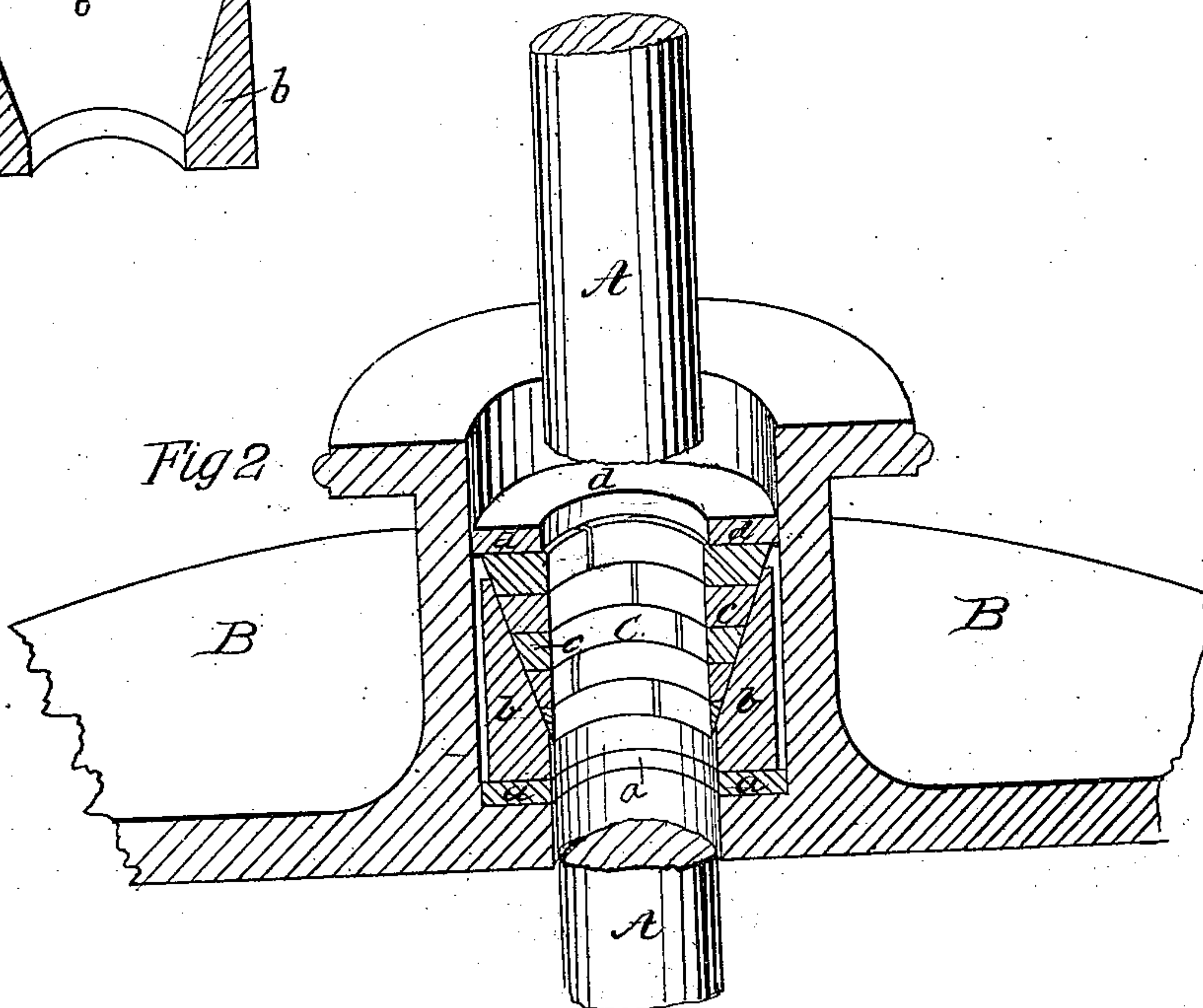
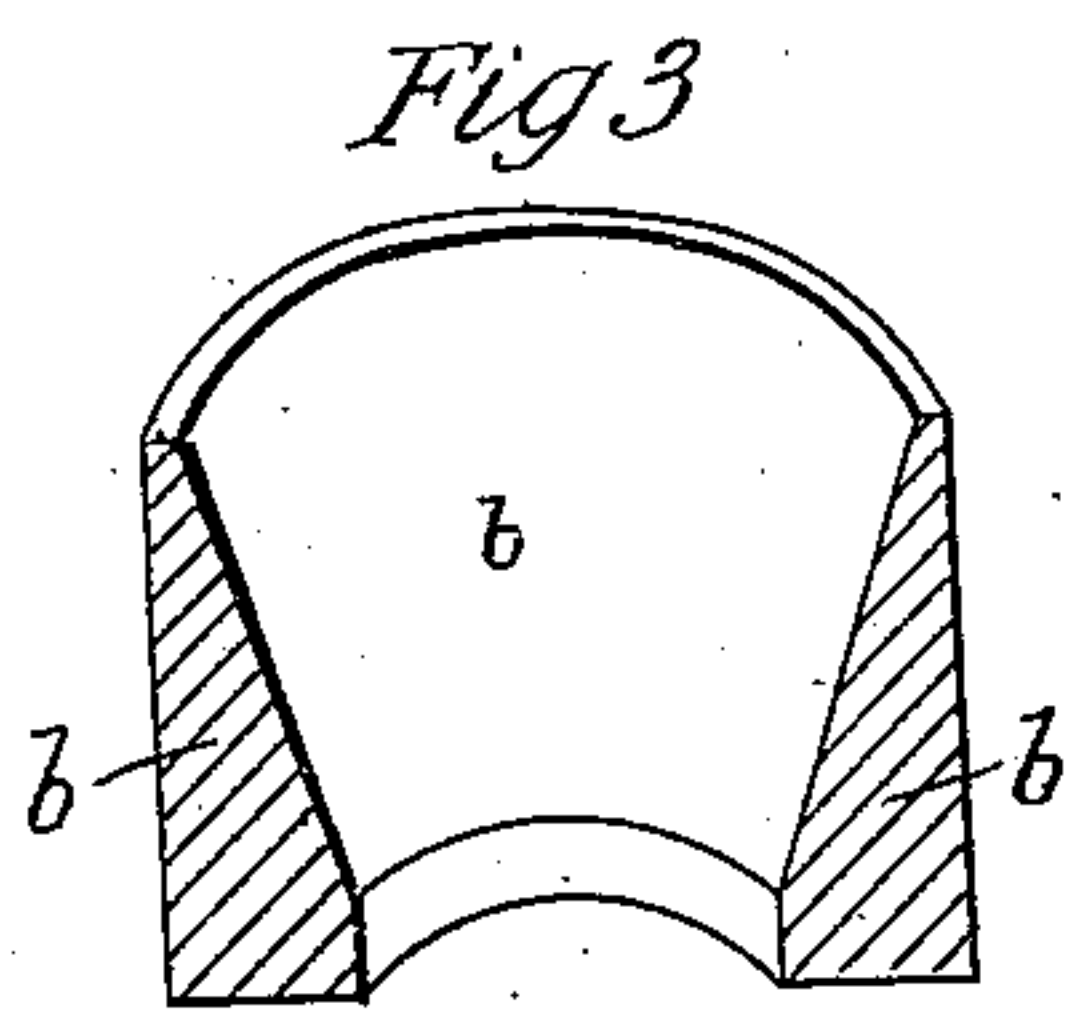
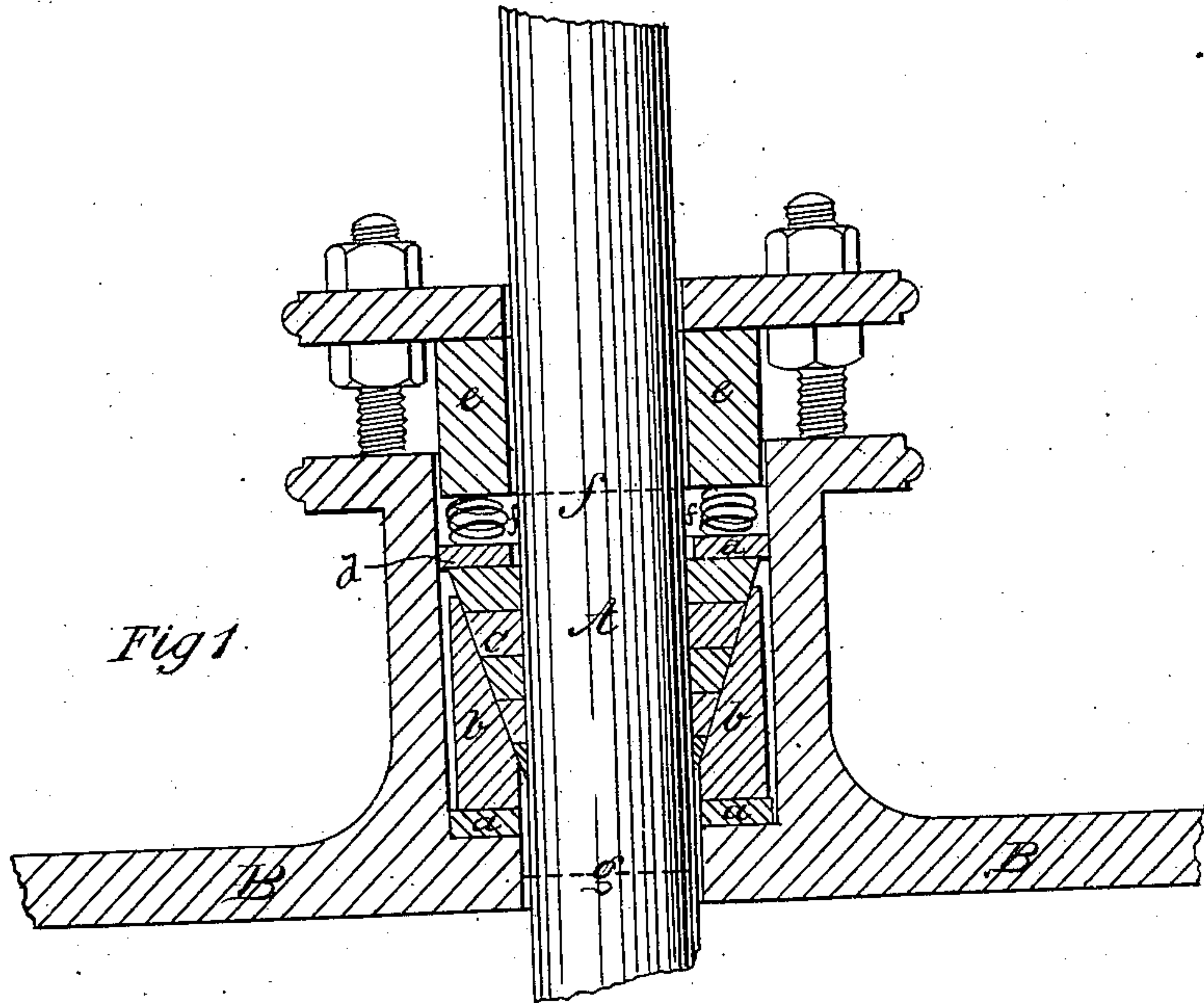


*Allen & Noyes.*  
*Piston-Rod Packing.*  
*No 5,357.* *Patented Nov. 6, 1847.*





# UNITED STATES PATENT OFFICE.

THOMAS W. ALLEN AND CHARLES W. NOYES, OF GREENBUSH, NEW YORK.

## STUFFING-BOX.

Specification forming part of Letters Patent No. 5,357, dated November 6, 1847; Reissued January 10, 1854, No. 254.

*To all whom it may concern:*

Be it known that we, THOMAS W. ALLEN and CHARLES W. NOYES, of the town of Greenbush, Rensselaer county, and State of New York, have invented a new and improved mode of packing the stuffing-boxes of steam-cylinders or other machinery in which they are used and which we denominate "Allen and Noyes' metallic self-adjusting conical packing for stuffing-boxes," of which the following is a full and exact description, so prepared that any mechanic skilled in the manufacture of cylinders, pistons, and such machinery can construct the same.

The diagram annexed hereto as part of this specification, represents on a scale of half its size the stuffing box of a locomotive engine's cylinder in which this invention has been proved and exhibits the method of construction.

The stuffing box of a cylinder made in the ordinary way; is bored out truly, and the annular portion of its bottom between the sides of the box and the orifice through which the piston plays is turned or ground down smoothly and truly at right angles to the axis of the piston-rod. Upon the annular bottom we place a brass or composition ring (in the diagram marked) *a, a* of (say) a quarter inch thick fitting snugly within the box, but having a play of (say) one eighth of an inch around the piston-rod. This ring is ground or fitted truly to the annular bottom of the box, and has its upper surface made truly parallel with its lower one. On this ring we next place a brass or composition cup which we call the vibrating cup. It is externally a cylinder, one eighth of an inch less in diameter than the stuffing box's bore, and (say) two and a half inches long. Internally it is so shaped as to receive in addition to the piston rod, as its matrix or bed the metallic packing, hereafter described, conforming and fitting to it truly, as shown at *b b*. Its lower surface is also truly fitted to the ring *a a*.

The packing which may be made of brass or composition metal, or Babbitt metal, which last we use and prefer, consists of several rings, (we have used five of half an inch thick each,) ground truly to each other, fitting accurately with their internal edges the piston-rod, and having, when laid one on the other in their place in the cup, just

described, externally the shape of a frustum of an inverted cone, whose upper or greater diameter is one eighth of an inch less than that of the bore of the stuffing box, and its lower and lesser diameter equal to the thickness of the piston-rod, as represented by *c c c c c*. These rings are cut or divided in one or more places as convenience and experience may direct, taking out sufficient metal at the cuttings to allow a contraction of the circle of the rings, as the wear of their internal surface against the piston-rod, causes their parts to approach the center of their circles. On the top of these conical rings we place another brass or composition metal ring marked *d d* similar to the lower one *a a* in all respects, and accurately ground or fitted to the topmost packing ring. Upon the top of this ring, or else attached to the bottom of the cap or cover of the stuffing box, are to be placed one or more springs of a spiral, elliptical, or any other form convenient for the purpose of keeping a suitable pressure upon said ring, the effect of which will be to depress the packing into the conical shaped chamber of the vibrating cup, and thereby thrust the packing inward so as to embrace snugly the piston-rod and effectually prevent the escape of steam or ingress of air along the rod; while the accuracy of the fitting of the outside of the packing to the cup and of the rings to each other, and to the bottom of the stuffing box will prevent escape of steam or entrance of air in any other direction.

The cap of the stuffing box is formed in the usual way leaving a sufficient space between its lower surface and the upper ring for the introduction of the springs.

For the purpose of conveniently regulating the pressure of the springs upon the packing, we use, in addition to the nuts employed to screw down the said cap, a set of nuts underneath the cap, so as to hold it exactly in any desired situation and give a fixed pressure upon the packing.

The object and intention of the vibrating cup is to afford that lateral motion to the piston rod in the stuffing box which necessarily arises in the best made machines from wear of parts, loosening of joints, and other derangements, especially in machines which like locomotives are driven with great velocity over irregular surfaces, and made to undergo great straining of parts and which



lateral motion if imparted to the conical packing lying in an unyielding matrix or bed would force it up obliquely to the line of the axis of the piston, and soon wear into irregularities the surfaces of impact of the rings on each other, and also on the piston.

We do not limit the proportions of the parts to those stated above but vary them, so as to suit the case of different engines and different service nor do we fix the angle made by the outer surface of the packing rings and the axis of the piston at the degree of inclination described in this specification (by way of illustration) but vary it as may be found in practise best suited to effect the proper degree of pressure against the piston rod by the packing.

We do not think it necessary to describe the various methods that may be used to keep the packing and the rings from revolving when the stuffing box is used with rotating shafts, as any intelligent mechanic can adapt a variety of simple fixtures to effect that end.

What we claim as our invention is not the employment of metallic packing in a stuffing box generally; but—

1. The employment of metallic packing, arranged shaped and combined in a peculiar way: viz: in a metallic matrix or cup shaped and arranged as is stated in this specification

and its illustrations so as to allow the piston rod or shaft passing through the stuffing box liberty to vibrate laterally to a sufficient extent to meet the unavoidable irregularities of the engine to which it may be applied; and at the same time support within it conical shaped metallic rings moving against and along the piston rod or shaft as well as against and along its (the cup's) oblique surface, so that as the inner surface of the packing-rings wear away, the rings may, by the proper application of springs or screws pressing them in the direction of the axis of the piston-rod or shaft, be advanced along the conical surface of the matrix, so as to maintain a perfect contact of surface both with the piston rod or shaft, and with the matrix.

2. We also claim the use of the said vibrating cup without the metallic packing, in which case we use hempen or other packing in connection with it.

In witness whereof we the claimants, have signed this specification this twenty second day of May A. D. 1847.

THOMAS W. ALLEN.  
CHAS. W. NOYES.

Witnesses:

RICHD. VARICK DE WITT,  
PETER GANSEVOORT.