S. KEPNER.

Automatic Governor for Hot-Air Furnaces.

No. 162,662. Patented April 27, 1875.

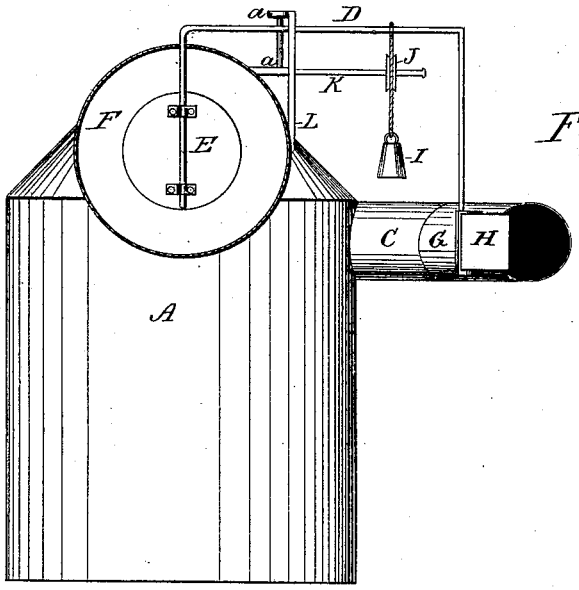

Fig. 1.

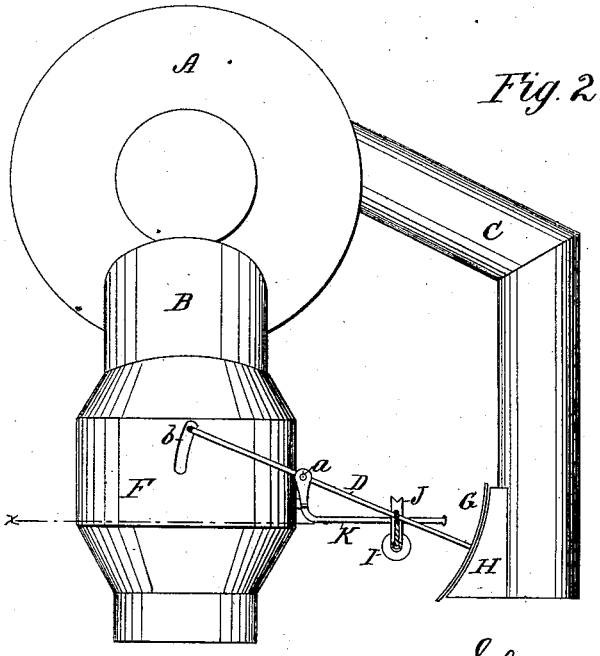

Fig. 2.

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UNITED STATES PATENT OFFICE.

SOLOMON KEPNER, OF POTTSTOWN, PENNSYLVANIA.

IMPROVEMENT IN AUTOMATIC GOVERNORS FOR HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **162,662**, dated April 27, 1875; application filed April 12, 1875.

To all whom it may concern:

Be it known that I, SOLOMON KEPNER, of Pottstown, in the county of Montgomery and State of Pennsylvania, have invented a new and Improved Automatic Governor for Hot-Air Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing forming a part of this specification, in which—

Figure 1 is a vertical side elevation with the drum in section; Fig. 2, a plan view.

The object of this invention is to provide an automatic or self-regulating governor for hot-air furnaces, in which the blast of hot air is made to regulate the draft to the fire-box, or from the combustion-chamber of the furnace.

It consists in a pivoted lever provided with a valve and a damper so arranged, that as the valve is moved by the blast of hot air the damper opens communication from the outer air to the fire-box or smoke-pipe, and by diminishing the draft, correspondingly reduces the generation of heat in the furnace. The pivoted lever is graduated and provided with a weight, by means of which the device may be rendered sensitive, as would be desirable in moderate weather, or might be so regulated for cold weather, as to admit the passage of the maximum amount of heat without melting the cinders in the coal, and filling the furnace with clinkers.

In the drawing, A represents the body of a heater. B is one of the hot-air flues, and C the smoke-pipe leading from the combustion-chamber of the furnace. D is a lever pivoted upon vertical pivots *a a*, so as to move horizontally. Said lever has a valve, E, attached to one end, which said valve may be a plain disk or a cone, the latter affording less resistance to the blast, and consequently rendering the governor less sensitive, which may in some cases be desirable. The said valve is arranged to receive the force of the blast from the flue, and is disposed in a drum, F, which is slotted at *b*, to allow the valve to respond to the pressure of the blast. G is a damper, which is attached to the opposite end of lever D, which opens and closes communication between the outside air and the smoke-pipe C. The said pipe C is provided with an offset, H, which opens with a circular face, so as to make a perfect registration with the damper, which is of a corresponding shape and moves upon the arms of the lever in the arc of a circle. I is a weight whose function is to regulate the sensitiveness of the governor by being placed closer to or farther from the pivots of the graduated lever. Said weight is attached to the lever by means of a cord which passes over an adjustable pulley, J, revolving upon an arm, K, of the standard L.

By means of this improved governor a uniform and equable passage of heat may always be had, for just in proportion as the blast of hot air from the furnace increases, in an equal degree is the generation of heat reduced by a diminution of the draft from the combustion-chamber. Instead of having the damper open communication with the smoke-pipe, as shown, it may be arranged to open communication at the door of the fire-box, and thus produce the same result.

Heaters are frequently constructed with several hot-air flues, and when the blast is cut off from a portion of them it is correspondingly increased in the others. The excess of heat, it is true, can be regulated, to some extent, by registers, but this does not diminish the generation of heat in the furnace, and the result is an unnecessary consumption of fuel. My device obviates this difficulty by making the generation of heat always commensurate with the supply, and vice versa, so that, relatively speaking, no more heat is generated than is utilized. By means of the delicately-pivoted graduated lever and adjustable weight, the operation of the governor may be controlled at will, the said governor being most sensitive when the weight is nearest the pivots, and the maximum blast being obtained when the weight is farthest from the pivots. This position for the maximum passage of heat is absolute, and is the point at which the furnace melts its cinders to form clinkers, which point is determined by experiment for different forms of heaters.

In using my improved governor, I do not confine myself to the exact construction, as described, for it is obvious that numerous

modifications of the device may be made, without departing from my invention—as, for instance, in vertical hot-air flues a vertically pivoted lever will be used, and no cord and pulley is necessary, the weight being attached directly to the lever. I may also attach both valve and damper to one arm of an elbow-lever and suspend the weight upon the other arm.

Having thus described my invention, what I claim as new is—

1. An automatic hot-air furnace governor, consisting of a pivoted lever, a valve contained in the hot-air flue and attached to said lever, and a damper attached also to said lever, which opens and closes communication between the outside air and the smoke-pipe or fire-box, all combined substantially as and for the purpose described.

2. The combination of the graduated lever D, the valve E, damper G, the pulley J, and weight I, substantially as and for the purpose described.

The above specification of my invention signed by me this 3d day of April, 1875.

SOLOMON KEPNER.

Witnesses:
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CHAS. A. PETTIT.