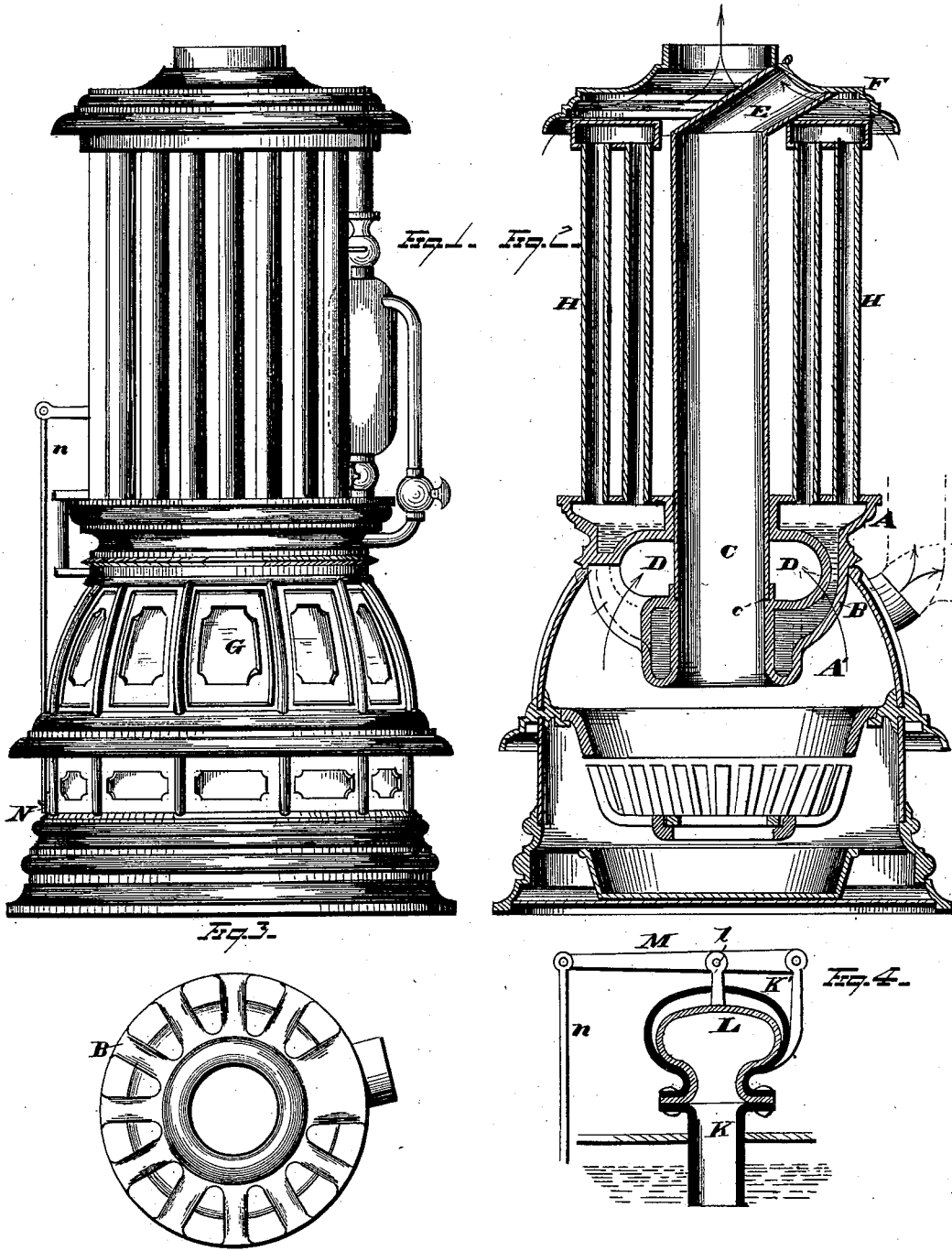


W. H. BROWN.  
Steam-Radiator.

No. 200,601.

Patented Feb. 26, 1878.



WITNESSES

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN STEAM-RADIATORS.

Specification forming part of Letters Patent No. **200,601**, dated February 26, 1878; application filed June 12, 1877.

*To all whom it may concern:*

Be it known that I, WILLIAM H. BROWN, of Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Steam-Radiator Stoves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention consists of a steam-heat-radiating stove, designed as an improvement upon that made the subject-matter of another patent the application for which was filed of even date herewith. According to this invention, one or more annular series of upright steam-pipes, acting as heat-radiating surfaces, are fed by a boiler located in the base of a stove, fitting about the fuel-cylinder, and formed with upper and lower ring-chambers, the latter connected by short curved passages, which form an annular smoke-flue about the inner side of the boiler. The base of the fuel-cylinder is seated upon a circular flange formed on the inner circumferential side of the boiler-casting, approximately in horizontal line with the top of the lower ring-chamber of the boiler, and this lower inner circumferential side of the casting forms a continuation of the magazine-cylinder, so that the fuel burns at the base of the boiler, heating it upon its outer side, and the heated products of combustion are carried in through the spaces between the passages connecting the upper and lower ring-chambers. The boiler is thus subjected to the action of the fire on all but its upper side, and the annular smoke-flue gives heat to the boiler in the passage of the smoke to the final-exit flue.

The base of the stove is provided with mica windows, instead of being a close-bodied metallic surface, so that an illuminated base may be afforded to the steam-heat-radiating stove.

The damper-regulator for automatically controlling the heat consists of a flexible diaphragm influenced by the pressure of steam in the boiler, and connected by an intermediate rod with a lever of the third class, which

latter, by suitable mechanism, operates a sliding damper.

Referring to the drawings, Figure 1 is a view, in side elevation, of my stove; Fig. 2, a central vertical section of the same. Fig. 3 is a bottom plan of the boiler, and Fig. 4 a sectional detail view of the automatic heat-regulating mechanism.

The boiler is formed with the upper and lower ring-chambers A A', connected by the short passages B, curved outward from the fuel-cylinder C, seated in the circular flange c on the upper portion of the inner circumferential side of the lower chamber A'. The annular smoke-flue D is formed between the lower side of the fuel-cylinder and the connecting-passages B, so that as the combustion is carried on about the outer circumference of the boiler the flame and products of combustion may pass through the spaces between the said water-connecting passages, and subject the boiler to the action of the heat on all sides but its upper.

Fuel is fed into the cylinder preferably through the diagonal opening E of the cap-plate F, though this construction is not material to this stove; and the lower portion of the ring-boiler continues this central fuel-magazine, and allows the fuel to burn at the base of the stove, acting against the boiler as the upper fire-surface of the combustion-chamber.

By making the stove with the mica windows G, I obtain an illuminated base. The connecting-passages B give the boiler an open central formation, and allow the light and flame of the inner circular flue to be seen. This, together with the combustion of the fire-chamber, gives a brilliant illumination to the base-section through the mica lights.

The steam-pipes H may be of any size, number, or in one or more annular series, and they extend vertically upward from the boiler, connecting their extremities, as shown in the drawings; or they may simply have closed ends, or in any other suitable manner be formed at their upper extremities.

The heat-regulating mechanism (shown in Fig. 4) consists of the hollow metallic cylinder K, tapped into the outer margin of the upper

body of the boiler, and the hollow spherical casing K', the two securing between their flanged connecting extremities the flexible diaphragm L. This latter is of any suitable yielding material, and is of form adapted to rest against the inner side of the said casing. The short connecting-rod l passes through the top of the casing, and engages, by firm connection, the central body of the diaphragm. Its opposite or upper end operates the lever M, fulcrumed as a third-class lever, and actuating the vertical rod n, which latter operates the sliding damper N. As the steam presses against the diaphragm the latter is forced against the inner side of its spherical casing, and thus the strain upon it is transferred from its flexible body to the rigid body of the casing; and this operates to close the damper through the intermediate connections. Upon reduction of the fire incident to this closing of draft, the diaphragm is released from the strong steam-pressure before exerted upon it, and as it relaxes from its former position the damper is opened correspondingly, as is apparent.

This heat-regulating mechanism, which I regard as a valuable invention in connection with the use of my stove, is yet applicable in many other connections; and hence I do not claim it in this patent, but reserve it as subject-matter for a future patent.

The stove is provided with the reservoir attachment for maintaining a constant water-level in the boiler, and a glass indicating-gage, as are fully described in my other Letters Patent previously referred to; and the present invention does not include such subject-matter. So, too, the stove may be adapted to convey heated air to upper rooms by means of an opening in its top plate, to receive a pipe leading therefrom into such apartments; and the annular series of steam-pipes, excepting the outer or first series, may pass through a supporting-plate, to give them upper lateral bearing.

Suitable safety-valves attached to the boiler, air-vents connected with the steam-passages; and other attachments, I may supply as found desirable.

The ash-pit and means of outer communication therewith, the ash-pan, fire-pot, and similar lower parts of the stove, form no part of my invention, and the drawings are intended to represent only the material features of my improvement.

The same mechanism for making the damper-rod detachable from its actuating device may be used as is shown and described in my other patent before referred to, and the sliding damper be held closed, even when the steam-pressure is low.

While I have shown the stove as circular and its steam-pipes as being formed in annular series, I may, instead thereof, make the same square, rectangular, or of any other desired horizontal section.

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

1. A steam-radiator stove provided with an illuminated base and a boiler partly inclosed thereby, the latter having an annular flue formed about its inner central body between upper and lower ring-chambers, and connecting by side-flue openings with the fire-chamber, substantially as described.

2. In a steam-radiator stove, a boiler having its upper ring-chamber made in full cross-measurement of the stove, and forming a portion of its outer wall, the smaller ring-chamber being located in the fire-chamber, and the short vertically-curved passages connecting the said chambers, substantially as described.

3. In a steam-radiator stove, a boiler having an upper ring-chamber, which forms a part of the outer wall of the stove, and the lower ring-chamber of smaller diameter, and the water-passages connecting the two, the said passages being formed as shown, whereby they are subjected on all sides to the action of the fire and smoke of the combustion-chamber, substantially as described.

4. In a steam-radiator stove, a boiler made as an independent casting, having the annular flue within its inner central body, and the side flues connecting the fire-chamber therewith, and combined with the exit-flue, substantially as described.

5. In a steam-radiator stove, a boiler having its lower ring-chamber provided with the annular shoulder formed on the inner circumference of its upper surface, and upon which the fuel-cylinder is supported, substantially as described.

6. In a steam-radiator stove, the boiler having upper and lower ring-chambers connected by short vertical passages, curved at their sides, and an annular flue formed centrally within its body, the said flue communicating with the fire-chamber through the passages which connect the ring-chambers, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of June, 1877.

WILLIAM H. BROWN.

Witnesses:

CAS. BYFIELD,  
LIVINGSTON HOWLAND.