L. McKELVEY.
Door for Furnaces.

No. 222,068. Patented Nov. 25, 1879.

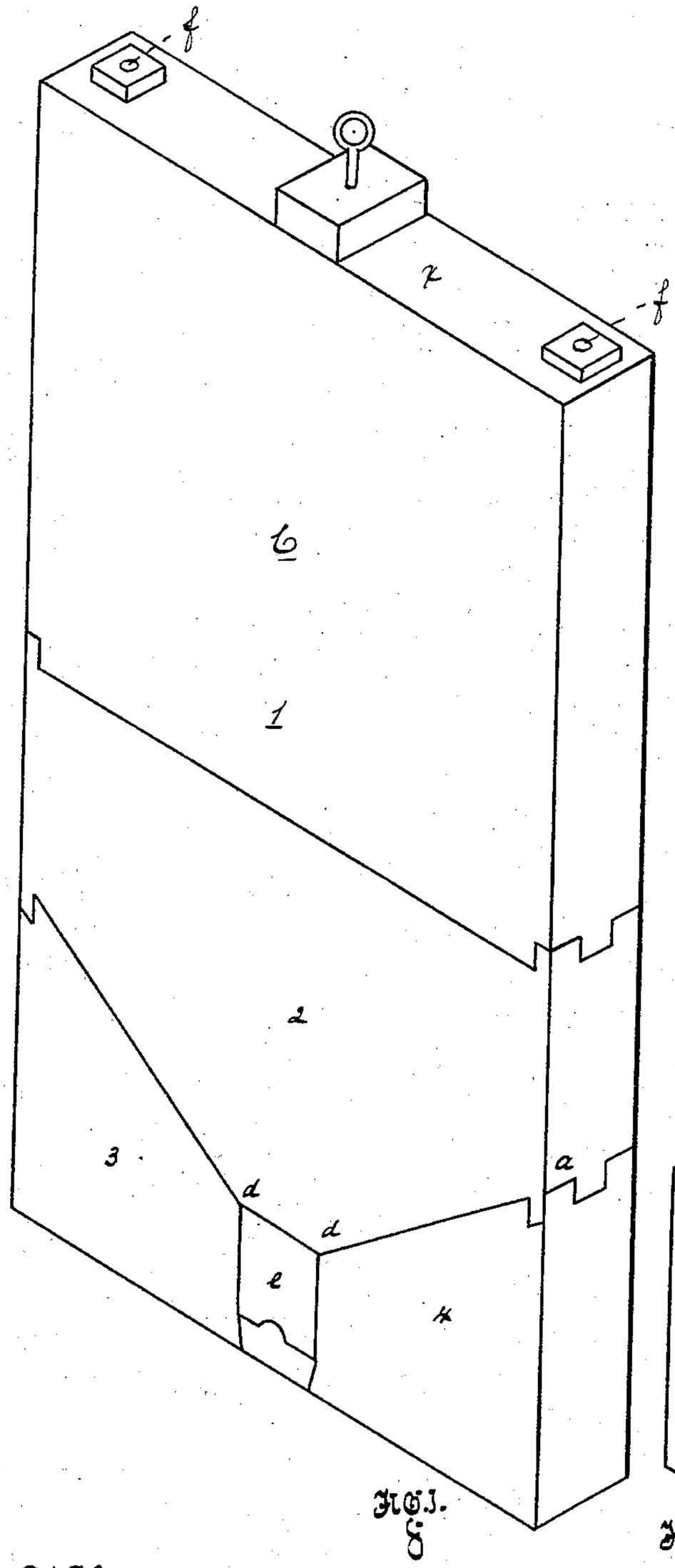

Fig. 1.

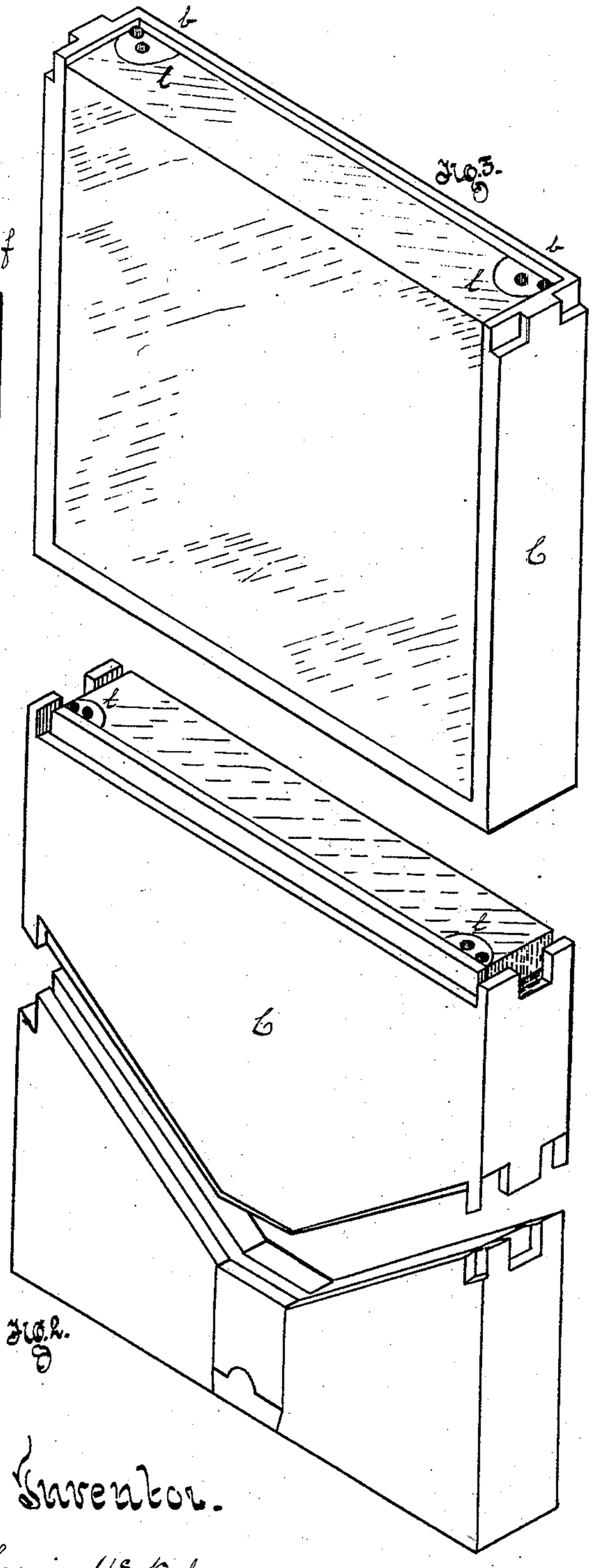

Fig. 2.

Witnesses.
Jno. K. Smith
L. C. Fitler.

Inventor.
Louis McKelvey
by his attys
Bakewell & Kerr

UNITED STATES PATENT OFFICE.

LEWIS McKELVEY, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN DOORS FOR FURNACES.

Specification forming part of Letters Patent No. **222,068**, dated November 25, 1879; application filed September 29, 1879.

To all whom it may concern:

Be it known that I, LEWIS MCKELVEY, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Doors for Furnaces; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a perspective view of my invention. Figs. 2 and 3 are detached views of the same.

My invention relates to furnace-doors, and is designed to overcome the loss arising from the rapid burning away of the door, especially in puddling and heating furnaces; but it is applicable to all descriptions of furnaces, and especially to those in which the door is subjected to a greater degree of heat in one part than in another.

In the case of the doors of puddling-furnaces, which ordinarily weigh from one hundred and sixty-five to three hundred pounds, of iron casting, the lower part of the door is exposed to a much more intense heat than the upper part, and the same is the case in heating-furnaces, where the weight of the doors runs from one hundred and fifty to six hundred pounds. In such furnaces, although they are lined with fire-brick, the lower part will frequently burn away in a few weeks, while the upper portion will remain good and will last for many years; but as the entire door becomes ruined and worthless where any portion of the iron is burned through a great loss and waste is the consequence. These doors are, of course, subjected to the greatest heat at or near the bottom, or near the level of the hearth; but the destruction or burning out of the shell is found in practice to also extend up the sides to a greater or less extent, due probably to the access of air at the junction of the door and frame.

To remedy this difficulty I propose to build the iron part or shell of the door in two or more pieces, the base piece or pieces being of general triangular form and extending up the sides along the line of greatest exposure, the several parts being flanged and bolted together, as shown in the drawings, so that when the lower part burns away or becomes so warped as to be no longer useful it may be removed, and its place supplied by a new piece or pieces.

I will now describe my invention, so that others skilled in the art may manufacture and use the same.

The casing C of the door, which is of the usual size and shape, is made in two or more pieces, as shown in the drawings, which pieces dovetail together and are fastened by means of the lugs *l*, through which pass the screw-bolts *b*, by which the several sections of the casing are firmly fastened together. These lugs *l* are placed in the inside of the casing C, between the brick-work, and are made with and form part of the casing. Each section of the casing is furnished with two or more of these lugs, which are so arranged that the lugs of one section join and fit over the lugs of the counter-section of the casing.

In puddling-furnaces I prefer to make the casing in four parts, as shown in the drawings, dividing it horizontally about half-way between the top and bottom of the door, and again at an angle running from the points *a a*, at the sides of the casing, a little more than one-fourth the length of the door from the bottom thereof, downward, at about an angle of forty-five degrees, to the points *d d*, thence horizontally across between these points, and also vertically from the points *d d* to the bottom of the door. This divides the casing into four parts, and leaves a space, *e*, at the bottom, in which is fitted what is known as a "patent bit."

In addition to the dovetailed edges of the casing and the lugs and screw-bolts *l* and *b*, I use iron rods or standards *f*, which are attached to the lower sections of the casing, pass up along the edges of the casing on the inside, and are fastened to the upper flanges, *x*, of the top section of the casing by nuts or other device.

The casing, being thus made in sections, is fastened firmly together by means of the lugs, screw-bolts, and standards, or other suitable devices, which may be used instead, and the brick-work is filled in the usual way.

The upper section, 1, of the door will last

from fifteen to twenty years, while the lower portions, 2, 3, and 4, will burn away in from six to eight weeks.

When one portion has been destroyed by the heat the fastening devices are unloosed, and the door taken to pieces and another portion substituted in its place.

If it is desired, the pieces 3 and 4 may be made in one piece instead of two, as shown in the drawings.

When the door to be constructed is very wide it may be made in vertical sections, which are fastened by standards and bolts passing horizontally across the door. The sections of the door may, if preferred, be filled in with brick-work separately, and there fastened together as hereinbefore described.

The lines of sections may be varied in different furnaces according to the extent of surface exposed to the greatest heat.

My invention is especially applicable to puddling and heating furnaces, but is also applicable to ovens and other furnaces where the doors are exposed to irregular degrees of heat.

I am aware that furnace-doors have heretofore been formed in sections and with detachable base or bottom pieces, and therefore do not broadly claim the same; but,

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a sectional furnace-door, the combination, with one or more upper sections, of a detachable base section or sections separable therefrom, on a line corresponding to the joint lines *a d d a*, substantially as and for the purpose set forth.

2. In a sectional furnace-door, the combination, with an upper section, of two angular corner-sections, forming the base or bottom of the door, and an interposed bit, substantially as and for the purpose specified.

In testimony whereof I, the said LEWIS MCKELVEY, have hereunto set my hand.

LEWIS MCKELVEY.

Witnesses:

JAMES K. BAKEWELL,

A. C. JOHNSTON.