

No. 864,740.

PATENTED AUG. 27, 1907.

H. HILDENBRAND.
TAPPING APPARATUS.
APPLICATION FILED APR. 10, 1903.

2 SHEETS—SHEET 1

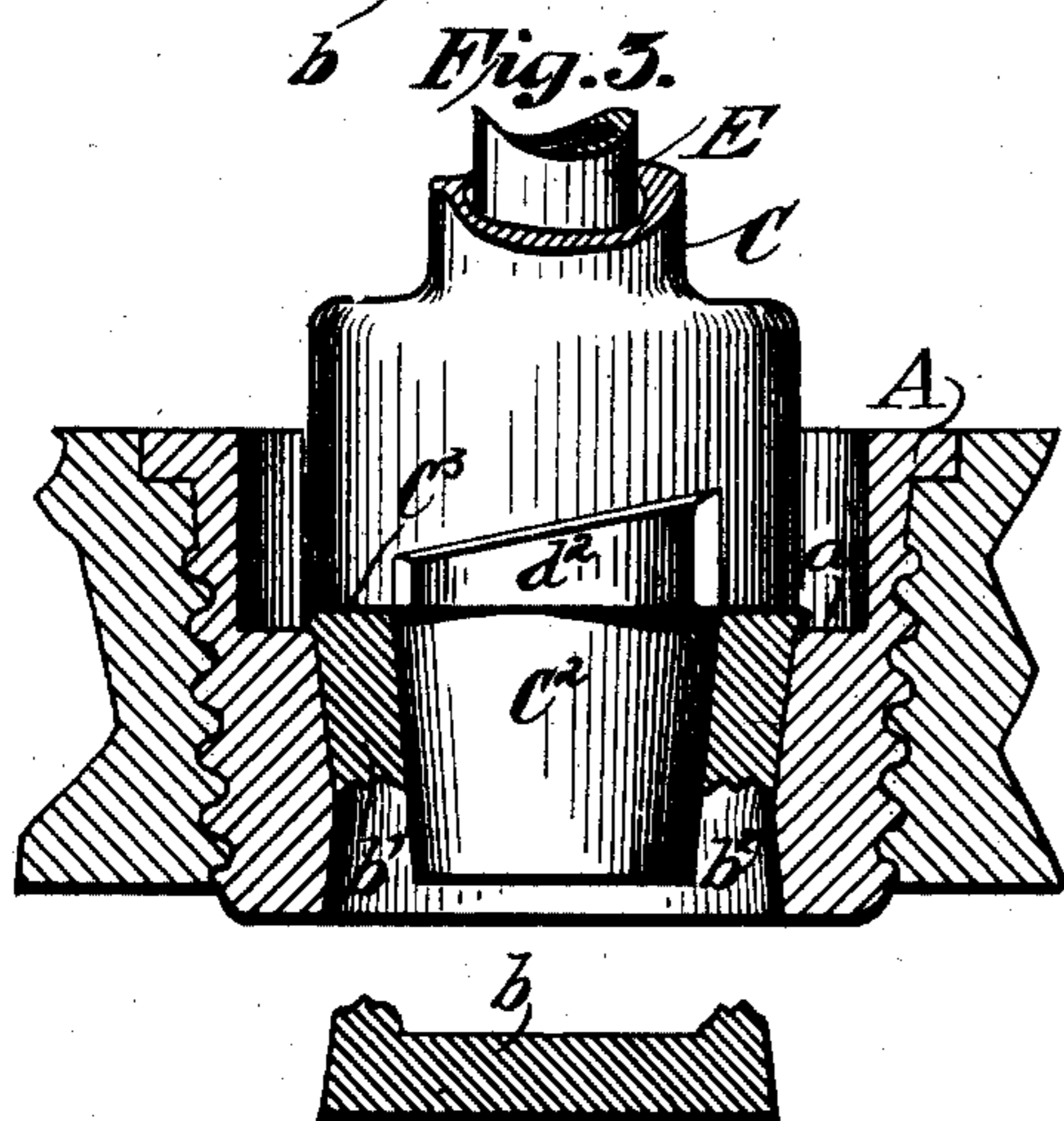
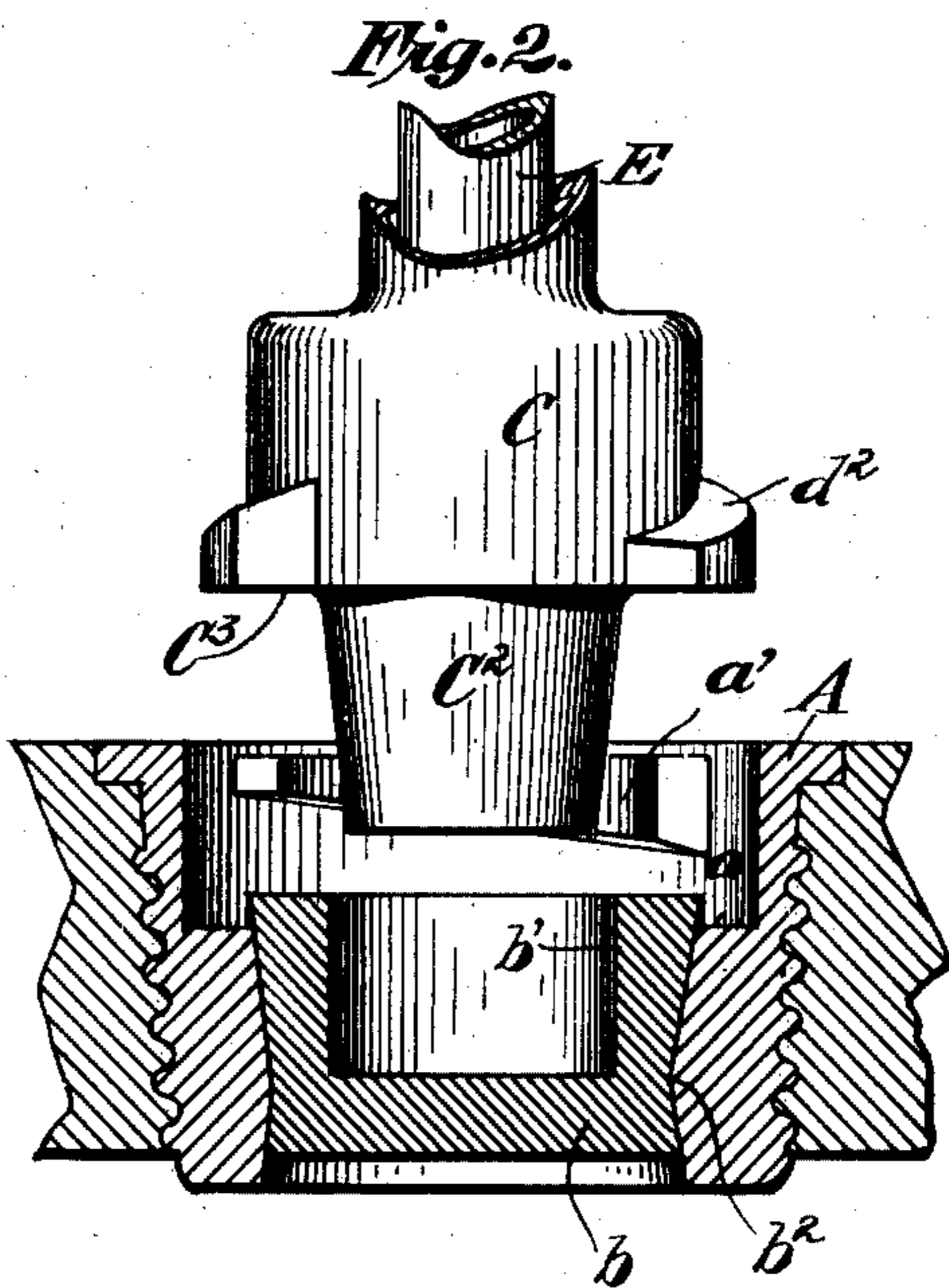
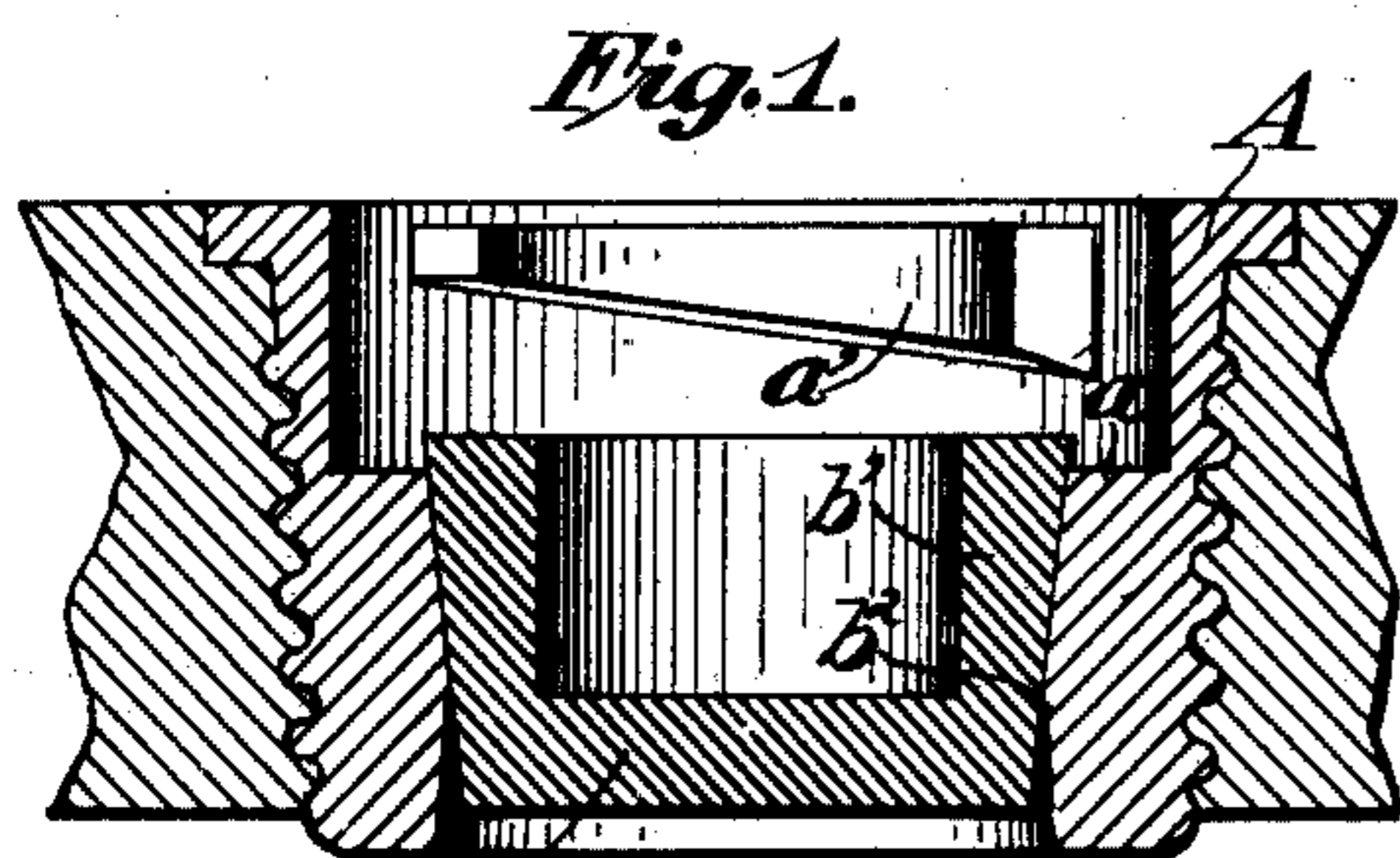
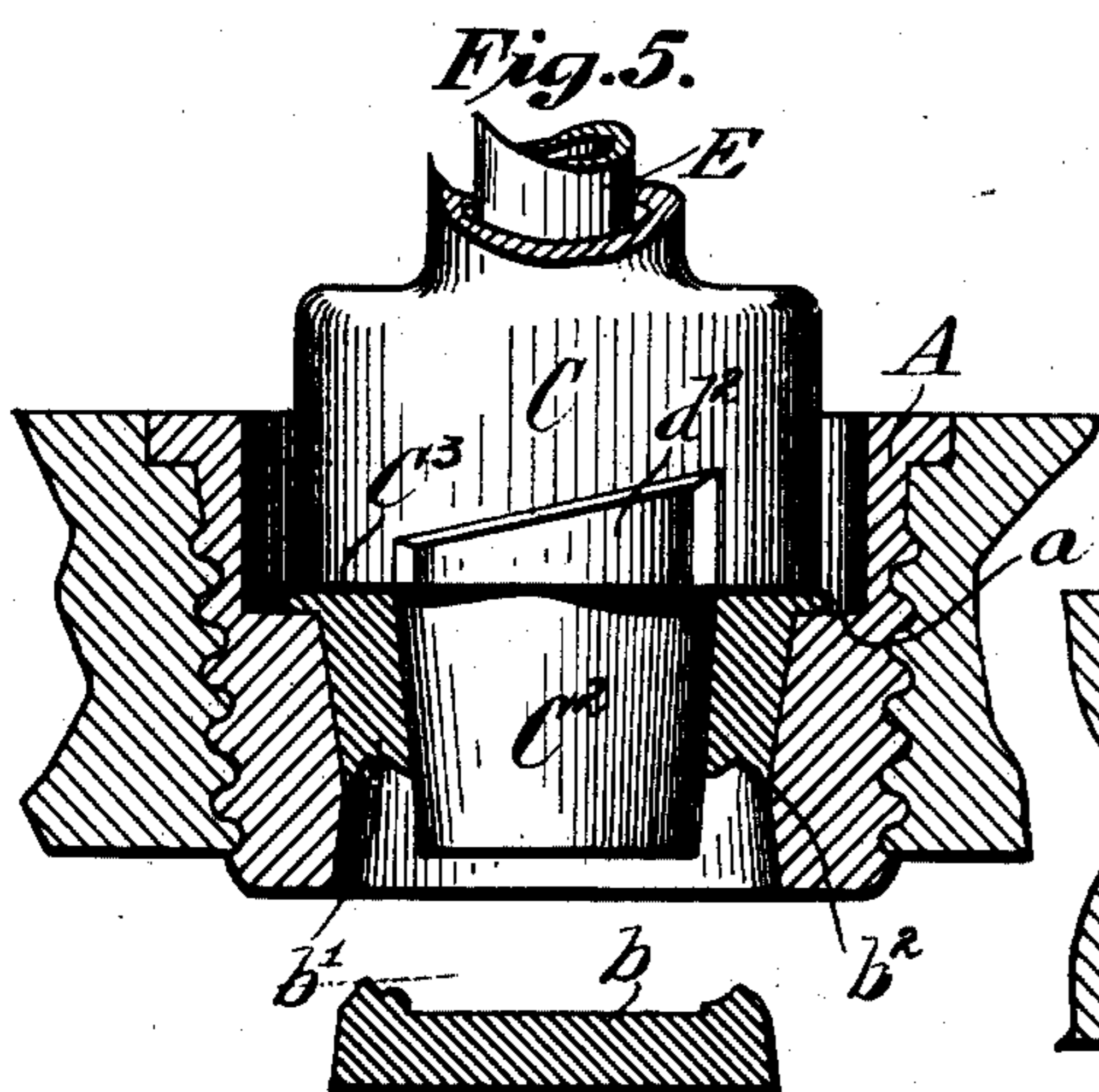
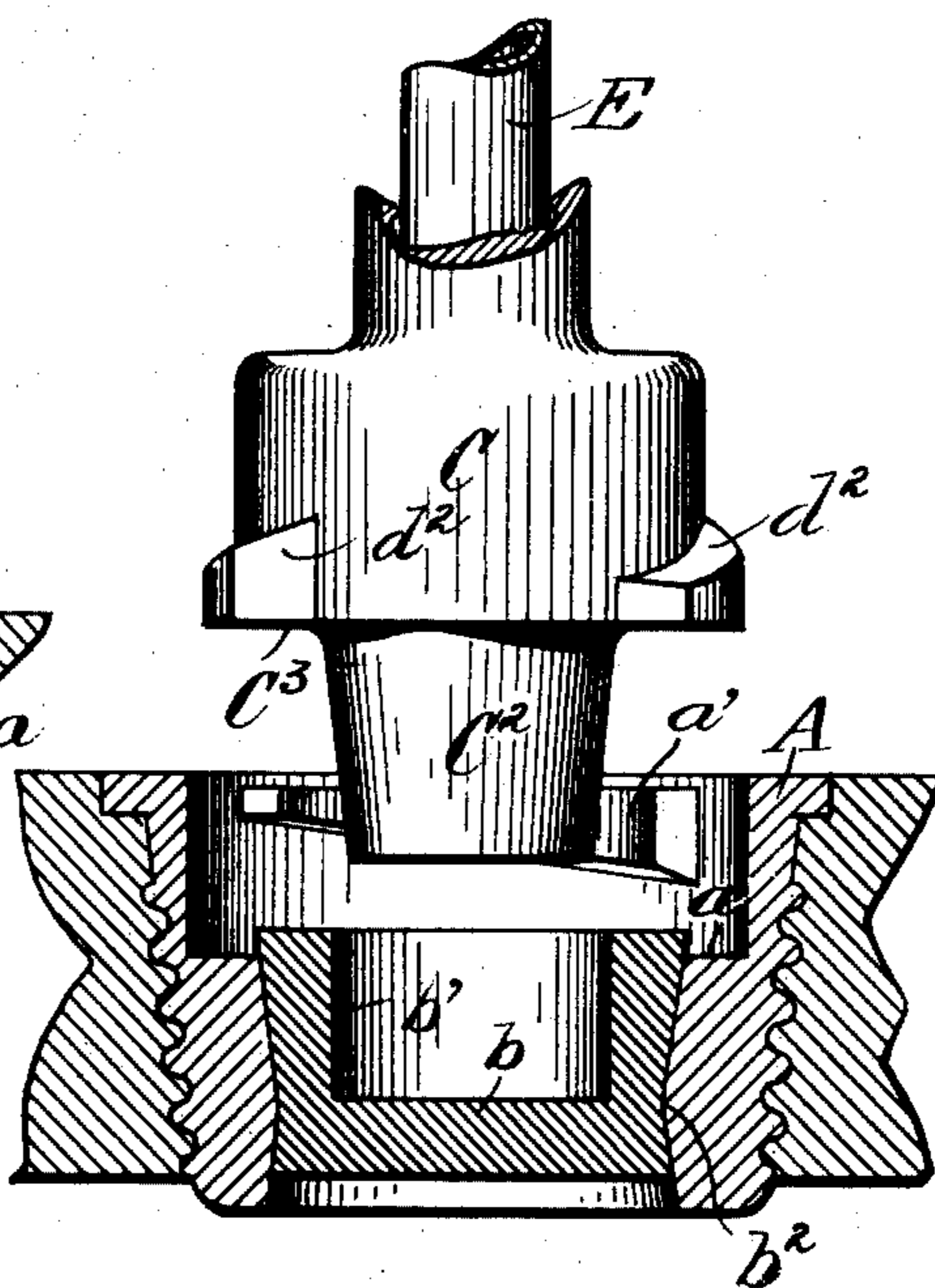


Fig. 4.



Witnesses
Comstock
Arthur

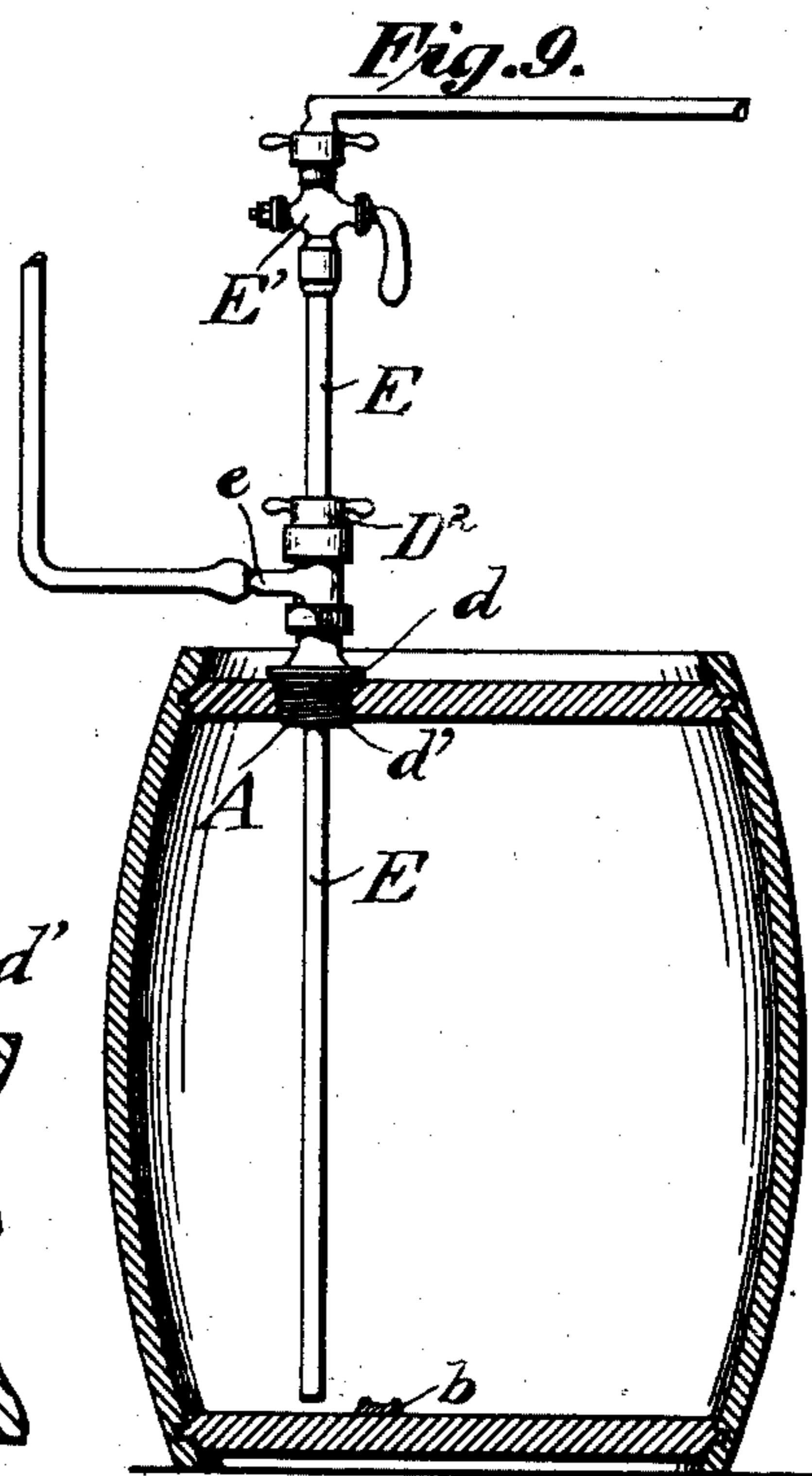
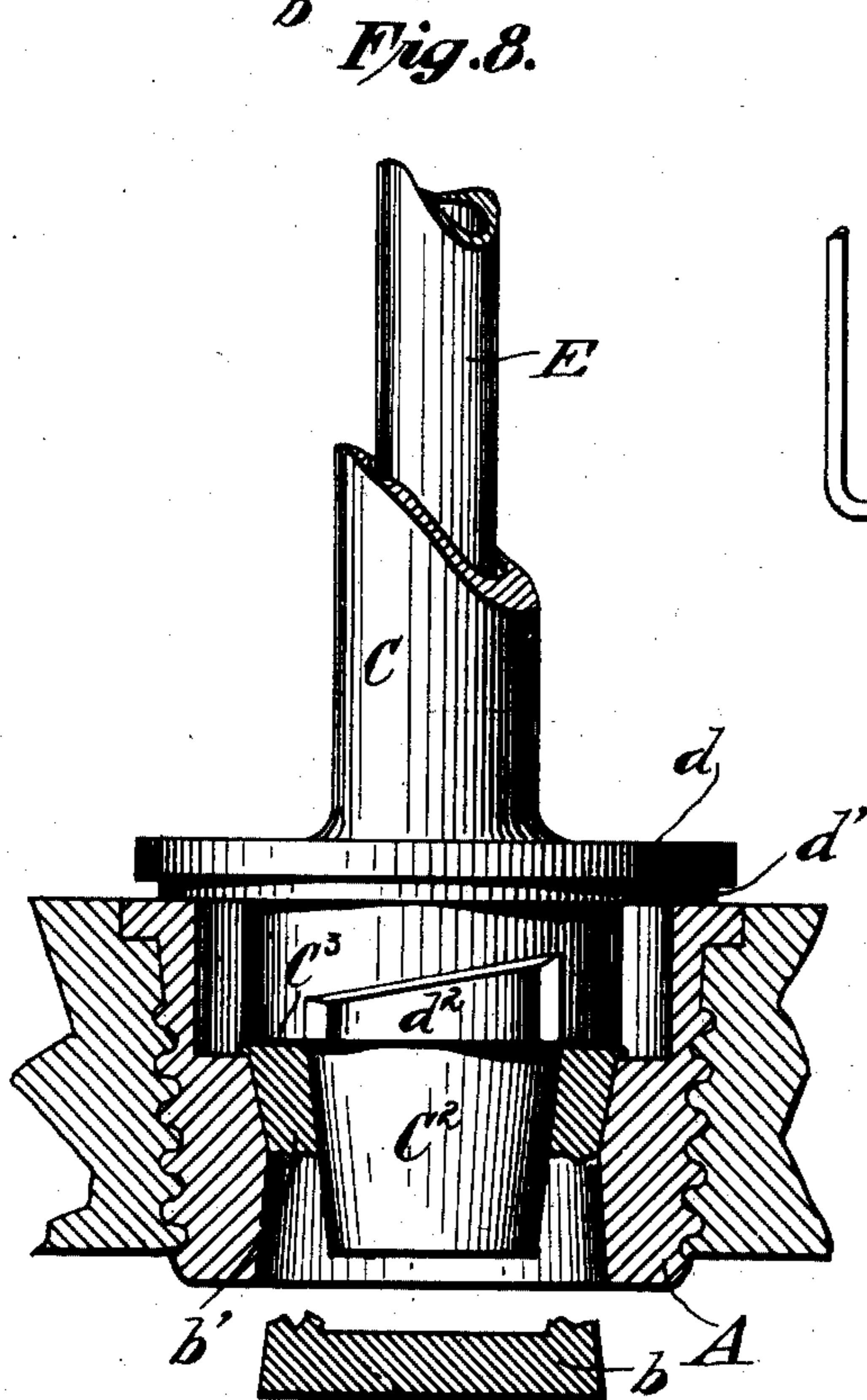
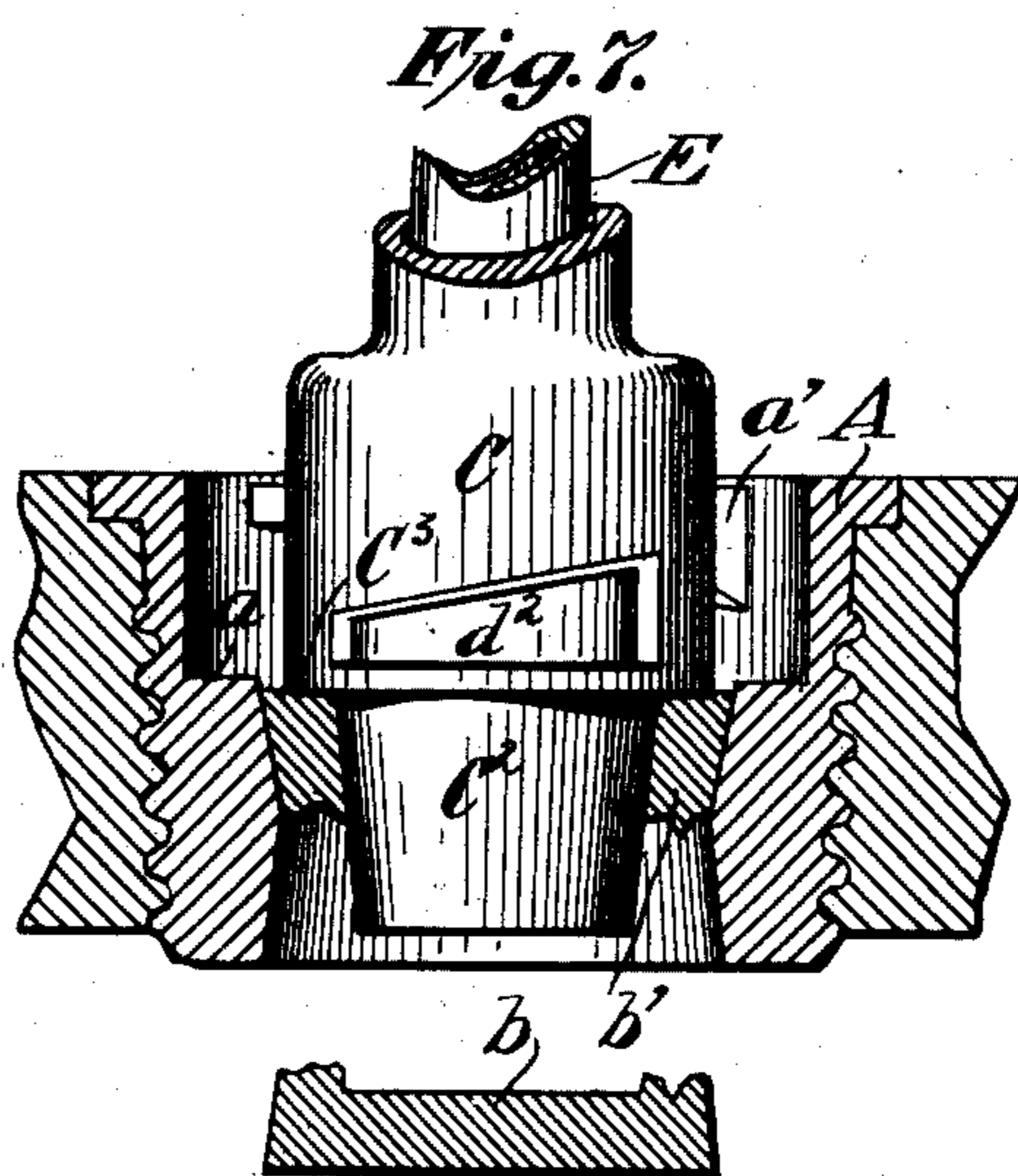
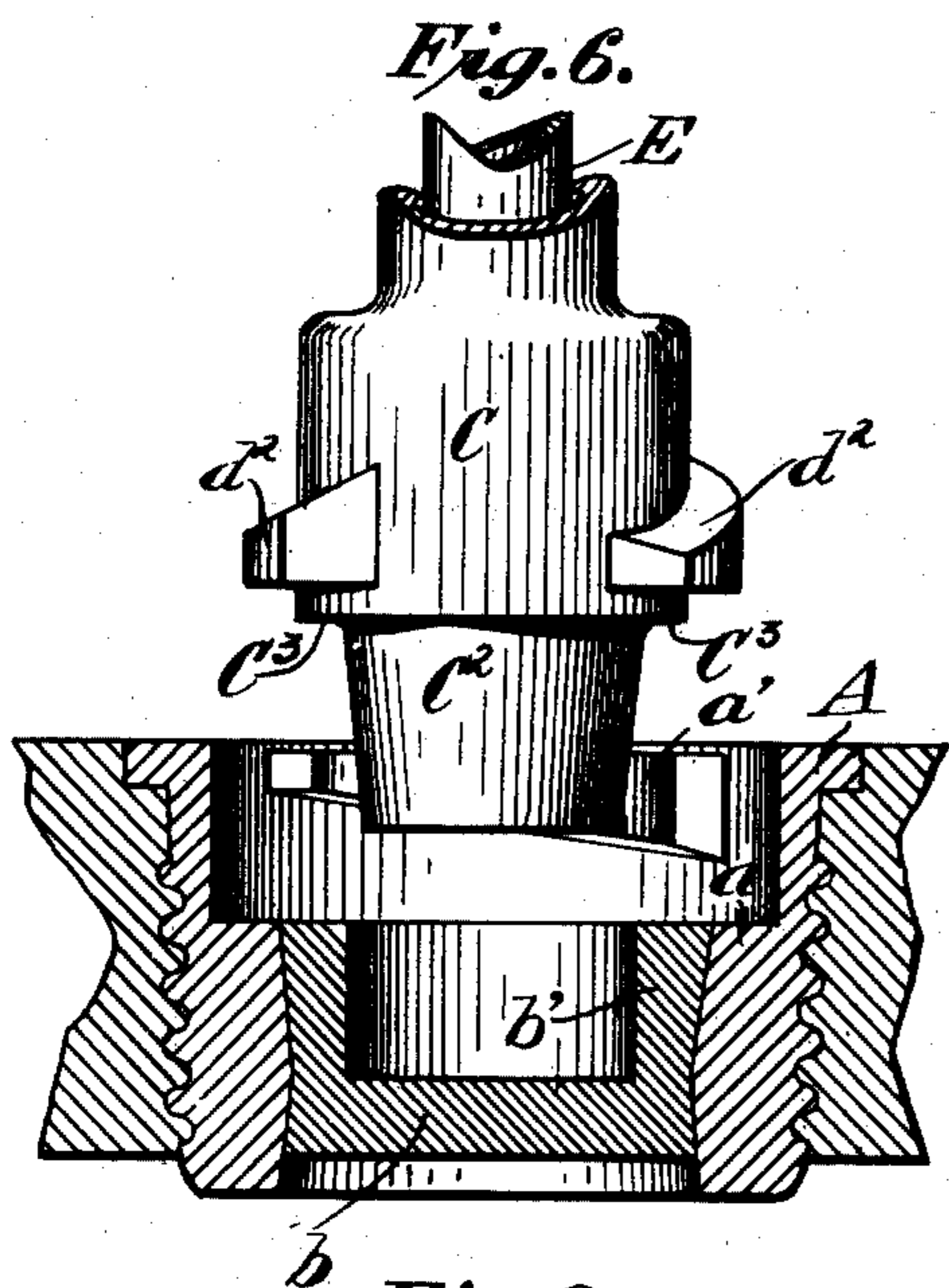
Inventor:
Henry Hildenbrand
By his Attorneys, *Georgie & Massie*

No. 864,740.

PATENTED AUG. 27, 1907.

H. HILDENBRAND.
TAPPING APPARATUS.
APPLICATION FILED APR. 10, 1903.

2 SHEETS—SHEET 2.



Witnesses
Comptrol
Autos Glaciers

Inventor:
Henry Hildenbrand
By his Attorneys,
Georgii & Masie.

UNITED STATES PATENT OFFICE.

HENRY HILDENBRAND, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO CHARLES F. TERNEY, OF NEW YORK, N. Y.

TAPPING APPARATUS.

No. 864,740.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed April 10, 1903. Serial No. 152,055.

To all whom it may concern:

Be it known that I, HENRY HILDENBRAND, a citizen of Germany, residing at New York, in the county of New York and State of New York, have invented certain
5 new and useful Improvements in Tapping Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

10 My invention relates to improvements in tapping apparatus and in particular to improvements in the device shown in U. S. Patent No. 604,596, granted May 24, 1898, to Andrew Berger and myself.

The broad objects of my invention are, first, to provide a tapping apparatus in which a packed joint will be formed inside the bushing, or, preferably, to provide
15 two packed joints, one, at least, being inside the bushing; second, to insure the breaking out of the closure by the faucet-piece; and, third, to provide means for making a tight joint around that portion of the faucet-piece
20 which serves to break the closure.

A further and most important object of my invention is to provide a packed joint of such a nature that every time a barrel is tapped it is certain that the packing
25 joint, or at least one of them, where two are employed, will have a fresh packing material, thereby insuring a tight joint, while at the same time this advantage is obtained without any additional expense or complication.

The features of which my invention consists will be clear from the specific description hereinafter of the preferred embodiments of my invention, taken in connection with the generalization which follows said description, and from the claims.

In the drawings, Figure 1, is a central sectional view
35 of a bushing and closure embodying my invention, showing the plug as it would appear when first driven into the bushing. Fig. 2, is a similar view showing the plug as it would appear after it had swollen from the moisture of the liquid and showing, also, so much of the
40 faucet-piece, in elevation, as is necessary to illustrate my invention. Fig. 3, is a sectional view, partly in elevation, showing the faucet-piece in place after the closure has been broken. Figs. 4 and 5, are views similar to Figs. 2 and 3 and illustrate another modification
45 of my invention, in which the packing seat of the faucet-piece has a diameter larger than the outer end of the plug. Figs. 6 and 7 are views similar to Figs. 2 and 3 and illustrate a further embodiment of my invention, in which the seat of the faucet-piece is smaller than the
50 outer end of the plug. Fig. 8 is a sectional view, partly in elevation, of a structure embodying my preferred form of construction wherein two packing seats are provided. Fig. 9 is a side elevation of my improved tap-

ping apparatus, in place in a barrel, the latter being in section.

Referring to Figs. 1, 2 and 3 of the drawings, A is a bushing arranged to be secured in the faucet-hole of the barrel, or other receptacle, in any suitable way, but preferably by making the exterior of the bushing slightly conical and providing it with screw-threads
60 which engage corresponding threads in the faucet-hole. The interior of the bushing has a portion of reduced diameter which receives the closure device, the latter, preferably consisting of a plug which has a frangible portion and an annular portion. In the construction
65 shown, the closure is a webbed plug, the web being shown at *b* and the annular portion or wall at *b'*. This webbed plug is preferably made of wood and has a conical exterior, the smaller diameter of the plug being at its inner end, as will be clear from Fig. 1. The interior of
70 the plug-receiving portion of the bushing is also made conical to conform to the exterior configuration of the plug, that is to say, the outer end of the plug-receiving portion is coned outward. Furthermore, the inner end of the plug-receiving portion is chamfered inward from
75 about the point marked *b*² in Figs. 1 and 3, which point is about in the same plane as the outer face of the web *b* of the plug. The bushing also has an enlarged portion outside the plug-receiving portion, whereby an offset or shoulder is formed, as indicated at *a*, Figs. 1, 2 and 3,
80 and the plug is of such size relative to the smaller portion of the bushing that when it is driven firmly into place its outer face will project outward slightly beyond the plane of the offset or shoulder, as will be clear from Figs. 1 and 2. The bushing is provided with suitable
85 devices for locking, or assisting in locking, the faucet-piece to the bushing as, for example, the cam-projections *a'*, Figs. 1 and 2. The faucet-piece C has corresponding devices arranged to co-act with the locking devices carried by the bushing, as, for example, the
90 cam-projections *d*², and also has an extension C² which serves to break the frangible portion of the plug, said extension having its inner end of a diameter slightly less than the interior diameter of the plug while the outer end of said extension, or that portion which enters the outer end of the plug annulus is of slightly
95 greater diameter than the interior of said outer end of the annulus, for a purpose hereinafter explained. Adjacent to said outer end of the extension C² the faucet-piece is provided with a packing seat C³, which, in the
100 construction shown in Figs. 1, 2 and 3, is of substantially the same diameter as the exterior diameter of the outer end of the plug.

The operation of the apparatus thus far described is as follows:—When the barrel or other receptacle has
105 been filled the plug is driven into place, its outer face

projecting slightly outside the shoulder of the bushing, as already explained hereinbefore. At this time the bushing and plug would have the appearance in cross-section as shown in Fig. 1. When, however, the bung
 5 has been wet by the liquid in the barrel, as will soon occur, it will swell and its inner end will expand into the chamfered portion of the bushing, as will be clear from Fig. 2. In this condition it becomes an absolutely safe closure because it is positively held in
 10 place by its two coned portions, one of which prevents it from being forced inward accidentally and the other prevents it from being forced out accidentally. When it is desired to tap the barrel or other receptacle, the faucet-piece is inserted in the bushing until its cam-
 15 projections interlock with those of the bushing and the extension of the faucet-piece has its inner end resting upon the webbed portion of the plug. Upon the further inward movement of the faucet-piece, preferably brought about by a quick rotation of the said
 20 faucet-piece in a well-known manner, the web portion of the plug is forced into the barrel, breaking loose from the annular portion of the plug substantially along the plane through the junction of the chamfered portion of the bushing with the coned portion of said
 25 bushing, as will be clear from Fig. 3, this plane being the weakest part of the plug. At the same time that the web-portion is being forced inward and before the web-portion has been broken away, the enlarged tapered portion of the extension C^2 of the faucet-piece
 30 engages the annulus and tends to crowd the same outward so that it will spread slightly onto the shoulder of the bushing, while immediately thereafter the packing seat of the faucet-piece comes into contact with the outer face of the plug, whereupon, by the
 35 further inward movement of the faucet-piece the said seat is forcibly pressed against the said outer face of the plug and compresses the same firmly, owing to the elasticity of the wood, thereby pinching that portion of the plug which has spread onto the shoulder
 40 of the bushing, between the packing seat and the shoulder, as shown in Fig. 3, whereby a tight joint is formed around the extension piece and at the shoulder, thereby preventing the escape of any liquid or gas.

Owing to the conical shape of the plug-annulus, and
 45 the corresponding shape of the bushing which holds it, the said annulus cannot be forced inward during the act of tapping, except perhaps to a small extent due to the elasticity of the wood, while at the same time on account of the chamfered portion of the bushing, the
 50 swelling of the web-portion of the plug by the moisture does not prevent the said web-portion from being driven inward by the extension, as sometimes occurs when the chamfer is omitted. Moreover, at the junction of the coned portion and the chamfered portion
 55 a plane of least resistance is formed across the plug so that even though the wood of the plug does not have its grain exactly at right angles to the axis of the faucet-piece, still it will break substantially along said plane of least resistance and thus leave the annulus in good
 60 condition and without cracks, so that it can form a satisfactory packing around the extension of the faucet-piece. The other elements of the faucet-piece may be as desired, but preferably comprise the usual connection piece c , Fig. 9, for the attachment of the air-pump,
 65 a longitudinally-movable discharge pipe E , arranged

to be forced into the barrel after the closure has been opened, means for packing the faucet-piece around the discharge-pipe as indicated at D^2 , and means for controlling the flow of liquid through the discharge-pipe, as the stop-cock E^1 .

70

The structure shown in Figs. 4 and 5, of the drawings differs from that shown in Figs. 1, 2 and 3 in having a packing seat larger than the outer diameter of the plug, whereby said seat will extend over the shoulder of the bushing and thus bring a pressure to
 75 bear directly inward against said shoulder and against that portion of the plug which has been spread outward over the shoulder, as will be clear from Fig. 5.

The construction illustrated in Figs. 6 and 7 differs from the preceding ones in having the packing seat of
 80 the faucet-piece slightly less in diameter than the outer end of the plug, the latter not projecting beyond the plane of the shoulder, the cam-projections of the faucet-piece being cut away or set back from the seat so that the seat can follow the annulus into the smaller
 85 inner portion of the bushing and thereby compress the same to form a tight joint, which would not be the case if the cam-projections had their inner faces flush with the seat, because they would then contact with the shoulder at the same time that the seat touched the
 90 outer face of the plug, and thus prevent any further inward movement of the faucet-piece.

In Fig. 8, I have shown my invention applied to a structure in which an outer packed joint, also, is provided, said outer joint being located, preferably, be-
 95 tween the faucet-piece and the bushing, the difference between this structure and that shown in Figs. 1, 2 and 3 consisting merely in providing the faucet-piece with a circumferential flange d beneath which is an elastic washer d' arranged to be compressed between the said
 100 flange and the outer face or edge of the bushing. This is my preferred combination, because it provides two packing joints so that in case through any means one should be defective, it is not at all likely that the second will also be defective, and thus, practically con-
 105 sidered, it is almost certain that no loss of liquid or gas can ever occur even with the most careless operatives.

It will be noted that all these modifications have a packing joint which is wholly within the bushing and around the extension, whereby said joint is well pro-
 110 tected against injury and, moreover, is likely to be a good joint even if, in the original placing of the plug, the latter be so inserted as to have its axis at an angle to the axis of the faucet-piece. That is to say, the angular variation between the packing seat and the part
 115 it abuts against is less, close to the extension, than outside and some distance away from the same, so that while with a packing joint outside the bushing the one side of the joint may be well compressed and tight while the other side is loose and perhaps leaky, this
 120 will not be the case with the joint close to the extension.

In each modification the faucet-piece can be given a longitudinal movement inward, after its seat has first come into contact with the outer face of the plug,
 125 thereby compressing the plug and making it serve as a compressible packing material to form a tight joint. The prime advantage of this is that as the plug is destroyed when the barrel is tapped and must be replaced by another when the barrel is refilled, the said packing
 130

material formed by the plugs is continually being renewed and hence is practically certain to be in good condition at each tapping of the barrel. Furthermore, this great advantage is obtained without any additional expense and in a most simple manner. It is also to be observed that as the outer end of the extension C² which enters the outer end of the annulus is somewhat larger in diameter than the interior diameter of the annulus, the said extension fits the annulus quite tightly before the web-portion is broken away, while the further inward movement of the extension in breaking the closure causes a compression of the outer end of the annulus, in a lateral direction, thus compressing the annulus tightly against the interior of the bushing and around the extension, the seat of the faucet-piece at the same time compressing the outer face of the annulus, so that upon the application of further pressure to the interior of the barrel by the air-pump or the like, there is no reasonable chance of leakage, and this efficiency is further enhanced in those constructions where the plug projects outside the shoulder of the bushing and, hence, can be compressed against said shoulder.

Having thus fully described my invention, what I claim is:

1. In a tapping apparatus, the combination, with a bushing having a shoulder, of a plug closing said bushing and having its outer face projecting outside said shoulder, said plug also having a frangible portion, a faucet-piece provided with an extension arranged to break the frangible portion of the plug and with a seat arranged to contact with the outer face of the plug, and means for forcing said faucet-piece inward to break the frangible portion and to compress the outer portion of the plug between the seat and the shoulder.

2. The combination, with a bushing having a part arranged to receive a plug, said part having its outer end coned outward and its inner end chamfered inward, the coned and chamfered surfaces substantially intersecting, of a plug of expansible material inserted in the bushing and having an annular portion and a web-portion, the outer face of the web-portion being substantially in the plane of the intersection of the coned and chamfered portions of the bushing, said web-portion extending inwardly beyond said plane being arranged to swell into the chamfered portion of the bushing, and a faucet-piece arranged to be locked to the bushing and provided with an extension piece arranged to enter the annular portion of the plug and to break away the web-portion of said plug.

3. In a tapping apparatus, the combination, with a bushing having a portion arranged to receive a plug, said portion being chamfered inward of the inner end, of a plug of

expansible material located in said bushing, having a web-portion arranged to swell into the chamfered portion of the bushing and also having an annular portion, and a faucet-piece provided with an extension arranged to enter the annular portion of the plug and to break away the web-portion of the plug, said faucet-piece having a seat arranged to contact with the outer face of the plug, and means for locking the faucet piece to the bushing and at the same time forcing the faucet-piece inward, and for bringing said seat of the faucet-piece in contact with the outer face of said plug and pressing said outer face inward, whereby a compression of the plug will accompany the breaking of the web portion.

4. In a tapping apparatus, the combination, with a bushing having a shoulder, a plug located in said bushing and having a web-portion and an annular portion whose outer face projects outside the shoulder, of a faucet-piece having an extension arranged to break away the web-portion of the plug, said extension having an enlarged diameter arranged to fit tightly into and spread outward the part of the plug projecting outside the shoulder before the web-portion is broken away, said faucet-piece having a seat arranged to contact with the outer face of the annular portion of the plug and compress the same.

5. The combination, with a bushing having a part arranged to receive a plug, the outer end of said part being formed substantially as a truncated cone having its base of smaller diameter below that of larger diameter, and the inner end of said part beginning from the lower base of said cone being formed with an enlarged diameter, of a plug of expansible material inserted in the bushing and having an annular portion and a web-portion, the outer face of the web-portion being substantially in the plane of the lower base of said cone, said web portion extending inwards beyond said plane being arranged to swell into the portion of enlarged diameter of the bushing, and a faucet-piece arranged to be locked to the bushing and provided with an extension piece arranged to enter the annular portion of the plug and to break away the web portion of said plug.

6. In a tapping apparatus, the combination, with a bushing having a shoulder, of a plug closing said bushing, said plug having an annular portion and a frangible web portion, the outer face of the annular portion projecting outside the shoulder, a faucet-piece provided with an extension arranged to break the frangible web, said faucet piece having a seat arranged to contact with the outer face of the plug, and a cam-locking device arranged to simultaneously lock the faucet-piece to the bushing and to force the faucet piece inward to break the frangible portion and to compress the annular portion of the plug.

In testimony whereof I affix my signature to this specification, in the presence of two witnesses.

HENRY HILDENBRAND.

Witnesses:

M. C. MASSIE,
CHARLES F. TENNEY.