

No. 721,316.

PATENTED FEB. 24, 1908.

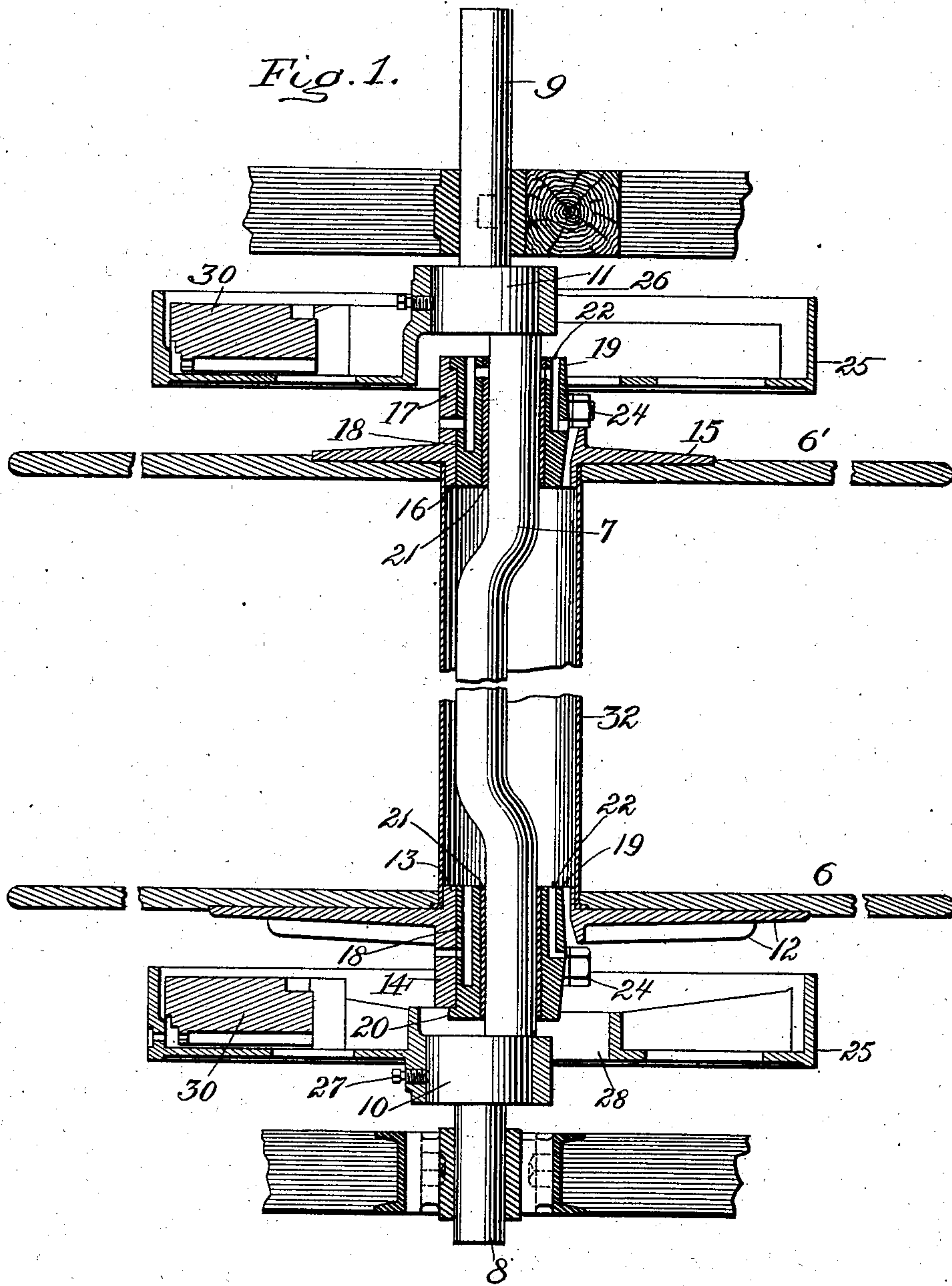
A. G. MATHER.

SHAFT FOR BOLTING OR OTHER MACHINES.

APPLICATION FILED OCT. 29, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:  
 W. E. Burdine  
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Inventor,  
Allen G. Matter,  
by Douglas Loma Attys.

No. 721,316.

PATENTED FEB. 24, 1903.

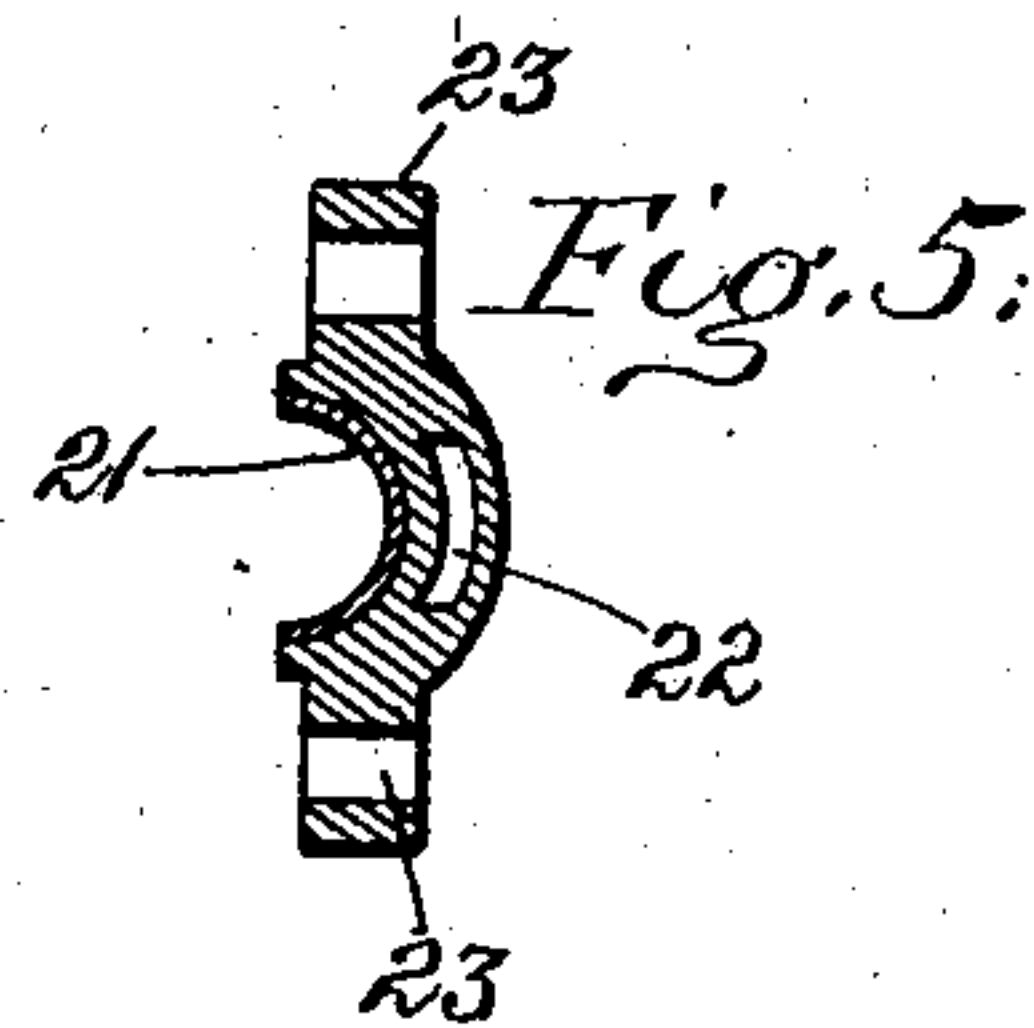
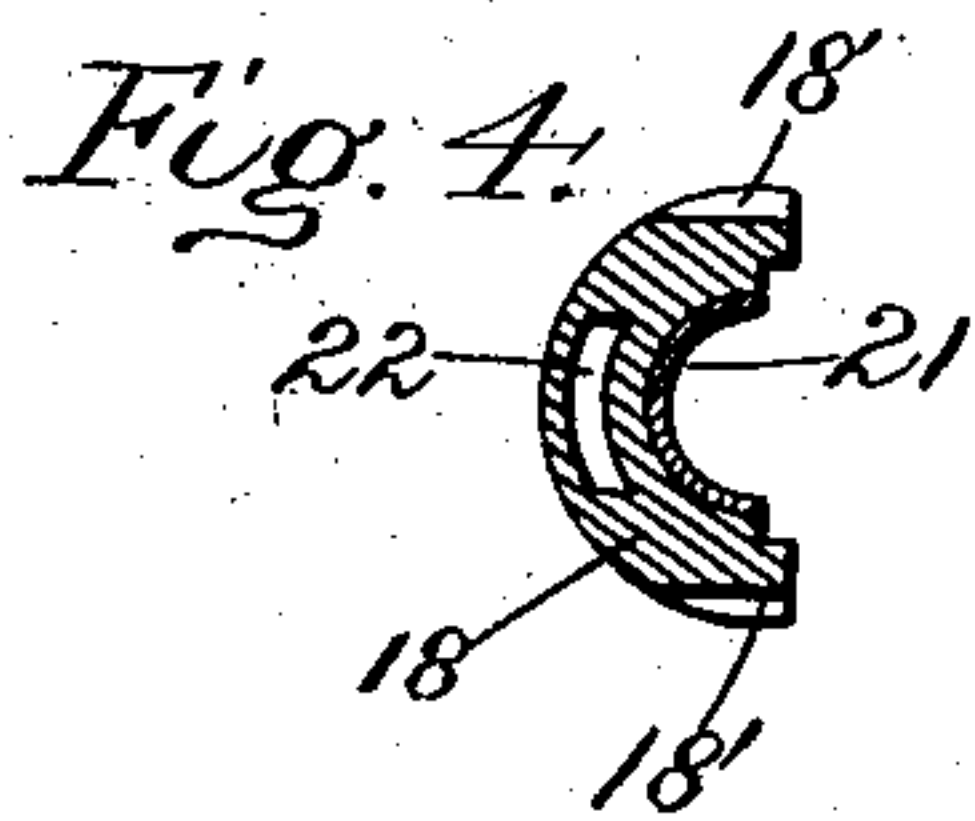
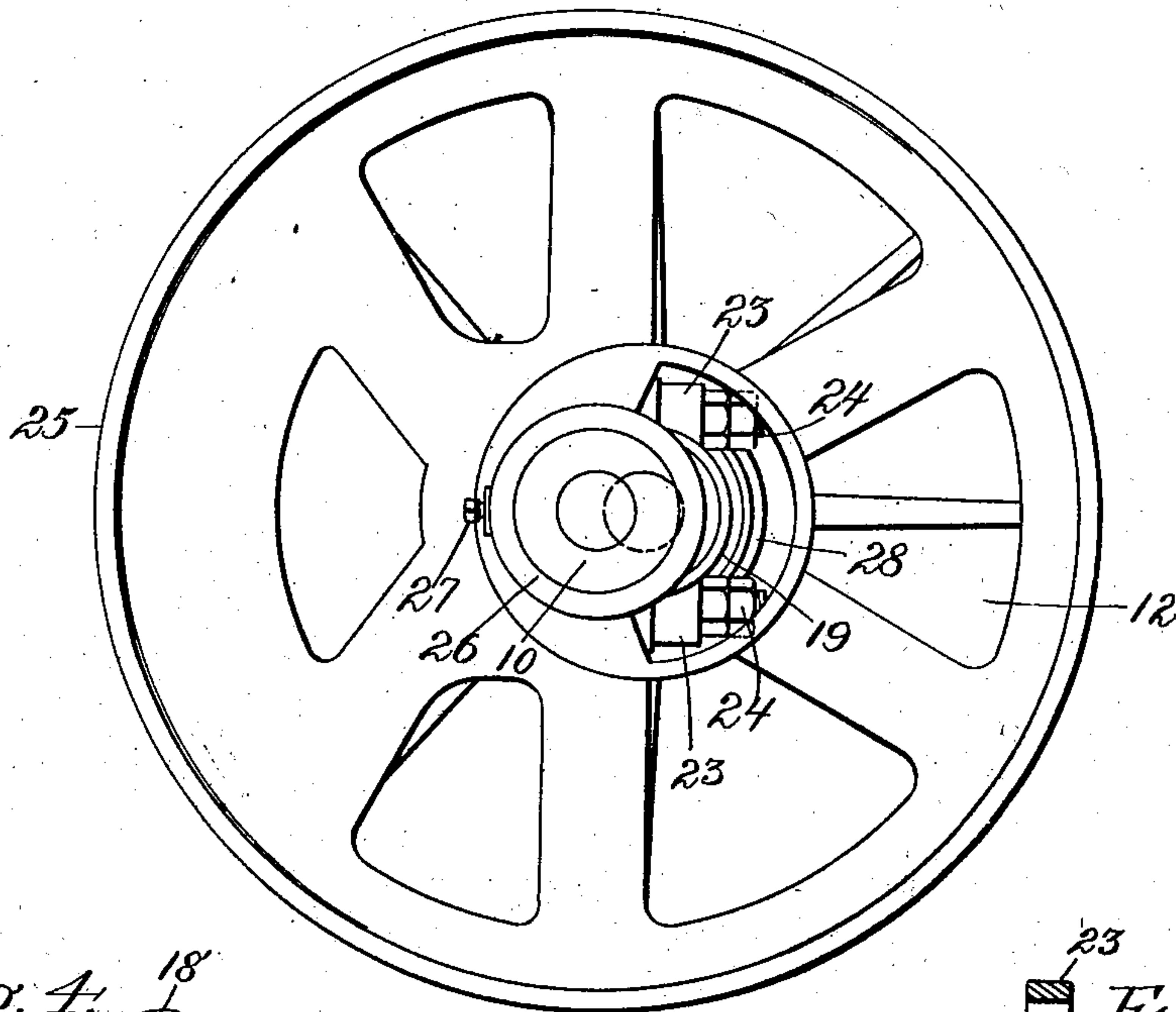
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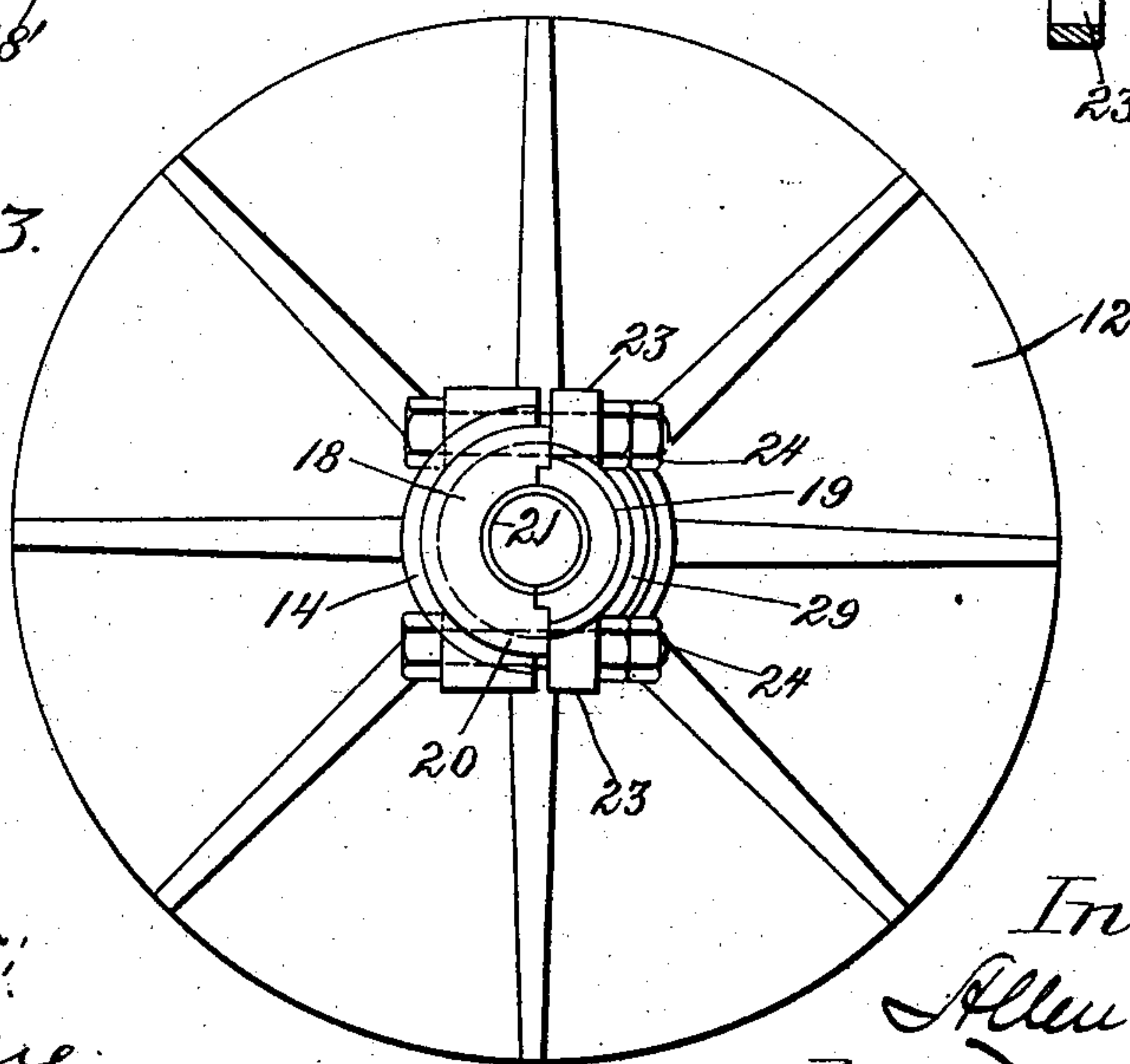
NO MODEL.

2 SHEETS—SHEET 2.

*Fig. 2.*



*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

ALLAN G. MATHER, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF TO ALLIS-CHALMERS COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF NEW JERSEY.

## SHAFT FOR BOLTING OR OTHER MACHINES.

SPECIFICATION forming part of Letters Patent No. 721,316, dated February 24, 1903.

Application filed October 29, 1901. Serial No. 80,462. (No model.)

*To all whom it may concern:*

Be it known that I, ALLAN G. MATHER, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Shafts for Bolting or other Machines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in shafts for bolting and other machines and in means for removing the bearing-boxes from said shafts.

Heretofore in the construction of bolting machines it has been impossible to remove the bearing without first removing the balance-wheel.

It is the primary object of my invention to provide an improved construction of the shaft and balance-wheels and the construction and arrangement of the bearing-boxes in connection therewith, whereby said bearing-boxes may be readily removed at any time with but the slightest difficulty and without the necessity of disturbing the balance-wheels.

With the above primary object and other incidental objects in view the invention consists of the devices and parts or their equivalents, as hereinafter set forth.

In the accompanying drawings, Figure 1 is a central section of so much of a bolting-machine as is necessary to illustrate my invention. Fig. 2 is an under view of the lower balance-wheel. Fig. 3 is an under view of the lower disk, the bearing-boxes being in proper position with relation thereto. Fig. 4 is a detail sectional view of one half of one of the bearing-boxes, and Fig. 5 is a detail sectional view of the other half of one of the bearing-boxes.

Referring to the drawings, the numerals 6 6', respectively, indicate the upper and lower portions of the sieve-frame of the machine. In the form or embodiment of the invention illustrated in the drawings the main shaft of the bolter consists of a central portion 7, which may be bent outwardly at a medial point, a lower portion 8, and an upper portion 9. Between the lower end of the central portion 7

and the upper end of the lower portion 8 is a boss 10, which is forged or otherwise secured solid to said ends of the sections of the shaft. A similar boss 11 is arranged between the upper end of the central portion 7 and the lower end of the upper portion 9 and is forged or otherwise secured solid to said ends. These bosses are concentric to the end portions 8 and 9 of the shaft, but eccentric to the ends of the central portion 7 of said shaft.

Secured to the underside of the frame-piece 6 is a disk 12, said disk provided with a central hub 13, which extends upwardly therefrom for a short distance and is surrounded by the bordering edge of the central opening of the frame-piece. This hub is provided with a semicircular downward extension 14, which is in the nature of a pillow-block, for holding the lower bearing-box in place. A similar disk 15 is secured to the upper side of the upper frame-piece 6' and is provided with a central hub portion 16, the bordering edge of the central opening of the frame-piece 6' surrounding the downwardly-extending portion of said hub. This hub is also provided with an upwardly-projecting semicircular extension 17, which extension is in the nature of a pillow-block and is adapted for holding the upper bearing-blocks in place.

Surrounding the shaft and located within the hub 13 of the lower disk 12 is the lower bearing-box, said box consisting of two sections, one of said sections being indicated by the numeral 18 and the other by the numeral 19. Section 18 may be provided at its lower end with an outwardly-extending flange 20, which fits beneath the lower edge of the extension 14. The inner face of each section of the bearing-box is provided with a suitable lining 21 of Babbitt metal or other suitable material. Both sections 18 and 19 are also provided with oil-chambers 22. A suitable lubricant may be introduced into the chamber of the section 18 through registering ports in the extension 14 and in said section and may pass from the chamber of said section to the shaft through registering openings in the section and the inner lining 21. A port may be provided through the section 19



for the introduction of the lubricant, and provision may be provided for the passage of the lubricant from the chamber 22 of said section to the shaft by means of registering ports in the section and in its lining. The section 19 forms the cap-piece of the bearing-box and is provided with laterally-extending flanges 23 23, (see particularly Fig. 5,) having bolt-openings through which bolts 24 pass and engage the extension or pillow block 14. These bolts also engage notches 18' in the sides of the section 18, and thereby prevent turning of said section. The upper bearing-box is fitted in the hub 16 of the upper disk 15, and as this bearing-box is a duplicate of the lower box the parts thereof are indicated by the same reference-numerals.

The lower balance-wheel is indicated by the numeral 25. This wheel is provided with a central hub 26, which surrounds the boss 10 and is secured thereto, preferably, by means of a set-screw 27. This wheel is provided with an opening 28, which is below and is adapted to be brought in line with the sections of the bearing-box. The bore of the hub 13 of the disk 12 is enlarged slightly at one side, as indicated by the numeral 29, so as to afford sufficient clearance for the removal of the bearing-box section 19 downwardly through the opening 28.

Carried by the balance-wheel 25 at one side thereof is a counterbalance-weight 30.

The upper balance-wheel is constructed similarly to the lower wheel in all essential particulars, and hence the parts thereof are indicated by the same reference-numerals. The bore of the hub 16 of the upper disk 15 is also enlarged at one side, as indicated by the numeral 31, so as to provide clearance for the ready removal of the section 19 of the upper bearing-box through the opening 28 of the upper balance-wheel.

The main shaft, as usual in machines of this character, is surrounded by a tubular casing 32 to prevent particles of the material being operated upon from passing to the bearings, and thereby clogging said bearings.

In the use and application of my invention if either one of the bearing-boxes is required to be removed for any purpose the bolts 24 are first withdrawn. The balance-wheel is then turned until the opening 28 thereof is in line with the cap-section 19 of the bearing-box, which section may then be readily drawn through the enlarged portion of the bore of the hub of the disk and through said opening 28 of the balance-wheel. The balance-wheel is next turned until its opening 28 is in line with the section 18 of the box, when of course said section is removed in a similar manner. In replacing the sections of the bearing-boxes the balance-wheel is turned to bring its opening in line with the position occupied by one of the sections of the box—say the section 18—when of course said section may be readily replaced, and the wheel is then turned so as bring its opening in line with the position oc-

cupied by the other section of the box, or the section 19. This latter section is then adjusted to place and finally the two sections connected by the bolts 24.

It will be seen that in my construction by having the ends of the central portion 7 of the shaft eccentrically connected to the bosses 10 and having the central hubs of the balance-wheel surrounding and secured to said bosses I am enabled to provide the openings 28 in the balance-wheels at such points of location that they may be brought in line with the sections of the bearing-boxes. I would furthermore call attention to the fact that the construction of the shaft and other parts is such as to permit the bearing-boxes to extend into the balance-wheels, so that the counterbalance-weights are carried up as near the centers of said bearing-boxes as possible in order to secure a direct outward pull, and thereby avoid the springing of the shaft.

While I have herein shown the central portion 7 of the main shaft as bent outwardly at a medial point, yet this is not absolutely essential, as said central portion of the shaft, if preferred, could be straight throughout its length.

What I claim as my invention is—

1. The combination of a shaft having a boss fast thereon, the portion of said shaft which extends from the boss in one direction being eccentric to said boss, and the portion of said shaft which extends from the boss in the opposite direction being concentric to the boss, a bearing-box surrounding the eccentric portion of the shaft, said box being composed of sections, a frame having a hub in which the bearing-box is located, said hub being extended so as to form a pillow-block for one section of the bearing-box, means for detachably connecting the cap of the bearing-box to the pillow-block, and a balance-wheel having its hub fitting and secured to the boss, said balance-wheel provided with an opening adapted to be brought in line with the sections of the bearing-box, so as to provide for the removal of the bearing-box through said opening without disturbing the balance-wheel.

2. The combination of a shaft having a boss fast thereon, the portion of said shaft which extends from the boss in one direction being eccentric to said boss, and the portion of the shaft which extends from the boss in the opposite direction being concentric to the boss, a bearing-box surrounding the eccentric portion of the shaft, said box being composed of sections, a frame having a hub in which the bearing-box is located, said hub being extended so as to form a pillow-block for one section of the bearing-box, bolts passing through the cap-section of the bearing-box and engaging the pillow-block, and a balance-wheel having its hub fitting and secured to the boss, said balance-wheel provided with an opening adapted to be brought in line with the sections of the bearing-box so as to pro-



vide for the removal of the bearing-box through said opening, without disturbing the balance-wheel.

3. The combination of a shaft having a boss fast thereon, the portion of said shaft which extends from the boss in one direction being eccentric to said boss, and the portion of the shaft which extends from the boss in the opposite direction being concentric to said boss, a bearing-box surrounding the eccentric portion of the shaft, said box being composed of sections, the cap-section thereof being provided with bolt-holes, and the other section with notches or recesses, a frame having a hub in which the bearing-box is located, said hub being extended so as to form a pillow-block for one section of the bearing-box, bolts passing through the bolt-openings of the cap-section of the bearing-box and engaging the notches of the other section of said bearing-box, and finally engaging the pillow-block, and a balance-wheel having its hub fitting and secured to the boss, said balance-wheel provided with an opening adapted to be brought in line with the sections of the bearing-box so as to provide for the removal of the bearing-box through said opening, without disturbing the balance-wheel.

4. The combination of a shaft having a boss fast thereon, the portion of said shaft which extends from the boss in one direction being eccentric to said boss, and the portion of the shaft which extends from the boss in the opposite direction being concentric to the boss, a bearing-box surrounding the eccentric portion of the shaft, said box being composed of sections, a frame having a hub, the bore of the hub being enlarged at one point, and in which hub the bearing-box is located, said hub being extended so as to form a pillow-block for one section of the bearing-box, means for detachably connecting the cap of the bearing-box to the pillow-block, and a balance-wheel having its hub fitting and secured to the boss, said balance-wheel provided with an opening adapted to be brought in line with the enlarged portion of the bore of the hub, so as to provide for the removal of the sections of the bearing-box, without disturbing the balance-wheel.

5. The combination of a shaft having a boss fast thereon, the portion of said shaft which extends from the boss in one direction being eccentric to said boss, and the portion of the shaft which extends from the boss in the opposite direction being concentric to the boss, a bearing-box surrounding the eccentric portion of the shaft, said box being composed of sections, a frame having a hub in which the bearing-box is located, said hub being extended so as to form a pillow-block for one section of the bearing-box, means for detachably connecting the cap of the bearing-box

to the pillow-block, and a balance-wheel having its hub fitting and secured to the boss, and having the bearing-box extending therein so as to bring the counterbalance-weight of the wheel as near as possible to the center of the bearing-box, the said balance-wheel provided with an opening adapted to be brought in line with the sections of the bearing-box so as to provide for the removal of the bearing-box through said opening, without disturbing the balance-wheel.

6. The combination of a shaft having bosses fast thereon, the portion of the shaft between said bosses being eccentric to the bosses, and the portions of the shaft extending from the bosses being concentric thereto, bearing-boxes surrounding the eccentric portion of the shaft, each of said boxes being composed of sections, a frame having hubs in which the bearing-boxes are located, each of said hubs being extended so as to form a pillow-block for one section of each bearing-box, means for detachably connecting the cap of each bearing-box to its pillow-block, and balance-wheels having their hubs fitting and secured to the bosses, each balance-wheel provided with an opening adapted to be brought in line with the sections of each bearing-box, so as to provide for the removal of the bearing-boxes through the openings of the balance-wheels, without disturbing said wheels.

7. In combination with a shaft having journal portions concentric with the axis of rotation of said shaft and a portion eccentric to said axis, a frame provided with an open hub; a separable box or bearing mounted in said hub, removable therefrom and encircling the eccentric portion of the shaft; and a balance-wheel applied to the concentric portion of the shaft and provided with an opening through which to remove the parts of the separable box or bearing without removing said balance-wheel.

8. In combination with a frame or support, a shaft having journal portions concentric with the axis of rotation, carried in suitable boxes or bearings in the supporting-frame, and having also an eccentric portion; a movable frame provided with open hubs or bosses; separable boxes mounted in said hubs, encircling the eccentric portion of the shaft and removable from said hubs; and balance-wheels applied to the shaft, each provided with an opening adapted to be brought into line with the sections of the bearing-boxes and thereby to permit the removal of said sections without removing the balance-wheels.

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

ALLAN G. MATHER.

Witnesses:

A. L. MORSELL,  
ANNA V. FAUST.