(No Model.)

L. F. SMITH.

PIPE DAMPER REGULATOR.

No. 477,276. Patented June 21, 1892.

Fig 1

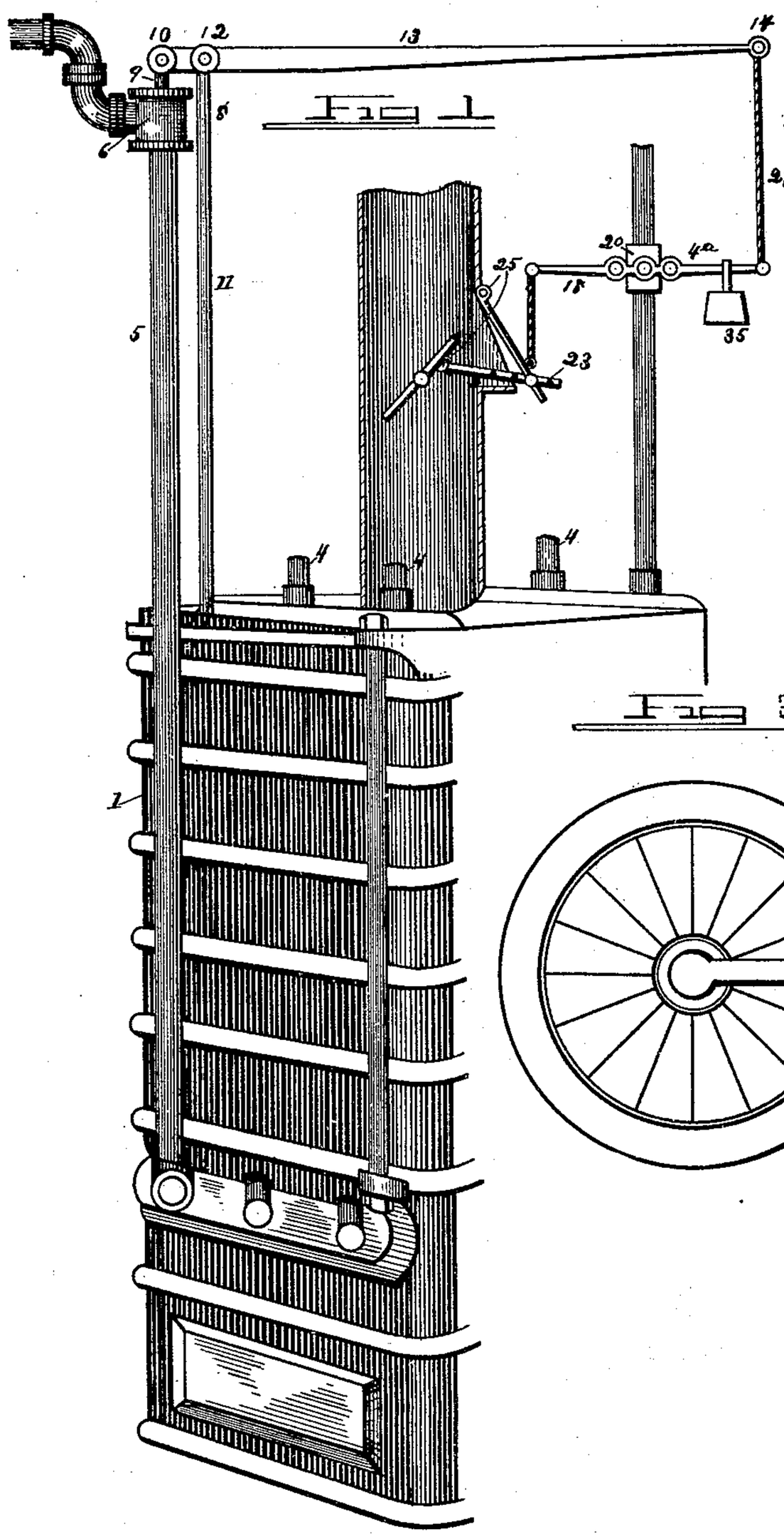

Fig 2

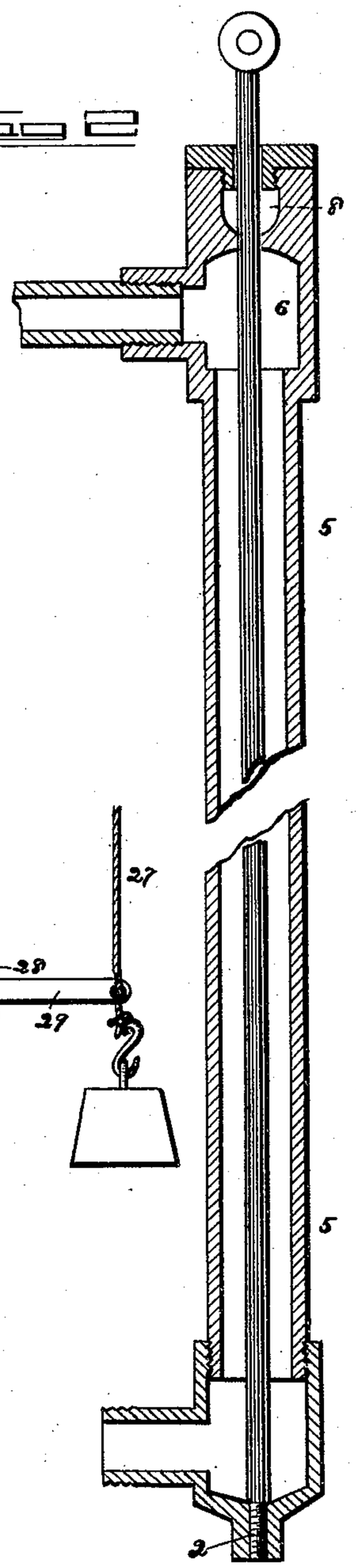

Fig 3

Witnesses

C. W. Seville

Arthur E. Sowell

Inventor

Levi F. Smith

By his Attorney W. Alexander

UNITED STATES PATENT OFFICE.

LEVI F. SMITH, OF PHILADELPHIA, PENNSYLVANIA.

PIPE-DAMPER REGULATOR.

SPECIFICATION forming part of Letters Patent No. 477,276, dated June 21, 1892.

Application filed August 13, 1891. Serial No. 402,588. (No model.)

To all whom it may concern:

Be it known that I, LEVI F. SMITH, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Pipe-Damper Regulators, of which the following is a specification.

The nature and object of the invention will be fully understood from the following general description and the annexed drawings, and will be subsequently pointed out in the claims.

Figure 1 is a partial view of an ordinary water-heater with my invention attached. Fig. 2 is a detail view of a part of the mechanism, more fully hereinafter described. Fig. 3 is another detail view of the mechanism, also more fully hereinafter described.

1 designates the body of the heater, 4 4 4 the flow-pipes, and 3 3 5 the return-pipes. The pipe 5 is connected with the heater by a T-joint at 2. This pipe 5 is also surmounted by a T-joint 6, by which it is connected with the return-pipe 7. Through the whole length of the pipe 5 extends the expansion-rod 9. This rod is screwed firmly into the bottom of the T 2 by its lower end, and passing without the stuffing-box 8 terminates in an ear 10 at its top. An upright supporting-bar 11 is secured by its lower end to the body of the heater and terminates at its top in an ear 12. These two ears 10 and 12 are of equal height and are quite close together. To both of these is pivoted the lever 13, as illustrated. This lever extends a little to the front of the heater and terminates in an eye 14. At 4^a, on one of the flow-tubes, may be secured a clip or bracket 20, which may embrace said tube and may be of any convenient form. Upon this is pivoted the lever 18. The outer end of this lever is connected by the wire cord 27 to the eye 14 of the lever 13.

23 designates a damper-door hinged to the smoke-pipe 26, as illustrated, and attached by the wire cord 21 to the inner end of the lever 18.

25 designates a disk damper of the common and well-known form within the said smoke-pipe 26. This is attached by rod 22 to said door-damper 23, which connection may be made adjustable—as, for instance, by means of a pin on said damper-door that may be placed in adjusting-holes in said rod.

The water-heater herein illustrated is supposed to be of the common and well-known kind. When a fire is built in the furnace and the water in said heater begins to be heated, it will in the common and well-known way flow out through the upper flow-pipes 4 4, through the radiators, and back again to the heater through the lower return-pipes 3 3 and 5. The water passing through the pipe 5 will surround so much of the rod 9 as is in that pipe. The rod should be made of brass or copper or some other metal easily expanded by heat, so that when the water in said tube 5 grows hot said rod will expand lengthwise and in so doing oscillate the lever 13. This will move the eye 14 downward and the weight 35 will draw down the outer end of the lever 18. The inner end of this lever 18 draws up the damper-door 23 by means of the cord 21. The damper-door, as before explained, is connected by the rod 22 to the damper 25, so that when said door is moved the said rod 22, moving with it, simultaneously opens the door 23 and closes the damper 25, shutting off the draft of the furnace and admitting cold air to cool the furnace by decreasing the action of the fire. On the other hand, when the heat of the water passing through the tube 5 decreases the expansion-rod 9 will contract and in so doing reverse the action just described, simultaneously opening the damper 25 and closing the damper-door 23, and so giving the furnace sufficient draft to increase the heat. Thus the draft may be automatically regulated. It is also evident that the cord or chain 27 might be attached to the furnace-damper of said heater, so that the said furnace-damper and the pipe-dampers might be worked simultaneously to open one and close the other, or vice versa, by the same apparatus; but as I have in my said application, Serial No. 402,587, filed August 13, 1891, described and claimed an expansion apparatus for regulating a furnace-damper in a similar way I will not further describe or claim it here.

In Fig. 1 the cold-air damper 23 is illustrated as a door operated by the cord 21; but I have found in practice that a circular damper having wings 28, as illustrated in Fig. 3, will serve equally well in some cases for the same

purpose. To this end the lever 29 is attached to said wings 28, as illustrated in said Fig. 3. The cord 27, which is attached to said lever 29, is also attached to the eye 14 of the lever 13 of Fig. 1, so that when the long end of said lever 13 is tilted up it will raise the end of the lever 29 to which it is connected, and when the long end of said lever 13 is tilted down the weight 30 will draw down the end of the lever 29 to which it is attached. With each motion of the lever 29 the wings 28 of the damper will be moved. Thus by the expansion of the rod 9, as before described, the entry of air may be controlled at this point. I, however, prefer the door damper 23, as illustrated in Fig. 1, for this purpose.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a water-heater, of an exterior return-flow pipe connected therewith, having a stuffing-box on its upper end, a rod formed of expansive metal, passing through said stuffing-box into the pipe and rigidly connected at its lower end to the lower end of the pipe, a lever fulcrumed on a fixed support and having its short arm pivotally connected to the upper end of the rod above the tube, a damper for regulating the draft, and connections between the long arm of said lever and the damper, substantially as and for the purpose specified.

2. The combination of the heater, the exterior hot-water return-flow pipe, the expansible rod in said pipe, secured to the lower end thereof and projecting through its upper end, the pivoted lever connected to the projecting upper end of said rod and pivoted on a bar rising beside said rod, the oscillating weighted lever connected by its weighted end to the free end of said first lever, and the damper connected to the free end of said oscillating lever and operated thereby, substantially as set forth.

In testimony that I claim the foregoing as my invention I have hereto signed my name, in presence of two witnesses, this 28th day of March, 1891.

LEVI F. SMITH.

Witnesses:
JOSHUA R. MORGAN,
MARY G. TAYLOR.