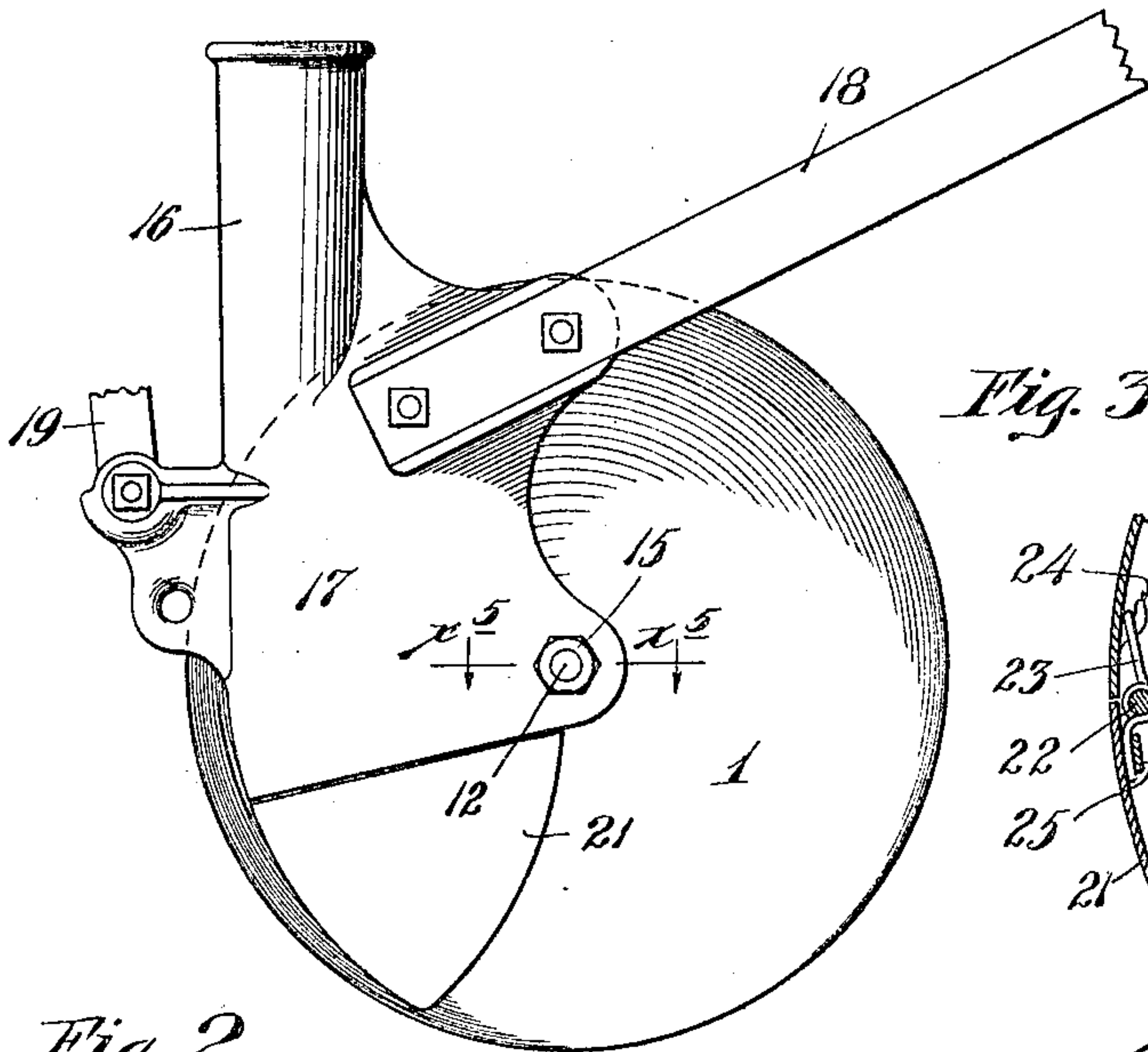


W. J. BROWNE.  
DISK DRILL.

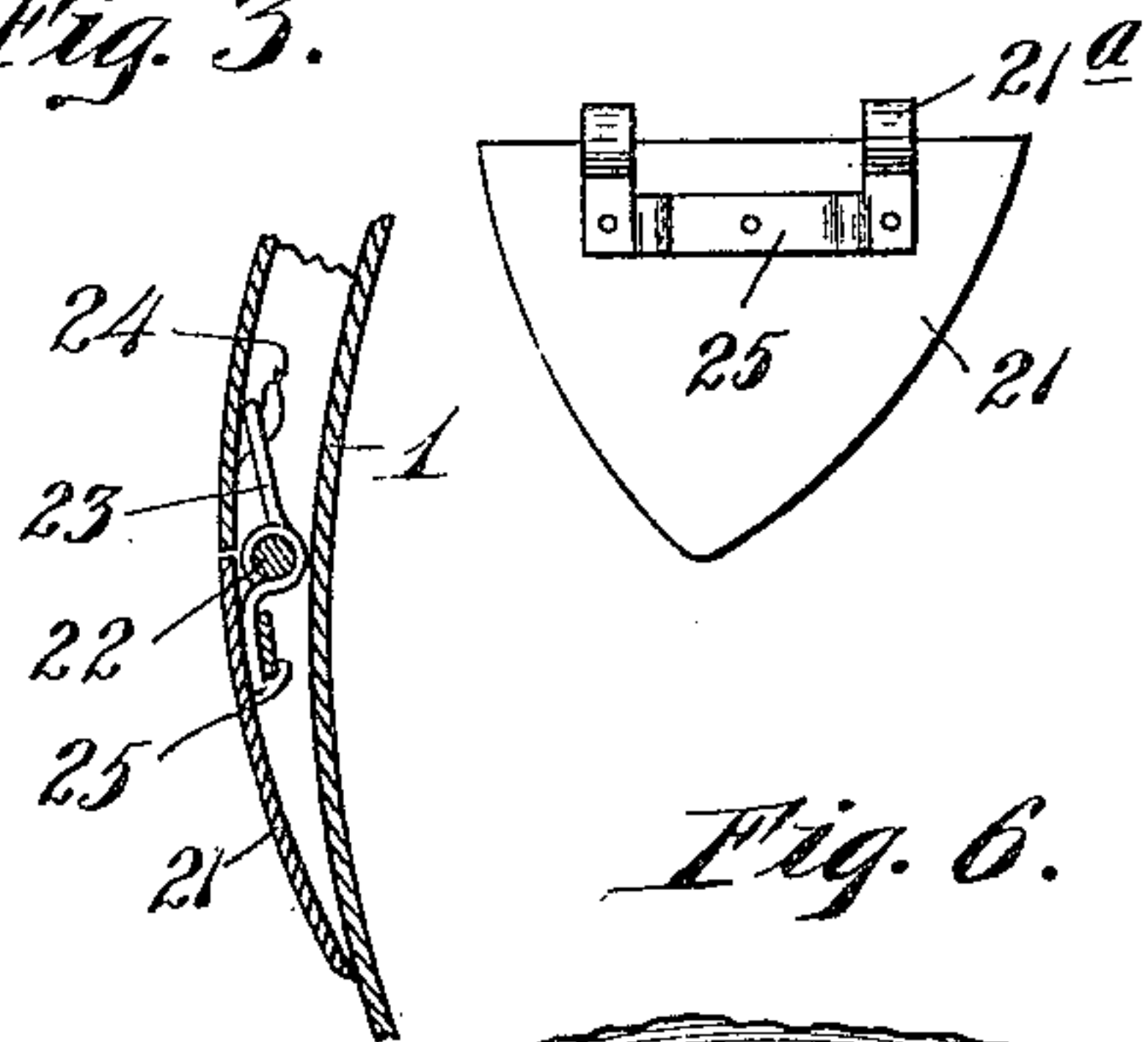
APPLICATION FILED JUNE 28, 1905.

*Fig. 1.*



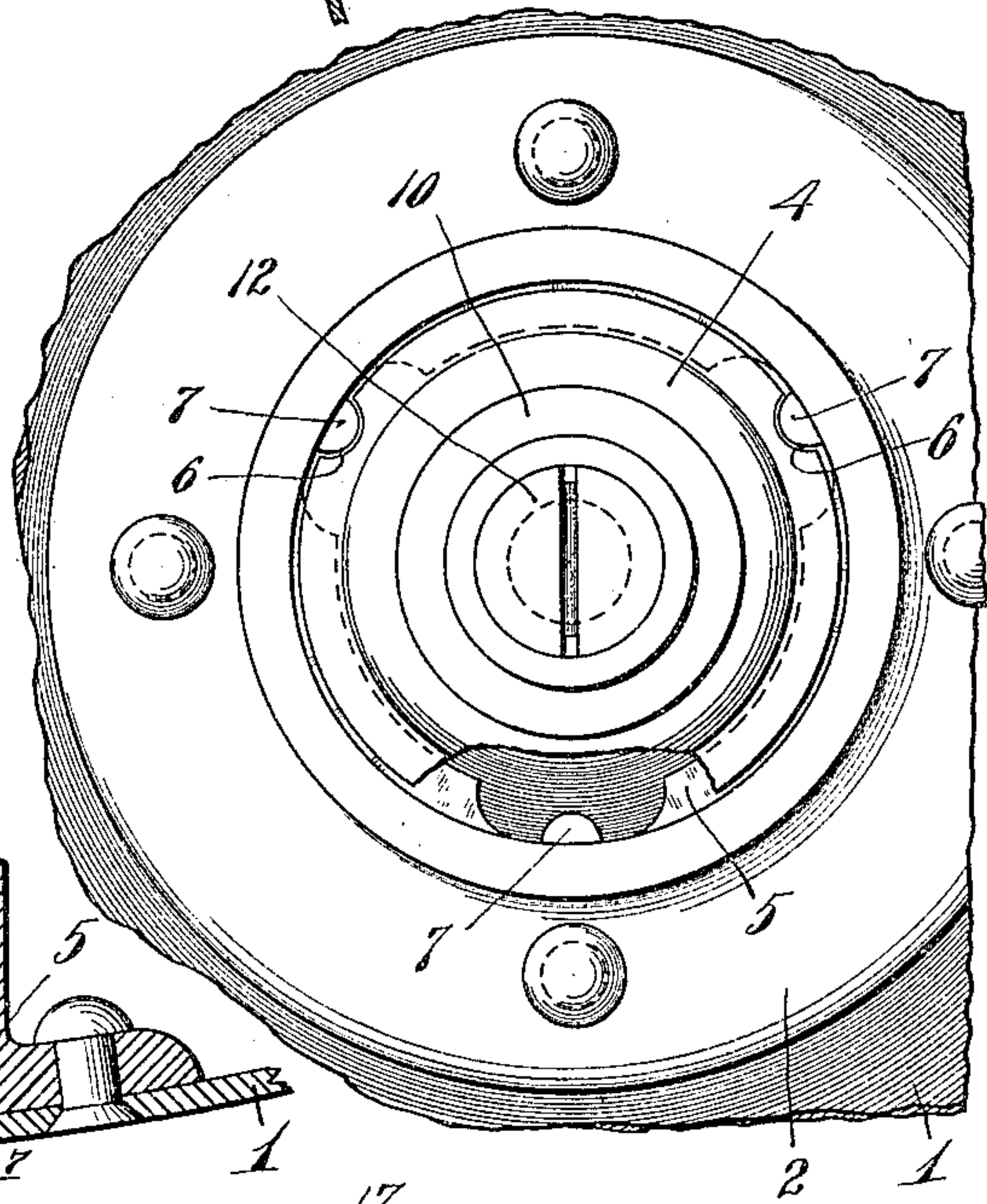
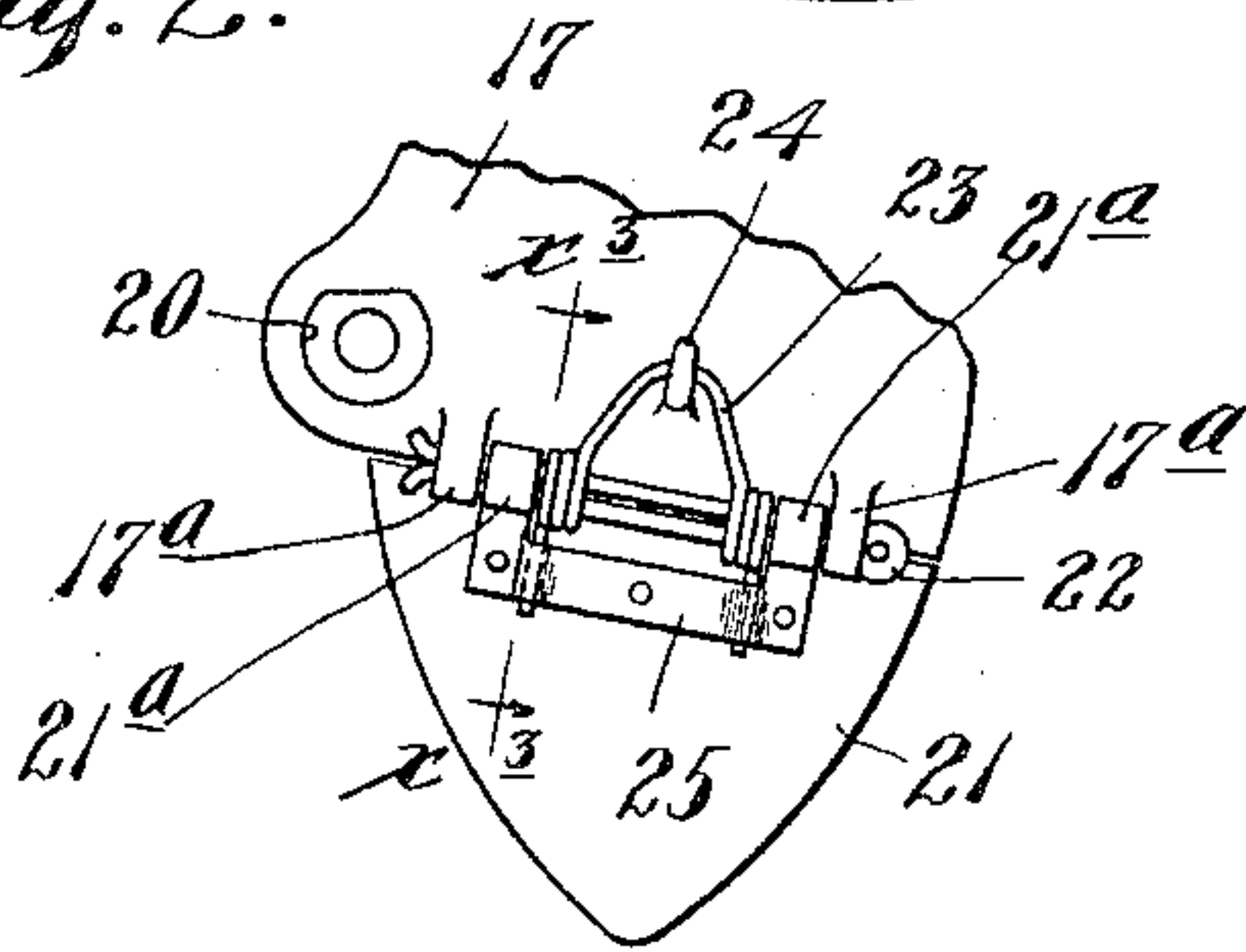
*Fig. 4.*

*Fig. 3.*

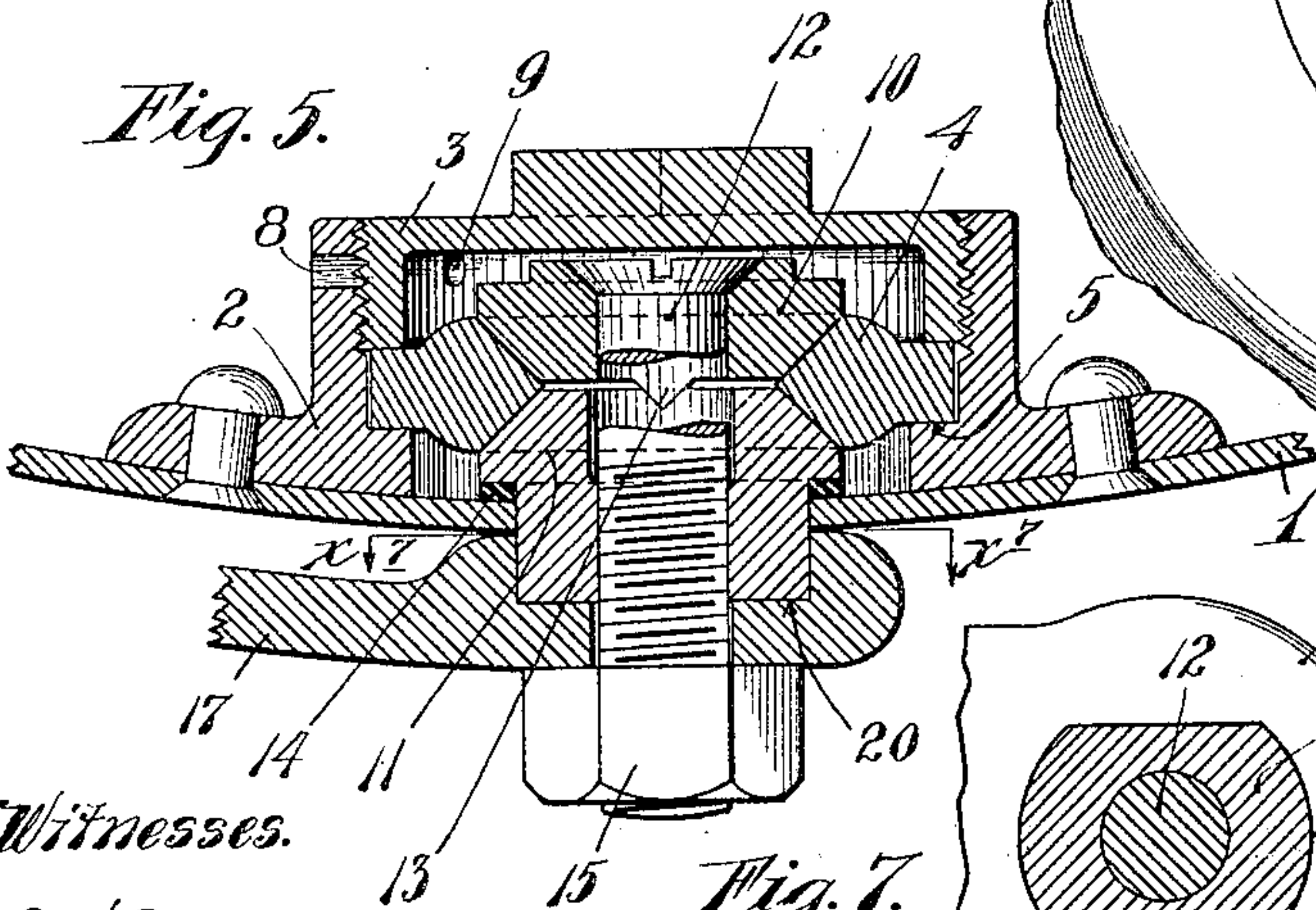


*Fig. 6.*

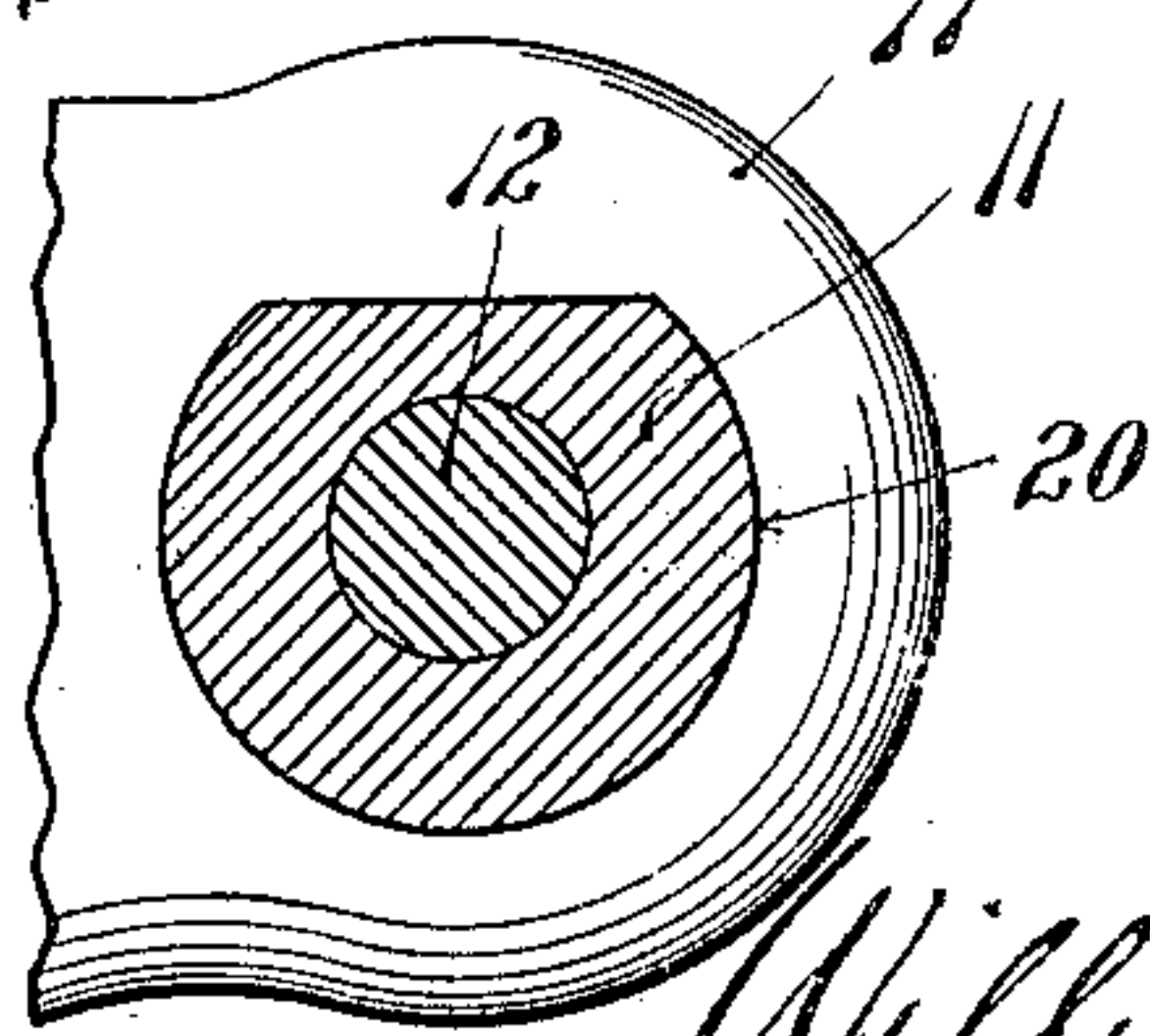
*Fig. 2.*



*Fig. 5.*



*Fig. 7.*



Witnesses.

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Inventor:  
W. J. Browne.  
By his Attorneys,

William M. Merchant



# UNITED STATES PATENT OFFICE.

WILLIAM JEROME BROWNE, OF MINNEAPOLIS, MINNESOTA.

## DISK DRILL.

No. 803,047.

Specification of Letters Patent.

Patented Oct. 31, 1905.

Application filed June 28, 1905. Serial No. 267,363.

*To all whom it may concern:*

Be it known that I, WILLIAM JEROME BROWNE, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Disk Drills; 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.

My invention relates to disk drills, and has for its object to improve the same in the several particulars hereinafter noted.

The invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

In the accompanying drawings, which illustrate my invention, like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 is a view in side elevation with some parts broken away, showing a disk, a seed-boot, and associated parts, some parts being broken away. Fig. 2 is a detail in side elevation showing the lower portion of the seed-boot bearing-plate and a scraper-plate which is hinged thereto, the said parts being viewed in a direction reverse from that shown in Fig. 1. Fig. 3 is a vertical section taken on the line  $x^3 x^3$  of Fig. 2. Fig. 4 is a detail of the hinged scraper-plate looking at the inner face thereof. Fig. 5 is a horizontal section taken on the line  $x^5 x^5$  of Fig. 1, parts being shown on a larger scale than in the views previously noted and some parts being broken away. Fig. 6 is a view in side elevation with some parts broken away and with the cap-nut of the hub removed, the said parts being viewed in a direction reverse from that in which the parts are viewed in Fig. 1; and Fig. 7 is a detail in vertical section taken on the line  $x^7 x^7$  of Fig. 5, some parts being removed and some being broken away.

The numeral 1 indicates the concavo-convex furrow-opening disk, to the central portion of which, on the concave side thereof, is rigidly secured a flanged hub 2, the open end of which is normally closed by a cap-nut 3, that has threaded engagement therewith. Within the hub 2 is an annular bearing 4, the marginal flange of which is adapted to be firmly clamped between the inwardly-projecting flange of the cap-nut 3, and an annular shoulder 5, formed within said hub, as

best shown in Fig. 5. To positively lock this bearing 4 for rotation with the hub 2, it is provided with notches 6, that are engaged by lugs 7 on the inner surface of said hub, as best shown in Fig. 6. The hub 2 is provided with an oil-hole 8, and the peripheral flange of the cap-nut 3 is provided with an oil-hole 9, which holes are normally out of line with each other, but are adapted to be turned into registration to permit the admission of oil into the hub by slightly turning and loosening the said cap-nut. The normal position of the said oil-holes is illustrated in Fig. 5.

The inner surface of the annular bearing 4 is made reversely conical or flaring in opposite direction from its central portion, and with these reversely-flaring surfaces engage a pair of correspondingly-beveled bearing-cones 10 and 11, which cones are mounted on a strong bolt 12, that has screw-thread engagement with the inner cone-bearing 11 and the head of which is preferably counter-sunk into the hub of the cone-bearing 10. The two cone-bearings 10 and 11 are locked against rotation, the one with respect to the other, by pointed lugs 13 on one of the said bearings which engage correspondingly-formed seats in the other cone-bearing, as is clearly shown in Fig. 5.

The cone-bearing 11 is provided with an extended hub portion of reduced diameter, that works loosely through a closely-fitting seat formed in and at the axis of the disk 1. A gasket 14, preferably of leather, is placed on the hub of the cone-bearing 11 between the inner face of the disk 1 and the shoulder of the said cone-bearing. Working with screw-threaded engagement on the projecting end of the bolt 12 is a nut 15, the purpose of which will presently appear.

The numeral 16 indicates the seed-boot, which said boot is provided with an extended bearing-plate 17, preferably cast integral therewith, as shown in Fig. 1.

The numeral 18 indicates a drag-bar which is rigidly bolted to the bearing-plate 17 in the usual way.

The numeral 19 indicates a pressure-bar, which is pivoted to a rear projection of the boot 16 and bearing-plate 17.

At its lower forwardly-projecting portion the bearing-plate 17 is formed with a seat 20, that receives and closely fits the projecting hub of the cone-bearing 11. As clearly shown in Fig. 7, the said seat 20 and the hub of said bearing-cone 11 are flattened at one



side, so as to lock the said cone-bearing against rotation with respect to said bearing-plate. The threaded end of the bolt 12 works loosely through a perforation in the plate 17, and the said plate is firmly clamped between the nut 15 and the hub of said bearing 11.

Hitherto the bearing-plate of the seed-boot has been extended downward to form a scraper for action on the lower portion of the disk and to form a continuation of the guide for delivering the grain from the lower end of the seed-boot to the bottom of the furrow.

In accordance with one feature of my invention I provide a separable plate extension or the scraper 21 and hinge the same at its upper edge to the lower edge of said plate 17, preferably by means of a cotter or pin 22, that works through lugs 17<sup>a</sup> and 21<sup>a</sup> on the said plates 17 and 21, respectively. The forward edge of the scraper 21 is yieldingly pressed against the convex surface of the disk by a spring 23, which, as shown, is coiled about the pin 22 and is anchored at its extremities to the plate portions 17 and 21. As shown, one extremity of the spring 23 is held by a hook-shaped lug 24 on the inner surface of the plate 17, and the other extremity of said spring is held by a bar 25, rigidly applied to the inner surface of the scraper 21, as best shown in Figs. 2 and 3. Clearance must, of course, be left between the convex surface of the disk and the rear edge of the scraper 21. This hinged and spring-pressed scraper 21 will always maintain close engagement with the disk regardless of any slight irregularity in the movement thereof.

In the drawings I have shown the so-called "bearing-cones" 10 and 11 as having frictional engagement with the bearing-ring 4; but, if desired, bearing-balls may be interposed between the said parts. When the disk is attached to the said boot by means of my improved bearing and the cap-nut 3 is turned so that the oil-holes 8 and 9 are out of alinement with each other, the running parts of the journal are incased in a dust-proof box. This dust-proof box may be filled or partly filled with oil, so that the running parts will work in oil and the journal will not require reoiling except at very distant intervals of time.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination with a seed-boot and a disk-drill, the latter having a rigidly-secured hollow hub and a cap-nut working with screw-threaded engagement in said hub, of an annular cone-bearing held within said hub by said cap-nut and interlocked against rotation with respect to said hub, a pair of cone-bearings cooperating with said annular

cone-bearing, the one thereof projecting through and engaging a part rigid on said boot, and a bolt passed through said pair of cone-bearings and securing the same to said boot, substantially as described. 65

2. The combination with a seed-boot having a bearing-flange, of a disk having a rigidly-secured annular hub, a cap-nut working in the outer end of said hub, an annular bearing clamped within said hub by said cap-nut and interlocked against rotation with respect to said hub, a pair of bearing-cones cooperating with said annular bearing, said cones being interlocked against rotation, one with respect to the other and one thereof projecting through said disk and engaging a seat in the bearing-flange of said seed-boot, and a nutted bolt passed through said bearing-cones and through said bearing-flange, said bolt having threaded engagement with the outwardly-projecting bearing-cone, and said bearing-flange being clamped between the nut of said bolt and the hub of said outwardly-projecting bearing-cone, substantially as described. 70 75 80 85

3. The combination with a seed-boot having a projecting bearing-flange formed with a seat 20, of a disk 1 having the rigidly-secured annular hub 2 formed with an internal shoulder 5, a cap-nut 3 working in the outer end of said hub, an annular bearing 4 clamped between said shoulder 3 and interlocked with said hub against rotation with respect thereto, the bearing-cones 10 and 11 cooperating with the said annular bearing 4, said cone 11 projecting through said disk and fitting in the seat 20 of said bearing-flange, said cone-bearing 10 having lock-lugs 13 fitting seats in said cone-bearing 11, a bolt 12 loosely passed through said cone-bearing 10 and the bearing-flange of said seed-boot and having screw-threaded engagement with the said cone-bearing 11, the nut 15 on the outer end of said bolt clamping said bearing-flange against the hub of said bearing-cone 11, and a gasket 14 interposed between said disk and the body of said cone-bearing 11, substantially as described. 90 95 100 105 110

4. The combination with a seed-boot and a disk journaled thereto, of an annular hub rigidly secured on said disk and a cap-nut closing the outer end of said hub, said hub and cap-nut having oil-holes adapted to be turned into and out of registration with each other, and which hub and cap-nut inclose the running parts of the disk journaled, substantially as described. 115 120

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM JEROME BROWNE.

Witnesses:

MALIE HOEL,  
F. D. MERCHANT.