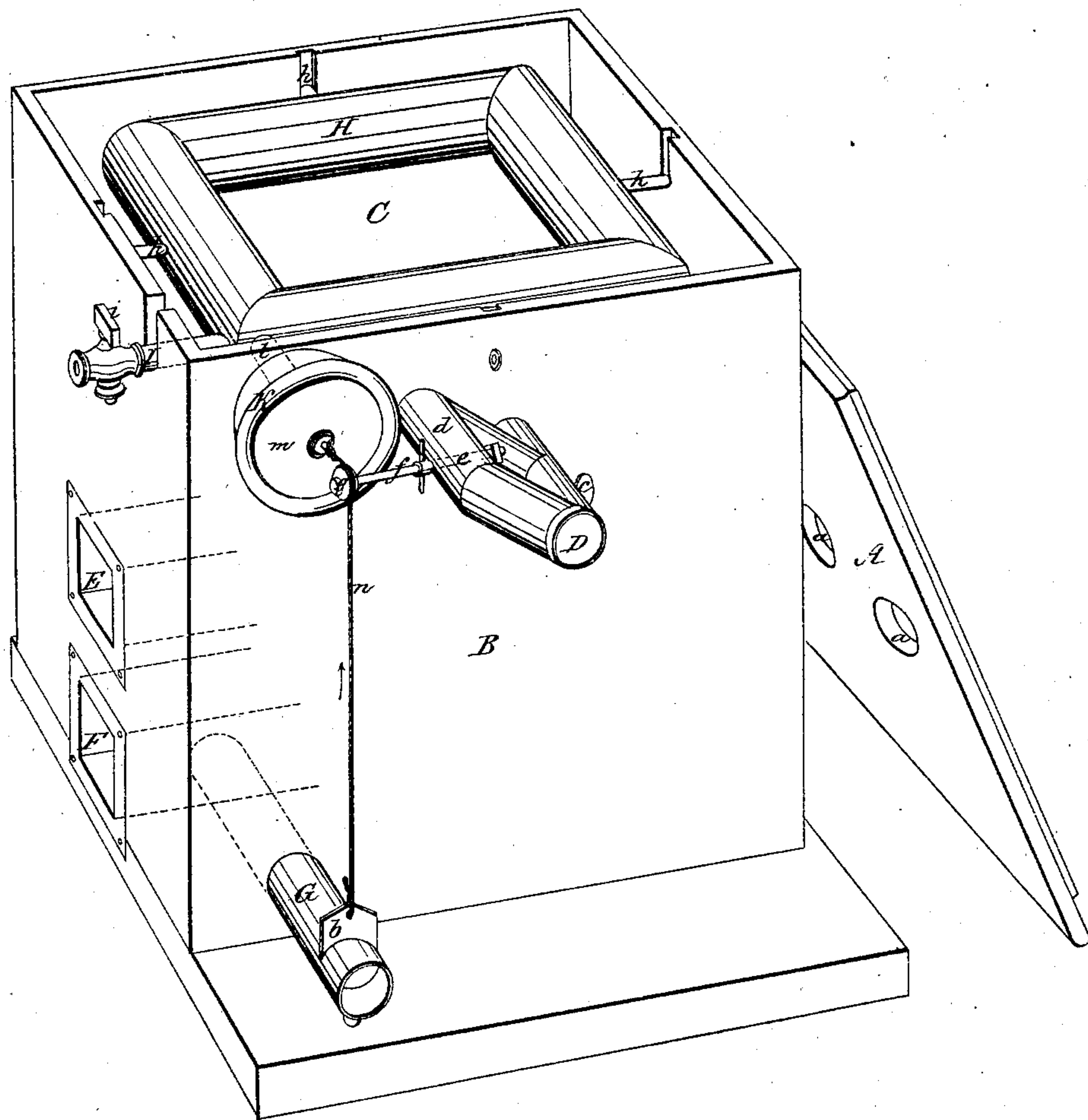


E. L. Brown,

Damper.

No. 30,716.

Patented Nov. 27, 1860.



Witnesses.

Thos R Roach
J. E. Tschumacher.

Inventor.

Edwin S eo Brown.

UNITED STATES PATENT OFFICE.

EDWIN LEE BROWN, OF BROOKLYN, NEW YORK.

REGULATOR FOR HEATING APPARATUS.

Specification of Letters Patent No. 30,716, dated November 27, 1860.

To all whom it may concern:

Be it known that I, EDWIN LEE BROWN, of Brooklyn, county of Kings, and State of New York, have invented an Improved
5 Regulator for Hot-Air Heating Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, making part of this specification, in which is represented a view
10 of an apparatus for heating buildings by hot air, with my regulator attached thereto, the top being removed to show the parts within.

The object of my present invention is to
15 regulate and maintain at as near as possible a uniform temperature the air chamber from which the hot air is supplied to the building; and my invention consists in a tight air-vessel placed within the hot-air
20 chamber, the expansion and contraction of the air within said air-vessel, caused by the changes of temperature in air-chamber, being employed, through the intervention of suitable mechanism, to operate one or more
25 dampers for regulating the fire, to keep the hot-air chamber as near as possible at the pre-determined temperature.

That others skilled in the art may understand and use my invention, I will proceed
30 to describe the manner in which I have carried out the same.

In the said drawing, "B" represents the brick-work which forms the hot-air chamber, "C;"—the cover or top, "A," which is re-
35 moved, is furnished with apertures, "a," communicating with the apartments to be heated, by suitable pipes;—the air-chamber, "C," as usual contains a stove, from which a smoke-pipe, "D," passes through the
40 brick-work to the chimney;—the fire-door, "E," gives access to the fire, and the door, "F," to the ash-pit, which in addition is furnished with a pipe, "G," to supply the fire with air when the doors "E" and "F"
45 are closed;—the pipe "G" is commanded by a damper, "b," and the smoke-pipe "D" by a damper "c," and this pipe has attached to it an auxiliary pipe "d," with double elbows, forming a communication from one
50 side to the other of the damper "c," so that when the damper "c" is open, the smoke may pass directly out of the pipe "D," but when this damper is closed, its course will be through the pipe "d," which is command-

ed by a damper "e," the stem "f" of which 55 projects far enough to bring a pulley "g" on the end of it over the damper "b" in the pipe "G." An air-vessel "H" (which may be of any convenient form) is suspended by brackets "h" from the inside of the brick- 60 work "B;"—it has a pipe "I" communicating with the external atmosphere and commanded by a stop-cock "i;"—there is also a pipe "l" leading from the vessel "H" through the brick-work, where it is 65 connected with another air-vessel "K," which is bell-shaped and has its mouth covered (in such a manner as to make it air-tight) by a sheet of india-rubber "m," to the center of which is attached a cord "n," 70 which cord passes over the pulley "g," and is attached to the damper "b" in the pipe "G."

The operation of my regulator is as follows:—The damper "c" in the smoke-pipe 75 "D" being open, the fire is started; the cock "i" is left open until the air in the chamber "C," as well as that in the vessel "H," has reached the required temperature, when this cock is closed, the doors "E" and "F" 80 are shut, and the whole supply of air to the fire must pass through the pipe "G," and from the fire through the pipe "d," the damper "c" being closed; the dampers "e" and "b" are set, by adjusting the cord "n," 85 to keep the fire uniform. If now the temperature of the air in the chamber "C" should fall below the desired point, either by the fire getting too low or by more out- 90 lets "a" to the apartments being opened, the air in the vessel "H" will cool and decrease in volume, when the pressure of the atmosphere on the elastic disk "m" will press in its center, making it concave, and draw the cord "n" in the direction of its 95 arrow; this opens the damper "b," and by revolving the stem "f" of the damper "e" also opens it, and more draft is supplied to urge the fire; if, on the contrary, the heat in the chamber "C" is increased, the ex- 100 pansion of the air in the vessel "H" will press out the disk "m" and close the dampers "b" and "e," and check the fire. The whole apparatus thus becomes self-regulating, and has the advantages that besides 105 saving fuel, the temperature of the air admitted to any of the apartments of a building may be kept uniform, notwithstanding

the amount of air taken from the air-chamber "C" is varied by opening or closing the registers of some of the apartments.

5 The temperature of an oven or other compartment may be regulated in the same manner as that of the chamber "C;"—and other arrangements of dampers, or other mechanical powers for operating them by the movements of the disk "*m*" may be employed, without departing from the spirit of
10 my invention. The form of the air-vessel "K" may also be varied, but that represented is one which I prefer.

I am aware that the pressure of steam

from a boiler has been applied to one side of 15 a flexible diaphragm, the motion of which was used to regulate dampers.

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

The air vessel H with its stop cock *i* and 20 regulator *m* as combined and arranged with the dampers *e* and *b* and the pipes G and *d* for the purpose specified.

EDWIN LEE BROWN.

Witnesses:

THOS. R. ROACH,

P. E. TESCHEMACHER.