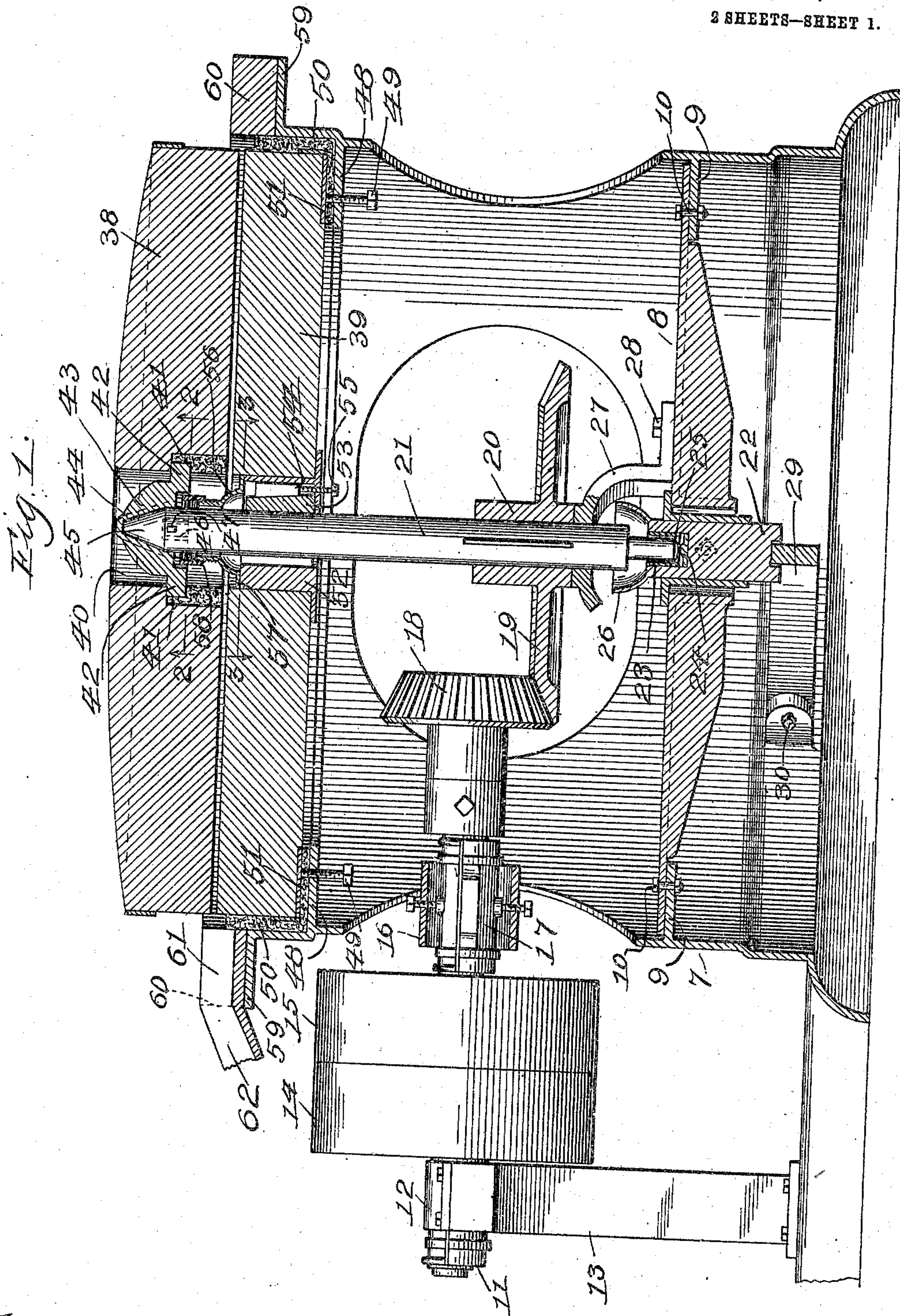


957,997.

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MUSTARD GRINDING MILL.
APPLICATION FILED NOV. 26, 1909.

Patented May 17, 1910.
2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 2.

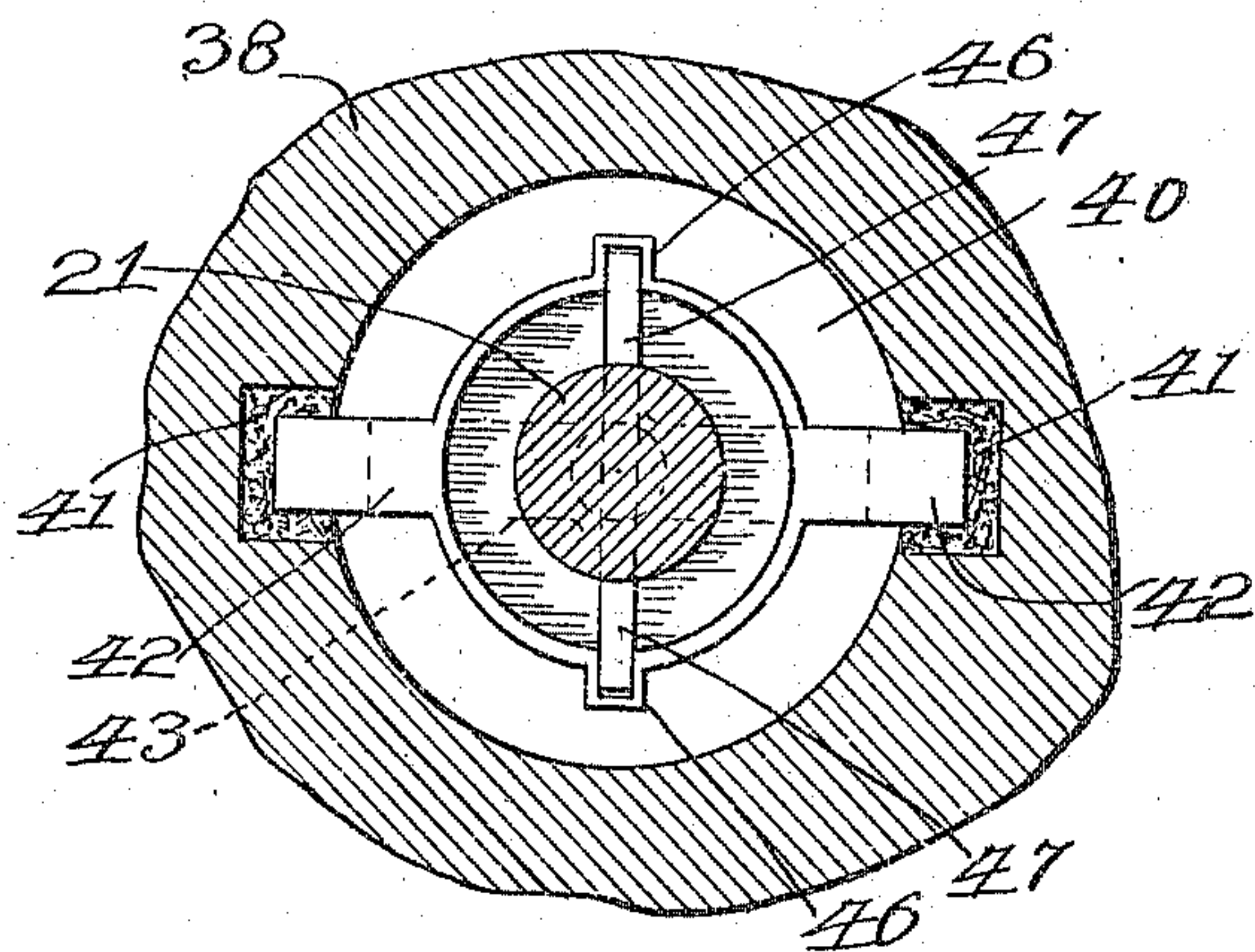


Fig. 5.

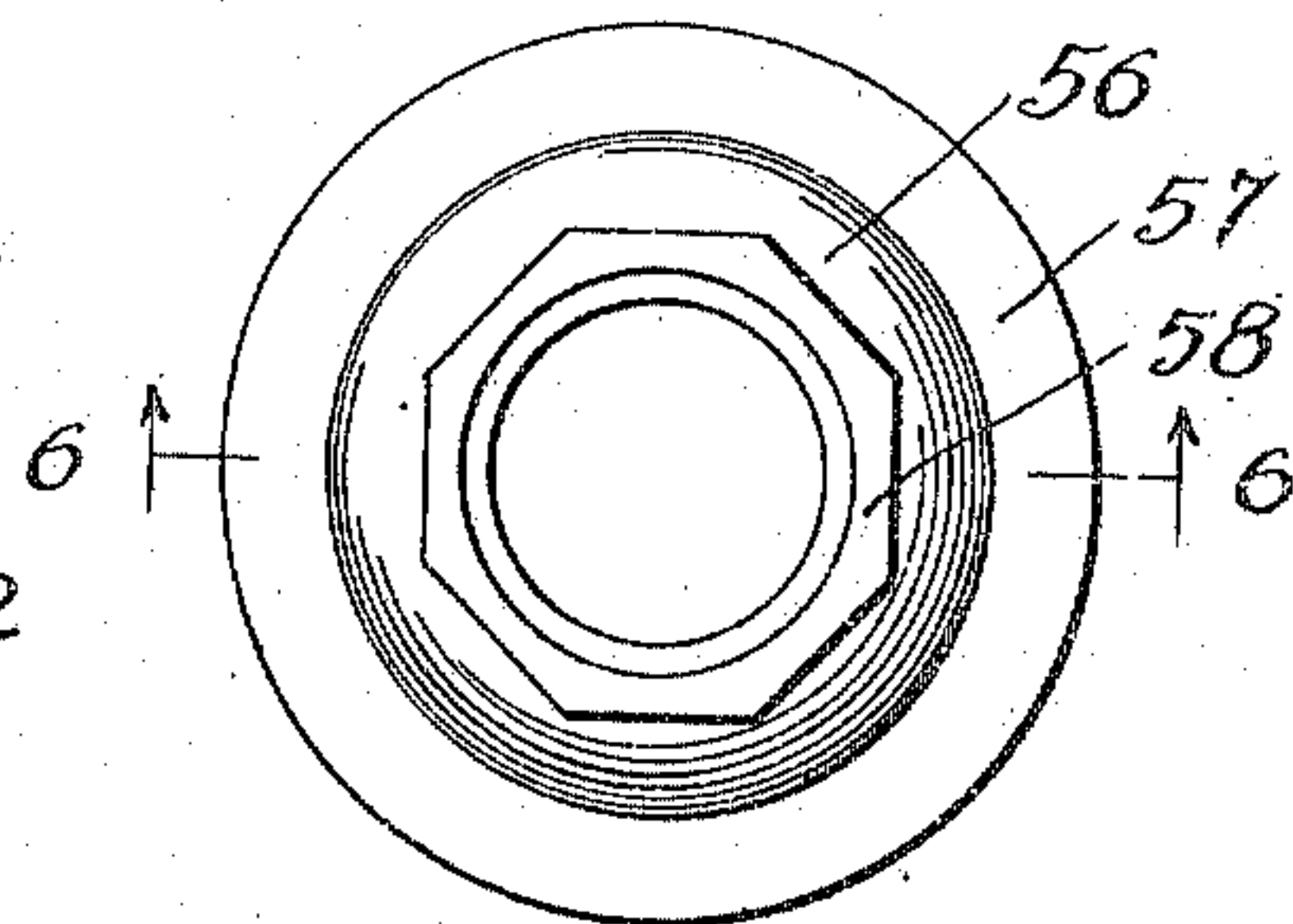


Fig. 3.

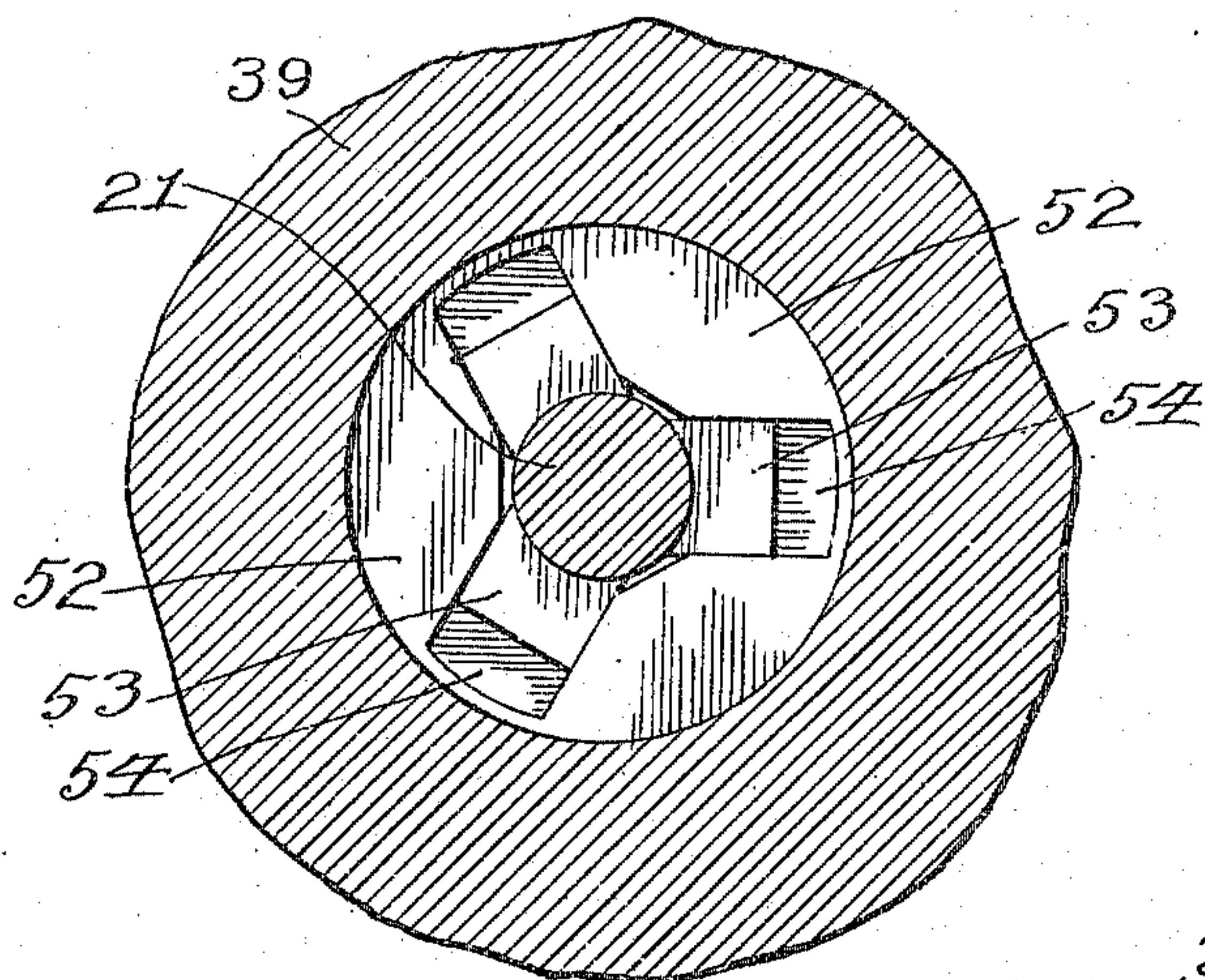


Fig. 6.

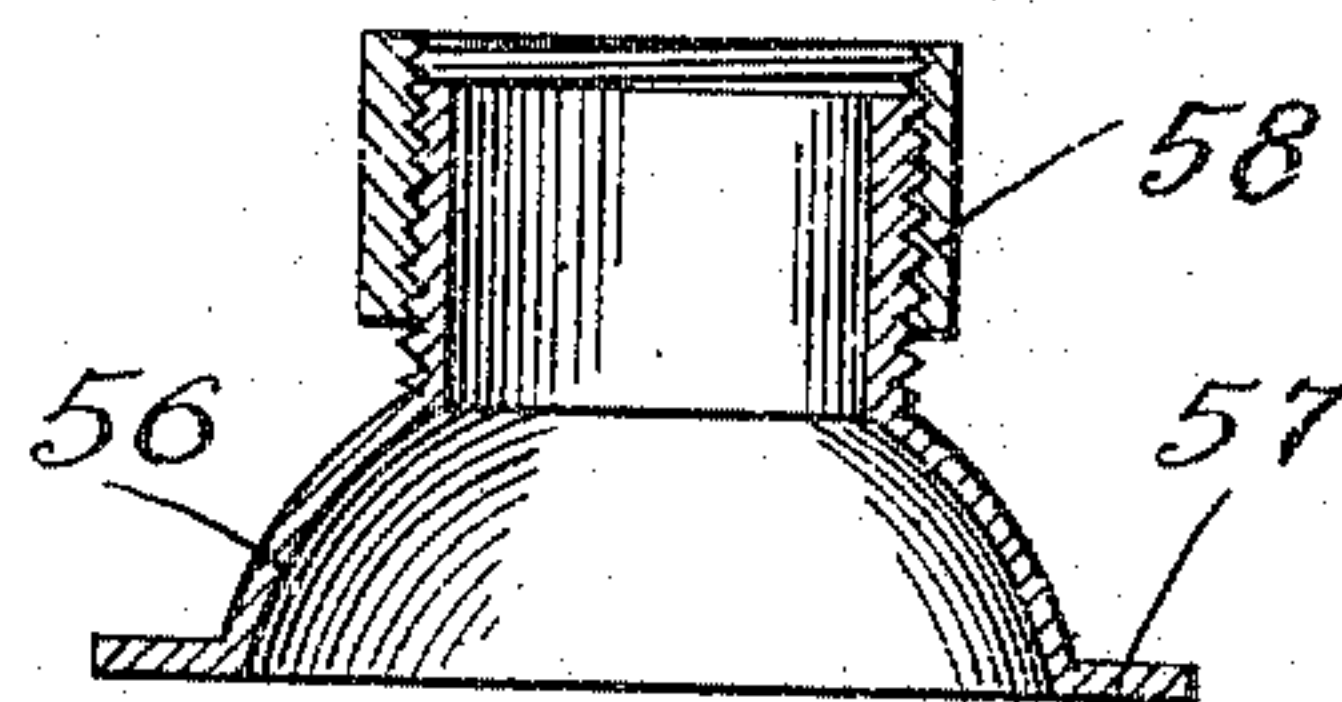
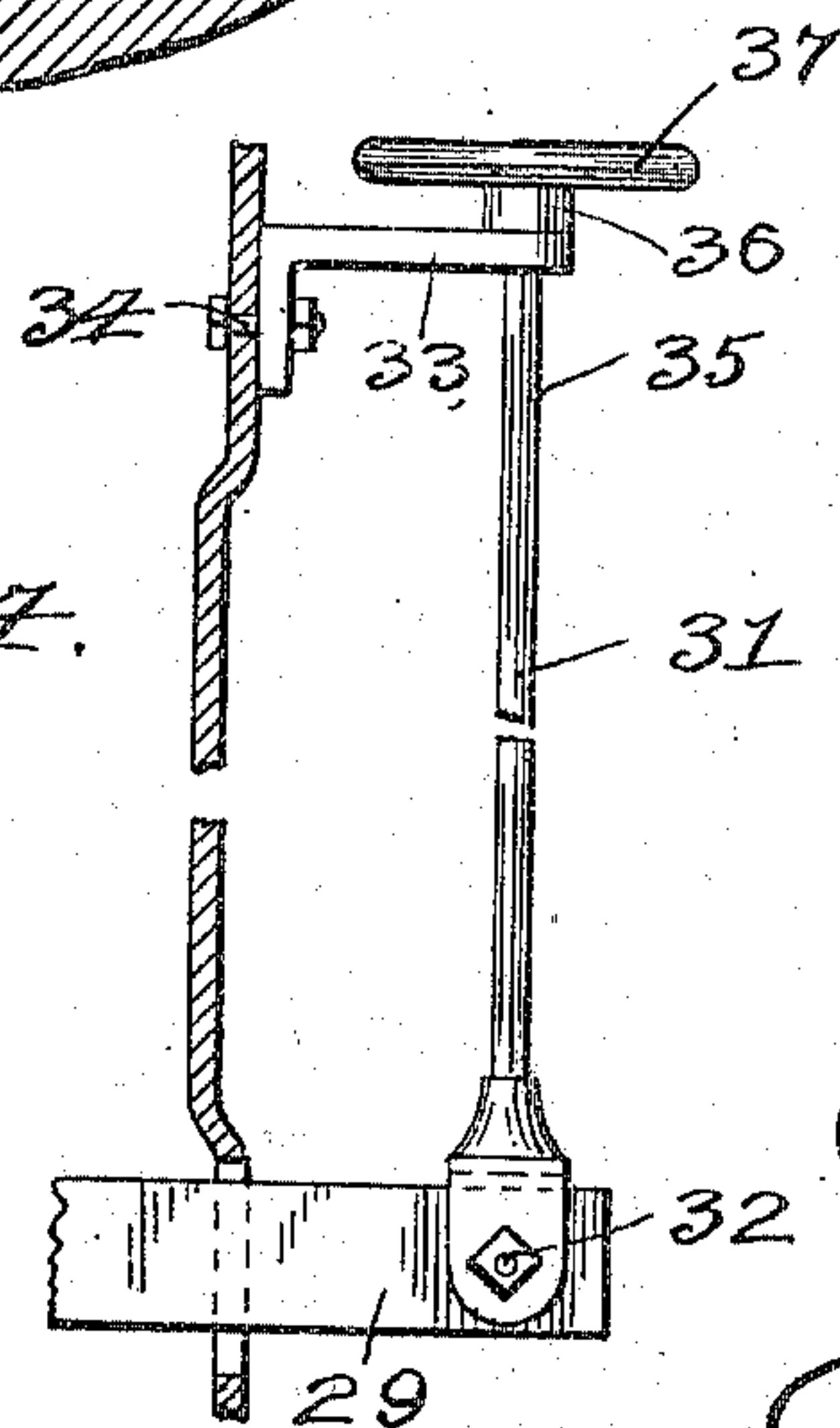


Fig. 4.



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UNITED STATES PATENT OFFICE.

PAUL OEHMIG, OF CHICAGO, ILLINOIS.

MUSTARD-GRINDING MILL.

957,997.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed November 26, 1909. Serial No. 529,873.

To all whom it may concern:

Be it known that I, PAUL OEHMIG, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Mustard-Grinding Mills, of which the following is a full, clear, and exact specification.

This invention relates to improvements in mustard grinding mills, in which mustard is prepared for use by grinding it up with vinegar, and not infrequently with spices mixed therewith, in which mills, as heretofore constructed, the upper stone is fixed and the lower stone revolved about a vertical axis, in which bearings, shaft and other metal portions of the machine are exposed to the corrosive effect of the vinegar, simultaneously conducted with the mustard to the grinding surfaces of the stones thereof.

The prime object of my invention is a simple, convenient and effective means by which to isolate the bearings, shaft and other wearing portions of a mustard mill, from the corrosive effect of the vinegar supplied, to a mustard grinding mill during the operation thereof.

A further object of this invention is to utilize for mustard grinding purposes, and, at the same time isolate from contact with vinegar, the bearings and shaft of a grinding mill in which the lower stone is fixed, and to have the upper stone, through which the mustard and vinegar mixture is supplied, revolve, and thereby promote the rapidity of feeding the mustard mixture between the grinding stones and uniformly throughout their surface in every direction, or, in other words, utilize the centrifugal force of the stone through which the mixture is supplied for promoting the rapidity of feed, uniformity of its distribution over the surface of the stones and in the grinding of the mass however large it may be.

With these ends in view, my invention finds embodiment in certain features of novelty in the construction, combination and arrangement of parts by which the said objects and certain other objects are herein-after attained, all as fully described with reference to the accompanying drawings, and more particularly pointed out in the claims.

In said drawings: Figure 1 illustrates a vertical section through a mustard grinding mill embodying my invention, the power

shaft, the belt pulleys and gear thereof, together with the driving shaft of the upper stone being shown in full lines. Fig. 2 is an enlarged detail sectional view looking in the direction of the arrows, taken on the line 2—2 of Fig. 1. Fig. 3 is a similar view looking in the direction of the arrows, taken on the line 3—3 of Fig. 1. Fig. 4 is an enlarged detail showing the means for adjusting the upper stone toward the lower stone, and for taking up the wear of the opposing stones. Fig. 5 is an enlarged top plan view of the adjustable protecting cone-like shield; and, Fig. 6 is a vertical section thereof, taken on the line 6—6 of Fig. 5 looking in the direction of the arrows.

Similar characters of reference indicate the same parts in the several figures of the drawings.

7 indicates a suitable casing forming the bed plate, and inclosing the mill stones and the devices directly actuating them, the bed plate proper being formed of a plate 8 mounted upon a flange 9 projecting inwardly from the casing and secured thereto by bolts 10.

The power shaft 11 of the machine is journaled, at its outer end, in a box 12, supported by a standard 13, next which standard on this shaft are driving belt wheels 14 and 15, a bracket 16 secured to the casing surface to support a box 17 forming the inner bearings for the shaft 11, on the free end of which is secured a bevel gear 18 meshing with a bevel gear 19, all of which parts are of the usual construction and arrangement in grinding mills.

The bevel gear 19 is provided with a hub 20 keyed on a drive shaft 21, which is supported by and has an end bearing in a socket in the upper end of a cylindrical support 22, which socket is preferably provided with a brass lining 23 and a cone bearing 24 opposing a rounded end 25 of the shaft 21, an oil cup 26 being provided for supplying the lubricant for the end bearing of the shaft. The shaft 21 also has a side bearing in a bracket 27, secured to the bed plate 8 by one or more bolts 28, adjacent which bracket is arranged the bevel gear 19.

The cylindrical support 22 rests upon a bent lever 29, one end of which swings upon a pivot 30 secured to the inner side of the lower portion of the casing with its opposite end projecting through the casing, and suspended by a screw threaded rod 31 by means

of a bolt 32, the upper end of which rod projects through a bracket 33 secured to the casing by a bolt 34; the upper end of the rod being provided with screw threads 35 working in a screw threaded hub 36 supported on top of the bracket and provided with a hand wheel 37, whereby the shaft 21 may be vertically adjusted and the upper mill stone 38 mounted upon the end thereof, as will presently be described, toward and from the lower mill stone 39, and an adjustment by which the two stones may be made to grind either coarse or fine, and also to take up wear.

The upper mill stone is provided with an opening 40 axially thereof, and for the purpose of mounting this stone upon and supporting it from the shaft 21 there are recessed at opposite sides of this opening metal socket pieces 41—41 adapted to receive lugs 42—42 projecting from a cap piece 43, provided with a cone shaped bearing 44, supported upon the upper end of the shaft 21, which is correspondingly tapered at its upper extremity, as shown at 45, to conform to the cone recess. As a convenient means of accessible connection between the drive shaft 21 and the upper stone 38, for rotating the latter through the operation of the former, the cone is provided with opposing socket pieces 46—46, for receiving the ends of a bar 47 projected through the shaft.

The lower stone 39 is supported by an inwardly projecting annular flange 48, but is level thereon by means of screw bolts 49, screw threaded through the flange 48 at intervals thereof, reinforced by a fibrous angle plate 50 through which the adjusting screws 49 pass and have an end bearing against an angle plate 51, or a continuous angle plate bearing against the outer edge of the stone 39, and preferably recessed in its under surface, as shown in Fig. 1. The lower stone 39 is also adjustable on its shaft, and to which end it has a metallic hub 52, between which and the shaft is a fibrous bushing 53, adjustable upon the shaft to take up wear, by means of wedge blocks 54, interposed between the fibrous bushing and casing, and actuated by bolts 55 screw threaded in a flange projecting inwardly of the hub, and of which there may be as many as there are pieces or parts of the fibrous bushing, which thereby forms an adjustable bearing for and sustaining the shaft in a vertical position.

In the adjustment of the mill now described, the lower stone 39 is first leveled by means of the screw bolts 49, following which the upper stone is adjusted to the lower stone by raising or lowering, as may be, the drive shaft, and by turning the screw threaded rod 31 by means of its hand wheel 37.

In operation, vinegar and mustard are discharged from a hopper (not shown) upon

the cone bearing 44, and thence through the surrounding aperture in the upper stone to the lower stone, whence it would come in contact with the shaft and its bearing in the lower stone and oxidize these parts to their serious injury were it not for a cone shield 56 supported upon the upper end of the hub 52 of the lower stone in such a manner that a liquid tight joint is formed between the base of the cone and said hub, an annular flange 57 of which is fitted tightly against the adjacent surrounding stone wall formed by the lower stone. The cone shield, which is preferably made of bronze or other non-corrosive material, projects upward into the axial opening in the upper stone, and is contracted toward its upper end to lie close to the drive shaft 21, though not necessarily in contact therewith, and is preferably provided with a collar 58 screw-threaded thereon for the purposes of adjusting the height of the shield as the stones become worn away from prolonged use. In other words, when the mill is new, the collar 58 is screwed up until its upper edge is just out of contact with the bar 47, but, as wear in the stones takes place and the upper stone is lowered for its proper adjustment to the lower stone, the collar 58 is correspondingly screwed down upon the shield, and by these means the shield is made extensible and its height so maintained that vinegar may not enter between it and the shaft 21 to the destruction of said shaft and its bearings. In this connection, it should be observed that the cone and its extension, being of less diameter than the cone bearing 43, the vinegar or other liquid striking the cone bearing 43, will be deflected against the surrounding walls of the upper stone and away from the open end of the cone shield.

A cone shield, such as now described, provides for the successful use, in a mustard grinding mill, of a fixed lower and an opposing revolving upper grinding stone, and the utilization of both gravity and centrifugal force for supplying a mixture of mustard and vinegar to and uniformly spreading it over the grinding surfaces of the stones, and thereby not only insuring a uniform grinding of the mixture but increasing the rapidity of the passage of the mixture between and discharge from the mill, with a corresponding increase in capacity of mustard mills as heretofore employed, while, at the same time, the drive shaft, the bearings therefor and other frictional wearing parts of the mill are entirely isolated from contact with vinegar, or such other acids, as may be, in the mixture, and the possible injury therefrom to these parts of a mustard grinding mill.

Surrounding and laterally embracing the fibrous angle plate 50, and supported on an annular flange 59, of the casing 7, is a fibrous

rim 60, which, at one side of the mill, is transversely slotted or grooved, as indicated at 61, from which groove portion projects a downwardly inclined spout 62, through which the ground mustard, in its finished state, is discharged, and in practice there may be several of these discharge passages, although for securing the best possible results but one discharge passage is provided, for the reason that ordinarily one is sufficient for that purpose, and that when but one discharge passage is employed the grinding of the mustard, vinegar and spices, as may be, is prolonged a sufficient time to insure their absolutely perfect mixture and uniformity in fineness of the solid particles. The fibrous angle plate 50, annular rim 60 and downwardly inclined spout 62 are preferably of wood, but may be of any other material, not metal, which is not attacked by the mixture, or which will not taint the finished mustard mixture, as for example, paper board, vulcanized rubber or other compounded materials.

In conclusion, it should be observed that the embodiment of my invention is not limited to the precise form and arrangement of the several features of construction, such as the form of the shield, the axial openings in the stones, the bearings for the shaft, or so long as a mustard grinding mill includes an upper revolving grinding stone, opposing a lower fixed grinding stone, and is provided with means for leveling the lower stone, adjusting the upper stone thereto initially, and to take up wear, and a shield is employed of such a character as to isolate the shaft and other frictional wearing parts from contact with acids supplied to and between the stones, such a structure would be well within the spirit of my invention.

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

1. A mustard grinding mill comprising in combination a lower fixed grinding stone, means for leveling the same, a drive shaft passing axially therethrough, an adjustable fibrous bushing a tightening wedge between said bushing and stone, an upper grinding stone, a cap bearing secured to said stone and having a bearing on the end of said shaft, a bar passing through said shaft and sockets in the upper stone receiving the end of said

bar, and an axial feed opening in said stone, substantially as described.

2. A mustard grinding mill comprising in combination opposing upper and lower grinding stones provided with axial openings therethrough, a hub in the lower stone, a drive shaft passing therethrough, an adjustable cone shield surrounding said shaft seated water tight upon said hub and projecting in a plane substantially above the lower surface of the upper stone, substantially as described.

3. A mustard grinding mill comprising in combination opposing upper and lower grinding stones provided with axial openings therethrough, a hub in the lower stone, a drive shaft passing therethrough, a cone shield surrounding said shaft seated water tight upon said hub and projecting in a plane substantially above the lower surface of the upper stone, and rotatable means for adjusting the height of said shield above said surface, substantially as described.

4. A mustard grinding mill comprising in combination opposing upper and lower grinding stones provided with axial openings therethrough, a hub in the lower stone, a drive shaft passing therethrough, a cone shield surrounding said shaft seated water tight upon said hub and projecting in a plane substantially above the lower surface of the upper stone, and a screw threaded collar for adjusting the height of said shield, substantially as described.

5. A mustard grinding mill comprising in combination upper and lower stones, an axial feed opening through the upper stone, a hub in the lower stone, a drive shaft passing through said hub, a cone bearing cap secured to the upper stone and supported at the upper end of said shaft, a shield surrounding said shaft and seated water tight upon said hub projecting in a plane substantially above the lower stone, and means for adjusting the height of said shield, substantially as described.

In witness whereof I have hereunto set my hand and affixed my seal, this 23rd day of November, A. D. 1909.

PAUL OEHMIG. [L. s.]

Witnesses:

JNO. G. ELLIOTT,
O. E. BROM.