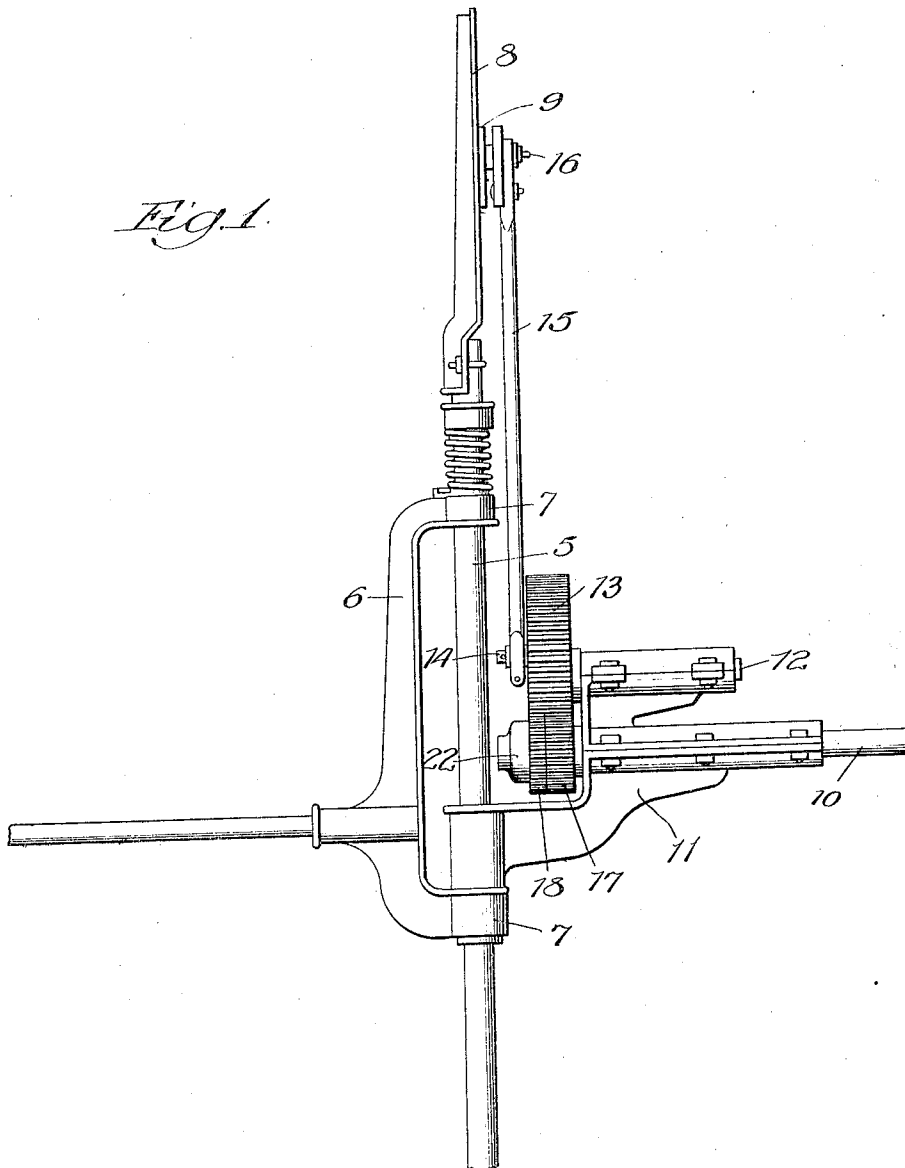


F. M. GOODHUE.
TRANSMISSION MECHANISM.
APPLICATION FILED MAR. 25, 1914.

Patented Mar. 16, 1915.
2 SHEETS—SHEET 1.

1,132,177.

Fig. 1.



Witnesses:

E. C. Taylor.
Irwin C. Bowman.

Inventor:

Frank M. Goodhue,
By J. J. Smith, L. C. Chilton and W. H. Allen,
Attys.

F. M. GOODHUE.
TRANSMISSION MECHANISM.
APPLICATION FILED MAR. 25, 1914.

Patented Mar. 16, 1915.
2 SHEETS SHEET 2

1,132,177.

Fig. 3.

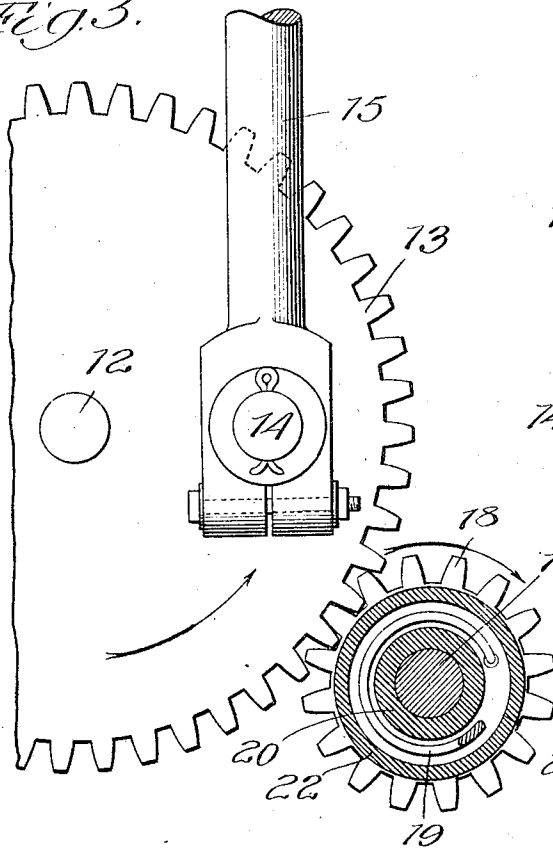


Fig. 2.

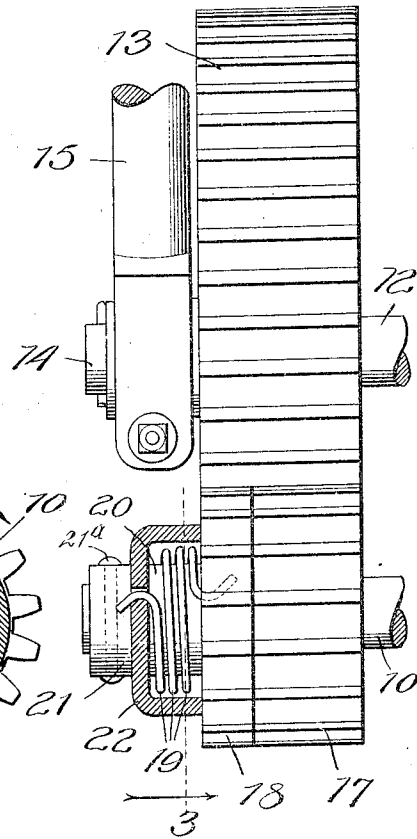
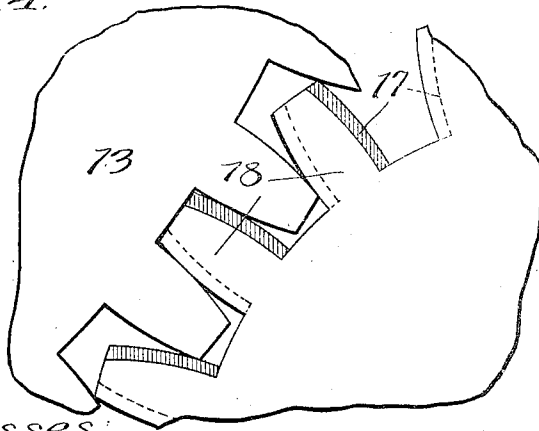


Fig. 4.



Witnesses:

E. C. Gaylord,
Inventor: C. Bowman.

Inventor:

Frank M. Goodhue,
By J. H. Goodhue, Sec. Crittenden & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

FRANK M. GOODHUE, OF VAN NUYS, CALIFORNIA.

TRANSMISSION MECHANISM.

1,132,177.

Specification of Letters Patent.

Patented Mar. 16, 1915.

Application filed March 25, 1914. Serial No. 827,057.

To all whom it may concern:

Be it known that I, FRANK M. GOODHUE, a citizen of the United States, residing at Van Nuys, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Transmission Mechanism, of which the following is a specification.

My invention relates more particularly to improvements in transmission-mechanism used under the conditions presented in wind-mill constructions, my invention having been devised for use more particularly in connection with wind-mills.

In wind-mill constructions employing gear-transmission between the shaft carrying the wind-wheel, and the reciprocable pump-rod, the pitman which is connected with the crank-gear and with the pump-rod, exerts force against the crank-gear at all times in the same direction, in the operation of the wind-mill. Thus in a wind-mill of the type in which the pitman extends upwardly from the crank-gear, the force exerted eccentrically on this gear is a downward force at all times. As there is always some lost motion between the gears of the transmission, each time the pitman passes beyond the vertical center line of the crank-gear, the force exerted by the pitman causes the teeth of the crank-gear in mesh with those of the driving gear, to be driven by the pitman out of the engagement with those faces of the driving gear with which it engages in the up or down movement of the pitman and into engagement with the opposed faces of the adjacent gears, or in other words, "backlashing" which produces very objectionable noise and jar of the mechanism.

My object is to provide a construction of gear-transmission whereby objectionable noise from the cause above stated, will be avoided, and the mechanism will not be subjected to jar from this cause.

Referring to the accompanying drawings: Figure 1 is a broken view in elevation of the upper end of a wind-mill, the gear-transmission of which is constructed in accordance with my invention. Fig. 2 is an enlarged view in end elevation of the gear mechanism of the structure illustrated in Fig. 1, the cap carried by one of the shafts being shown in section. Fig. 3 is an enlarged broken view in side elevation of the crank-gear with a portion of the pitman,

and the driving-gear therefor; and Fig. 4, an enlarged face view of the intermeshing portions of the driving-gear and crank-gear.

I have chosen to illustrate my invention as applied to a wind-mill of the type generally known as the "back-geared" type, wherein the gear-transmission operated by the wind-wheel shaft, drives the crank-gear at a slower speed than that of the wind-wheel shaft, and as this type is well known in the art, a general description only of the machine will suffice. The central tube of the wind-mill is represented at 5, this tube in accordance with common practice forming the support for the wind-wheel and vane and the pump-operating parts of the mill actuated by the wind-wheel. The vane-supporting frame is shown at 6, this frame being in the form of a yoke rotatably mounted at its arms 7 on the tube 5. The upper end of the tube 5 carries a slotted cross-head guide 8 rotatable thereon and in which reciprocates a cross-head 9 connected with the reciprocating pump-rod (not shown) which operates in the tube 5.

The framework in which the shaft 10 of the wind-wheel (not shown) is journaled, is represented at 11, this frame supporting my improved gear-transmission mechanism, a description of which is as follows: Fixed on the end of a shaft 12 paralleling the shaft 10, is a crank-gear 13, the eccentrically disposed pin of which, represented at 14, is connected with the lower end of the pump-rod-operating pitman 15, the upper end of this pitman being connected with a pin 16 on the cross-head 9, the gear 13 when rotated operating to reciprocate the pump-rod hereinbefore referred to. The drive-shaft 10 carries two gears 17 and 18 of the same size, and meshing with the crank-gear 13, the gear 17 being fixed on the shaft 10 and the gear 18 being journaled thereon, each of the gears 17 and 18 being preferably smaller than the crank-gear 13, a ratio of approximately 1 to 3 being preferred.

The gear 18, which is in effect a cushioning gear, coöperates with a coiled torsion spring 19 which encircles a sleeve 20 rigid with the gear 18, one end of this spring being connected with the gear 18 and the other end thereof connected with a cup-member 22 which surrounds the spring and is rigidly fastened to a sleeve 21 pinned to the shaft 10, as indicated at 21^a. The spring 19 is arranged to exert force on the

gear 18 tending to rotate it on the shaft 10 in the direction opposite to that in which the gear 17 is driven by the rotation of the shaft 10. Thus in the case of the construction illustrated the gear 17 is driven in Fig. 3 in a clockwise direction to rotate the crank-gear 13 in the opposite direction, and the spring 19 tends to turn the gear 18 in an anti-clockwise direction on the shaft 10. It will, therefore, be manifest that the teeth on the crank-gear 13 as they are moved into meshing engagement with the teeth on the gears 17 and 18, while the pitman is being raised, are engaged at their opposite faces by the teeth on these last referred to gears, the teeth on the gear 17 engaging at their upper sides with the under-sides of the teeth on the gear 13, and the teeth on the gear 18 engaging at their under-sides with the upper sides of the teeth on the gear 13, as illustrated somewhat exaggeratedly in Fig. 4. The pitman 15 in passing over the center of the shaft 12 tends to cause the gear 13 to run ahead of the gear 17, but instead of being free to thus run ahead which would cause the objectionable noise hereinbefore referred to when the upper sides of the teeth on the gear 13 struck the lower sides of the teeth on the gear 17, owing to lost motion between the gears, is restrained by the teeth on the gear 18, as the teeth on the gear 13 bear at their upper sides against the lower sides of the teeth on the gear 18, the latter yielding to a degree depending on the torsion of the spring 19, and thus noise is prevented; it being understood that if desired the torsion of the spring may be such as to maintain the teeth on the gear 13 in engagement at their opposite faces with the teeth on the gears 17 and 18 while the pitman is descending.

While I have illustrated and described a particular construction embodying my invention, and have shown it as applied to a particular type of wind-mill, I do not wish

to be understood as limiting it thereto, as various modifications and alterations may be made in the construction illustrated, and it may be used in other types of wind-mills and in other situations, without departing from the scope of the invention.

What I claim as new, and desire to secure by Letters Patent is:

1. The combination of a gear, means connected therewith and operating in the rotation of said gear to exert on the latter force tending to rotate it in one direction throughout a part of its revolution, and to resist the movement of said gear during the remainder of its revolution, a driving-gear meshing with said first-named gear, a third gear meshing with said first-named gear, a cap-member fixed on the shaft of said driving-gear, a spring connected at one end with said cap-member and at its opposite end with said third gear and operating to yieldingly force said third gear in a direction contrary to the direction of rotation of said driving-gear.

2. The combination of a gear, means connected therewith and operating in the rotation of said gear to exert on the latter force tending to rotate it in one direction throughout a part of its revolution, and to resist the movement of said gear during the remainder of its revolution, a driving-gear meshing with said first-named gear, a third gear meshing with said first-named gear, a sleeve rigid with said third gear, a cap-member fixed on the shaft of said driving-gear, a spring encircling said sleeve and engaging said third gear and said cap-member at its opposite ends and operative to yieldingly force said third gear in a direction contrary to the direction of rotation of said driving-gear.

FRANK M. GOODHUE.

In presence of—

H. S. TROTTER,
D. A. BEVIS.