

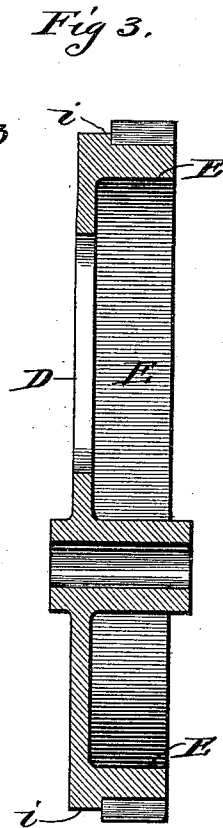
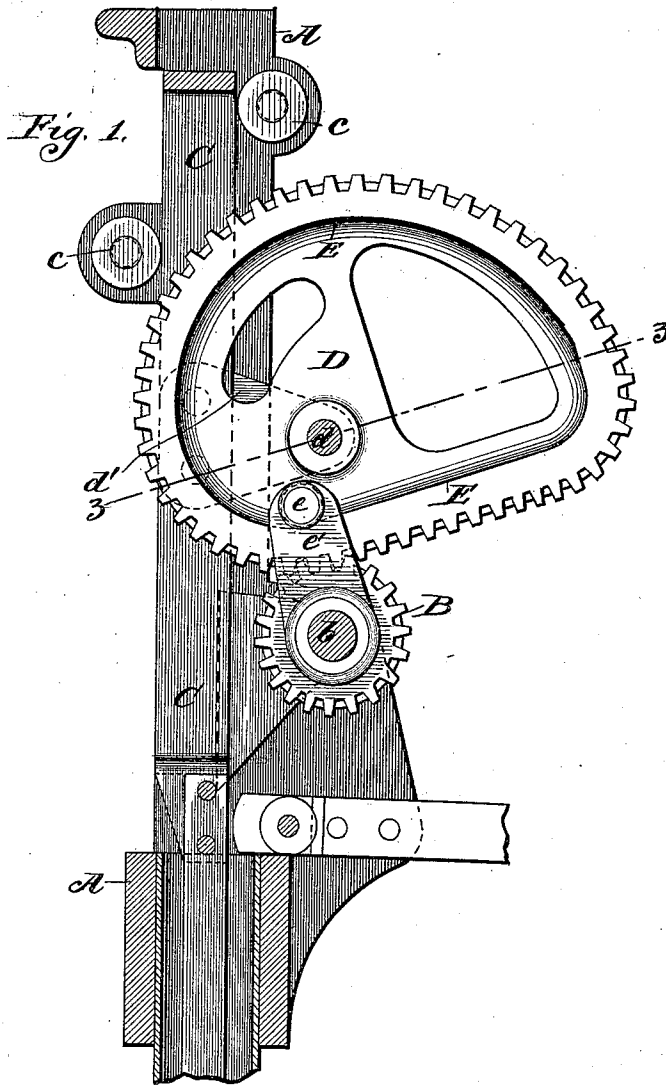
(No Model.)

3 Sheets—Sheet 1.

G. M. ALLEN.  
MECHANICAL MOVEMENT.

No. 463,977.

Patented Nov. 24, 1891.



Witnesses  
 W. C. Collier  
 Martin A. Olson

Inventor  
 George M. Allen  
 By L. Hill His Atty.

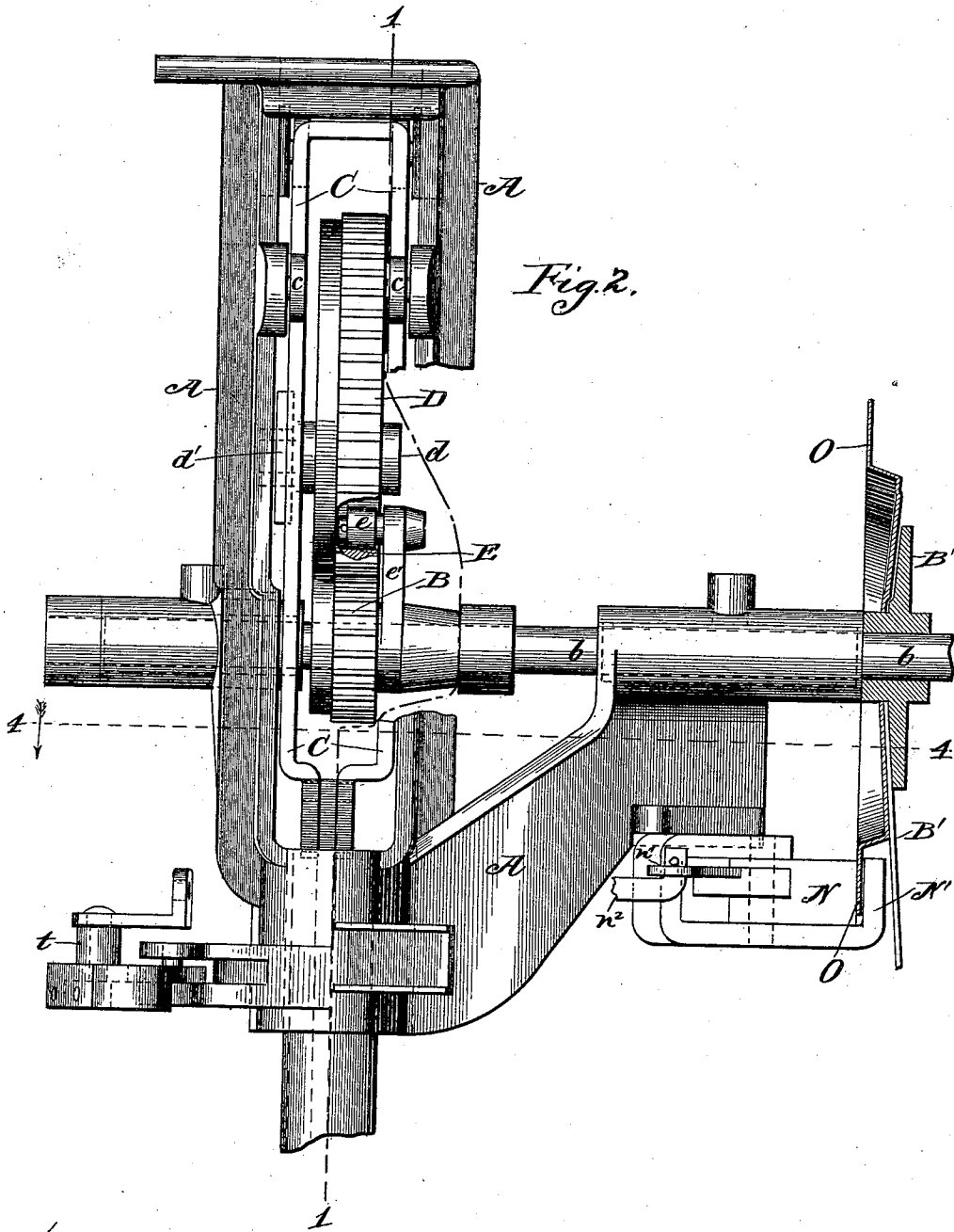
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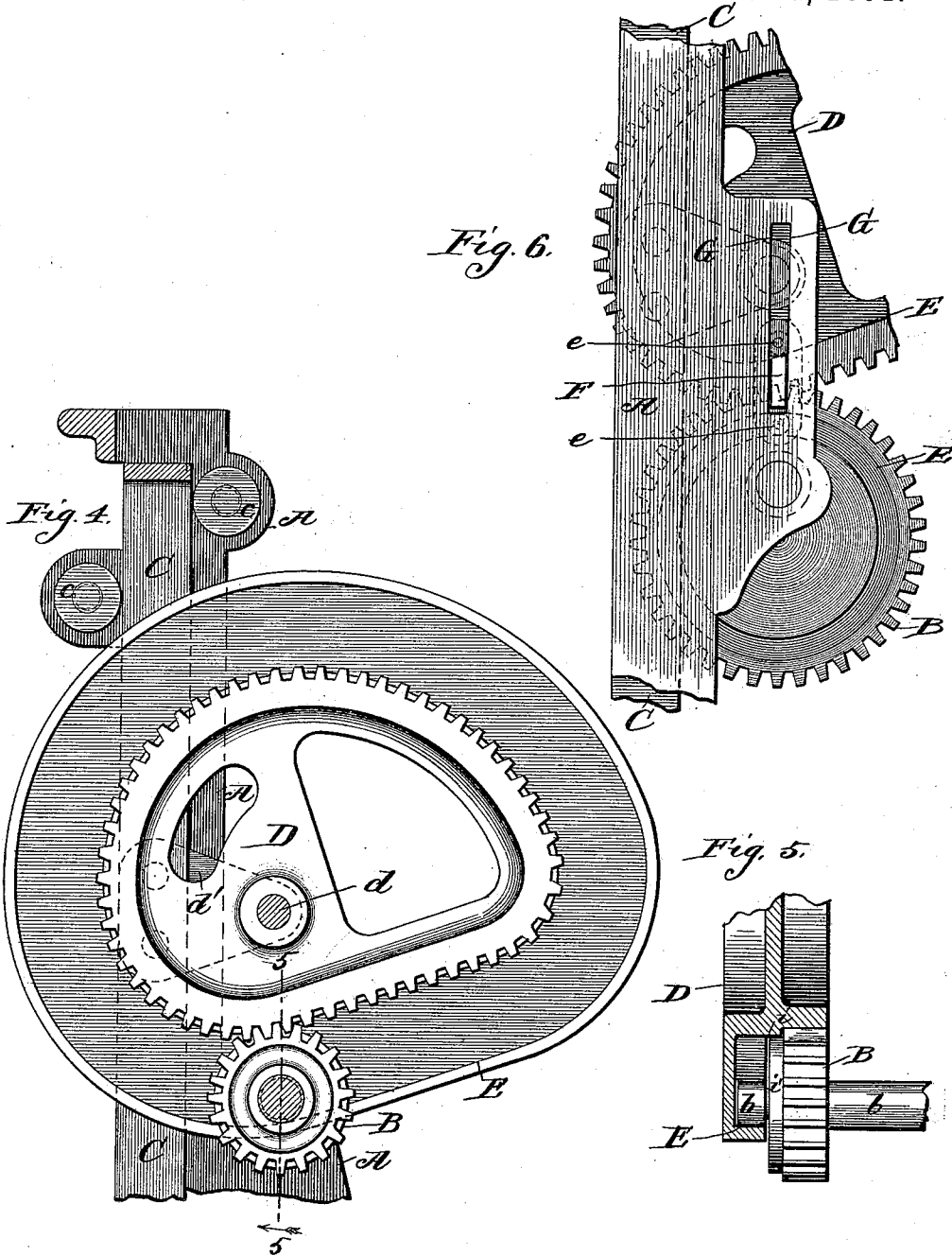
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# UNITED STATES PATENT OFFICE.

GEORGE M. ALLEN, OF BELOIT, WISCONSIN.

## MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 463,977, dated November 24, 1891.

Application filed February 19, 1891. Serial No. 382,119. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE M. ALLEN, a citizen of the United States of America, residing at Beloit, in the county of Rock and State of Wisconsin, have invented a certain new and useful Mechanical Movement, of which the following is a specification.

Referring to the accompanying drawings, where like reference-letters indicate like parts, Figure 1 is a vertical section; Fig. 2, a side elevation with parts broken away; Fig. 3, a section through the eccentric gear-wheel in line 3 3 of Fig. 1; Fig. 4, a modified form of the eccentric gear-wheel; Fig. 5, a section in line 5 5 of Fig. 4, and Fig. 6 a modified arrangement of the combination.

This improvement relates to that style of mechanical movements in which a wheel having a regular motion is caused to give an irregular motion to another wheel; and the invention consists in the peculiar construction, arrangement, and combinations of parts hereinafter more particularly described, and then definitely claimed.

The accompanying drawings show a form of eccentric driven wheel specially contrived and adapted to produce certain desirable characteristics in the form of motion of a vertical pump-rod reciprocated by the rotary motion of a wind-wheel. This form is herein selected merely for the purpose of illustrating the general principle, and is not claimed in this application, being reserved to constitute a part of the subject-matter of a separate application filed by me contemporaneously herewith for an improvement in windmills and officially designated as Serial No. 382,120.

Proceeding now to describe the invention herein claimed by reference to the form of embodiment shown in the illustrative drawings, A indicates the revolving mill-head mounted on a supporting-frame of any suitable construction; B, the rotary driving member, here shown in the form of a pinion mounted upon a stationary shaft or stud  $b$  and receiving motion from any suitable source of power; C, the reciprocating or vibrating member guided in any suitable manner—for example, by the guide-rollers  $ccc$ —and D the eccentric driven wheel, here shown in the form of a non-circular gear-wheel meshing with the pinion B and mounted upon a stud  $d$ , pro-

jecting from an arm  $d'$ , attached to and moving with the member C. An inspection of the drawings, Fig. 1, will readily show that as the wheel B rotates the journal  $d$  of the wheel D will be raised and lowered, carrying with it the connected member C, the range of whose vibration will depend upon the extent (not the form) of the eccentricity of the wheel D. It will also be observed that by making the wheel D larger—that is, of longer pitch-line—than the wheel B, as shown in the form illustrated the number of complete vibrations of the member C will be less than the number of revolutions of the driving-wheel B, and that by making the driven wheel smaller than the driving-wheel the number of vibrations of the member C will be greater than the number of revolutions of wheel B; hence that by varying the relative length of the two pitch-lines the rate of the produced vibration may be varied at will without varying the speed of the driving-wheel.

It is necessary to provide means for holding the two wheels in contact without interfering with the function of either. This object I accomplish in the following manner: I construct on the side of the wheel D a guide-shoulder E, substantially parallel to and within the pitch-line of the wheel, and combine therewith a retaining device arranged to bear against the concave face of said shoulder in line with the axis  $b$  and the contact-point of the two wheels to prevent said wheels from separating from each other. Where the shoulder E is interior to the pitch-line of its wheel, the retaining device is best applied in the form of a friction-roller  $e$ , connected to the shaft  $b$  by a strap or arm  $e'$ , pivoted thereon, as shown in Fig. 1, where the shoulder is exterior to said pitch-line, and the wheel B is at or near the end of its shaft. A hub on the wheel B or the end of the shaft  $b$  may be made to bear against the shoulder and operate as a retaining device, as shown in Figs. 4 and 5. The principle is that the shoulder E is arranged in a certain definite relation to the pitch-line of its own wheel and the retaining device in a certain definite relation to the pitch-line of the driving-wheel, thus causing both pitch-lines to always coincide at the point of their desired contact. Where both

wheels are eccentric, (as may be the case without departing from the principle of my invention,) each should have a guide-shoulder E, and the retaining device should have two friction-rollers  $e$ , one acting against one shoulder and the other against the other, and should be bodily movable to accommodate the swaying movement of the pitch-line contact-point and be suitably guided to prevent dislocation. Such an arrangement is illustrated in Fig. 6, where the two friction-rollers are shown mounted on a sliding block F, guided by guide-bars G. In most instances the roller or rollers  $e$  may run quite loosely behind the guide-shoulder, so long as the lost motion is not sufficient to disengage the contact-surfaces of the two wheels.

Where cog-wheels are employed, it is advisable, in order to insure smoothness of motion and the safety of the cogs, to have the two wheels bear against each other by means of friction-surfaces independent of the cogs—for example, by a friction-shoulder  $i$  on wheel D, resting against and rotating in contact with an opposing friction-shoulder  $i'$  on wheel B. These convex shoulders will act both as supports and guides to the wheel D, and in combination with the concave shoulder E and its retaining-roller  $e$  will guide the eccentric driven wheel in a perfectly smooth and uniform line of movement.

I use the term "pitch-line" herein as applicable both to cog-wheels and friction-contact wheels and indicating the line along which either wheel by its contact with the opposing wheel receives or imparts the driving force, as the case may be.

It will be evident that by making the shoulder E on the wheel itself and within the pitch-line thereof a much lighter and cheaper construction is obtained.

Having thus stated the mechanical principles of my invention and described one form in which they may be practically embodied, what I claim herein as new, and desire to secure by Letters Patent, is—

1. As a new mechanical movement, the combination of a rotary driving member and a guided reciprocating driven member with

an eccentric driven wheel having its axis of rotation mounted on and reciprocating with the guided reciprocating member, with a guide-shoulder formed integral with the eccentric wheel parallel to its pitch-line, and a retaining device bearing against the concave face of said shoulder to hold it in a predetermined relation to the pitch-line of the driving-wheel, substantially as described.

2. As an improved mechanical movement, the combination of a rotary driving member and a guided reciprocating driven member with an eccentric non-circular driven wheel having its axis of rotation mounted on and reciprocating with the guided reciprocating member, with a guide-shoulder formed integral with the eccentric wheel parallel to its pitch-line, and a retaining device bearing against the concave face of said shoulder to hold it in a predetermined relation to the pitch-line of the driving-wheel, substantially as described.

3. In combination with a rotary driving member, a guided reciprocating driven member, an eccentric driven wheel having its axis of rotation mounted on and reciprocating with the guided reciprocating member, a guide-shoulder on the eccentric wheel parallel to and within its pitch-line, and a retaining device bearing against the concave face of said shoulder to hold it in a predetermined relation to the pitch-line of the driving-wheel, substantially as described.

4. In combination with a rotary driving-wheel, a guided reciprocating member, an eccentric wheel mounted on the latter, the guide-shoulder E and its retaining device, and the two contact-shoulders  $i$   $i'$ , substantially as described.

5. In combination with a rotary driving-wheel, a guided reciprocating member, an eccentric wheel mounted on the latter, and the two contact-shoulders  $i$   $i'$ , substantially as described.

GEORGE M. ALLEN.

Witnesses:

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FRANCIS E. DRESSER.