(No Model.)

M. M. HOOTON.

DEVICE FOR STARTING THE DEAD WHEEL IN MUTILATED GEARS.

No. 326,984. Patented Sept. 29, 1885.

Fig. 1.

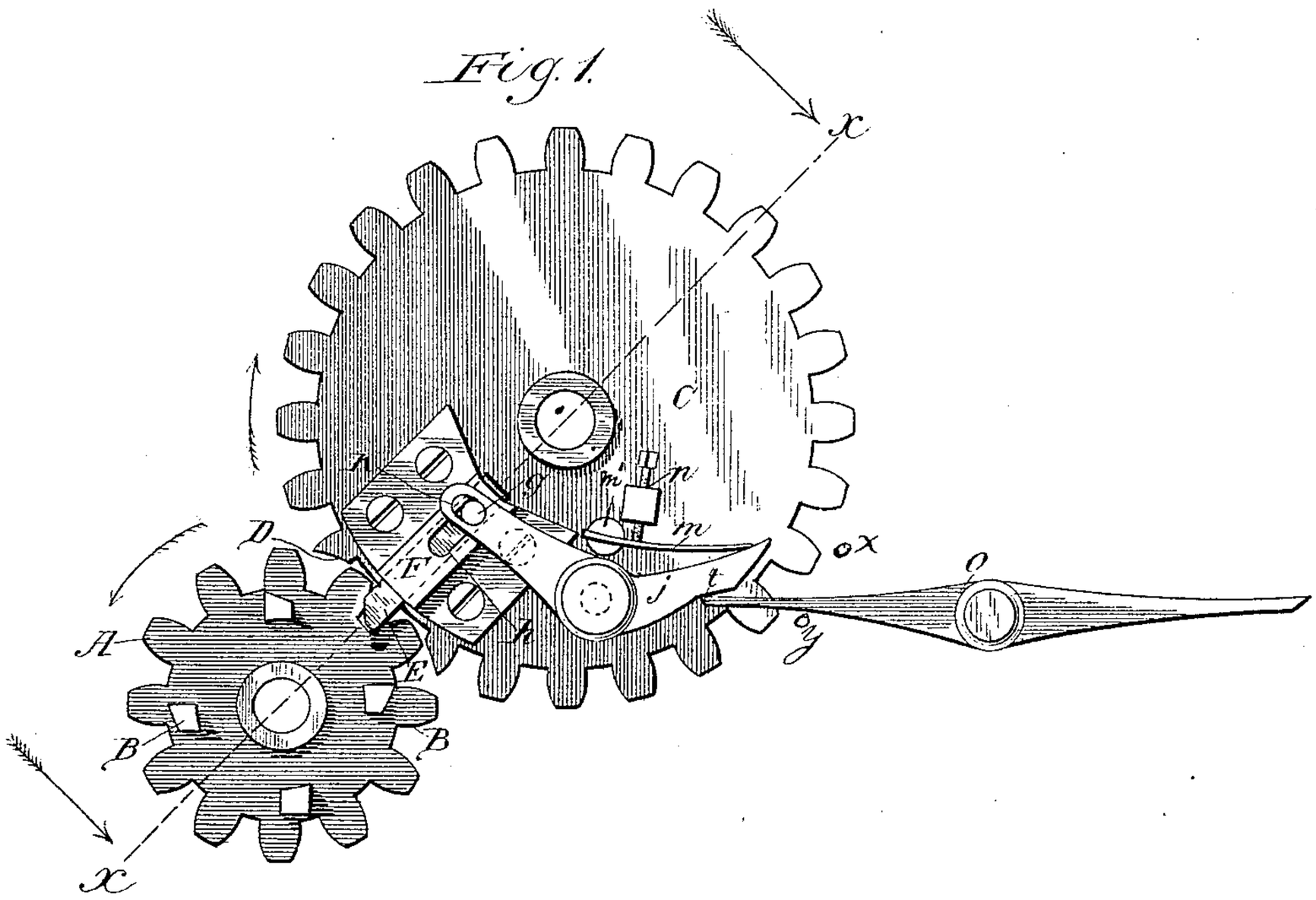


Fig. 3.

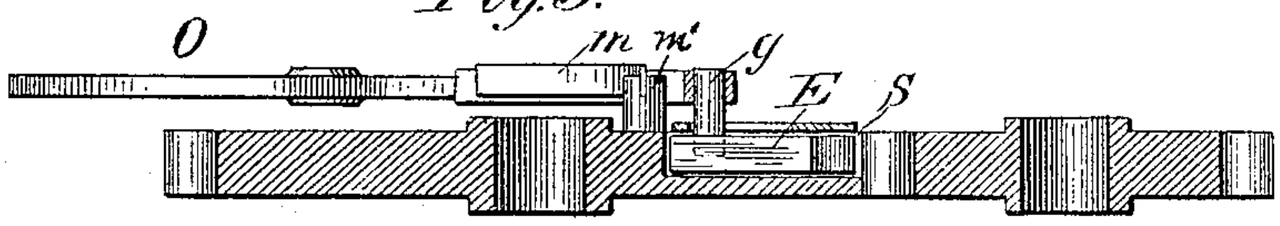
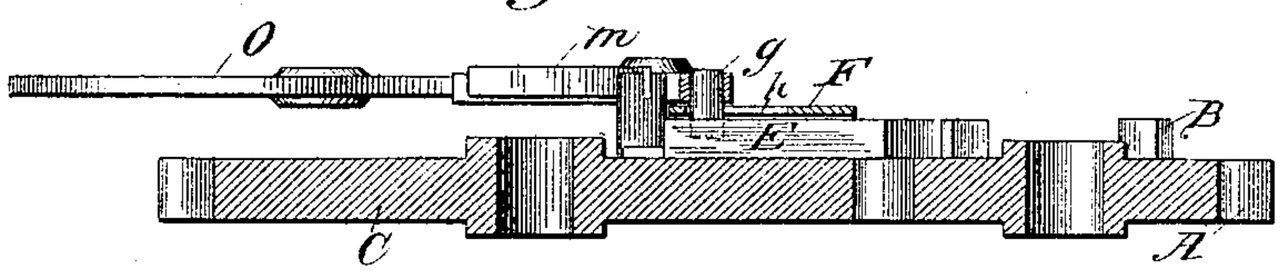


Fig. 2.



Witnesses.
Will C. Dinsmore
W. Rossiter.

Inventor.
Marsena M. Hooton.
By,
Atty.

UNITED STATES PATENT OFFICE.

MARSENA M. HOOTON, OF CHICAGO, ILLINOIS.

DEVICE FOR STARTING THE DEAD-WHEEL IN MUTILATED GEARS.

SPECIFICATION forming part of Letters Patent No. 326,984, dated September 29, 1885.

Application filed January 27, 1885. (No model.)

To all whom it may concern:

Be it known that I, MARSENA M. HOOTON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Devices for Starting the Dead-Wheel in Mutilated Gears, of which the following is a description.

This invention relates to improvements in mutilated gear-wheels, in which the "dead" or mutilated wheel is intermittingly operated by a "live" or continuously-operating drive-wheel, which has a full set of teeth.

Prior to my invention the dead-wheel has been actuated at regular intervals by means of a stud or other projection on the live-wheel coming in contact with some fixed projection on the dead-wheel, the result being that after the mutilated portion of the dead-wheel has been brought in oppositon to the live-wheel, so as to effect a stoppage on the part of the dead-wheel, the live-wheel cannot make more than one complete revolution before it will again start the dead-wheel, so as to cause the mutilated part of the latter to pass the live-wheel and again bring the teeth of the two into mesh.

The object of my invention is to provide means by which the dead or mutilated gear-wheel can be started at any time without reference to the number of revolutions or parts of a revolution which the live-wheel may have performed. In this way while the dead-wheel can be brought to a stop each time it has performed a revolution or after it has made a part of a revolution, according to the number of its mutilations, it can nevertheless be instantly started at any moment, thereby rendering the mutilated wheel susceptible of a wide range of application.

The essential features of my invention consist in providing the dead-wheel with a movable tooth, slide, or latch susceptible of being thrown into engagement with the live-wheel at any instant during the time the mutilated portion of the dead-wheel is in opposition to the live-wheel, whereby the instant such engagement takes place the live-wheel will turn the dead-wheel so as to again bring the teeth of both wheels into mesh.

Other features consist in means for normally holding the tooth or its equivalent device in a back position until it is desired to throw it forward, and means for operating the tooth or latch, either automatically or at will, so as to throw it into engagement with the live-wheel.

In the annexed drawings, Figure 1 represents a side view of a mechanism embodying my invention. Fig. 2 is a section on line *x x* of Fig. 1. Fig. 3 is a section also on the line *x x*, but with the movable tooth countersunk in the dead-wheel so as to engage the teeth on the periphery of the live-wheel when thrown forward, as shown at S.

Referring by letter to the several figures of the drawings, in which like letters denote like parts, A indicates the live or driving wheel, which is provided with a full set of teeth, and C the mutilated or dead wheel, which may be provided with one or more mutilations, D, if desired, the wheel herein shown being mutilated at one point only. At the point of its mutilation the dead-wheel is provided with a movable tooth, E, arranged to be projected from the wheel at the point where the usual teeth of the wheel are removed.

In Figs. 1 and 2 the live-wheel is provided on one side with an annular series of studs, B, or other suitable projections. When the movable tooth E of the dead-wheel is thrown out to a certain distance, its outer end stands in the way of these studs on the live-wheel, so that the first one coming in contact with the movable tooth or latch on the dead-wheel will turn the dead-wheel enough to bring the common teeth of the two wheels into mesh. On the other hand, means are provided for normally holding the movable tooth or latch on the dead-wheel back to an extent sufficient to allow the live-wheel to turn freely without causing the studs B to strike the movable tooth or latch, so that when the mutilated part of the dead-wheel comes around to the live-wheel it will again stand still until means are again called into action for throwing the movable tooth forward into the path of the studs on the live-wheel, as before.

The movable tooth E (shown in Figs. 1 and 2) is arranged to slide radially with reference to the dead-wheel, upon which latter the movable tooth is retained by means of a suitable casing or keeper, F. The sliding tooth is normally held back in its keeper by some suitably-located spring, and is thrown forward

from its back position by means of a lever, *j*, which is pivoted upon one side of the dead-wheel and connected with the sliding tooth by any suitable yielding connection—such, for example, as a pin, *g*, on the inner end of the tooth extending out through the elongated opening *h* in the keeper, and engaging in a slot, *k*, formed in one end of the lever *j*. The opening or slot in the keeper permits a suitable extent of end movement on the part of the sliding tooth, while the pin-and-slot connection between the sliding tooth and the lever permit the lever to oscillate about its pivot on the dead-wheel, and effect the required end movement on the part of the sliding tooth.

The lever *j* is pivoted toward its middle upon the dead-wheel, and is preferably arranged so as to lie within the circumference of the latter, so that when studs B are used on the live-wheel the lever *j* will not come in contact with them. The lever *j* is normally controlled by a spring, *m*, secured at one end to a stud, *m'*, or other fixture on the dead-wheel. The free end of this spring bears against the outer end of the lever *j*, and its force is controlled by a set-screw, *n*, having a bearing at one end in any suitable block or projection on the dead-wheel. This spring serves as the initial controlling means for normally holding the sliding tooth E in its back position, and to this end the spring so acts against the lever *j* as to normally hold the lever in position to keep the sliding tooth in its back position; but it will be evident from the end to be attained that a like result could be attained by applying a spring directly to the tooth E in any suitable way.

The lever *j* is operated to project the sliding tooth by means of an oscillating lever, O, pivoted to any suitable support and arranged so that one end shall normally lie in the path of the outer end of the lever *j*. Assuming the two levers to be in the relative positions shown, the sliding tooth will be in its back position, and the teeth of the live-wheel A will freely pass the mutilated portion of the dead-wheel C, and the studs on the live-wheel pass by the tooth without engaging the same. If, now, the lever O is from any cause or source or by any mechanism whatever turned about its pivot, so as to turn the lever *j* in a direction to throw the sliding tooth forward so that its outer end will be in the path of the studs B, one of the studs will engage with the tooth, and thus the dead-wheel be started into mesh with the live-wheel, as above described. During this action the lever O turns the lever *j* against the resistance of the spring *m*, so that as soon as the lever *j* clears or slides off the lever O, the force of the spring will restore the lever *j* and the sliding tooth to their normal position. At the completion of the revolution of the dead-wheel its mutilation, again coming opposite the live-wheel, will necessarily take the two wheels out of gear, thus leaving the dead-wheel at a standstill, while the live-wheel continues to revolve. This position brings the outer end of lever *j* again in contact with one end of lever O, which is held in the path of the outer end of lever *j* by any suitable devices—such as the pins *x* and *y*—which serve as stops to limit its motion, so that it can never be thrown entirely out of the path of the lever *j* when the dead-wheel is at a stand.

Obviously, where the dead-wheel is mutilated at more than one place, a starting mechanism such as the one above described can be provided for each one of the mutilations, and one lever, O, employed for all of them.

Where coarse or slow-moving gears are used, the studs B on the live-wheel can be dispensed with, and the common teeth of the live-wheel employed to subserve the purpose of said studs. This is illustrated in Fig. 3, in which the sliding tooth E is countersunk in the dead-wheel—that is to say, the dead-wheel is provided with a radial channel, S, running back from its mutilated portion, and the sliding tooth E is arranged to work in said channel, in which case the keeper F can be formed by a slotted plate secured on the dead-wheel; or, in other words, the keeper shown in the preceding figures will be simply flattened down. Under this arrangement the sliding tooth will be normally retracted clear of the teeth of the live-wheel A, and when thrown forward will engage with one of said teeth, and thus cause the dead-wheel to be rotated sufficiently to bring the common teeth of the two wheels into mesh.

The mutilation D of the dead-wheel should be of such size and shape as to permit the live-wheel to revolve freely without touching the dead-wheel, as represented in Fig. 1, and only so much of the teeth of the dead-wheel should be cut away as to make this possible. In this way the mutilation of the dead-wheel will be somewhat concave, to suit the convexity of the teeth of the live-wheel.

The lever O can be spring-controlled, and can be operated from any source. Thus, for example, it could be operated from the sheaf-gage on a grain-binder or from devices in measuring apparatus or other machines in which an intermittent motion is required, and where at any moment it may be desirable to instantly start the dead-wheel, so as to cause through its motion the operation of certain other mechanisms which, through the medium of mutilated gears, have been temporarily kept from action.

It will be observed that, by means such as herein described, the dead-wheel can at any time during the revolution of the live-wheel be instantly started by simply throwing forward the sliding tooth on the dead-wheel, so as to bring it into engagement with the live-wheel. It is obvious that the result is the same whether the sliding tooth is thrown into engagement with a stud or projection on the side of the revolving live-wheel or with one of the usual gear-teeth on its periphery, since in either case the deficiency in the mu-

tulated wheel resulting from the cutting away or absence of a part of its teeth is temporarily supplied by the substitution of the sliding tooth or latch for the time, and as soon as its function is performed the tooth or latch is returned to its back position leaving the mutilation complete, as before.

I have not deemed it necessary to show a tooth movable in any other way than sliding longitudinally, since it will be so apparent that a spring-controlled tooth pivoted on the dead-wheel could be made to perform the same function as the longitudinally-sliding tooth.

What I claim as my invention is—

1. A gear having at one point only of its periphery a mutilation of one or more of its teeth, in combination with a single movable tooth mounted thereon, substantially as described.

2. A gear having at one point only of its periphery a mutilation of one or more of its teeth, in combination with a single tooth mounted thereon and movable on a line radial to the axis of said gear, substantially as described.

3. A mutilated gear and a movable tooth thereon, in combination with the spring actuating said tooth, substantially as described.

4. A mutilated gear and a movable tooth thereon, in combination with the spring actuating said tooth and a screw for adjusting the tension of said spring, substantially as described.

5. The mutilated gear and the sliding tooth, in combination with the lever pivoted on said gear and engaging the sliding tooth, substantially as described.

6. A gear having one or more of its teeth removed, in combination with a perfect gear and a movable tooth on the mutilated gear for engaging said perfect gear, substantially as described.

7. A perfect gear and one or more studs on the face thereof, in combination with the movable gear and a movable tooth thereon for engaging said studs, substantially as described.

8. The mutilated gear and the sliding tooth thereof, in combination with a connecting-lever, O, and a connection between said lever and tooth, substantially as described.

MARSENA M. HOOTON.

In presence of—
CHAS. B. MELROSE,
F. L. BROWN.