

(No Model.)

2 Sheets—Sheet 1.

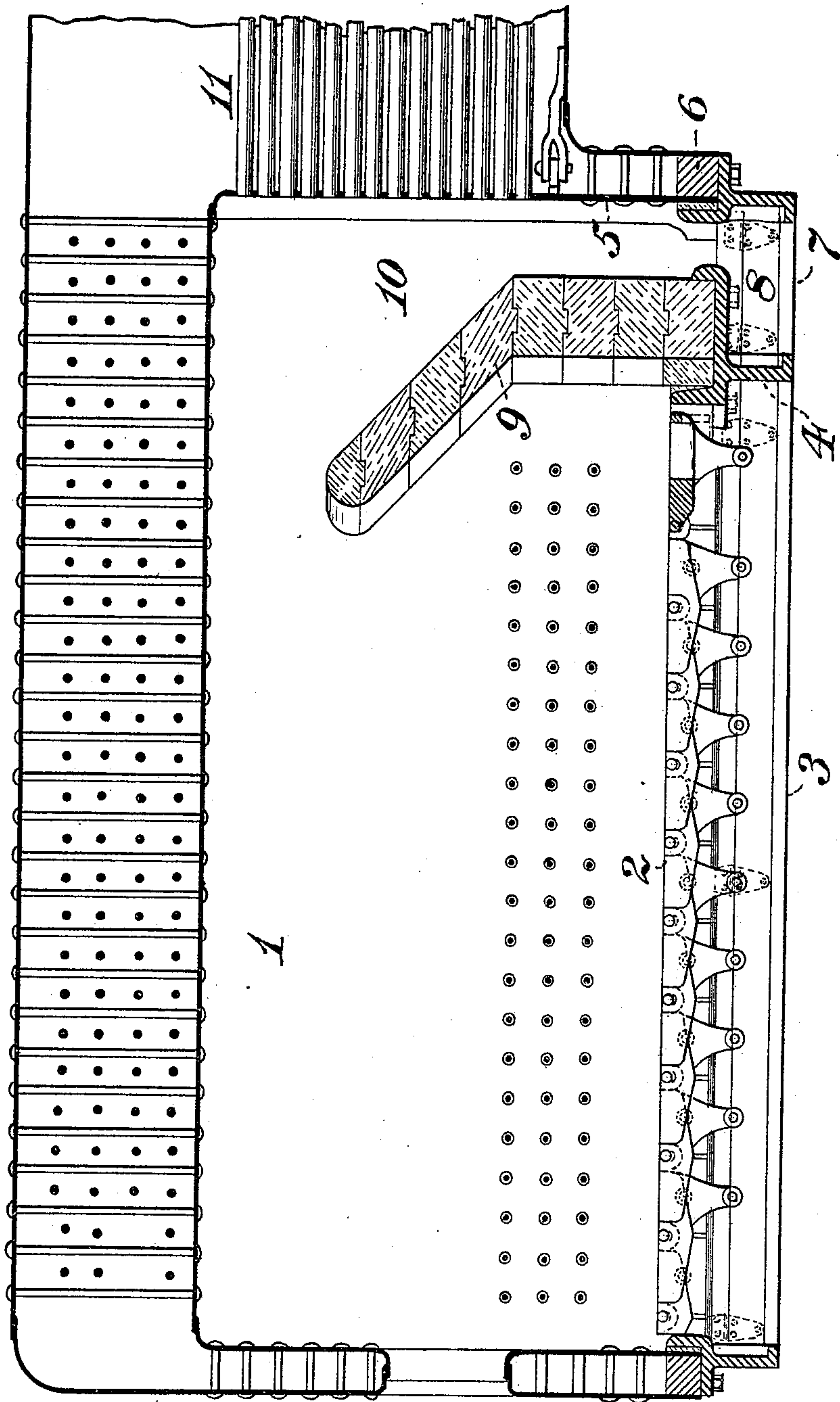
F. W. JOHNSTONE.

BRICK ARCH FOR LOCOMOTIVE FIRE BOXES.

No. 481,232.

Patented Aug. 23, 1892.

FIG. 1.



Witnesses:

*R. H. Whittlesey*  
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Inventor.

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*att'y.*

(No Model.)

2 Sheets—Sheet 2.

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FIG. 2.

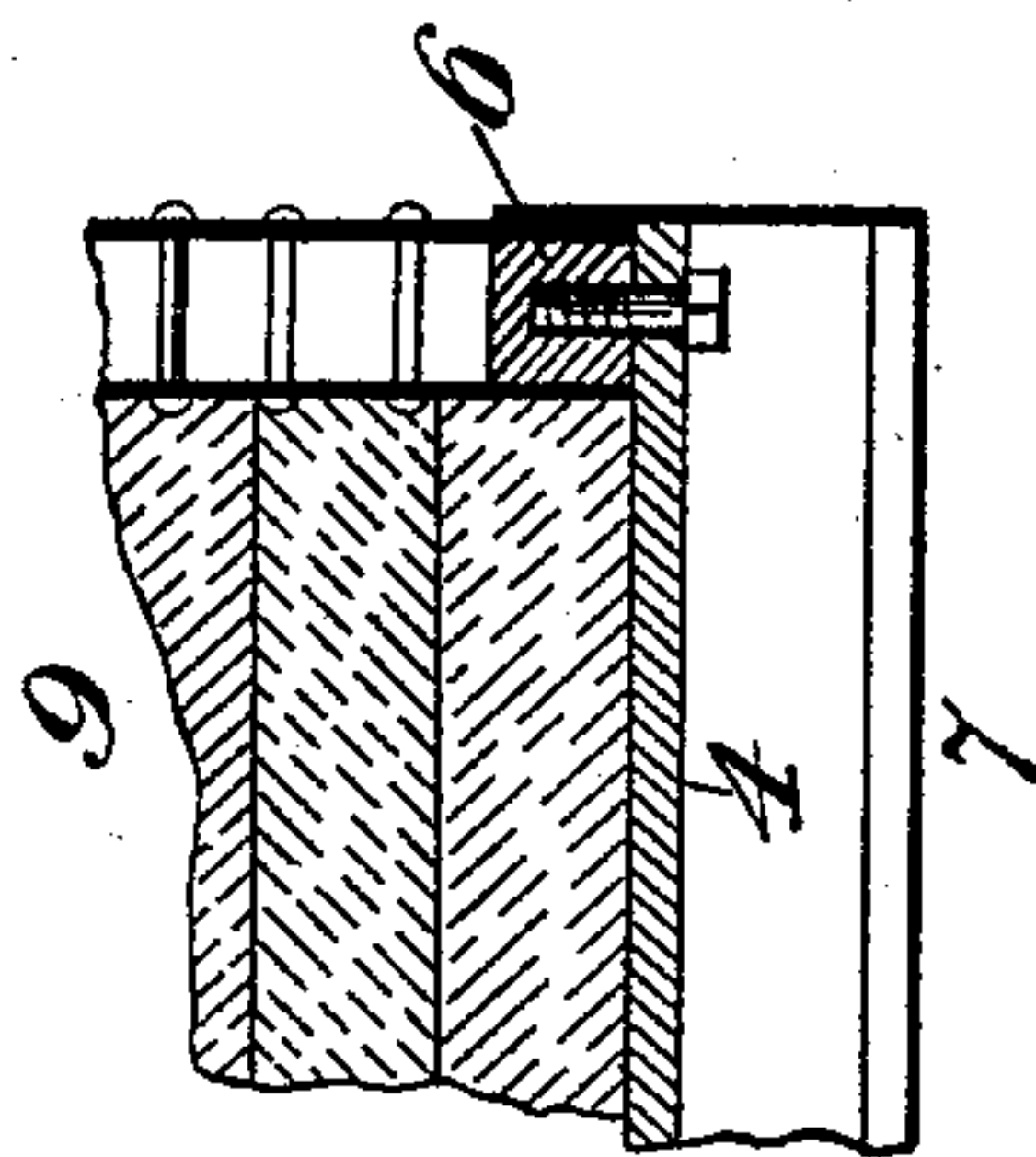
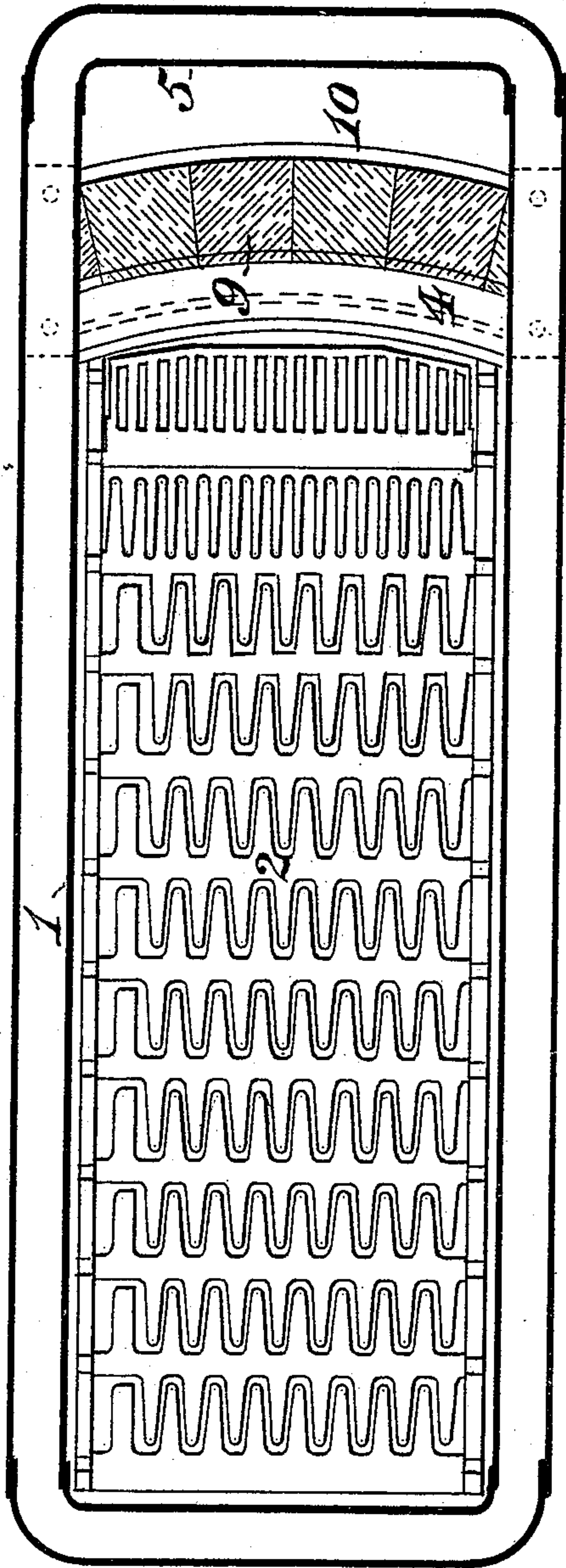


FIG. 3.

Witnesses:  
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# UNITED STATES PATENT OFFICE.

FRANCIS W. JOHNSTONE, OF MEXICO, MEXICO.

## BRICK ARCH FOR LOCOMOTIVE FIRE-BOXES.

SPECIFICATION forming part of Letters Patent No. 481,232, dated August 23, 1892.

Application filed February 13, 1892. Serial No. 421,404. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS W. JOHNSTONE, a citizen of the United States, residing at the city of Mexico, in the Republic of Mexico, have invented a certain new and useful Improvement in Brick Arches for Locomotive Fire-Boxes, of which improvement the following is a specification.

The object of my invention is to admit of the application of brick arches to locomotive fire-boxes of any of the various constructions in standard practice, in such manner that the arch may be firmly supported when in use without the employment of attachments to the fire-box sheets, and may be readily and expeditiously inserted and removed, as required, for renewal or repair.

To this end my invention, generally stated, consists in the combination, with a locomotive fire-box, of a transverse girder or support fixed below the mud-ring or bottom bar, a brick arch supported on said girder, and an auxiliary ash-pan located below the fire-box and between the girder and the flue-sheet. The improvement claimed is herein-after fully set forth.

In the accompanying drawings, Figure 1 is a vertical longitudinal central section through a locomotive fire-box, illustrating an application of my invention; Fig. 2, a horizontal section through the same, and Fig. 3 a vertical transverse section through the lower portion of one of the side water-legs and the adjacent portion of the brick arch and supporting girder.

My invention is herein shown as applied in a locomotive fire-box 1 of the well-known Belpaire type, to which special construction it will, however, be obvious that it is in no degree limited. The fire-box is provided at bottom with a suitable grate 2, which extends for the major portion of its length and with an ordinary ash-pan 3 below the grate. A girder or support 4, which is preferably of cast-iron, extends across the bottom of the fire-box in front of the ash-pan 3—that is to say, at or near its end which is adjacent to the flue-sheet 5—said girder being secured at its ends either to the side members of the mud-ring or bottom bar 6 of the fire-box, as shown in Fig. 3, or to the engine-frames when the fire-box is so located relatively thereto as to make such attachment convenient

or desirable—for example, entirely above the frames, as is frequently the case in recent and present practice. The girder 4 forms the rear wall of a supplemental ash-pan 7, which extends below the forward portion of the fire-box to or near the plane of the flue-sheet 5, and is provided at its sides with tight doors or dampers 8. An arch or bridge-wall 9, formed of a series of fire-brick sections, and having, preferably, a rearwardly-inclined upper portion, rests upon and is supported wholly by the girder 4, which may be, as shown, provided with lateral flanges on its upper surface to abut against and hold in position the lower sections of the arch 9. The space 10 between the arch and the flue-sheet is open at bottom to the supplemental ash-pan 7 and serves the purpose of a combustion-chamber in which the combustion of the gaseous products of the ignited fuel on the grate is perfected before passing into and through the tubes 11.

It will be seen that the construction above described obviates the necessity of perforating the fire-box sheets for the attachment of the supporting devices ordinarily heretofore employed, and that the brick arch may be readily put in place and removed or repaired, as required. The supplemental ash-pan 7 being practically air-tight, such cinders as may be carried over the top of the arch by the action of the exhaust fall into a space in which they are undisturbed by any upward draft and remain quiescent in the supplemental ash-pan, from which they may be removed at proper intervals through the openings controlled by the side doors or dampers 8.

I claim as my invention and desire to secure by Letters Patent—

The combination, with a locomotive fire-box, of a transverse girder or support fixed below the bottom of the fire-box and independently of the side sheets thereof, as by connections to the mud-ring, and a brick arch built upon and supported by said girder independently of the fire-box sheets and extending across the fire-box, substantially as set forth.

FRANCIS W. JOHNSTONE.

Witnesses:

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WM. M. EDGAR.