

No. 895,388.

PATENTED AUG. 4, 1908.

F. MILLIKEN.
FURNACE ROOF.
APPLICATION FILED OCT. 22, 1907.

2 SHEETS—SHEET 1.

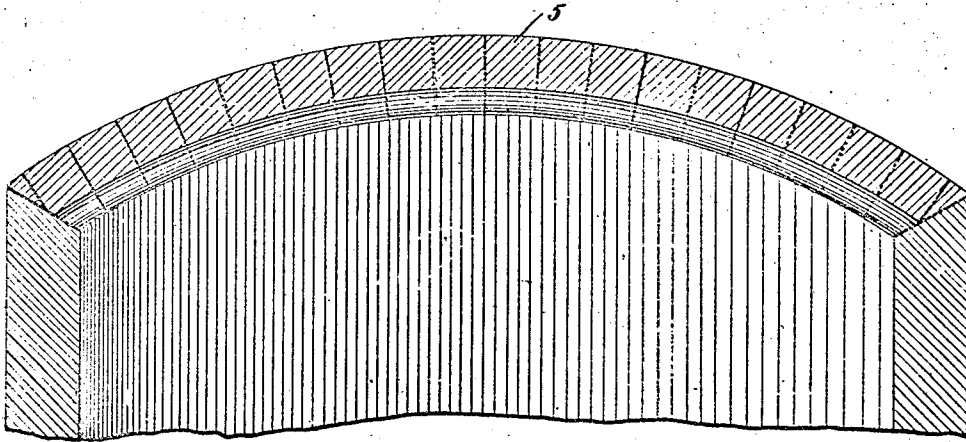


Fig. 1.

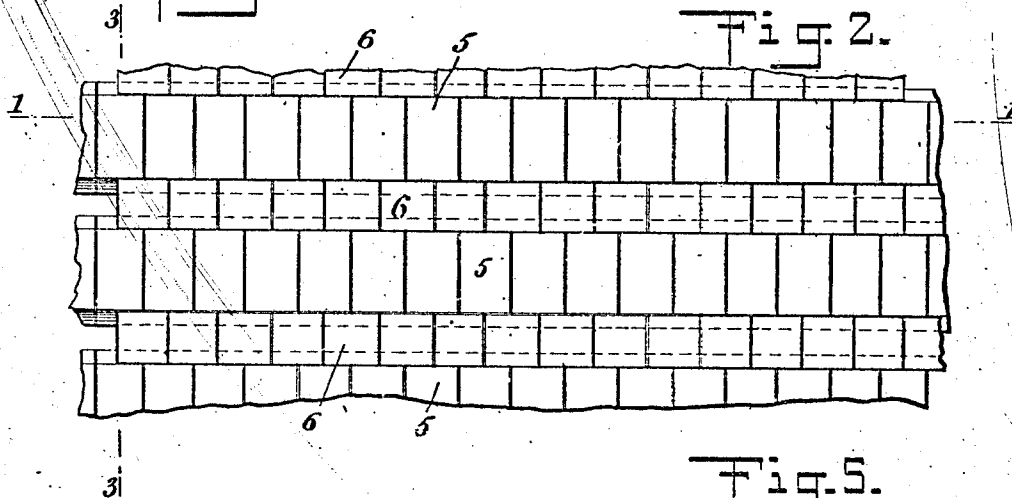


Fig. 2.

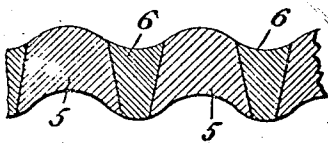


Fig. 3.

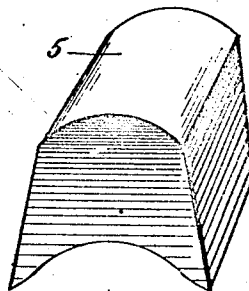
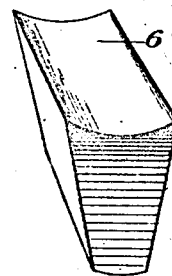


Fig. 4.

Fig. 5.



WITNESSES

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2 SHEETS—SHEET 2.

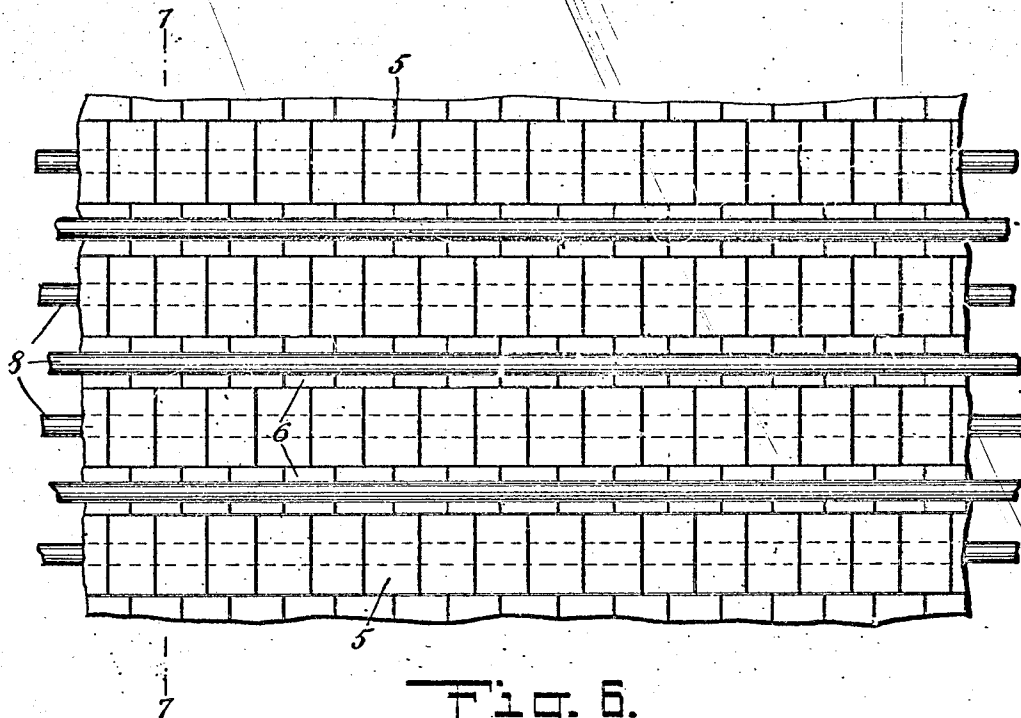


Fig. 6.

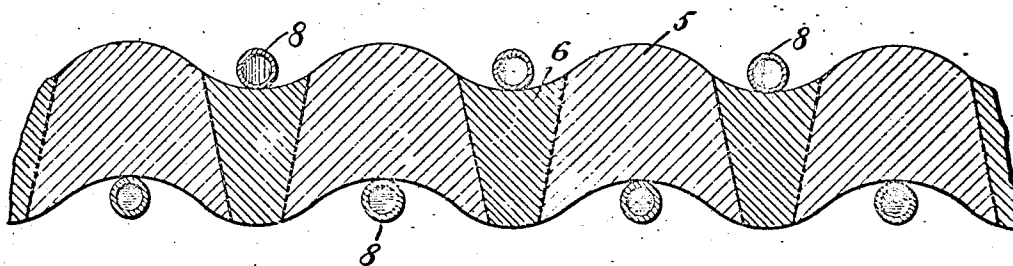


Fig. 7.

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FOSTER MILLIKEN, OF NEW YORK, N. Y.

FURNACE-ROOF.

No. 895,388.

Specification of Letters Patent.

Patented Aug. 4, 1908.

Application filed October 22, 1907. Serial No. 398,547.

To all whom it may concern:

Be it known that I, FOSTER MILLIKEN, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Furnace-Roof, of which the following is a full, clear, and exact description.

This invention is an improved roof, more especially designed for open hearth steel furnaces, and having for an object primarily to provide for the expansion and contraction of the roof in both a longitudinal and transverse direction.

The invention further contemplates the provision of a roof which may be easily and economically erected, repaired and adjusted, and which will operate to deflect the heat to the bath of the furnace and have a natural tendency to remain tight at the joints, whereby the escape of the heat from this source is prevented.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a cross-section through a furnace roof embodying my invention, the section being taken substantially on the line 1—1 of Fig. 2; Fig. 2 is a fragmentary plan of the same; Fig. 3 is a longitudinal section through the roof on the line 3—3 of Fig. 2; Fig. 4 is a perspective view of a fireproof brick employed in the construction of the alternate arches; Fig. 5 is a like view of a brick which is used in the intermediate arches; Fig. 6 is a plan of a modified form of the roof; and Fig. 7 is a section on the line 7—7 of Fig. 6.

My improved furnace roof is composed of a series of arches of fireproof brick, the alternate arches of which are built of brick 5, convex-concave on their top and bottom faces respectively in a direction parallel to the arch, as shown in Fig. 4. These brick, it will be observed, are wedge-shaped in both cross and longitudinal section and have convergent and divergent opposite sides, the enlarged portion in a longitudinal direction being at the top, and the enlarged portion in a transverse direction arranged at the bottom.

The intermediate arches are composed of fireproof brick 6, concavo-convex on their top and bottom faces respectively, and are also wedge-shaped both transversely and longitudinally and have convergent and di-

vergent opposite sides, as shown in Fig. 5. The enlarged portions of these brick, in the construction of the intermediate arches, are arranged at the top and are keyed together not only in the direction of the arch, but also cross-wise thereof by the downwardly divergent sides of the arches composed of the brick 5, as shown in Fig. 3, and form in connection therewith, a roof arched in one direction and corrugated in the opposite direction. It is apparent from this construction that the longitudinal expansion and contraction of the roof will be provided for by the corrugations, and the expansion and contraction transversely of the roof will be compensated for by the rise and fall of the arch.

Should one or more blocks of the roof burn out they may be replaced without destroying the adjacent arches and also without the necessity of scaffolding over the inside of the roof, as is the common practice in furnace roofs of the customary construction. The roof possesses further advantages over the ordinary roof, among which may be mentioned that in the erection of a roof of the usual type, it is necessary to scaffold entirely over the furnace, whereas in the construction of my improved roof, a supporting ridge may be placed under the center of the several arches composed of the brick 5, and the brick 6 composing the intermediate arches dropped in position; the erection would therefore be accomplished with less scaffolding and could be performed quicker and cheaper, since no particular skill is required in the building operation.

When a portion of the arch of a furnace roof as usually constructed burns out, the brick fall in, leaving the balance of the roof in a dangerous condition. This is obviously not true of a roof embodying my improvements, since should any of the arches composed of either the brick 5 or brick 6 burn out, they will settle down without injury to the arches adjacent thereto. The roof moreover will by reason of the corrugations tend to reflect the heat to the bath of the furnace and will, under the action of gravity, keep tight at the joints, whereby the escape of the heat through cracks will be prevented.

In Figs. 6 and 7 I have shown the depressed portions of the corrugations or channels of my improved roof provided with water pipes 8, which may be found desirable in instances to assist in keeping the roof in a comparatively cool condition.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. A furnace roof comprising a series of
5 arches having convergent and divergent opposite sides and composed of fireproof brick, the brick of the alternate arches being concavo-convex in a direction parallel to the arch, and the brick composing the intermediate arches being convexo-concave in a like direction.
2. A roof arched in one direction and corrugated in a direction at substantially right-angles to the arching, with the corrugations
15 extending to both the inside and outside of the roof.
3. A corrugated roof composed of fireproof brick arched in a direction transverse of the corrugations and with the inner and outer
20 faces of the roof substantially parallel.
4. A furnace roof composed of a series of arches of fireproof brick corrugated in a direction transverse to said arches on both its inner and outer faces, and with the corruga-
25 tions on both faces in substantial conformity to each other.
5. A furnace roof comprising a series of arches wedge-shaped in cross-section, composed of fireproof brick, and corrugated in a
30 direction transverse of said arches.
6. A furnace roof comprising a series of arches of fireproof brick, the brick of the alternate arches having convex tops and concave under faces arranged parallel to the
35 arch and having the opposite sides thereof converging upwardly.
7. A furnace roof comprising a series of

arches of fireproof brick, the brick of the alternate arches having concave tops and convex under faces arranged parallel to the arch and having the opposite sides thereof diverging upwardly. 40

8. A furnace roof comprising a series of fireproof arches, the alternate arches of which are concavo-convex in cross-section, 45 and the intermediate arches being convexo-concave in a like direction.

9. A furnace roof comprising a series of fireproof arches, the alternate arches of which are concavo-convex in cross-section 50 and have convergent and divergent opposite sides, and the intermediate arches being convexo-concave in cross-section with counter-part sides.

10. A furnace roof corrugated in one direction and arched in a direction transverse thereto, and cooling means arranged in the depressions or channels of the corrugations. 55

11. A furnace roof corrugated in one direction and arched in a direction transverse thereto, and water pipes for cooling the roof, arranged at both sides thereof in the depressions or channels of the corrugations. 60

12. A fireproof roof arched in one direction and corrugated in another direction, with the corrugations in the roof in substantial conformity on both its inner and outer faces. 65

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FOSTER MILLIKEN.

Witnesses:

JOHN M. ELLIS,
A. A. CANNON.