

(No Model.)

B. F. ORTMAN.

GEAR WHEEL.

No. 287,711.

Patented Oct. 30, 1883.

Fig. 1.

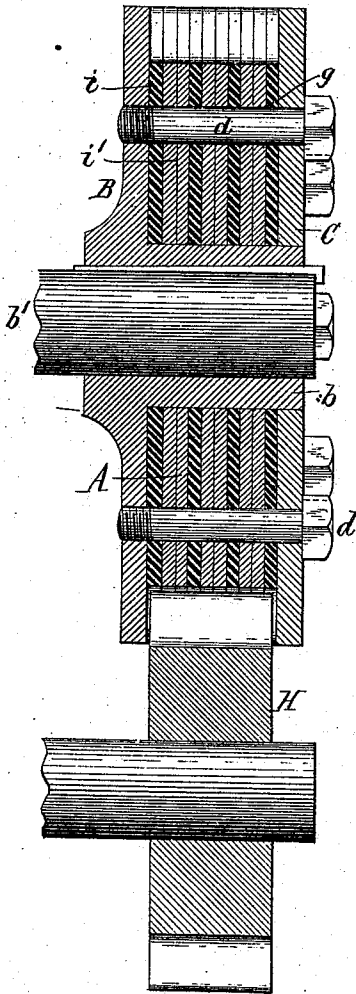


Fig. 2.

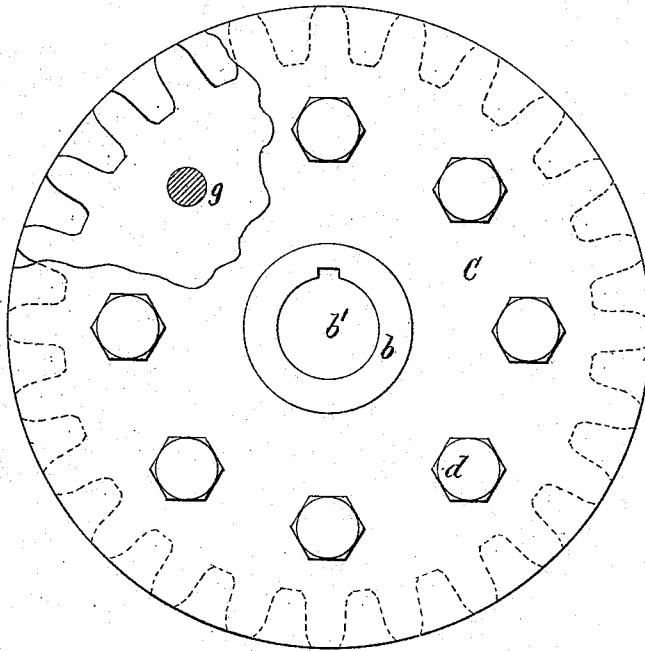
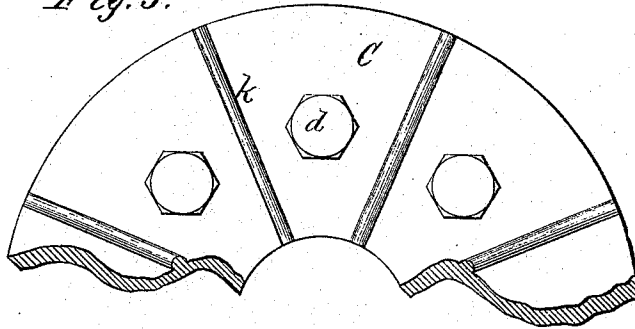


Fig. 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

BARNIM F. ORTMAN, OF BUFFALO, ASSIGNOR OF ONE-HALF TO GEORGE URBAN, JR., OF CHEEKTOWAGA, NEW YORK.

GEAR-WHEEL.

SPECIFICATION forming part of Letters Patent No. 287,711, dated October 30, 1883.

Application filed July 10, 1883. (No model.)

To all whom it may concern:

Be it known that I, BARNIM F. ORTMAN, of the city of Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Gear-Wheels, of which the following is a specification.

The object of this invention is to produce a noiseless gear-wheel which can be constructed at comparatively small expense, and which possesses sufficient strength to enable it to be used with safety in machines in which considerable power is transmitted by the wheel—for instance, in roller-mills employed in the manufacture of flour, hoisting-machines, and the like.

Heretofore it has been proposed to construct noiseless gear-wheels of leather, or of paper or paper-board; but such wheels do not possess the requisite degree of strength to render them capable of use in heavy machinery, and they do not last long even in light machinery. To render such wheels more durable, it has been proposed to employ metallic plates between the plates of paper or leather; but this construction is objectionable, because the narrow metallic plates wear rapidly, producing a fine metallic dust, which cuts and wears the intermediate layers of paper or leather and soon destroys the wheel.

In my improved wheel these difficulties are overcome; and my invention consists of the improved wheel, which will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a sectional elevation of my improved gear-wheel and an ordinary cast pinion meshing therewith. Fig. 2 is a sectional elevation of my improved gear-wheel at right angles to Fig. 1. Fig. 3 is a fragmentary inside elevation of the washer.

Like letters of reference refer to like parts in the several figures.

A represents the body of my improved gear-wheel, which is composed of layers of vulcanized fiber laid one upon the other and glued or otherwise cemented together, preferably by application of pressure.

B represents a metallic disk arranged against one side of the body A, and constructed with a sleeve or hub, *b*, which is fitted in a central opening in the body A. The disk B and hub *b* are preferably constructed in one piece, of

cast-iron, and the hub *b* is secured to the shaft *b'* by a key or other suitable device.

C represents a metallic washer, which is fitted against the opposite side of the body A, and which surrounds the hub *b*.

The disk B, body A, and washer C are secured together by screw-bolts *d*, which pass through openings in the washer C and body A, and are tapped into screw-threaded openings in the disk B.

In constructing the body A a suitable number of disks of vulcanized fiber are employed, each having stamped or cut in it a central opening, of the proper size to fit snugly around the hub *b* of the wheel to be constructed. The several disks are then glued or cemented together and secured between templets provided in their peripheries with teeth of the same form which are to be formed on the wheel. The templets are secured to the body A by screw-bolts passing through the openings *g*, which have been previously drilled through the body composed of said disks. One of said templets is provided with a hub which fits in the central opening of the body. The latter, secured between the templets, is placed in a suitable press to dry. Upon being removed from the press it is placed in a gear-cutting machine, by which the cogs or teeth are cut in the face of the body in the same manner in which such teeth are cut in metallic wheels. The templets are then removed, and the body is secured between the disk B and washer C by the bolts *d*, the body being preferably also cemented to said disk and washer.

The teeth of the body A are made somewhat wider than the teeth of the metallic pinion H, so that the metallic teeth mesh with the teeth of the body A between the projecting peripheries of the disk B and washer C. The latter parts bear against the ends of the teeth and support the same, and prevent them from spreading.

When this composite wheel is used in a machine in which heat is generated, which would cause the body A to shrink when the wheel is first put in use, the shrinkage can be taken up from time to time by tightening the bolts *d*.

The vulcanized fiber of which the body A is constructed is very strong, hard, and durable, and wears evenly and smoothly, and does not

swell or warp when exposed to moisture, in which respects it differs from paper, paper-board, leather, rawhide, and similar material.

In order to cheapen the wheel, without materially reducing its desirable qualities, layers of junk or Manila board *i* may be placed between the layers of vulcanized fiber *i'*, as represented in Fig. 1.

The disk B and washer C are constructed on their inner sides with radial ribs *k*, which imbed themselves in the adjacent layers of vulcanized fiber or junk-board and assist in securing the body A between the disk and washer.

When the teeth of the body A have become worn to such an extent as to render a renewal of this part desirable, this is readily accomplished by removing the washer C and body A from the hub *b* and inserting a new body, A, in the place of the one so renewed, thereby enabling the working-face of the wheel to be renewed without removing the hub *b* from the shaft.

My improved gear-wheel is produced at comparatively small expense, and is adapted for use in all cases in which a noiseless gear is desirable. It is particularly advantageous in roller-mills for manufacturing flour, because of its even and uniform working, whereby the operation of the rollers is rendered more uni-

form than that of rollers which are driven by metallic gear-wheels, and because of the absence of noise, which renders this gear as desirable in this respect as a belt-driving mechanism, while it possesses the great advantage of a positive movement over the belt-driving mechanism, so that it retains the important advantage of a gear mechanism which positively maintains the proper differential speed of the rollers, while doing away with the objectionable noise created by ordinary gear-driving mechanism.

I claim as my invention—

1. A gear-wheel having a non-metallic noiseless body, A, constructed wholly or partially of vulcanized fiber, and having cogs or teeth formed in said body, substantially as set forth.

2. In a gear-wheel, the combination, with a body, A, constructed wholly or partially of layers of vulcanized fiber cemented together, and having cogs or teeth formed in said body, of metallic disks B and C, provided on their inner sides with ribs K, and secured to opposite sides of said body A, substantially as set forth.

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Witnesses:

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