

Brookfield & White, Glass Furnace,

No 9,789,

Patented June 14, 1853.

Fig. 2.

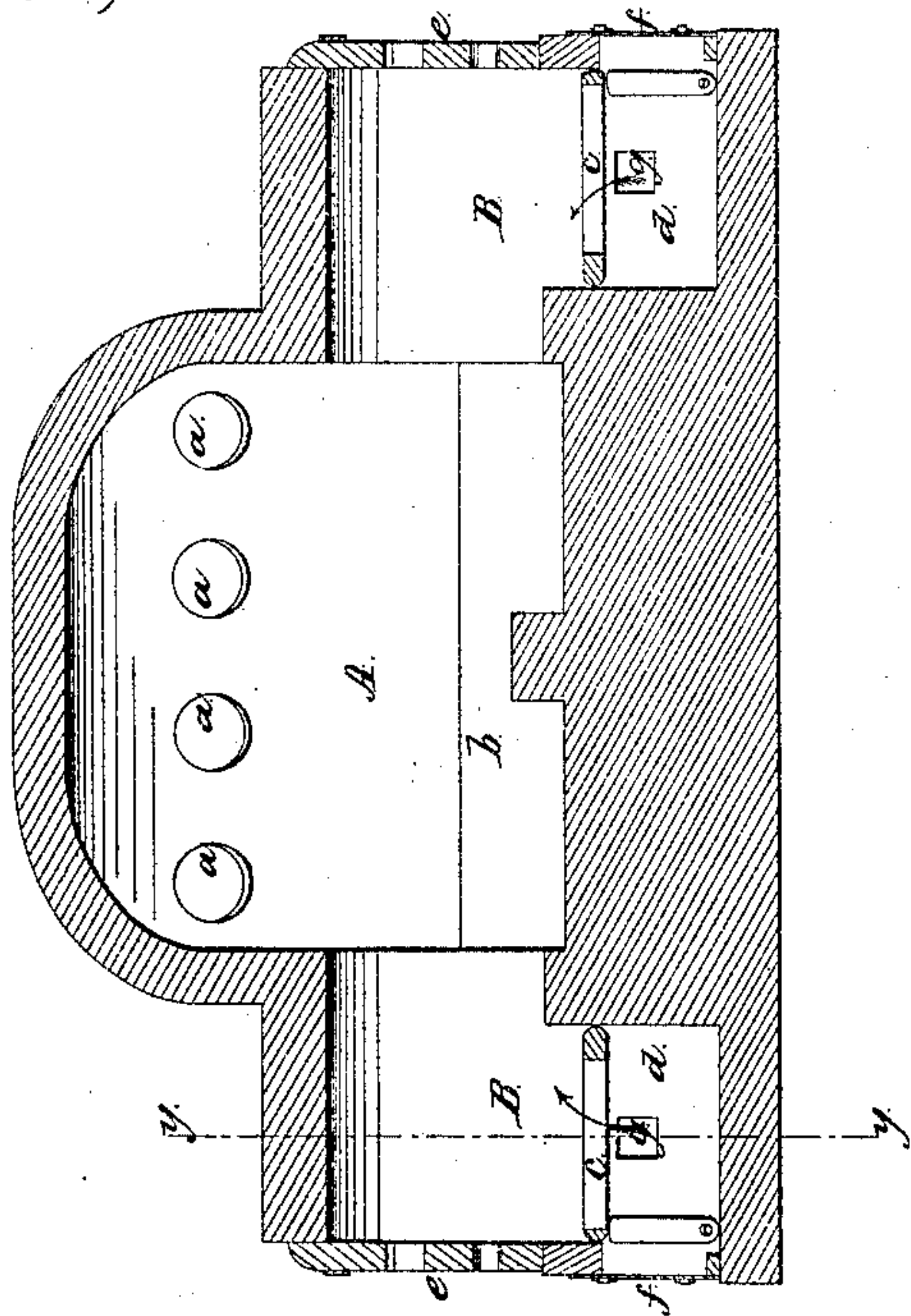


Fig. 3.

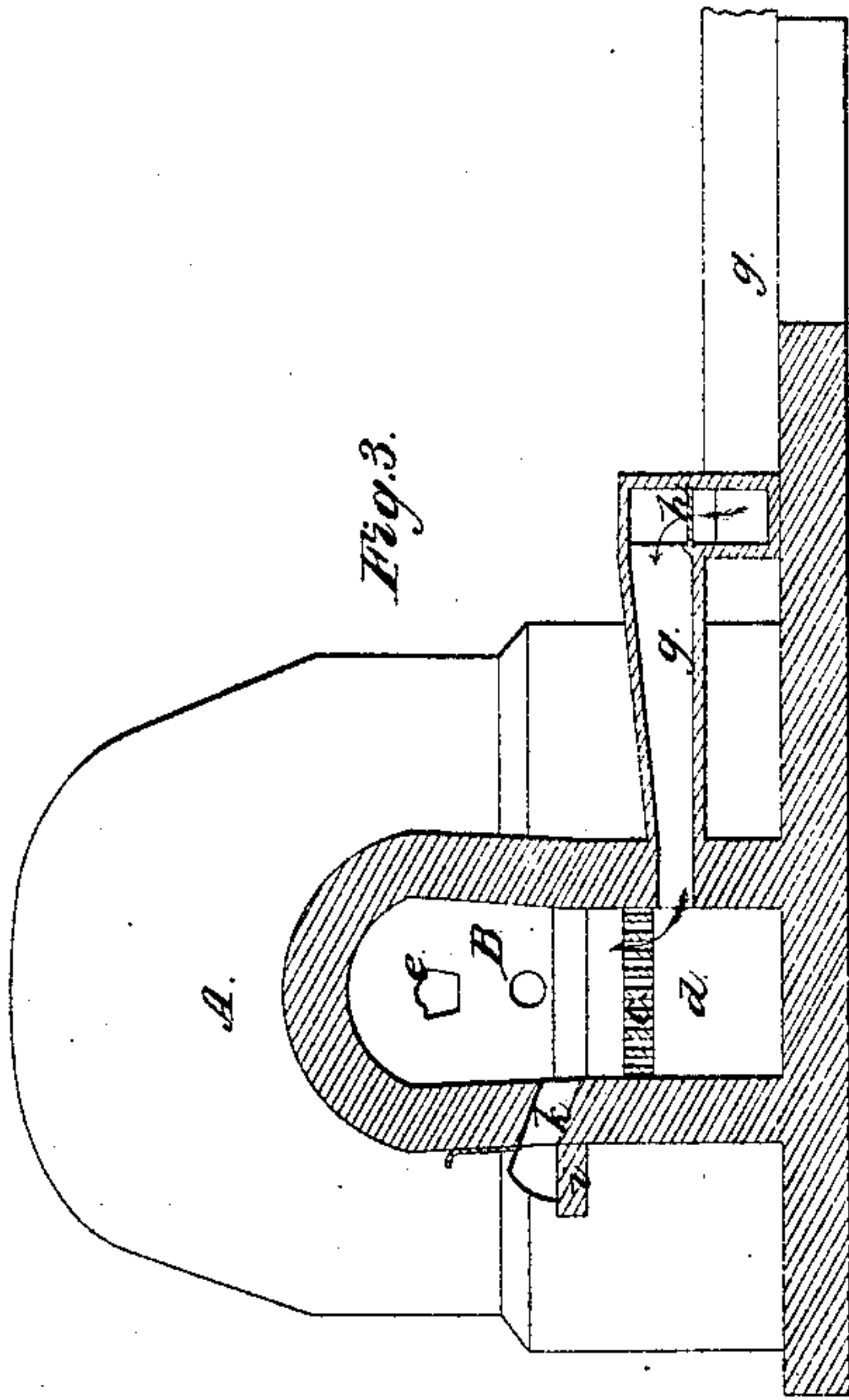
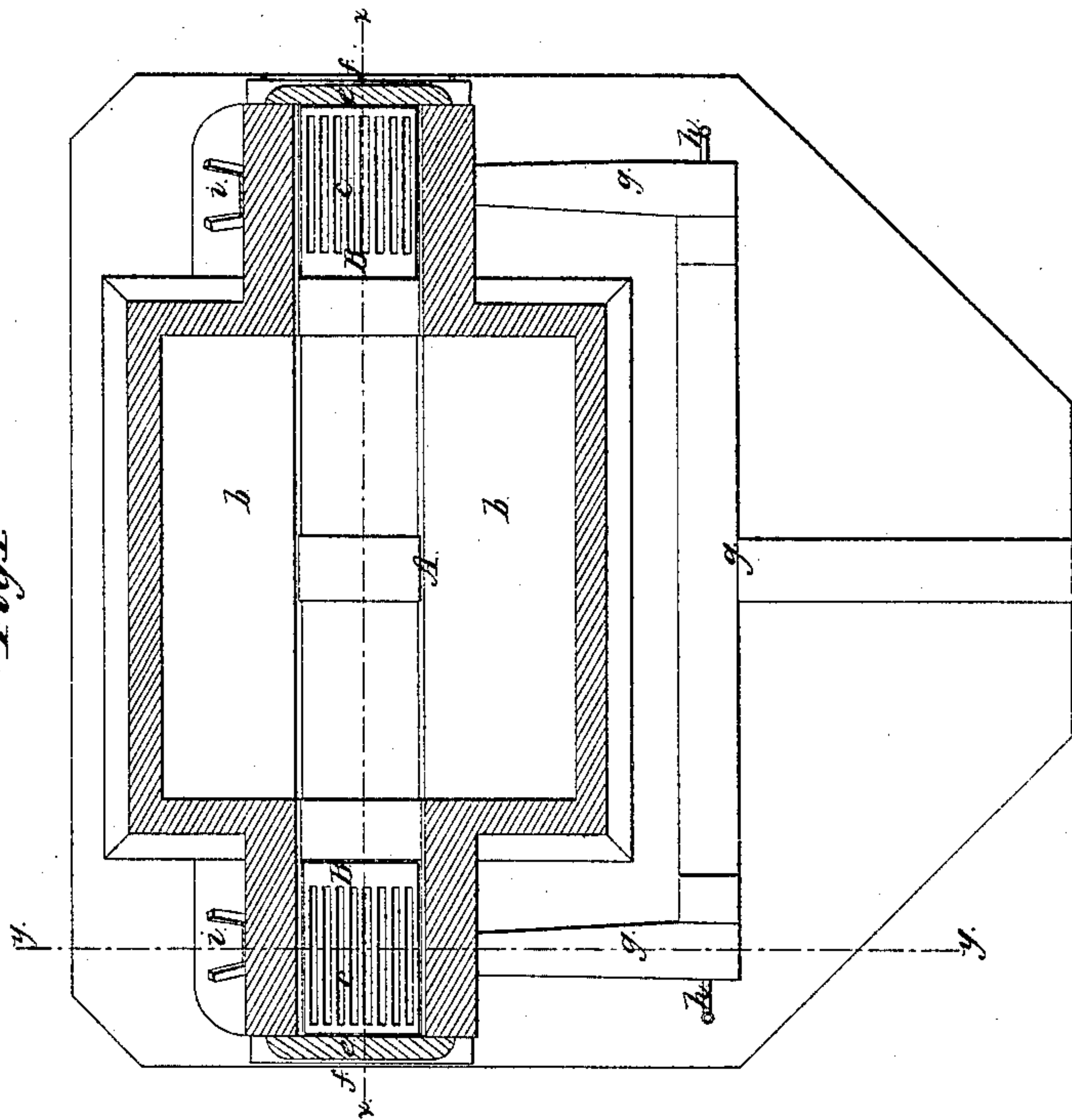


Fig. 1.



UNITED STATES PATENT OFFICE.

JAMES M. BROOKFIELD AND EPHRAIM V. WHITE, OF HONESDALE, PENNSYLVANIA.

MANUFACTURING GLASS.

Specification of Letters Patent No. 9,789, dated June 14, 1853.

To all whom it may concern:

Be it known that we, JAMES M. BROOKFIELD and EPHRAIM V. WHITE, of Honesdale, in the county of Wayne and State of Pennsylvania, have invented a new and Improved Mode of Manufacturing Glass by the Use of Anthracite Coal as a Fuel; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

Figure 1, is a horizontal section, at the height of the sieges, of a glass furnace constructed with our improvements; Fig. 2, a longitudinal vertical section in the line *x*, of Fig. 1; and Fig. 3, a transverse vertical section in the lines *y*, *y*, of Figs. 1 and 2.

Like parts are designated by like letters in the several figures.

The nature of our invention consists in combining and using a blast with the ordinary furnace and anthracite coal as a fuel for melting the materials in the manufacture of glass.

We make use of a common furnace, having the ordinary arched chamber A, for containing the melting pots, working holes *a*, *a*, &c., sieges *b*, *b*, heating chambers B, B, grates *c*, *c*, air chambers *d*, *d*, doors *e*, *e*, *f*, *f*, &c.; and to enable us to burn anthracite coal we apply, in addition, a blast apparatus, constructed so as to use any known and convenient means of producing a blast, which blast is conducted through the pipe *g*, to the air chambers *d*, *d*. The strength of the blast is regulated by the sliding valves *h*, *h*, or their equivalents. The blast is diminished in force by partly closing the valve *h* and increased by opening the same. The effect of the blast with the anthracite is to raise a flame and diffuse the heat about the parts and over the materials to be melted. The shelves *i*, *i*, and apertures *k*, *k*, are for heating the coal and introducing it into the heating chambers B, B, to burn, the coal being placed upon the shelves previous to its introduction to the furnace.

It is well known to those skilled in the manufacture of glass that a brisk, intense and constant heat is necessary for melting the materials of glass in the furnace, as the fuel is consumed at a comparatively long distance from the melting pots, and the heat must be conveyed rapidly to the said pots. It is also well known that anthracite coal, though producing a very intense and constant heat and for those reasons peculiarly

adapted to this purpose, has heretofore failed to produce suitable heat on account of the small amount of flame produced thereby, thus not enabling the heat to be readily conveyed to the pots. This objection is oviated, in our improved mode, by the application of the blast properly regulated, through the aforesaid pipe *g*, whence it passes up through the grates *c*, *c*, through the burning coal, into the arched chamber A, and surrounds the pots, when it escapes through the working holes *a*, *a*, &c., or by chimneys. Experience has proved that with anthracite coal and various other kinds of fuel, a certain degree of blast must be used, whether cold or hot, to regulate the diffusion of heat. An intense blast will produce intense combustion and heat, but the heat will be in this case topical and confined to the burning mass. For instance a stream of oxygen gas directed upon the burning coal would produce vivid combustion but without flame, and a very moderate blast of atmospheric air would produce slow combustion and little or no flame. There is certain degree of blast which will raise a flame of carbonic oxid above the anthracite coal and about the pots and over the surface of the glass and this must be determined by inspection constantly, and the attendant must regulate the blast accordingly by opening or closing the valve *h*. By this means the great amount of heat engendered by the burning coal is quickly conveyed to the melting pots as desired.

We are aware that anthracite coal has been used with a blast in other processes of the arts; but their application and objects attained in our improved mode of manufacturing glass being peculiar and important we claim our invention to be new and useful.

What we claim as our invention and desire to secure by Letters Patent, is—

The application of a blast and anthracite coal as a fuel in the manufacture of glass, substantially as herein set forth.

The above specification of our improved mode of manufacturing glass by the use of anthracite coal as a fuel signed this 18th day of July, 1851.

J. M. BROOKFIELD.
E. V. WHITE.

Witnesses:

M. A. BIDWELL,
RICHARD SANGWIN.