J. J. ALLEY.

COKE OVEN DOOR.

APPLICATION FILED JULY 3, 1909.

950,422.

Patented Feb. 22, 1910.

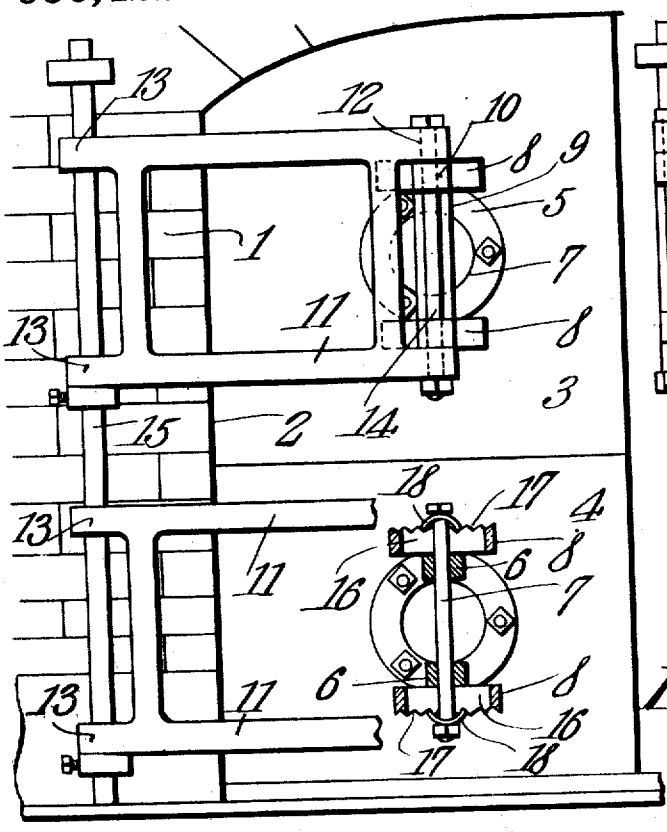

Fig. 1.

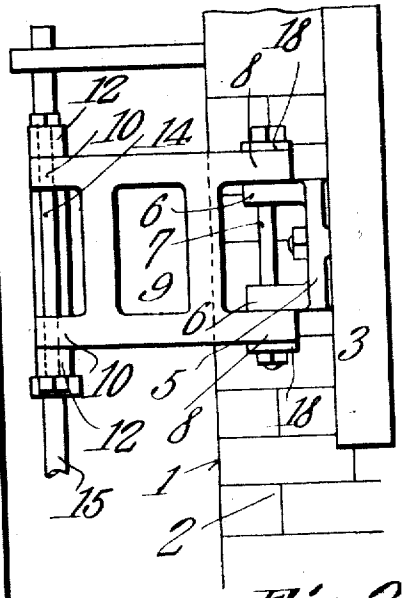

Fig. 2.

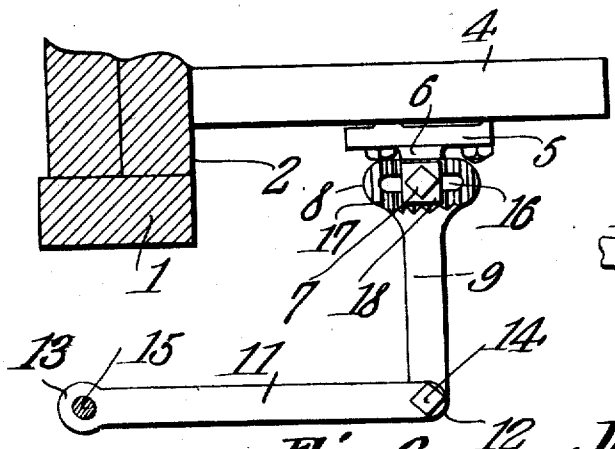

Fig. 3.

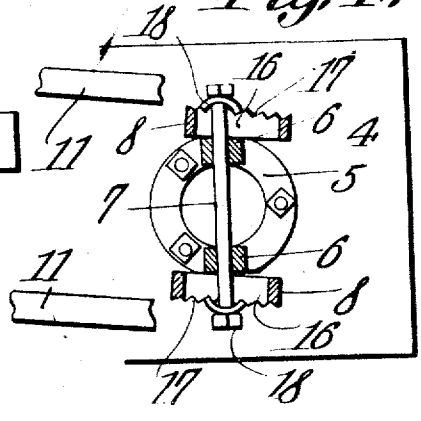

Fig. 4.

Witnesses

E. F. Clement

F. T. Chapman

Inventor

John J. Alley.

By C. A. Snow & Co.

Attorneys

UNITED STATES PATENT OFFICE.

JOHN J. ALLEY, OF BRISTOL CITY, VIRGINIA.

COKE-OVEN DOOR.

950,422. Specification of Letters Patent. Patented Feb. 22, 1910.

Application filed July 3, 1909. Serial No. 505,902.

To all whom it may concern:

Be it known that I, JOHN J. ALLEY, a citizen of the United States, residing at Bristol City, in the State of Virginia, have invented a new and useful Coke-Oven Door, of which the following is a specification.

This invention has reference to improvements in coke oven doors, although the door forming the subject matter of the present invention may be used for furnaces, kilns, and in other places where the heat generated is great.

The present invention is an improvement over the coke oven door shown and described in Letters Patent No. 882,365 granted to me on March 17, 1908.

The present invention relates more particularly to the hinge structure and manner of hanging the door, and that portion of the door subjected to the heat of the furnace may be constructed in a manner similar to that described in the said Letters Patent.

In accordance with the present invention provision is made for counteracting warping of the door or change in shape of the coke oven opening or displacement of the hinges, so that the door may be brought into proper engagement with the coke oven opening, and since it is customary to use a number of doors for each opening, the arrangement is such that the doors may be made to fit closely and so properly close the opening irrespective of lack of proper alinement of the supports initially or because of warping or other causes affecting the hanging of the door at a later time.

The invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawings forming a part of this specification in which drawings—

Figure 1 is an elevation partly in section of a portion of a coke oven opening showing two doors in place therein. Fig. 2 is edge view of one of the doors in place in the coke oven opening. Fig. 3 is a plan view of one of the doors in place in the coke oven opening with the hinge rod shown in section. Fig. 4 is a view showing the adaptability of the hinge or hanger structure for compensating for want of proper alinement of the parts.

Referring to the drawings, there is shown a small portion of a coke oven 1 which may be taken as typical of any suitable coke oven and there is also shown a portion of an opening 2 leading to the interior of the oven. In such ovens it is customary to provide two sets of doors one above the other, the doors of one set opening to one side of the opening 2 and the doors of the other set opening to the other side of the opening 2. In the drawings there is shown an upper door 3 and a lower door 4, it being understood that two like doors are employed to complete the closure for the coke oven opening 2.

The structure of the doors does not in itself enter into the present invention and the said doors may therefore be considered as being made in the manner set forth in the aforesaid Letters Patent.

The door has secured thereto a ring 5 by bolts or other means embedded in the material of the door so as to be protected from the heat of the interior of the furnace and this ring 5 is spaced away from the door by legs, as shown, to form an air space between the ring and the outer face of the door to protect the ring from the action of heat. The outer face of the ring is formed with two ears 6 in spaced relation one to the other and disposed one opposite the other in a line diametric to the ring 5. Through these ears there is passed a bolt 7 and this bolt also passes through two ears 8 projecting from opposite corners of a rectangular frame 9 made up of two longitudinal members and two end cross members beyond one of which the ears 8 project and beyond the other of which other ears 10 project. There is also provided another frame 11 similar to the frame 9, that is, it is made up of two longitudinal members and two end cross members and from this frame project corner ears 12 and 13 respectively. The frame 11 is larger than the frame 9 both in height and length and the ears 12 are sufficiently spaced to receive the ears 10 between them and these ears are traversed by a pivot bolt 14. The ears 13 are pivoted upon an upright rod 15 secured to the coke oven 1 on each side of the opening 2.

In the structure considered there are four doors and consequently there are four structures such as described, one for each door but two doors are mounted upon each pivot rod or bar 15.

The ears 8 are extended laterally and each ear is provided with a slot 16 extended in the direction of the length of the ear which

is lateral to the length of the frame 9. The outer surface of each ear is provided with a series of corrugations 17 extending in the direction of the length of the frame 9 and these corrugations are adapted to receive the ends of a curved washer 18 through which the bolt 7 extends and which are engaged by the head of the bolt at one end of the latter and by a nut applied to the other end of the bolt. These washers 18 serve to position the bolt 7 with relation to the slots 16 and consequently position the doors with relation to the frame 9.

The frames 9 and 11 form a double hinge support for each door so that when a door is in position in the opening 2 the frame 9 may be substantially parallel with the side wall of the opening while the frame 11 is substantially parallel with the face of the kiln. By this means the door may be well seated in the opening 2 without undue projection of the frame 11 beyond the face of the kiln.

When it is desired to remove the door from the opening 2 it may be readily swung around on the pivot rod 15 until both frames 9 and 11 are in alinement and parallel with the outer face of the kiln while the door may be turned parallel with the frame 9 and lie flat against the outer face of the kiln.

Because of the corrugations 17 and the elongated slot 16, the bolt 7 may be set near one end of one of the ears 8 and near the other end of the other ear 8 and so tilt the door about an axis cutting the bolt at right angles. By this means the door may be made to fit accurately in the opening 2 whether the parts sustaining the door were initially improperly adjusted or whether they afterward got out of adjustment because of warping of the kiln walls. The pivot bolt 7 permits the swinging of the door thereabout for the accurate placing of the door in the oven opening and for bringing the door flat against the kiln wall when the door is swung away from the oven opening, while the slots 16 and washers 18 permit the movement of the door on an axis at right angles to the length of the bolt 7 to bring the door into accurate relation to the opening or to the outer doors or both, if necessary.

What is claimed is:

1. A coke oven door having a hinge provided with ears formed with elongated slots and each corrugated or grooved on one face, a pivot bolt traversing the slot, and curved washers on the bolts entering the grooves or corrugations and thereby positioning the bolt.

2. A coke oven door having a hinge provided with ears formed with elongated slots and each corrugated or grooved on one face, a pivot bolt traversing the slots, curved washers on the bolts between the grooves or corrugations and thereby positioning the bolt, and a door-carried member pivoted to the bolt between the slotted ears.

3. A coke oven door provided with a door-carrying member having spaced ears, a hinge member provided at one end with ears extending laterally and each having an elongated slot in the direction of its length and corrugated on one face, a pivot bolt traversing the ears on the door and the slots in the ears on the hinge member, curved washers carried by the bolt and engaging in the corrugations on the face of the slotted ears, and another hinge member having ears exterior to the end of the first-named hinge member remote from the slotted ears, a pivot bolt traversing the matching ears of the two hinge members, and a pivot support for the second-named hinge member remote from the end carrying the first-named hinge member.

4. A coke oven door having a ring secured thereto at a central point and spaced away from the outer face of the door for the circulation of air, said ring being formed with diametrically disposed ears, a pivot bolt extending through the ears, and about which bolt the door is movable, a hinge for the door having ears with elongated slots traversed by the pivot bolt and having each ear formed on one face with corrugations at right angles to the length of the slot, and washers traversed by the bolt and engaging the corrugations.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOHN J. ALLEY.

Witnesses:
C. M. MINNICH,
H. E. JONES.