

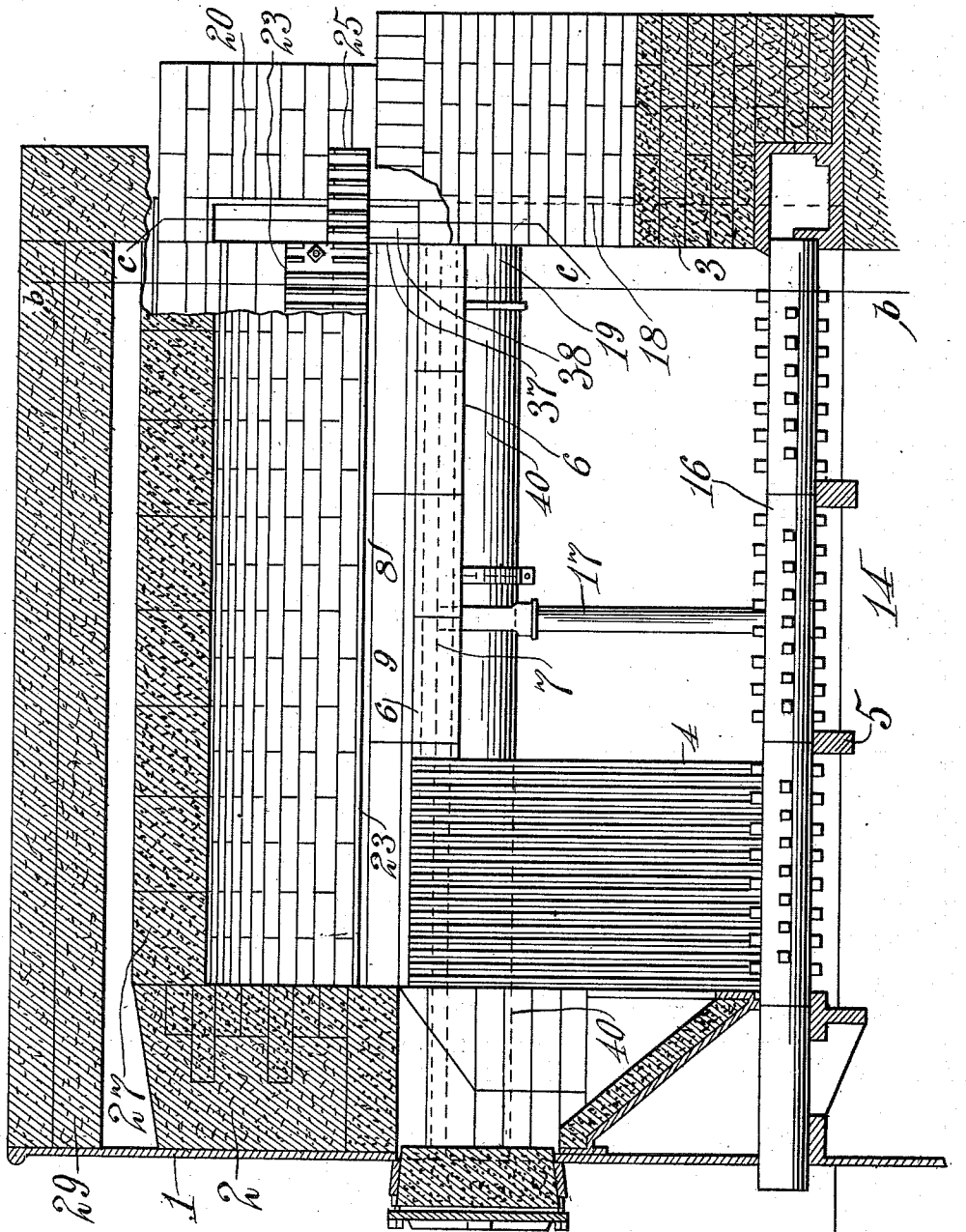


Fig. 1.

Witnesses
M. S. L. S. L.
H. A. Smith

Inventors
O. D. Cotton
H. M. Cotton
R. J. McCarty
 Attorney

O. D. & H. M. COTTON.
STOKER FURNACE.
APPLICATION FILED APR. 25, 1911.

1,018,649.

Patented Feb. 27, 1912.

4 SHEETS—SHEET 2.

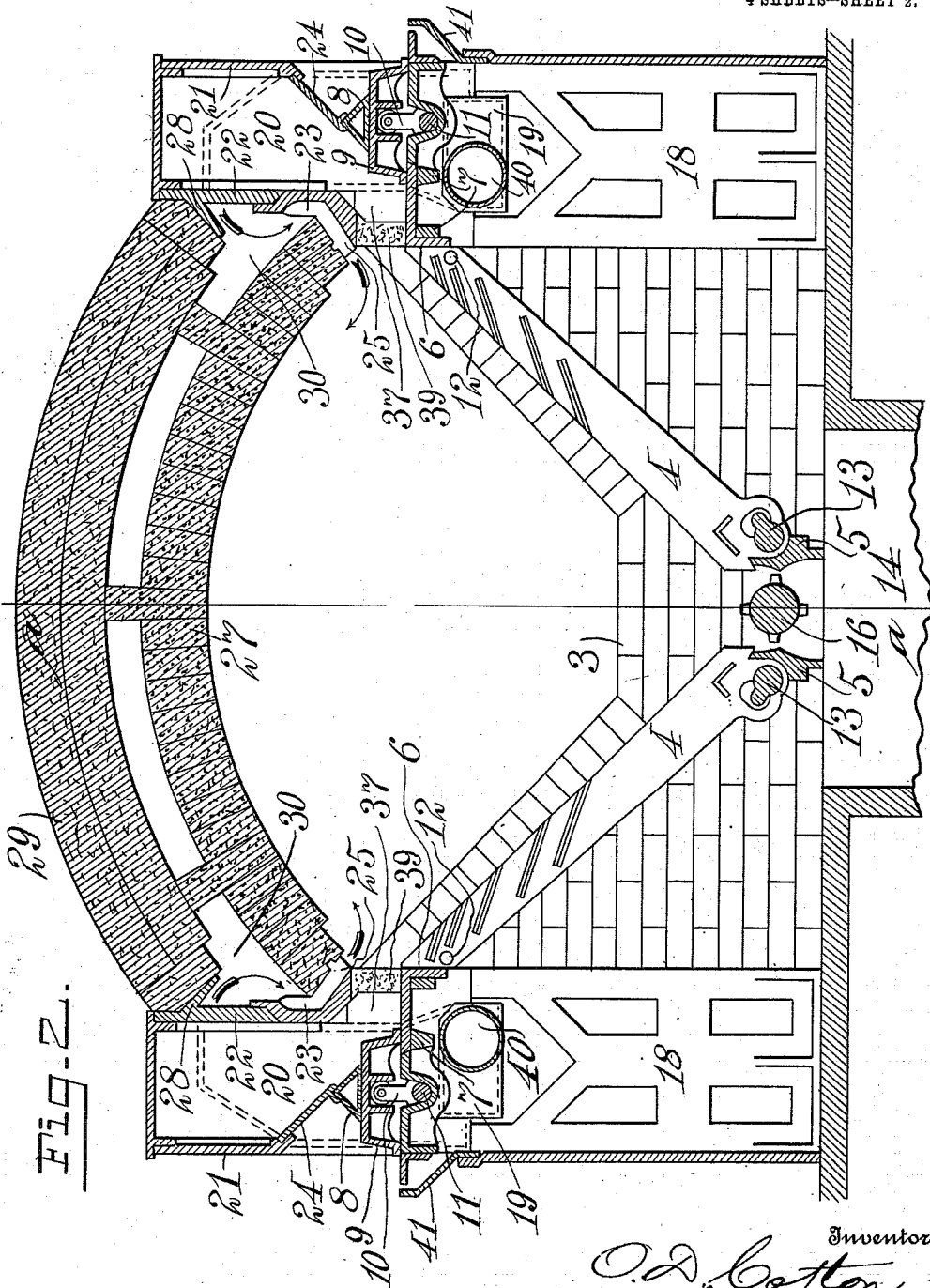


Fig. 2.

Witnesses
M. S. L. S. L.
A. P. Smith

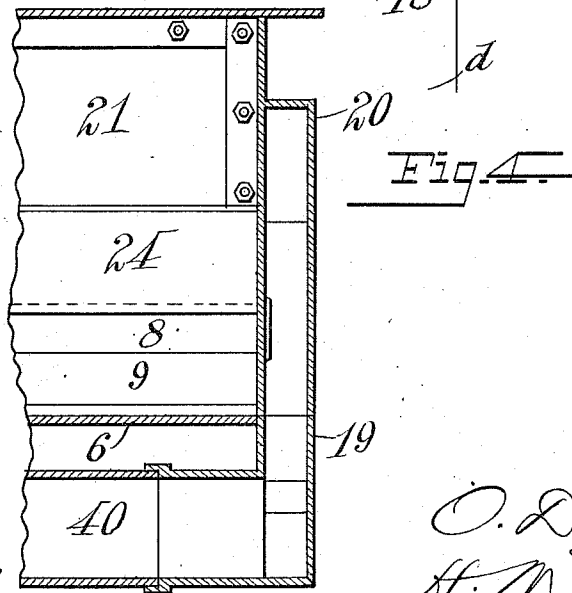
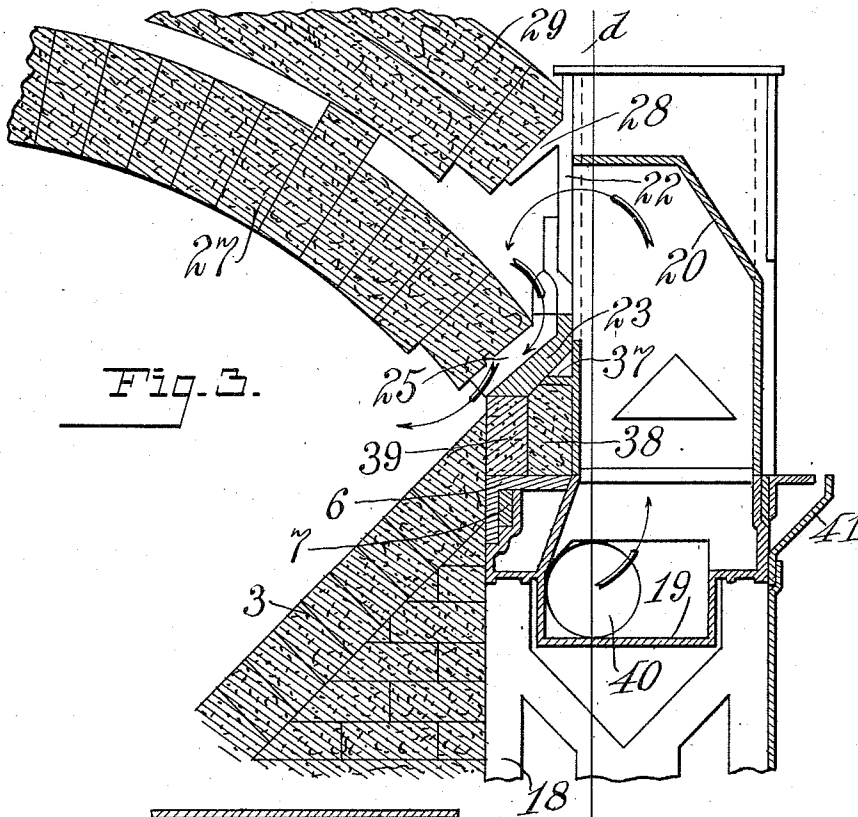
Inventors.
O. D. Cotton.
H. M. Cotton.
By R. J. McCarty
Attorney

O. D. & H. M. COTTON.
STOKER FURNACE.
APPLICATION FILED APR. 25, 1911.

1,018,649.

Patented Feb. 27, 1912.

4 SHEETS—SHEET 3.



Witnesses
M. Sieber
H. P. Smith

By

Inventors.
O. D. Cotton.
H. M. Cotton.
R. J. McCarty,
their Attorney

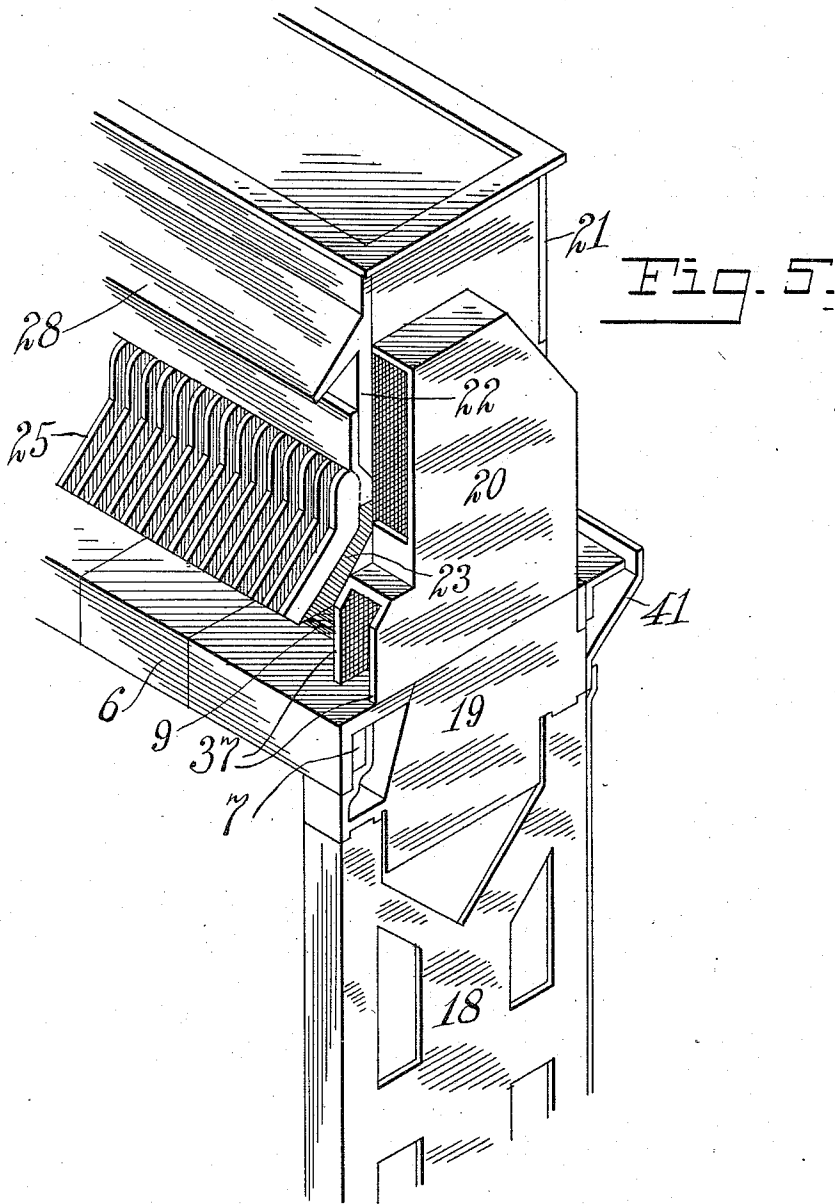
O. D. & H. M. COTTON.
STOKER FURNACE.

APPLICATION FILED APR. 26, 1911.

1,018,649.

Patented Feb. 27, 1912.

4 SHEETS—SHEET 4.



Witnesses

M. L. Lister
H. A. Smith

Inventors.

O. D. Cotton and
H. M. Cotton

By

R. J. McCarty
Attorney

UNITED STATES PATENT OFFICE.

ORVILLE D. COTTON AND HERBERT M. COTTON, OF DAYTON, OHIO.

STOKER-FURNACE.

1,018,649.

Specification of Letters Patent.

Patented Feb. 27, 1912.

Original application filed February 15, 1911, Serial No. 608,832. Divided and this application filed April 25, 1911. Serial No. 623,240.

To all whom it may concern:

Be it known that we, ORVILLE D. COTTON and HERBERT M. COTTON, citizens of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Stoker-Furnaces; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in stoker furnaces. The subject matter is divided from our pending application filed Feb. 15, 1911, Serial No. 608,832.

The object of the invention is to provide means for introducing air for combustion, from the front of the furnace to the air boxes in the rear. The air is introduced through flues which are free from contact with any parts of the furnace except at the forward and rearward ends where they are united to the front plate and the air boxes respectively. The air introduced through these flues is for a two-fold purpose, to aid in combustion and to protect the rear end of the magazines and especially the arch plates. These plates being exposed to the heat of the furnace, it is important that their temperature be kept below destructive heat. This is accomplished by subjecting said plates to the air of said flues at the lowest practicable temperature.

The invention relates further to means for protecting the rear portions of the magazines from the heat of the furnace; to provide for the recovery of fine coal which may sift onto the feed plate of the magazines; all as will hereinafter more fully appear from the following specification taken in connection with the accompanying drawings.

Referring in general terms to the accompanying drawings, Figure 1 is a longitudinal, vertical, sectional elevation of our im-

proved furnace on the line *a a* of Fig. 2; Fig. 2 is a lateral, vertical section on the line *b b* of Fig. 1; Fig. 3 is a section on the line *c c* of Fig. 1; and Fig. 4 is a section on the line *d d* of Fig. 3. Fig. 5 is a perspective view of the rear end of one of the magazines and the air box attached thereto, together with the pocket for the fire brick for the protection of the end piece of the magazine.

Throughout the specification and drawings, similar reference characters indicate corresponding parts.

Referring to the drawings, 1 designates a face plate in the rear of which is brick work 2. The rear of the furnace is provided with a fire wall 3 between which and the front brick work 2, the grates 4 are located. These grates are of a well known form, and are arranged in the form of an incline from the side down to the central part, the lower ends resting on a bearer frame 5 and the upper ends resting against feed plates 6 mounted on magazine bed plate 7. The coal is fed from the magazines on each side of the furnace, over the feed plates 6 onto the grates 4 by stoker boxes 9 actuated by arms 10 on rock shafts 11 journaled in the bed plates 7. The coal falls on the plates 6 by gravity when the stokers are in an outer position, and is delivered to the grates 4 when the stokers are moved inwardly. Each alternate grate is pivoted at its upper end 12, and their lower ends are adapted to be actuated by rock bars or shafts 13. When the alternate movable grates are actuated, the coal thereon will move downwardly thereon, and their movements are so timed, that, by the time the coal reaches the lower ends of said grates, it has become entirely consumed. The ashes resulting from the consumption of the coal are discharged from the furnace into an ash pit 14 by the movement of the alternate grates and a slow rotating clinker bar 16 provided with spurs, and mounted in the bearer between the lower ends of the grates. The stoker rock shafts 11, the grate rock shafts 13 and the clinker bar 16 may be actuated manually or by any of the well known means driven from a stoker engine

(not shown). The bed plates 7 are supported on the front plate 1 and rear frames 18, and support the magazines and air boxes 19. The intermediate portions of said bed plates 7 are held by supports 17. Above the air boxes 19, and communicating therewith, are air flues 20 which are formed on the rear ends of the magazines. The outer sides of the magazines are formed by plates 21, while the inner sides are formed by plates 22 and arch plates 23. The lower portions of the magazines consist of inclined plates 24 which join the upper edges of guide bars 8 mounted directly above the stokers 9. The guide bars 8 hold the stokers in position. The arch plates 23 are provided with ribs 25 which form air passageways between them. The lower portions of said arch plates 23 are placed at an angle, thereby forming supports for an arch 27 directly above the furnace grates. The plates 22 are provided with angular members 28 which support brick-work 29, which, in connection with the arch 27, forms air passageways 30 leading to the air ducts between the ribs 25. The brick-work 29 may be formed in an arch, as is shown in the drawings, or the passageways 30 may be formed by separate tile.

The air passageways 30 which lead to the air ducts between the ribs 25, communicate with the air boxes 20 as is shown in Fig. 2. To protect the rear ends of the magazine parts, against the intense heat, these air boxes are constructed as follows. The edge toward the fire of the lower portion of said rear ends is provided with a recess formed by side walls 37. The rear feed plates 6 extend along the inner edges of the air boxes 20, and mounted within the recess formed by the walls 37, and above the feed plates 6, are fire brick 38. Also mounted on the feed plates 6, in front of the brick 38, are fire brick 39 which lie adjacent to and are held in place by the upper course of brick of the rear wall 3. By this construction the intense heat at the rear wall is insulated from the iron work of the rear end of the magazines, and the same is protected from the heat.

The magazine parts are therefore prevented from deteriorating, and as the brick 38 are held within a recess, they will be prevented from becoming displaced. Should the brick 39 become displaced, the brick 38 will remain intact and give protection to the metal parts. The air flues 20 receive air from the boxes 19, which are provided with air flues or pipes 40 extending beneath the bed plates 7 from the boxes 19, to the front wall of the furnace, where they communicate with the atmosphere through openings in the face plate 1. The flues 40 are made of thin sheet metal, and are so placed as to prevent contact with heat. This provides for a free circulation of air around the exterior of said

flues 40. The said air pipes 40 are supported at their front ends by the face plate 1, and at their rear ends by the air boxes 19. By thus mounting these air conductors, the air passing therethrough is maintained at a minimum temperature, and has a cooling effect on the air flues 20 when it enters the same. This cooling action of the air will prevent the heat of the furnace warping or otherwise damaging the surrounding metal. From Fig. 3 it will be seen that the air thus introduced will have the effect of maintaining the arch plates 23 at a safe temperature, thereby preserving the life of said arch plates and obviating the necessity of frequent renewal of the arch plates and the arch supported thereby.

In furnaces of this type it is impracticable to maintain tight joints, therefore some of the finer coal will necessarily sift through the joints onto the feed plates. To prevent the coal siftings falling at the outside of the furnace and littering the floor, there are mounted along the upper outer edges of the feed plates 6, longitudinal angle bars 41, the upper edges of which are removed from the edges of said feed plates. During the outward reciprocation of the stoker boxes 9, the coal siftings which have sifted through the joints, will be pushed off the feed plates 6, and will be caught by the bars 41 and directed to the interior beneath the bed plates 7 where said siftings may be recovered through suitable doors in the face plate 1.

Having described our invention, we claim:

1. The combination with the arch, arch plates, magazines, and bed plates of a stoker furnace, and air-feeding ducts leading to the interior of the furnace at the base of the arch through ducts provided in the arch plates, of air flues or boxes at the rear ends of the magazines communicating with said air-feeding ducts, the sides of said air boxes exposed to the fire being provided with pockets above the bed plates and fire brick within said pockets, substantially as specified.

2. The combination with the arch, arch plates, bed plates and magazines of a stoker furnace, of air boxes or flues at the rear ends of the magazines and communicating with the interior of the furnace, pockets formed on the sides of said air boxes exposed to the fire, fire brick within said pockets resting upon the magazine feed plates, and an inner layer of fire brick supported on the feed plates adjacent to the pocketed fire brick, substantially as described.

3. The combination with the arch, arch plates, gates, magazines and bed plates of a stoker furnace, of air ducts leading to the interior of the furnace, air boxes or flues at the rear of the magazines, communicating with said air ducts, pockets formed on the inner sides of said air boxes above the ad-

5 jacent ends of the feed plates, fire brick secured within said pockets and resting on said feed plates, an inner layer of fire brick interposed between the pocketed fire brick and the furnace grate, and air pipes extending from the front of the furnace to the air boxes, and lying beneath the magazines, substantially as described.

In testimony whereof we affix our signatures, in presence of two witnesses.

ORVILLE D. COTTON.
HERBERT M. COTTON.

Witnesses:

R. J. McCARTY,
HOWARD S. SMITH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
