J. J. GRAIN.

GRINDING WHEEL CLAMP.

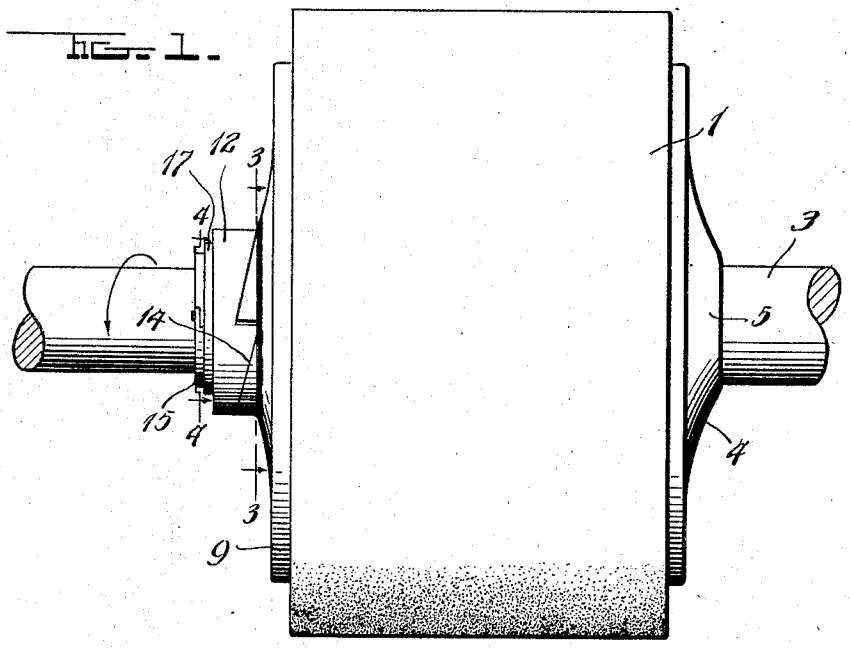
APPLICATION FILED MAY 16, 1918.

1,300,161.

Patented Apr. 8, 1919.

2 SHEETS—SHEET 1.

Fig. 1.



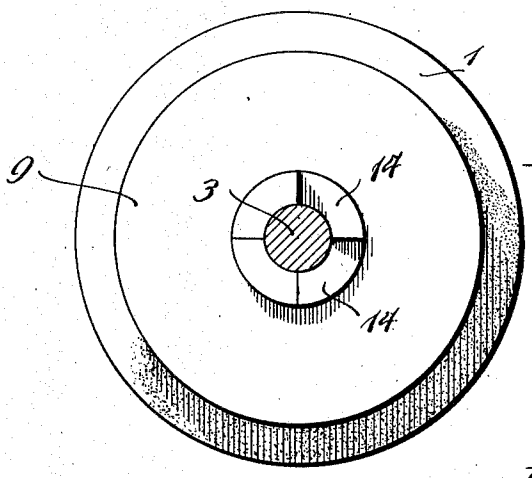


Fig. 3.

Witness

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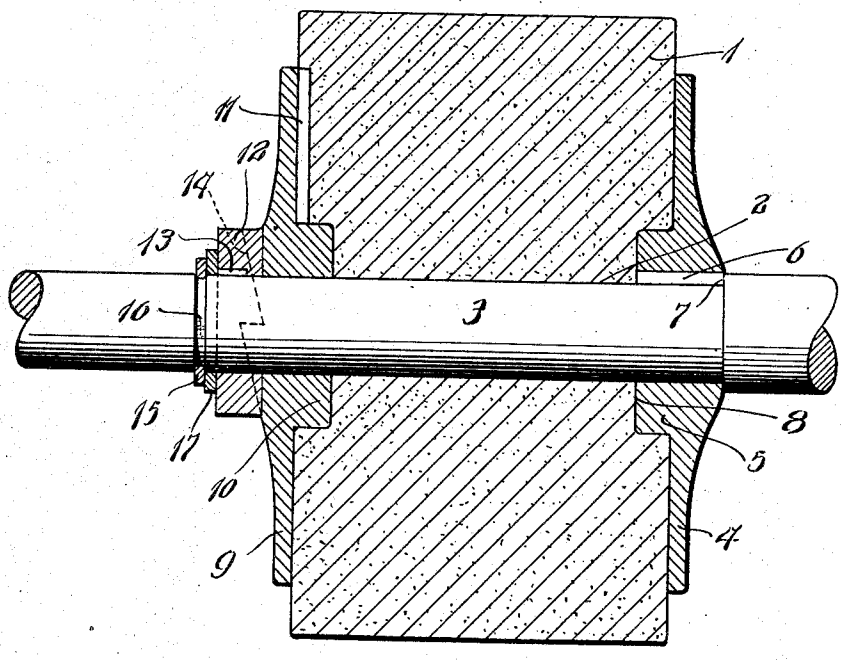
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2 SHEETS—SHEET 2.

FIG. 2.



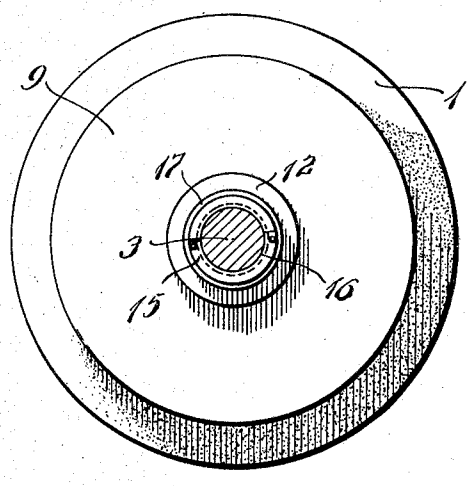


FIG. 4.

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UNITED STATES PATENT OFFICE.

JACOB J. GRAIN, OF GRAND RAPIDS, WISCONSIN.

GRINDING-WHEEL CLAMP.

1,300,161. Specification of Letters Patent. Patented Apr. 8, 1919.

Application filed May 16, 1918. Serial No. 234,988.

To all whom it may concern:

Be it known that I, JACOB J. GRAIN, a citizen of the United States, residing at Grand Rapids, in the county of Wood and State of Wisconsin, have invented certain new and useful Improvements in Grinding-Wheel Clamps; and I do 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 improvements in means for securing numerous kinds of grinding wheels upon their driving shafts or arbors, the invention being particularly adapted for use in connection with the grinding stones of pulp mills. Heretofore, in most cases, the stone has been clamped on the arbor between two disks threaded thereon, but the conditions under which the stone operates are such as to cause rusting and pitting of the screw threads so that they are not only short-lived, but greatly interfere with removal of the disks whenever it is necessary to apply a new grinding stone, usually about once in eighteen months. In screwing the old disks in place, it has been necessary to connect say a 16 foot rail thereto in some suitable manner for use as a lever, several men then pulling downwardly on the outer end of the rail, this operation being also necessarily duplicated in removing the disks. In threading the disks in place, they cannot be as tightly engaged with the wheel as desirable, by the method above set forth, yet considerable difficulty is experienced in removing the disks after the life of the stone is exhausted. In fact, it often happens that the entire stone and arbor must be shipped to a foundry in order to remove the old disks. Even then, it is often found that the screw threads are so rusted and pitted as to be of no further use.

My invention aims to overcome the difficulties above pointed out by providing a stone clamp which operates totally without the use of screw threads, the arrangement being such as to not only permit easy removal of a worm stone, but to cause the rotation of the shaft and the resistance offered by the stone to coöperate in more tightly clamping the latter in place.

With the foregoing object in view, the invention resides in the novel arrangement and construction of parts herein described and claimed, and shown in the accompanying drawings wherein:

Figure 1 is a side elevation of the improved clamping means applied to a stone;

Fig. 2 is a longitudinal section of the parts shown in Fig. 1;

Fig. 3 is a transverse section on the plane of the line 3—3 of Fig. 1; and

Fig. 4 is a similar view on the plane of the line 4—4 of Fig. 1.

In the drawings above briefly described, the numeral 1 designates the grinding stone of a pulp mill although it is to be understood that my invention could be used for securing other forms of grinding wheels in place. The center of the stone 1 is formed with the usual bore 2 through which the arbor or shaft 3 passes, and cement may be used if required to provide for snug reception of said shaft or arbor in the bore. An abutment disk 4 is provided with a hub 5 at its center, said hub being keyed at 6 on the arbor 3 and resting against a shoulder 7 thereon. The inner end of the hub 5 by preference extends beyond the inner face of the disk 4, and the adjacent side of the wheel 1 is recessed at 8 for its reception. Contacting with the side of the stone 1 opposite the disk 4, is a flat clamping ring 9 having a hub 10 mounted on the shaft 3 but keyed in no manner thereto, said ring 9 however being keyed at 11 for rotation bodily with the grinding wheel 1. It is the office of the ring 9 to force wheel 1 tightly against the disk 4 and to thus rigidly secure it in place, and in attaining this end, the following construction is employed.

A collar 12 is keyed at 13 on the arbor 3 adjacent the outer end of the hub 10, and the adjacent faces of said collar and hub are provided with coacting helical cams 14 whose oblique faces contact with each other in such a manner as to cause any rotating tendency of the arbor 3 in the wheel 1 to thrust the clamping ring 9 tightly against said wheel, the collar 12 being held against outward movement along the arbor by a split ring 15 which is received in a circumferential groove 16 formed in said arbor, a shim 17 being by preference interposed between said split ring and the collar 12.

The arrangement of parts above described permits easy assembling and disassembling without the loss of time and the wheel 1 is much more effectively clamped in place

than by the old method. Any tendency whatever on the part of the shaft 3 to turn within the wheel 1, will be utilized to cause the coacting cams 14 to thrust the clamping ring 9 tightly against the wheel, and consequently the latter is forced snugly against the abutment disk 4. The greater the force applied to turn the arbor and the greater the resistance of the wheel, the more tightly the latter will be held upon the arbor.

From the foregoing, taken in connection with the accompanying drawings, it will be obvious that although my invention is of extremely simple and inexpensive nature, it will be highly efficient and desirable, and since probably the best results are obtained from the several features shown and described, they are preferably employed. Within the scope of the invention as claimed however, numerous minor changes may well be made as occasion may dictate.

I claim:

In a pulp mill grinding wheel mounting, an arbor reduced in diameter to form an outstanding shoulder, a wheel clamping disk surrounding the reduced part of said arbor and bearing against said shoulder, a key securing said disk to the arbor for rotation bodily therewith, a grinding wheel mounted on the arbor and bearing against the inner side of said disk, the latter having a hub extending into said wheel, a second clamping disk mounted on the arbor and free to turn thereon, said second disk having a hub extending into the grinding wheel and the latter being provided with a radial key-way adjacent said second disk, a key in said key-way for securing said second disk and the grinding wheel together for movement in unison, wedge shaped cams on the outer side of said second disk, a collar surrounding the arbor and having cams engaging said first named cams, a key securing said collar to said arbor, a washer abutting the outer side of said collar, and a split ring against which said washer bears, said arbor having a peripheral groove in which said ring is secured.

In testimony whereof I have hereunto set my hand.

JACOB J. GRAIN.

Witnesses:

JOHN T. GRAIN,

JOHN KAJA.