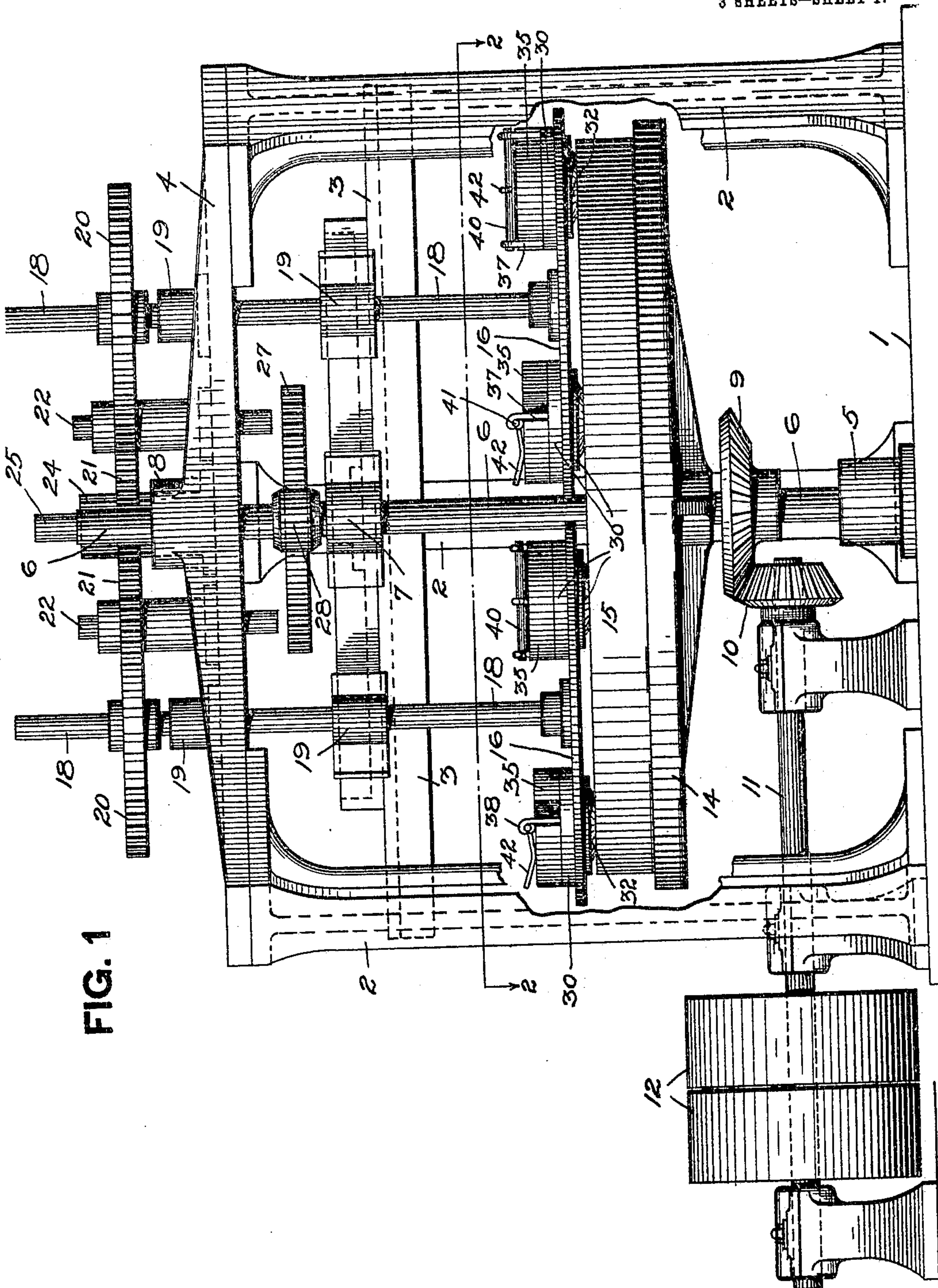


No. 799,192.

PATENTED SEPT. 12, 1905.

A. J. SANFORD.  
GLASS GRINDING APPARATUS.  
APPLICATION FILED MAY 2, 1904.

3 SHEETS—SHEET 1.



WITNESSES.

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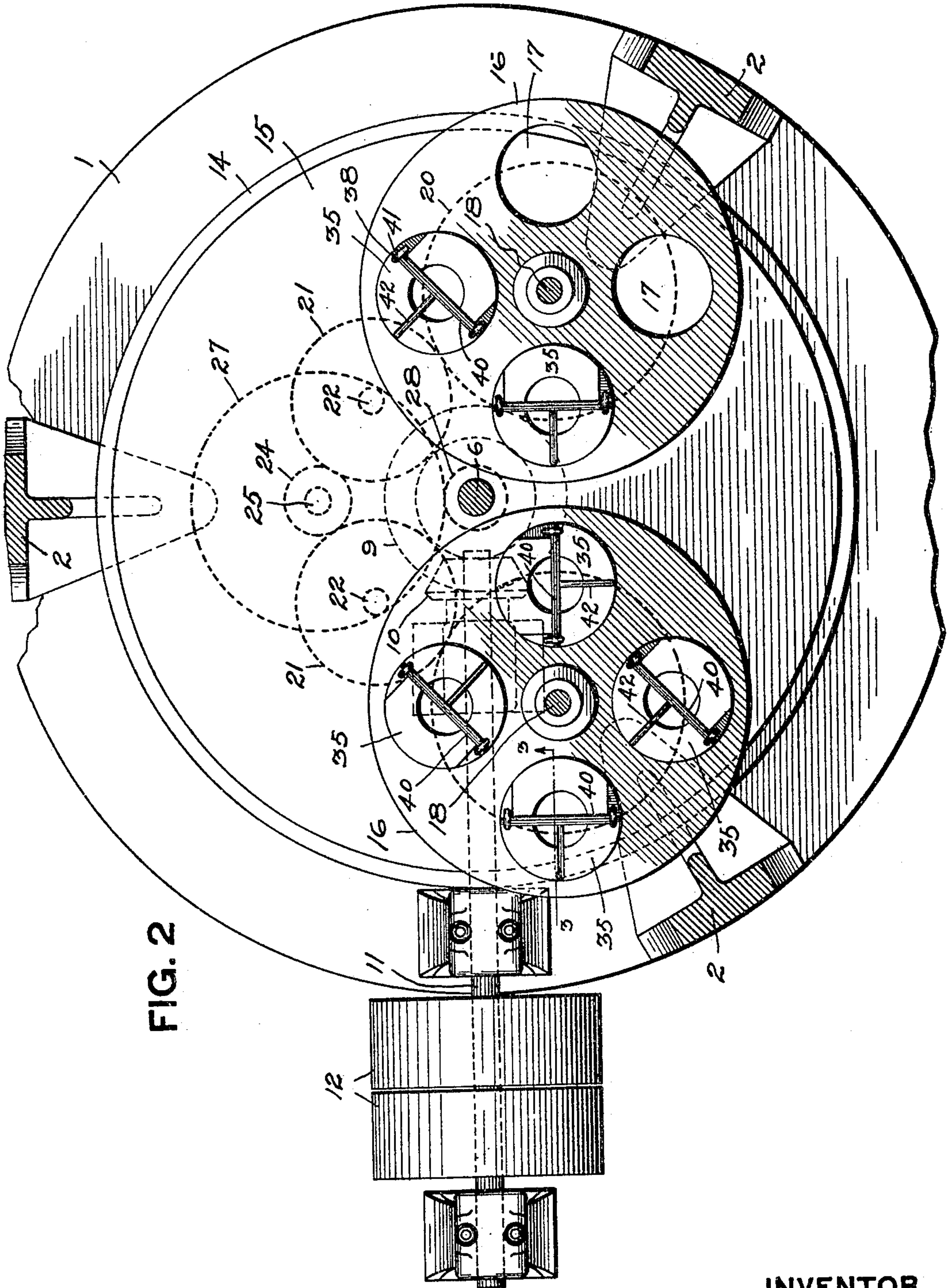


FIG. 2

WITNESSES.  
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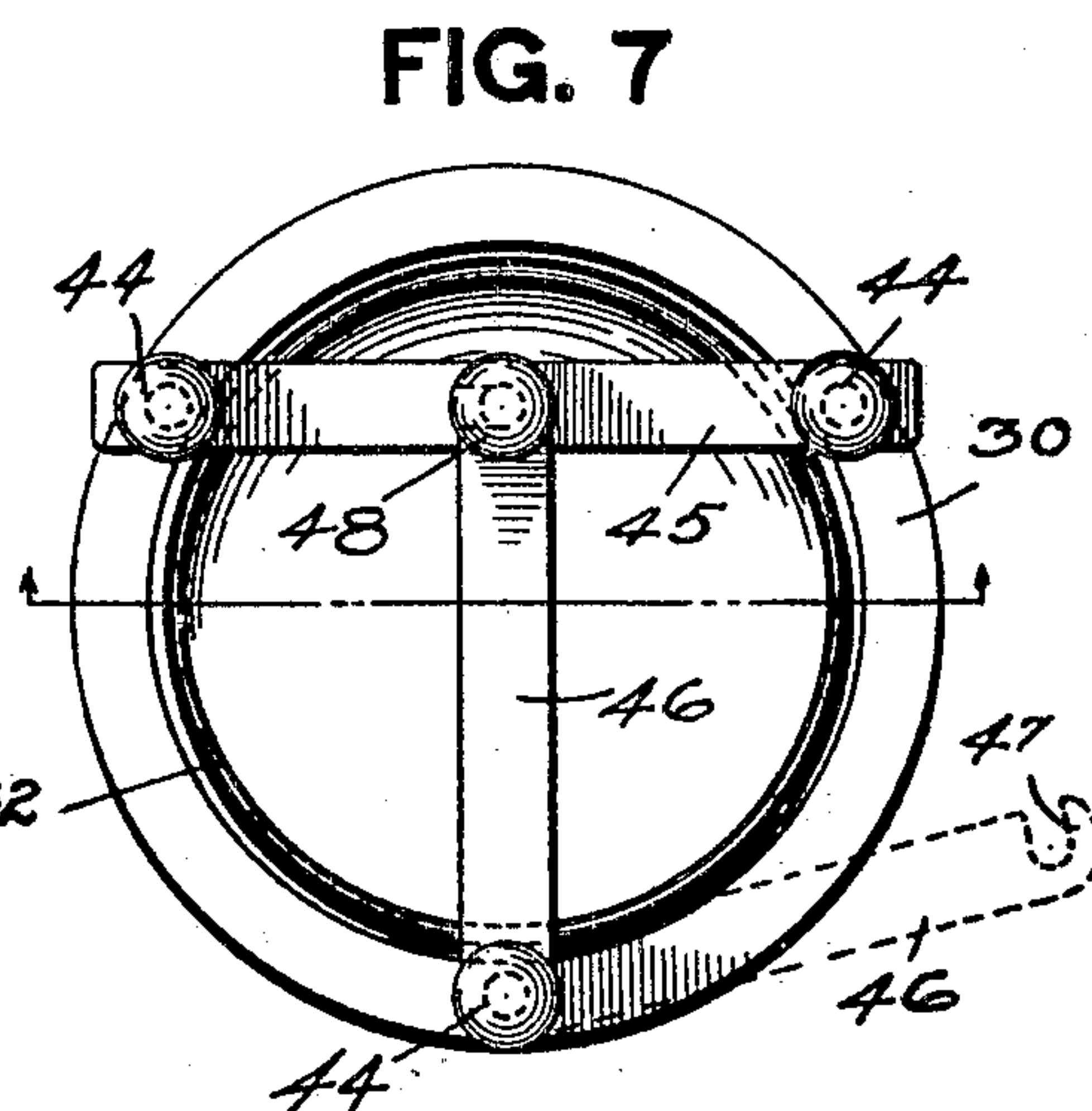
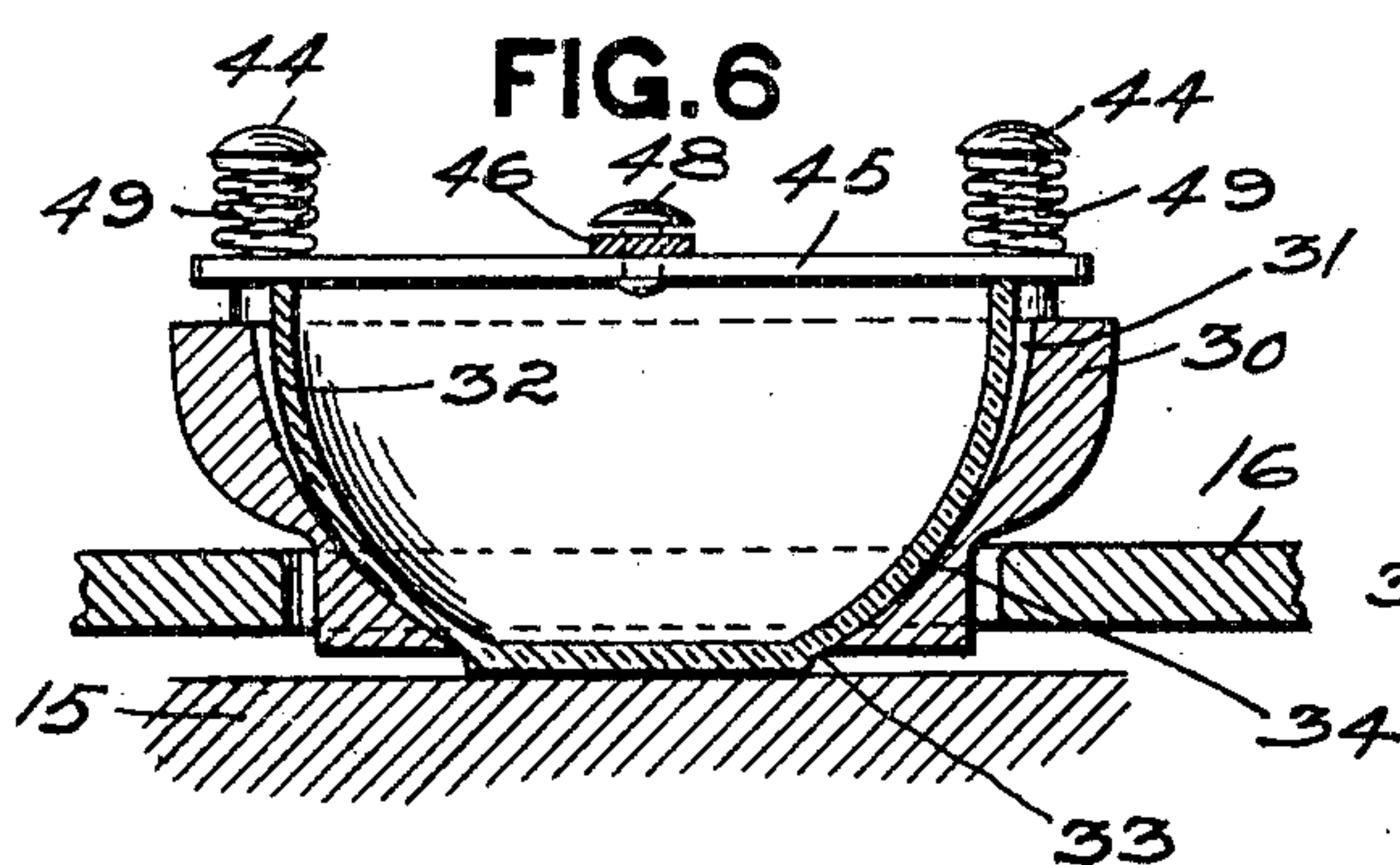
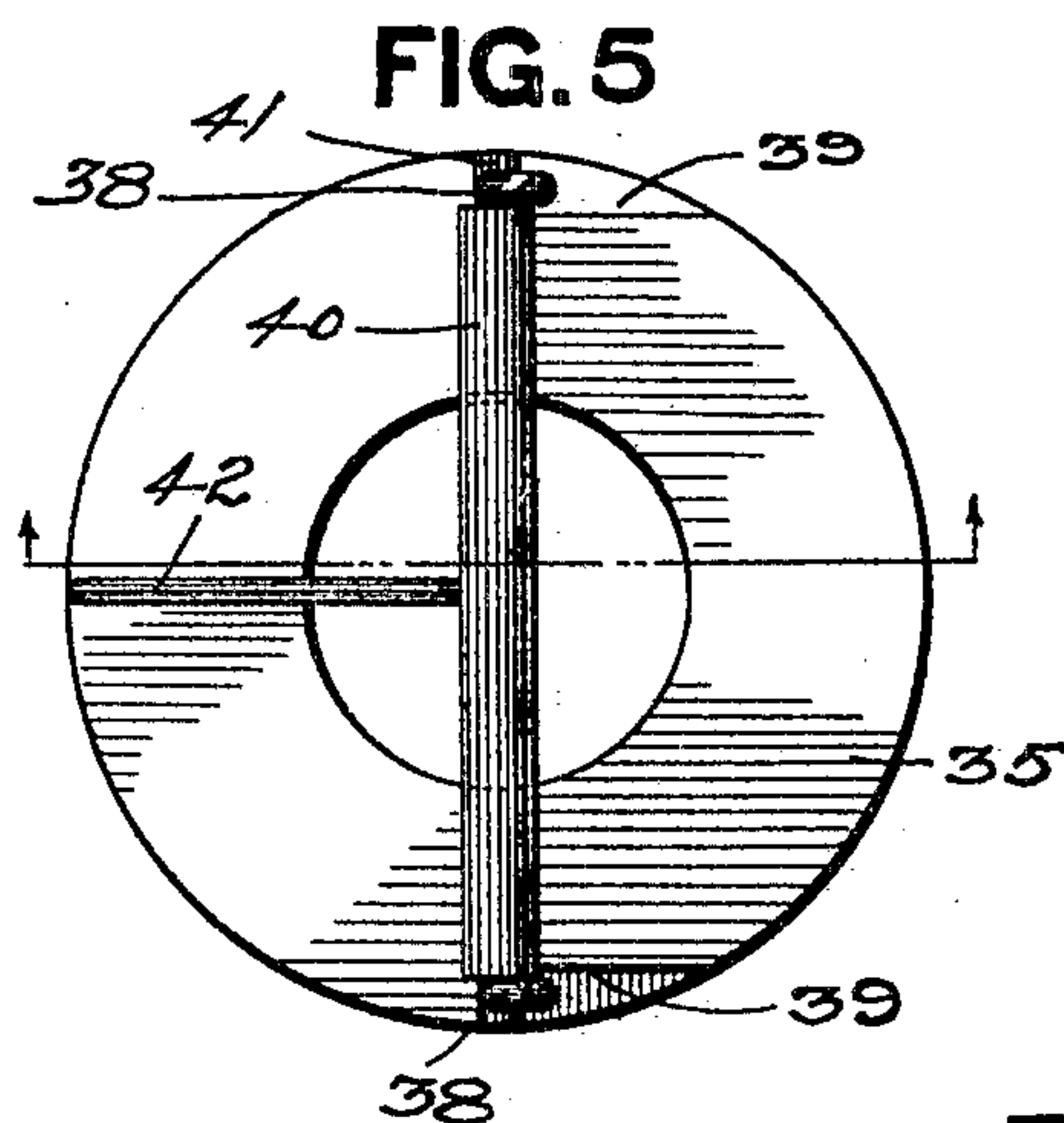
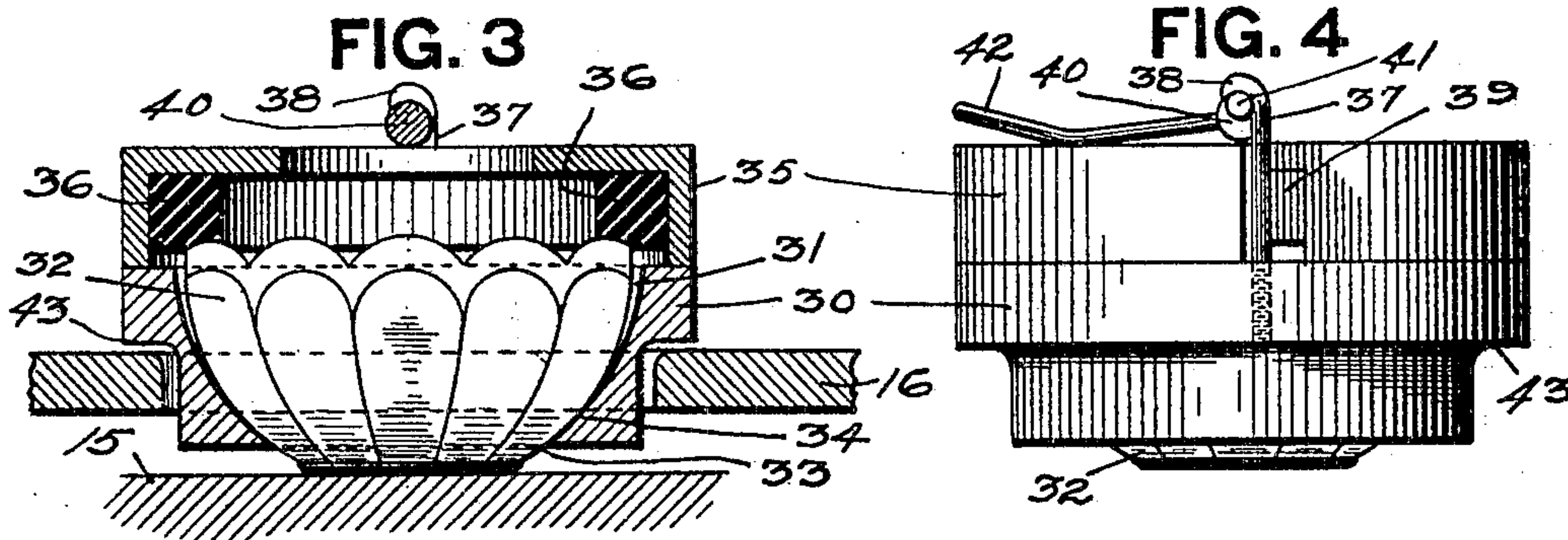
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3 SHEETS—SHEET 3.



WITNESSES.

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INVENTOR.

*Andrew John Sanford,*  
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# UNITED STATES PATENT OFFICE.

ANDREW JOHN SANFORD, OF NEWARK, OHIO, ASSIGNOR TO A. H. HEISEY  
& COMPANY, OF NEWARK, OHIO.

## GLASS-GRINDING APPARATUS.

No. 799,192.

Specification of Letters Patent.

Patented Sept. 12, 1905.

Application filed May 2, 1904. Serial No. 205,950.

*To all whom it may concern:*

Be it known that I, ANDREW JOHN SANFORD, a resident of Newark, in the county of Licking and State of Ohio, have invented a  
5 new and useful Improvement in Glass-Grinding Apparatus; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to grinding apparatus,  
10 and more especially to apparatus for grinding glassware and similar articles.

The object of my invention is to provide a holder for the article to be ground and which may be used with ordinary types of glass-  
15 grinding machines, such as tumbler-machines, and which is adapted especially for holding nappies, bowls, and similar flaring glass articles.

In the manufacture of pressed glassware  
20 the pressing and reheating process leaves on the bottom of the article more or less pronounced fins, ribs, and other projections, which must be removed by grinding. In the case of tumblers and a few other practically  
25 cylindrical articles this grinding has been accomplished by means of machinery. The type of machine in most general use for this purpose comprises a horizontally-arranged stone rotated at a high speed and a disk or  
30 disks located above the stone and slowly rotated in a direction opposite the rotation of the stone, which disk or disks are provided with openings therethrough, into which the tumblers or similar articles are set with their  
35 bottoms resting upon the rapidly-rotating stone. The disks hold the tumblers from being carried around by the stone and also carry them slowly in the opposite direction, the combined effect of the stone and disks  
40 imparting rotation to the tumblers. To produce the necessary friction between the tumblers and the stone to produce a grinding effect, the custom is to place a bag of shot or other suitable weight into the tum-  
45 bler. While such machines have been in quite general use for grinding tumblers and a few other practically cylindrical articles, they have been found unadapted for grinding nappies, bowls, and other glass articles  
50 having a flaring shape. This is due to the fact that the thin disks bear against the rounded or flaring surfaces of the nappies and cause such articles to be lifted from the

stone and rolled or tumbled in the opening in the disk, thus quickly ruining such articles. 55  
As a consequence nappies, bowls, and the like have heretofore had their bottoms ground by holding them by hand against the side of a vertically-rotating stone. This work is quite tedious and slow, and the labor inci- 60  
dent thereto adds considerably to the cost.

The object of my invention is to provide a suitable holder for nappies, bowls, and similar articles in which such articles can be clamped and which can be placed in the 65  
openings in the disk or disks of ordinary tumbler-grinding machines and which will hold the articles in true vertical position with their bottoms bearing against the stone and preferably being of sufficient weight to 70  
supply the necessary adhesion between the article and the stone.

The invention also comprises other features, such as constructing the holder so that the article will be clamped therein 75  
yieldingly to prevent marring or breaking of the article and also so constructing the holder as to expose only the lower portions of the articles to be ground, thus protecting the body of the article from the action of particles of 80  
stone, as well as other details of construction which will be hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side view of a grinding-machine with my 85  
improved holder applied thereto. Fig. 2 is a horizontal section on the line 2 2, Fig. 1. Fig. 3 is a vertical section, on an enlarged scale, on the line 3 3, Fig. 2, showing the holder in place. Fig. 4 is a side view of the 90  
holder. Fig. 5 is a plan view of the holder, and Fig. 6 is a vertical section, and Fig. 7 a plan view showing a modified form of holder.

My invention is applicable to any type of grinding-machine having a rotating stone 95  
and a disk cooperating therewith and provided with openings therethrough for receiving the article to be ground. In Figs. 1 and 2 is shown one type of such machine, this having, however, been selected largely for 100  
purposes of illustration, and it will be understood that any other suitable machine may be used instead.

The grinding-machine shown comprises a suitable base 1, having erected thereupon a 105  
frame comprising standards 2 and cross



frames or spiders 3 and 4. On the base 1 is provided a suitable bearing 5, in which is stepped the lower end of a vertical shaft 6, whose upper end is guided in suitable bearings 7 and 8, secured, respectively, to the horizontal frames 3 and 4. The shaft 6 will be driven by any suitable mechanism, such as having secured thereon a bevel-gear 9, meshing with a similar gear 10 on the horizontal shaft 11, which is provided with belt-pulleys 12. Also secured to the shaft 6 is a table 14, to the upper surface of which is secured the stone 15, which may be either a disk of metal or a natural or artificial stone, as is now the custom.

Coöperating with the upper surface of the stone 15 are one or more disks 16, two such disks being shown, and which are provided with one or more openings 17, four such openings being shown in each disk, extending through said disks and in which the articles to be ground are placed with their lower surfaces resting on the upper face of the stone 15. The disks 16 are slowly rotated and preferably in a direction contrary to the rotation of the stone 15. Any suitable mechanism for this purpose may be employed. In the drawings the said disks are shown secured to the lower ends of shafts 18, mounted in suitable bearings 19 in the cross-frames 3 and 4 and having secured to their upper ends spur-gears 20. Each of these gears meshes with an idler-gear 21, mounted on a stub-shaft 22, which is mounted in the top cross-frame 4. The idler-gears 21 in turn mesh with a pinion 24, secured to the upper end of a vertical counter-shaft 25, mounted in suitable bearings in the cross-frames 3 and 4 and having secured near its lower end a spur-gear 27, which meshes with a pinion 28, secured to the vertical shaft 6. The rotation of the shaft 6 carries the stone 15 with it in one direction and through the gearing just described imparts a slow rotary motion to the disks 16 and in a direction opposite to that of the stone 15. Any other well-known type of grinding-machine might be used in place of the one described. In use the articles to be ground are placed in the openings 17 of the disks 16, with their faces in contact with the grinding-stone 15.

My invention relates to the means for holding nappies, bowls, and other flaring articles in the disks 16. I provide for this purpose a suitable weighted holder in which the article is clamped and which is placed, together with the article, in an opening 17 of the disks 16. This holder may be of a large variety of forms; but preferably the body 30 thereof will be of general cup shape having an interior cavity 31 of suitable size and shape to receive the desired article, the particular holder shown in the drawings being adapted for holding a nappy or bowl 32. This holder is provided on its lower side with the opening 33, through

which the lower end of the article to be ground will project, so as to come in contact with the stone 15. The holder is so shaped on its inside that it bears on the article near its bottom, as at 34, thus holding the article against tipping or tumbling. The article will be held in this holder and against the bearing 34 by any suitable means, preferably yielding means being provided, so as to obviate danger of cracking or marring the article. In the preferred modification I have shown for this purpose a cover 35, adapted to fit onto the body 30 and provided on its interior with a yielding cushion 36, which preferably is a ring of rubber or similar elastic material. This cover will be secured to the body by any suitable means. I have shown for this purpose a pair of posts or projections 37, secured to the body 30 and provided at their upper ends with hooks 38. The cover is provided on opposite sides with the cut-away portions 39, through which these posts pass. The cover and body are locked together by means of a cam or eccentric, which is shown as a shaft 40, provided at its ends with eccentric extensions 41, which take into the hooks 38 of the posts, this shaft being provided with a handle 42, whereby it can be turned to lock the cover onto the body, as will be readily understood. As a result the article to be ground is held securely in the holder, being pressed, by means of the cushion, yieldingly down against the bearing 34 at the bottom of the cup-shaped opening in the body of the holder.

The body 30 and preferably also the cover 35 will be made of metal and of such weight as to give the desired friction of the article against the stone. This holder is provided on its exterior with substantially vertical shoulders 43, against which the disk 16 bears, and consequently the holder and article will not roll or tumble under the action of the stone, but will always remain in a true vertical position with the bottom of the article resting squarely against the stone.

In place of the yielding cover just described the article may be held in the cup-shaped holder by an arrangement such as shown in Fig. 6. In this figure a number of headed screws or bolts 44 are secured to the upper edge of the body 30, three such bolts being shown. A bar 45, having openings near its ends, is slidably mounted on two of such bolts, and a transverse swinging latch member 46 is slidably mounted at one end on the other bolt and has at its opposite end a hook 47, adapted to take under a headed projection 48, located about midway of the bar 45. Surrounding each of the bolts 44 and interposed between the heads thereon and the bars slidably mounted on said bolts are spiral springs 49, which constitute yielding means for holding the article in the cup-shaped holder. In this modification the



body of the holder is of sufficient weight to give the requisite friction of the article against the grinding-stone 15.

Various other modifications of the holder will suggest themselves to those skilled in the art. In all cases, however, the holder will be provided with means for securely clamping the article therein, will be of sufficient weight to hold the article against the stone with the requisite friction to do the grinding, and will be provided with an opening in its lower face to permit the lower end of the article projecting therethrough a sufficient distance, so that the holder itself will not be in contact with the grinding-face of the stone. The cup-shaped interior of the holder adapts it to nappies and other flaring articles, while the vertical outer wall thereof offers such a bearing for the disk 16 that the holder and article will always remain in true vertical position. The cup-shaped holder also protects all portions of the article being ground except the portion projecting out through the opening in the lower part thereof, and as a consequence there is little or no chance of the particles of stone injuring the article being ground. Furthermore, this holder will prevent the article from being injured by contact with the edges of the openings 17 in the disks 16.

What I claim is—

1. In grinding apparatus, the combination with a rotating stone, of a disk cooperating therewith and provided with an opening therethrough, a weighted holder adapted to receive the article and to be inserted with the same in the opening in the disk, and means for clamping the article to said holder.

2. In grinding apparatus, the combination with a rotating stone, of a disk cooperating therewith and provided with an opening therethrough, a weighted holder adapted to receive the article and provided with an opening in its bottom through which the article to be ground will project and being adapted to be placed with the article in the opening in the disk, and means for clamping the article in said holder.

3. In grinding apparatus, the combination with a rotating stone, of a disk cooperating therewith and provided with an opening therethrough, a weighted holder adapted to receive the article and to be placed with the same in the opening in the disk, and yielding means for clamping the article in said holder.

4. In grinding apparatus, the combination with a rotating stone, of a disk cooperating therewith and provided with an opening therethrough, a cup-shaped weighted holder open at its bottom and adapted to receive the article and to be placed with the same in the opening in the disk, and yielding means for clamping the article in said holder.

5. In grinding apparatus, the combina-

tion with a rotating stone, of a disk cooperating therewith and provided with an opening therethrough, a weighted cup-shaped holder provided with an opening in its bottom and adapted to receive the article and be placed with the same in the opening in the disk, means for holding the article in said holder, and a cam for operating said holding means.

6. In a grinding-machine, the combination with a rotating stone, of a disk cooperating therewith and provided with an opening therethrough, a weighted cup-shaped holder open on its bottom and adapted to receive the article and be placed with the same in the opening in said disk, and a weighted cover clamped to said holder and serving to clamp the article therein.

7. In grinding apparatus, the combination with a rotating stone, of a disk cooperating therewith and provided with an opening therethrough, a weighted cup-shaped holder open on its bottom adapted to receive the article to be ground and placed with the same in the opening in the disk, a weighted cover adapted to be clamped to said holder and to clamp the article in said holder, and yielding means between said holder and cover.

8. In grinding apparatus, the combination of a rotating stone, of a disk cooperating therewith and provided with an opening therethrough, a holder open on its lower side and adapted to receive the article to be ground and placed with the same in the opening in the disk, a weighted cover clamped to said holder, and a cushion located on the lower face of said cover and adapted to bear against the upper edge of the article.

9. In grinding apparatus, the combination with a rotating stone, of a disk cooperating therewith and provided with an opening therethrough, a cup-shaped holder provided with an opening in its bottom to receive the article to be ground and placed with the same in the opening in the disk, a weighted cover for said holder, and a cam for locking said cover to said holder.

10. A holder for glass-grinding machines comprising a cup-shaped body open on its lower side and adapted to receive the article to be ground, and yielding means connected to said holder and clamping the article in said body.

11. A holder for glass-grinding machines comprising a cup-shaped body open on its lower side, a weighted cover for said body, and means for clamping said cover to said body.

12. A holder for glass-grinding machines comprising a cup-shaped body open on its lower side and adapted to receive the article to be ground, a weighted cover for said body, hooked posts projecting upwardly from said body, and a cam-shaft having its ends en-



gaging said hooked posts and its body bearing against said cover.

13. A holder for glass-grinding machines comprising a cup-shaped body adapted to receive the article to be ground, a cover therefor, means for clamping said cover to said body, and a cushion secured on the under surface of said cover.

14. A holder for glass-grinding machines comprising a body open on its lower side and having a vertical exterior surface, and means connected to said body and clamping the article in said body.

15. A holder for glass-grinding machines comprising a cup-shaped body open on its lower side and adapted to receive the article to be ground, and having a vertical outer face and means connected to said body and clamping the article in said body.

16. A holder for glass-grinding machines comprising a cup-shaped body open on its

lower side and provided with a bearing on its interior around said opening for contacting with the article to be ground near the bottom thereof, and means connected to said body and clamping the article in said body and against said bearing.

17. A holder for glass-grinding machines, comprising a cup-shaped body open on its lower side and provided with a bearing on its interior near the bottom for contacting with the article to be ground, and means connected to said body and arranged to bear on the top of the article and clamp the same into contact with said bearing.

In testimony whereof I, the said ANDREW JOHN SANFORD, have hereunto set my hand.

A. JOHN SANFORD.

Witnesses:

CHAS. P. KING,  
CALL NORPELL.