No. 791,159.

PATENTED MAY 30, 1905.

C. H. NORTON.

ABRASIVE WHEEL MOUNTING.

APPLICATION FILED MAY 18, 1904.

2 SHEETS—SHEET 1.

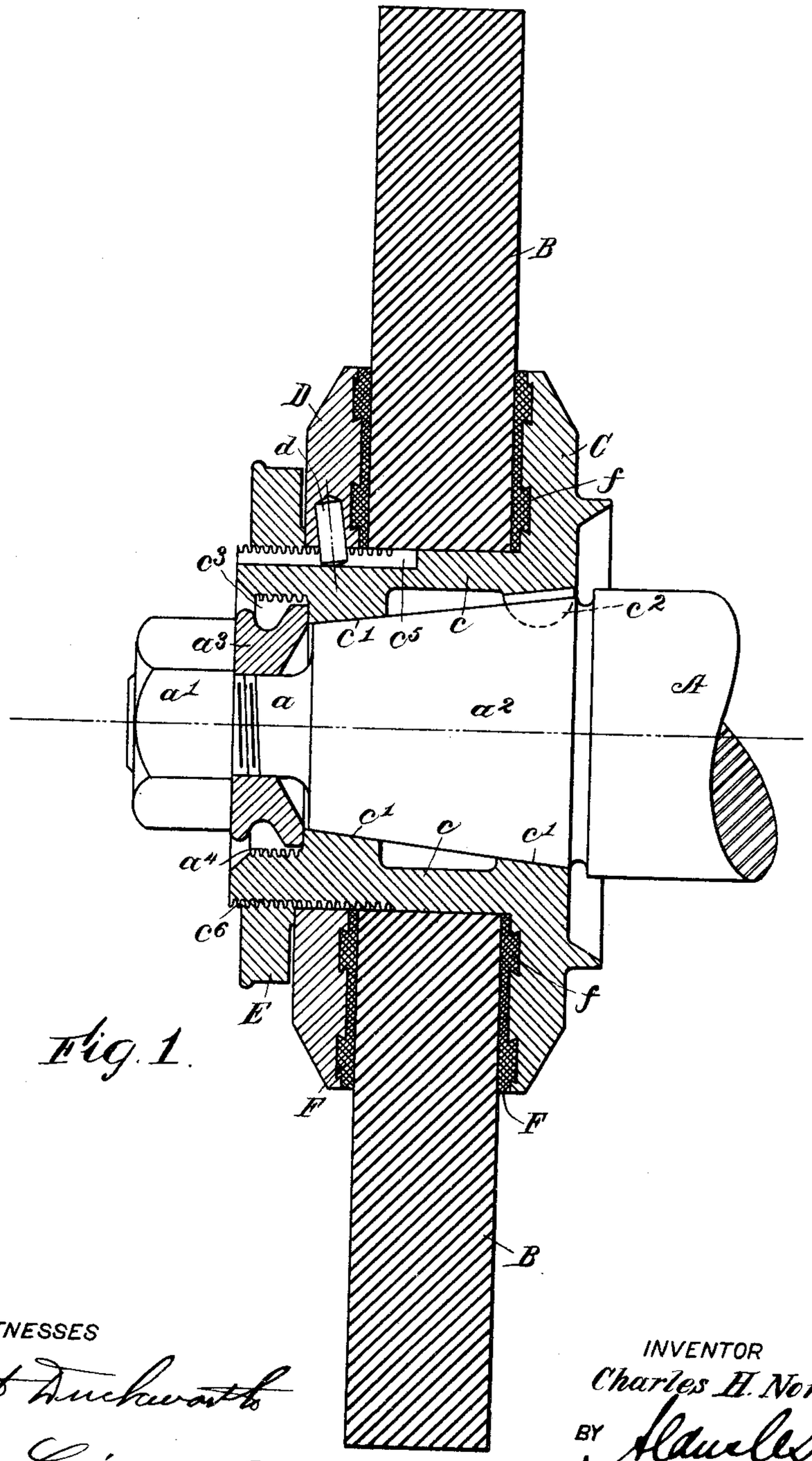

Fig. 1.

WITNESSES

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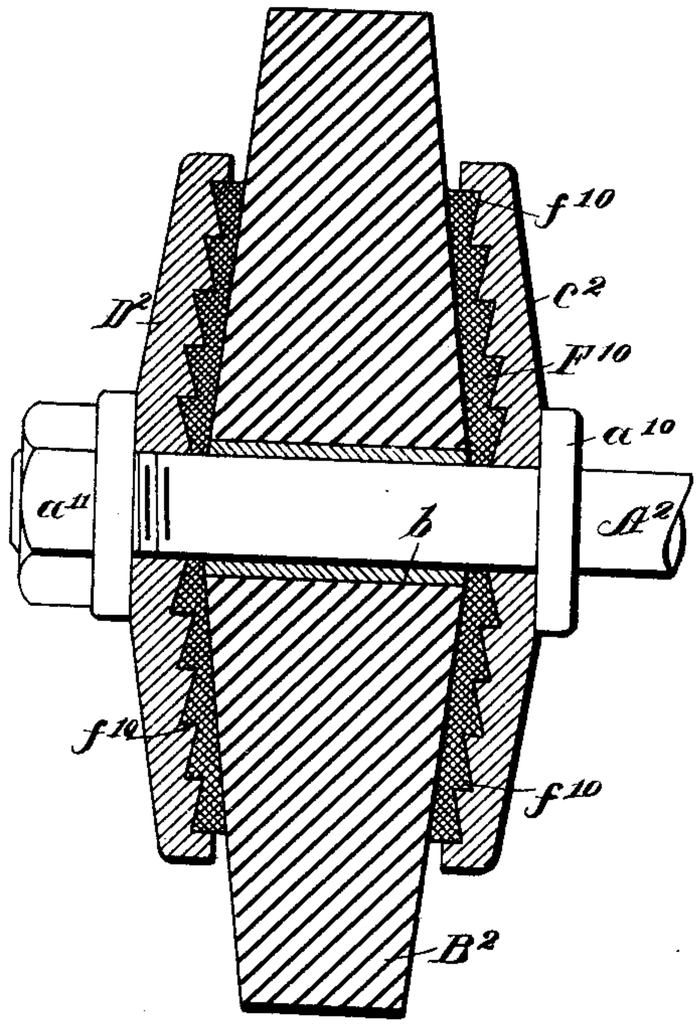

Fig. 2.

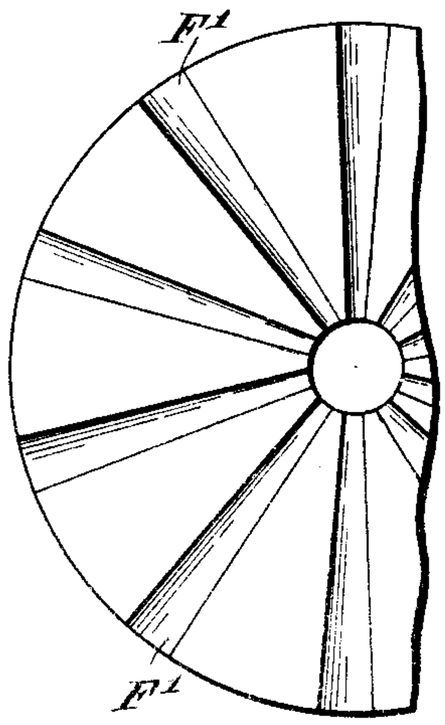

Fig. 3.

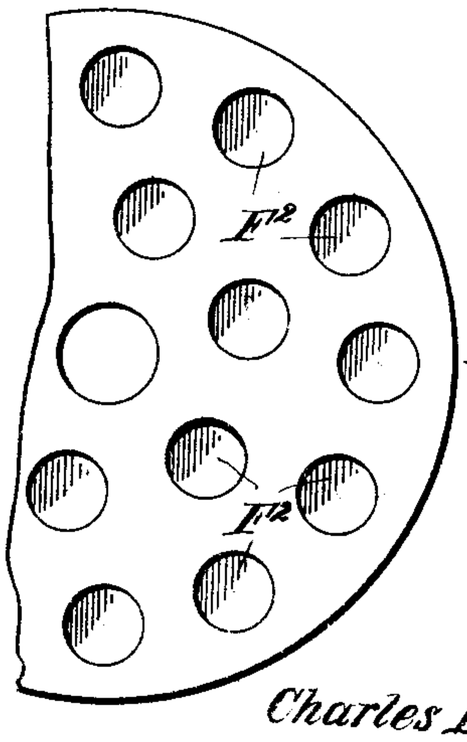

Fig. 4.

WITNESSES

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UNITED STATES PATENT OFFICE.

CHARLES H. NORTON, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO NORTON GRINDING COMPANY, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

ABRASIVE-WHEEL MOUNTING.

SPECIFICATION forming part of Letters Patent No. 791,159, dated May 30, 1905.

Application filed May 18, 1904. Serial No. 208,526.

To all whom it may concern:

Be it known that I, CHARLES H. NORTON, a citizen of the United States of America, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Abrasive-Wheel Mountings, of which the following is a specification.

The invention to be hereinafter described relates to emery-wheels, and more particularly to the mounting of such wheels upon their carrying-arbors or other instrumentalities. In one form of such mounting the emery-wheel is carried on a rotatable shaft or arbor to which it is secured by means of collars, between which the emery-wheel is clamped. In such form of mounting it has been proposed to apply an elastic medium between the faces of the emery-wheel and collars; but such elastic medium is difficult of application, deteriorates in elasticity by the constant pressure thereon, becomes seriously injured and impaired by the oil or other lubricant, so that the pressure of the collars on the emery-wheel varies under the conditions of use, and cracking of the wheel is liable to result.

With these general defects in view the object of the present invention is to provide a mounting for the emery-wheel on its carrying shaft or arbor that will not only overcome these defects, but afford a yielding though inelastic bearing of the collars against the emery-wheel, prevent slipping of the wheel between the collars, and hold the parts of the wheel from flying apart in case of rupture.

Having these and other objects in view, the invention consists, primarily, in providing a soft and yielding yet inelastic metal facing for the emery-wheel collars or flanges which shall bear directly upon the wheel and yield to accommodate itself to the irregularities thereof without resulting elasticity and in providing convenient means for attaching the soft-metal facing to the collars or flanges and other features, as will hereinafter be more fully described and then definitely pointed out in the claims.

In the drawings, Figure 1 is a sectional view showing an emery-wheel mounting embodying one form of my invention. Fig. 2 is a like view of a slightly-modified form of mounting. Figs. 3 and 4 are detail face views of two forms of collars or flanges, parts being broken away and such collars or flanges being provided with recesses or cavities into which the soft-metal facing may project for holding such facing fixedly with relation thereto.

Referring to Fig. 1 of the drawings, A represents any usual or ordinary form of shaft or arbor for carrying and operating an emery-wheel B, which wheel may be of any usual construction in this class of devices. The end a of the shaft or arbor A is provided with a screw-thread adapted to receive a nut a' for securing the emery-wheel B and its clamping collars or flanges to the shaft or arbor A.

In the present form of the invention as illustrated in Fig. 1 I have shown one of the flanges C as provided with a sleeve portion c, adapted to fit the usual bore or hole formed centrally in the emery-wheel B. This sleeve portion c of the collar or flange C also has a suitable bearing at c' upon the tapering end a^2 of the shaft or arbor A and is made to rotate with said shaft or arbor A by being fixedly secured in any suitable manner—as, for instance, by the projection c^2 of the collar or flange engaging a corresponding cavity or recess in the part a^2 of the shaft or arbor A. Of course it is understood that these details of connecting means may be widely varied. In the present form of the device also I have provided a washer a^3, adapted to engage by exterior screw-threads thereon the screw-threads a^4, formed on the interior of an end cavity c^3, formed on the collar or flange C. Against this washer a^3 the nut a' bears to hold the collar or flange C in the proper position on its shaft or arbor A; but other means may be employed for this purpose, as will be evident.

Mounted so as to loosely pass onto the sleeve c of the collar or flange C is the second

collar or flange D, and in order that said collars or flanges C and D may rotate in unison the sleeve *c* of the collar C has formed on its exterior a longitudinal slot or opening c^5, which is engaged by a pin *d*, extending from the collar or flange D.

In order that the emery-wheel B may be securely clamped between the collars or flanges C and D, the exterior portion of the sleeve *c* is provided with screw-threads c^6 and a nut E, having an internal screw-thread engaged therewith, so as to force the collars or flanges C and D toward each other and securely hold the emery-wheel B therebetween.

The inner faces of each of the collars or flanges C and D—that is, the surfaces next to the emery-wheel B—have each a facing F of a soft metal, such as lead, which while yielding in character possesses no elasticity and is not materially affected by the lubricant used in connection with the wheel, such as water, oil, and so on. This facing F, I preferably form of lead; but it will be understood, of course, that any metal having the characteristics of lead—namely, yielding, but not elastic—will fulfil the purposes in view.

In order that the soft-metal or lead facing F may be fixedly secured to the faces of the collars or flanges C and D, I preferably provide such faces each with cavities which, as shown in Fig. 1 at *f*, may be undercut or dovetailed, and I may run the soft metal into these cavities and on the faces of the collars while in a molten condition and thereafter true up the surface, or since the metal is of a soft and yielding nature I may force the cold metal into such cavities, as will be well understood by one skilled in the art.

Of course it will be obvious that various forms of cavities may be provided in the surfaces of the collars or clamps C and D, and two of such forms I have shown by Figs. 3 and 4. In the former these cavities are illustrated in the form of radial grooves, as F′, while in Fig. 4 they are designated as circular holes or recesses F^2. In either case, however, the purposes of perforations or openings serve to hold the soft-metal facing fixed with relation to the collars or flanges, and this without the addition of screws or other separate holding means.

In Fig. 2 I have shown a slightly-modified form of emery-wheel mounting in which the wheel B^2 is shown tapering from its center outward, and I have also disclosed a different form of mounting on the shaft A^2 of the collars C^2 D^2. The shaft or arbor A^2 in Fig. 2 is preferably provided with a collar a^{10}, against which the collar or flange C^2 has a bearing after being placed upon the arbor or shaft A^2.

The emery-wheel B^2 in Fig. 2 may be provided with a bushing *b*, and the collar or flange D^2 may be forced toward the collar C^2 by means of a nut a^{11}, screw-threaded to the shaft or arbor A^2. In this modified form of the device it will be noticed that the collars or flanges C^2 D^2 are tapered in accordance with the taper of the emery-wheel B^2 and at their inner surfaces are provided with stepped recesses f^{10}, into which the soft-metal or lead facing F^{10} is either run while in molten condition or forced by pressure in a manner corresponding to that already described for Fig. 1.

It will be evident, of course, that numerous modifications may be made in the form and general disposition of parts and that in the character of device as shown by Fig. 2 the tapering collars or flanges C^2 D^2 act as safety devices to prevent the emery-wheel flying apart should it become ruptured.

From the construction herein described it will be noted that the yielding and inelastic metal facing for the collars or flanges can be readily made fast to such collars or flanges without any separate fastening devices, as already explained, and that the soft-metal facing can be trued up at any time to correspond to the surface of the emery-wheel. Such soft-metal facing presents a strong and yielding yet inelastic bearing for the sides of the emery-wheel, so that the particles of the emery on the surface of the wheel may become embedded in it when the nut is tightened. Thus all slipping of the wheel is absolutely prevented, even in heavy work, nor is it necessary to tighten the screw with any great severity, as the connection between the soft-metal facing and the emery-wheel is such that such wheel is caused to rotate with the collars or flanges, even when the nut is not tightened to its limit. This obviates undue tightening of the nut, as sometimes occurs in the elastic-faced collars or flanges which have been tried heretofore and frequently resulted in the breaking or rupturing of the emery-wheel. By the soft-metal and non-elastic facings it is not necessary that the sides of the wheel be exactly parallel nor need the center hole of the wheel be an accurate fit on the shaft, since the soft metal entering the surface of the emery-wheel under the slight pressure of the nut will hold the wheel in proper position, and in case of rupture during operation the lead facing tends to cling to the surface of the emery-wheel and prevent particles flying outward

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a device of the character described, an emery-wheel, collars or flanges for securing said wheel in place, said collars or flanges each having a soft, yielding, and non-elastic metal facing.

2. In a device of the character described, an emery-wheel, collars or flanges for securing said wheel in place, said collars or flanges having recesses in a surface thereof, and a soft yet non-elastic metal facing projecting into said recesses.

3. In a device of the character described, the combination of an emery-wheel, an arbor or shaft for carrying the same, collars or flanges disposed one on each side of said wheel, said collars or flanges each having a soft yet non-elastic metal facing for engaging the sides of the emery-wheel, and means independent of the arbor for forcing the collars or flanges toward each other to clamp the emery-wheel between the soft-metal facings.

4. In a device of the character described, the combination of an emery-wheel, an arbor or shaft for carrying the same, collars or flanges disposed one on each side of said wheel, and each provided with surface recesses, a soft yet non-elastic metal facing for each of said collars or flanges and engaging the recesses therein, and means independent of the arbor for forcing said collars or flanges toward each other to clamp the emery-wheel between said soft-metal facings.

5. In a device of the character described, the combination of an emery-wheel, an arbor or shaft for carrying the same, collars or flanges disposed one on each side of said wheel, and each provided with undercut surface recesses, a soft yet non-elastic metal facing for each of said collars or flanges and engaging the recesses therein, and means for forcing said collars or flanges toward each other to clamp the emery-wheel between said soft-metal facings.

6. In a device of the character described, the combination of an emery-wheel, an arbor or shaft for carrying the same, collars or flanges disposed one on each side of said emery-wheel, one of said collars or flanges having a sleeve on which the other collar or flange is mounted, each of said collars or flanges having a soft yet non-elastic metal facing, and means for forcing one of said collars or flanges toward the other to clamp the emery-wheel between the soft-metal facings.

7. In a device of the character described, the combination of an emery-wheel, an arbor or shaft for carrying the same, collars or flanges disposed one on each side of said emery-wheel, one of said collars or flanges having a sleeve on which the other collar or flange is mounted, each of said collars or flanges having a soft yet non-elastic metal facing, said collars or flanges being connected to rotate in unison, and means for forcing one of said collars or flanges toward the other to clamp the emery-wheel between the soft-metal facings.

8. In a device of the character described, the combination of an emery-wheel, an arbor or shaft, collars or flanges having soft yet non-elastic metal facings disposed one on each side of said wheel, one of said collars or flanges having a sleeve fitted to said arbor or shaft and on which the emery-wheel is directly supported, a screw-thread on said sleeve, and a nut for clamping the soft-metal facings of the collars against opposite sides of the emery-wheel.

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

CHARLES H. NORTON.

Witnesses:
ALDUS C. HIGGINS,
M. A. COOKE.