

No. 712,366.

Patented Oct. 28, 1902.

F. J. DONOUGHE.
MECHANICAL MOVEMENT.

(Application filed Feb. 13, 1902.)

(No Model.)

Fig. 1.

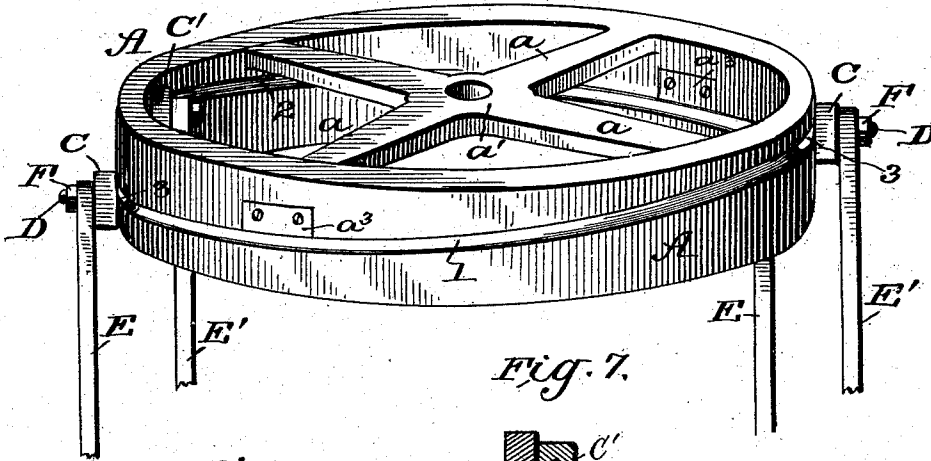


Fig. 7.

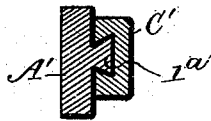


Fig. 3.

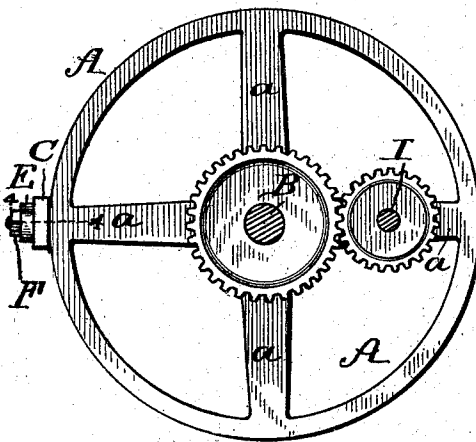


Fig. 2.

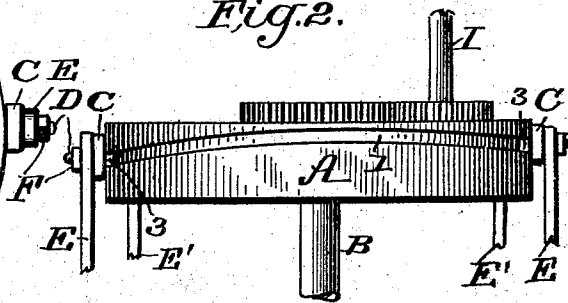


Fig. 5.

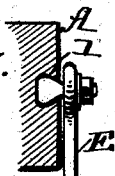


Fig. 4.

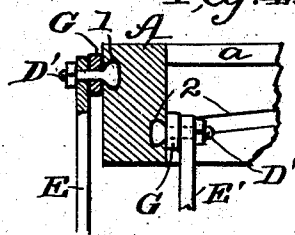
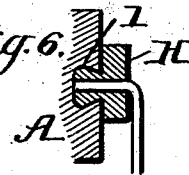


Fig. 6.



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FRANCIS J. DONOUGHE, OF GALLITZIN, PENNSYLVANIA.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 712,366, dated October 28, 1902.

Application filed February 13, 1902. Serial No. 93,885. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS J. DONOUGHE, a citizen of the United States, and a resident of Gallitzin, in the county of Cambria and State of Pennsylvania, have made certain new and useful Improvements in Mechanical Movements, of which the following is a specification.

My invention is an improvement in the class of mechanical movements involving the principle of a cam-wheel operating through the medium of reciprocating devices or agents for the production of work.

The invention is applicable for operating oil, water, and air pumps and for a variety of other uses whereby reciprocating motion can be utilized.

The construction, arrangement, and combination of parts are as herein described and claimed, and shown in accompanying drawings, in which—

Figure 1 is a perspective view of the main portion of the apparatus or movement embodying my invention. Fig. 2 is a side view of the apparatus. Fig. 3 is a horizontal section. Fig. 4 is a vertical section on the line 4 4 of Fig. 3. Fig. 5 is a section illustrating a modification. Fig. 6 is a sectional view showing another modification. Fig. 7 is a sectional view showing a third modification.

The cam-wheel I have devised is composed of a broad rim A, radial spokes a , and a central hub a' . It is arranged horizontally and supported and adapted to rotate with a suitable central axis B. The latter may be supported by any suitable means. The rim A has parallel outer and inner sides and is secured to the spokes a at its upper edge, so that it is virtually pendent from them, as shown in Figs. 1 and 4.

A continuous cam-groove 1 is formed in the outer face of the wheel-rim A—that is to say, the said groove is inclined at every point in its length, it being highest on one side of the wheel and lowest on the other side. A similar cam-groove 2 is formed in the inner face or side of the rim A; but its highest and lowest points are directly reversed from those of the outer groove 1, so that the highest and lowest points of the respective grooves are adjacent on the same side of the wheel. The said grooves 1 2 are undercut or dovetail

shape in cross-section, as shown in the sectional views. Blocks C C' (see Figs. 1, 2, 3) are provided with elongated dovetail ribs 3, adapted to fit somewhat loosely in the respective grooves 1 2, and thus slide easily therein. The said blocks thus constitute sliding travelers. Bolts D pass through the blocks C, and to the shanks of such bolts vertical rods E E' are pivotally connected, as shown, for operating pump-pistons or other devices. It will be noted that the rods E are attached to blocks C on the outer side of the rim A and the rods E' to blocks C' in the inner side of the rim. The bolts pass through the blocks C and C' and heads of the rods E E', and the latter are secured thereon by means of nuts F. In Fig. 4 I show an arrangement in which the rods E E' are attached to bolts D', having heads that travel in the grooves E E' of wheel-rim A. A washer G is interposed between the rods and rim. In Fig. 5 I show an arrangement wherein such washer is dispensed with, the rods thus being brought close to the rim A, whereby leverage on the bolts and friction in the grooves are somewhat lessened.

In Fig. 6 the ends of the rods are shown bent at a right angle and passing directly through a block H, having a dovetail rib. Thus bolts are dispensed with.

It will be noted that the enlarged heads of the bolts are rounded slightly on the upper and lower edges and that the grooves correspond with this form, so that the binding and friction are less than if an acute angle were adopted.

To provide for insertion of dovetail rib 3 in the grooves 1 and 2, the rim A may be constructed with a recess adjacent to the grooves and of suitable size to receive the said rib and allow it to pass down to place, after which the recess is filled by a block a^3 and the latter secured by screws.

I may provide the rim A with a dovetail rib instead of a groove, as shown in Fig. 5, and the sliding block or traveler may be applied thereto.

In Fig. 7 the rim A' is shown provided with a dovetail rib 1^a and the block or traveler C' with a groove adapted to receive the same.

The rods E E' are shown arranged in pairs, one directly opposite the other, and in con-

sequence of the arrangement of the cam-grooves 1 and 2, the highest point of one being nearest the lowest point of the other, it is apparent that the outer rods E will descend 5 as the inner ones rise, and vice versa. There may be any desired or practicable number of rods or pairs of rods, it being preferred and intended that any two rods or pairs shall be arranged at diametrically opposite points on 10 the wheel-rim A. The rods are in practice to be suitably connected with pistons of pumps or cranks of rotary shafts or any other devices by which the power of the cam-wheel is to be utilized, since I propose to employ 15 the apparatus for any purpose or use for which it may be applicable.

Power may be applied to the cam-wheel by any preferred means. I show for this purpose a vertical shaft I, (see Figs. 2 and 3,) arranged over the cam-wheel and having on its 20 lower end a spur-pinion that meshes with a large spur-gear fixed on the axis B of the wheel.

What I claim is—

25 1. A mechanical movement comprising a rotatable wheel having a rim provided with continuous cam-guides on its inner and outer faces, which guides are arranged at opposite inclinations, their highest and lowest points 30 being thus on the same side of the wheel or adjacent, travelers running in said cam-guides, and rods pendent therefrom and reciprocating in opposite directions, alternately, substantially as shown and described.

35 2. A mechanical movement comprising a rotatable wheel having a rim provided with cam-guides on its outer and inner faces, which guides are oppositely inclined as specified, blocks having dovetail ribs adapted to 40 run in said guides, and rods pivotally connected with the blocks and arranged parallel to the said rim, as shown and described.

45 3. A mechanical movement comprising a rotatable wheel having a rim provided with outer and inner continuous cam-grooves

which are dovetailed or undercut as specified, travelers arranged in said grooves and having a similar cross-section, whereby they are held in place, and rods connected with such travelers, substantially as shown and 50 described.

4. A mechanical movement comprising a wheel having a rim provided with parallel faces having continuous cam-grooves which are arranged with the highest point of one on 55 the same side of the wheel with the lowest point of the other, travelers arranged in said guides, and rods connected therewith, and means for rotating said wheel, whereby the rods are reciprocated in opposite directions 60 simultaneously, substantially as described.

5. A mechanical movement comprising a rotatable wheel having a pendent rim provided on its opposite parallel faces with cam-guides which are continuous and arranged 65 with the highest point of one on the same side of the wheel with the lowest point of the other, travelers adapted to slide in such grooves and arranged in pairs on the inner and outer sides of the rim, and rods also arranged in pairs and connected with the travelers, as shown and described, whereby as 70 one rod descends the other rises, and vice versa, as specified.

6. A mechanical movement comprising a 75 rotatable wheel having a rim with parallel sides provided with cam-guides arranged in opposite relation to each other so that the highest point of one is on the same side of the wheel as the lowest point of the other, travelers adapted to slide in said grooves and arranged in pairs, rods connected with said 80 travelers, and means for imparting rotation to the wheel substantially as shown and described.

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