(No Model.) 2 Sheets—Sheet 1.

F. R. TIBBITTS & C. J. ALLEN.

FURNACE FRONT.

No. 576,919. Patented Feb. 9, 1897.

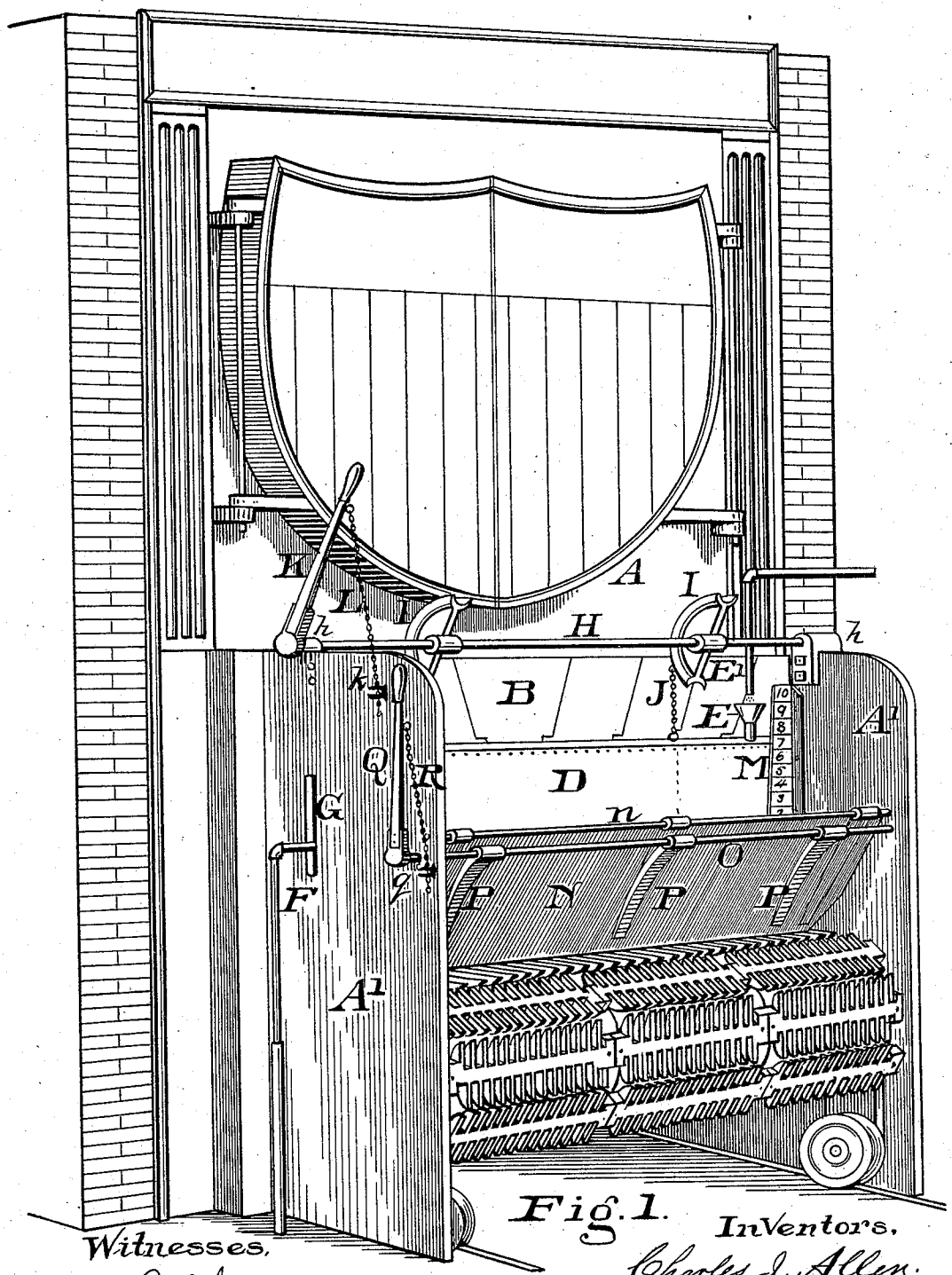

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

F. R. TIBBITTS & C. J. ALLEN.

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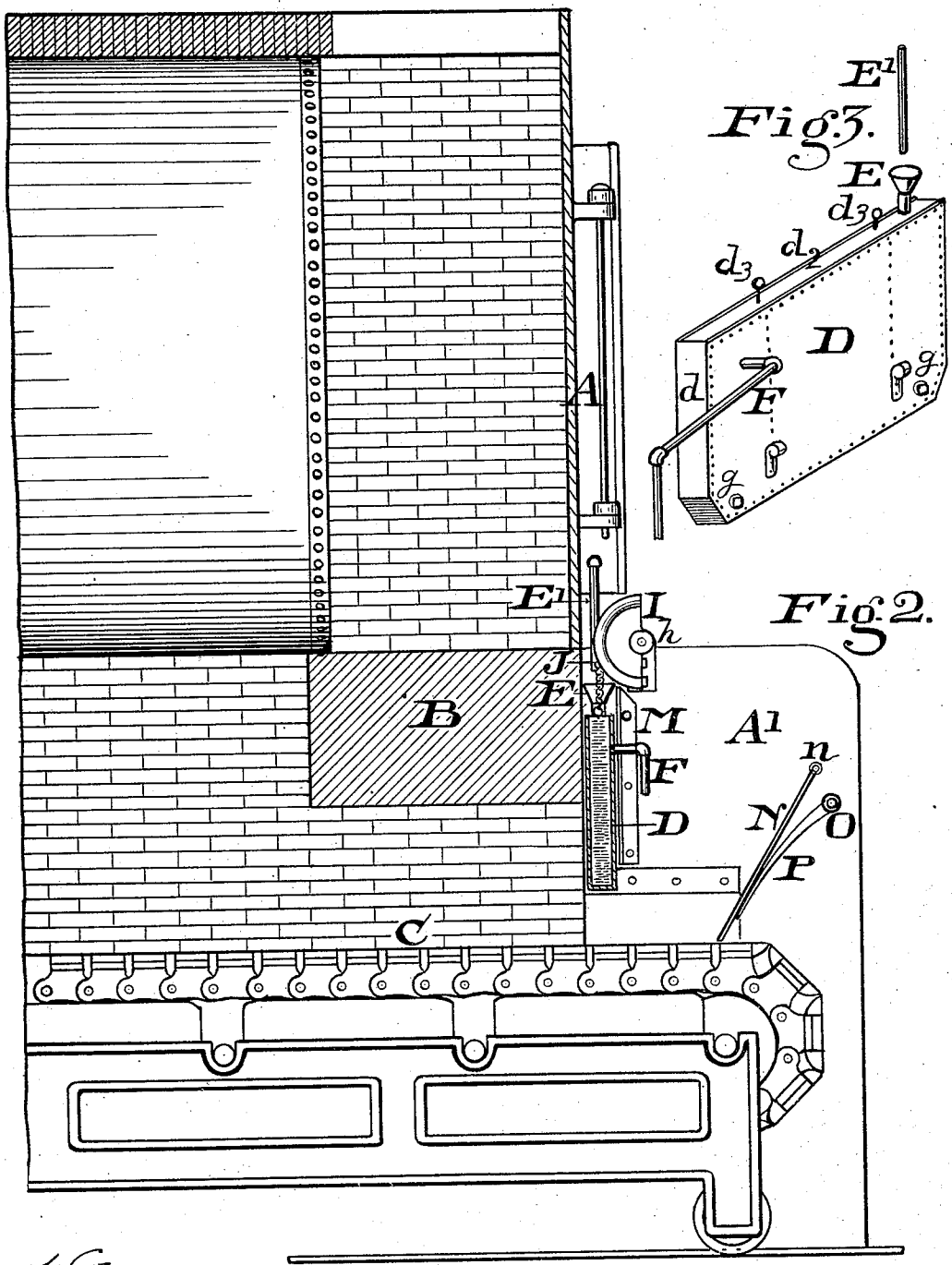

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UNITED STATES PATENT OFFICE.

FRANK R. TIBBITTS AND CHARLES J. ALLEN, OF CLEVELAND, OHIO, ASSIGNORS TO THE PLAYFORD STOKER COMPANY, OF SAME PLACE.

FURNACE-FRONT.

SPECIFICATION forming part of Letters Patent No. 576,919, dated February 9, 1897.

Application filed May 18, 1896. Serial No. 591,984. (No model.)

To all whom it may concern:

Be it known that we, FRANK R. TIBBITTS and CHARLES J. ALLEN, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Furnace-Fronts, of which the following is a specification.

This invention relates to fronts for furnaces for steam-boilers and other purposes; and it consists, first, in providing a hollow or chambered gate or door having water circulating through it for protecting it against the heat of the furnace; second, a hinged apron-front to the fuel-hopper. The nature and objects of these improvements will fully appear from the subjoined description, when considered in connection with the accompanying drawings, in which—

Figure 1, Sheet 1, is a perspective view of a furnace-front embodying our improvements. Fig. 2, Sheet 2, is a vertical section of the same, showing the construction and application of said improvements. Fig. 3 is a detached perspective view of the water-gate.

A represents the front of a steam-boiler setting, which is all open below the arch B.

C is a traveling grate and grate-carriage which occupies a portion of the opening below the arch and the boiler. The space between the arch and the grates comprises the opening through which the fuel is fed to the furnace. A′ are front extension-plates at the sides of opening. D is a gate or door for closing said fuel-opening, comprising the first part of our improvement, described as follows:

The gate or door is made hollow or chambered and preferably of sheet metal, as cast metal is liable to crack or break. As seen in Fig. 3, two sheets, or one sheet folded, form the two sides of the gate or door. Narrow ends, or ends and bottom piece *d*, placed between said plates and riveted thereto, form the bottom and ends of a narrow box. Stay-pieces are also put between the plates vertically and reaching from the top to about three-fourths the distance down, leaving ample room for circulation. A top plate d^2 is also put in the top, held in by eyebolts d^3, screwed into the stay-pieces.

E is an inlet-pipe fixed in one end of the top plate d^2 and extends down to near the bottom of the gate for the admission of water. It has a funnel mouth and receives water from a pipe E′, leading from a suitable supply-source.

F is an overflow waste-pipe attached to the opposite end of the gate and extends out through a slot G in the side extension-plate A′ and may lead away into a sewer or other receptacle. Holes with plugs *g g* are put in the side of the gate, near the bottom, for convenience of emptying and cleaning it.

H is a rock-shaft journaled in bearings *h h* on the tops of the side extension-plates A′. I I are grooved half-wheels fixed on said shaft over the gate and are connected with the eyebolts d^3 by chains J J. K is a lever on one end of said shaft, by means of which the shaft may be rotated for raising or lowering the gate for regulating the size of the feed-opening below it.

L is a chain attached to the lever K, by means of which the lever may be held in any desired position, when depressed, by inserting one of its links in a fork *k* on the side of the plate A′.

M is a plate fixed to the side plate A′ and in front of the gate, having a scale marked on it by which the height of the gate is shown and the feed-opening under it is graduated.

N is an apron which forms the front of the fuel-hopper. It is hinged to a tie-rod *n*, extending across from one side plate A′ to the other. Its lower edge rests upon the grates.

O is a rock-shaft journaled in the side plates A′ just beneath the tie-rod *n* and has arms P P attached, which lie against the under side of the apron. Q is a lever on one end of said rock-shaft O, by means of which the rock-shaft may be turned for raising the apron.

R is a chain attached to the lever Q, by which it may be held down by inserting one of its links in a fork *q* on the side of the plate A′. The purpose of this is to provide for turning and holding the apron up, when desired, for looking into the furnace below the gate, when the hopper is empty, without having to lift out and remove the apron.

The advantages of the water protection in the gate are that such gate will last very much longer, and it also protects the fuel in the

hopper, which is liable to be burned by the heat from an unprotected gate.

Having described our invention, we claim—

1. The combination with the furnace-front and the traveling grate, of the chambered gate D, having inlet-funnel E and outlet-pipe F, adapted to provide a water circulation through said gate, the shaft H mounted on the end plates A′, half-wheels I I mounted on said shaft, chains J J connecting said half-wheels with the gate, and the lever K on the end of said shaft, and the chain L attached to said lever and adapted to hold the lever in fixed positions, by engagement with fork *k*, all constructed to operate substantially as described and for the purpose specified.

2. The combination with the furnace-front and the traveling grate, of the tie-bar *n* connecting the two extension-plates A′, apron N hinged onto said tie-bar, shaft O journaled in the extension-plates A′, arms P P mounted on said shaft O, lever Q on the end of said shaft, and the chain R attached to the lever, and adapted to hold the lever and apron in position, by engagement with fork *q*, all constructed to operate substantially as described and for the purpose specified.

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