

No. 692,164.

Patented Jan. 28, 1902.

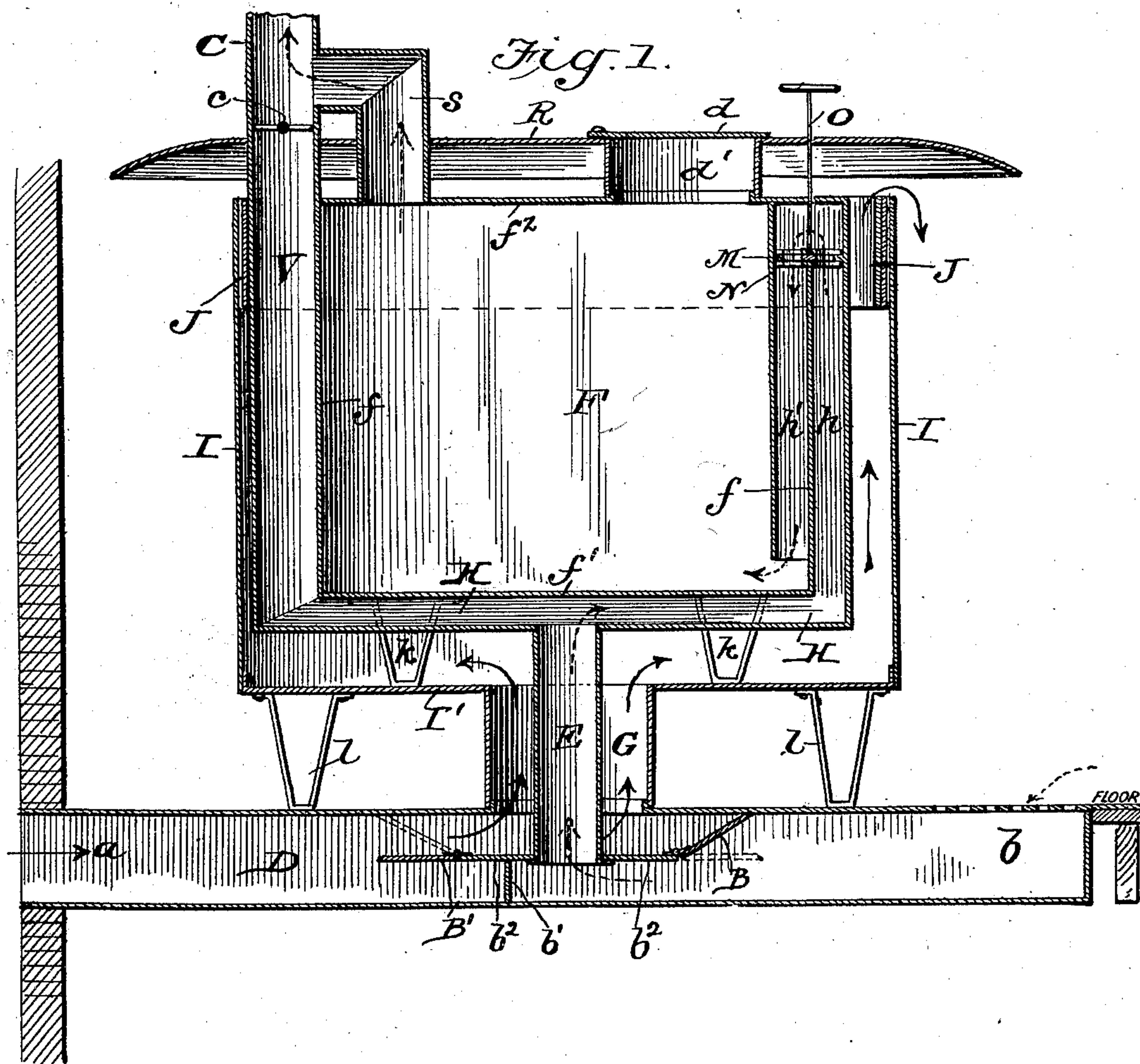
J. M. MILLER.

HEATING AND VENTILATING APPARATUS.

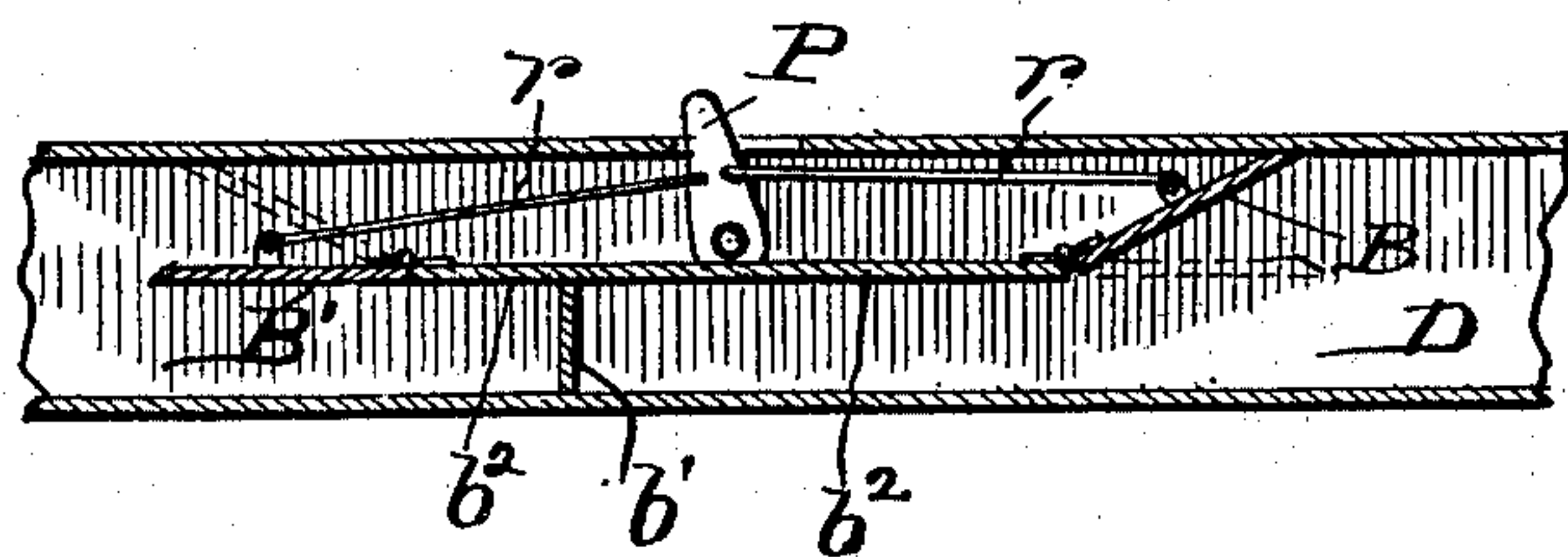
(Application filed July 10, 1901.)

(No Model.)

2 Sheets—Sheet 1.



*Fig. 3*



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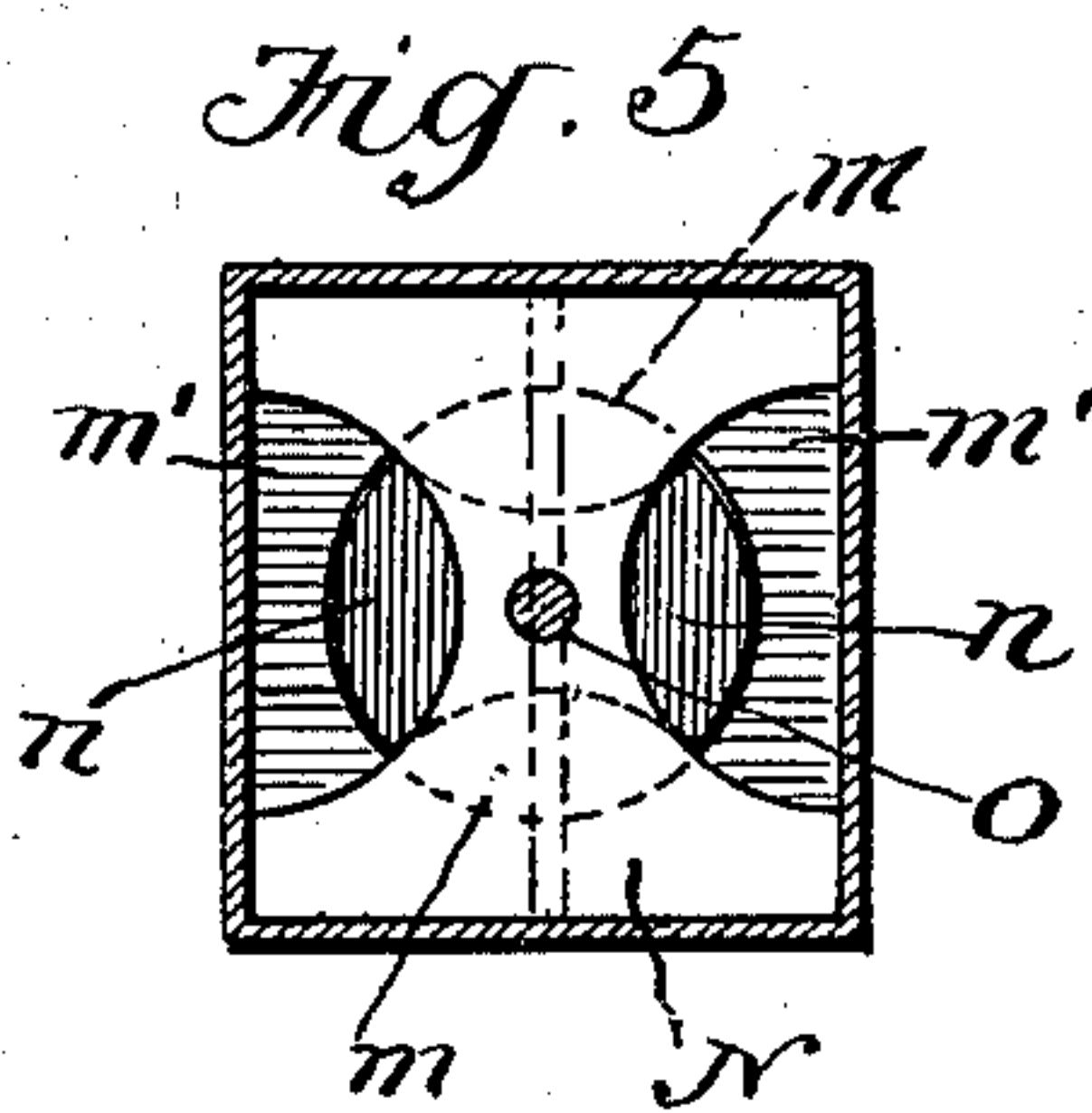
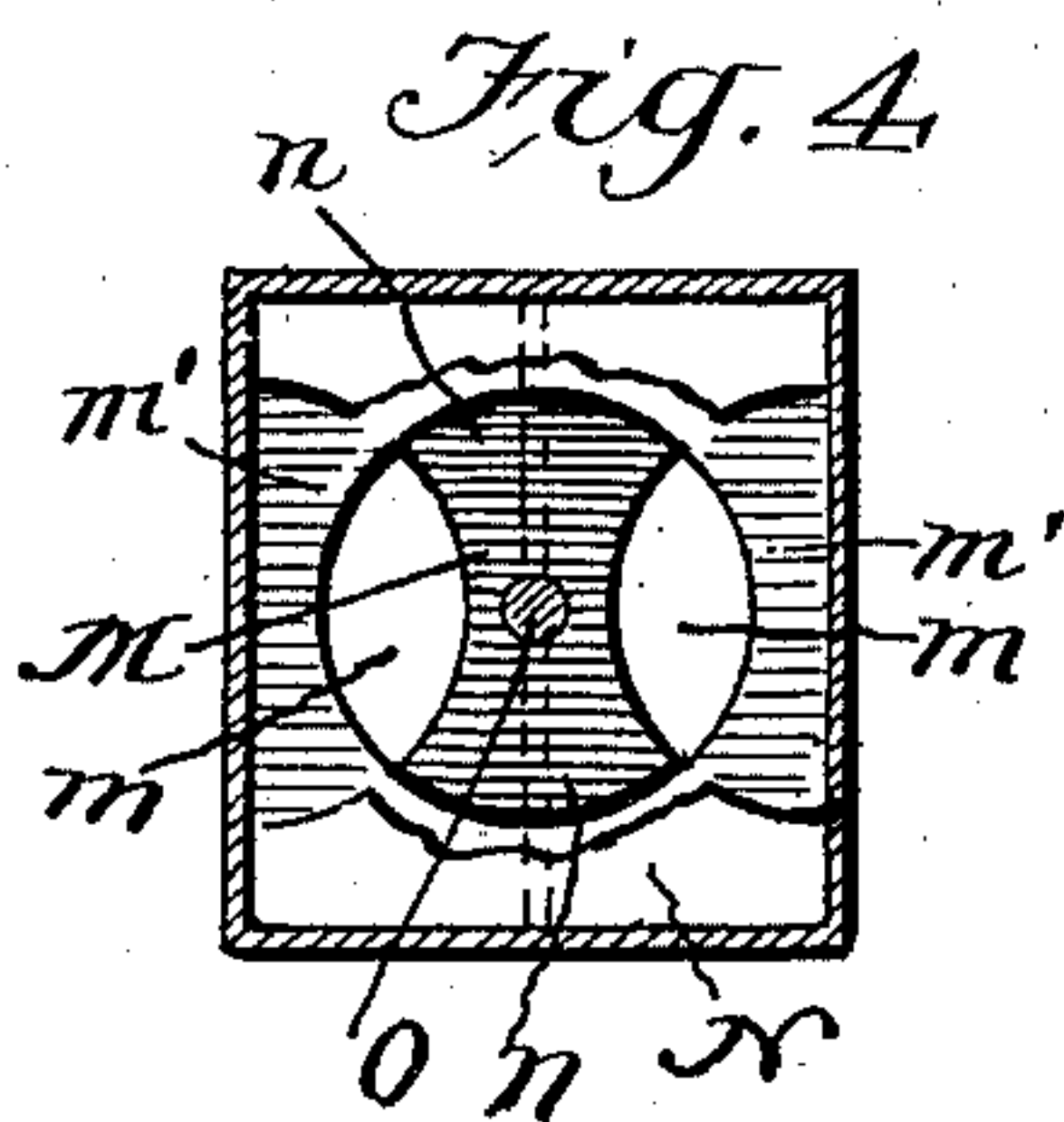
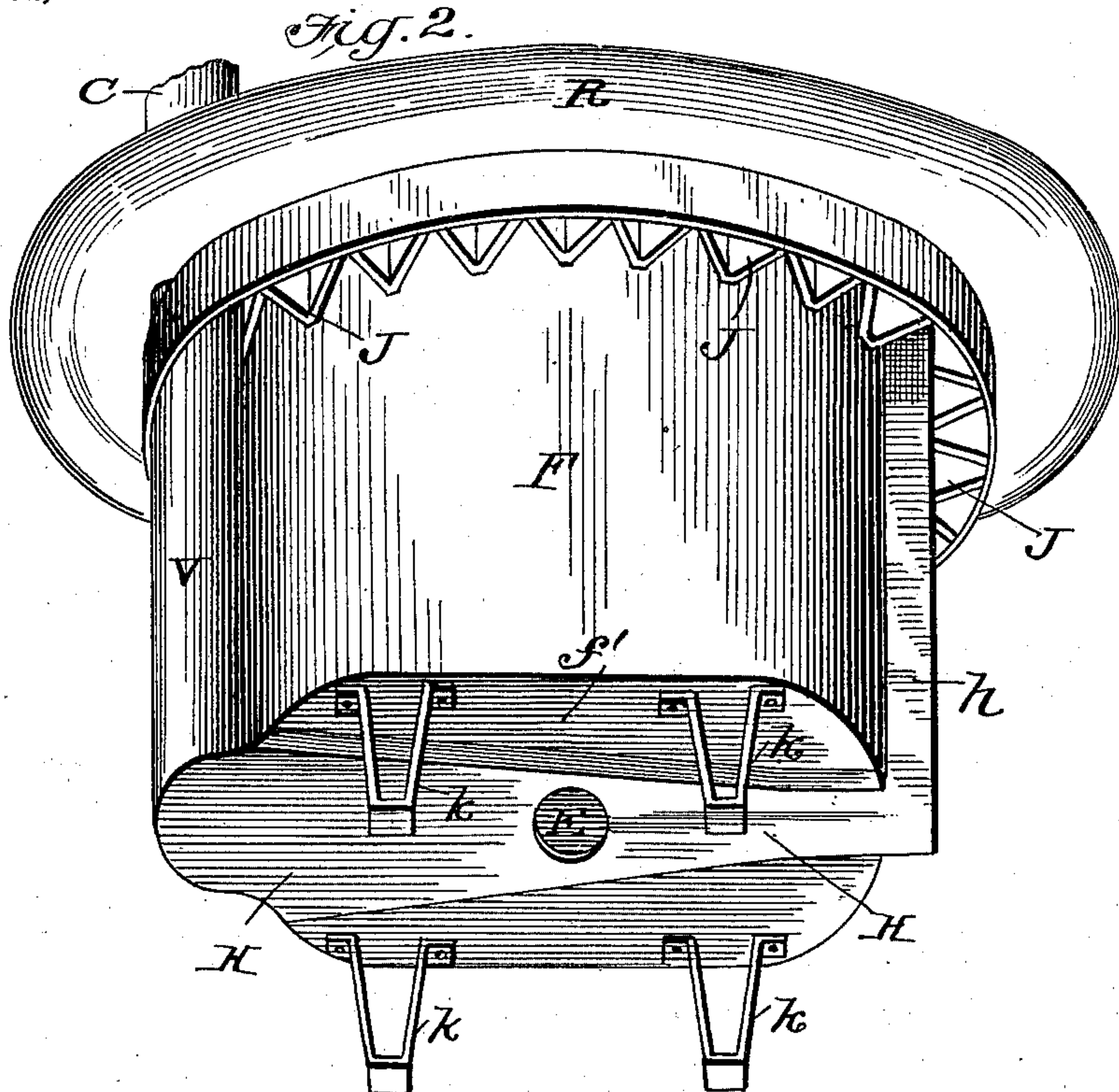
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2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

JOHN MORTON MILLER, OF BALDWIN, KANSAS.

## HEATING AND VENTILATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 692,164, dated January 28, 1902.

Application filed July 10, 1901. Serial No. 67,712. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN MORTON MILLER, of Baldwin, in the county of Douglas and State of Kansas, have invented a new and useful Improvement in Heating and Ventilating Apparatus, of which the following is a specification.

My invention is in the nature of an improved heating and ventilating apparatus designed to furnish the rooms of buildings with fresh air from out of doors heated to a suitable temperature and to carry away the stagnant or dead air from the rooms; and it consists in the peculiar construction and arrangement of the various parts of the device, which I will now proceed to describe with reference to the drawings, in which—

Figure 1 is a vertical longitudinal section of the apparatus. Fig. 2 is an underneath perspective view of the stove and its attached parts, the outer casing being removed. Fig. 3 is a detail of the ventilating-damper to the stove, and Figs. 4 and 5 are details of the stove-damper.

In the drawings, D represents a horizontal conduit or flue, which is made of sheet metal and is placed beneath the floor with its upper surface on a level with the floor-line. This conduit opens at one end *a* through the wall of the house, so as to be in open communication with the outer fresh air, which it takes into the room to be heated. The other end of the conduit has on its horizontal surface a register-grating *b*, through which the dead stagnant air of the room is carried away.

At an intermediate point between the inlet-openings *a* and *b* there is mounted upon legs *ll* an outer casing for the heating-stove, said casing composed of side walls *I* and a bottom *I'*. Into an opening in the bottom of this casing a short vertical pipe *G* is inserted and connects it with a corresponding opening in the top of the conduit *D*.

Inside the casing *I I'* there is mounted on legs *k k* the central fire-chamber or stove *F*. This fire-chamber has its side walls *ff* spaced apart from the outer casing *I* by corrugated or zigzag strips of metal *J*, running around the upper edge.

Under the bottom *f'* of the fire-chamber is arranged in horizontal middle position a lon-

gitudinal flue *H*, which at one end communicates with a vertical ventilating-flue *V* and at the other end communicates with a double air-draft flue *h h'*, which takes air into the fire-chamber to support combustion. The flue *H* communicates with the bottom of flue *h*. Flue *h* communicates at the top through a valve, as hereinafter described, with a down-dipping flue *h'*, and this flue *h'* opens at its bottom into the bottom of the fire-chamber *F*. From the top of the fire-chamber a smoke-flue *s* emerges and after turning at right angles communicates with the chimney-flue *C*, which also communicates with the ventilating-flue *V* through a damper *c*.

In the top *f<sup>2</sup>* of the fire-chamber a charging-opening is formed, through which fuel is introduced. This consists of a short section of pipe *d'*, covered by a horizontally-swinging door *d*. On a level with this door a top plate *R* is arranged, which extends over the whole stove and is flanged downwardly at its outer edges and acts as a reflector to throw the heat downwardly.

In the center of the flue *H* under the fire-chamber there is formed an opening with which communicates a pipe *E*, of smaller diameter than *G*, through which it concentrically passes. Just below pipe *E* a partition is formed in the conduit *D*, consisting of a horizontal part *b<sup>2</sup>* and a vertical part *b'*. The vertical part *b'* prevents communication between the opposite ends of the conduit *D* below the horizontal part *b<sup>2</sup>*. The pipe *E* opens through the partition *b<sup>2</sup>*, so as to be in communication with the end *b* of the conduit *D*. The horizontal partition *b<sup>2</sup>* has at its opposite ends the hinged flap-dampers *B* and *B'*. When the damper *B* is up, as shown, the end *b* of the conduit communicates only with pipe *E*, and when the damper *B* is horizontal, as in dotted lines, the end *b* of the conduit communicates both with the pipe *G* and the pipe *E*. When the damper *B'* is horizontal, as shown, the fresh-air end *a* of the conduit communicates with the pipe *G*, and when the said damper *B'* is up, as indicated in dotted lines, the fresh-air end *a* of the conduit is cut off entirely from the pipe *G*.

To regulate the admission of air to the stove for combustion, a rotary segmental draft-



damper is used, as seen at M, Fig. 4. This damper has two opposite open spaces  $m m$  and two alternate blank spaces  $n n$ , which may be turned into or out of registration with two corresponding openings  $m' m'$  in a partition-plate N, placed across the top of the two flues  $h h'$ , with the openings  $m' m'$  just above the tops of these flues. An axial rod O is attached to the damper M and extends through the top of the stove in the form of a handle, by which the damper is turned. When the damper is turned so that openings  $m$  and  $m'$  coincide, the flue  $h$  is in communication with  $h'$ , and when said openings are turned out of registration flue  $h$  is cut off from  $h'$  and air is cut off from the fire-chamber, so as to arrest combustion.

Wood or other fuel is burned in the fire-chamber F by air fed through flues  $h h'$ , the smoke passing out at  $s$  and the ashes being removed from time to time by a dipper through the charging-door  $d$ , or, if desired, a separate ash-door in the side may be provided.

The operation of this device as a heating and ventilating apparatus is as follows: Damper  $c$  being closed, damper B being up, and B' down, the cold fresh air comes in at  $a$  from the outside and passing into pipe G distributes itself around the stove, as indicated by the full arrows, and striking the reflector R is thrown downwardly into the room heated. The dead foul air, which naturally lies near the floor, passes down grating  $b$  and entering the pipe E passes to flue H and thence through flues  $h$  and  $h'$  into the stove to support combustion, as shown by the dotted arrows. When the damper M is closed and this foul air is not used for combustion, then it passes to the left in flue H and up flue V to the chimney, damper  $c$  being opened for this purpose. Dead air may be used for combustion and also be carried up flue V at the same time by having both dampers M and  $c$  open. If the air in the room is not sufficiently foul to require expulsion from the room, then it may be reheated with an economy of fuel, as follows: Fresh-air damper B' is raised, as shown in dotted lines, so as to cut off the end  $a$  of the conduit from the pipe G, and damper B is lowered to a horizontal position. The air from the room now entering at  $b$  passes partly through pipe E to support combustion and partly into the pipe G to be reheated and discharged into the room again.

To work the dampers B B', they may have separate handles projecting up through the top of the conduit D, or they may, as shown, be both connected to a single lever P by pull-rods  $r$ , so as to act together in opposite directions.

In making use of my invention any kind of a stove, furnace, or other heating appliance may be used in the place of the fire-chamber F, and for some of the purposes of my inven-

tion even a steam-radiator or hot-water coil may be substituted therefor.

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

1. The combination with an air-conduit along the floor, one end of which conduit is open to the outer air, and the other end open into the room; of a partition with dampers in said conduit between said openings, and a heating and ventilating device located above the same and having concentric foul-air and fresh-air passage-ways communicating with the conduit on opposite sides of the partition the foul-air passage-way opening into and taking air from the room, and the fresh-air passage-way opening through the external walls substantially as described.

2. The combination with an air-conduit along the floor, one end of which is open to the outer air, and the other end open into the room; of a partition with dampers in said conduit between said openings, two vertical concentric pipes connecting therewith and opening on opposite sides of said partition and a heating and ventilating device, one of said concentric pipes being in communication with the air-heating spaces of the heater and the fresh-air side of the partition and the other pipe being in communication with the fire-chamber and smoke-flue thereof and the foul-air side of the partition substantially as described.

3. The combination with a horizontal air-conduit having its opposite ends opening into the outer air and the room as described; of a right-angular partition  $b' b^2$  having at its opposite ends the dampers B B', means for working these dampers, a central pipe opening through the partition to the foul-air end of the conduit, and an outer pipe inclosing the central pipe and opening on the fresh-air side of the partition, and a heating and ventilating device mounted above these pipes substantially as described.

4. The combination with the conduit D having fresh-air and dead-air inlets at opposite ends, and separating-partitions  $b' b^2$  with regulating-dampers B B' as described; of two concentric pipes E G opening on opposite sides of the partition, the outer casing I I' opening into pipe G, the fire-chamber F having bottom flue H and vertical end flues  $h h'$  and V communicating with the pipe E, spacing devices J arranged between the fire-chamber and outer casing, and a reflecting-top R extending over the whole device a little above the outer casing substantially as shown and described.

JOHN MORTON MILLER.

Witnesses:

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WILLIAM H. ALLEN.