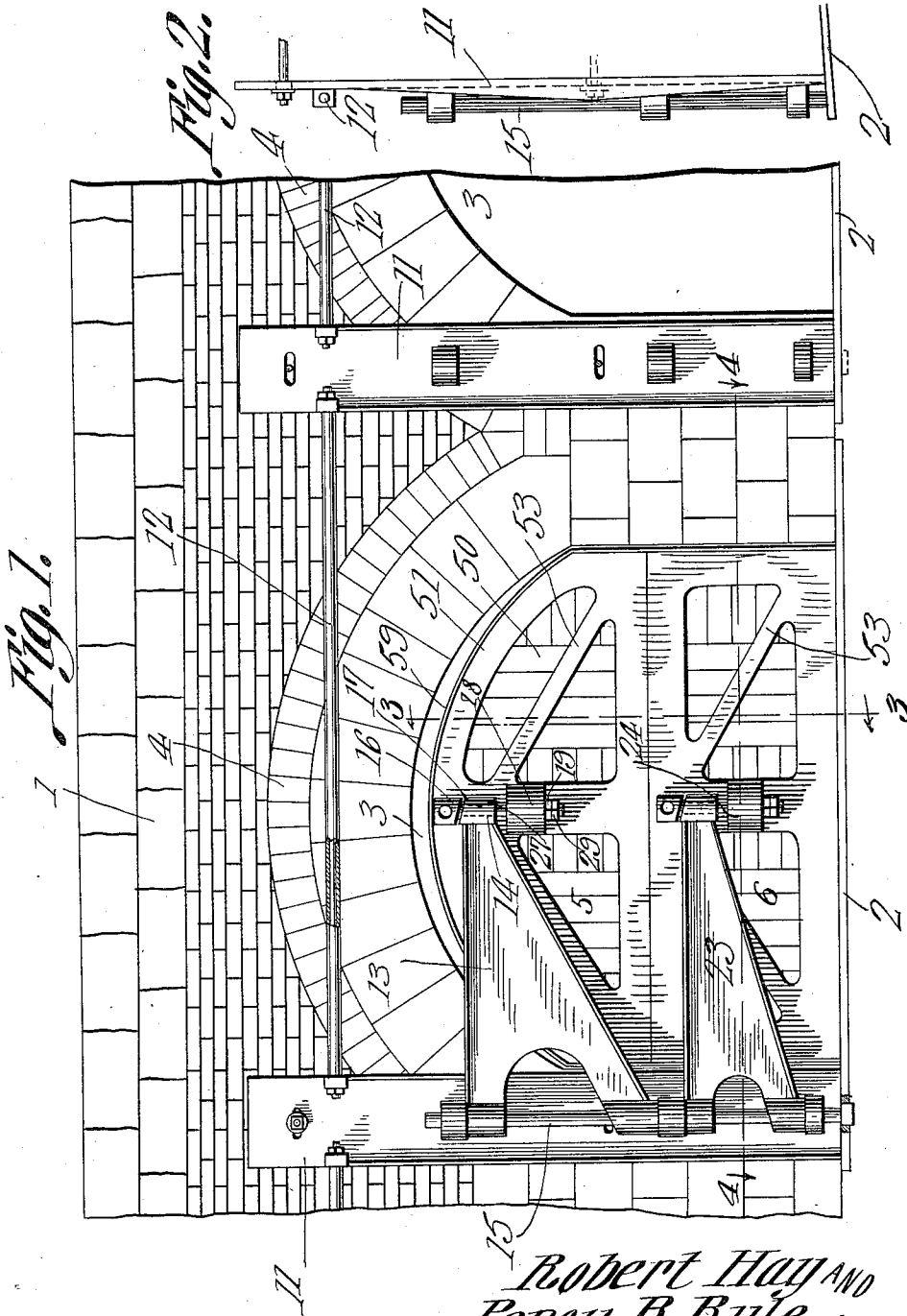


R. HAY & P. B. RULE.
COKE OVEN DOOR.
APPLICATION FILED DEC. 6, 1910.

1,012,848.

Patented Dec. 26, 1911.

2 SHEETS-SHEET 1.



Witnesses

J. P. Downey
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Robert Hay and
Percy B. Rule, Inventor

by

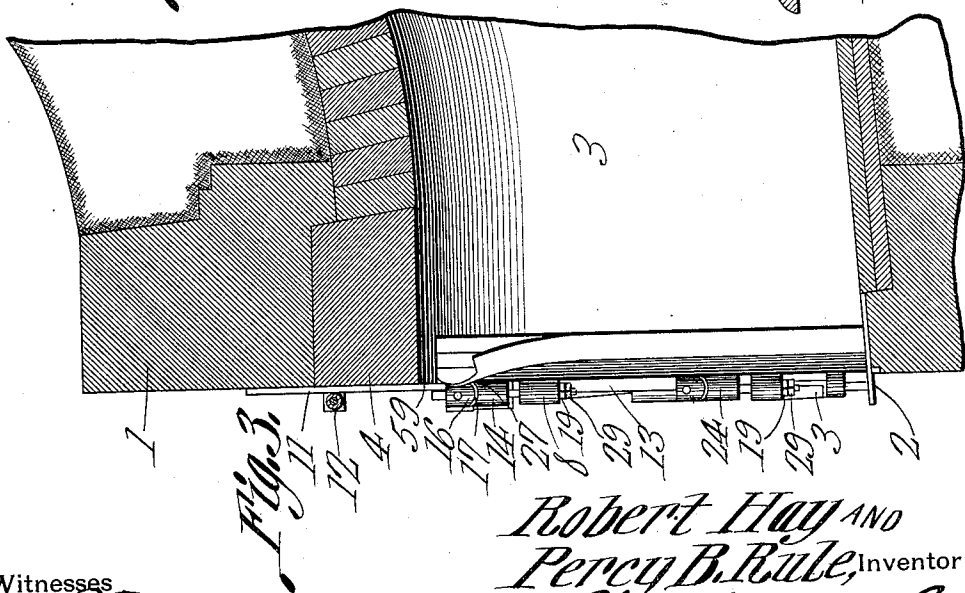
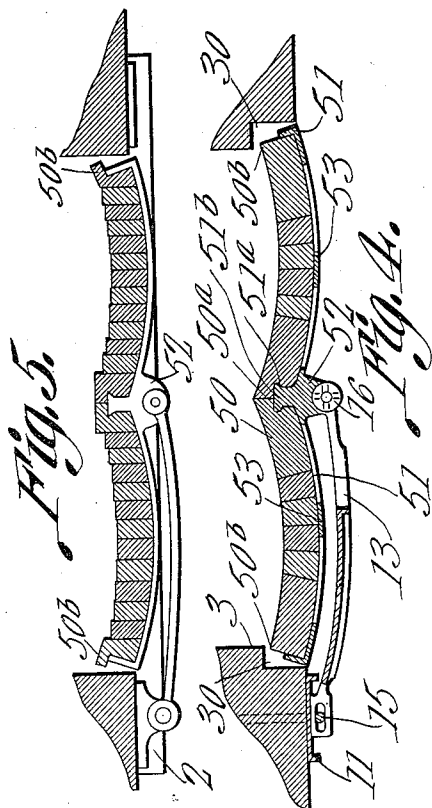
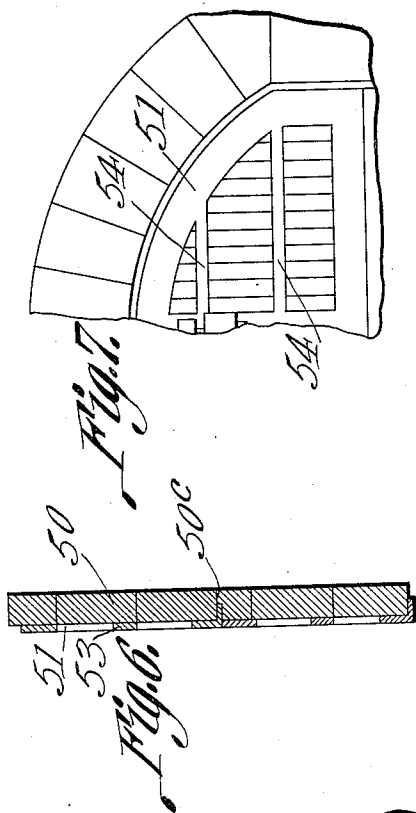
C. A. Snow & Co.
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Percy B. Rule, Inventor
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UNITED STATES PATENT OFFICE.

ROBERT HAY AND PERCY B. RULE, OF MOUNT PLEASANT, PENNSYLVANIA.

COKE-OVEN DOOR.

1,012,848.

Specification of Letters Patent.

Patented Dec. 26, 1911.

Application filed December 6, 1910. Serial No. 595,927.

To all whom it may concern:

Be it known that we, ROBERT HAY and PERCY B. RULE, citizens of the United States, residing at Mount Pleasant, in the county of Westmoreland, State of Pennsylvania, have invented a new and useful Coke-Oven Door, of which the following is a specification.

This invention relates to ovens for coke and the like, and more particularly to the doors thereof; and the primary object of the same is to improve the construction of such a door and to adapt thereto the masonry of the coke oven and the shape of its door opening.

A secondary object of the present invention is to provide an improved means for handling a door of this character.

The invention consists in a construction whereof the preferable form is set forth below and is shown (with one modification) in the accompanying drawings wherein—

Figure 1 is an elevation of the front end of one coke oven and part of another, showing one door complete and the parts constructed as they will be when the front of the oven is vertical. Fig. 2 is a side elevation of one of the posts between two contiguous door openings. Fig. 3 is a vertical section on the line 3—3 of Fig. 1. Fig. 4 is a horizontal section on the line 4—4 of Fig. 1. Fig. 5 is a section similar to Fig. 4 but showing a slightly different construction. Fig. 6 is a vertical section of the two parts of the door itself. Fig. 7 is an elevation showing a slight modification in the shape of the door framework of the door sections.

In the drawings, the numeral 1 designates the masonry of a series of coke ovens, its face being preferably inclined as usual so that the sill 2 of each individual oven 3 projects a little beyond the top of the arch 4. Between said ovens posts 11 are secured to the front of the masonry and connected with each other by bracing rods 12, and one post for each oven is provided with a pivotal support 13 having at its outer end a hanger 14 for carrying the door. The latter is by preference made in two sections, upper and lower, in which case the pivotal support is duplicated as at 23 and the hanger as at 24; and said supports in the present instance are shown as mounted on an upright rod 15 carried by the post 11, so that the pivotal point of the supports 13 and 23 is at one side of the door and its opening and said

support as a whole constitute a carrying crane for the door. The hanger as shown herein consists of a screw whose head 16 is beveled on its lower face as at 17 to engage the beveled upper face of an eye 27 at the outer end of the support, the shank of the screw passing loosely through an ear 18 on the framework of the door and receiving a nut 19 and a jam nut 29 at its lower end whereby the length of the hanger may be adjusted or the door detached from the hanger at will. However, we do not limit ourselves to this form of hanger nor in fact to this form of pivotal support although we consider the former and especially the latter highly useful.

By preference our door comprises upper and lower sections 5 and 6 meeting on a horizontal line, and each section is composed of a steel frame of angle iron casting and a number of tiles of refractory material and of suitable pattern to fill out the frame. However, it is quite within the province of our invention that the two sections should be united at the vertical center in a single door. By preference, the door is slightly wider than the door opening 3 if the walls of the latter be recessed as at 30 in Fig. 4, whereby the side bars of the door are protected from heat; although as shown in Fig. 5 this feature may be omitted.

In the illustration herewith the upper door section 5 comprises a number of tiles 50 inclosed within a frame 51 across which stands an upright mullion 52 carrying the ear 18 above referred to. This mullion divides the section into two parts which in Fig. 1 are subdivided by oblique bars 53 into four parts, and in Fig. 7 are subdivided by horizontal straps 54 into six parts; and said straps may extend over the outer faces of the tiles only or may be constructed like the mullions themselves, as best shown in Fig. 4. That is to say, the meeting edges of the innermost tiles 50 are preferably grooved as at 51^a and the mullion 52 has a dove-tailed projection 51^b whereby the fire faces of said tiles overhang the metal portion of the mullion as at 50^a and protect it from heat. At the sides of the door the frame 51 is of a casting of L-iron, and the extreme side tiles may be grooved in their edges so as to overhang the metal as at 50^b in Fig. 5 and protect it from heat, although the recesses 30 of Fig. 4 would make the overhang unnecessary. The up-

permost tile of the lower door section projects upward a little as at 50° in Fig. 6 so as to overhang and protect the lower frame bar of the upper door section.

5 An important feature in the construction of our door is its double arched or curved shape as best shown in Fig. 4. We are aware that it is common to arch a door outward on a single curve, but we find that if
10 it is arched outward on a double curve between which stands the upright mullion, greater strength results while still permitting the expansion of parts. When used in combination with the pivotal support
15 above described, this central mullion also affords convenient means for attaching the hanger, as will be understood. In Fig. 4 the tiles are shown as slightly wedge-shaped and in Fig. 5 they are strictly parallel, but
20 these details are unimportant. By preference the top of the frame 51 is spaced slightly from the top of the arch 4 so as to leave an opening at the point 59 for the admission of air above the uppermost door
25 section, even when both sections are closed.

The use of doors of this general character is now quite common in coke ovens, and the manner of operating the latter is well known. When the head 16 of the hanger
30 is turned its shank raises the door section bodily within the door opening, after which the pivotal support 13 can be swung to one side to carry the entire section out of place, and as the pivotal support is mounted on
35 the face of the oven at one side of the door opening the whole door section and support can be swung around to a position at right angles to the face of the furnace so that access can be had to the open oven.
40 The use of angle irons on the frame prevents the tiles from falling out of place even if they should become cracked, and the double arch of the door assists. If the straps 53 or 54 pass simply across the outer

face of the tiles, they will serve to hold the 45 latter in place under varying conditions of temperature.

What is claimed as new is:

1. A coke oven door comprising a metallic frame, an upright mullion across the 50 frame, and a filling of tiles of refractory material within the frame and arched outward at each side of said mullion.

2. A coke oven door comprising a metallic frame, an upright mullion across the 55 frame, straps bowed outward and connecting the mullion with each side bar of the frame, and a filling of tiles of refractory material within the frame and arched outward at each side of said mullion. 60

3. A coke oven door comprising a metallic frame, an upright mullion across the frame and having a dovetailed projection extending inward of the door, straps bowed outward and connecting the mullion with 65 each side bar of the frame, and a filling of tiles of refractory material within the frame and arched outward at each side of the said mullion, those adjacent the latter having grooves in their edges engaging its dove- 70 tailed projection.

4. A coke oven door made in sections each consisting of a metallic frame, blocks of refractory material having grooves in the edges where they meet at the transverse 75 center of the door, their fire faces being more extensive than their outer faces, and an upright metal mullion extending across the frame and having a dovetail projection standing in said grooves. 80

In testimony that we claim the foregoing as our own, we have hereto affixed our signatures in the presence of two witnesses.

ROBERT HAY.

PERCY B. RULE.

Witnesses:

C. J. KLINE,

EDWD. DONOHUE.