G. L. ALLEN.

BOILER FURNACE FRONT.

No. 189,077. Patented April 3, 1877.

FIG. 1.

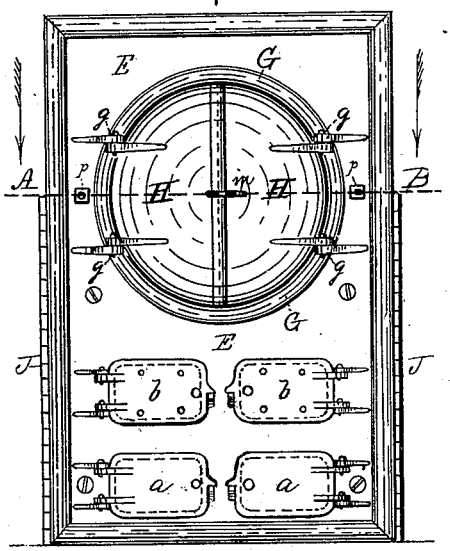

FIG. 2.

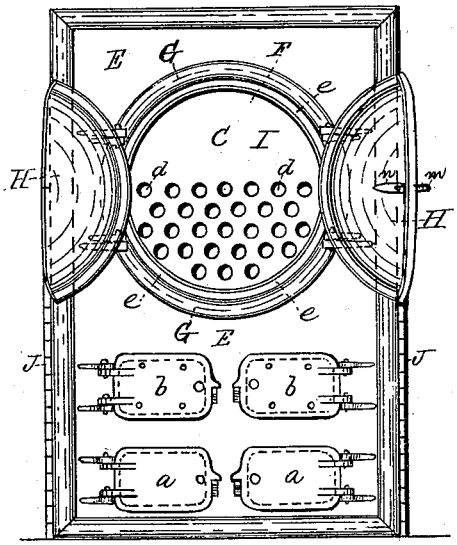

FIG. 3.

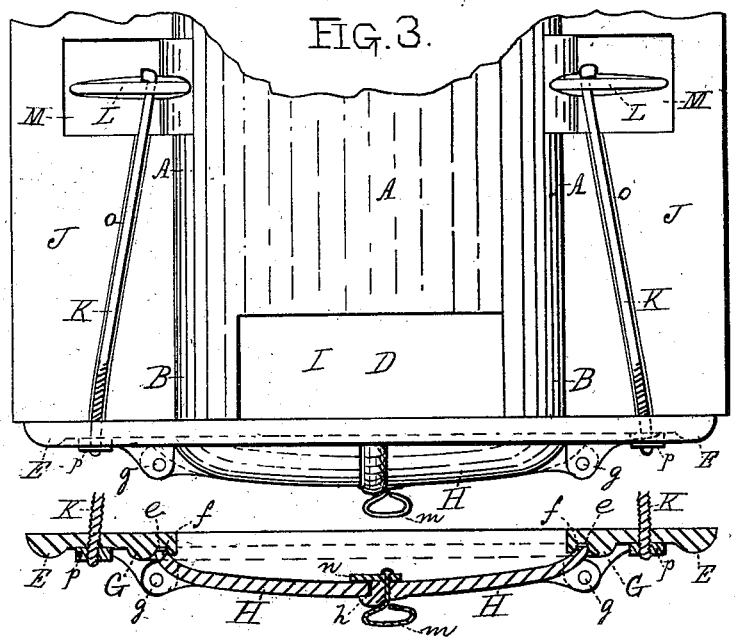

FIG. 4.

Witnesses:

Edwin E. Moore

Albert A. Barker.

Inventor:

George L. Allen.

UNITED STATES PATENT OFFICE.

GEORGE L. ALLEN, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO WILLIAM ALLEN & SONS, OF SAME PLACE.

IMPROVEMENT IN BOILER-FURNACE FRONTS.

Specification forming part of Letters Patent No. **189,077**, dated April 3, 1877; application filed March 2, 1877.

To all whom it may concern:

Be it known that I, GEORGE L. ALLEN, of Worcester, county of Worcester, and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Boiler-Furnace Fronts; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings forming part of this specification, and in which—

Figure 1 represents a front view of so much of a boiler-furnace as is necessary to illustrate my present invention. Fig. 2 represents a similar view to that shown in Fig. 1, excepting the doors to the front of the boiler are swung open. Fig. 3 represents a top or plan view of a portion of the boiler-furnace and boiler-front, as will be hereinafter more fully explained, and Fig. 4 represents a horizontal section on line A B, Fig. 1, through the boiler-front, as will be hereafter more fully explained.

To enable those skilled in the art to which my invention belongs to make and use the same, I will proceed to describe it more in detail.

In the drawings, the part marked A represents the front end of the boiler, and B the extension of the boiler-shell beyond the boiler-head C, and D represents the draft-opening for the escape of the smoke and gaseous products of combustion. E represents the boiler-furnace front, which is cast in a single piece, and is provided with suitable openings for the ash-doors *a a* and fire or feed doors *b b*, and also with a large opening, F, sufficient to expose the head C of the boiler and its fire flues or tubes *d*. A flange or projection, G, is cast upon the outer side of boiler-front E, entirely around the opening F, said flange having a groove, *e*, cast or formed therein, for receiving and holding the curved edges *f f* of the boiler-doors H H, which are hinged to the boiler-front at *g g*. The boiler-doors are made so that when they are closed they form a convex circular head for closing the smoke-chamber I, between the boiler-head C and convex doors H H. By making the boiler-front E with a grooved circular flange or projection, G, and *e*, the boiler-front is greatly strengthened, while at the same time the outer curved edges *f f* of the doors H H are prevented from springing or warping out of place, while at the same time a close and tight joint between the doors and the boiler-front E is obtained.

Then, again, another advantage is obtained by my mode of constructing the boiler-doors H H in the peculiar manner shown and described, since I obtain by such construction an increased smoke-chamber, whereby the shell part B of the boiler, which projects beyond the water-line, or head C of the boiler, can be reduced in length some six inches and still obtain the same effective draft, through the draft flue or opening D, as before such reduction in the length of the shell part B. Still, by this reduction of the part B I am able to bring the lower part of the shell of the boiler under the opening D, outside of the fire-line, thus insuring greater utility and duration of the boiler. The doors are provided with a lap-joint, as shown at *h*, Fig. 4, and hand-piece *m*, which passes through one of the doors, and is provided with a catch-piece, *n*, whereby, when the doors are closed and hand-piece *m* turned to bring the catch-piece *n* into the position shown in Fig. 4, the doors are securely locked together, as indicated in the same figure.

Previous to my present invention, great trouble had been experienced in consequence of the cracking of the boiler-fronts, by reason of the expansion of the boiler, settling of the same or of the brick or mason work about it. To obviate these objections, my boiler-front is secured to the front of the boiler, and the mason-work J about it, by means of self-adjusting holding-rods K K. These rods pass through the ear-pieces L, upon the projections M M, secured to the sides of the boiler, thence through openings or holes *o o* in the brick-work, and through holes in the boiler-front, with nuts *p p* upon their outer ends, whereby the boiler-furnace front E is drawn up and trued against the end of the boiler-shell B. From this construction it will be seen that, as the rods *o o* have play in the mason-work J,

the boiler can rise or fall in consequence of contraction or expansion, or it may settle with the brick-work, and still not injure the boiler-furnace front. Still, again, the shell part B of the boiler may expand and contract without injuring or cracking the furnace and boiler-front E.

In setting a boiler, my construction enables the work to be performed in a very quick and expeditious manner, since the boiler-front can be arranged and drawn against the shell part B, where it will be held in a very true and even manner while the mason-work is being completed.

In addition to the advantages before enumerated as resulting from my construction of the doors H H in the manner shown and described, I am enabled to expose the entire front of the boiler-head C and the ends of the tubes *d*, as indicated in Fig. 2 of the drawngs, which is a great convenience, since it enables the boiler-head to be examined, and the smoke-chamber D and boiler-flues *d* to be cleaned, with little trouble, as well as any repairs which may be necessary from time to time.

Having described my improvements in boiler-furnace fronts, what I claim therein as new and of my invention, and desire to secure by Letters Patent, is—

1. The combination, with the grooved circular projection or flange G of the boiler-furnace front E, of the convex doors H, provided with curved projecting edges *f f* to fit the circular groove F, substantially as and for the purposes set forth.

2. The combination, with boiler-furnace front E and projecting ears L upon projections M M upon the boiler A, of the self-adjusting holding-rods K K, substantially as and for the purposes set forth.

GEORGE L. ALLEN.

Witnesses:
EDWIN E. MOORE,
ALBERT A. BARKER.