No. 754,792. PATENTED MAR. 15, 1904.

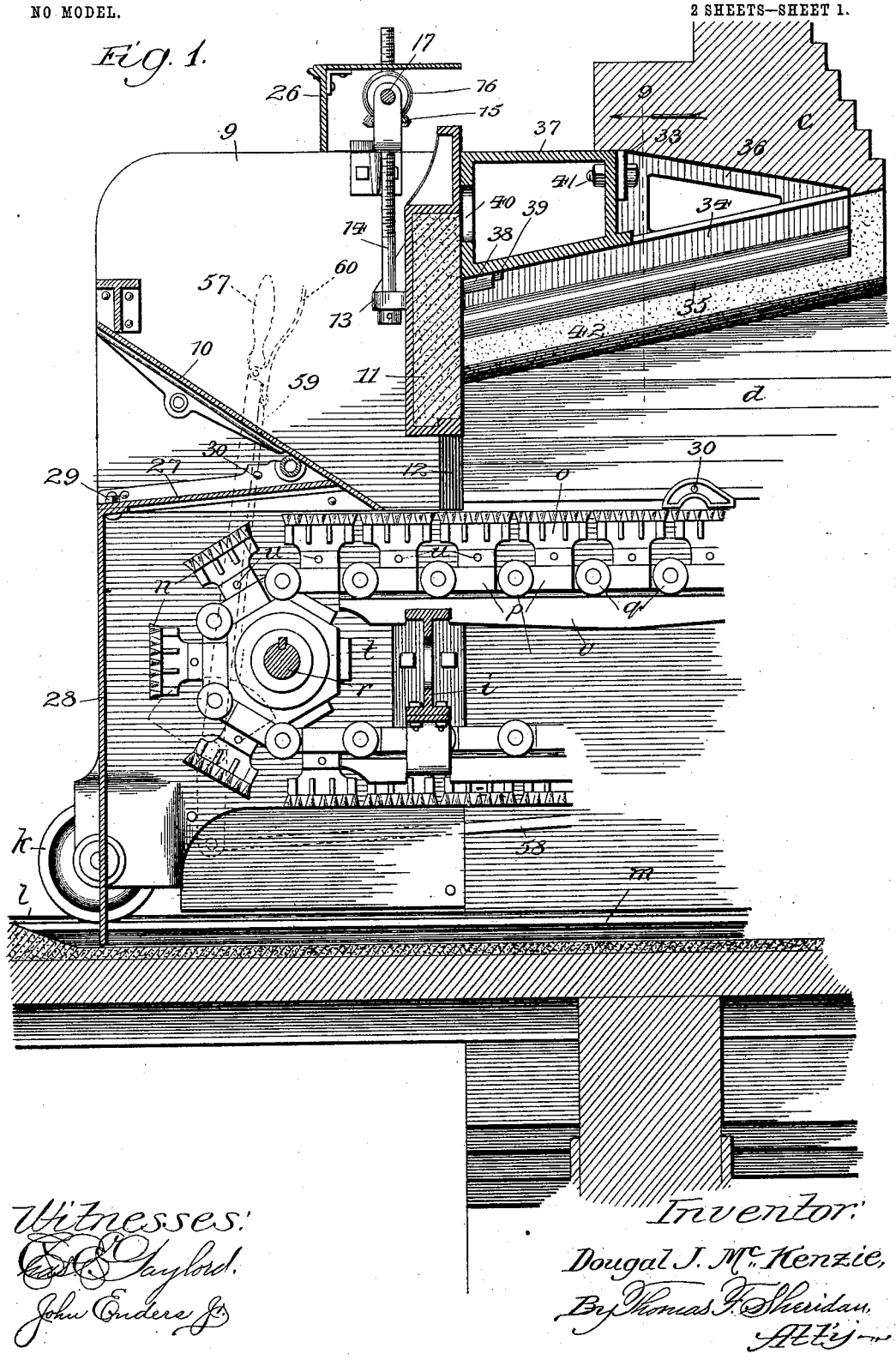
D. J. McKENZIE.

FURNACE.

APPLICATION FILED APR. 7, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Ed. C. Gaylord.
John Enders Jr.

Inventor:
Dougal J. McKenzie,
By Thomas F. Sheridan.
Atty.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

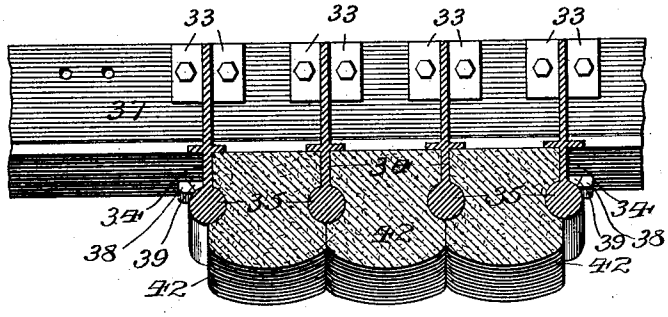
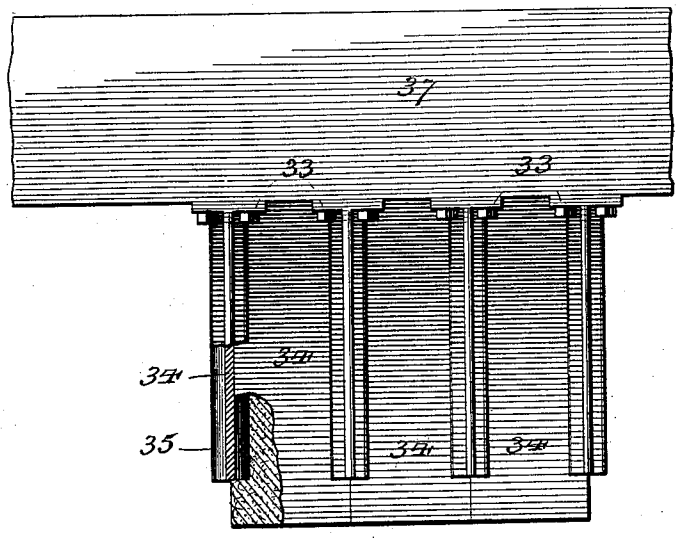


Fig. 3.



Witnesses:
Chas. E. Taylor,
John Enders Jr.

Inventor.
Dougal J. McKenzie
By Thomas F. Sheridan,
Atty.

No. 754,792. Patented March 15, 1904.

UNITED STATES PATENT OFFICE.

DOUGAL J. McKENZIE, OF CHICAGO, ILLINOIS.

FURNACE.

SPECIFICATION forming part of Letters Patent No. 754,792, dated March 15, 1904.

Application filed April 7, 1902. Serial No. 101,726. (No model.)

To all whom it may concern:

Be it known that I, DOUGAL J. McKENZIE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

The invention consists in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is an enlarged longitudinal sectional elevation of the front portion of the furnace; Fig. 2, a sectional elevation of a portion of the mechanism; Fig. 3, a plan view of the mechanism shown in Fig. 2.

In constructing a furnace in accordance with these improvements I provide it with the usual side walls and rear walls (not shown) and front supporting-walls *c*, which assist in supporting and confining the usual boiler and other parts in position. These walls not only assist in supporting and confining the different parts in position, but form and provide a furnace combustion-chamber *d* at or near the front portion thereof and directly under the boiler, which may be of any desired type.

Most furnace-arches are made in the shape of an "arch" in the true technical sense of the word. It has been demonstrated, however, that while an arch is a very good thing in a reverberatory furnace it does not consume or uniformly burn the coal on account of deflecting the waves of heat, the heated gases, and products of combustion toward the center of the furnace. One of the objects of my invention is to do away with this type of arch and provide a furnace with an arch with a multiplicity of convex surfaces arranged longitudinally therein and inclining inwardly and upwardly, and, further, to provide such a construction and arrangement of independent arch-sections that each may be inserted or removed from the furnace without disturbing any of the other parts. To accomplish this result, I provide the front wall of the furnace with a plurality of brackets 33, having flanged lower surfaces and front lugs. Integrally cast or otherwise secured to these flanged lower surfaces—that is, depending therefrom and extending forwardly thereof—are web portions 34, provided at their lower edges with rod-shaped truck portions 35. Secured to the lugs 36 on the front of these brackets, so as to assist in positioning the same, is a box 37, which extends entirely across the front of the furnace and is hollowed out at the central portion thereof and open at each end, so that air may circulate therethrough. This box, as above suggested, rests in the side wall of the furnace and is largely supported thereby. On the lower side of this box is a plurality of lugs 38, arranged in pairs, so as to form dovetail grooves, into which dovetail projections 39 at the front end of the web portions of the brackets are passed, which assist in suspending or holding these brackets at the front end thereof. The front portion of the box is provided with a multiplicity of openings 40, through which whenever it is desirable or necessary and when the gate 11 is removed an employee may insert his hands and get at the bolts 41 by which the brackets and box are secured together. The arch proper is formed of a plurality of independent tile-sections 42, convexed on their lower surfaces and provided with semicircular depressions in the sides corresponding to the rod-shaped pieces 35 at the lower parts of the brackets, which rod-shaped pieces form tracks to support the sections of the arch and permit the same to be pushed into place or removed therefrom. These brackets are arranged so that they incline inwardly and upwardly, and a corresponding incline is thereby given to the tile-sections of the arch, and as these arches are formed of convex surfaces when considered singly they form all together a corrugated arch for the front end of the combustion-chamber and act to deflect the heat-waves, hot gases, and products of combustion to all parts of the furnace, thereby insuring uniform combustion of the fuel after it is fed into the furnace.

I claim—

1. In a furnace of the class described, provided with a combustion-chamber, the combi-

nation of a grate portion, an arch-wall formed of a plurality of parallel-arranged tiles having convex lower surfaces independently and longitudinally arranged at the front upper portion of the furnace, substantially as described.

2. In a furnace of the class described provided with a combustion-chamber, the combination of a supporting-grate, an arch-wall formed of a plurality of parallel-arranged tiles provided with convex lower surfaces independently and longitudinally arranged at the front upper wall of the furnace and inclined inwardly and upwardly, substantially as described.

3. In a furnace of the class described provided with a combustion-chamber, the combination of a grate mounted therein, a plurality of brackets arranged at the upper forward part of the furnace-chamber and provided with depending webs and rod-shaped tracks extending downwardly and forwardly thereof, a box-shaped piece extending across the furnace in front of the brackets to which it is secured, and a plurality of tiles having recesses corresponding to the rod-shaped tracks arranged parallel to and independently of each other and longitudinal of the furnace at the front upper portion, substantially as described.

4. In a furnace of the class described provided with a combustion-chamber, the combination of a grate mounted therein, a plurality of supporting-brackets at the front upper portion of the combustion-chamber provided with depending web and round rod-shaped track portions extending downwardly and forwardly thereof at an incline, a metallic hollow box open at each end arranged across the furnace and supported by the side walls thereof and secured to the independent brackets and their tracks to assist in supporting the same, and a plurality of tiles arranged parallel and provided with recesses at the side portions thereof and with concave lower surfaces removably engaged with the rod-shaped tracks of the supporting-brackets arranged longitudinal of the furnace at the front upper portion thereof and inclining inwardly and upwardly, substantially as described.

DOUGAL J. McKENZIE.

Witnesses:
THOMAS F. SHERIDAN,
J. E. RUPP.