

(No Model.)

S. J. ADAMS.
PATTERN FOR TUBULAR ARTICLES.

No. 455,142.

Patented June 30, 1891.

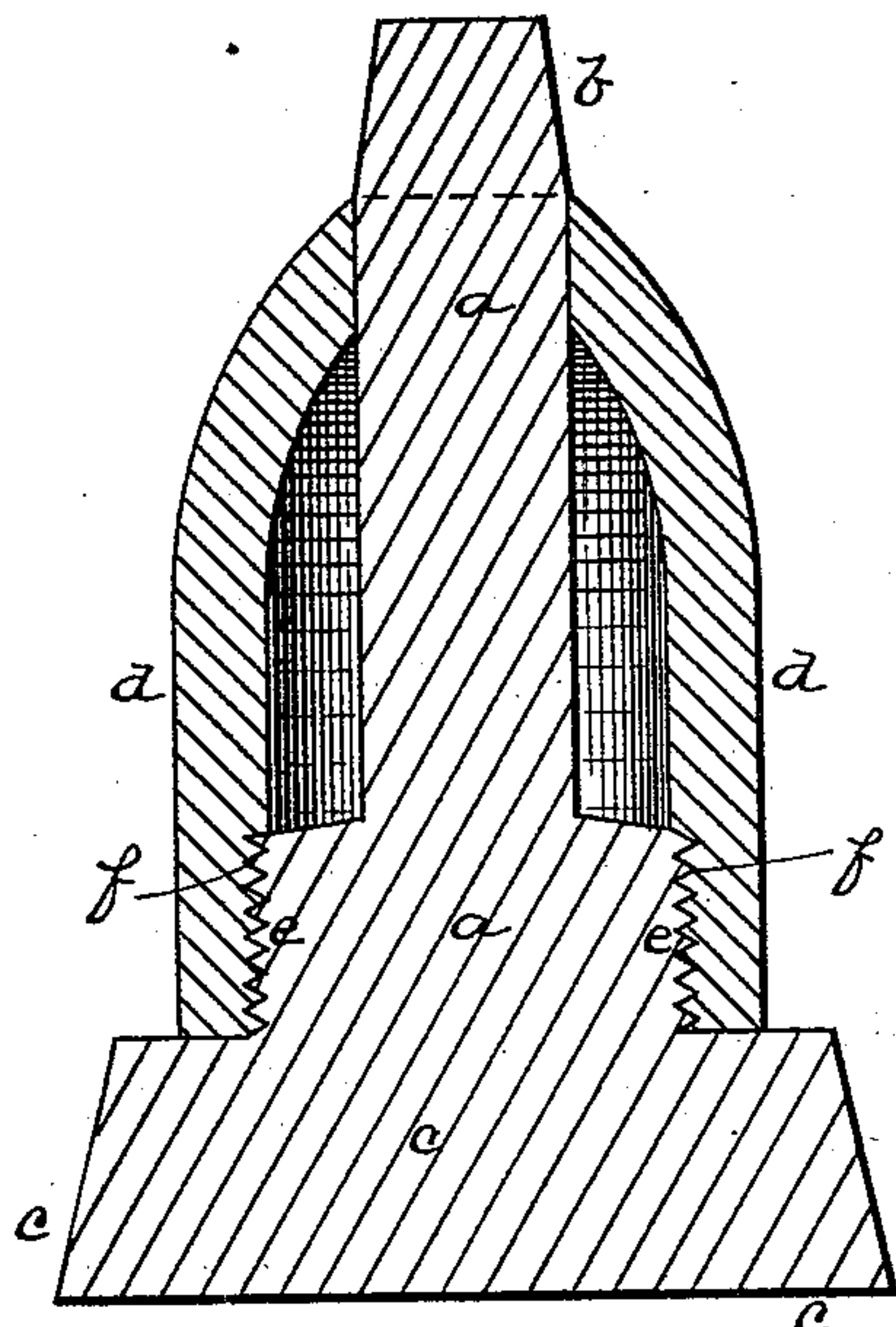
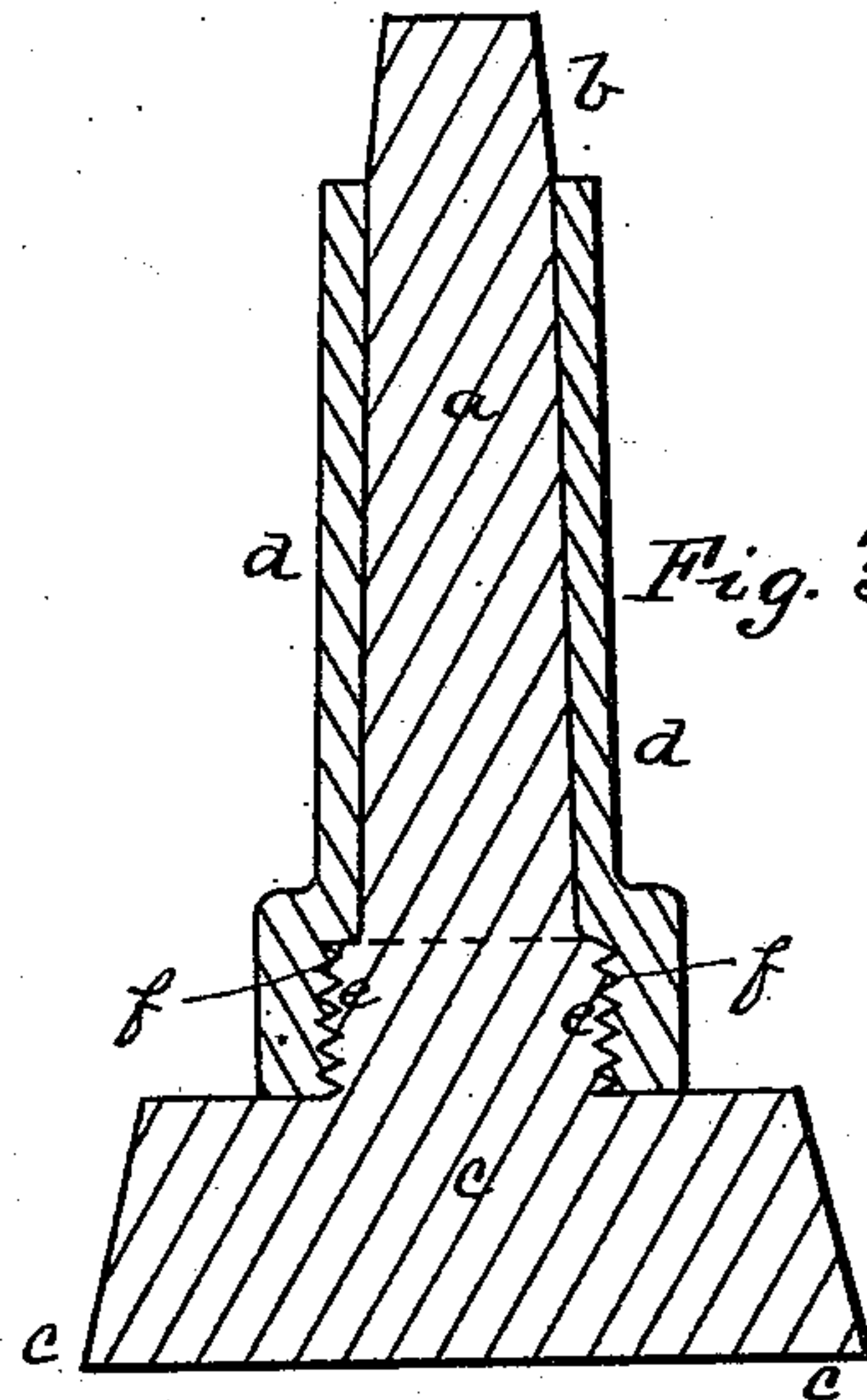
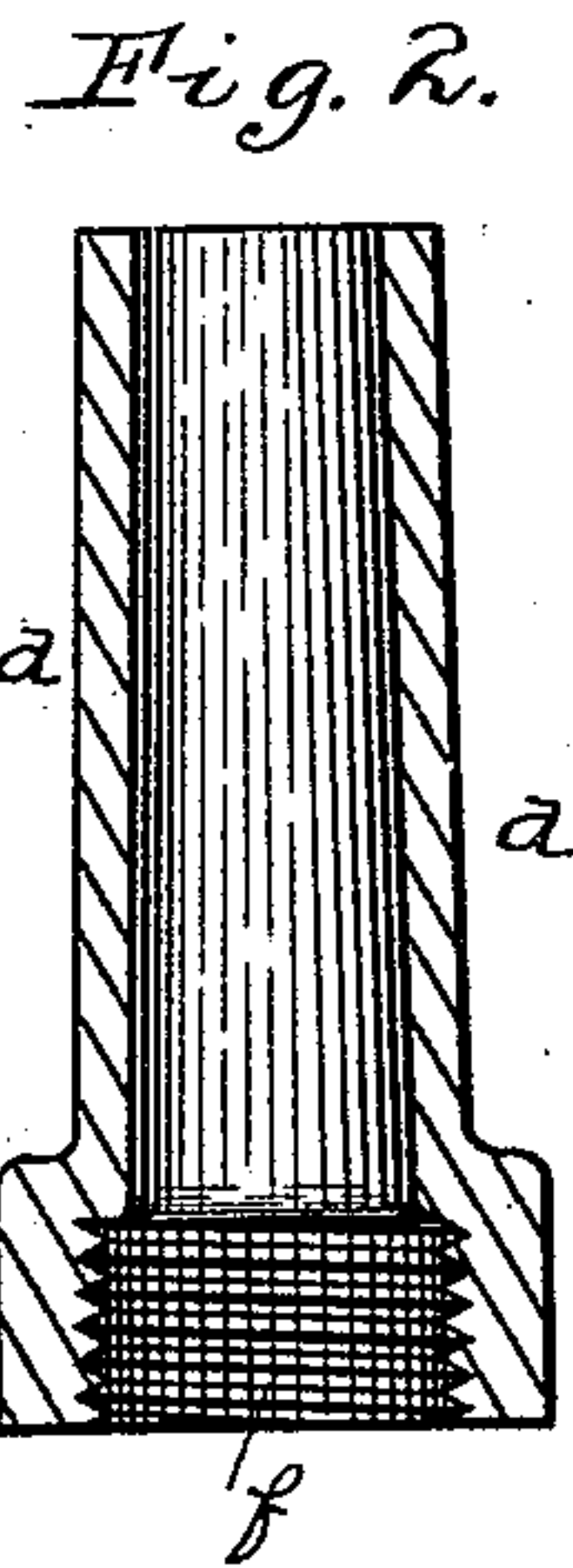
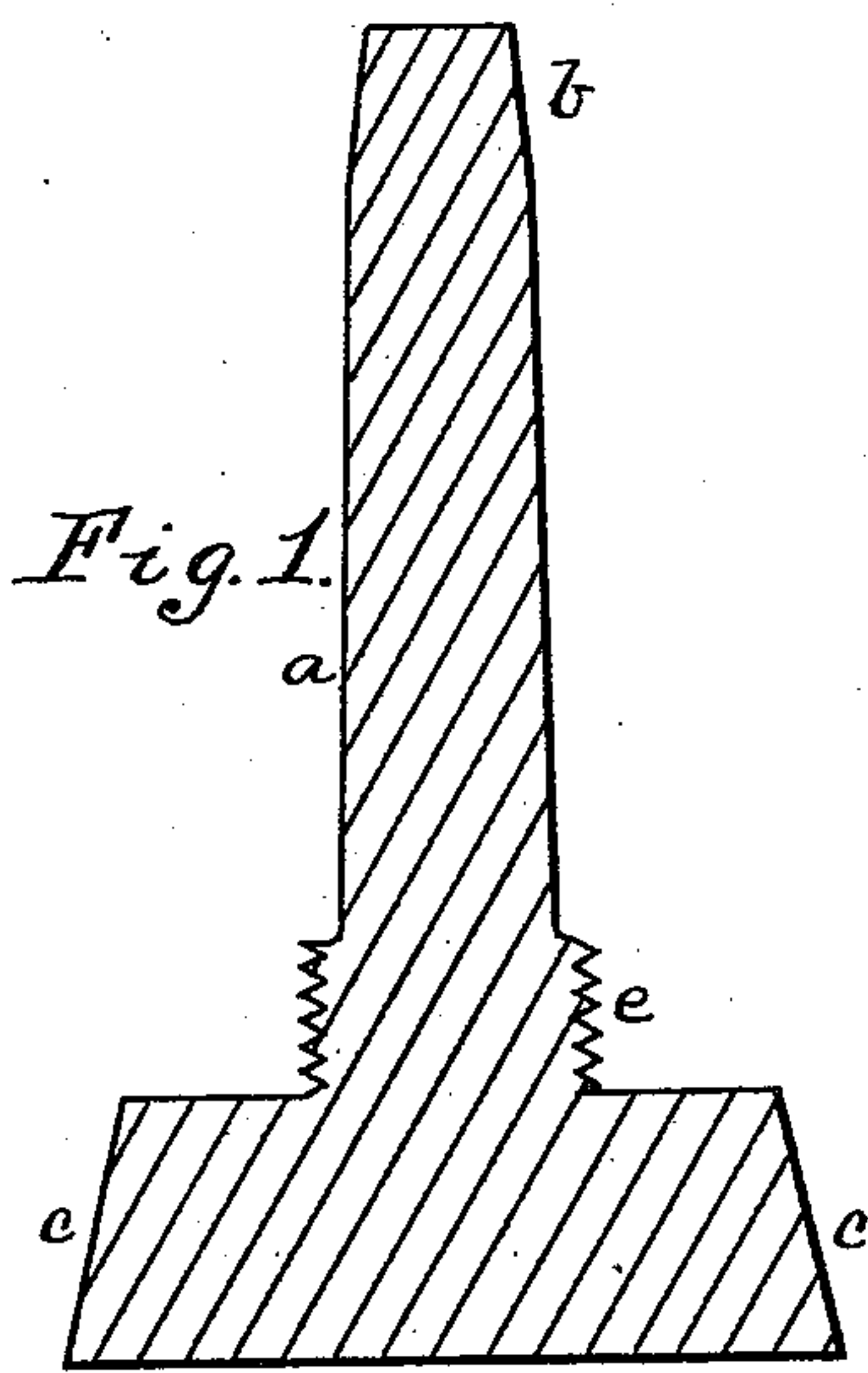


Fig. 4.

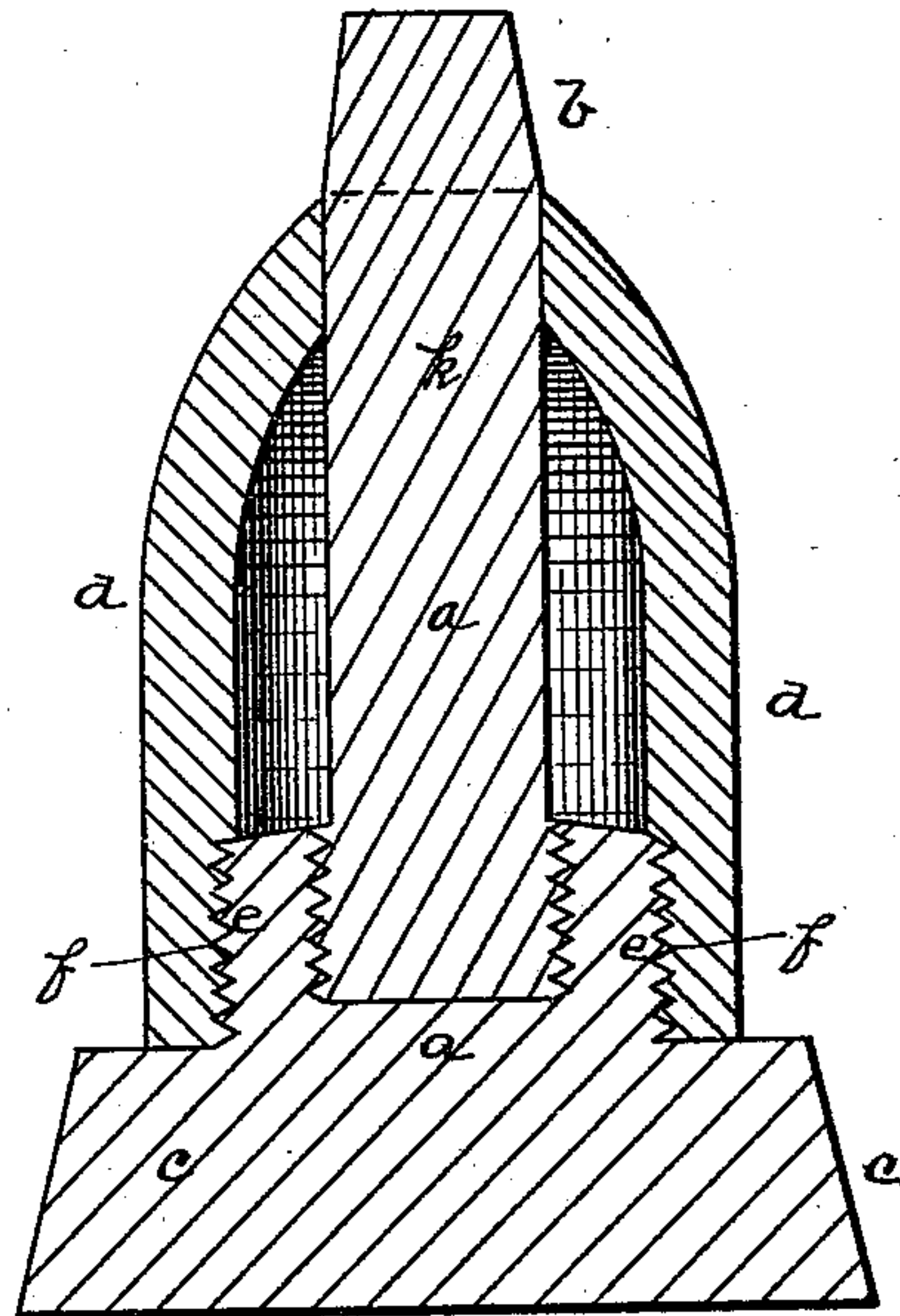


Fig. 5.

Witnesses:

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UNITED STATES PATENT OFFICE.

STEPHEN JARVIS ADAMS, OF PITTSBURG, PENNSYLVANIA.

PATTERN FOR TUBULAR ARTICLES.

SPECIFICATION forming part of Letters Patent No. 455,142, dated June 30, 1891.

Application filed August 4, 1890. Serial No. 360,889. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN JARVIS ADAMS, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Patterns for Tubular Articles; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to patterns for forming tubular castings, such as wagon-boxes, pipe-balls, and like articles. It is a well-known fact that castings of this character are necessarily made very accurate, the castings being generally formed in one-part flasks and the pattern being withdrawn through one end of the flask and a core inserted within the cavity formed, and this core being seated in a "print" or "prints," as they are termed, at the upper or upper and lower ends of the mold's cavity, the prints being generally employed at both ends to give a more perfect support to the core, though for some castings—such as the smaller sizes of pipe-balls—the core is only seated at the larger end of the mold. In forming these wagon-boxes and pipe-balls it is found that the sizes of the pipes vary materially, some manufacturers requiring wagon-boxes to be of different thicknesses and tapering, though of the same length, or to vary in length for the same thickness, or the boxes varying slightly in shape, according to the desire of the different users, and each change requires an entirely separate pattern. For pipe-welding balls it is found necessary to make even a larger number of patterns, the pipe-welding balls, especially in the smaller sizes, varying only the one one-hundredth part of an inch in diameter, and it being necessary in such sizes to provide separate patterns for each particular size. It is therefore found necessary in foundries making this class of castings to have a very large number of patterns, and this adds greatly to the cost of manufacture, and at the same time requires a large space in the foundry for the storing of the patterns not in use.

Another difficulty with this class of castings has been found in the centering of the cores, as in finishing the patterns, unless the prints at the top and bottom thereof forming the seats or prints for the cores were made perfectly central and of perfectly-accurate

size relative to the size of the core, there would be liability of the core pressing to one or the other side, which would of course make the walls of the casting thicker at one point than the other, and so form imperfect castings. This difficulty in centering the patterns is very largely increased, on account of the necessity of making so many patterns and of each pattern carrying its own prints, and the different methods of calipering such patterns or working from drawings, and especially on account of the difficulty of turning all the prints on the patterns to accurate size in the large number of patterns employed, the same cores being often employed in the different sizes of patterns—for instance, in two-inch pipe-balls—the same core being employed in molds made by fifty different patterns, the patterns differing one one-hundredth of an inch and extending from two to $2\frac{4}{100}$ inches in size, the same being true of patterns up to five inches in size. If the prints of the molds were too small, there was liability of the cores being crushed or broken when inserted, while if the prints were too large there was liability of the cores moving out of center and the finning of the metal between the core and mold. In the ordinary operation in foundries these mistakes will not be discovered for several days and tons of imperfect castings may have been formed, causing large loss to the manufacturer, while after the prints of the pattern have been changed the same difficulties and delays may again occur. It is thus seen that by far the most difficult part of the work in making patterns is in making the prints, which are generally tapering and exceedingly hard to turn accurately to size.

The object of my invention is to overcome these difficulties in connection with patterns for forming these tubular castings; and it consists, generally stated, in a pattern for forming such castings consisting of a standard body portion having the core print or prints thereon and an interchangeable sleeve secured around such body portion and corresponding substantially in outer form to the casting to be produced, it being found that by employing the standard body portion the print or prints thereon can be formed very accurate and carefully tested with the core, so that there shall be the proper seating of

the cores in the prints of the mold-cavities molded thereby, and the sleeve for forming the mold-cavity can be quickly changed, according to the slight variations necessary between different patterns, by the removal of one sleeve from the standard body portion and the securing of another sleeve of proper diameter and shape around the same.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a longitudinal central section of a standard body portion for forming wagon-boxes. Fig. 2 is a view of one sleeve adapted to be applied thereto. Fig. 3 is a view of the sleeve applied to the standard body portion, so forming the complete pattern. Fig. 4 is a like view of a pattern for pipe-balls, illustrating my invention; and Fig. 5 is a modification in which the standard body portion is formed in two parts to provide for the changing of the smaller core-print of the pattern when necessary.

Like letters of reference indicate like parts in each.

The patterns are generally formed of metal and are generally cast to shape and turned and finished to bring them to the desired accurate shape. In forming the standard body portion *a*, as so large a number of them are not required to be made, they can be more accurately turned to shape, so that they will perfectly correspond to the core-box and the core formed therein, and can be practically tested with the core to see that no mistake is made. In this way all the standard body portion of any particular length or taper and having any particular diameter of head print, as at *b*, or base-print, as at *c*, can be brought to accurate and positive shape, and so insure the proper seating of the cores in the seats formed in the sand by the prints *b* *c* of the standard body portion *a*. Fitting around such standard body portion is the sleeve *d*, which is also cast to shape, and corresponds to the exterior of the casting to be formed in the mold, the interior of the sleeve *d* fitting neatly around the standard body portion *a*, and being firmly secured thereto in any suitable way. The most simple way of securing such sleeve in place is by forming a threaded portion *e* on the body portion *a* just above the head *b* and threading the larger end of the sleeve *d*, as at *f*, so that it will screw upon the standard body portion and so be permanently secured thereto. These sleeves *d* can be of any proper diameter or thickness of wall and have any desired shape, according to the casting to be produced, and as they will so vary in thickness and in shape different sizes and shapes of sleeves may be employed with the same standard body, so that the necessity for forming the large number of different sizes of complete patterns, including the prints for the cores, is overcome. These sleeves, after the rough

castings are formed therefor, may be bored to fit standard mandrels corresponding to the standard body portions of the patterns and then be threaded at the ends and fit over standard body portions, and when supported on such mandrels may be turned and finished as desired, according to the thickness of the casting to be formed and the shape thereof. In this way in order to provide sets of patterns for the different sizes of wagon-boxes or balls—as for example, where in pipe-welding balls the manufacturer desires a variation of one one-hundredth part of an inch or more—it will only be necessary to finish the sleeves and secure to the standard body portions the new set of sleeves when the patterns are ready for use, and as the head-prints and base-prints of the cores are also accurately formed the perfect fitting and centering of the cores within the mold-cavities formed by the patterns is also insured. This is also clearly indicated in connection with Fig. 4, showing the standard body portion, the sleeve united in the complete pattern for forming the pipe-welding balls, and the advantage of the invention in connection with that class of castings should be apparent in view of the fact that within certain sizes of balls there are probably fifty variations in diameter, with all of which the same core is used, to one variation in the length of the pattern, and consequently the same standard body portions can be employed with all these different sizes of sleeves, and in all such cases the standard body portion which forms the core print or prints insures the perfect formation of the same and the proper fitting of the core within the mold-cavities.

In the making of these articles it is found that some manufacturers desire larger openings in the point end of the castings than others, and this has also required the formation of another complete set of patterns having only this one variation from the ordinary patterns. To provide for this change, I in some cases divide the standard body portion *a* into two parts, as illustrated in Fig. 5, the upper part *k* being separable from the main body portion *a* and being secured thereto by screwing or in any other suitable way, and that upper part being made to a standard according to the desired opening in the end of the casting, so that it may be used in forming all castings having that size of opening therein.

By my invention I am enabled thus to obtain the accurate centering of the cores within the molds, as the parts of the pattern forming the seats or prints in the mold-cavity are made to a standard which is maintained throughout the whole line of patterns, this being comparatively easy in the small number of such body portions employed and practically all liability of the crushing or breaking of the core or core-print in the mold or of the core getting out of center is overcome.

5 A further advantage is found in the reduction of the cost of the line of patterns, as the interchangeable sleeves cost much less than the forming of entire patterns for each size of article to be formed.

10 A still further advantage is found in the ease with which the patterns can be changed and the firmness with which the standard body portions can be secured to the pattern-plates. As the necessity of removing the entire pattern from the pattern-plate from time to time is overcome, the standard body portions can be firmly and permanently secured thereto, while the sleeves screwing thereon
15 can be quickly changed and accurately adjusted with much less labor than heretofore found in the ordinary patterns, and the difficulties of these patterns becoming loose or out of line and the binding of the stripping-plate on the patterns are entirely overcome.
20

A still further advantage is found in the fact that where operative mechanism is employed within the pattern for forcing wings or lugs into the sand or runners through the
25 sand to connect with the gate of the mold, such as fully described in applications filed by me on the 26th day of November, 1890,

Serial Nos. 372,687 and 372,688, such operative mechanism may be operated entirely within the standard body portion of the pattern and the necessity of duplicating it for each pattern is entirely overcome.

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

1. A pattern for forming tubular castings, comprising a standard body portion having the core print or prints thereon and an interchangeable sleeve secured around such standard body portion and conforming to the exterior of the casting to be produced, substantially as and for the purposes set forth. 35 40

2. A pattern for forming tubular castings, comprising the standard body portion formed of the main part *a* and the interchangeable end *k* and interchangeable sleeve *d*, secured around the same and conforming to the exterior of the casting to be produced, substantially as and for the purposes set forth. 45

In testimony whereof I, the said STEPHEN JARVIS ADAMS, have hereunto set my hand.

STEPHEN JARVIS ADAMS.

Witnesses:

ROBT. D. TOTTEN,
F. G. HAY.