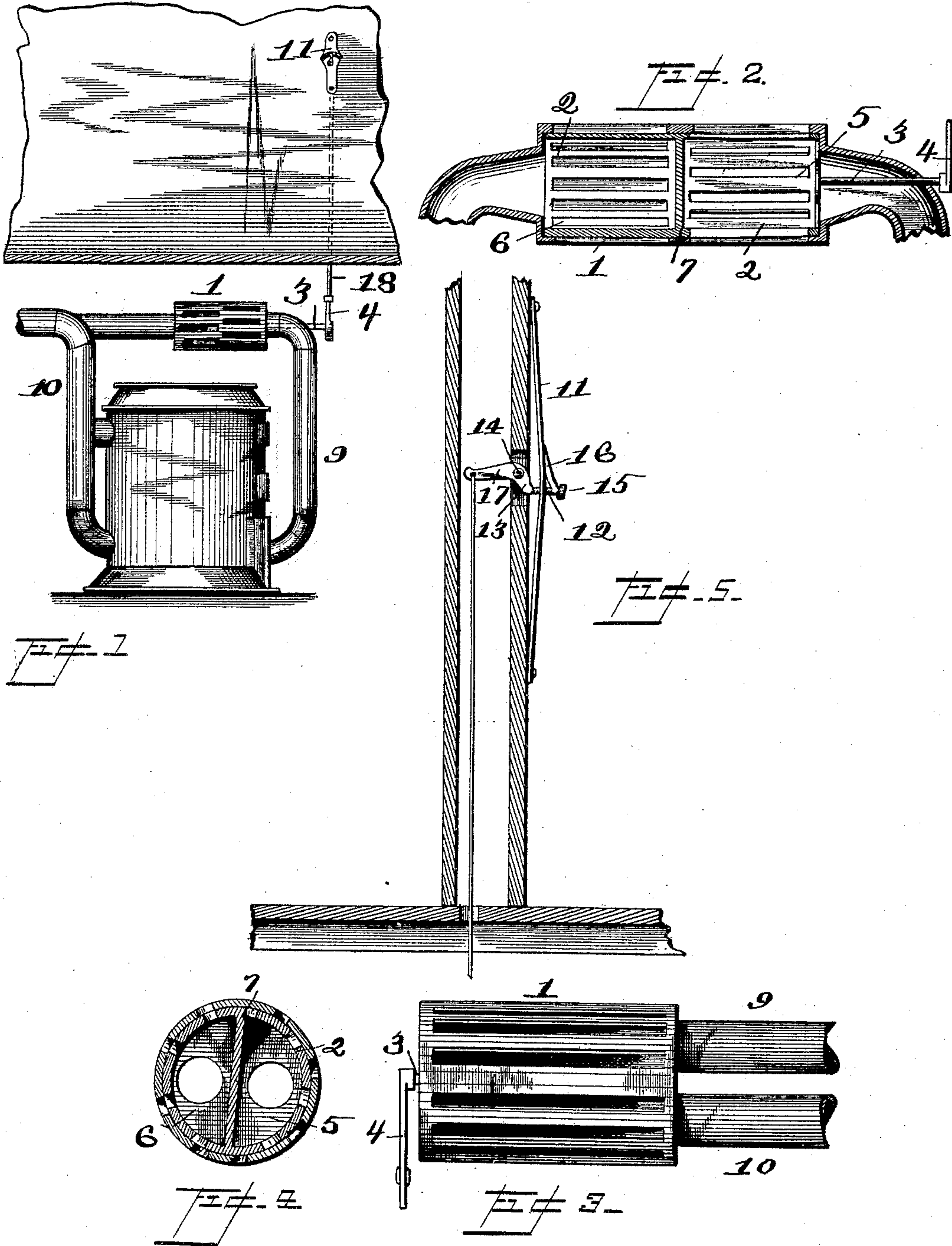


(No Model.)

C. D. HOWARD.
DRAFT REGULATOR.

No. 491,752.

Patented Feb. 14, 1893.



WITNESSES:

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E. R. Mille

INVENTOR

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UNITED STATES PATENT OFFICE.

CHARLES D. HOWARD, OF SYRACUSE, NEW YORK.

DRAFT-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 491,752, dated February 14, 1893.

Application filed November 16, 1891. Serial No. 412,040. (No model.)

To all whom it may concern:

Be it known that I, CHARLES D. HOWARD, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Draft-Regulators, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

The invention relates to certain improvements in automatic draft regulators for heating apparatus; and it has for its objects to provide an improved damper and mechanism for operating the same, to simultaneously control the draft to the ash-pit and the escape flues of the furnace, and thus automatically regulate the combustion of the fuel, as more fully hereinafter set forth.

To this end the invention consists of a cylindrical damper, arranged to partially rotate in a suitable casing, the damper being divided by a partition, into two chambers, the walls of which are longitudinally slotted, the casing also having similar slots so situated, in respect to the slots in the damper-cylinder, that while the slots leading to one chamber of the cylinder are closing those leading to the other are opening, and vice versa.

The invention further consists in the combination with the doubled chambered damper and casing, of thermostatic devices whereby the damper is automatically operated by changes of temperature in the room in which the thermostat is situated as more fully hereinafter explained.

In the accompanying drawings forming part of this specification—Figure 1 represents a side elevation of a furnace with my improved damper connected to the pipes thereof, and showing the thermostatic devices located in an apartment above the furnace; Fig. 2, a longitudinal, vertical section of the damper; Fig. 3, a side elevation of a modified form of the damper; Fig. 4, a transverse section of the same, and Fig. 5, a vertical section of the thermostat.

Referring to the drawings, similar reference numerals indicate similar parts throughout the several views, in which—

The numeral 1 indicates a cylindrical casing in which is fitted a partially rotating damper-cylinder, 2, which is provided with a shaft, 3, projecting at one end. To the outer end

of the projecting shaft is secured an arm, 4, by which the damper cylinder is partly rotated or oscillated. The said cylinder is divided into two chambers or compartments; by means of a diaphragm, 7, and the walls of the respective chambers are slotted longitudinally to form air-passages for the draft. The casing is also slotted, as indicated in the drawings, the slots of the damper-cylinder and those of the casing being so disposed, respectively, that while the slots in the wall of one chamber of the damper-cylinder are opening, those in the other are closing. From the casing extend two pipes 9 and 10, one of which leads to the ash-pit of the furnace and the other to the escape flue, so that while the draft to the ash-pit is being opened the draft to the escape-flue is being closed, and vice versa.

In the form shown in Figs. 1 and 2 of the drawings, the diaphragm is situated midway between the ends of the damper-cylinder, and the pipes 9 and 10 lead from opposite ends of the casing. In this case the slots in the said cylinder and the casing extend longitudinally from about midway to near the ends of said casing or cylinder, and those at one end are out of line, longitudinally, with those at the other, so that while the slots are opening on one side, they are closing on the other side of the partition to regulate the draft as before mentioned.

In the modification shown in Figs. 3 and 4, the pipes 9 and 10 lead from one end of the casing, and the diaphragm is situated longitudinally within the damper-cylinder.

The numeral 11 indicates the thermostat by which the damper is automatically operated. The said thermostat consists of a plate composed of two sheets of material having different expansible properties, preferably sheet iron and hard rubber or vulcanite suitably united. The plate is attached at both ends to a support secured to the wall of the compartment in which it is to be placed, and, midway between its ends is provided with an adjusting screw, 12, which works through a threaded aperture in said plate. The inner end of said shaft bears against the short arm of a lever, 13, fulcrumed at 14, in the wall or support. The outer end of the adjusting-screw is provided with a knob, 15, by which

it may be turned, and with a pointer, 16, arranged to move over a segmental scale, for the purpose hereinafter explained. The long arm, 17, of the lever has attached to it one
 5 end of a chain or connection, 18, the other end being attached to the damper-operating-arm, as shown in Fig. 1 of the drawings.

The operation of the invention will be readily understood in connection with the above description. The thermostat is first set, by
 10 means of the threaded adjusting-screw, to move the damper when a predetermined temperature is reached, which is indicated upon the scale by the pointer. When the temperature rises above the predetermined point, the
 15 rubber face of the thermostat plate expands, causing said plate to bulge outwardly, permitting the damper-cylinder to rotate sufficiently to partially or wholly close the draft
 20 to the ash-pit, and correspondingly open the draft to the escape flue, and thus retard combustion in the furnace. When the temperature falls below the predetermined point, the thermostat contracts, causing the adjusting
 25 screw to press outward against the short arm of the lever and operate the same to positively move the damper-cylinder in a reverse direction.

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

1. The damper herein described, consisting of a rotary cylinder divided by a suitable par-

tion into two compartments, and slotted longitudinally as described, in combination with
 35 an inclosing casing also longitudinally slotted as described, and the pipes leading from the casing to the ash-pit and escape-flues, respectively.

2. The combination, with the outer casing, 40 of the damper-cylinder arranged to rotate within said casing, the dividing partition located between the ends of said damper-cylinder and the pipes leading from opposite ends of the casing to the ash-pit and escape-flue of
 45 the furnace, the casing and damper-cylinder being longitudinally slotted at each end, the slots at one end being longitudinally out of line with those at the other, substantially as specified. 50

3. The combination with the damper-cylinder having two compartments, and the casing within which it is arranged to rotate, the cylinder and casing being slotted as described, the pipes leading to the ash-pit and escape-
 55 flue of the furnace, the lever connected with the damper operating-arm and the thermostat, whereby said lever is actuated to operate the damper-cylinder, substantially as and for the
 60 purpose set forth.

In witness whereof I have hereunto set my hand this 12th day of November, 1891.

C. D. HOWARD.

In presence of—

HOWARD P. DENISON,

C. B. KINNE.