

No. 661,564.

Patented Nov. 13, 1900.

M. M. SUPPES.
FURNACE CONSTRUCTION.

(Application filed Oct. 13, 1899.)

(No Model.)

Fig. 1.

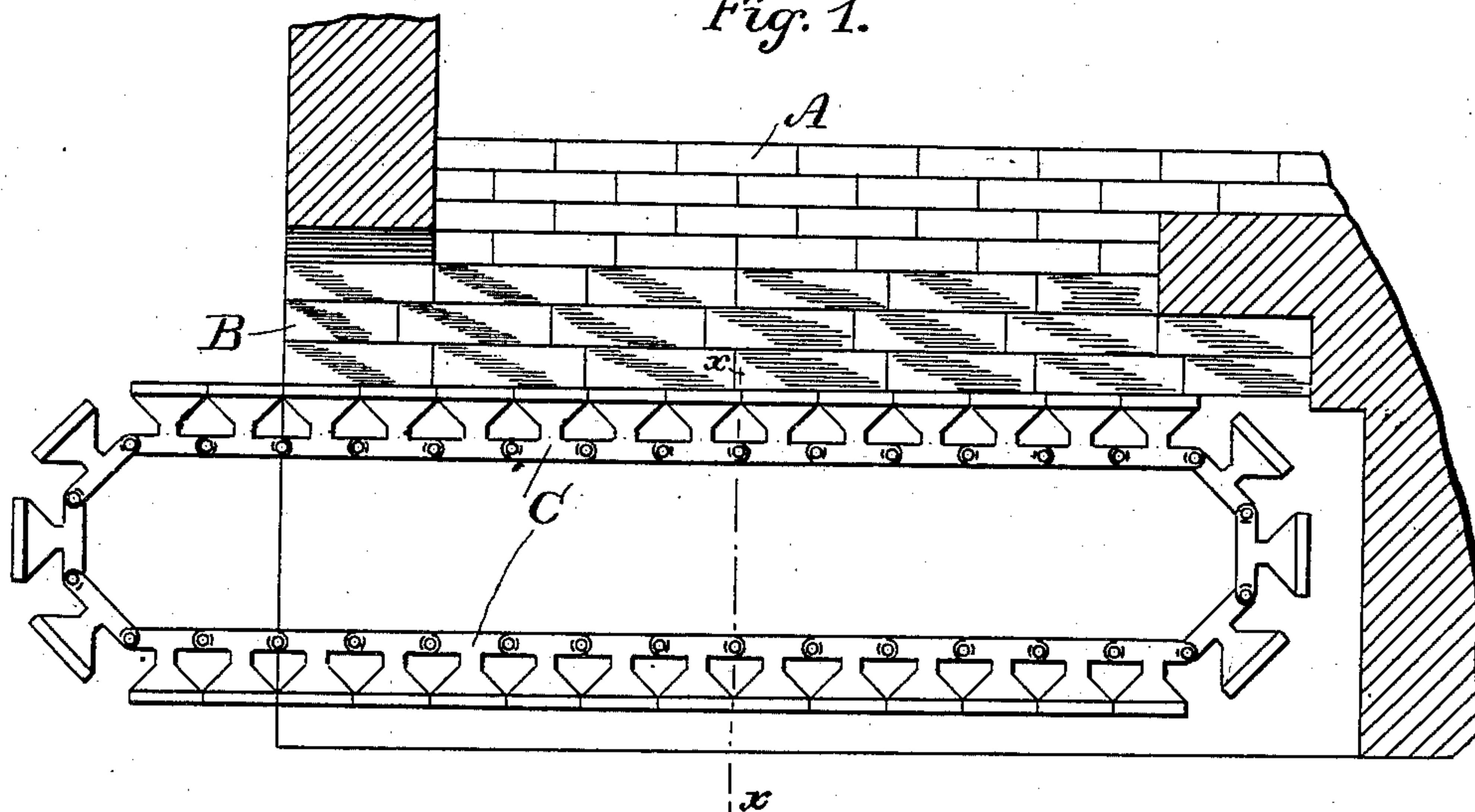
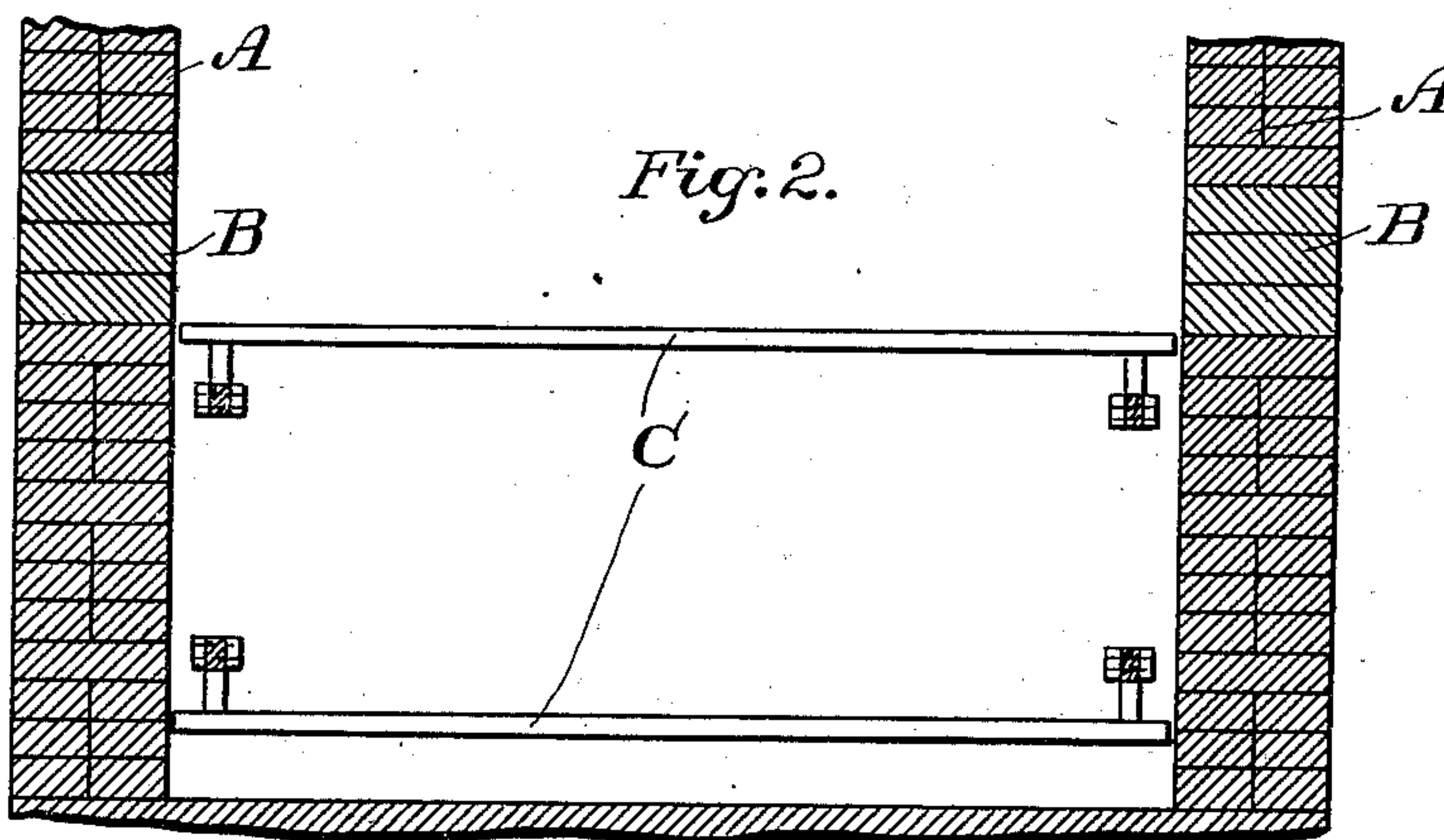


Fig. 2.



WITNESSES:

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FURNACE CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 661,564, dated November 13, 1900.

Application filed October 13, 1899. Serial No. 733,473. (No model.)

To all whom it may concern:

Be it known that I, MAXIMILIAN M. SUPPES, of Elyria, in the county of Lorain and State of Ohio, have invented a new and useful Improvement in Furnace Construction, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

10 This invention has relation to furnace construction, and more particularly to the construction of the side walls of steam-boiler furnaces, my object being to prevent or minimize the formation of clinkers on the walls of the
15 fire-box.

As is well known, the formation of clinkers on the walls of a furnace fire-box is a source of great trouble. The walls require frequent cleaning and in removing the clinkers therefrom are more or less seriously injured by
20 pieces of the fire-brick being broken out with the clinkers. This necessitates frequent repairs, during which the furnace and boilers and the apparatus dependent thereon for
25 power must remain idle. If not removed frequently, they lessen the surface area of the grate and reduce the efficiency of the furnace. In those furnaces which employ chain or stoking
30 grates the trouble is very much aggravated, as the clinkers adhering to the side walls project to such an extent that with the movement of the grate the coal thereon is pushed toward the center, leaving the grate bare
35 along each side. This allows air to pass up through the grate and under the boilers and seriously affects the combustion.

The fire-brick usually employed in furnaces has a peculiar affinity for clinkers, for the reason that it is very similar in composition to the ashes, containing, as it does, from
40 fifty to sixty-five per cent. of silica and bases differing from those of the ashes only in respective amounts. Consequently if the heat in the furnace be high enough to fuse the
45 ashes it may also fuse or at least soften the fire-brick walls sufficiently to make any ashes or clinkers brought in contact with said walls adhere thereto. It is possible that ashes which contain too little silica to fuse at the
50 temperature present in the furnace may fuse when coming in contact with the fire-brick,

which may contain silica in just the right proportion to combine with it to form a fusible silicate. It has been found that the silicates which are the most easily fused are those
55 which contain from thirty-five to sixty per cent. of silica (depending on the proportion of the respective bases present) and that if the silica be increased to over sixty per cent. a less-fusible silicate is formed. My invention
60 takes advantage of these facts by providing a furnace side wall constructed in part of a refractory material which is nearly all silica and which will therefore not fuse or
65 soften sufficiently at the temperature usually obtained under a steam-boiler to unite with the ashes or clinkers. The material which I prefer to employ is sandstone or silica-stone, which contains a very high percentage of
70 silica, being in fact nearly all silica. This material stands the heat of the furnace as well as the fire-brick, and its percentage of silica is altogether too high to enable it to fuse and form a silicate.

Inasmuch as the difficulty above referred
75 to is limited to portions of the furnace-walls adjacent to the grate, the entire wall need not be constructed of this material, but only so much thereof as is exposed to clinker formation. In the practice of my invention I have
80 therefore usually provided the usual fire-brick walls of the furnace with insets of sandstone extending the full length of the fire-box and from about the upper level of the grate-bars to a point about one foot above
85 the same. I have found the results of this construction to be extremely satisfactory, as no clinker adhered to the stone, the grate kept fairly covered with coal, the furnace repairs are reduced to a minimum, and the
90 labor involved in taking care of the fire is lightened, as well as the combustion and results from the fire improved.

In the accompanying drawings, Figure 1 is a longitudinal section of the fire-box of a
95 steam-boiler furnace embodying my invention, and Fig. 2 a transverse section of the same.

A designates that portion of the furnace-walls constructed of ordinary fire-brick, and
100 B the insets, of sandstone. This stone is laid in layers composed of stones about two inches

thick, nine inches wide, and about one foot in length. These particular dimensions are, however, entirely immaterial to my invention.

5 C represents an endless-chain grate.

The sandstone which I have heretofore used in the practice of my invention has been obtained from quarries situated at Berea, Cuyahoga county, in the State of Ohio; but there
10 are many other sources from which the material may be obtained.

I do not wish to limit myself to the use of my invention in connection with steam-boiler furnaces, as it is equally adapted to other
15 large furnaces wherein coal is burned on a grate either stationary or movable.

Having thus described my invention, what

I claim, and desire to protect by Letters Patent, is—

1. A steam-boiler or other furnace in which 20 coal is burned on a grate, having those portions of its fire-box which are exposed to clinker formation constructed with an inset or lining of sand or silica stone.

2. A steam-boiler or other furnace in which 25 coal is burned on a grate, having the walls of its fire-box adjacent to the grate provided with a lining composed of sand or silica stone.

In testimony whereof I have affixed my signature in presence of two witnesses.

MAXIMILIAN M. SUPPES.

Witnesses:

FRED. W. WATERMAN,
D. W. LAWRENCE.