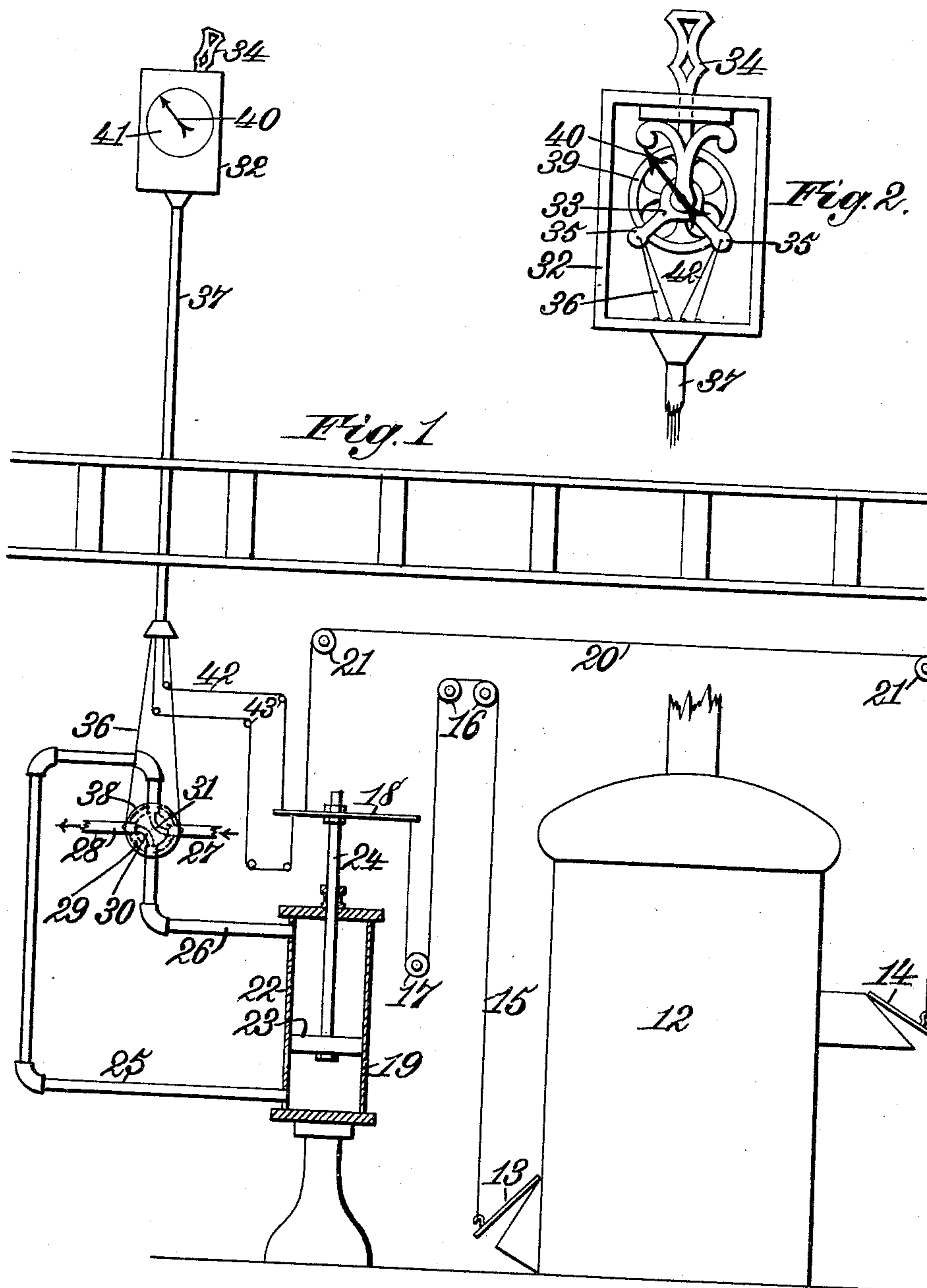


No. 886,183.

PATENTED APR. 28, 1908.

H. M. BROWNE.  
DAMPER REGULATOR.  
APPLICATION FILED JULY 1, 1907.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

HUGH M. BROWNE, OF CHEYNEY, PENNSYLVANIA.

## DAMPER-REGULATOR.

No. 886,183.

Specification of Letters Patent.

Patented April 28, 1908.

Application filed July 1, 1907. Serial No. 381,727.

*To all whom it may concern:*

Be it known that I, HUGH M. BROWNE, a citizen of the United States, residing at Cheyney, in the county of Delaware and State of Pennsylvania, have invented new and useful Improvements in Damper-Regulators, of which the following is a specification.

This invention relates to mechanism for regulating the positions of the dampers of a furnace in order to regulate the draft of the furnace.

One object of the invention is to provide reliable means for positively moving and regulating the dampers, together with means for controlling said first named means from a distance, which controlling means shall be of such a character as will enable the same to be placed in a parlor or other room of a house without inconvenience, whereby the dampers of the furnace, and accordingly the draft, may be regulated and controlled at will from a point remote from the furnace such as a floor above the basement or other point at which the furnace is located.

A further object of my invention is to provide, at or near the point at which the aforesaid controlling means is located, a suitable indicating or signaling device which shall indicate to the operator the position of the damper regulating means and consequently the position of the dampers themselves.

To these ends my invention consists in certain novel constructions and combinations of parts as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings, which show one construction in which my invention may be embodied—Figure 1 is a diagrammatic view of my improved apparatus, and Fig. 2 is an enlarged detail view of the controlling device and indicator.

The furnace 12 may be of any well-known or usual construction and is provided with the usual front damper 13 and back damper 14, the respective offices of which dampers will be at once understood by those familiar with the art. To the front damper 13 is attached a cord, wire, or other suitable flexible connecting device 15, passing over pulleys 16 and 17, and connected at its other end to a movable member 18 of a motor or regulating device, indicated generically by the numeral 19. The movable member 18 is connected, by means of a second cord or wire 20, passing over pulleys 21, 21, with the back damper 14.

It will be obvious that movement of the member 18 in one direction will open the damper 13 and close the damper 14, while movement thereof in the opposite direction will close the damper 13 and open the damper 14.

The regulating device 19 is preferably in the form of an hydraulic motor comprising a cylinder 22, containing a piston 23, provided with a suitable piston rod 24, carrying at its outer end the member 18. Service pipes 25 and 26, respectively, communicate with the opposite ends of the cylinder 22, and are adapted to be placed alternately in communication with a supply or pressure pipe 27 and an exhaust pipe 28 by means of a suitable four-way controlling valve 29. This valve may be of any suitable construction, but preferably is provided with two passages 30 and 31. With the valve in the position shown in dotted lines in Fig. 1, the pipe 26 will be in communication, through the passage 30, with the exhaust pipe 28, while the pipe 25 is in communication, through the passage 31, with the supply pipe 27, thus admitting fluid under pressure to the lower side of the piston 23 and causing the same to rise. It will be obvious that a quarter turn of the valve 29, from the position shown, will cause a downward movement of the piston 23. The supply or pressure pipe 27 may be connected with any source of hydraulic pressure, preferably with the source of water supply for the building in which the system is located, and the necessary power for manipulating the dampers 13 and 14 will thus be always available immediately upon the turning of the valve 29.

Suitable manually controlled means will preferably be provided for operating the valve 29. Such means as herein shown are as follows: A casing 32 is placed at any conveniently accessible point more or less remote from the furnace and motor, preferably in the room above that in which the furnace and motor are located. Within the casing 32 is fulcrumed a three-armed lever 33, having a handle portion 34, which extends through a slot in the casing 32 to the exterior thereof, and two downwardly extending arms 35, 35. Attached to the arms 35 is a wire or cord 36 which passes downwardly through a suitable guide tube 37, and thence around a pulley 38, fast on the stem of the valve 29. It will now be obvious that a movement of the handle 34 to the right or left will cause a corresponding movement of



the valve 29, which will be followed by a movement of the piston 23 and a consequent change in the position of the dampers 13 and 14.

5 It will be noted that the function of the mechanism in the casing 32 is merely to turn the valve 29, this requiring very little power, the movement of the dampers 13 and 14 being caused by auxiliary power, controlled  
10 by the said valve 29. This mechanism and its casing may therefore be so small as to offer no inconvenience and may be made of such a form as not to offer an objectionable appearance in whatever room the same may  
15 be placed.

While I prefer to employ the mechanism just described for operating the valve 29, this mechanism may, if desired, be dispensed with, and the valve 29 itself placed in a conveniently accessible position in any room in  
20 the building, the pipes 25, 26, 27 and 28 being, of course, correspondingly extended.

As heretofore mentioned, an indicating or signaling device is provided for indicating  
25 the position of the motor 19 and consequently of the dampers 13 and 14. A pulley 39, provided with a pointer 40, adapted to cooperate with a suitable dial 41, is journaled, preferably in the casing 32, but free  
30 to turn entirely independently of the lever 33. A cord or wire 42 passes over this pulley, thence through the guide tube 37, and, if necessary, over suitable pulleys 43, and is connected at its ends to a movable part of  
35 the motor 19, preferably the member 18, in such a manner that movement of the said movable part in either direction causes a corresponding movement of pulley 39 and pointer 40. It will be noted that this sig-  
40 naling mechanism is entirely independent of the valve 29 and its operating mechanism. Consequently if, for any reason, the motor 19 fails to respond to the movement of the handle 34, such a fact will be instantly indi-  
45 cated by a failure of the pointer 40 to move, and the actual positions of the dampers 13 and 14 will be correctly indicated upon the dial 41 irrespective of the position of the handle 34.

50 Where my apparatus is employed in connection with a steam heating plant the motor 19 may, if desired, be operated by steam from the boiler of the heater. I prefer, however, to operate the said motor from some external  
55 source of power, as by constructing the same as a hydraulic motor and connecting it with the source of water supply for the building in which the apparatus is located, as described, for the reason that the said motor will then  
60 be operative under all circumstances and entirely independent of the presence or absence of steam pressure in the boiler.

As shown in the drawings, the length of the cords or wires 15 and 20 are such that the  
65 movements of the two dampers 13 and 14

will be simultaneous. If desired, however, these cords may be lengthened somewhat, thereby providing for a certain slack or lost motion between these cords and the member 18 as said member approaches the limit of its  
70 movement in either direction, whereby the damper 14 may be fully closed before the damper 13 commences to open and vice versa. It will be obvious that the piston 23 may be stopped at any point in its travel  
75 from one end of the cylinder 22 to the other by giving the valve 29 a one eighth turn from the position shown in the drawings, thereby putting the pipes 25 and 26 out of  
80 all communication with the pipes 27 and 28, and effectively locking the piston 23 in the position in which it is stopped. It will now be seen that, with the arrangement of the cords 15 and 20 last described, the draft  
85 of the furnace may be set for any amount, from the minimum, when the damper 14 is wide open and the damper 13 closed, to the maximum when the damper 13 is wide open and the damper 14 closed, and that the exact position of these dampers may be indi-  
90 cated by the pointer 40 upon the dial 41.

I claim:—

1. In a draft regulating apparatus, the combination with the dampers of a furnace, of a plurality of pulleys, flexible means  
95 traveling over the pulleys and connecting with the dampers for regulating the positions thereof, a fluid-pressure operated means for operating said flexible means, means for controlling the operation of said  
100 fluid-pressure operated means, a lever and flexible connections between said controlling means and lever for actuating the controlling means when the lever is shifted, and an indicating device connected with said  
105 fluid-pressure regulating means for indicating the positions of the dampers.

2. In a draft regulating apparatus, the combination with the dampers of a furnace, of a plurality of pulleys, flexible means trav-  
110 eling over the pulleys and connecting with the dampers for regulating the positions thereof, a fluid-pressure operated means for operating said flexible means, means for controlling the operation of said fluid-pres-  
115 sure operated means, a lever and flexible connections between said controlling means and lever for actuating the controlling means when the lever is shifted, an indicator device for indicating the positions of the  
120 dampers, and a flexible connection between said indicator device and said fluid-pressure operated means for operating said indicator when said means is actuated.

3. In a draft regulating apparatus, the  
125 combination with the dampers of a furnace, of a plurality of pulleys, flexible means traveling over the pulleys and connected with the dampers for regulating the positions thereof, a cylinder, means for supplying fluid under  
130



pressure to each end of said cylinder, a recip-  
rocatory member extending in said cylinder  
and operated in either direction by fluid  
pressure, said reciprocatory member con-  
5 nected with said flexible means and adapted  
to operate the same, a valvular element for  
controlling the supply of fluid to said cylin-  
der, means for actuating said valvular ele-  
ment, an indicator for indicating the posi-  
10 tions of the dampers, and a flexible connec-

tion between said indicator and said mem-  
ber for operating the indicator when the  
member is actuated.

In testimony whereof I have hereunto set  
my hand in presence of two subscribing wit- 15  
nesses.

HUGH M. BROWNE.

Witnesses:

WM. J. DICKSON,

THOS. I. DICKSON.