

(No Model.)

J. PEDDER.
Crucible.

No. 230,050.

Patented July 13, 1880.

Fig. 1.

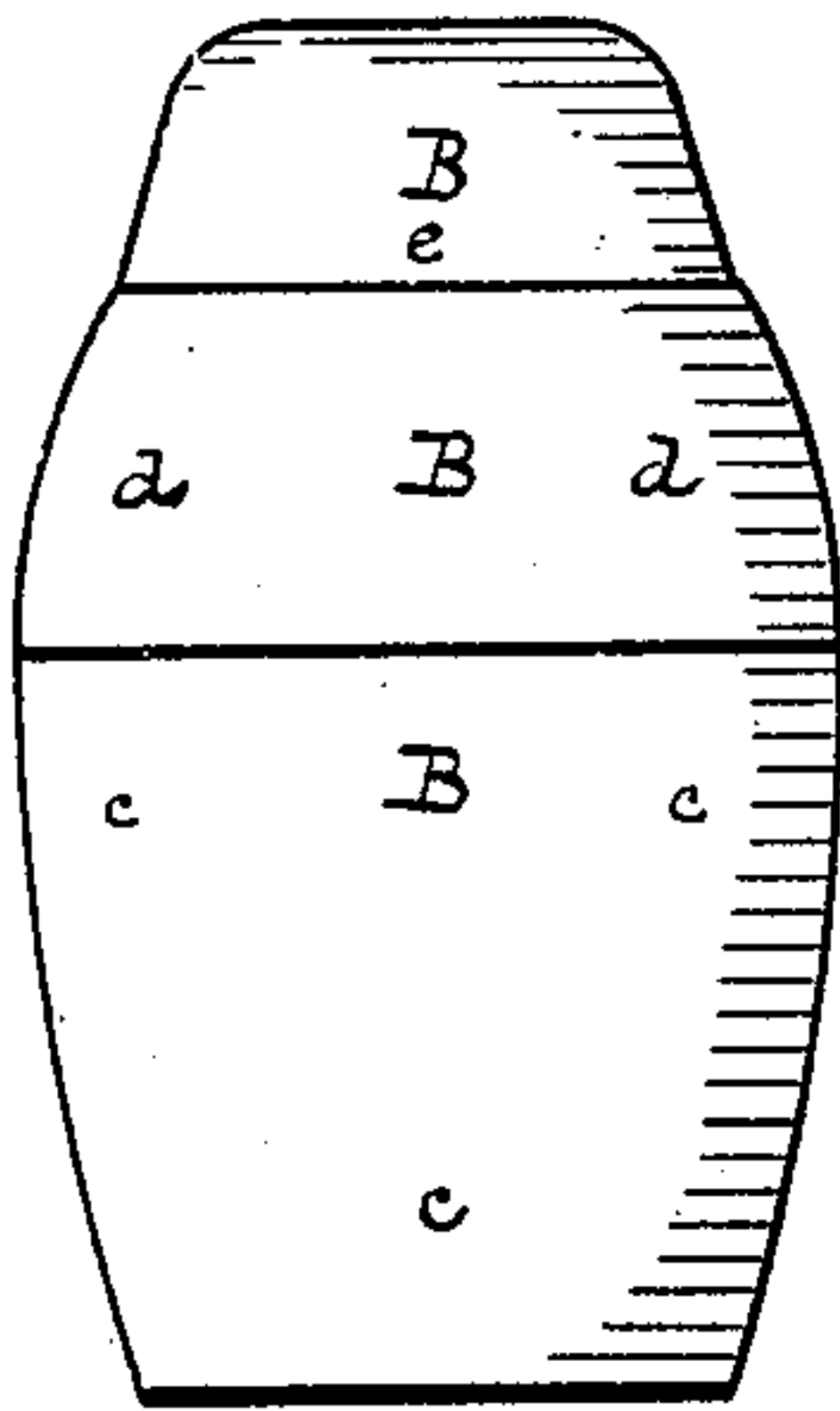


Fig. 2.

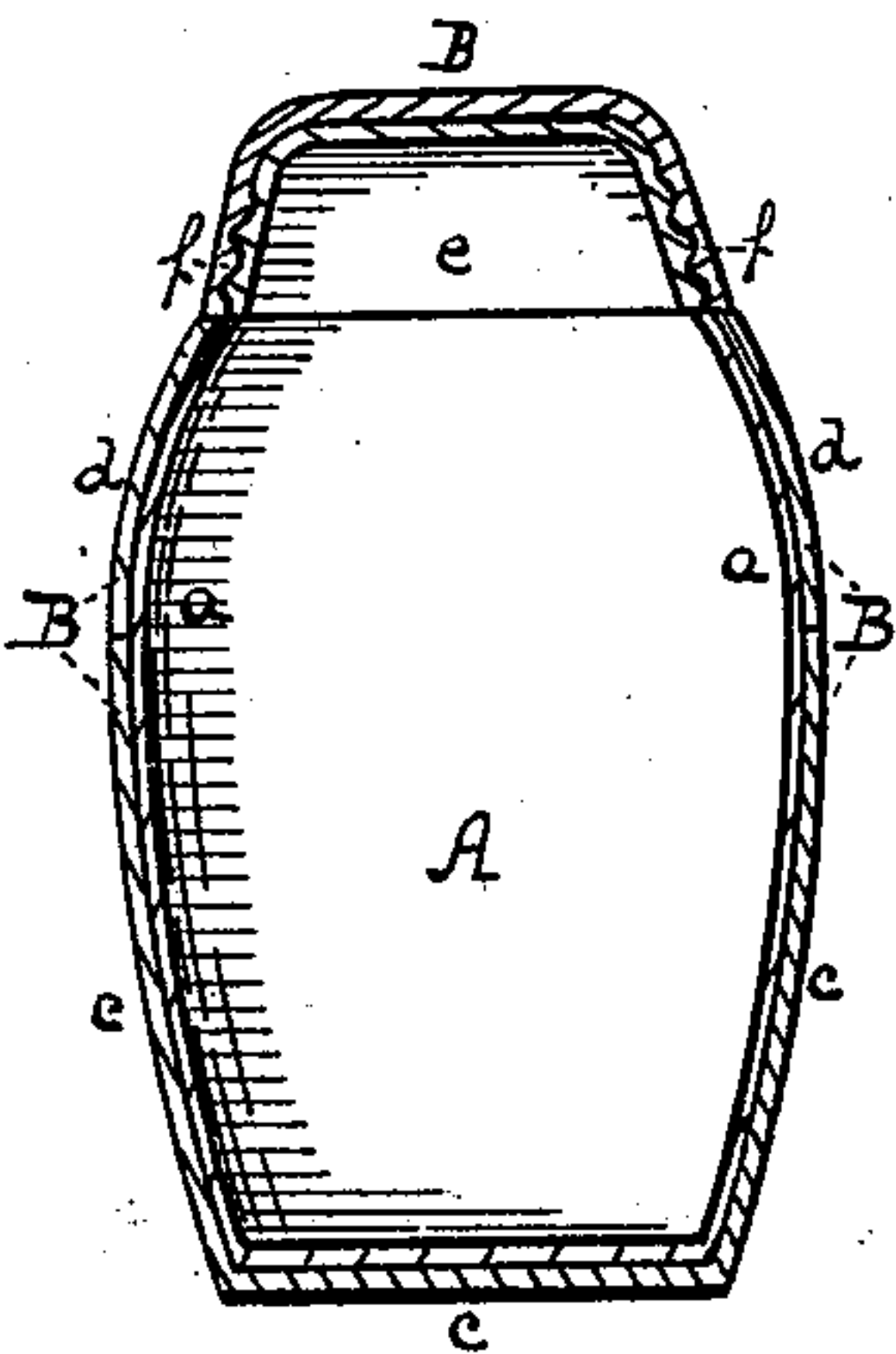
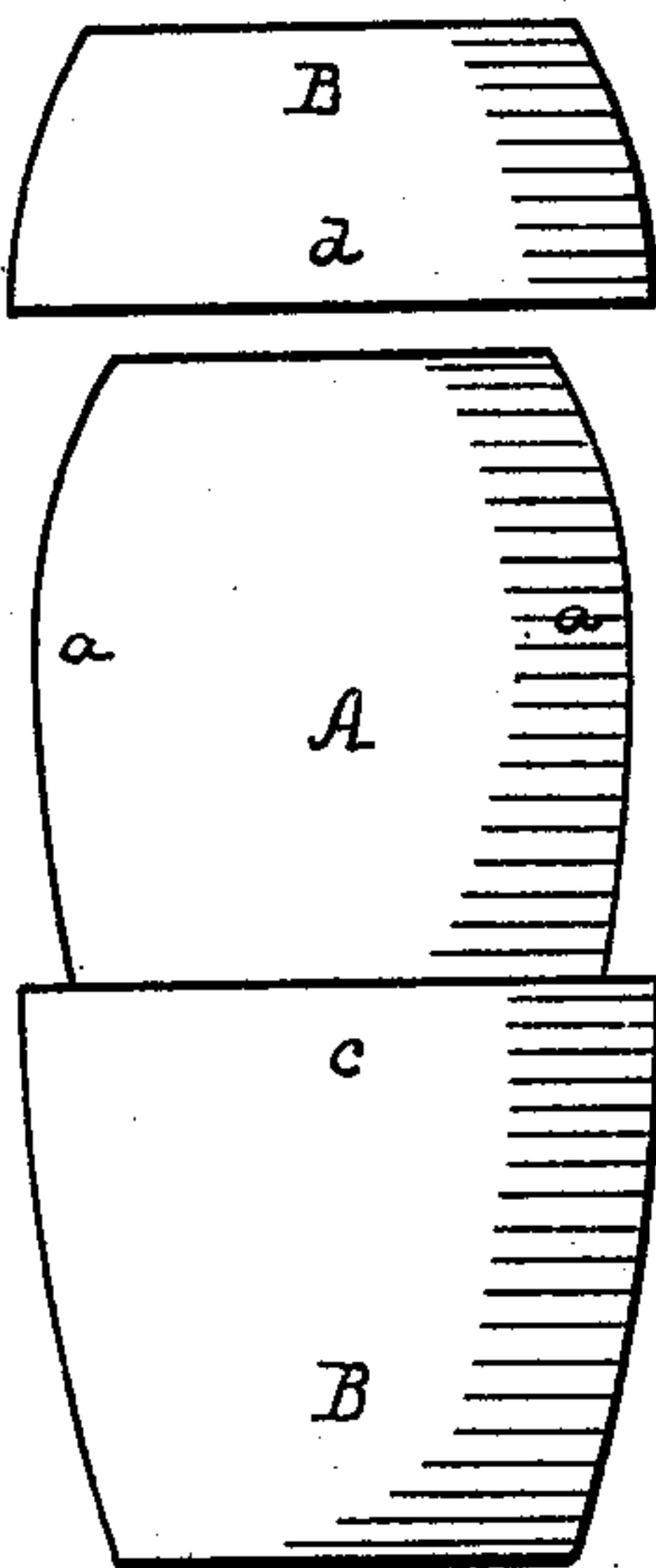


Fig. 3.



Witnesses

Geo. Elphinstone.
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UNITED STATES PATENT OFFICE.

JOHN PEDDER, OF PITTSBURG, PENNSYLVANIA.

CRUCIBLE.

SPECIFICATION forming part of Letters Patent No. 230,050, dated July 13, 1880.

Application filed May 3, 1880. (No model.)

To all whom it may concern:

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

Figure 1 is a side view of my improved crucible. Fig. 2 is a vertical central section of the same; and Fig. 3 illustrates the manner in which the outer shells are placed around the crucible.

Like letters of reference indicate like parts in each.

My invention relates to the crucibles used in melting steel, brass, and other metals. These crucibles have generally been formed of plumbago and German clay and other ingredients, and are generally known as "plumbago crucibles." These crucibles are usually contracted at the mouth, so as to form a bulge a short distance below the mouth, to increase its capacity, strengthen it, and render it easier to pour from. In steel-making they are formed of different sizes, to hold from fifty to one hundred pounds of metal. After the filling of the crucibles they are placed in the steel-melting furnaces and the metal converted into steel.

The intense heat, flame, and air-draft of the furnaces burn away or wear out these crucibles very rapidly, so that different methods have heretofore been adopted for repairing them after use, the principal methods being the dipping of the crucible repeatedly into a solution of, or mechanically coating the crucible with a mixture of, plumbago, clay, or like substances. Even when so repaired, however, the crucibles seldom last over five heats, becoming then too thin for safe use.

The new pots, from different causes, (such as dampness, contact with water, or insufficient burning,) are liable to break or scalp, and therefore they sometimes last only one or two heats. As the crucibles are expensive, they therefore form a large item in the cost of the manufacture of cast-steel.

The object of my invention is to utilize these worn-out or injured crucibles, so as to obtain two or more heats from them after they have been thrown aside as worthless.

It consists in securing around the crucible in which the metal is to be held an outer shell, which supports the crucible and protects it from the heat and flame of the furnace, thereby causing the crucible to last several heats longer than it would otherwise do.

To enable others skilled in the art to make and use my invention, I will proceed to describe it.

In the drawings, A represents the crucible, which is formed, in the usual way, out of any desired material, being generally bulged, as at *a*, thus increasing its capacity, rendering it easier to pour from, and at the same time adding to its strength, as the arch or bulge below the contracted mouth enables it to sustain the weight of the metal better. When in use the heat and flame of the furnace melt down and wear away the outer surface of the pot or crucible, so that after standing about five heats it is found too thin to support the weight of molten metal, and is thrown aside as worthless. The crucibles are also sometimes thrown aside after the first heat on account of some imperfections. This worn-out or imperfect crucible I take, and, after removing the slag adhering to its sides, place it in an outer shell, B, the crucible and shell being secured together by plumbago, German clay, or other suitable cement or binding substance, or secured together in any suitable manner.

The shell B may either be formed specially for the purpose or may be formed of a larger-sized worn-out or imperfect crucible, the latter being preferable, as its cost is very little, and it answers the purpose equally well. Where the shell is formed for the purpose, if the crucible is not bulged, the shell is made to envelop the crucible, being of such size that the crucible will fit neatly and be secured therein. When the crucible is bulged the shell is formed in sections *c d*, the lower section, *c*, inclosing the lower part of the crucible and extending up around the crucible to the largest part of the bulge *a*, and the section or ring *d* fitting down from the contracted mouth to the bulge and meeting the lower shell, *c*, at or near the largest part of the bulge.

When the outer shell, B, is formed from a worn-out or imperfect crucible or a larger size than the crucible to be inclosed, the crucibles are not bulged, the slag is removed from them,

and the smaller one placed within the larger one and secured therein as above described.

If the crucibles are bulged, the larger one is divided transversely into sections at or near the largest part of the bulge, forming the base *c* and ring *d*. These parts or sections, being then placed around the smaller crucible, are secured in place as above described, the smaller crucible being thus entirely inclosed by the larger one.

If desired, the crucibles may be turned down and the shell reamed out by suitable machinery, so that they will fit together without any binding substance. A slight screw-thread may also be formed on the outer surface of the crucible and inner surface of the shell, and the parts screwed together. This is shown in connection with the cap *e*, where the two parts are screwed together, as at *f*.

When the crucible thus formed is in use, it is filled in the usual way and placed in the furnace. The outer shell will thus protect the inner crucible from the heat and direct action of the flame, which, coming in contact with the outer shell, burns and wears it away without materially affecting the inner crucible. The outer shell also braces the inner crucible, and so strengthens the thin crucible as to enable it to hold the metal, and also prevents the leakage of the metal where the inner crucible is cracked or scalped. It thus enables the crucible to be used several heats longer after having been used for its usual time without the outer shell.

I have found by actual practice that the crucibles thus formed from two old crucibles have been used for six heats, producing one hundred

pounds of cast-steel at each heat, which is a larger proportional product than can be obtained from new crucibles. As these crucibles are formed of crucibles previously submitted to the intense heat of the melting-furnace and tried thereby, they are not so liable to damage from the same causes as new crucibles.

In some cases it is not necessary to entirely inclose the crucible in the shell, as the upper or lower part may be thick enough to stand further heats, and the shell is placed only around the thin or weak part. The caps *e* for the crucibles may be formed in the same manner as shown in the drawings, either out of two old caps or the bases of two old crucibles, and this I also include in my invention.

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

1. A crucible for melting metals, formed of a worn-out, partially worn-out, or imperfect crucible and an outer crucible or shell of larger diameter secured around the inner crucible, and adapted to support and protect it, substantially as and for the purposes set forth.

2. A crucible for melting metals, formed of a bulged crucible or inner shell for holding the metal and an outer crucible or shell divided transversely into sections and secured around the inner crucible, substantially as and for the purposes set forth.

In testimony whereof I, the said JOHN PEDDER, have hereunto set my hand.

JOHN PEDDER.

Witnesses:

T. G. KAY,
JAMES I. KAY.