No. 774,397. PATENTED NOV. 8, 1904.

J. W. PIPER.

GRATE FOR STOVES OR FURNACES.

APPLICATION FILED AUG. 1, 1903.

NO MODEL.

Fig. 1

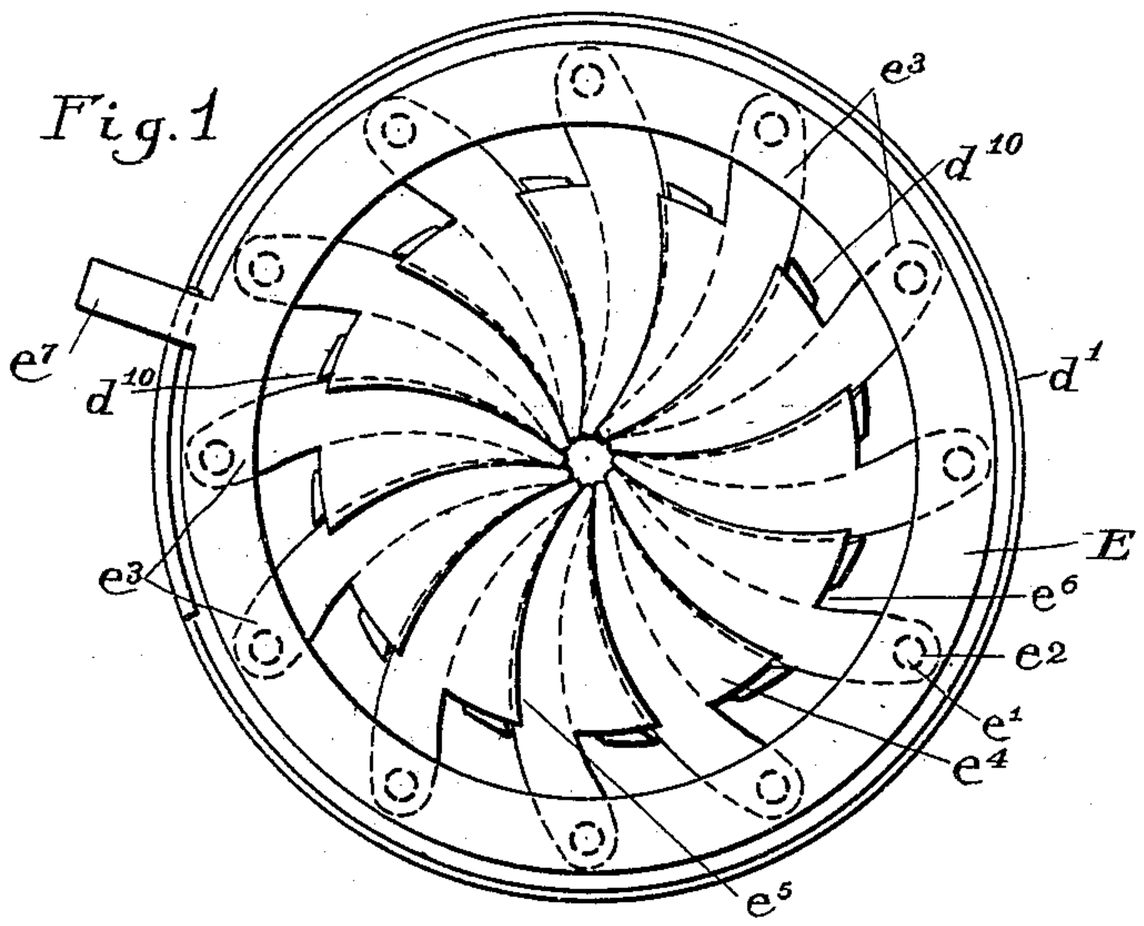

Fig. 2

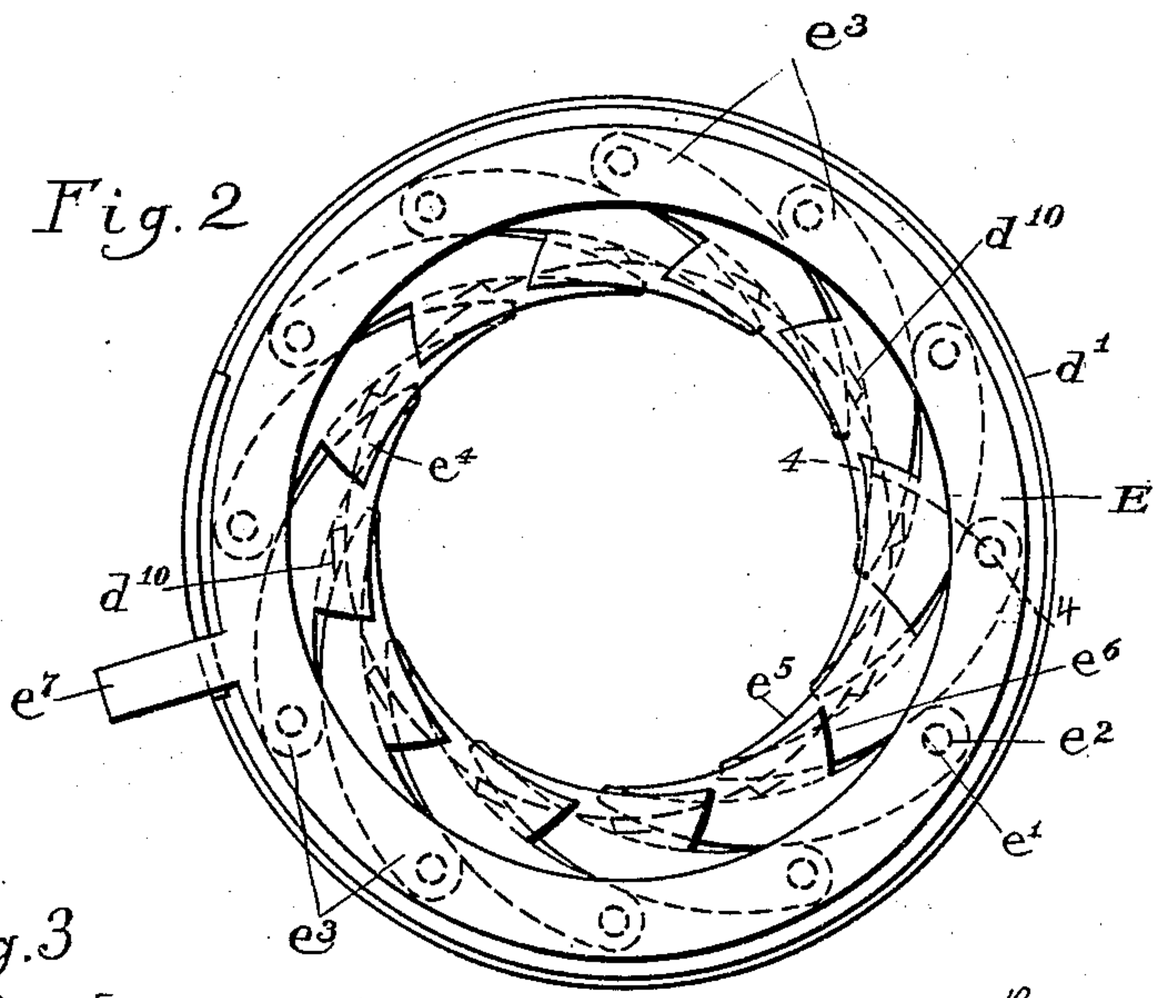

Fig. 3

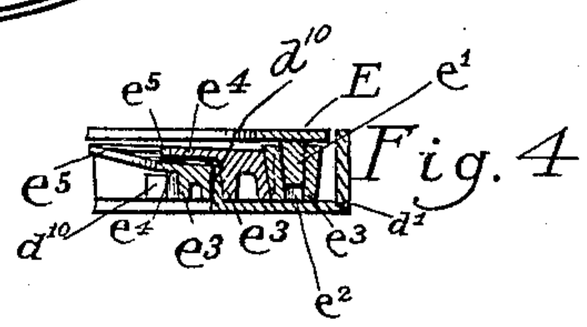

Fig. 4

WITNESSES.

Anna T. Halloran.
William M. Hannaford

INVENTOR

Joseph W. Piper,
By Albert M. Moore,
His ATTORNEY.

No. 774,397. Patented November 8, 1904.

UNITED STATES PATENT OFFICE.

JOSEPH W. PIPER, OF LOWELL, MASSACHUSETTS.

GRATE FOR STOVES OR FURNACES.

SPECIFICATION forming part of Letters Patent No. 774,397, dated November 8, 1904.

Application filed August 1, 1903. Serial No. 167,865. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. PIPER, a citizen of the United States, residing in Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Grates for Stoves or Furnaces, of which the following is a specification.

This invention relates to grates for stoves and furnaces, having especial reference to that variety of stoves and furnaces in which the grate comprises a ring with grate-bars pivoted thereto and extending when in use toward the center of the ring to support a mass of fuel, but capable of being swung away from the center of said ring to discharge ashes and clinkers. Such grates are shown and described in United States Letters Patent No. 629,719, granted July 25, 1899, and No. 718,998, granted January 27, 1903. In each of these patented devices two grates are used, one arranged above the other, the lower grate in each case being intended normally to support the mass of fuel, and means are provided to extend the upper grate-bars into the fuel to support the upper part of the same while the lower grate-bars are withdrawn to allow the ashes and clinkers which may be below the upper grate to be discharged into the ash-pit, the grate-bars of the two grates in the former patented device operating independently or successively and in the latter device operating simultaneously, but in both cases in opposite directions, to discharge the ashes and clinkers and subsequently to restore the grates to normal position. The grate-bars in these devices are tapering from their pivots and curved and leave considerable spaces through which fine fuel may fall.

The object of this invention is to prevent waste of such fuel as is originally very fine and does not cake together in burning or of such fuel as breaks or bursts into very small pieces in the fire or which consumes to ashes on the outside, leaving a constantly-diminishing core, which is liable to fall through the grate before it is very nearly consumed. This object I accomplish by providing the grate-bars the bodies of which are of the shape substantially of the grate-bars shown in the patents referred to—that is, of the shape of curved tapering fingers, with lateral extensions or wings on the concave sides of the fingers, these wings being arranged and adapted to overlap slightly at their free or unattached edges the bodies of the adjacent grate-bars, so that when the grate-bars are in their fuel-supporting position they together form a sufficiently continuous surface to prevent the escape of small fuel between the bars without fitting so closely as to prevent the admission of air.

This invention consists in the combinations hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a plan of my improved grate with the grate-bars in operative position; Fig. 2, a plan of the same with the bars out of operative position; Fig. 3, a plan of the bottom of a single grate-bar; Fig. 4, a section of three grate-bars on the line 4 4 in Fig. 2.

The stationary housing d' (except as hereinafter noted) and movable grate-ring E are substantially as shown in either of said patents, said housing corresponding to the lower housing ring or section of said patents and being an annular tray provided at equal intervals in its inner wall with openings, the parts of said inner wall remaining between said openings forming vertical abutments d^{10}. The grate-ring E is arranged in the annular space of said housing and is provided at intervals with pins e', which project vertically downward therefrom and enter holes e^2 in grate-bars e^3 and serve as pivots for said bars. The body of each grate-bar projects from the grate-ring between two abutments d^{10}, so that when the grate-ring is turned in said housing, as it may be by a handle e^7 rigidly secured to said grate-ring, the bodies of the grate-bars will strike said abutments and swing the free ends of said grate-bars toward or away from the center of the housing and grate-ring, according to the direction in which said ring is turned.

The bodies of the grate-bars e^3 are or may be of the shape shown in said patents; but each bar is provided with a wing e^4, which extends from the top of the concave side of the body of the bar far enough to overlap the con-

vex side of the next bar when the bars are in the operative position, (shown in Fig. 1,) the wing being inclined upward from the body sufficiently to ride freely above the convex side of the next bar. Each convex or broad end e^6 of the wing nearest the housing is curved to be parallel with the inner wall of said housing, and the concave side e^5 of said wing is nearly parallel with and overlaps the convex side of the next grate-bar when the bars and wings are in the operative position, (shown in Fig. 1,) and said end e^6 may at this time be directly over the inner wall of the housing or may be farther from the center of said housing than said inner wall. The abutments d^{10} act only on the body or bar proper and are short enough to allow the wings to pass freely over them when the bars are retracted into the position shown in Fig. 2.

I claim as my invention—

1. The combination of a grate, consisting of a grate-ring and a series of grate-bars having laterally-curved tapering bodies, pivoted at their larger ends at equal intervals on said ring, each of said bars being provided on its concave side with a wing adapted to overlap the next bar, to prevent the escape of fine fuel between adjacent bars when the same are in operative position, and means for swinging said bars simultaneously toward or away from the center of said ring.

2. The combination of an annular housing having abutments arranged at equal intervals in the inner wall of said housing, and a grate, consisting of a grate-ring arranged in said housing and a series of grate-bars, arranged in the intervals between said abutments and having laterally-curved tapering bodies and pivoted at their larger ends on said ring, each of said bars being provided on its concave side between the corresponding abutment and the free end of said bar, with a wing adapted to overlap the next grate-bar, to prevent the escape of fine fuel between adjacent grate-bars.

3. The combination of an annular housing having abutments arranged at equal intervals in the inner wall of said housing, and a grate consisting of a grate-ring arranged in said housing and a series of grate-bars, arranged in the intervals between said abutments and having laterally-curved tapering bodies, pivoted at their larger ends on said ring, each of said bars being provided on its concave side with a wing extending from the top of the body of the bar and higher than the top of the adjacent abutment and adapted to ride over the same.

In testimony whereof I have affixed my signature in presence of two witnesses.

JOSEPH W. PIPER.

Witnesses:

ALBERT M. MOORE,

LEWIS F. LONGMORE.