

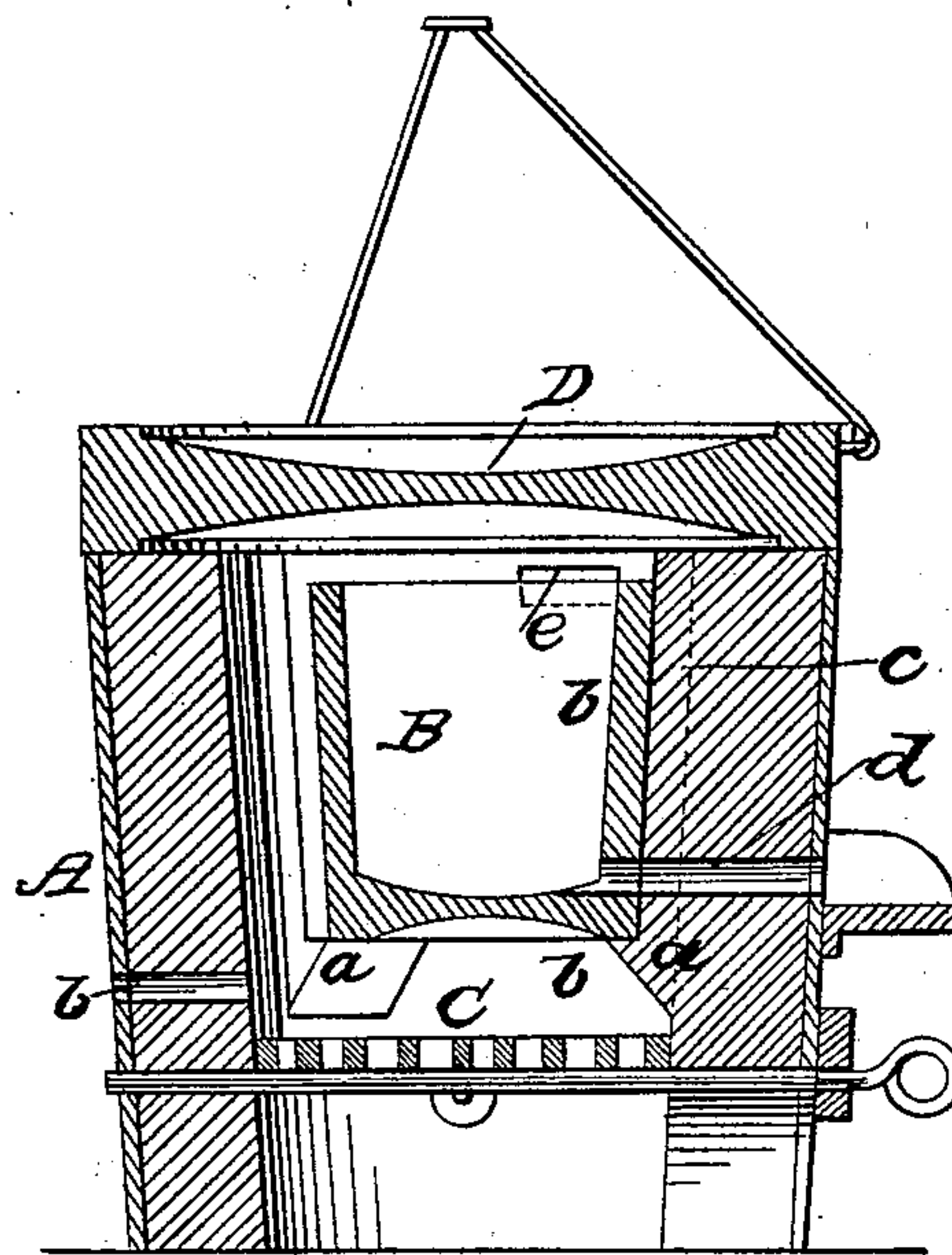
THOMSON & WIDDOWFIELD.

Furnace for Melting Metals.

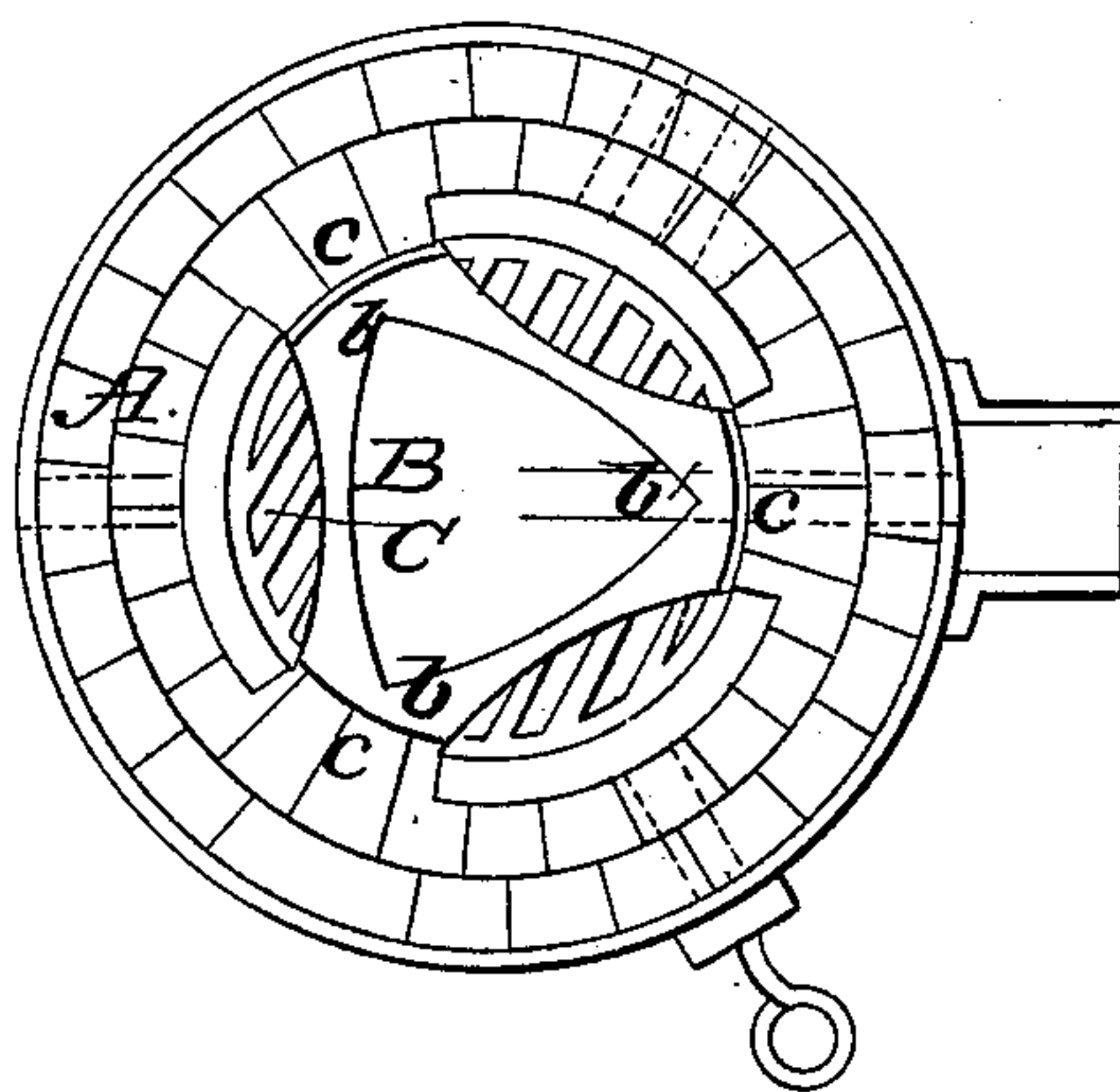
No. 43,048.

Patented June 7, 1864.

*Fig. 1.*



*Fig. 2.*



*witnesses*  
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# UNITED STATES PATENT OFFICE.

JOHN THOMSON, OF NEW YORK, AND THOMAS WIDDOWFIELD, OF BROOKLYN, N. Y.

## IMPROVEMENT IN FURNACES FOR MELTING METALS, &c.

Specification forming part of Letters Patent No. 43,048, dated June 7, 1864.

*To all whom it may concern:*

Be it known that we, JOHN THOMSON, of the city, county, and State of New York, and THOMAS WIDDOWFIELD, of Brooklyn, in the county of Kings and State aforesaid, have invented a new and useful Improvement in Melting-Furnaces; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a vertical central section of our invention. Fig. 2 is a plan or top view of the same, the cover having been removed to expose the interior of the furnace.

Similar letters of reference indicate corresponding parts.

This invention consists in the employment or use, for the purpose of melting metals or other materials, of a crucible with double-arched or double-concave bottom and sides in such a manner that said bottom and sides are braced every way by the double arch, and the crucible is prevented from cracking or splitting; also, in a crucible provided with rounded corners, and fitting in a casing with correspondingly concave seats in such a manner that by said seats the crucible is strengthened and the application of a tap-hole to the crucible is rendered practicable; finally, in the use of a double-arched cover fitting on the casing in such a manner that by the two arches the cover is strengthened, and it is prevented from cracking or splitting.

A represents a furnace or casing made of wrought or cast iron, and lined with brick. This casing is provided with a ledge or shoulder, *a*, to support the crucible B, and at a convenient distance below this ledge is the fire-grate C. If the crucible is to be heated by natural draft, or if an artificial draft is to be used, the grate is replaced by a solid plate, and the blast is introduced through three (more or less) tuyere-holes *b*.

The crucible B is made in the form shown in Fig. 2. Its sides are concave on the inside and outside, giving to the interior of the cru-

cible the form of a spherical triangle and rendering the sides double-arched, so as to increase their power of resistance and render them safe against splitting or cracking. The bottom of our crucible is also double arched, and its strength is thereby increased in the same ratio as that of the sides. The corners *b* of the crucible B are rounded off, as clearly shown in Fig. 2, and they fit nicely against concave seats *c* built in the interior of the casing A. By means of these seats the crucible is held in the center of the casing, and its rounded corners are supported and prevented from cracking. The corners fit closely to the seats from top to bottom, and a hole, *d*, extends through one of the corners of the crucible and through one of the seats, as clearly shown in Fig. 1. This hole forms the tap-hole, through which the melted metal is drawn off, and it is made slightly tapering and stopped up by a tapering plug, which is operated by a lever hinged to the outside of the casing or attached thereto in any convenient manner. The crevice which may exist between the crucible and seat of the casing around the tap-hole *d* can be easily stopped up by suitable luting to prevent the loss of metal. This luting can be easily renewed whenever it should be necessary, but if the rounded corners of the crucible are fitted nicely to the concave seats in the casing, very little, if any, luting will be required.

The casing A is provided with a cover, D, which is made double-arched, similar to the sides and bottom of the crucible, and by this double arch its power of resistance is considerably increased and its liability to crack or split is greatly reduced.

The heat and flame rising from the fuel on the grate C pass up on the sides of the crucible and over it, heating the same, with its contents, thoroughly and uniformly, and the products of combustion pass off through an aperture, *e*, which is on a level, or nearly so, with the top edge of the crucible.

This furnace can be used with advantage for melting metal of any description. It is convenient in its operation, there being no necessity of removing the crucible; and it is



also very economical, particularly on account of the strength and durability of the crucible and all other parts connected with the furnace.

We claim as new and desire to secure by Letters Patent—

1. The crucible B, made with double-arched sides and bottom, as shown and described.

2. The rounded corners *b* of the crucible applied in combination with the concave seats *c* in the casing, and with the tap-hole *d*, in the manner and for the purpose substantially as set forth.

3. The double-concave cover D, in combination with the furnace A and crucible B, constructed and operating as and for the purpose specified.

JOHN THOMSON.  
THOMAS WIDDOWFIELD.

Witnesses:

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