vary the spring tension. The drip-openings above and below the valve also serve to drain the device of water of condensation, which by collecting in the steam-spaces of the device would seriously interfere with the proper operation of the device, and the connection of the device to the bracket 1 is such that all of the parts which ordinarily require attention and repair are located below the bracket-arm 2 and may be removed therefrom together or singly for purposes of repair or cleaning without necessitating the removal of the parts above the bracket, which are more difficult to handle by reason of their weight.

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

1. In a damper-regulator the combination of a piston, a cylinder, a valve-casing provided with a port for admission of steam, a valve within the valve-casing, a steam-pipe

arranged for communication with the steam-port of the valve-casing, a spring-casing detachably connected to the valve-casing and extended below said steam-pipe and adapted
5 to receive water of condensation therefrom, an adjusting means having threaded engagement with the spring-casing, a spring in the spring-casing and strained between and having at its ends swiveled connection both with
10 the valve and said adjusting means, and means engaged with both the spring and the spring-casing for preventing the spring from turning in said casing, substantially as set forth.

2. In a damper-regulator, the combination
15 of a piston, a cylinder, a valve-casing having a valve, an adjusting means, a spring-casing detachably connected to the valve-casing and with which the adjusting means has threaded engagement, a spring strained between and
20 having at its ends swiveled connection both with the valve and said adjusting means, an angular guide-sleeve within the spring-casing, and a device held against turning movement relative to the said spring and engaged
25 with the guide-sleeve in the spring-casing to hold the spring against turning in said casing, substantially as set forth.

3. In a damper-regulator, the combination of a bracket having an arm provided with a
30 bearing, a cylinder, a piston extended above the bracket-arm and having a lower portion held by the bearing of the bracket-arm, a valve-casing detachably connected to the piston below the bracket-arm, a valve in said
35 casing, means to admit steam to the casing and a tension device connected to the valve, substantially as set forth.

4. In a damper-regulator, the combination of a bracket having an arm provided with a
40 bearing, a cylinder, a piston extended above the bracket-arm and having a lower portion held by the bearing of the bracket-arm and extended below said arm, a valve-casing having threaded engagement with the extended
45 portion of the piston below the bracket-arm, a valve in said casing, means to admit steam

to the casing and a tension device connected to the valve, substantially as set forth.

5. In a damper-regulator the combination of a valve-casing having a steam-port, a valve
50 controlling said port, a spring-casing connected to the valve-casing, an adjusting-rod having threaded engagement with the spring-casing, a cap held on the adjusting-rod in the
55 spring-casing and having a central opening, a swivel having an enlarged part held between the cap and adjusting-rod and formed with a reduced portion extended through the
60 central opening of the cap and adapted for free turning movement relatively to the adjusting-rod, a guide in the spring-casing, a part held against turning movement on the
65 swivel and engaged with the guide and a spring having one end connected to the swivel and its opposite end connected to the valve to hold the same pressed on its seat, substantially as set forth.

6. In a damper-regulator the combination of a bracket having an arm provided with a
70 bearing, a cylinder, a piston above the bracket-arm and having a lower portion extended through the bearing of the bracket-arm and projected below said arm, a valve-casing detachably held on the projecting
75 lower portion of the piston below the bracket-arm and provided with a steam-port, a valve in said valve-casing and controlling said port, a spring-casing detachably connected to the
80 valve-casing, an adjusting-rod having threaded engagement with the spring-casing and a spring held in the spring-casing and having at one end connection with the adjusting-rod and at its opposite end connection with the
85 valve to hold the same pressed on its seat, substantially as set forth.

Signed at Cincinnati, Ohio, this 14th day of September, 1900.

SAMUEL A. KELLAM.

Witnesses:

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