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J. F. CAMPBELL ET AL.

BOTTOM DRAFT DEFLECTOR FOR FURNACES AND STOVES.

FILED SEPT. 12, 1919.

Fig. 1.

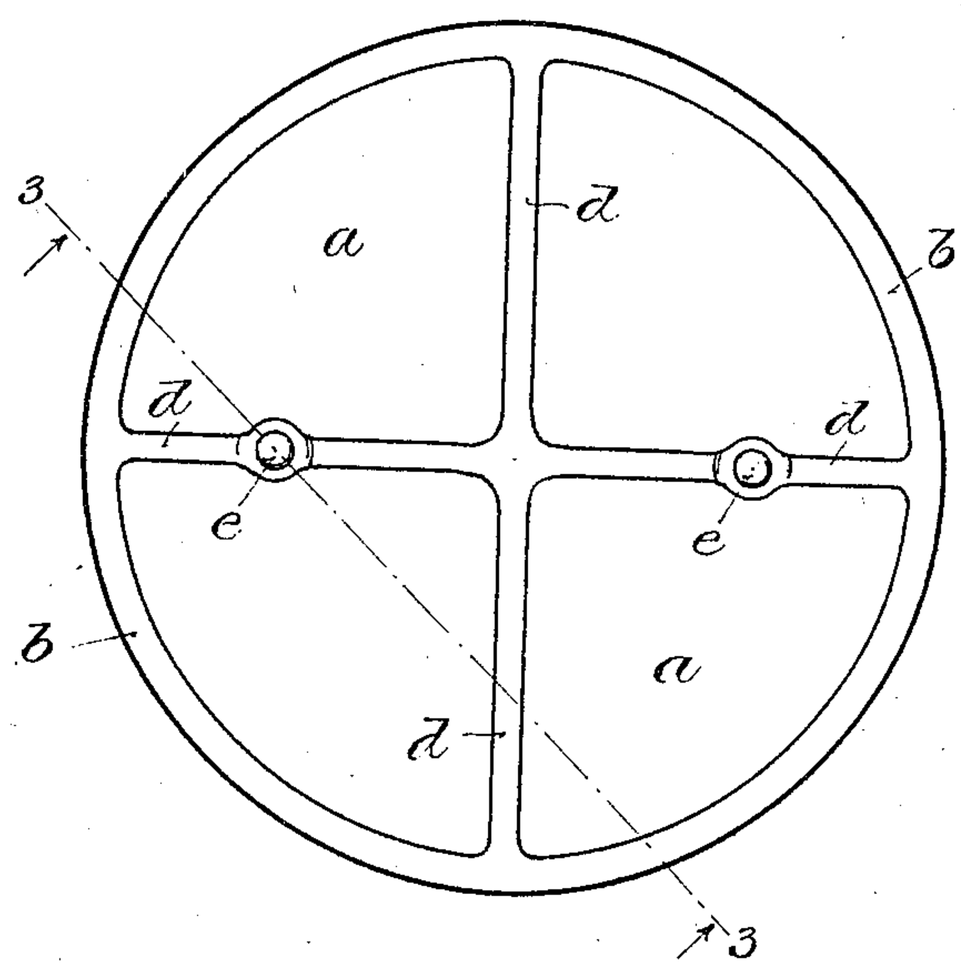



Fig. 2.

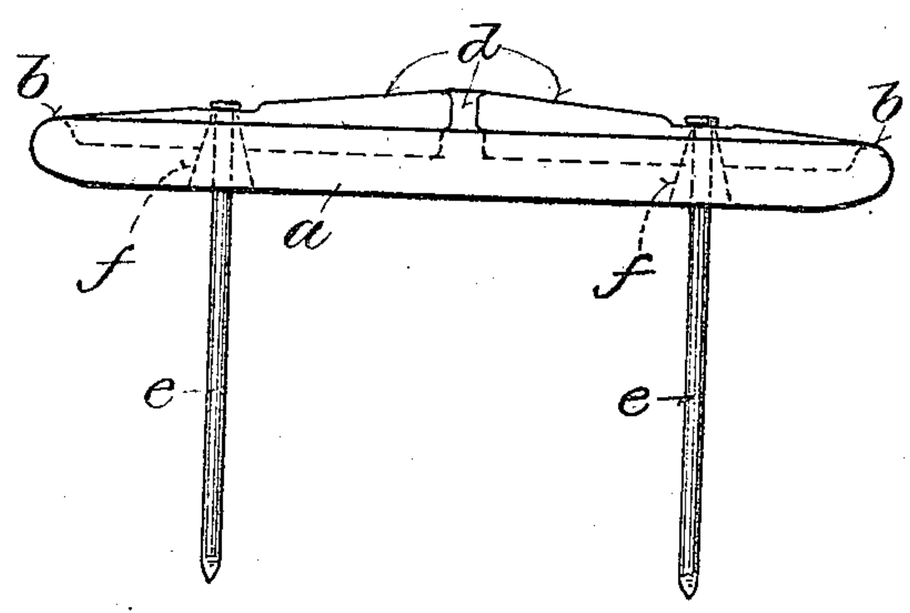
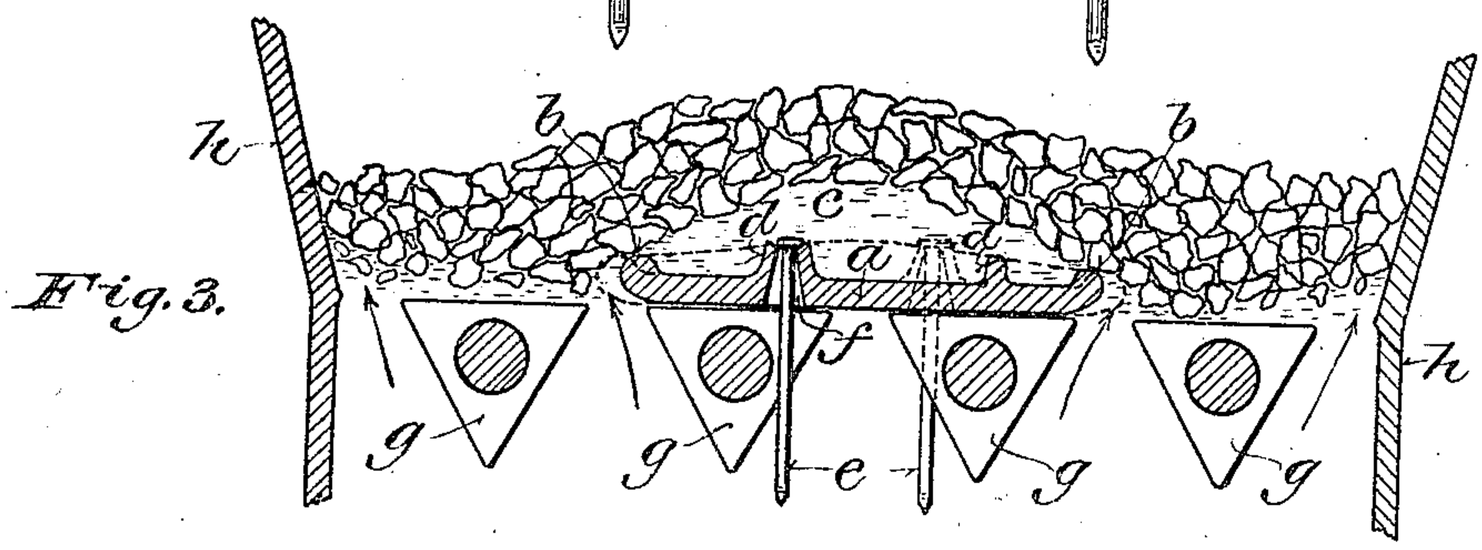



Fig. 3.

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# UNITED STATES PATENT OFFICE.

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## BOTTOM-DRAFT DEFLECTOR FOR FURNACES AND STOVES.

Application filed September 12, 1919. Serial No. 323,240.

*To all whom it may concern:*

Be it known that we, JAMES F. CAMPBELL and RALPH G. CHAMBERLIN, citizens of the United States, residing at White Fish Bay, in the county of Milwaukee and State of Wisconsin, and at Grand Rapids, in the county of Kent and State of Michigan, respectively, have invented certain new and useful Improvements in Bottom-Draft Deflectors for Furnaces and Stoves, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof.

This invention relates more particularly to stoves and furnaces or heaters having rotary or rocker bar grates.

The main objects of the invention are to promote combustion of the fuel in the annular space next to the wall of the fire pot, where under ordinary conditions with grates of the kind above mentioned, coal clinkers and ashes tend to lodge, impede the draft and cause sluggish and imperfect combustion, thus impairing the efficiency of the heater and resulting in waste of fuel; to adapt the deflector to an ordinary rotary or rocker bar grate without change in the construction of the grate so that the deflector can be readily applied thereto without the use of tools and when so applied, will retain its proper central working position on the grate; and generally to improve the construction and operation of devices of this class.

It consists in the construction, arrangement and combination of parts as hereinafter particularly described and pointed out in the claims.

In the accompanying drawing like characters designate the same parts in the several figures.

Figure 1 is a plan view of a deflector plate constructed in accordance with the invention; Fig. 2 is a side elevation of the same; and Fig. 3 is a vertical cross section on a reduced scale of the grate and a portion of the fire pot of a furnace or heater showing the deflector in position on the grate and covered with a protecting coating of ashes, the deflector plate being shown in section on the line 3—3, Fig. 1.

The deflector consists of a substantially flat circular metal plate *a*, of considerably smaller diameter than the grate and fire pot of the heater with which it is to be used. It is formed with an upwardly projecting marginal flange or rim *b*, which reinforces and strengthens it and also serves to retain an insulating and protecting layer or body *c*, of ashes on the plate, as shown in Fig. 3. The plate is also formed on the upper side with reinforcing and strengthening cross ribs *d*. The deflector plate is provided on diametrically opposite sides of and equidistant from its center, with depending retaining pins or prongs *e*, as shown in Figs. 2 and 3. These retaining prongs or pins may consist as shown, of round spikes or large wire nails, loosely inserted and held in downwardly flaring holes *f*, formed in one of the ribs *d* on diametrically opposite sides of and equidistant from the center of the plate.

By engagement with the grate bars *g*, between which they are loosely inserted, the pins or prongs *e* confine the deflector plate *a* in its central working position on the grate, as shown in Fig. 3, without interfering with the rotary or rocking movement of the grate bars. The holes *f* in which the retaining pins *e* are loosely inserted, flaring downwardly as shown in Figs. 2 and 3, permit the pins to swing a limited distance laterally in all directions relative to the plate, so that they will not be bent or broken by the rotation or oscillation of the grate bars, and will not interfere with their operation, but will effectively confine the plate in an approximately central position, leaving an annular draft opening between the plate and the wall of the fire pot *h*.

In the operation of the grate, the plate *a* naturally assumes a position in which the ribs *d* are disposed obliquely to the grate bars, as shown in Fig. 3, and as indicated by the dotted line 3—3, Fig. 1, thereby carrying one of the pins *e* between the lugs or projections on one of the grate bars, and the other pin between the lugs or projections on the adjacent bar, so that the plate when in use, is prevented from shifting out of its proper central working position lengthwise of the grate bars on which it loosely rests.

The deflector plate closing the central portion of the grate and leaving an annular draft opening around it, deflects the draft away from the center towards the wall of the fire pot as indicated by arrows in Fig. 3, thereby obstructing direct draft through the center of the fuel bed and promoting combustion of the fuel next to the wall of

the fire pot. The accumulation of unburned coal or fuel, cinders and ashes around the margin of the grate next to the wall of the fire pot and consequent waste of fuel, is thus avoided or materially reduced, combustion is accelerated where it is most advantageous for effective heating, and the capacity of the heater for a given consumption of fuel is correspondingly increased.

We claim:

1. A bottom draft deflector for heaters having rocker bar grates, which consists of a substantially flat plate adapted to rest loosely on adjacent grate bars and having retaining pins depending loosely from the plate and adapted to pass loosely between the bars and to confine the plate in position thereon, leaving an annular draft opening around the grate next to the wall of the fire pot.

2. A bottom draft deflector for heaters having rocker bar grates, which consists of a substantially flat plate adapted to rest loosely on adjacent grate bars and formed on diametrically opposite sides of its center with downwardly flaring holes, and retaining pins loosely inserted in said holes and adapted by engagement with the grate bars between which they are loosely inserted, to confine the plate in a central position on the grate, leaving an annular draft opening between the plate and the fire pot.

3. A bottom draft deflector for heaters having rocker bar grates, which consists of a substantially flat circular metal plate adapted to rest loosely on adjacent grate bars and provided with retaining pins depending loosely from the plate and adapted by engagement with the grate bars between which they are loosely inserted, to confine the plate in a central position on the grate, said plate being formed with an upwardly projecting marginal rim adapted to retain a protecting layer of ashes thereon.

In witness whereof we hereto affix our signatures.

JAMES F. CAMPBELL.
RALPH G. CHAMBERLIN.