

W. Swindell,

Furnace Stack.

No. 106,636.

Patented Aug. 23, 1870.

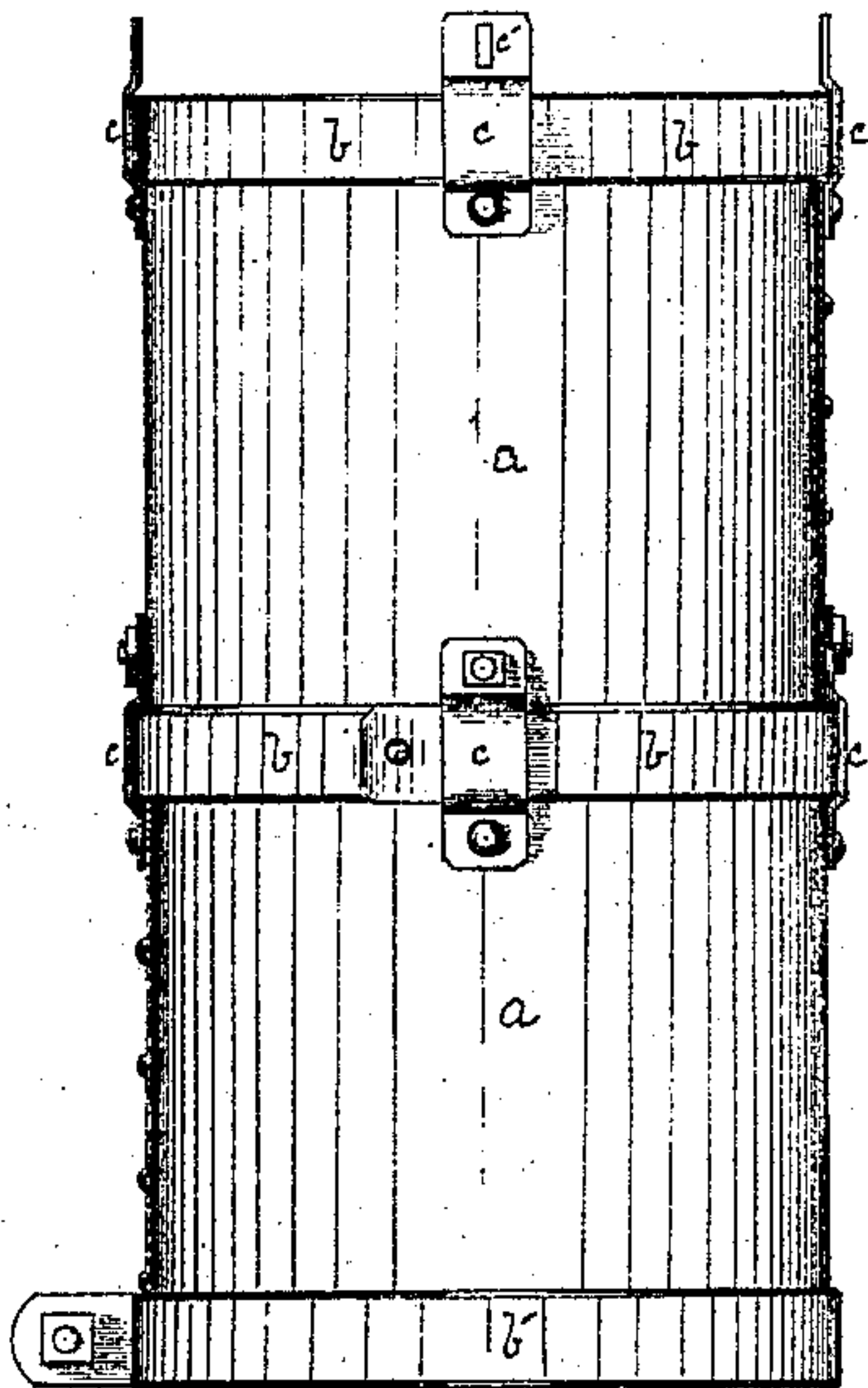


Fig. 1.

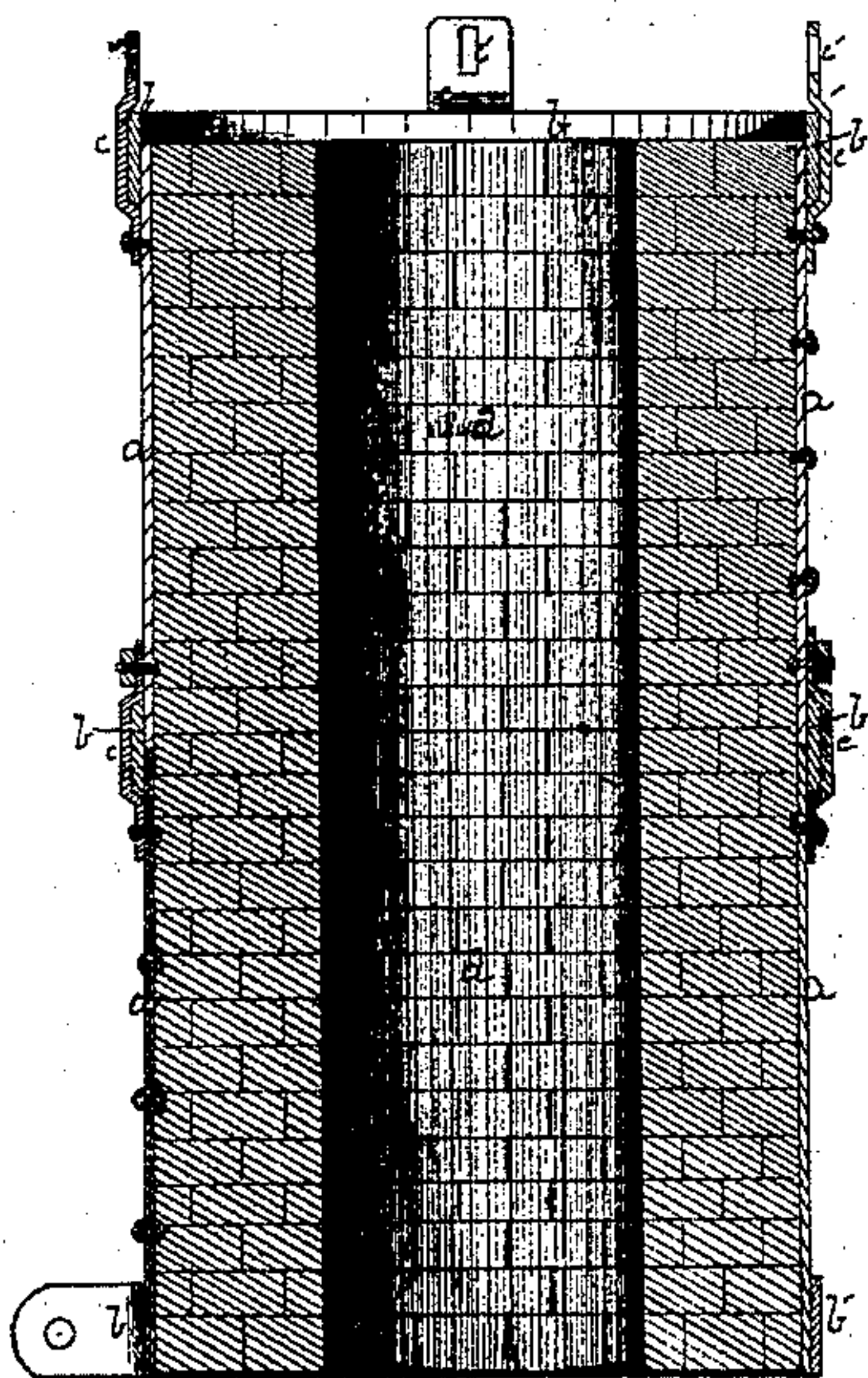


Fig. 2.

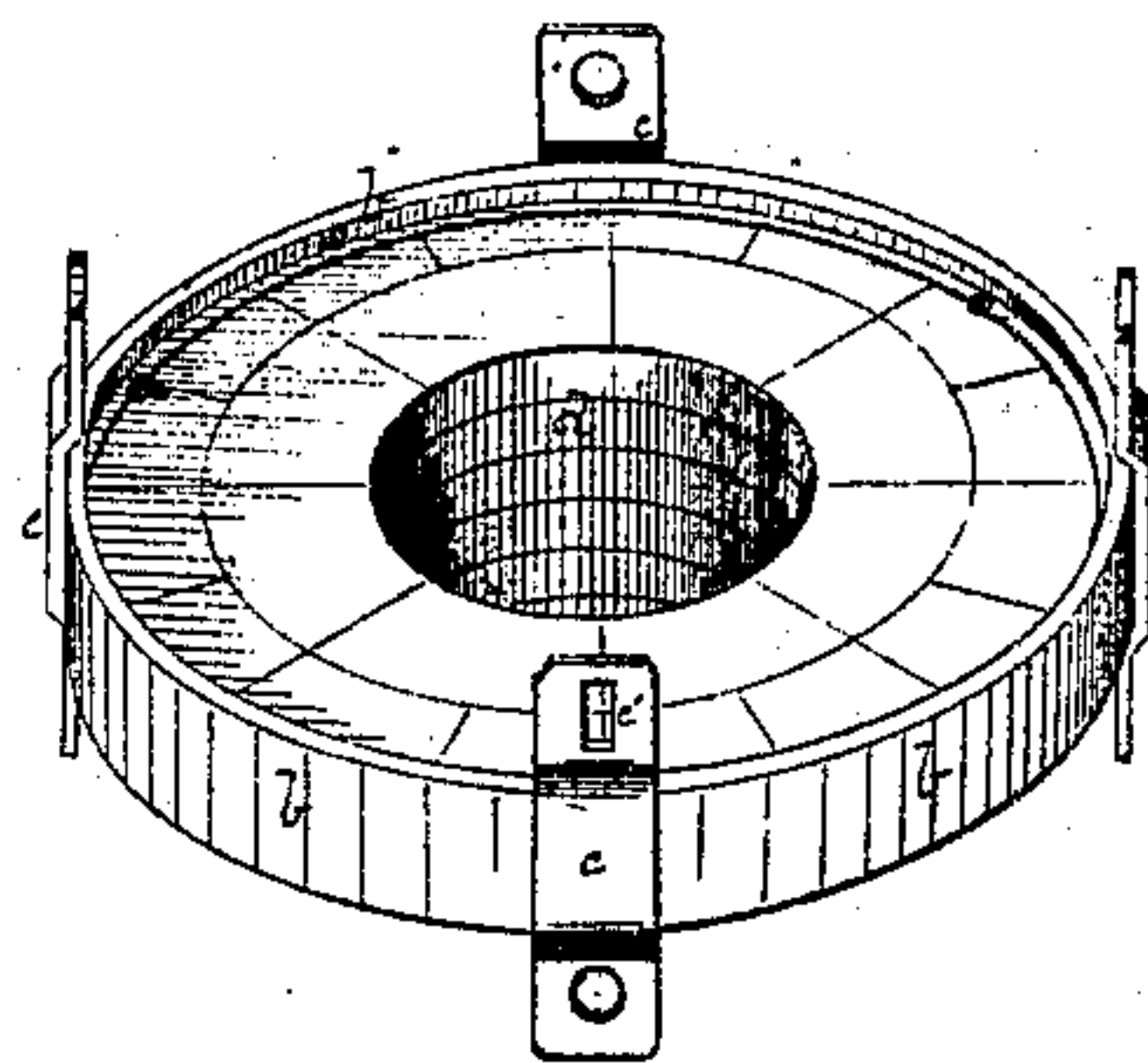


Fig. 3.

Witnesses:

Thos Bakewell  
R. C. Wrenshall

Inventor:

William Swindell,  
by Bakewell & his  
his Attys.



# United States Patent Office.

WILLIAM SWINDELL, OF ALLEGHENY CITY, PENNSYLVANIA.

Letters Patent No. 106,636, dated August 23, 1870.

## IMPROVEMENT IN STACKS FOR PUDDLING, BOILING, AND OTHER 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 Allegheny City, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Furnace-Stacks; 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 an outside view of a section of my improved furnace-stack;

Figure 2 is a vertical section thereof; and

Figure 3 is an enlarged perspective view, in section, of the parts forming the joint.

Like letters of reference indicate like parts in each.

In chimney-stacks for boiling, puddling, and other furnaces, in which an intense heat is required, it has been found highly advantageous to construct the stack of a casing of iron, lined on the inside with fire-brick. Such casings have commonly been made from sheets of boiler-plate iron, riveted together at the joints.

In the use of such stacks it has been found that the unequal vertical elongation and shortening of the brick-work lining and iron casing, effected by heating and cooling, often causes the sheets to tear apart or give away at the joints in the line of the riveting. In such case, the stack soon becomes ruined, and has to be taken down, at least as far as the ruptured joint.

The sheets forming the casing cannot be taken apart without spoiling them for any other use than reworking, and the cutting of the rivets in taking the stack down is slow and laborious work. The stack then has to be rebuilt with an entirely new casing.

By my improvement I make the casing in tubular lengths, set one on the other, end to end, cover the joint with a sleeve or draw band, which may be riveted or bolted to either length of casing, if so preferred, (but not to both, unless it be on opposite sides,) and then connect the lengths together by clips, of such construction that, while holding the lengths of casing and sleeve or draw-band in place, they shall permit of the elongation and contraction of the stack within the required limits, without danger of the tearing or giving away of any part. Then, when it becomes necessary, for any reason, to take down the stack, the clips can be removed, the lengths of casing lifted off successively, and rebuilt into the new stack, so as to last until used up by ordinary wear and tear.

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

Each length *a* of the outer casing is made of tubular form, and of any desired length, from boiler-plate iron or other suitable material, in any of the ways known to the art. These lengths are of such relative

size that they may be built up one on top of another, end to end, into a casing, as shown.

Over or around the joint formed by each two lengths *a* I place a sleeve, *b*, or a draw-band, *b'*, as may be preferred, which sleeve or draw-band may be riveted or bolted to either one of the lengths *a* before or after it is put in place, but not to both, unless it be on diametrically opposite sides of the casing.

From blanks of the required size I make the clips *c*, each bent so as to fit on outside of the sleeve *b* or draw-bar *b'*, with its ends resting, one against the upper, and one against the lower lengths *a*, where such clips are riveted or bolted to the lengths of casing, as shown, or they may be riveted to one length and bolted to the other, the latter being the preferable mode; or the clips may be cast, if so preferred. These clips *c* are arranged around each joint, at intervals greater or lesser, as may be preferred or found desirable.

As the lengths are built up, the fire-brick lining *d* is built in, which mode of building is a matter of great convenience.

Commonly, the clips *c*, if of wrought iron, being bent, and not fitting very closely, will elongate sufficiently with the vertical elongation of the casing, to hold the latter securely in place, without danger of rupture therefrom; or, if so preferred, one or both the rivet-holes in each clip may be made in the form of a slot, as shown at *c'*, in which case the clips will operate with equal efficacy in bracing the lengths of casing, and abundant room will be afforded for elongation and contraction, as set forth.

The mode of making casing described I claim, not only in its application to the uses set forth, but also as applied to the making of boiler-stacks, or other rolled or plate-iron chimneys, in which use the joint of the successive lengths may be further strengthened, if so desired, by a similar sleeve arranged inside, and attached as above described.

It will now be seen that, not only is the casing in little or no danger of being injured from unequal expansion or contraction, but also that, in case any length should, from defective workmanship, poor material, or other unforeseen cause, become broken or seriously injured, the stack can be taken down with comparatively little work, till the defective length is removed and replaced by a new one, and the old lengths which are still good can be rebuilt, with the loss only of the clips and the clip rivets; or, if the clips are bolted on at either end, without any loss at all; also, should it become necessary, from other causes, to rebuild the stack, the casing can be taken down length by length and rebuilt as before.

A further advantage consists in the fact that, by my improvement, I save a great part of the labor expended in punching and riveting the sheets for the or-



dinary construction of stacks. I also effect a further reduction in the labor of building the stack, since, in the ordinary mode of building brick-lined stacks, two sets of hands are required, one to rivet together the successive lengths of casing, and one to build in the brick lining, which operations must be carried on alternately, one set of hands being idle while the other is at work.

By placing one length on the other, covering the joint with a sleeve or draw-band, and supporting it with clips, as described, the bricklayers can carry on their work with little or no interruption; and, if the clips are bolted on, no skilled labor will be required in putting up the lengths of casing.

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

In furnace-chimneys or stacks, the metallic casing made in separate lengths, such lengths being joined together by sleeves or draw-bands and clips, substantially as set forth.

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

WILLIAM SWINDELL.

Witnesses:

WM. F. GRAHAM,  
G. H. CRISTY.