

(No Model.)

A. L. MURPHY.

FAGOT FOR TUBES.

No. 274,019.

Patented Mar. 13, 1883.

Fig. 9.

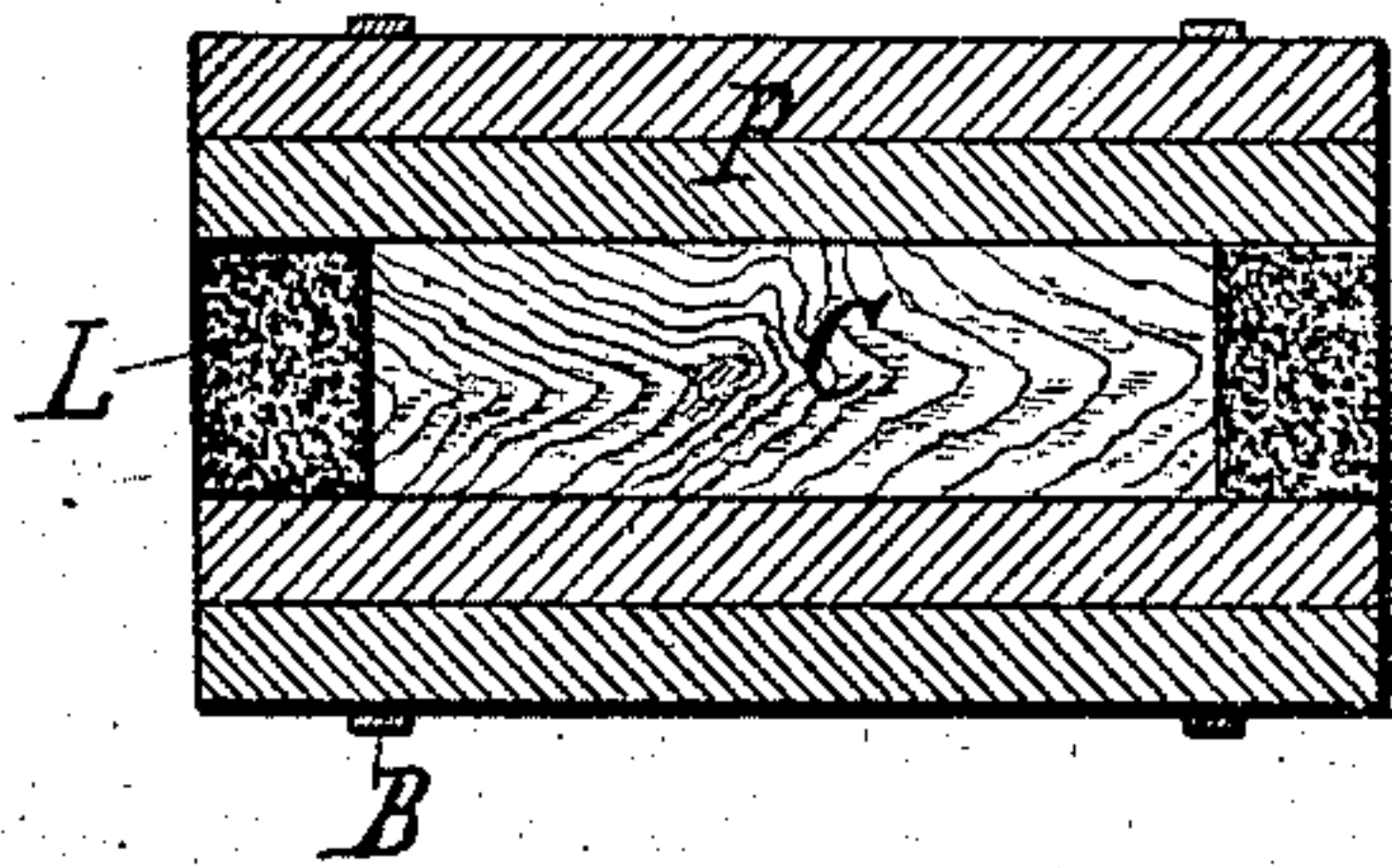


Fig. 1.

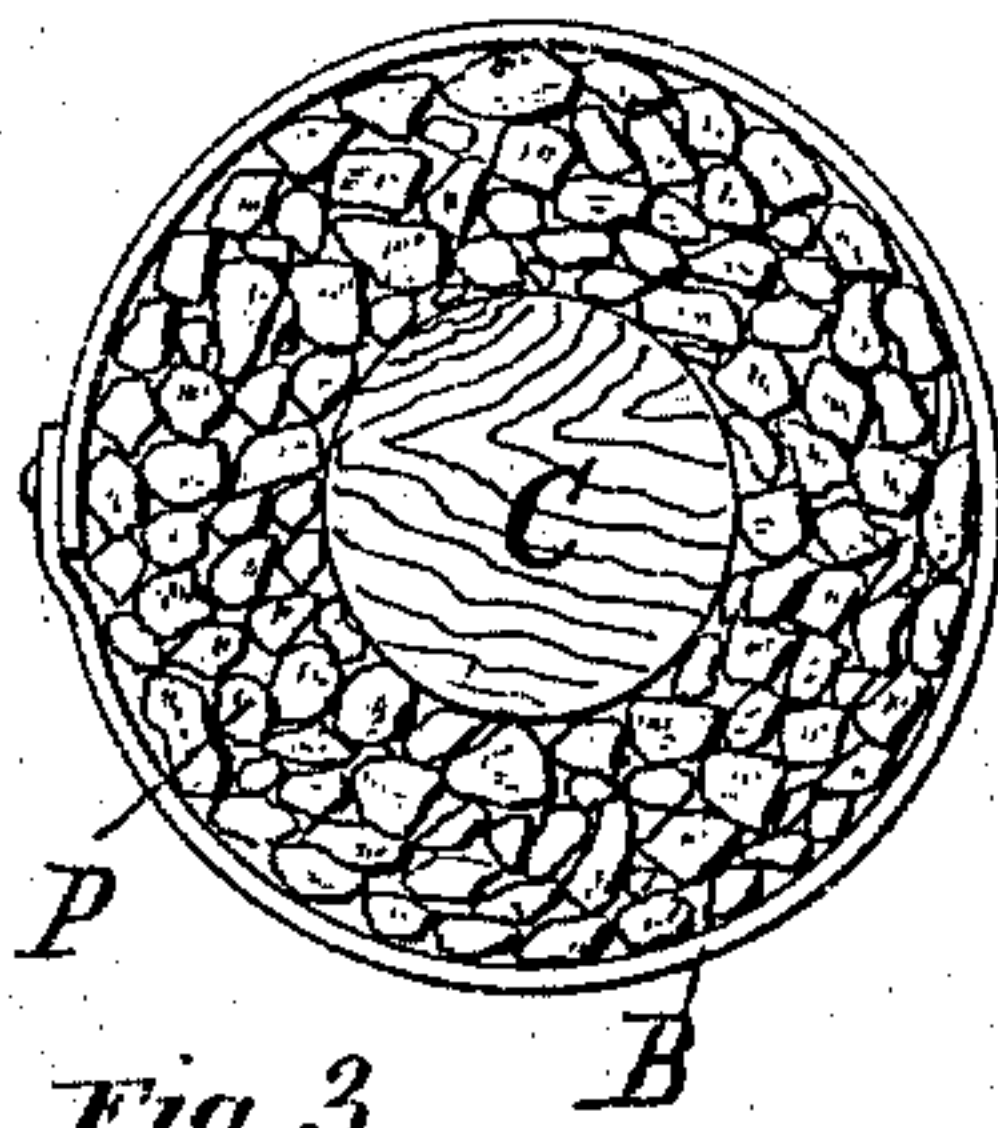


Fig. 10.

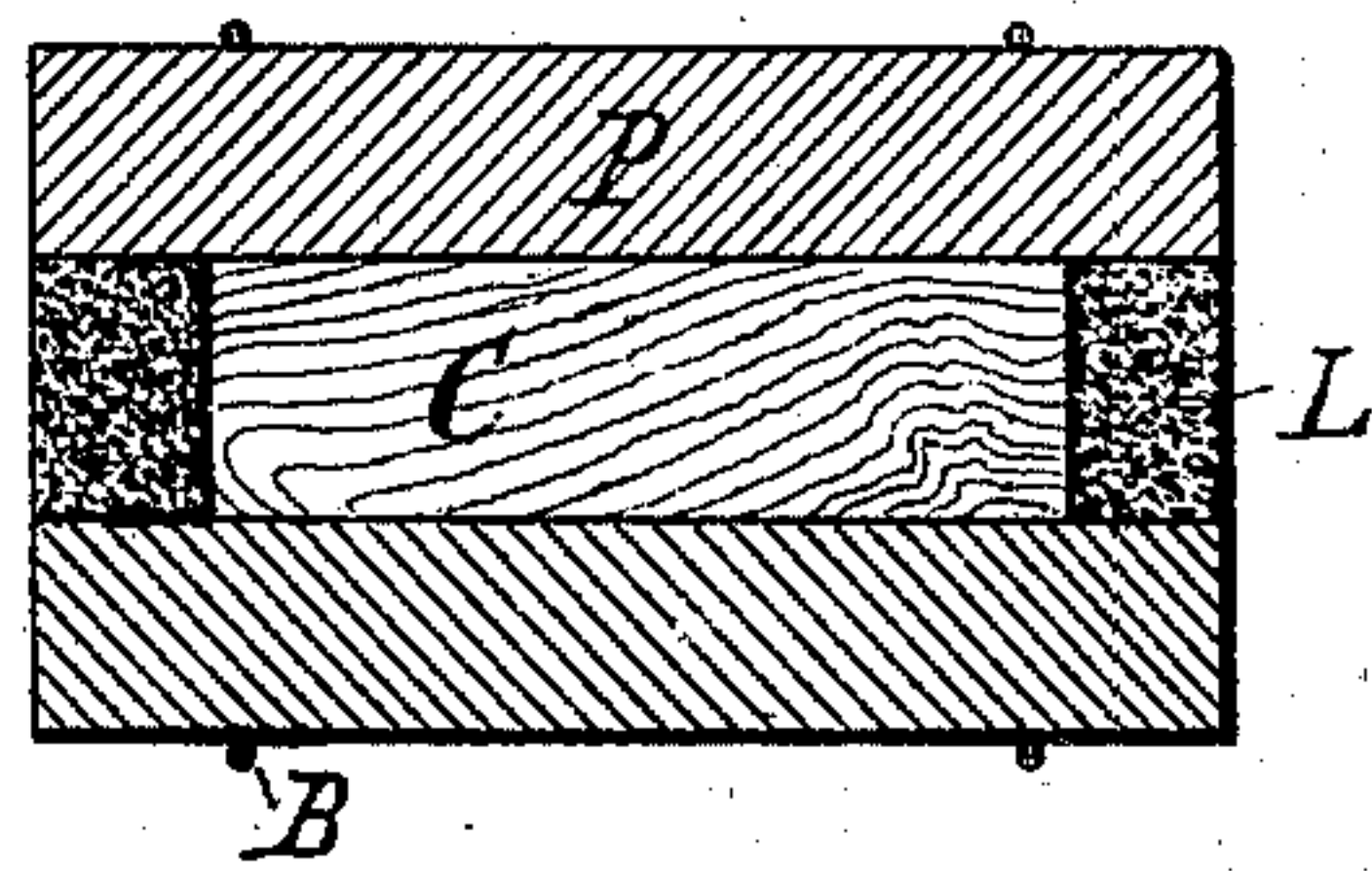


Fig. 2.

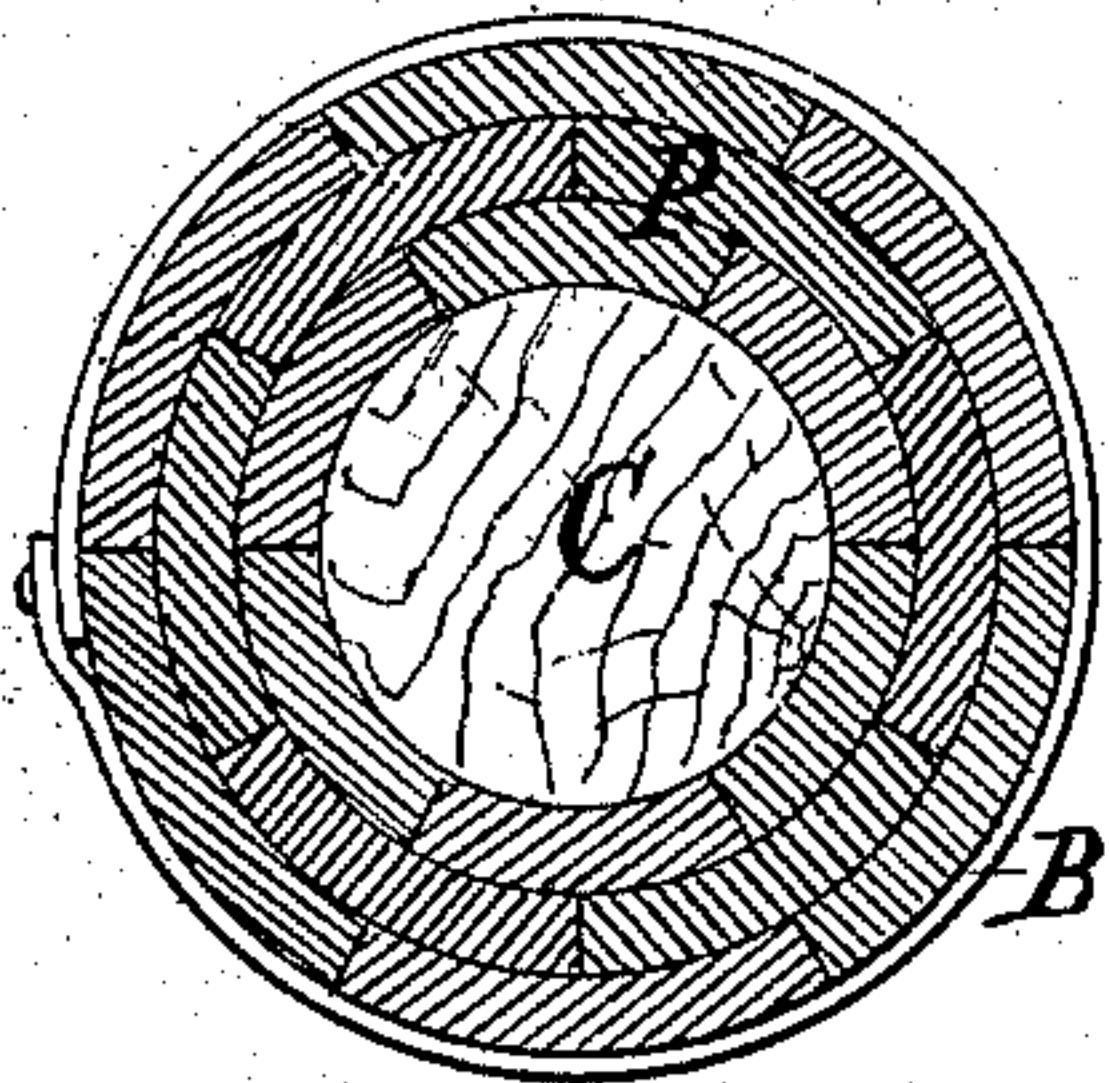


Fig. 3.

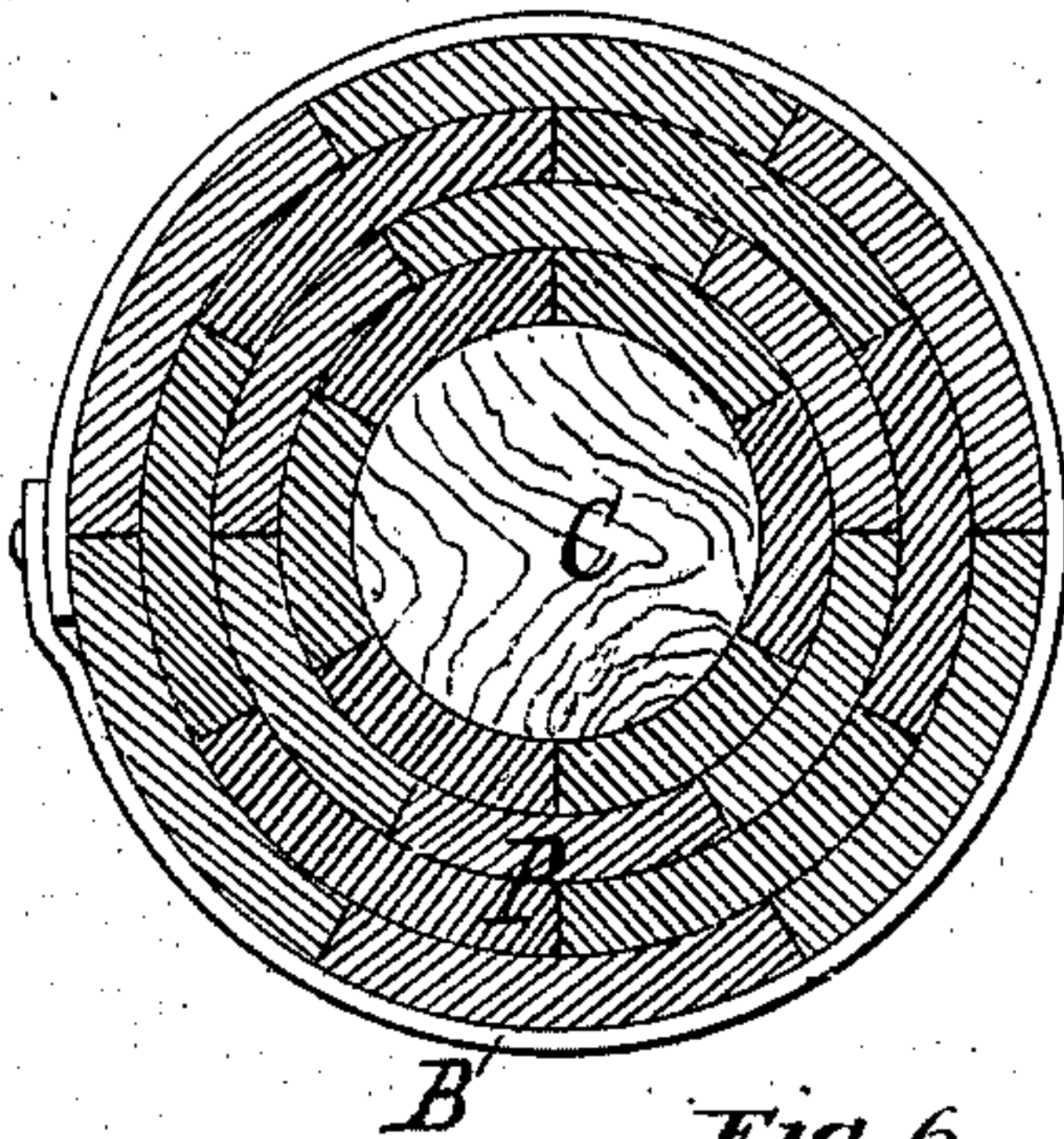


Fig. 4.

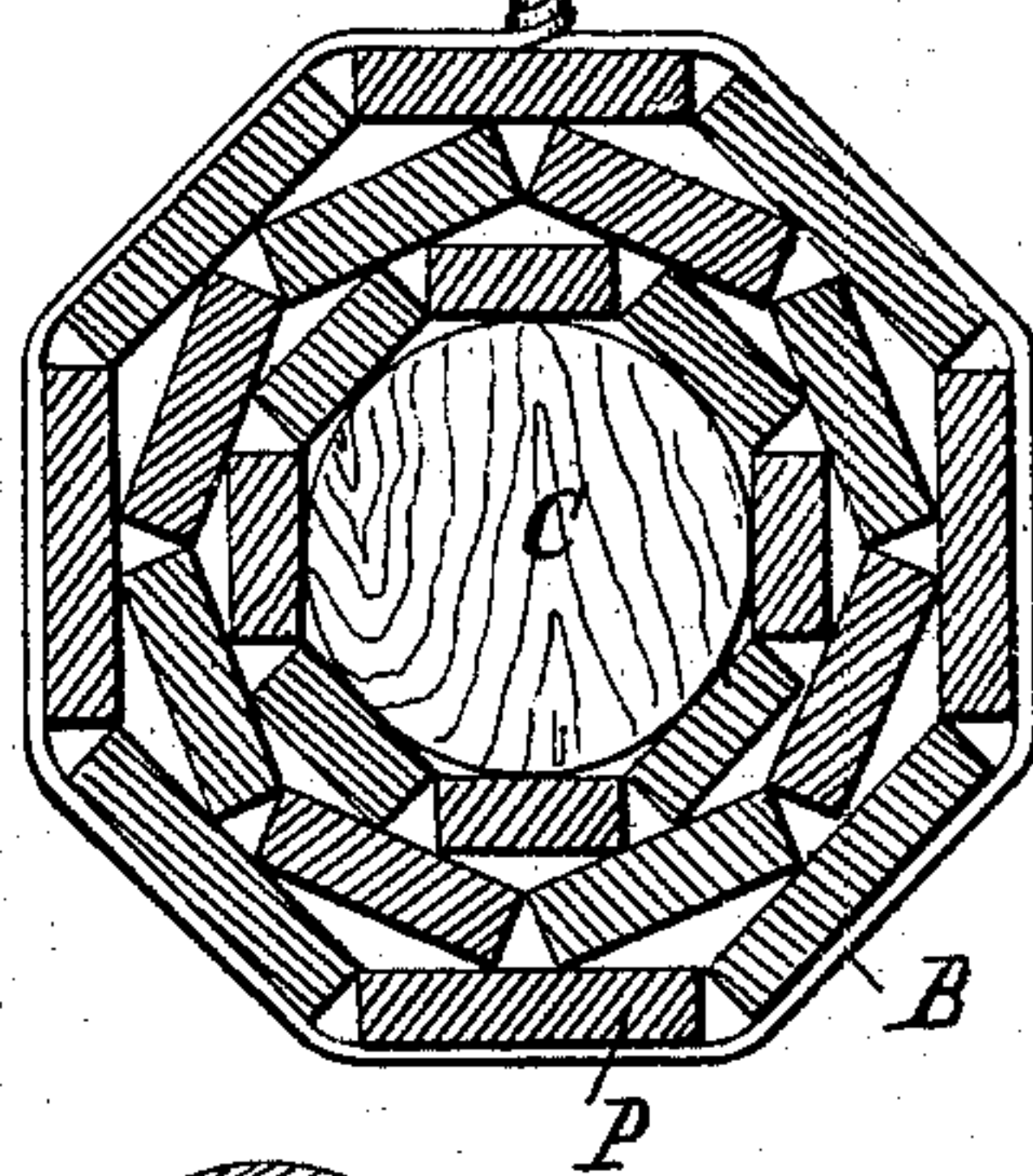


Fig. 5.

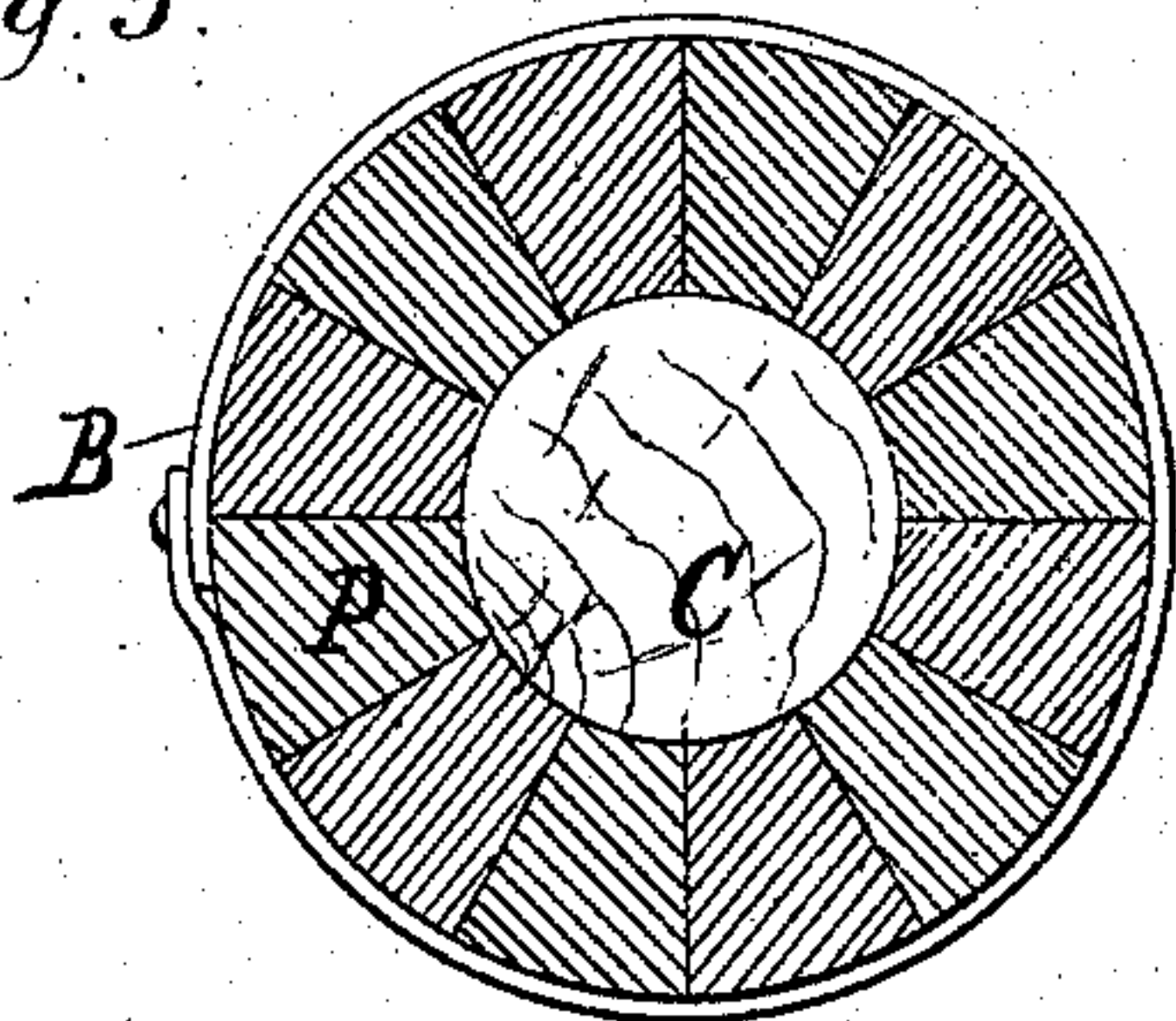


Fig. 6.

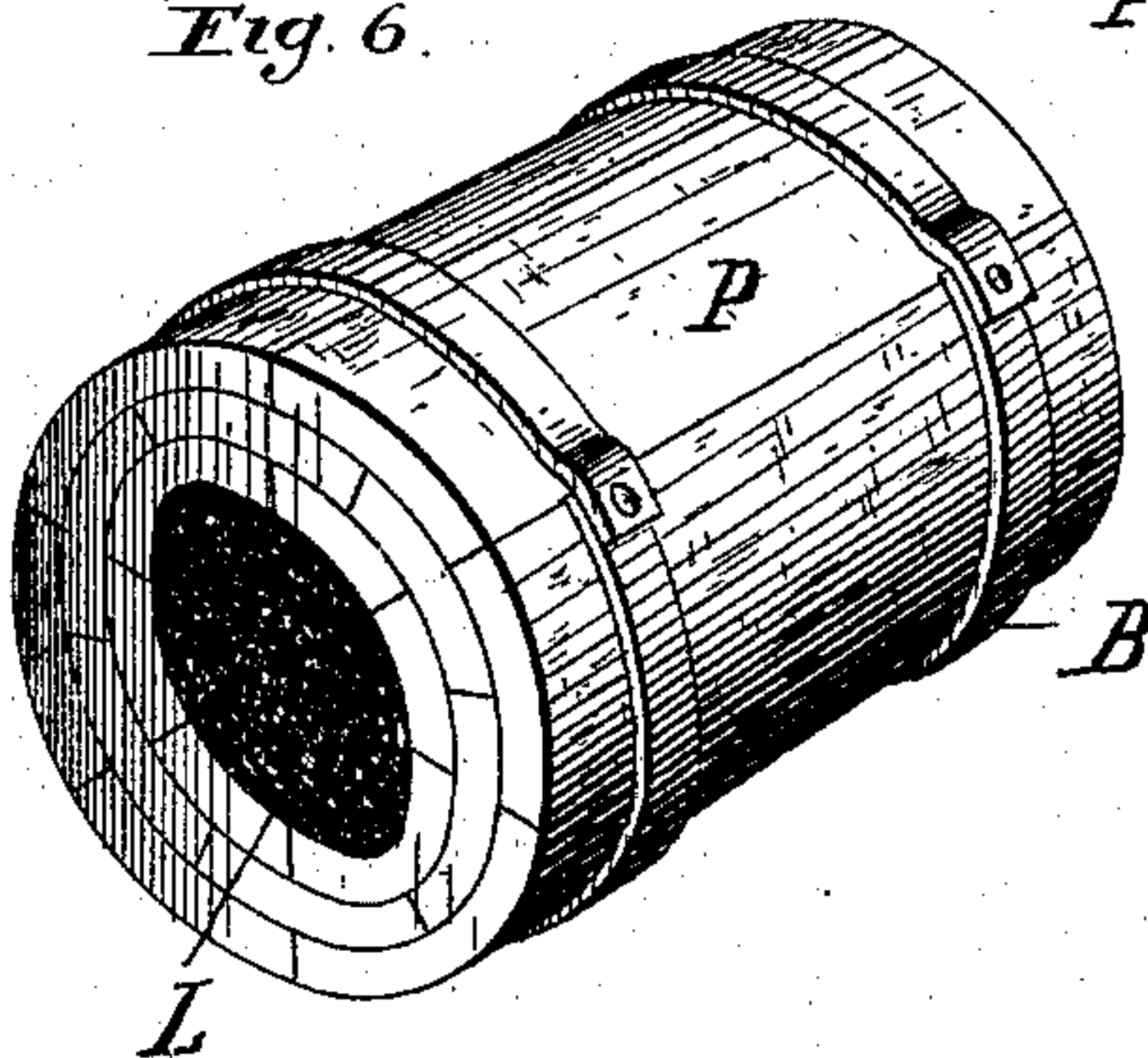


Fig. 7.

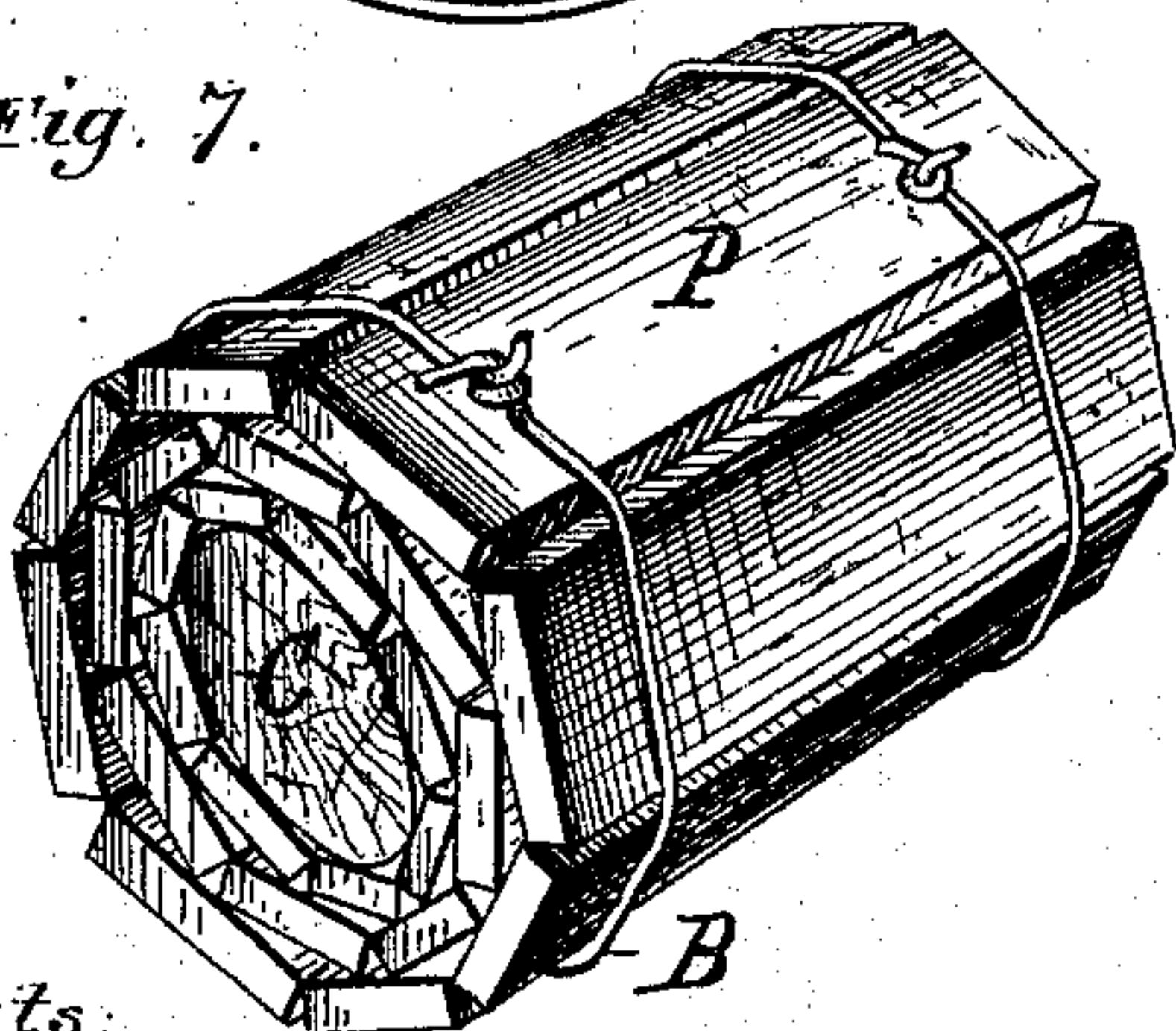
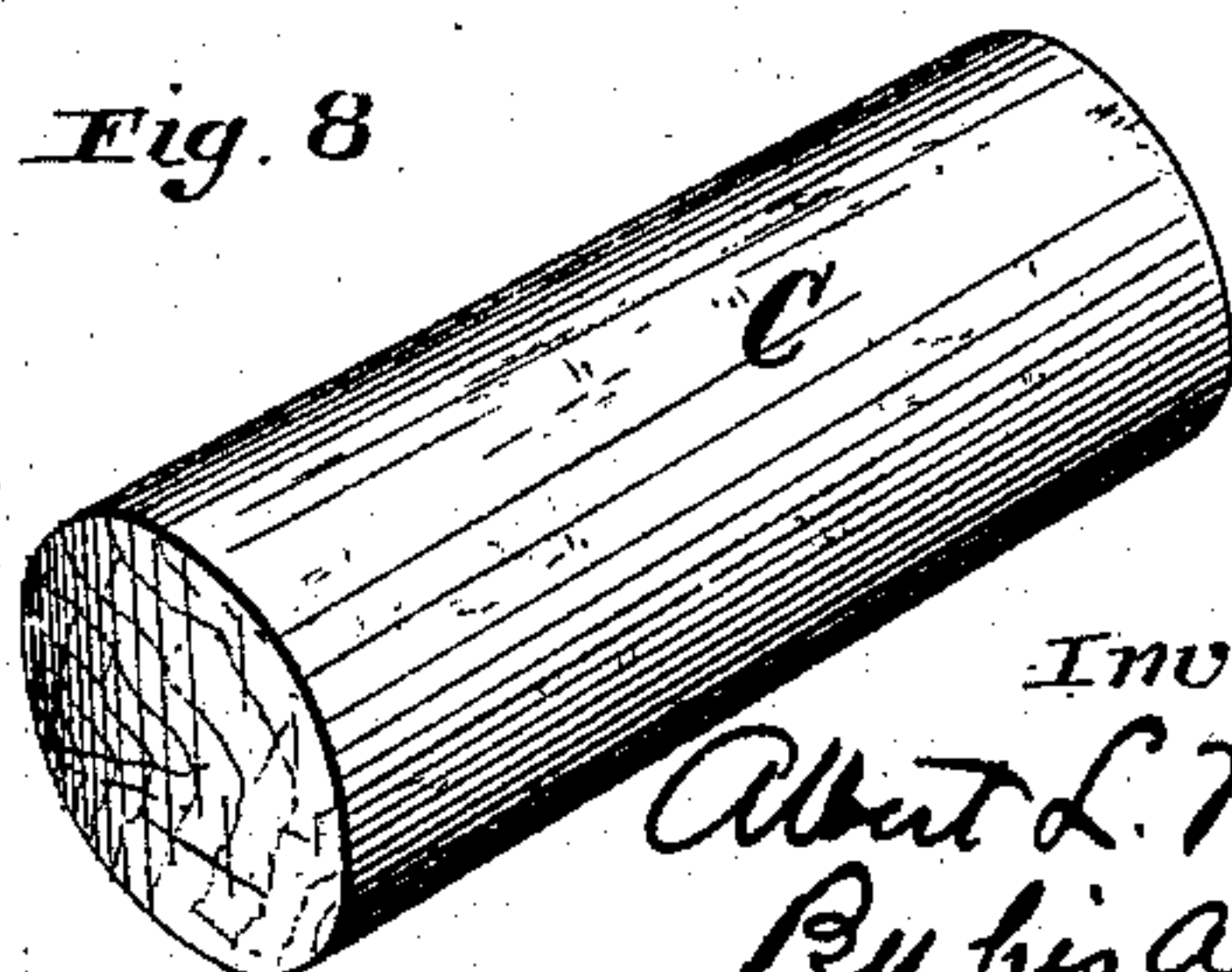


Fig. 8.



Attests:

J. Henry Kaiser.
John Solley

Inventor:

Albert L. Murphy
By his Attorneys,
W. C. Hawley
Bosman Taylor

UNITED STATES PATENT OFFICE.

ALBERT L. MURPHY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF
ONE-HALF TO STEPHEN P. M. TASKER, OF SAME PLACE.

FAGOT FOR TUBES.

SPECIFICATION forming part of Letters Patent No. 274,019, dated March 13, 1883.

Application filed April 6, 1882. (No model.)

To all whom it may concern:

Be it known that I, ALBERT L. MURPHY, of Philadelphia, Pennsylvania, have invented an Improvement in Piles from which to make
5 Tubing, of which the following is a specification.

My invention relates in general to the manufacture of tubing, shafting, columns, axles, and kindred hollow articles in metal from hollow piles, but more specifically from such hollow piles as are formed of separate pieces of metal piled upon a central core.

The object of my invention is the production, from a pile composed of pieces of unrefined
15 puddled or muck iron arranged or secured upon or about a solid combustible core composed of natural wood, or of some combustible material—such as coal, hardened peat, charcoal, or kindred material—which is not in a
20 granulated but in a coherent condition, as a new article of manufacture, of a seamless homogeneous tube of refined iron.

My invention consists in a new article of manufacture—a pile from which to make tubing, composed of pieces of unrefined puddled
25 or muck iron arranged or secured upon or about a core composed of combustible or inflammable material of solid character—such as wood, charcoal, peat, coal, or kindred material—whether
30 of vegetable or mineral origin.

Heretofore in the manufacture of piles from which to make tubing several constructions have been resorted to. For instance, pieces of properly-shaped metal have been supported
35 upon either a hollow core of metal, which has been subsequently rolled down and consolidated with the pieces, so as to form a tube of the desired dimensions, or else have been supported upon a solid metal core which has been
40 subsequently bored out after the piled pieces, together with the solid core, have been subjected to the proper condensation and reduction. Pieces of muck-iron have also been piled without any core whatever and subsequently
45 reduced to a tube. Hollow piles composed of pieces of wrought or refined iron have also, after having been completely formed and connected together, been provided with a core of granulated material rammed tight, retained in
50 place by plugs of metal welded into the ends

of the pile, and serving as a mandrel upon which to forge the pile solid after it has been heated with the core in place within it. I have discovered that such support as will constitute a convenient and permanent basis upon which
55 to build up together the pieces composing the pile, and as has heretofore been afforded by either the solid or the hollow metal cores which have been used, can be equally well afforded by the employment of a core of solid combustible material, (not being a granulated substance
60 compressed,) such as wood in its natural condition, and that the resultant tube will be of a serviceable character and be well adapted for such ordinary commercial purposes as tubes
65 are usually put to. The unrefined puddled iron which I employ to constitute the substance or body proper of my pile is known in the trade as "muck-iron," and is rolled directly from the puddle-ball to a bar of desired configuration, and is not reheated and rerolled.

In the accompanying drawings, Figure 1 represents in end view a pile composed of many irregularly-shaped pieces of unrefined puddled iron, arranged as they happen to
75 come about a central solid wooden core, and bound thereto by a band. Figs. 2 and 3 represent in end view piles composed respectively of three and of four layers of curved muck-bars, the curvature of each bar corresponding to
80 that of every other bar, so that when arranged about the wooden core represented in the drawings they lie snugly upon the latter and upon each other, and form a compact and solid pile without interior interstices. The bars in these
85 last arrangements are piled in such manner that they break joint, as is very clearly shown in the drawings. Fig. 6 is a perspective view of the pile of Fig. 2, the bars being tied by bands and the ends of the pile, which is slightly longer
90 than the core, being luted to prevent the complete combustion of the core before the pile becomes sufficiently heated to be coherent without the support of the core. Fig. 5 represents in end view a pile composed of a single layer
95 of muck-bars which have been rolled to the section of a keystone or skewback, arranged about a central solid wooden core and bound thereto by bands of sheet metal. Fig. 4 represents in end view a pile composed of many
100

variously-sized straight muck-bars arranged to break joints and bound by iron rope about a central wooden core. Fig. 7 represents in perspective the pile of Fig. 4. Fig. 8 represents in perspective a solid core of wood or kindred material of a character which I employ. Figs. 9 and 10 are side sectional elevations of piles composed respectively of two and of one layer of piled pieces upon wooden cores, the ends of each pile being luted.

Similar letters of reference indicate corresponding parts.

All of the foregoing piles are illustrative merely of good forms of a given type of pile formed of muck-bars secured upon a solid self-coherent core of combustible material.

In the drawings depicting the piles, B represents the binding devices; C, the wooden core; P, the muck-bars, of which the substance of the pile is composed, and L the luting or sealing material.

In practice, when the cores used are made of wood, they are best cut from a long piece of the same turned to the form of a cylinder. When the cores are of coal they are cut, ground, or otherwise shaped to the desired configuration. When peat, charcoal, or kindred combustible substance is used it is compressed, cast, or molded to the desired shape and suitably compacted or compressed to the desired hardness. The proportions of the core may be varied. Bands of metal are conveniently used to secure the pile together. Wire, wire rope, or other binding material may, however, be employed. The bars are simply arranged to the desired depth and bound together upon the core. When curved bars are employed they are previously rolled from the puddle-ball to the desired curvature. There are added around the core as many bars as are necessary to make the pile of the size and weight required.

After I have constructed my pile it is introduced into a furnace and heated to a degree of heat sufficient to consume the core and to occasion the adherence of the piled pieces to one another, so that the pile, although it has become practically without the support of the core, has sufficiently retained its form (that of a hollow cylinder) to enable it to be handled and subjected to any such method of reduction and condensation as it is deemed desirable to employ.

The reduction of the pile to a tube, column, shaft, axle, flue, or the like may be effectually carried out by any suitable apparatus, although such rolling-machines as embody in their construction a series of rolling passes,

successively diminishing in diameter, and as employ mandrels in connection with each pass, will most advantageously effect the consolidation and reduction desired.

I do not deem it necessary to describe more fully an apparatus suitable for the operation, as such machine is familiar to all rolling-mill men. Whatever apparatus I elect to employ operates, however, to reduce and condense the heated pile and occasion a conversion of the piled pieces or bars of unrefined puddled iron into refined iron, and their consolidation and mutual extension with each other, so that there results a tube of predetermined dimensions, the substance of which is of refined iron. The last pass of the rolls of the machines which I employ is in connection with its mandrel, adapted to produce a tube of the desired length, diameter, and thickness.

By my invention a merchantable refined-iron tube, flue, axle, column, or shaft of superior strength, quality, and cheapness can be made wholly from unrefined puddled or muck iron, thereby saving the cost of and dispensing wholly with the heretofore essential intermediate step of finishing or converting unrefined puddled iron into sheets or skelp prior to its manufacture by any known practical means into tubing.

It will of course be understood that the result of my invention is to produce a tube with a smooth bore or interior, from which it has not been necessary to drill out a bore, as has heretofore been the case when solid metal cores have been employed.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. As a new article of manufacture, a pile for the manufacture of tubing, consisting of pieces of unrefined puddled or muck iron, arranged and secured upon or about a coherent solid core of combustible material, substantially as and for the purposes set forth.

2. As a new article of manufacture, a pile for the manufacture of tubing, consisting of pieces of unrefined puddled or muck iron, arranged and secured upon or about a coherent solid core of combustible material, made shorter than the pieces and sealed with luting material at its ends, substantially as and for the purposes set forth.

In testimony whereof I have hereunto signed my name this 27th day of January, A. D. 1882.

ALBERT L. MURPHY.

In presence of—

J. BONSALE TAYLOR,
W. C. STRAWBRIDGE.