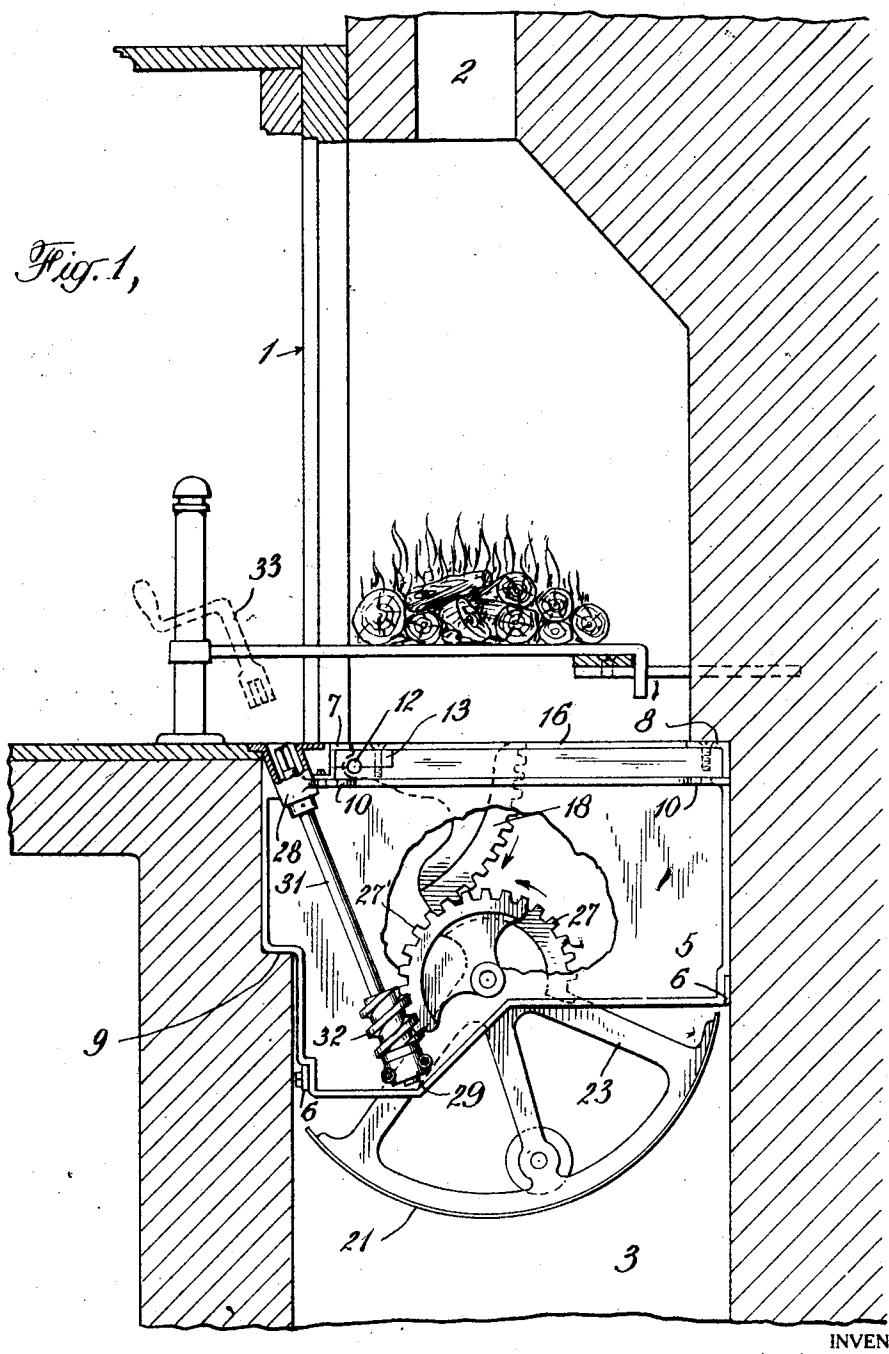
Feb. 19, 1929. 1,702,710

W. F. SPARROW

HEARTH

Filed April 23, 1927 3 Sheets-Sheet 1

Fig. 1,




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Fig. 2,

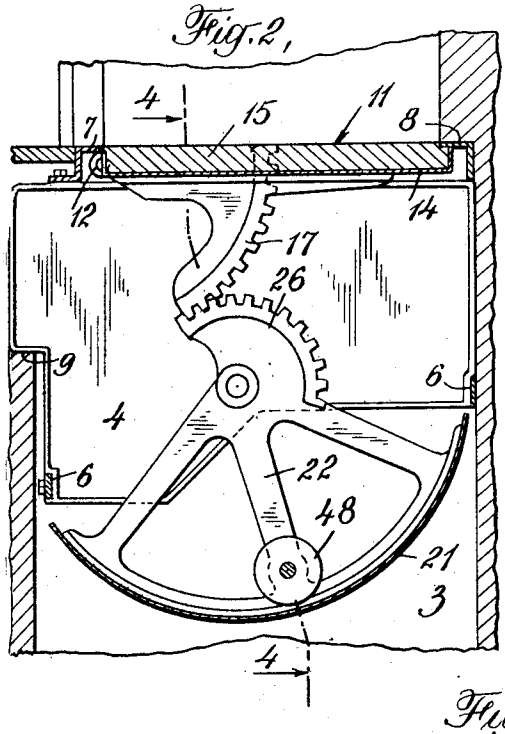



Fig. 3,

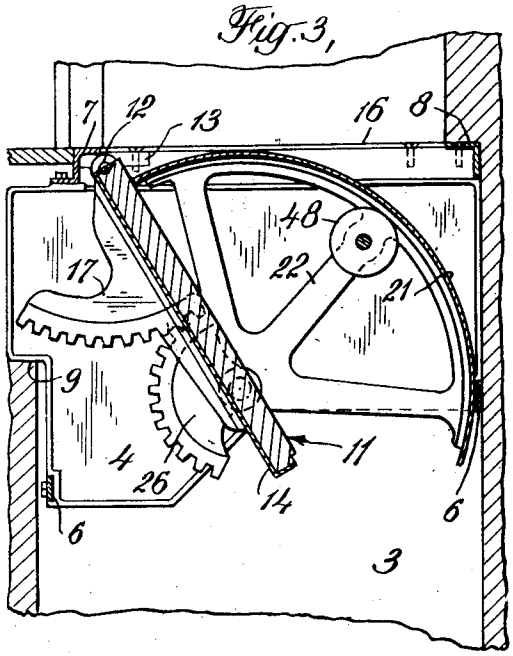
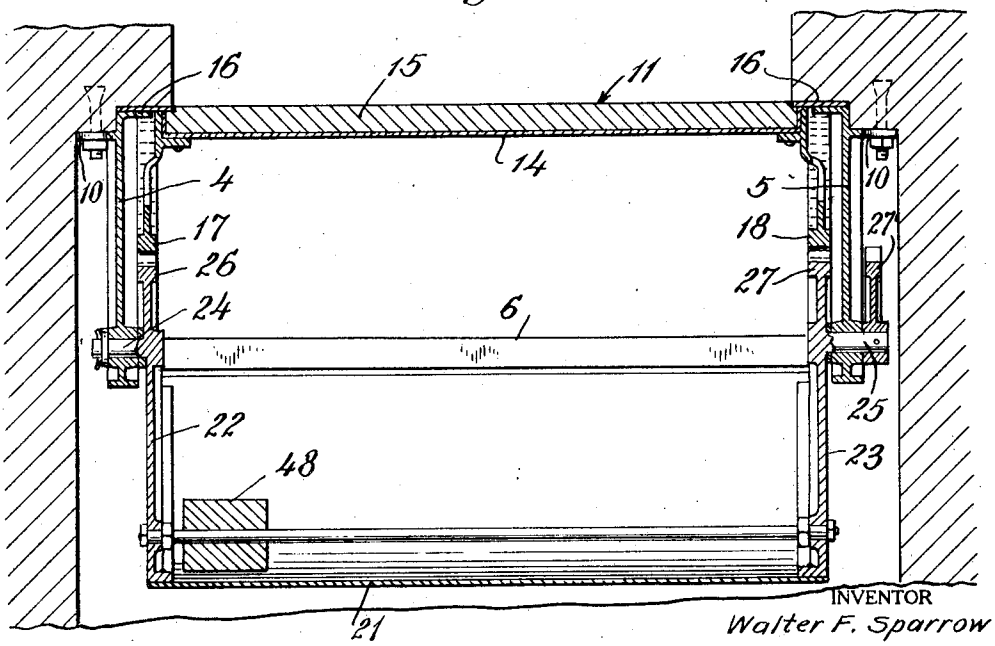



Fig. 4.




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Fig. 6,

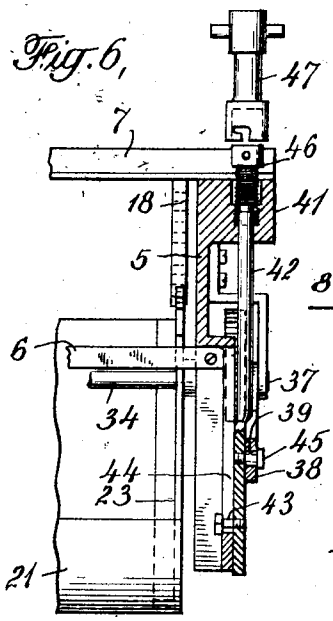



Fig. 5,

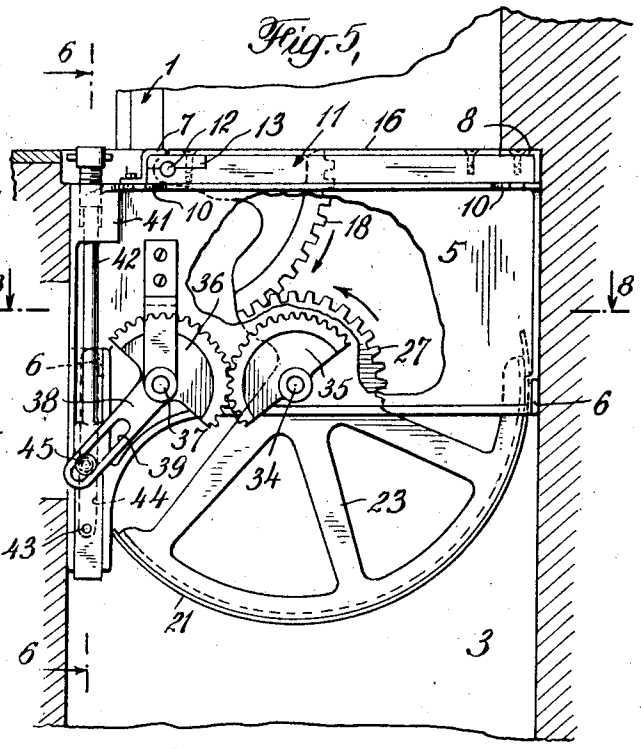



Fig. 7,

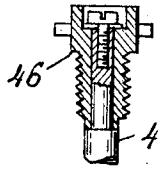
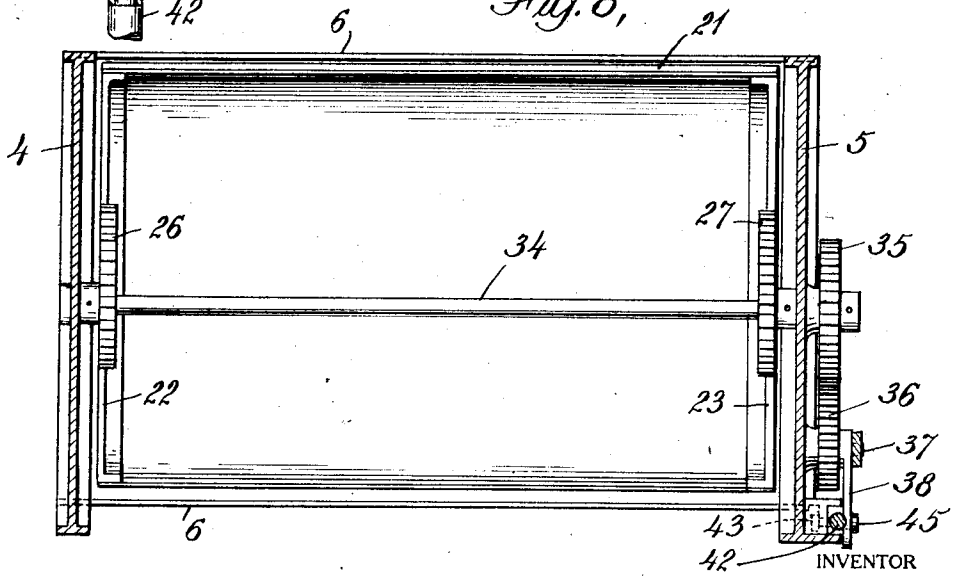



Fig. 8,




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# UNITED STATES PATENT OFFICE.

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## HEARTH.

Application filed April 23, 1927. Serial No. 185,946.

This invention relates to fireplaces and more particularly to a fireplace having a hinged hearth and an ash shaft therebeneath thru which ashes from the fireplace are dropped to the basement or cellar.

This application is related in many respects to my application Serial No. 147,209, filed November 9, 1926, in which I describe a hinged hearth and a vane cooperating therewith.

The present invention, briefly consists of a hinged hearth with which coacts, in cooperating relation, an arcuate vane located in parallel relation therewith. When the hearth is in its closed or horizontal position the vane resides beneath it. When the hearth is tilted the vane swings upwardly to close the space left by the tilting of the hearth and to prevent backdrafts from blowing ashes out into the room in which the fireplace, with which the hearth is used, is located. In the preferred embodiment, the coaction of the hearth and vane is made positive by gearing or otherwise; control mechanism is also provided, all of which will, together with the various objects of the invention, more fully appear from the description herewith.

In the drawings, in which like reference characters designate like parts,

Figure 1 is an end view of one embodiment of my invention mounted in a fireplace ash shaft which is shown in section, certain parts being broken away;

Figure 2 is a section thereof, taken at right angles, the hearth being in its closed position;

Figure 3 is a section thereof, taken at right angles, the hearth being in its open position;

Figure 4 is a section of the device, taken along the line 4—4 of Figure 2;

Figure 5 is an end view of a modified form of my invention (preferred in some respects), the hearth being in closed position;

Figures 6 and 7 are detail sections, taken upon line 6—6 of Figure 5, and

Figure 8 is a sectional plan view, taken along the line 8—8 of Figure 5.

My invention is adapted to be used with any type of fireplace used in the average home, such as that shown at 1 with the chimney 2. Beneath the fireplace is provided an ash shaft 3 in which my invention is mounted and thru which ashes from the fireplace are communicated to a receptacle in the basement or cellar.

Preferably, a frame is provided in which the various parts are mounted. This may consist of end supports or castings 4 and 5. Front and rear strips 6 and angle irons 7 and 8 position the end supports and secure them in spaced parallel relation, completing the frame. Shoulders 9 and ears 10 are provided upon the end supports 4 and 5 to assist in mounting the frame in the ash shaft.

In the upper portion of the frame is hinged, at its front edge, the hearth 11. I have shown the hearth 11 hinged by means of outwardly extending stub shafts 12, at each end thereof, extending into the end supports 4 and 5 which shafts are held in operative position by caps 13, altho it is obvious that the hearth 11 may be hinged to the frame by means of a hinge secured to the angle iron 7 instead of the shafts 12. The hearth 11 may be in one piece of cast or malleable iron or other metal or it may consist of an iron shell 14 lined with suitable ceramic 15. The upper edges of the end supports 4 and 5 are capped by strips 16 which permit of the cap 13 being placed and which also "level off" the top of the frame. To the hearth 11 and on the underside at each end thereof are mounted spur gear quadrants 17 and 18, for a purpose to be hereinafter described. These quadrants may be riveted, bolted or welded as desired, to the hearth.

The vane 21 is arcuate in cross section and in fact constitutes a longitudinal section of a cylinder. It is mounted in the frame upon its geometrical axis, so that the latter axis and that upon which the hearth swings are in parallel relation. This vane 21 is pivoted in the frame by means of supporting castings 22 and 23 to which it is secured and from which extend stub shafts 24 and 25 respectively. Each of these vane supporting castings 22 and 23 may also have secured thereto or integral therewith the spur gear quadrants 26 and 27 respectively, these quadrants being of the same size and tooth spacing as the quadrants 17 and 18. It will be obvious at this stage of the description that the teeth of the quadrants 17 and 26 mesh, that the teeth of the quadrants 18 and 27 mesh and that, in the pre-

ferred construction of my invention, the hearth 11 and vane 21 operate synchronously.

The stub shaft 25 may be longer than the shaft 24 and is of sufficient length to permit of the worm gear 27 being fixedly secured thereto. By means of bearings 28 and 29 upon the end support 5 is mounted a shaft 31 having a worm 32 thereon which meshes with worm gear 27. A crank 33 may be provided for turning the shaft 31, the crank having a socket fitting the irregular upper end of the shaft 31.

Thus it will be observed that I have mounted the hearth and the vane with their axes parallel and that as the hearth swings downward and the vane upward, the upper lip of the vane will contact with the upper face of the hearth near the front edge of the hearth on a line substantially parallel to that edge.

In the embodiment of my invention shown in Figures 5, 6, 7 and 8, which in some respects is the preferred embodiment, the essential parts of the invention are the same, the principal difference being in the means for operating the hearth and vane. In this embodiment the end support 5 is slightly altered to accommodate the plunger mechanism rather than the worm assembly previously described. I also provide a shaft 34 instead of the stub shafts 24 and 25. This shaft 34 is of a length approximately equal to the distance between the outer tips of the said stub shafts and constitutes the actual axis of the vane and the quadrants 26 and 27, all four of which are operatively in fixed relation with each other. The spur gear quadrant 35 is fixedly secured to the shaft 34 and has meshing therewith (as shown in Figure 5) the spur gear quadrant 36 which is mounted upon the end support 5 by a short shaft 27. Extending from the quadrant 36 is an arm 38 having a slot 39. In a hole in projection 41 upon end support 5 a plunger 42 is adapted to reciprocate. Upon the lower end of the plunger 42 is a pin 43 which rides in the slot 44 in the end support 5. Another pin 45 secured to plunger 42 rides in the slot 39 in arm 38. The upper end of the plunger 42 is provided with a rotatable cap 46, externally threaded to fit the threads in the hole in projection 41 so that the plunger 42 may be locked in its downward position by pressing downward and turning the cap 46. By means of a handle 47 the plunger 42 may be locked or reciprocated.

In either embodiment of my invention, the slope of the hearth in its most downward position depends upon the period in the downward swing of the hearth that the upper lip of the vane strikes the hearth. Thus when the vane is originally positioned upon its geometrical axis as shown in Figures 1 and 3, the hearth will reach a slightly steeper slope in its most downward position than it will when the vane is originally positioned (or has a slightly longer upper lip) as shown in Figure 5. In both cases the hearth reaches sufficient slope, in its most downward position, to permit of ashes to easily slide therefrom into the ash shaft 3. Furthermore a counterweight 48 for the vane may or may not be provided as found necessary or desirable. Also it is to be noted that it is preferable for the clearance between the vane and the frame to be as small as practical in order that back drafts, when the hearth is in its most downward position, shall be negligible. Furthermore quadrants 17 and 26 may be omitted if desired altho to retain them prevents torsion in the vane and hearth to some extent.

It will be observed that, preferably, my invention constitutes a unit which is manufactured and sold to home builders or owners for installations as a unit. With this in view I have provided means for mounting the unit in a fireplace ash shaft. I have provided ears 10 which may be used to fasten the unit in place by means of bolts anchored or set in the masonry. Lugs or other shoulders may also be provided.

While I have described my invention as a unit it, of course, may be constructed without being mounted in a frame. For instance the hearth may be hinged to the masonry (as described in my previous application) and the vane mounted directly in the ash shaft, control means of any suitable type being provided to operate the hearth and vane when thus mounted.

The operation of my device, as illustrated in the accompanying drawings, is as follows: Assuming that the unit is in place in the ash shaft and that the hearth is in its closed or horizontal position the vane 21 is actuated, in the first described embodiment of my invention, by rotating the worm 32 and thereby turning the worm gear 27 or, in the second described embodiment, by pulling the plunger 42 upwardly thereby lifting the arm 38 and rotating the quadrant 36 which in turn rotates the quadrant 35. Any movement imparted to the vane 21 is likewise imparted to the hearth 11 through the quadrants 17, 18, 26 and 27. Therefore as the vane swings upward the hearth swings downward until the upper lip or edge of the vane contacts with the face of the hearth near the front edge of the latter. The hearth can then move no farther because the movement of the hearth and vane are synchronized by the quadrants 17, 18, 26 and 27. The hearth having reached its predetermined slope, the ashes thereon slide therefrom into the ash shaft 3 and drop to the basement or cellar. Because the vane has closed the opening made by tilting the hearth, no back draft of any consequence can occur to blow the ashes out into the room in which the fireplace is located. The more rapid the action of the vane and hearth occurs, the less chance there is for any ashes to be blown out into the room and it may be

stated that speedier action of these elements is accomplished by the plunger mechanism than by the worm gearing.

To return the hearth and vane to their original positions the actuating mechanism is merely reversed. In the case of the plunger it can be locked in its downward position by turning the cap 46 as before described. In the case of the worm mechanism the threads may have sufficient lack of pitch to prevent the turning of the worm accidentally and counterweights may also be used to cause the vane to normally seek its downmost position.

The advantages of my invention will be obvious. It is simple to construct, simple to install and effective in accomplishing the purpose for which it is intended. Various changes may be made in its construction within the scope of the claims appended hereto and it is obvious that all reasonable equivalents are intended to be included therein.

I claim:

1. In combination, a hinged hearth and a vane, comprising a longitudinal section of a cylinder, pivoted at the geometrical axis of said cylinder, the last named axis and the axis of the hinge of said hearth being parallel, and means including gears upon said hearth and vane for moving them synchronously.

2. In combination, a hinged hearth and a vane, comprising a longitudinal section of a cylinder, pivoted at the geometrical axis of said cylinder, the last named axis and the axis of the hinge of said hearth being parallel, and the hearth and vane each having a gear secured thereto and meshing to synchronize the movements thereof.

3. In combination, end supports, a hearth pivoted at its edge to said end supports, a vane, comprising a longitudinal section of a cylinder, having its axis mounted in said end supports parallel to said hearth, a gear upon the hearth and upon the axis of the vane meshing to synchronize the movement of said hearth and vane, and means to control the movement of said hearth and vane.

4. In combination, end supports, a hearth pivoted at its edge to said end supports, a vane, comprising a longitudinal section of a cylinder, having its axis mounted in said end supports parallel to said hearth, a gear upon the hearth and upon the axis of the vane meshing to synchronize the movement of said hearth and vane, and means operable on said vane to control the movement of said hearth and vane.

5. In combination, end supports, a hearth pivoted at one edge to said end supports and having its other edge contacting with the inner face of a vane which comprises a longitudinal section of a cylinder which has its axis mounted in said end supports parallel to said hearth but non-inclusive of the pivots thereof, and means operable thru the said axis to synchronously control the movement of said hearth and vane.

6. In combination, end supports, a hearth pivoted at one edge to said end supports and having its other edge contacting with the inner face of a vane which comprises a longitudinal section of a cylinder which has its axis mounted in said end supports parallel to said hearth but non-inclusive of the pivots thereof, means to synchronize the movement of said hearth and vane and means to control the movement thereof.

7. In combination, a frame adapted to be mounted in a fireplace ash shaft, a hearth hinged to said frame, a vane, comprising a longitudinal section of a cylinder, mounted upon its axis in said frame in cooperative relation with said hearth, a gear secured to the hearth and a gear mounted upon the axis of the vane meshing to synchronize the movement of said hearth and vane, and means to control the movement of said hearth and vane.

8. In combination, a frame adapted to be mounted in a fireplace ash shaft, a hearth hinged to said frame, a vane, comprising a longitudinal section of a cylinder, mounted upon its axis in said frame in cooperative relation with said hearth, a gear secured to the hearth and a gear mounted upon the axis of the vane meshing to synchronize the movement of said hearth and vane, and means operable on said vane to control the movement of said hearth and vane.

9. In combination, a frame adapted to be mounted in a fireplace ash shaft, a hearth hinged to said frame, a vane, comprising a longitudinal section of a cylinder, mounted upon its axis in said frame in cooperative relation with said hearth, means to synchronize the movement of said hearth and vane and means to control the movement thereof.

10. In combination, a frame adapted to be mounted in a fireplace ash shaft, a hearth hinged to said frame, a vane, comprising a longitudinal section of a cylinder, mounted upon its axis in said frame in cooperative relation with said hearth, means operable thru the said axis to synchronously control the movement of said hearth and vane.

11. In combination, a frame adapted to be mounted in a fireplace ash shaft, a hearth hinged to said frame, a vane, comprising a longitudinal section of a cylinder, mounted upon its axis in said frame in cooperative relation with said hearth, a set of meshing gears, one secured to the hearth and the other mounted upon the axis of the vane, another set of meshing gears, one mounted upon the axis of the vane and the other journalled upon said frame, and means for actuating said last named gear.

12. In combination, a frame adapted to be mounted in a fireplace ash shaft, a hearth

hinged to said frame, a vane, comprising a longitudinal section of a cylinder, mounted upon its axis in said frame in cooperative relation with said hearth, a set of meshing gears, one secured to the hearth and the other mounted upon the axis of the vane, another set of meshing gears, one mounted upon the axis of the vane and the other journalled upon said frame, an arm secured to said last named gear, and a reciprocal plunger connected to said arm.

In testimony whereof I affix my signature.

WALTER F. SPARROW.