W. H. WILSON.

RADIAL DOOR.

APPLICATION FILED DEC. 29, 1908.

929,265.

Patented July 27, 1909.

2 SHEETS—SHEET 1.

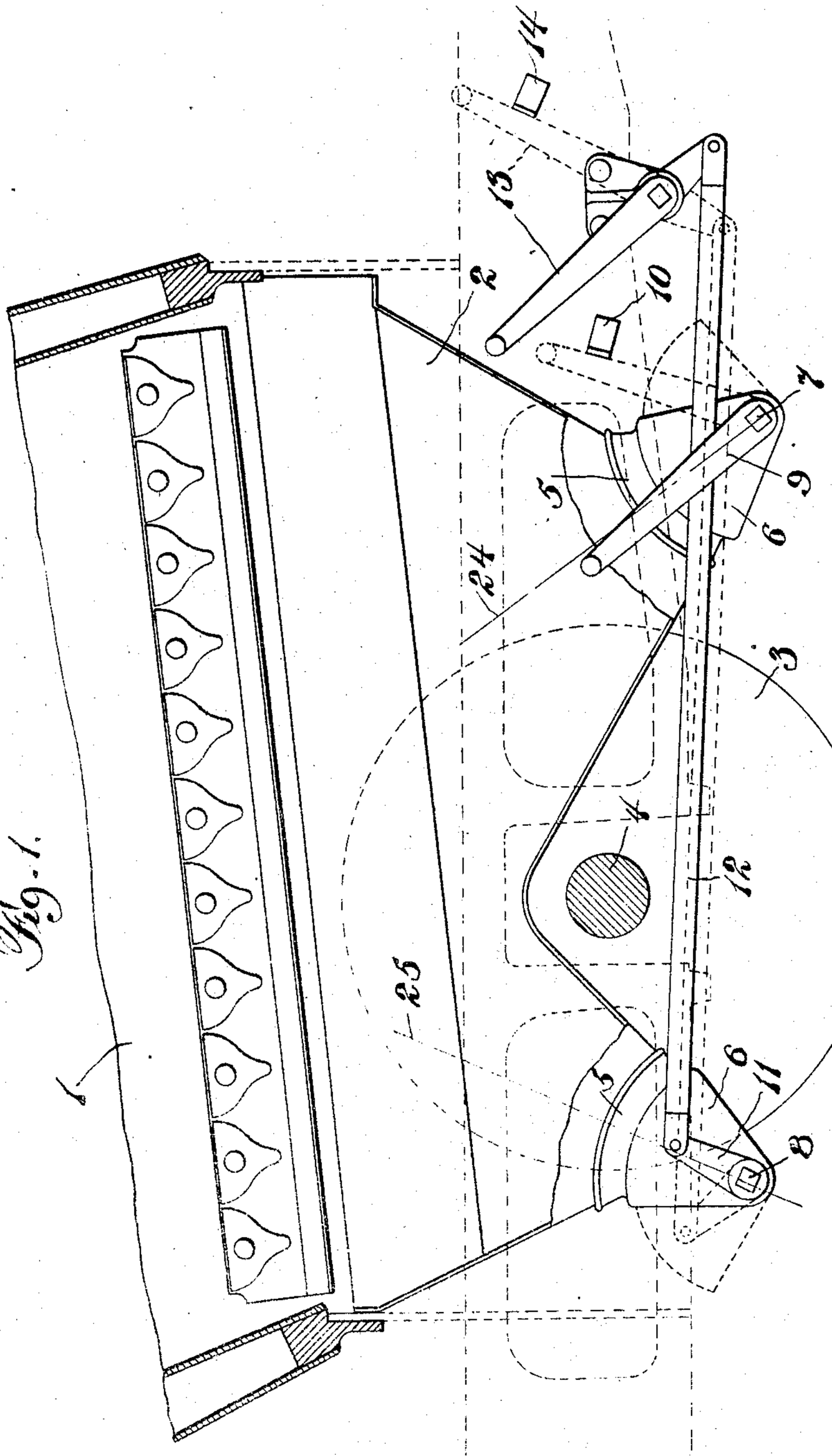

Fig. 1.

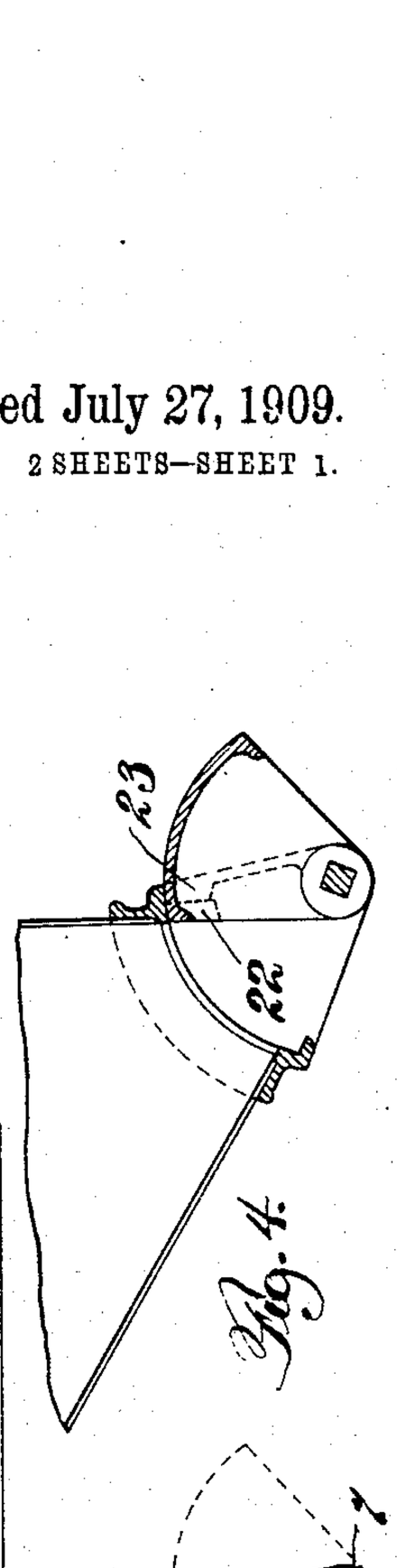

Fig. 4.

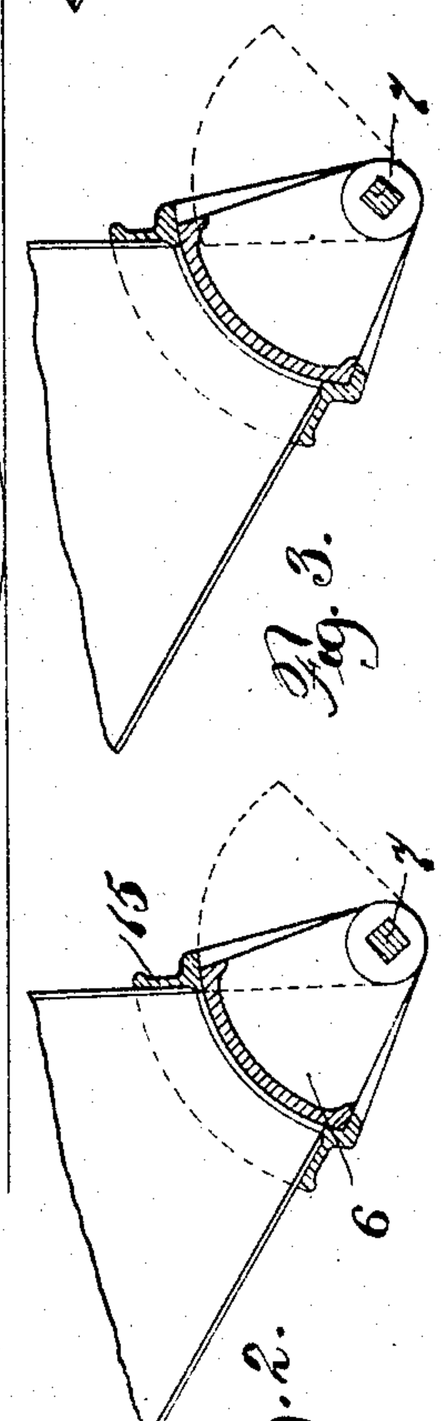

Fig. 3.

Fig. 2.

WITNESSES

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2 SHEETS—SHEET 2.

Fig. 5.

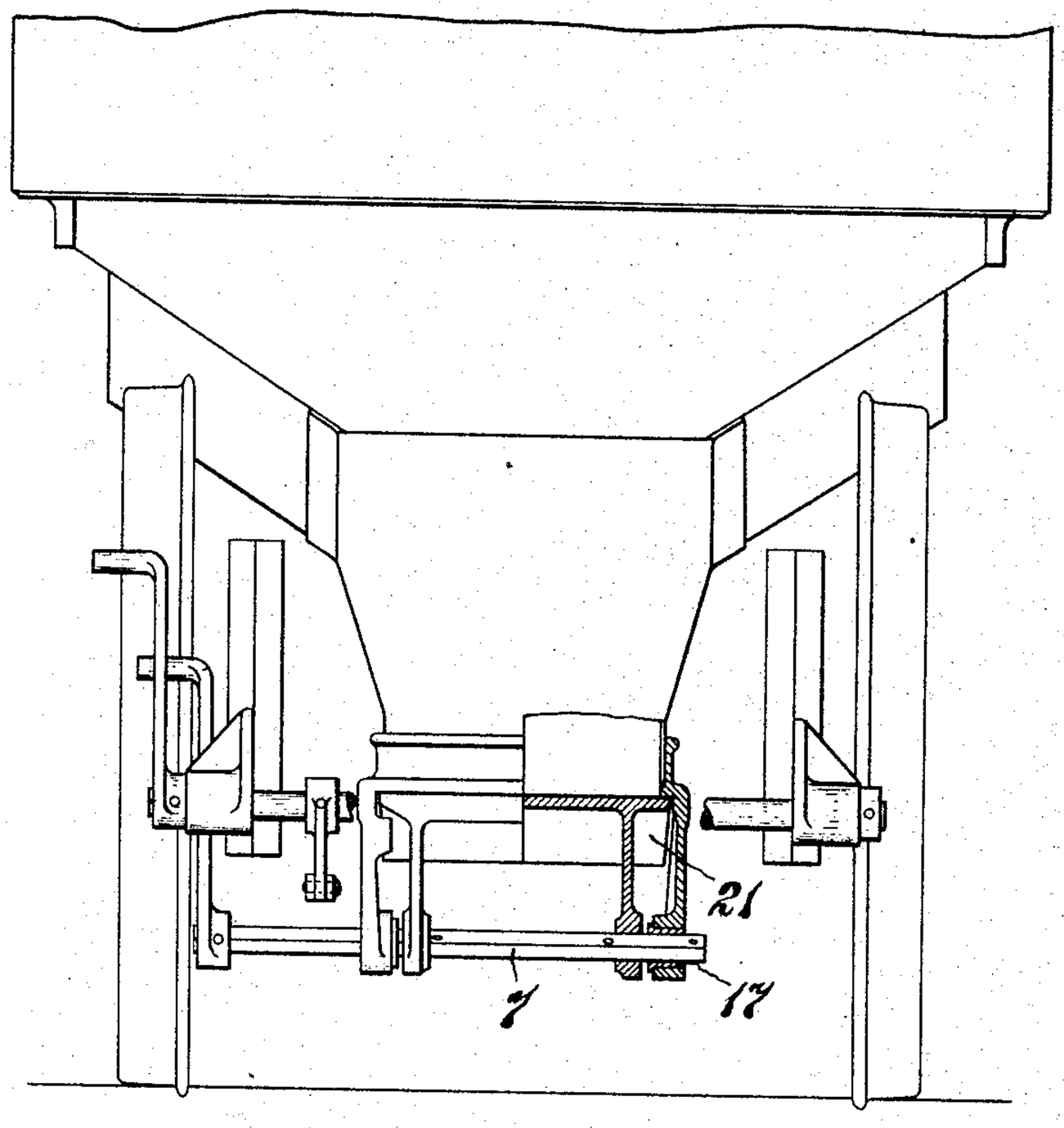

Fig. 6.

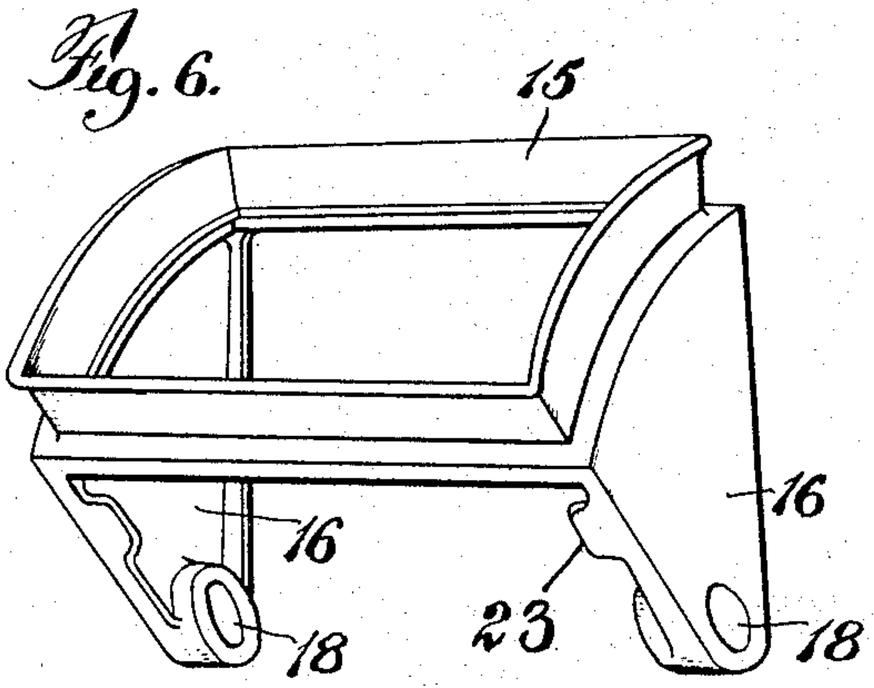

Fig. 7.

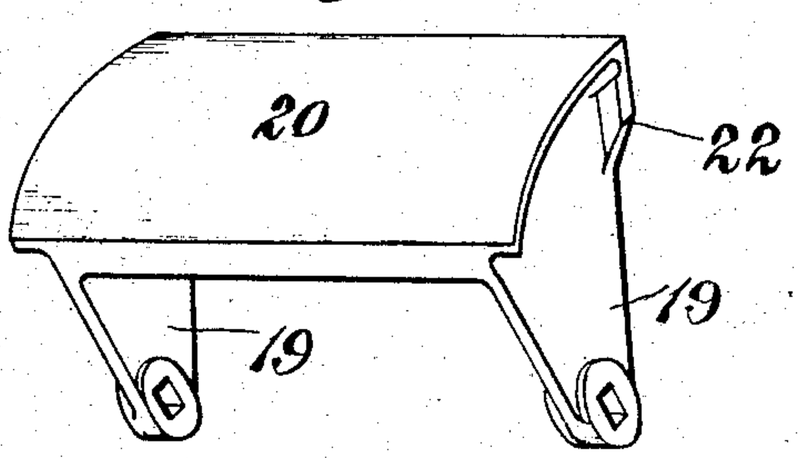

Fig. 8.

WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM H. WILSON, OF DUBOIS, PENNSYLVANIA.

RADIAL DOOR.

No. 929,265. Specification of Letters Patent. Patented July 27, 1909.

Application filed December 29, 1908. Serial No. 469,832.

To all whom it may concern:

Be it known that I, WILLIAM H. WILSON, a citizen of the United States, residing at Dubois, in the county of Clearfield and State of Pennsylvania, have invented certain new and useful Improvements in Radial Doors, of which the following is a specification.

My invention relates to radial doors, and particularly to doors suitable for use in connection with locomotive ash pans.

As heretofore constructed doors for use in this relation have either been of the sliding type or of the swinging type hinged at the upper edge and held by a latching device. Both of these prior constructions have been found objectionable in certain respects; the sliding doors because of the difficulty of operation and because of the clogging by ice and snow in winter, and the swinging type by reason of the liability of the latching device to be improperly secured or fail, and accidentally dump the pan, from which serious damage from fire may result in case the dumping occurs upon a bridge, viaduct or at some exposed location.

The objects of this invention are; to provide a door free from the above enumerated objections incident to prior constructions; to provide a door which will be maintained by gravity in either open or closed position; to provide a door of strong rigid construction wherein a tight closure is insured; to provide a radial door having improved means whereby it is securely centered with respect to its frame and seat; to provide a radial door having improved journaling means; and to provide a door mechanism which may be actuated without the necessity of the operator going beneath the engine.

Certain embodiments of the invention are illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of the lower portion of a locomotive, and shows the application of the improved radial door to the ash pan;

Figures 2 and 3 are sectional views through two forms of doors and their frames, the dotted lines indicating the positions of the doors when in open positions,

Figure 4 is a detail sectional view through still another form of door and its framing, the door being shown in open position,

Figure 5 is a front elevation of the lower portion of a locomotive, with the improved door applied thereto, one half of the door and its framing being broken away to more clearly indicate the construction, and

Figures 6, 7, and 8, are perspective views on an enlarged scale respectively of the door framing, the door itself, and one of the bushings employed in the door frame hangers.

Referring first to the general arrangement of parts as shown in Figures 1 and 5, 1 is the locomotive fire-box; 2 is the ashpan located beneath the fire-box; 3, 3, are the drivers carried by the axle 4; 5, 5, are the door framings at opposite ends of the ashpan 2; 6, 6, are the radial swinging doors for closing the openings in the door framings; 7 and 8 are the shafts upon which the radial doors 6, 6 are mounted; 9 is a handle by means of which the rear door 6 may be swung to the open position indicated in dotted lines in Figure 1; 10 is a stop for limiting the movement of the handle 9; 11 is a crank secured to the shaft 8 for operating the front door 6; 12 and 13 are respectively the connecting rod and handle by means of which the crank 11 is operated; and 14 is a stop for limiting the movement of the handle 13 when the door reaches the position indicated in dotted lines.

The construction of the door framing and radial door in which the invention particularly resides, will now be described in detail. By reference to Figures 2 and 6 it will be noted that the door framing 5 is provided with a flange 15 and with downwardly projecting hangers 16—16. The flange 15 fits outside the converging sides of the ashpan, and is held rigidly in position, preferably by rivets. The hangers serve to support the rod or shaft 7, which shaft carries at its ends bushings 17 (Figures 5 and 8) which bushings are rotatable in the openings 18 in the ends of the hangers 16. The door is secured upon the shaft 7 by means of the hangers 19—19 (Fig. 7), and in the form of construction as indicated in Figure 2, the bearing face 20 of the door is curved concentric with the center of the axis 7, to fit the curved surface of the door frame. The side edges 21 of the door (Fig. 5) are preferably slightly tapered, and the side edges of the door frame are also tapered to correspond, so that a tight fit is secured when the door reaches its closed position, and a greater clearance is secured at the edges of the door when in its forward position than would be the case if the opposite edges of the door were paral-

lel. If desired, the curvature of the seating face of the door and the corresponding face of the door frame may be made concentric with respect to the shaft 7, instead of concentric therewith, which arrangement is illustrated in Figure 3. This arrangement provides for a tighter fit, and more clearance as the door opens. Instead of stopping the opening movement of the door by means of the stops 10 and 14 which engage the handles 9 and 13, the door may be more directly stopped, if desired, by providing a stop 22 on the door itself, as indicated in Figure 4, which stop takes against a lug 23 on the door framing.

The mechanical advantages incident to the construction will be apparent from the foregoing. It will be seen from Figure 1 that the shafts 7 and 8 which support the radial doors 6—6 lie upon the center lines 24 and 25, midway between the converging sides of the ashpan, so that the pressure applied upon the curved surfaces of the doors by the contents of the ashpan has no tendency to open them, and as the center of gravity of the doors 6—6 lie to one side of the vertical planes in which the shafts 7 and 8 lie, the doors are securely held shut by gravity, without the necessity of another holding means. When the door is swung into the position indicated in dotted lines in Figure 1, and in full lines in Figure 4, the center of gravity of the door is shifted to the other side of the vertical plane in which the axis 7 lies, and the door is maintained in open position by gravity. The door is thus made more convenient of operation and is of simpler construction than those doors wherein fastening means must be provided for maintaining the door in its various positions. Another feature of advantage resides in the fact that the door framing by reason of its hangers 16—16 constitues a means of support for the door, thus insuring a proper fit between the face of the door frame and that of the door, even though the door framing should be somewhat shifted out of its normal position. The fitting of the door to the door frame may also be more readily and easily done than would be the case if the door framing and door had to be applied separately to the ashpan, and the fitting accomplished during such application. By the use of the squared shaft 7 and its bushings 17, the necessity of keying any of the parts is done away with. The arrangement also permits of the use of a shaft 7 of uniform cross section from end to end, and the ease with which the parts may be assembled is promoted.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent, is the following:

1. The combination with a door frame having a curved seating face and tapering side edges, of a pivoted door provided with a curved face for fitting the seating face and having tapered side edges adapted to fit between the side edges of the door frame, the pivot point of the door being so located with respect to the seating face and the center of gravity of the door that the door is held by gravity both in its closed and in its open position.

2. The combination with a receptacle provided with an opening, of a one-piece door frame secured in the opening having a curved seating face and projecting hangers, and a swinging door pivoted in the hangers and provided with a curved face for fitting the seating face.

3. The combination with a receptacle provided with an opening, of a one-piece door frame secured in the opening having a curved seating face and integral projecting hangers, and a swinging door pivoted in the hangers and provided with a curved face for fitting the seating face.

4. The combination with a receptacle having converging sides and an opening at the point of convergence of the sides, of a door framing comprising a casting with a flange fitting the opening and secured to the sides of the receptacle and provided with a curved seating face and projecting hangers, and a swinging door pivoted in the hangers and provided with a curved face for fitting the seating face.

5. The combination with a locomotive ash pan having converging sides with the center line therebetween inclined to the horizontal and having an opening at the point of convergence of the sides, of a curved seating face at the edges of the opening with its center of curvature lying approximately upon the said center line, a swinging door with its center line also approximately upon such center line and provided with a curved face adapted to fit the seating face, and means for stopping the opening movement of the door when its center line passes the vertical plane in which its axis is located.

6. The combination with a casing provided with an opening, of a one-piece door frame casting provided with a flange 15 fitting the casing around the opening and with hangers 16, and a swinging radial door 6 provided with hangers 19, and means whereby the hangers 19 are pivotally supported upon the hangers 16.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

WILLIAM H. WILSON.

Witnesses:
C. L. WARNER,
R. J. MATTHEWS.

Correction in Letters Patent No. 929,265.

It is hereby certified that in Letters Patent No. 929,265, granted July 27, 1909, upon the application of William H. Wilson, of Dubois, Pennsylvania, for an improvement in "Radial Doors," an error appears in the printed specification requiring correction, as follows: In line 3, page 2, the word "concentric" should read *eccentric;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 24th day of August, A. D., 1909.

[SEAL.]

F. A. TENNANT,

Acting Commissioner of Patents.