Jan. 2, 1923. 1,440,757.

W. R. WOOD ET AL.

ASH REMOVAL DEVICE FOR FURNACES.

FILED NOV. 10, 1919. 3 SHEETS—SHEET 1.

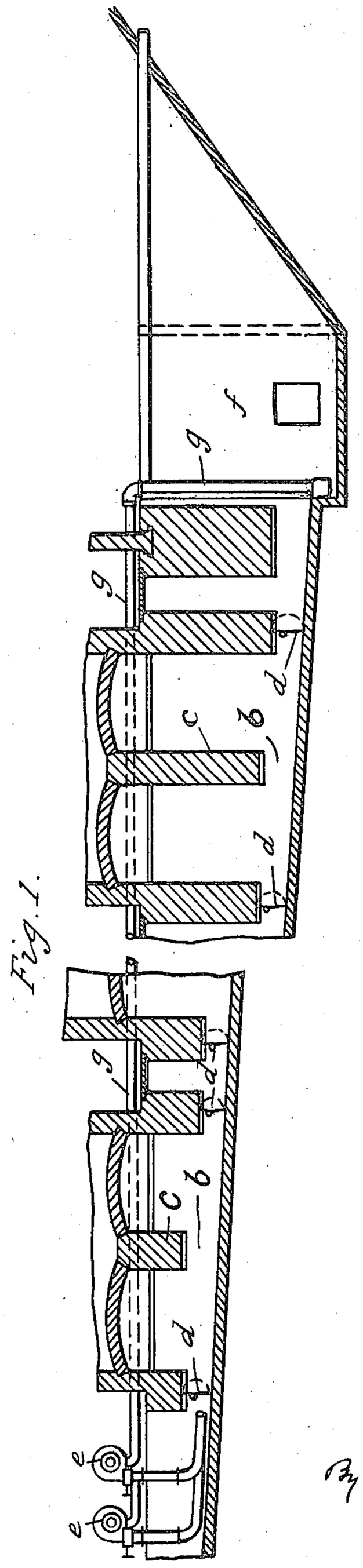

Fig. 1.

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Fig. 2.

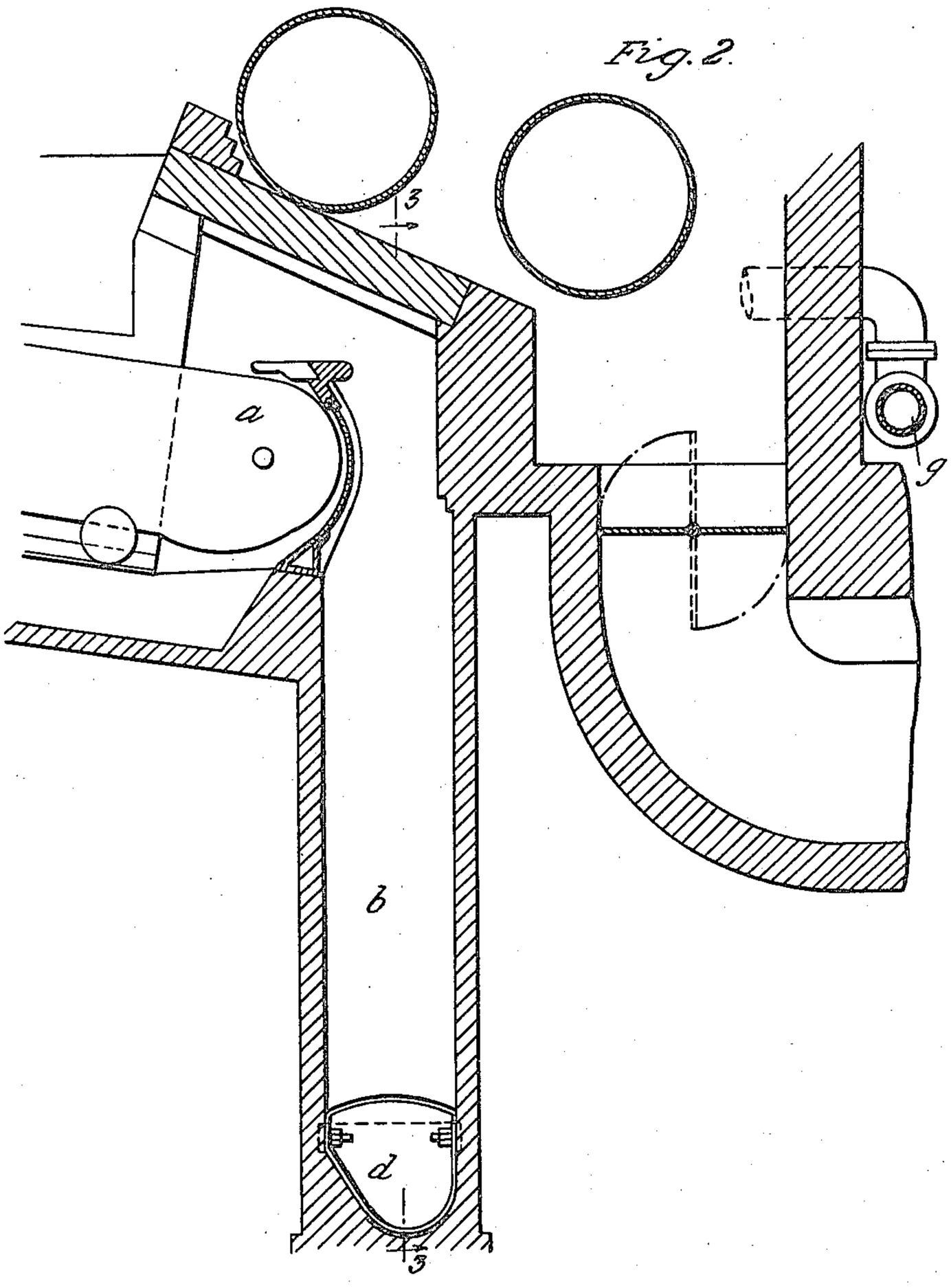

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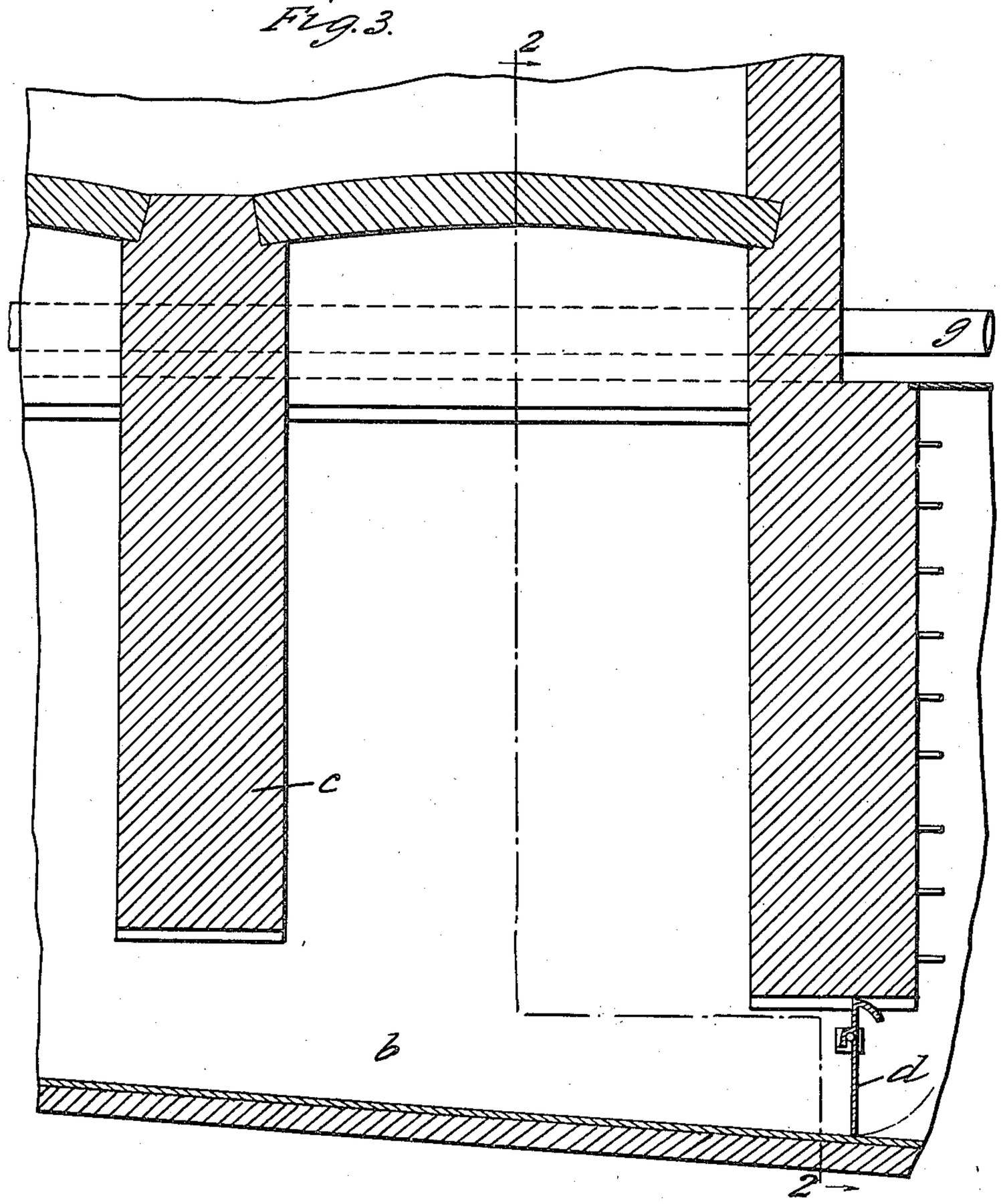
Fig. 3.



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UNITED STATES PATENT OFFICE.

WILFRED R. WOOD AND ERNEST W. ROBEY, OF LONDON, ENGLAND, ASSIGNORS TO UNDERFEED STOKER COMPANY LIMITED, OF LONDON, ENGLAND.

ASH-REMOVAL DEVICE FOR FURNACES.

Application filed November 10, 1919. Serial No. 337,063.

To all whom it may concern:

Be it known that we, WILFRED ROTHERY WOOD, a citizen of the United States of America, and ERNEST WILLIAM ROBEY, a subject of the King of Great Britain, both residing in London, England, have jointly invented certain new and useful Improvements in Ash-Removal Devices for Furnaces, of which the following is a specification.

A method of removing ashes and clinkers from a furnace fitted with a mechanical stoker which delivers the ashes and clinkers continuously, consists in constructing as a part of the furnace structure a trough extending transversely to the furnace grate to the rear thereof, so that the ashes and clinker are delivered into the trough where they are carried away by a stream of water flowing down the trough. In order to prevent air gaining access to the grate by way of this trough a hinged plate has been provided which normally is held as an inclined plane over the trough. The ashes pile themselves on this plate and are only intermittently dumped into the trough when the plate is liberated so that it can swing more or less into the trough. In this arrangement the dumping of ashes being intermittent, the stream of water required to remove them is comparatively copious; furthermore the attendant has to perform some operation to dump the ashes.

It is the object of the present invention to provide for the continuous and automatic removal of the ashes, and to this end to prevent access of air to the grate by way of the trough, by an automatically operating valve which does not interfere with the continuous dumping of the ashes and clinker.

For this purpose the aforesaid transverse trough has, at those parts of it where passage of elastic fluid is to be checked or prevented, transverse doors or valves adapted to be opened by the stream of water flowing down the trough substantially without permitting passage of elastic fluid. In these circumstances the water removes the ashes and clinker with inconsiderable consumption of power.

In the accompanying drawings which are partly diagrammatic, Fig. 1 is a longitudinal section through a trough for the purpose of this invention, serving a number of boiler furnaces having travelling grates. Fig. 2 is a cross section through the trough on line 2—2 of Fig. 3, looking in the direction of the arrows, drawn to an enlarged scale, and showing the position of a grate relatively to the trough. Fig. 3 is a section on line 3—3 of Fig. 2 looking in the direction of the arrows.

The ashes and clinker are delivered from each grate *a* into the trough *b* which is built as part of the furnace structure as indicated in Fig. 2 and has an inclined bottom as shown in Figs. 1 and 3. The transverse walls *c* of the furnace setting cross the trough at a sufficient height from the bottom thereof to permit ready passage of water, ashes and clinker. Beneath those transverse walls which divide the setting of one furnace from that of another, are hinged to the sides of the trough plates *d*, which are substantially in contact with the bottom of the walls at their upper edges and extend close to the bottom of the trough at their lower edges; they are hung above their center of gravity so that they close by their own weight and are of a shape to fill the cross section of the trough and have arc-shaped flanges at their upper parts so that when turning on their hinges they still substantially close the passage along the trough at its upper part.

Water delivered by pumps *e* flows down the trough washing the ashes and clinkers past the plates *d* into the sump *f*. The suction pipe *g* of the pumps opens through a suitable strainer in this sump, so that the water may be used continuously.

Having thus described the nature of the said invention and the best means we know of carrying the same into practical effect, we claim:—

1. In a furnace setting in combination, a closed ash pit, an inclined trough forming the lower portion of the pit, and a transverse door at one end of the trough for permitting the removal of ashes and for excluding air, said door being adapted to be closed by gravity and to be opened by a stream of water flowing down the trough.

2. In a furnace setting in combination, a closed ash-pit, an inclined trough forming the lower portion of the pit, and a transverse door pivoted above its center of gravity at one end of the trough, said door being adapted to be opened by a stream of water flowing down the trough and having an arcuate

flange at its upper edge adapted to contact with the wall of the setting and thus prevent the passage of air thru the trough when the door is opened.

3. In a furnace setting in combination, an ash-pit, an open-ended trough having an inclined bottom extending through the ash-pit and affording a passage for water through the ash-pit, and transverse doors in the said trough at the places where it enters and leaves the ash-pit, the said doors being arranged to exclude air from the ash pit and adapted to be opened by the water flowing down the trough.

4. In a furnace setting in combination, an ash-pit, an open-ended trough having an inclined bottom extending through the ash-pit and affording a passage for water through the ash-pit, transverse doors in the said trough at the places where it enters and leaves the ash-pit, the said doors being arranged to exclude air from the ash pit and adapted to be opened by the water flowing down the trough, a sump at the lower end of the said inclined bottom and means for lifting water from the said sump and delivering it at the upper end of the said inclined bottom.

5. A furnace setting comprising a number of grates, a trough built as a part of the setting below the grates, means for delivering the ashes from each grate into the said trough, transverse walls extending between adjacent grates nearly to the bottom of the trough, plates hinged to the sides of the trough transversely and of substantially the same width as the trough, each plate being placed immediately below a transverse wall and extending from the lower edge thereof to the bottom of the trough and adapted to be closed by gravity, and having an arc-shaped flange at the upper part thereof such that when the plate swings on its hinges it remains in contact with the lower edge of the wall.

In testimony whereof we have signed our names to this specification.

WILFRED R. WOOD.
E. W. ROBEY.

Witnesses:
A. E. HARRISON,
H. COTTAUL.