(No Model.)

JOSEPH SCHILL, JOHN SCHILL & P. SCHILL.

AIR WARMING FURNACE.

No. 511,164. Patented Dec. 19, 1893.

Fig. 2. On line x-x

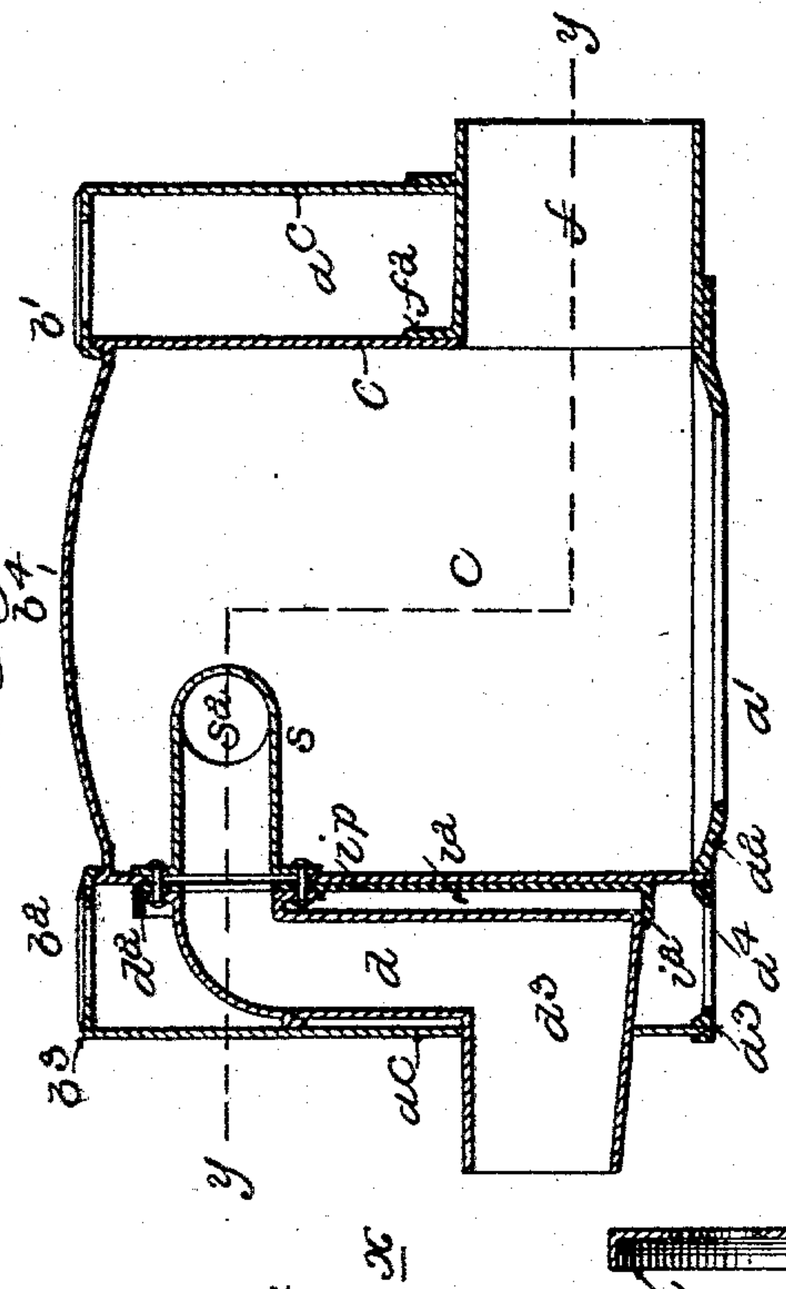


Fig. 4. On line z-z

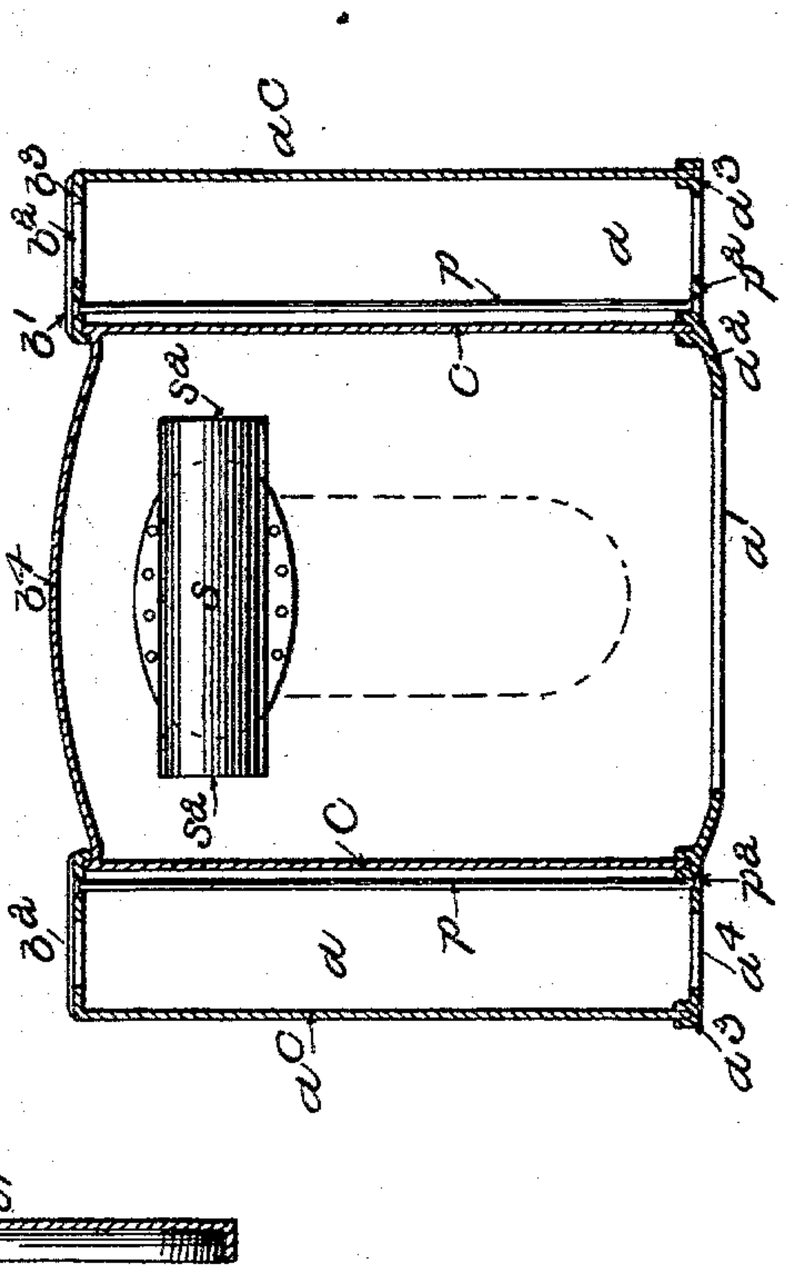


Fig. 1.

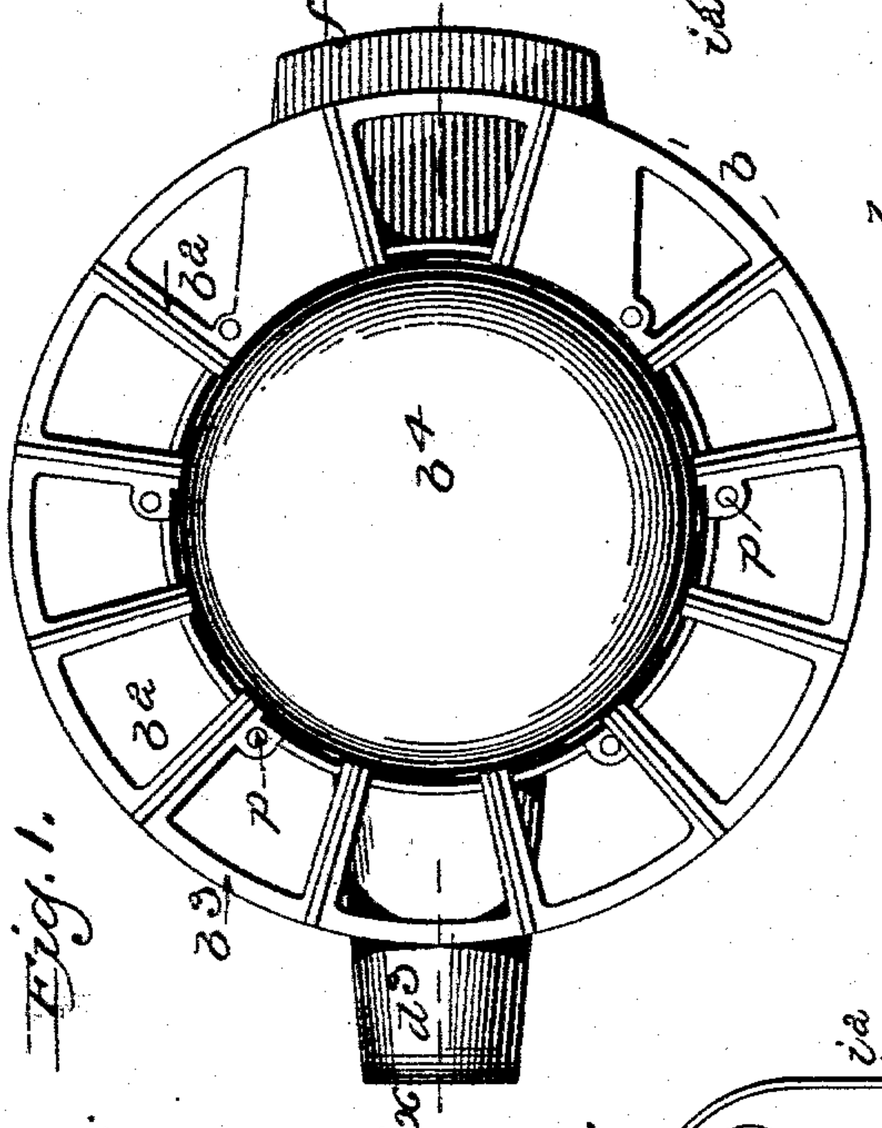


Fig. 3. On line y-y

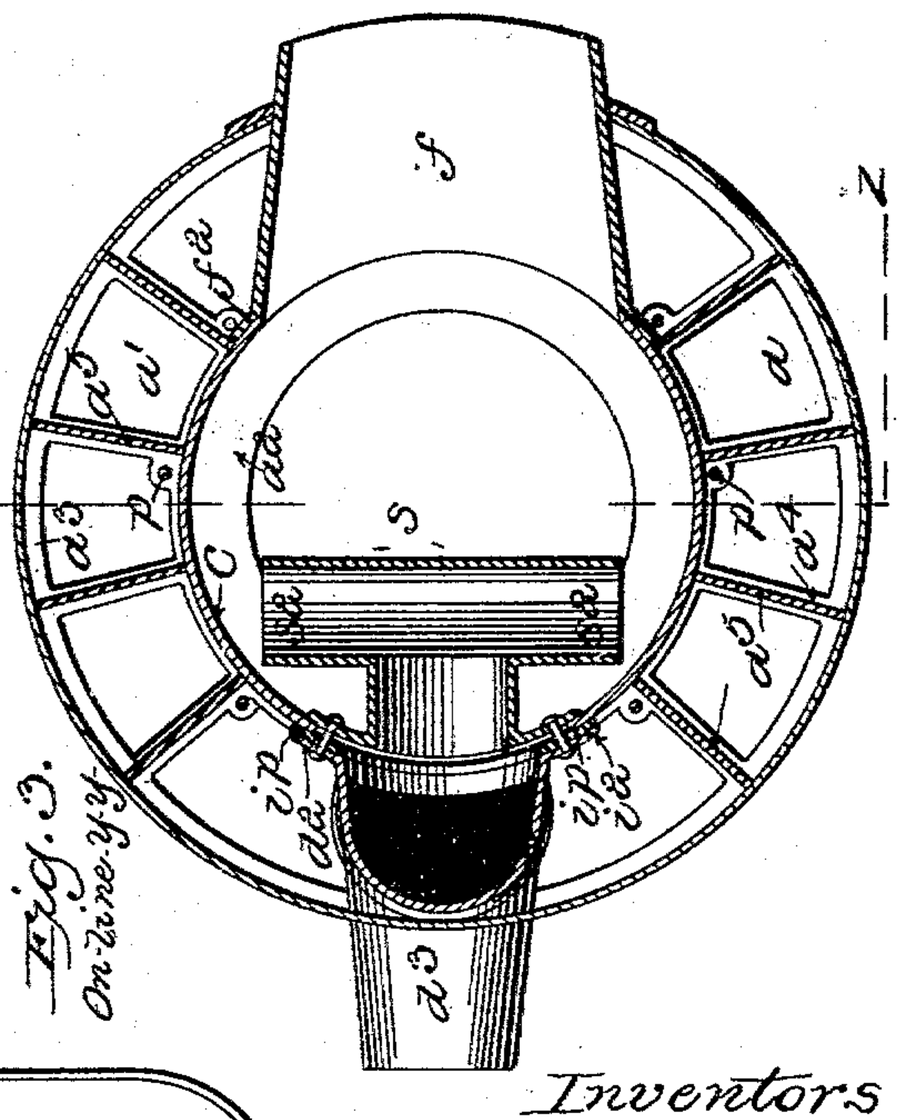
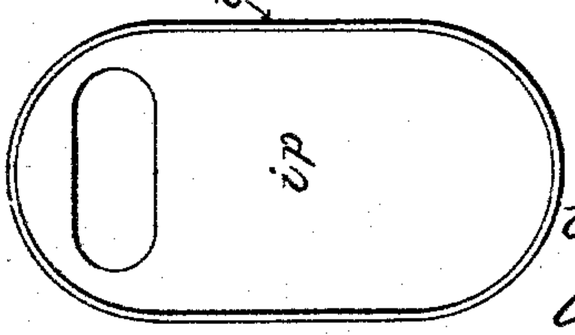


Fig. 5.



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JOSEPH SCHILL, JOHN SCHILL, AND PETER SCHILL, OF CRESTLINE, OHIO.

AIR-WARMING FURNACE.

SPECIFICATION forming part of Letters Patent No. 511,164, dated December 19, 1893.

Application filed July 7, 1893. Serial No. 479,847. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH SCHILL, JOHN SCHILL, and PETER SCHILL, citizens of the United States, and residents of the city of Crestline, in the county of Crawford, in the State of Ohio, have invented a new and useful Air-Warming Furnace, of which the following is a correct description.

The invention relates to certain improvements in that class of heaters or hot-air furnaces designed for use in dwelling houses and other structures, in which the heater or furnace proper is inclosed, except in its front central portion, by a casing which forms in connection therewith, an air chamber, which receives currents of fresh air at or near its lower extremity and which discharges the same warmed to the desired degree, through suitable openings in the upper extremity of the air casing, into metallic conduits, through which they are conveyed to the various portions of the structure which are to be warmed.

A leading object of the construction which we have devised, and which will now be described, is to provide at small expense a novel series or system of flues, for the discharge of the products of combustion; and a novel means for assembling the same in connection with a combustion chamber, of steel, in which necessity for perforating the body of the combustion chamber in the act of securing the parts together is avoided, and whereby the circulation is sufficiently restricted and controlled without the aid of a damper.

Another object is the provision of means for presenting to the action of the incoming and ascending air currents, an extensive radiating surface, or series of surfaces, in the interval between the body of the combustion chamber and the body of the air casing, in connection with the supports of such parts.

The invention consists in the novel parts, or combinations of parts which will now be described in detail, and which will be specifically set forth in the paragraphs which follow such detailed description.

In the accompanying drawings which constitute a part of this specification,—Figure 1 represents a top plan view of the combustion and air-warming chamber section of the furface. Fig. 2 is a vertical longitudinal central section,—as in the line x—x of Fig. 1. Fig. 3 is an irregular horizontal section,—as in the line y—y of Fig. 2. Fig. 4 is a transverse central section,—as in the line z—z of Fig. 3. Fig. 5 is a rear elevation, and Fig. 6 is a central section, of the auxiliary or intermediate flue plate, detached.

It will be seen that the base-plate or lower head a', of the combustion and air chamber section a, is composed of an inner ring a^2, an outer ring a^3, and intermediate connecting arms a^4, which serve as bearings for the lower extremity of the detachable radiating plates a^5; and that at suitable intervals the inner ring has perforations p^2, to receive securing rods p, by which when the parts are in place, the upper and lower plates are secured together. The upper head b is similar in its general construction to the lower head but the ring b^2, connects the exterior arms b^3, not to an interior ring, but to a closed head or dome b^4, which constitutes the top of the combustion chamber. At the front the feed chute f, is secured by its flanges f^2, to the body of the inner cylinder or combustion chamber c, in an ordinary manner.

In the rear of the extremity of the combustion chamber c, is the smoke hood s, which is of the T-form shown, the open ended arms s^2, of the same extending as shown nearly to the body of the cylinder.

Upon the exterior of the cylinder c, coincident with the smoke opening is fitted the intermediate plate i—p, which has raised rim or flange i^2, to constitute a recessed surface, within which is received by its flange d^2, the diving and out-take flue d, the lower and discharging end d^3, of which projects outwardly through the opening in the body of the air casing ac.

The rear opening in the body of the cylinder c, is of dimensions sufficiently greater than the corresponding portions of the smoke hood, the diving and out-take flue and the intermediate plate, to permit the flanges of the hood, the diving flue, and the interposed plate to be suitably secured together, without the necessity for perforating the body of the combustion chamber itself; thereby effecting much economy of time and labor.

The radiating plates a^5, having been set in place within their bearings, the air casing ac, is by its rear opening, fitted over the project-

ing extremity of the discharging end d^3, of the out-take flue, and its front is fitted over the body of the feed-chute. This being done, the securing rods are fixed in place, either by heading down, or by the application of suitable nuts.

The provision of the T-arms, upon the retarding-hood and the location of the same at a point near the walls, and near the upper extremity of the combustion-chamber, prevent a rapid escape of the products of combustion; and retard the flow of the smoke currents to such an extent that the provision of a damper to effect this purpose is rendered unnecessary.

The nature and objects of the invention having been thus described, and the construction and operation of the apparatus in which it is embodied having been set forth, what is claimed is—

1. The cylindrical combustion-chamber *c;* the cylindrical air-casing *ac;* the base-plate a', having inner ring a^2, outer ring a^3, connecting and supporting arms a^4, and perforations p^2; the upper head *b*, having central dome b^4, exterior ring b^3, and the connecting-arms b^2; the detachable plate a^5; and the securing rods *p;* in combination; substantially as specified.

2. In an air-warming furnace, the combination with the combustion-chamber, of the described smoke-retarding hood and flue, having the inlet branches s^2; arranged in the upper rear portions of such chamber, as shown, and the damperless diving and out-take flue, between the combustion-chamber and the air-casing and leading directly downward from the smoke-retarding hood and flue; substantially as and for the purposes set forth.

3. In an air-warming furnace, the combination with the combustion-chamber; of the flanged T-shaped smoke-retarding hood and flue therein; the flanged diving and out-take flue, in the encircling air-chamber of the furnace; and the recessed or flanged intermediate plate;—the hood, the diving and out-take flue, and the intermediate plate being secured together; substantially as shown and described.

4. In an air-warming furnace, the combustion-chamber *c;* the unobstructed, flanged, T-shaped hood and smoke-flue *s;* the intermediate flanged plate, in the annular air-chamber of the furnace; and the flanged diving and out-take flue *d*, resting upon the flange of the intermediate plate, and secured to the flange of the T-shaped smoke-hood, and flue; substantially as set forth.

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