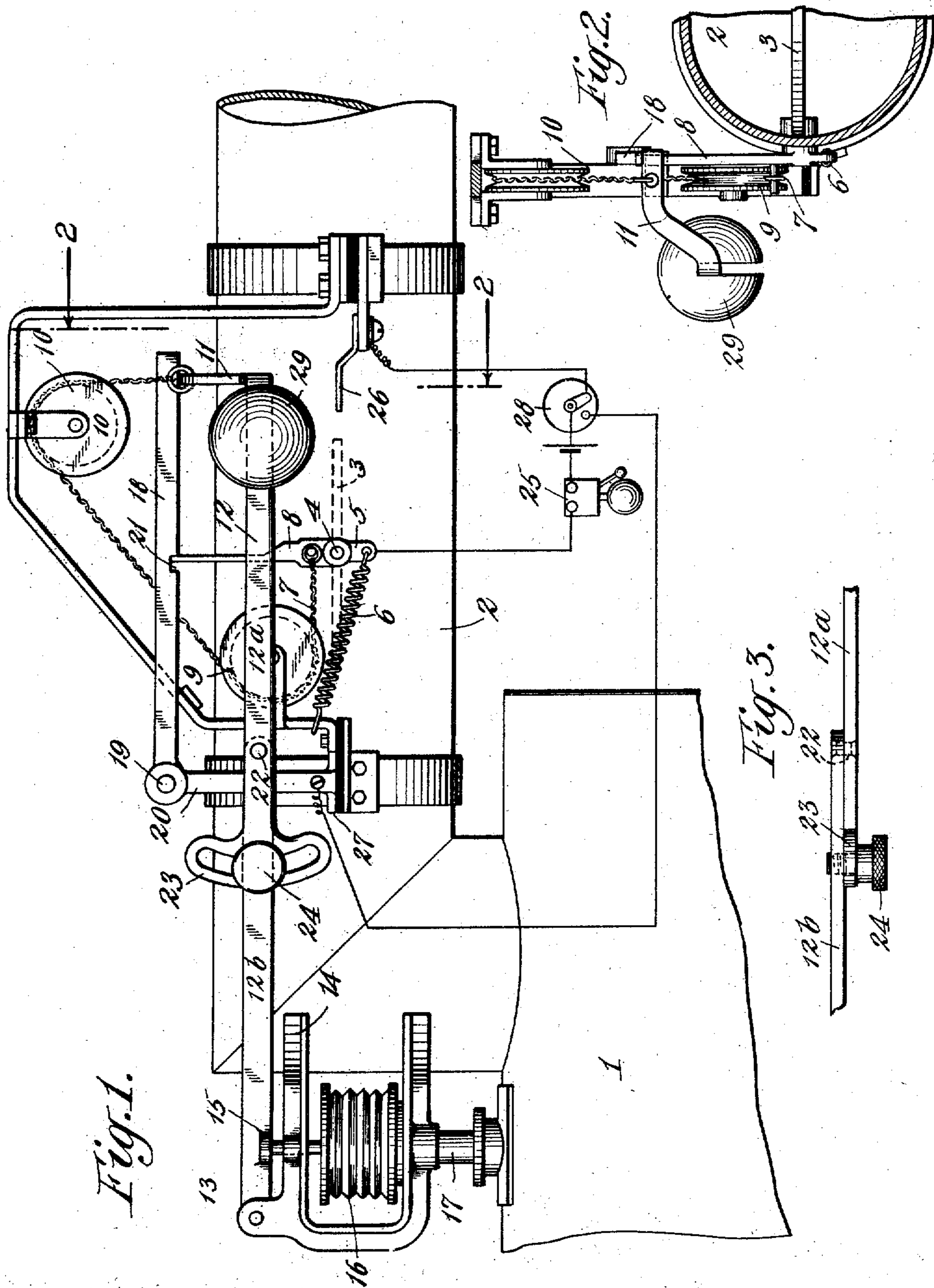


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PATENTED MAR. 3, 1908.

G. E. SCHUETZ.
AUTOMATIC DRAFT CONTROLLER.
APPLICATION FILED MAY 24, 1907.



WITNESSES

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AUTOMATIC DRAFT-CONTROLLER.

No. 880,924.

Specification of Letters Patent.

Patented March 3, 1908.

Application filed May 24, 1907. Serial No. 375,400.

To all whom it may concern:

Be it known that I, GEORGE E. SCHUETZ, a citizen of the United States, residing at West Hoboken, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improvement in Automatic Draft-Controllers, of which the following is a specification, reference being had therein to the accompanying drawings, forming a part thereof.

My invention relates to mechanism connected with a boiler and operating, by connection with the damper or other draft-controlling device of the boiler, to control the fire so as to maintain the temperature or pressure in the boiler at or near a predetermined point. In such mechanisms, as usually constructed, the draft-controlling device is constantly under the control of the automatic mechanism and is maintained in more or less operative position at all temperatures or pressures except the lowest, being moved to reduce the draft gradually in proportion as the temperature or pressure approaches the predetermined maximum. This arrangement is defective for the reason that it affords no provision for bringing the temperature or pressure in the boiler as quickly as possible to the desired point when, through any cause, such as a sudden increase in demand on the boiler, or an undue slackening in the fire, the temperature or pressure has fallen considerably below such point. To attain such a result it is necessary to use the full draft until the temperature or pressure has risen to or substantially to the proper point, and then to reduce the draft immediately to the amount required to maintain this temperature or pressure.

The object of the present invention is to produce a draft-controlling mechanism in which this result is attained, and to this end the invention comprises a mechanism arranged to maintain the draft-controlling device with which it is connected in position to give the full draft until the temperature or pressure in the boiler has risen to, or substantially to the predetermined point, and then to move the draft-controlling device quickly to a position to substantially reduce the draft, so that the fire, after raising the temperature or pressure as quickly as possible, may, upon the attainment of the desired temperature or pressure, be at once checked

sufficiently to prevent the temperature or pressure rising substantially above this point.

Another object of the invention is to provide an automatic draft-controlling mechanism with an alarm which will give warning when, for any reason, the operation of the mechanism is inadequate to prevent undue rise in the temperature or pressure, and to this end the invention comprises a draft-controlling mechanism provided with an alarm which operates automatically when the draft-controlling device with which the draft-controlling mechanism is connected has been moved to a position in which the predetermined maximum draft reduction is effected.

Other features of the invention will be noted in connection with the description of the illustrated embodiment of the invention.

I will now describe the embodiment of the invention illustrated in the accompanying drawings, and will thereafter point out my invention in claims.

Figure 1 of the drawings is a side elevation of a mechanism embodying the present invention. Fig. 2 is a section of Fig. 1 taken on the line 2—2 looking in the direction of the arrows, showing the damper operating mechanism in an end elevation. Fig. 3 is a detail plan view of the jointed part of the controlling lever.

A portion of the boiler 1 and the smoke pipe 2 is shown in the drawings, and the mechanism is arranged to control the damper 3, of ordinary form, in the smoke pipe. The damper is journaled in the smoke pipe by a rod 4 which extends outside of the pipe and is provided with a depending arm 5. A spring 6 connected with the arm tends constantly to rotate the damper from the open position indicated in the drawings to its closed position at a right angle thereto. Such movement is controlled, however, by a chain 7 connected with an upwardly-extending arm 8 on the rod 4. The chain passes around pulleys 9 and 10 and is attached to the offset end 11 of a controlling lever 12. The controlling lever is pivoted at 13 to a frame 14 mounted on the boiler, and a plunger 15 connects the lever with an elastic expansible pressure chamber 16 of ordinary form, connected, through a pipe 17, with the boiler.

The lever is provided with a weight 29, and the tendency of the weight and the lever

is to descend and, by pulling on the chain 7, to move the damper to wide-open position, but this tendency is resisted by the spring 6, assisted by the pressure chamber 16 in proportion to the pressure therein, and the parts are so adjusted that upon the attainment of a given pressure in the pressure chamber, corresponding to a given temperature in the boiler, the balance of forces will be such as to hold the damper in position to maintain the fire at the proper point to maintain such pressure in the boiler.

The mechanism for holding the damper in wide-open position comprises a detent 18 pivoted at 19 on an upright 20 and provided with a notch 21 which engages and retains the upper end of the arm 8 when the damper is in wide-open position. The end of the detent rests on the offset portion 11 of the lever 12 so that the detent is raised and the arm 8 released when the lever 12 rises.

When the pressure in the boiler is much below the desired degree, as, for example, upon first starting the fire in the boiler, the operator engages the arm 8 with the detent, and the damper is held wide open. As soon, however, as the pressure in the pressure chamber 16 is sufficient to raise the lever 12 the detent is raised and the arm 8 released, and the force of the spring 6 is then at once added to that of the pressure chamber 16, so that the damper is at once moved to close the smoke pipe to a substantial extent. Thereafter in the operation of the mechanism the damper is more or less closed gradually in proportion to variations of pressure in the boiler.

In order that the mechanism may be adjusted to keep the pressure at any required degree the lever 12 is divided into two parts and the outer part 12^a is pivoted at 22 to the inner part 12^b and is provided with an arc-shaped slotted portion 23. A binding screw 24 in the end of the inner part engages the curved slot and serves to maintain the parts in adjusted relation. By loosening the screw and moving the parts relatively about their pivotal connection the operation of the lever upon the damper may be effected to vary the pressure maintained by the mechanism.

The alarm device hereinbefore referred to comprises an electric bell 25, connected, as shown diagrammatically in Fig. 1, in circuit with a battery, the arm 8, and a fixed contact 26 located in position to be engaged by the arm 8 when the damper has been moved to fully-closed position. The sounding of

this alarm warns the operator that the limit of draft-reduction has been reached and that the fire is getting out of control of the automatic mechanism. The alarm device is also arranged to sound an alarm when the damper is moved to wide-open position, to warn the operator that the fire requires attention. For this purpose the upright 20 on which the detent is pivoted is insulated, and the detent and the arm 8 constitute contact members in a circuit including the bell 25, as shown diagrammatically in Fig. 1. A switch 28 is arranged to connect the two circuits alternately with the alarm according as it is desired to use the one or the other.

It is obvious that various modifications may be made in the construction shown and above particularly described within the nature and scope of my invention.

I claim:

1. Automatic draft-controlling mechanism comprising, in combination with a boiler, a draft-controlling device, means tending to move the draft-controlling device to more or less operative position in proportion to the pressure in the boiler, and a detent to prevent such movement, said means operating upon the attainment of a predetermined pressure in the boiler, to disengage the detent and release the draft-controlling device.

2. Automatic draft-controlling mechanism comprising, in combination with a boiler, a draft-controlling device, and means controlled by the pressure in the boiler and constructed and operating, upon the attainment of a predetermined pressure in the boiler, to move the draft-controlling device quickly to a position to effect a substantial reduction in the draft, and upon further rise of pressure in the boiler, to move the draft-controlling device gradually to further reduce the draft in proportion to such rise.

3. Automatic draft-controlling mechanism comprising, in combination with a boiler, a draft controlling device, a pressure chamber, and connections between the pressure chamber and the draft-controlling device comprising a lever actuated by the pressure chamber and provided with an adjustable joint to adjust the connection between the pressure chamber and the draft-controlling device.

In testimony whereof I have affixed my signature in presence of two witnesses.

GEORGE E. SCHUETZ.

Witnesses:

BERNARD COWEN,
WM. ASHLEY KELLY.