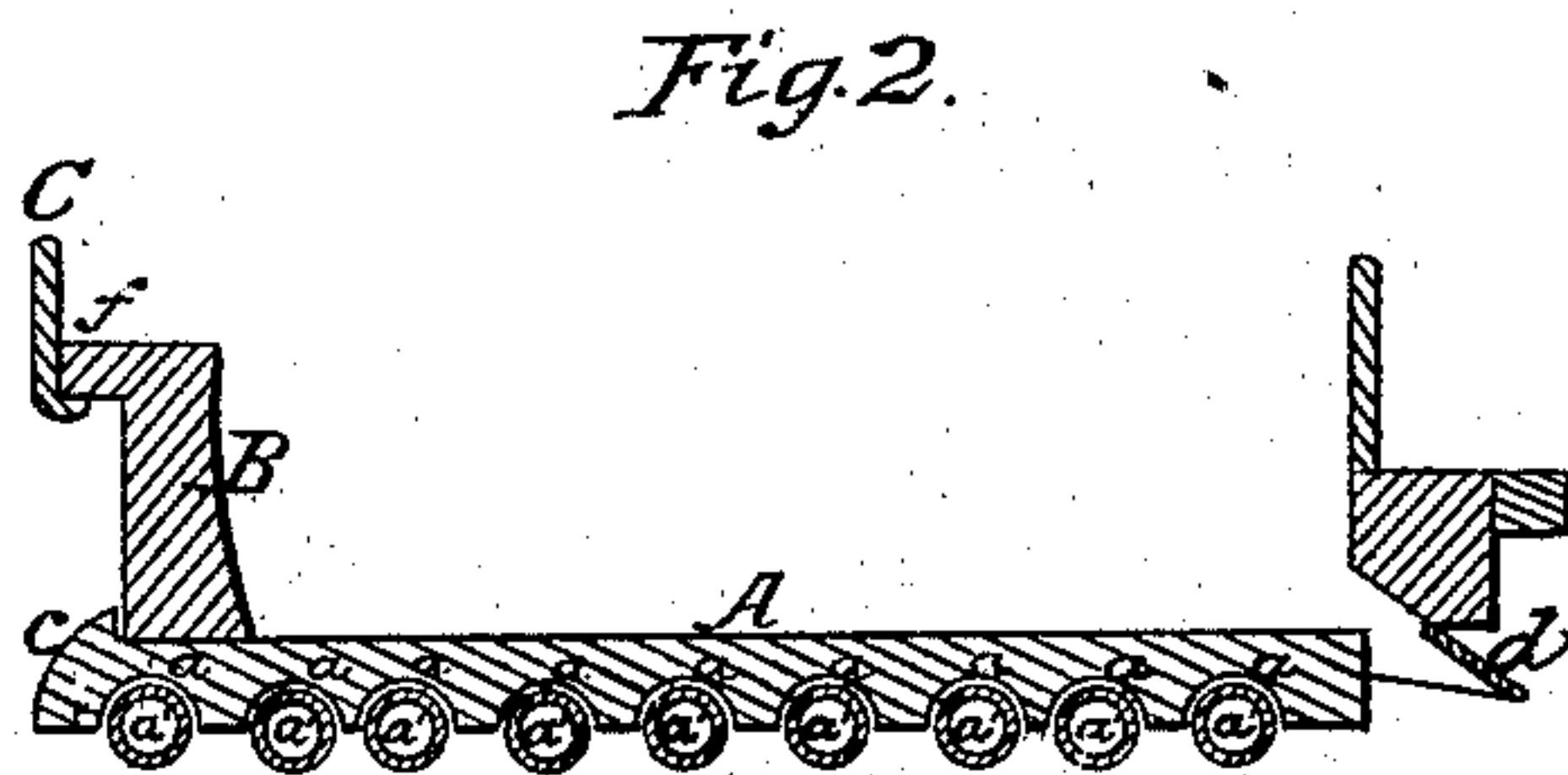
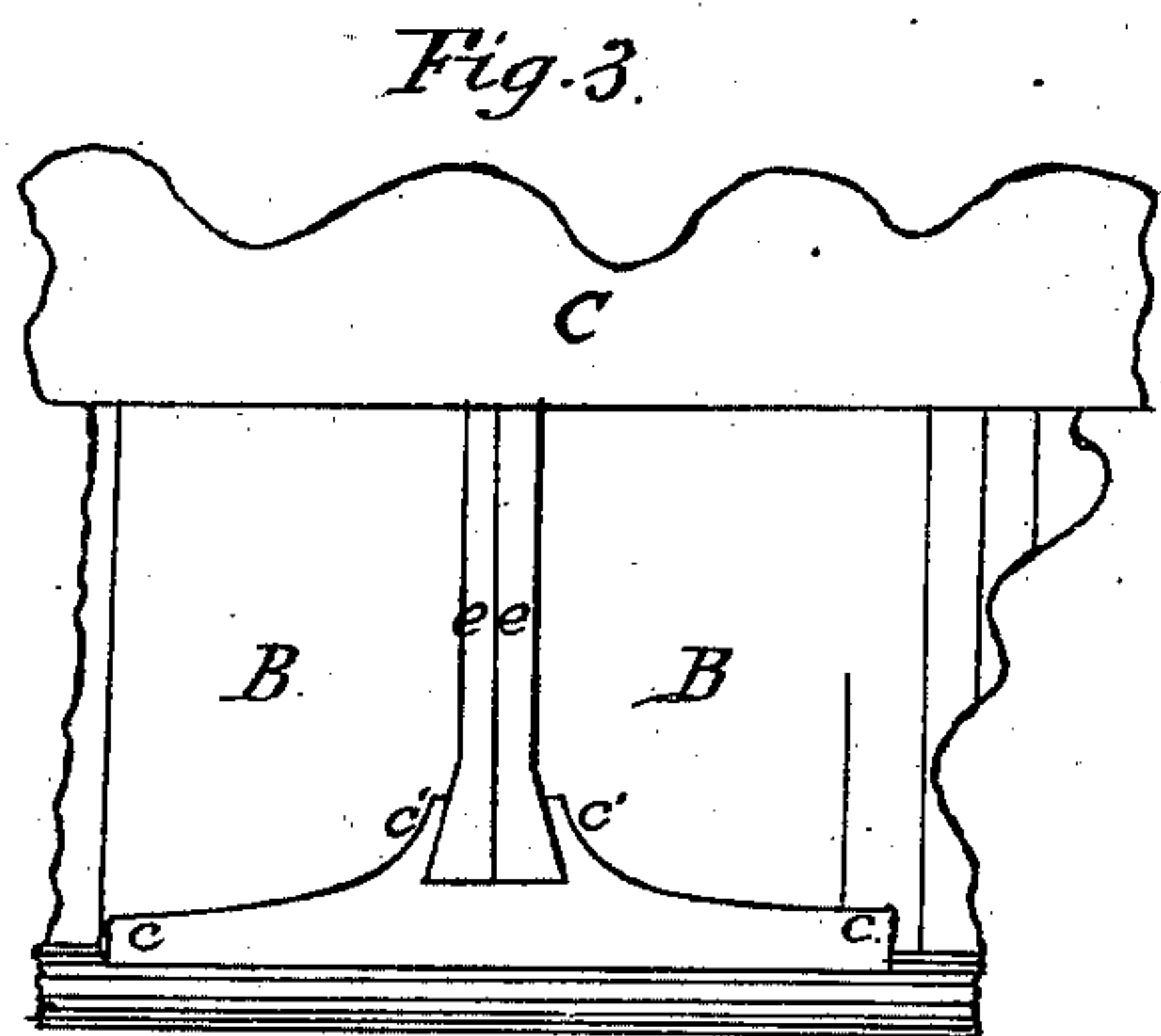
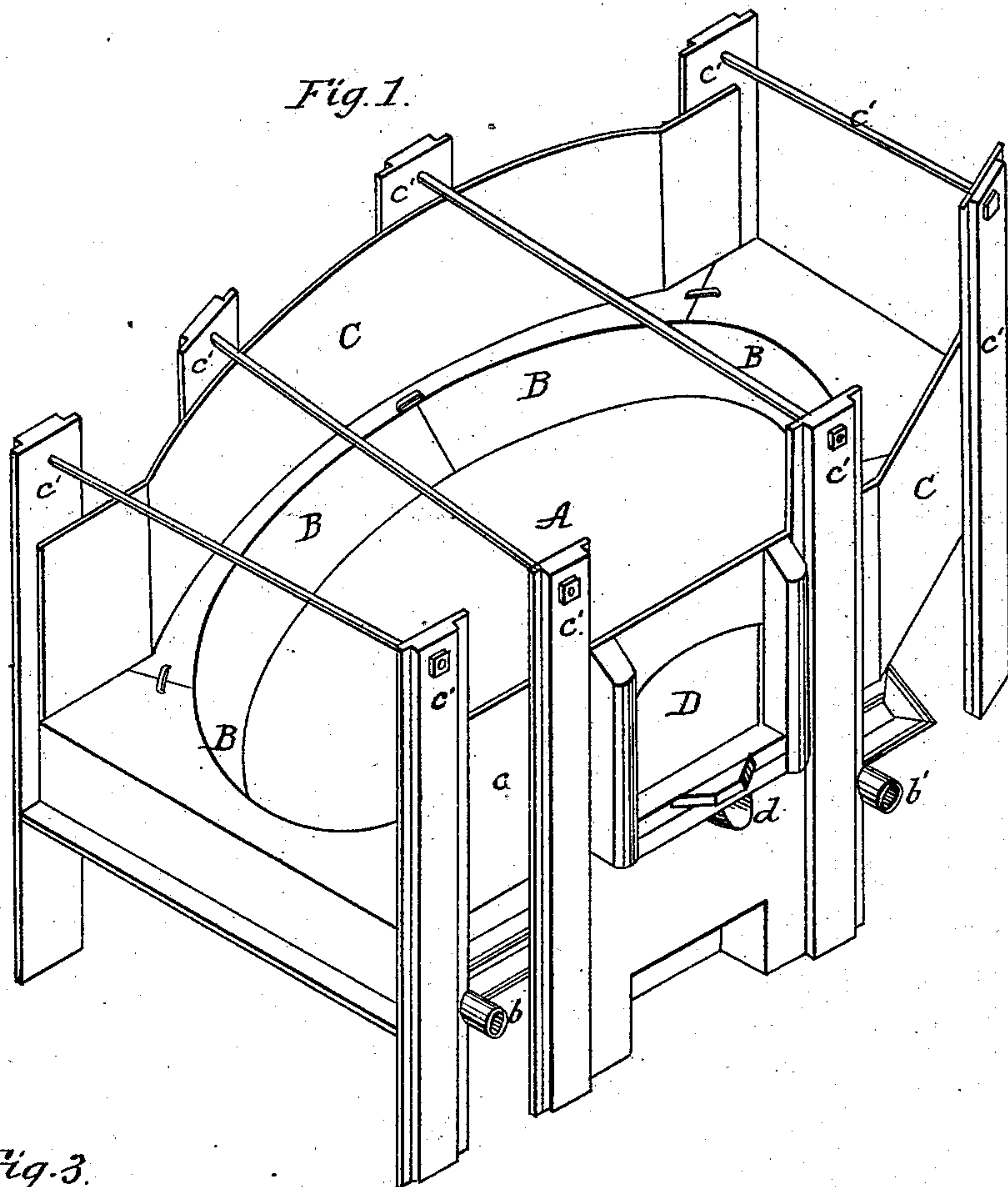


W. SWINDELL.  
Puddling and Boiling Furnace.

No. 77.932.

Patented May 12, 1868.



Witnesses.  
Thos. B. Kerr  
G. Hensbury

Inventor  
William Swindell.  
by Bakewell & Erush  
his Attys.



# United States Patent Office.

WILLIAM SWINDELL, OF ALLEGHENY CITY, PENNSYLVANIA.

Letters Patent No. 77,932, dated May 12, 1868.

## IMPROVEMENT IN PUDDLING AND BOILING-FURNACES.

The Schedule referred to in these Letters Patent and making part of the same.

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, WILLIAM SWINDELL, of the city of Allegheny, in the county of Allegheny, and State of Pennsylvania, have invented a new and useful Improvement in Puddling and Boiling-Furnaces; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawing, making a part of this specification, in which—

Figure 1 is a perspective view of a puddling-furnace furnished with my improvements.

Figure 2 is a vertical cross-section through the bottom plate and one of the rear boshes; and

Figure 3 is an enlarged outside view of a part of two contiguous boshes, illustrative of my mode of uniting them to the bottom plate and to each other.

Like letters of reference indicate like parts in each.

The nature of my invention consists, first, in casting the inner faces of the boshes of a puddling-furnace against a metallic chill placed in the mould; second, in extending a ledge or rim around the bottom plate, on its upper face, just outside the line of the boshes, against which to place the boshes, that they may be supported and held firmly in place; third, in attaching the boshes to the bottom plate and to each other by ribs on the ends of the boshes, so made as to dove-tail into lugs, projections, or a ledge on the bottom plate; and, fourth, in making the bottom plate with a series of grooves in or across its lower face, and in placing in such grooves a series of tubular water-chills, through which to pass a flow of water, for the purpose of counteracting the otherwise destructive or injurious action of the heat on the bottom plate.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and manner of use.

A represents the bottom plate of a puddling or boiling-furnace, and B the sides or boshes, enclosed in front and rear by walls C, strengthened by posts and brick staves C', in the usual or any known manner. D is the door, and d the tap-hole, also of the usual construction. The bottom plate A is made with a series of grooves, *a*, running along, across, or in its lower face, (fig. 2,) in any desirable number, or in any direction, as longitudinal, transverse, &c. In these grooves *a*, I arrange a series of water-pipes, *a'*, one in each groove, connecting them together, at their ends, in such way that a flow of water may be kept up through them, the water passing in by a supply-pipe, *b*, at one end of the series, and being discharged by a suitable pipe, *b'*, at the other end. By cocks of the usual construction, the flow of the water in the pipes *a'* can be so regulated that, while acting on the bottom plate A, it will have a uniformly high or low temperature, as may be preferred. Hence, it acts somewhat as a chill on the bottom plate, and prevents it from becoming so highly heated as to be destroyed or seriously injured while the process of puddling is being carried on.

The inner faces of the boshes B, I cast against a metallic chill placed in the mould. In this way I give them a chilled surface, whereby they better resist the destructive action of the excessive degree of heat to which they are subject. The cinder, also, is less liable to adhere to them, so that thus, and in connection with the water-pipes above described, a much less amount of scrap or "fixing" is required than in puddling-furnaces of the usual construction.

Around the bottom plate A, on its upper face, and just outside the line of boshes B, I cast a ledge or rim, *c*, against which to rest the boshes B when in position, as shown in figs. 2 and 3. This ledge *c* holds the boshes B in position from the outside, and lessens, materially, their liability to work out of place; but, as a further security, and an additional improvement, I cast on the outer face of each one of the boshes or sides B, at each end, a rib, *e*, which increases in breadth at its lower end, so that, when two boshes B are placed together, end to end, as in fig. 3, on the bottom plate A, the lower ends of the ribs *e*, entering between the lips *c'* on the ledge *c*, will form therewith a dove-tail joint, and the boshes will be more securely held in place; but this mode of jointing the boshes to the bottom plate may be used either with or without the ledge *c*; and, in the latter case, the female part of the dove-tail joint may be cast directly on the upper face of the bottom plate. I also support the boshes *b*, along their upper edge, by a flanged part, *f*, which rests on the plate C'', (fig. 2.)



In order to hold the boshes B as tightly together as possible along their upper edges, I use staples *g*, which are inserted in holes made in casting, or drilled for that purpose.

The devices described are used with fire and flue-bridges, and other necessary and well-known parts of a puddling-furnace, in the usual way.

The grooved bottom plate A may be made in two or more sections, and the pipes be used therewith in substantially the same manner.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A bottom plate for a puddling or boiling-furnace, cast with a series of grooves in or along its lower surface, in which to arrange a series of water-pipes, substantially as and for the purposes hereinbefore set forth.
2. The use of a series of tubular water-chills, *a'*, when arranged in grooves cast in the lower face of the bottom plate of a boiling or puddling-furnace, substantially as and for the purposes hereinbefore described.
3. Supporting the boshes of a puddling or boiling-furnace by a ledge or rim, *c*, on the upper face of the bottom plate, and extending around it in the outside line of the boshes, substantially as and for the purposes hereinbefore expressed.
4. Jointing the boshes of a puddling or boiling-furnace to the bottom plate and to each other by ribs *c*, so shaped as, in connection with lips *c'*, to form a dovè-tail joint, substantially as and for the purposes set forth.
5. Making chill-faced boshes for puddling or boiling-furnaces, by casting them against a metallic chill, substantially as and for the purposes hereinbefore set forth.

In testimony whereof, I, the said WILLIAM SWINDELL, have hereunto set my hand.

WILLIAM SWINDELL.

Witnesses:

W. BAKEWELL,  
ELL TORRANCE.