

(No Model.)

C. H. MORGAN.
GEAR WHEEL.

No. 427,103.

Patented May 6, 1890.

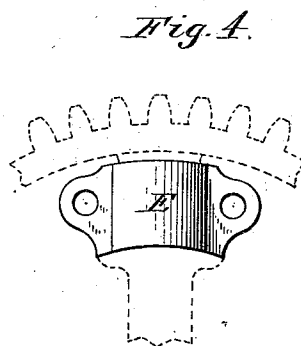
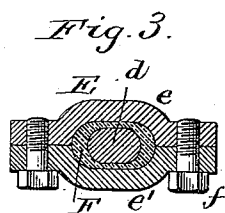
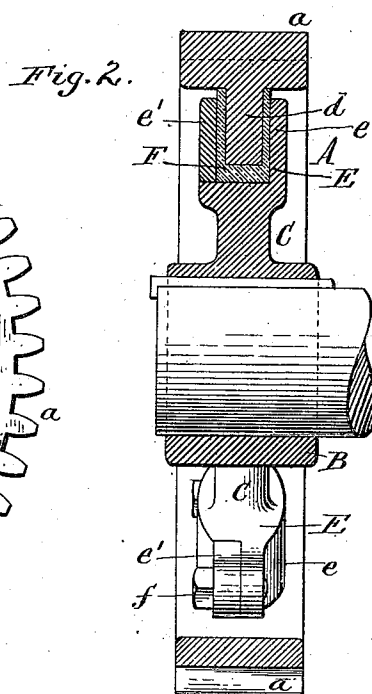
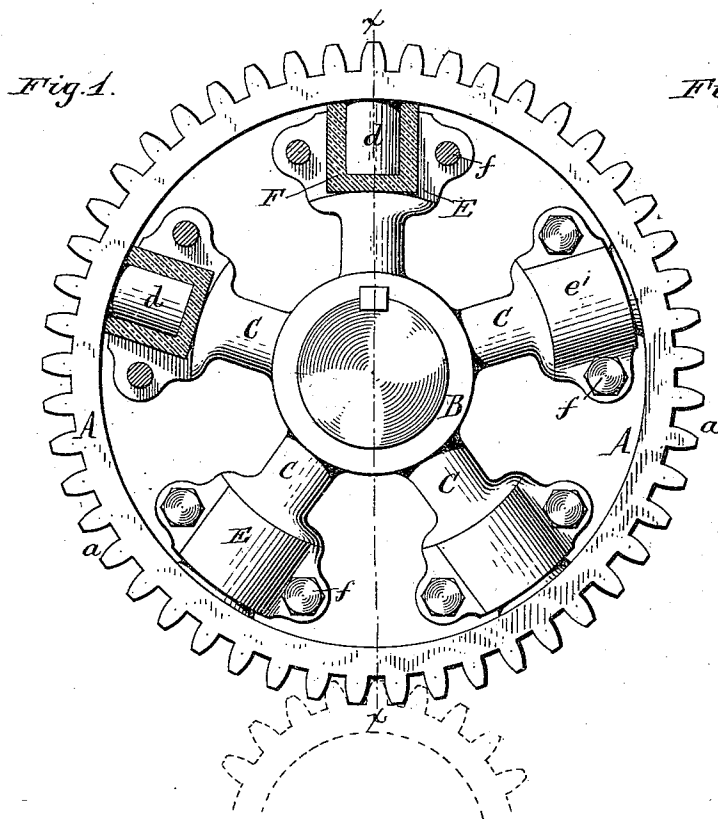
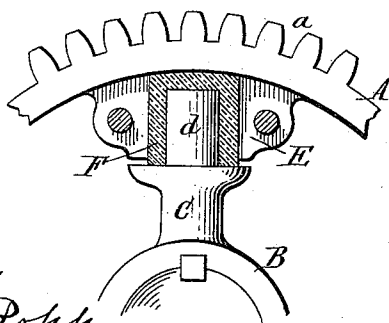


Fig. 5.



Witnesses:
Theo. L. Popp.
Geo. J. Buchheit Jr.

Chas. H. Morgan Inventor.
By Wilhelm H. Renner.
Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES H. MORGAN, OF BUFFALO, NEW YORK.

GEAR-WHEEL.

SPECIFICATION forming part of Letters Patent No. 427,103, dated May 6, 1890.

Application filed September 24, 1887. Serial No. 250,547. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. MORGAN, of the city of Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Gear-Wheels, of which the following is a specification.

This invention relates to an improvement in that class of gear-wheels in which the rim carrying the gear-teeth is made separate from the arms and hub or other internal part supporting the rim, and in which the rim is capable of a limited movement upon its support.

The object of my invention is to construct a gear-wheel of this class which shall be practically noiseless in its operation and which will avoid back or front lash.

The invention consists of the improvement which will be hereinafter fully set forth, and pointed out in the claim.

In the accompanying drawings, Figure 1 is a side elevation of my improved gear-wheel, showing two of the arms partly in section. Fig. 2 is a cross-section of the wheel in line *xx*, Fig. 1. Fig. 3 is a cross-section of one of the sockets at the outer ends of the arms. Fig. 4 is a side elevation of one of the removable caps forming a portion of said sockets. Fig. 5 is a fragmentary sectional elevation showing a slightly-modified construction of my improved wheel.

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

A represents the rim of the wheel, which is provided with the gear-teeth *a*.

B represents the hub, and C the arms formed on or secured to the hub B. The rim A is provided on its inner side with radial lugs or projections *d*, which enter sockets or recesses E, formed at the outer ends of the arms C.

F represents cups or bushings, of rubber or other elastic material, interposed between the lugs or projections *d* and the sockets E. The cups or bushings F are fitted snugly upon the lugs *d* and rest with their closed inner ends against the bottom of the sockets E, so that no portion of the lugs *d* comes in contact with said sockets.

As shown in the drawings, each socket E is divided lengthwise, the portion *e* of each socket being formed integral with the adjacent arm C, while the other portion of the

socket is formed by a cap *e'*, which is detachably secured to the arm portion *e* of the socket. The caps *e'* are secured to the arm portions *e* by screws *f*, inserted in lugs or ears with which these parts are provided.

In attaching the rim of the wheel to the arms C the lugs or projections *d*, with the elastic bushings F applied thereto, are placed into the arm portions *e* of the sockets E, and the caps *e'* are then secured in place on the arms C, whereby the bushings F are confined in their sockets. The bushings in turn confine the lugs *d*, whereby the rim A is held in its proper relative position to the inner supporting portion of the wheel, while being separated therefrom by the interposed elastic bushings, so that the metal of the rim does not come in contact with the metal of the inner supporting portion at any point.

My improved gear-wheel is especially desirable for use in connection with roller-mills, in which the grinding or crushing rollers revolve with differential speeds, a small gear-wheel being secured to the shaft of the fast roller and a gear-wheel of larger diameter to the shaft of the slow roller. The material entering between the rollers creates a friction, which has a tendency to cause both rollers to rotate with the same peripheral speed, thereby producing front lash of the gear-wheels and jars, which vibrate the rollers and the supporting-frame of the mill and interfere with the uniform grinding of the material. When the rotary speed of either the rim or the supporting-arms becomes suddenly accelerated, those parts of the elastic bushings F which were compressed in the normal working of the wheels expand upon being thus partially relieved from pressure and cause a corresponding acceleration in the arms or rim, as the case may be, thereby retaining the teeth of the gear-wheels in close contact at all times and preventing front or back lash. The elastic bushings F completely separate the metallic rim from the metallic supporting parts, and thereby deaden the noise caused by the contact of the gear-teeth, and also form an elastic connection between the rim and arms, which permits the rim to yield toward the axis of the wheel or eccentrically in case nails or other hard objects enter between the

wheels, or in case of an improper mounting of the wheels or imperfections in the gear-teeth, thereby avoiding injury to the latter.

It is obvious that the arrangement of the
5 projections *d* and sockets E may be reversed, if desired, the latter being formed on the rim A and the projections in the arms or supports C, as represented in Fig. 5.

I claim as my invention—

10 The combination, with the gear-rim provided on its inner side with lugs or projec-

tions *d*, of arms or supports provided with divided sockets E, each composed of an arm portion *e* and a cap *e'*, and yielding bushings interposed between said sockets and the lugs
15 *d*, substantially as set forth.

Witness my hand this 22d day of September, 1887.

CHARLES H. MORGAN.

Witnesses:

JNO. J. BONNER,

EDWARD WILHELM.