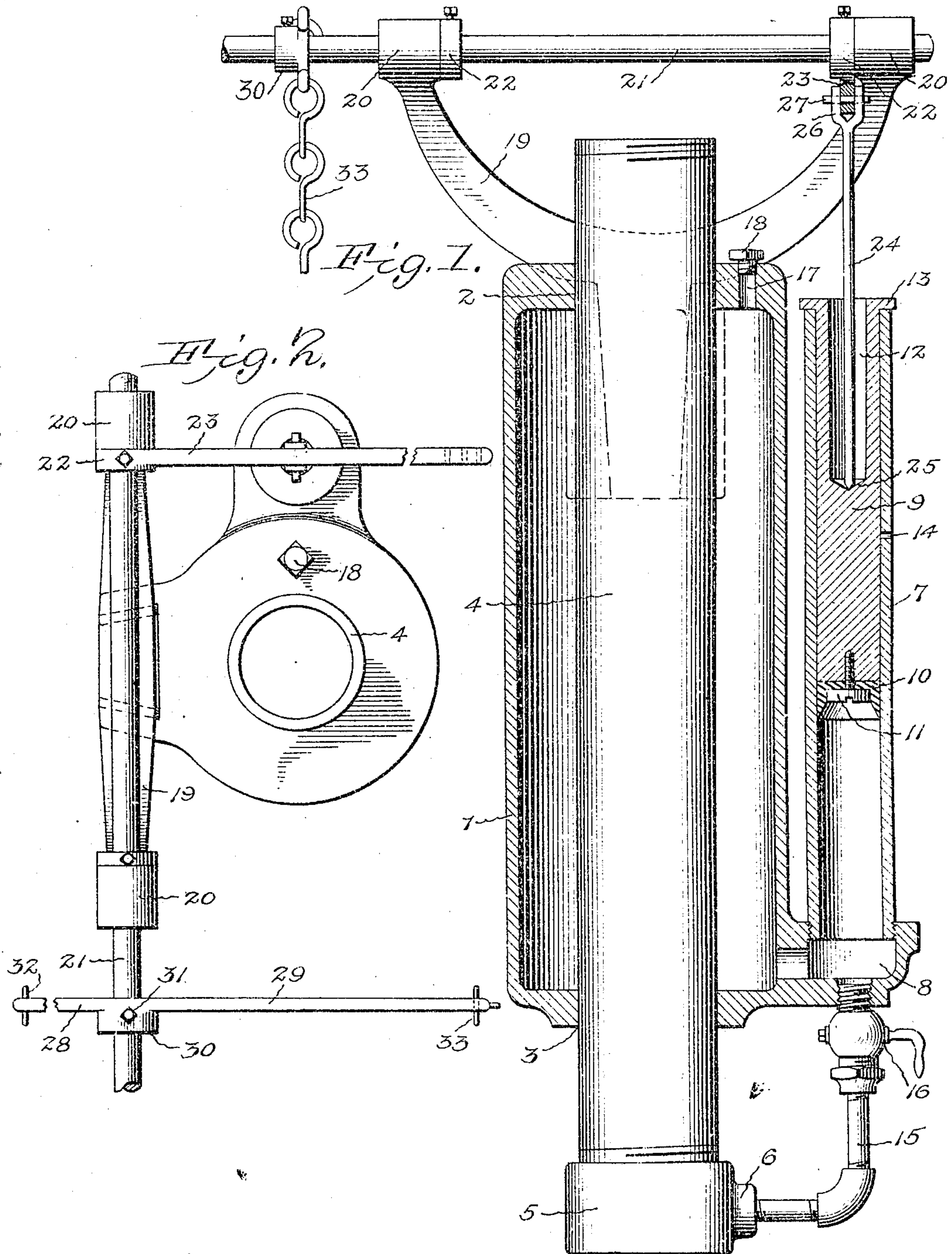


No. 825,820.

PATENTED JULY 10, 1906.

C. P. GERITZ.  
DAMPER REGULATOR.  
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# UNITED STATES PATENT OFFICE.

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## DAMPER-REGULATOR.

No. 825,820.

Specification of Letters Patent.

Patented July 10, 1906.

Application filed August 12, 1905. Serial No. 273,866.

*To all whom it may concern:*

Be it known that I, CLAUS PETER GERITZ, a citizen of the United States, residing at Kingsland, in the county of Bergen and State of New Jersey, have invented a new and useful Damper-Regulator, of which the following is a specification.

This invention relates to automatic damper-regulators, and is primarily designed for use in connection with hot-water heating systems for controlling the damper and draft-door of the furnace by the rise and fall in temperature of the water in the circulating system.

It is proposed to arrange the present device so as to be conveniently applied to the circulating system, preferably to the return-pipe thereof, without requiring any alteration therein beyond the disconnection of one of the lengths of pipe and the substitution therefor of the present device.

Other objects of the invention reside in the provision of means for maintaining the device supplied with the necessary amount of water from the circulating system, to effect the automatic escape or blowing off of an excessive collection of steam, and to provide for the convenient adjustment of the device for rendering the latter more or less sensitive, so as to accommodate the device to existing circumstances.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of a damper-regulating apparatus embodying the features of the present invention. Fig. 2 is a top plan view thereof.

Like characters of reference designate corresponding parts in both figures of the drawings.

The present apparatus includes a tank or chamber 1, which is pierced at its opposite ends with the aligned openings 2 and 3, through which extends a length of pipe 4, with its ends projected beyond the chamber and threaded for connection with adjacent lengths

of the return water-pipe of a water-heating system. One end of the pipe, preferably the lower end, is provided with a coupling 5 in the nature of an internally-threaded collar for connecting the pipe 4 to the return-pipe of the water-heating system, said coupling or collar being provided with a laterally-directed outlet-nipple 6 for a purpose as will be hereinafter described.

In substantial parallelism with the chamber 1 is a cylinder 7, which is in communication with the chamber 1, preferably by having its lower open end threaded or otherwise connected to the top of a hollow extension 8 of the lower end portion of the chamber, whereby the chamber and the cylinder are in constant communication. Within the cylinder there is a piston 9, provided at its lower end with a suitable packing 10, held in place by a screw 11, the upper end of the piston being provided with a longitudinal socket or recess 12, opening through the top of the piston. At the top of the piston there is an external annular flange 13, designed to engage with the top of the cylinder and limit the downward movement of the piston. The cylinder is provided with a vent-port 14, which is normally closed by the piston and is open only when the piston is elevated above the port by excessive steam-pressure within the chamber 1 and the cylinder.

Water is supplied to the chamber 1 by means of an elbow pipe or passage 15, which leads from the nipple 6 to the bottom of the extension 8 and is equipped with a controlling-valve 16, which is normally closed, said valve being opened merely to furnish the necessary water to the chamber 1 from the return water-pipe of the circulating system. The top of the chamber 1 is provided with a vent-passage 17, having a removable closure 18, preferably a threaded plug, this vent being employed to permit the escape of air and steam when supplying water to the chamber 1.

Rising from one side of the chamber 1 and projecting above the top thereof is a yoke or fork 19, the opposite ends of which are provided with tubular bearings 20 for the support of a shaft 21, which is held against endwise play by means of collars 22, secured to the shaft by set-screws and engaging the ends of the respective bearings 20. Upon one end portion of this shaft there is a crank-arm 23, lying across the top of the cylinder 7, and from which depends a connecting-rod 24.



with its lower end received within the socket or seat 12 in the top of the piston 9. The bottom of the socket 12 is dished or downwardly tapered, as at 25, and the lower end of the rod 24 is pointed for engagement with the lowermost portion of the bottom of the socket to form a loose step-bearing thereon. The upper end of the rod 24 is provided with a fork 26 to straddle the arm 23, and the latter is provided with a longitudinal series of perforations for the individual reception of a pin or key 27, which also pierces the fork for the purpose of connecting the latter to the crank-arm at different points throughout its length. Upon the other end portion of the shaft 21 there are oppositely-disposed arms 28 and 29, preferably carried by a suitable collar 30, fixed upon the shaft by means of a set-screw 31. Suitable flexible connections 32 and 33, preferably chains, are attached to the outer ends of the crank-arms 28 and 29, one of them extending to the damper of the furnace and the other to the draft-door thereof.

When the apparatus is in use, the valve 16 is opened to admit a suitable amount of water from the return water-pipe of the circulating system to the tank 1, after which the valve is closed, so as to prevent the further admission of water into the tank. As the pipe 4 constitutes one of the sections of the return water-pipe, there is of course a constant circulation of water through the pipe 4, whereby the water within the tank 1 is maintained at substantially the temperature of the water in the pipe 4, and any change in the temperature of the water in the pipe 4 will of course produce a similar change in the water of the tank 1. Should the water of the circulating system become heated beyond a predetermined degree, the temperature of the water in the tank 1 will be accordingly increased, and by the consequent expansion of the water and generation of steam within the tank 1 the piston 9 will be elevated, and through the medium of the push-rod 24 the rock-shaft 21 will be turned so as to pull upon the connections 32 and 33 to close the damper and open the check-draft door, thereby to slow down the fire of the furnace. On the other hand, should the temperature of the water of the heating system fall below a predetermined degree by reason of the fire in the furnace becoming low the water in the tank 1 will of course cool off, and by reason of its contraction and the reduction of the pressure the piston will descend and the rock-shaft 21 will be rocked by reason of the weight of the arms 23 and 29, which extend from the same side of the shaft, thereby opening the damper and closing the check-draft door, so as to accelerate the rate of combustion.

Should steam be generated to a dangerous extent within the chamber 1 and the cylinder

7, the piston 9 will be elevated beyond the escape-port 14, whereupon the steam can escape, and danger of explosion is thereby avoided.

From the foregoing description it will be understood that the apparatus of the present invention is entirely complete in itself and may be placed upon the market in the form illustrated in the accompanying drawings, wherefore the apparatus may be fitted in place without making any change or alteration in hot-water heating systems as now commonly installed, as the pipe 4 takes the place of one of the pipe-sections of the return water-pipe of the heating system.

It is important that the present regulator be included in the return-pipe rather than in the feed-pipe, for the reason that the controlling of the furnace would be premature if the regulator was acted upon by the hot water as it leaves the furnace, and therefore the most satisfactory results would not be obtained. By including the regulator in the return-pipe the regulator is acted upon by that portion of the water which has passed entirely through the circulating system, which gives the most satisfactory results.

Having thus described the invention, what is claimed is—

1. In a damper-regulator, the combination of a chamber, a circulating-pipe extending through the chamber from top to bottom thereof, the bottom of the chamber having a lateral extension in communication with its interior, an upright open-topped cylinder carried by the extension and in communication therewith, there being a valve-controlled passage leading from the circulating-pipe to the extension of the chamber for supplying the latter with water, a fluid-controlled element carried by the cylinder and accessible at the open top thereof, a bracket carried by the top of the chamber, damper-actuating means mounted upon the bracket, and a connecting-rod hung from the damper-actuating means and in cooperative relation with the fluid-controlled element.

2. A damper-regulator comprising a circulating-pipe, a chamber embracing the pipe and provided with a lateral extension, a valve-controlled supply-passage leading from the circulating-pipe to the extension of the chamber, a cylinder in communication with and rising from the extension of the chamber with the upper end of the cylinder open, a piston working in the cylinder and projecting through the open top thereof, the upper end of the piston being provided with an external stop-shoulder for engagement with the top of the cylinder to limit downward movement of the piston, and damper-actuating means associated with the piston.

3. In a damper-regulator, the combination of a chamber pierced at opposite ends for the reception of a circulating-pipe, a cylinder in



communication with the chamber and having its upper end open, a piston working through the open top of the cylinder and provided in its upper end with a socket and an external shoulder to engage the top of the cylinder to limit the downward movement of the piston, damper-actuating means, and a connecting-rod hung therefrom with its lower end received within the socket of the piston

independent of the latter and in the path of the upward movement of the piston.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CLAUS PETER GERITZ.

Witnesses:

C. E. GARLAND,  
JACOB LEMPERT.