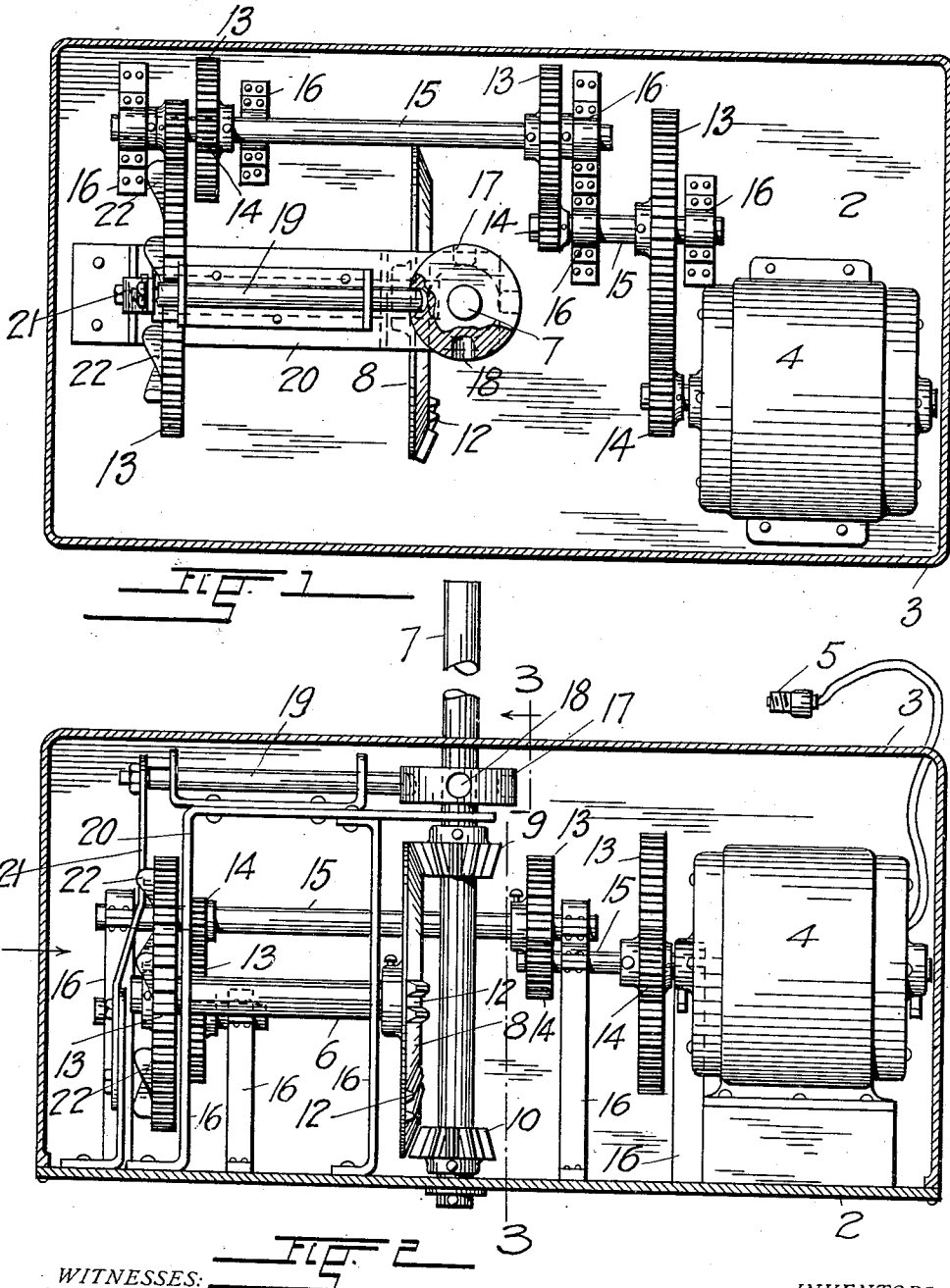


C. H. CRAIG & H. A. REIBER.
MECHANICAL MOVEMENT.
APPLICATION FILED FEB. 7, 1912.

1,057,710.

Patented Apr. 1, 1913.

2 SHEETS-SHEET 1.



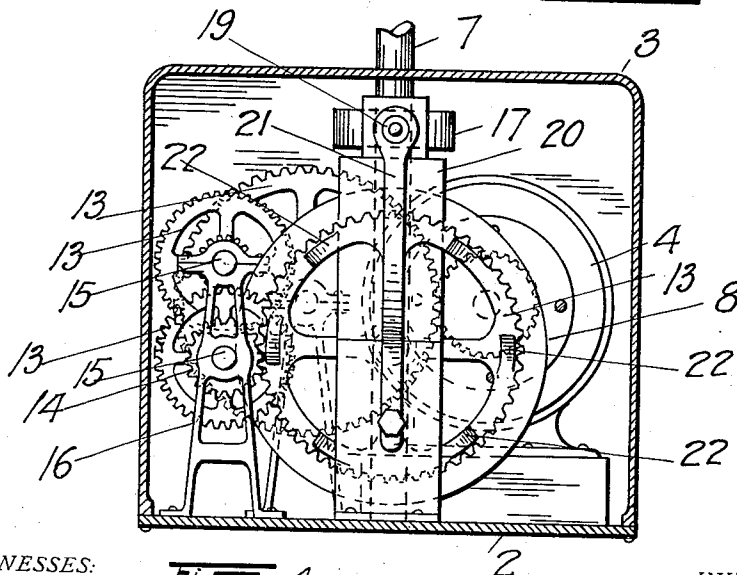
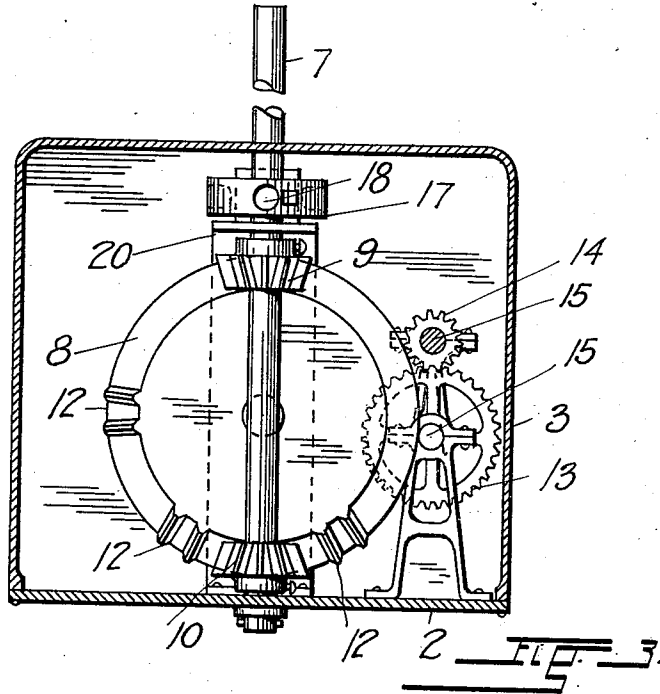
WITNESSES:
J. H. Cune.
A. Rhoades

INVENTORS
C. H. Craig
H. A. Reiber
BY
J. J. O'Connell
ATTORNEY.

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WITNESSES:
J. H. Cunn.
R. Rhodes

FIG. 4

INVENTORS
C. H. Craig
H. A. Reiber

BY
J. J. Coleman
ATTORNEY.

UNITED STATES PATENT OFFICE.

CLARENCE H. CRAIG AND HARRY A. REIBER, OF BOULDER, COLORADO.

MECHANICAL MOVEMENT.

1,057,710.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed February 7, 1912. Serial No. 675,999.

To all whom it may concern:

Be it known that we, CLARENCE H. CRAIG and HARRY A. REIBER, citizens of the United States, residing at Boulder, in the county of Boulder and State of Colorado, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a specification.

Our invention relates to mechanical movements and its object resides in the provision of a mechanism of simple construction whereby the continuous rotary movement of a motor is converted into series of intermittent movements of a driven element, which occur alternately in opposite directions.

While our invention may be utilized for many different purposes, it is particularly adapted to be employed in connection with signs such as are displayed at the outside of buildings, or with a figure or other object placed in a shop-window to attract the attention of passers-by.

An embodiment of our invention has been shown in the accompanying drawings in the various views of which like parts are similarly designated, and in which,

Figure 1 represents a plan-view of the movement, Fig. 2 a side-elevation of the same. Fig. 3, a transverse section taken along the line 3—3, Fig. 2, and Fig. 4 an end view looking in the direction of the arrow in Fig. 2, the casing in which the movement is inclosed having been shown in section in the various views.

Referring to the drawings by numerical reference characters, 2 designates a base upon which the several parts of the movement are assembled, and 3 the casing which together with said base provides an inclosure by which the movement is protected from dust and dirt and which to a considerable extent, deadens the sound produced by the motor and the parts of the transmission mechanism when the movement is in operation.

An electric motor 4 whose coils may be connected in an electric lighting circuit by the use of a plug 5 has its rotatory armature in operative connection with a transmission mechanism which includes a horizontal shaft 6 which, in the operation rotates at a greatly reduced rate of speed with reference to the velocity of the motor.

The driven element to which in practice, the sign or display object is attached, con-

sists of an upright shaft 7 which is rotatably supported in a step on the base 2 and which projects through an opening in the top of the casing to connect with the object above referred to.

The continuous rotary motion of the shaft 6 is transformed into intermittent movements of the upright shaft 7, occurring in series alternately in opposite directions, by means of a mutilated bevel gear-wheel 8, the teeth of which mesh with bevel pinions 9 and 10 fixed on the shaft 7 at opposite sides of the axis of rotation of the horizontal shaft 6. The teeth on the driving-gear 8 are disposed in groups 12 which in number and spacing may be varied in accordance with the motions it is desired to impart to the object attached to the upright shaft. The groups of teeth on the wheel 8 are preferably spaced in a series at equal distances from each other which each represent an aliquot part of the circumference of their pitch-circle so that during rotation of the driving wheel, the intermittent movements of the shaft 7 will occur at regular intervals. In the form shown in the drawings, for example, the distances between the groups of teeth are equal to one-sixth of the circumference of the pitch-line of the wheel, the groups are three in number and they each contain two teeth which will impart to the pinions 9 and 10 one-fourth of a revolution each time they are brought in mesh with the same. When by action of the motor the shaft 6 is rotated at a reduced rate of speed, the groups of teeth on the wheel 8 will be brought successively into mesh first, with one of the pinions to intermittently rotate the shaft 7 in one direction and then with the other pinion to intermittently rotate the said shaft in the opposite direction and these series of movements will thus occur alternately at regular intervals and enable spectators to observe different sides of the object connected at the protruding end of the shaft, which are consecutively presented to their view. It is obvious that to produce the above stated result, it is necessary that no two groups comprised in the series should be diametrically opposite to each other, so as to simultaneously engage the two pinions on the shaft 7.

The transmission mechanism by which the movement of the motor-armature is reduced consists of several sets of correlative gear-wheels and pinions, respectively designated

in the drawings by numerals 13 and 14, and carried on shafts 15 which are rotatably supported in bearings 16 mounted upon the base 2.

- 5 To prevent the shaft 7 from moving by its impetus, through arcs of greater length than those determined by the engagement of each group of teeth on the driving wheel 8 with the pinions 9 and 10, means are provided to automatically lock the said shaft against rotation during the intervals between the periods in the rotatory movement of the wheel during which the pinions are being driven by engagement with the teeth contained in each group. The locking mechanism referred to consists of a collar 17 fixed on the shaft 7 and provided at quadrant points in its circumference with recesses 18 which are adapted to successively receive the end of a plunger-rod 19 which is longitudinally slidably supported in bearings on a standard 20 formed by extensions of two of the bearings 16 in which the horizontal shaft 6 is mounted. The plunger-rod 19 is connected at the end of a leaf-spring 21 which during the rotary movement of the shaft 6, is engaged by cams 22 on the gear-wheel 13 mounted upon the said shaft, the said cams being formed and arranged on said wheel in a concentric circle, so as to draw the plunger rod out of the openings in the collar 17, in which it is normally held by action of the spring, during each period in the rotary movement of the wheel 18 in which the pinions 9 and 10 are by engagement of the groups of teeth 12, rotated through a fourth of a revolution.

- Having thus described our invention, it will be understood that, as stated hereinbefore, the arrangement of the groups of teeth on the driving gear may be varied in accordance with the motions of the driven element it is desired to produce during each revolution of the same, that furthermore the mechanism which transmits the movement of the motor to the mutilated gear may be changed to vary the velocity of the one with relation to the rate of speed of the other and that a motor driven by an agent other than electricity, as for example a spring, may be employed in lieu of the one shown in the drawings.

What we claim and desire to secure by Letters-Patent is:

- 55 1. A mechanical movement comprising a driving element, a driven shaft, power transmission mechanism adapted to transform a continuous rotary movement of said element into intermittent rotary movements of said shaft, a collar on said shaft having peripheral recesses, a spring-actuated plunger adapted to enter said recesses whereby to lock the shaft against rotation, and means coöperative with said transmission mechanism for withdrawing said plunger from

said recesses during each movement of the said shaft.

2. A mechanical movement comprising a driving element, a mutilated gear-wheel in operative connection therewith, its teeth being arranged in groups which are at equidistant points in its pitch line, and none of which is diametrically opposite to another, and a driven element including pinions disposed at opposite sides of the axis of rotation of said gear-wheel to be operatively engaged by said groups of teeth.

3. A mechanical movement comprising a driving element, a mutilated gear-wheel in operative connection therewith, its teeth being arranged in groups which are at points in its pitch circle at distances equal to an aliquot part of the circumference of the same, none of the said groups being diametrically opposite to another, and a driven element including pinions disposed at opposite sides of the axis of rotation of said gear wheel to be operatively engaged by said groups of teeth.

4. A mechanical movement comprising a driving element, a mutilated gear-wheel in operative connection therewith and having in its pitch circle a series of groups of teeth no two of which are diametrically opposite to each other, and a driven element including a pinion disposed to be operatively engaged by said groups of teeth.

5. A mechanical movement comprising a driving element, a mutilated gear-wheel in operative connection therewith and having in its pitch circle a series of groups of teeth, no two of which are diametrically opposite to each other, a driven element including a pinion disposed to be operatively engaged by said groups of teeth, and means for automatically locking said element against rotation during the intervals between the periods of engagement of said groups of teeth with said pinion.

6. A mechanical movement comprising a driving element, a mutilated gear wheel in operative engagement therewith, its teeth being arranged in a series of groups, a driven shaft including a pinion disposed to be operatively engaged by said groups of teeth, a collar on said shaft having peripheral recesses, a spring-actuated plunger adapted to enter said recesses whereby to lock said shaft against rotation, and a series of cams connected to move in unison with said gear-wheel and adapted to separately withdraw said plunger from the recesses in said collar.

7. A mechanical movement comprising a driving element, a mutilated gear-wheel in operative connection therewith, and having in its pitch circle a series of groups of teeth, no two of which are diametrically opposite to each other, and a driven element including pinions disposed at opposite sides of the

axis of rotation of said gear-wheel to be operatively engaged by said groups of teeth.

8. A mechanical movement comprising a driving element, an upright driven shaft, and power transmission mechanism adapted to transform a continuous rotary movement of said element into series of intermittent rotary movements of said shaft, said series occurring alternately in opposite directions, and a casing inclosing said movement, the

said shaft protruding through an opening in said casing.

In testimony whereof we have affixed our signatures in presence of two witnesses.

CLARENCE H. CRAIG.
HARRY A. REIBER.

Witnesses:

J. P. KILLGORE,
W. O. KING.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."