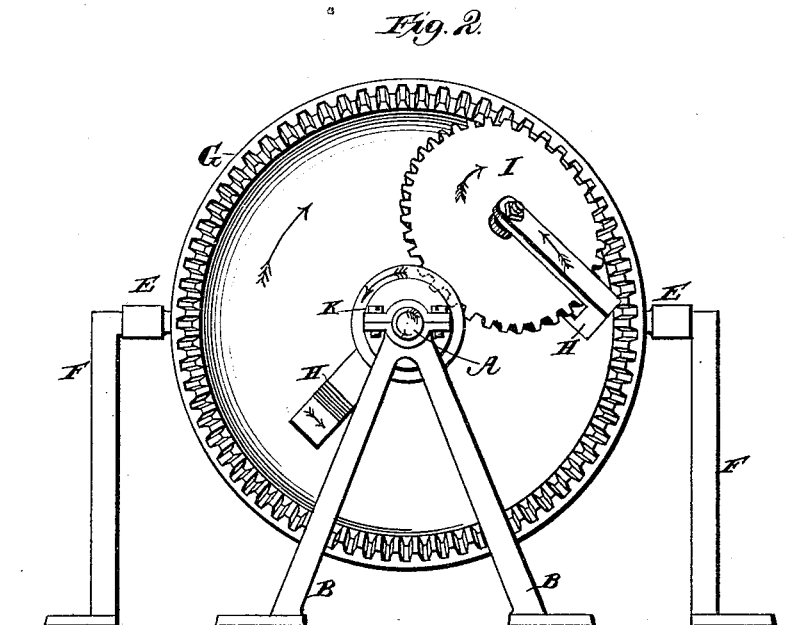
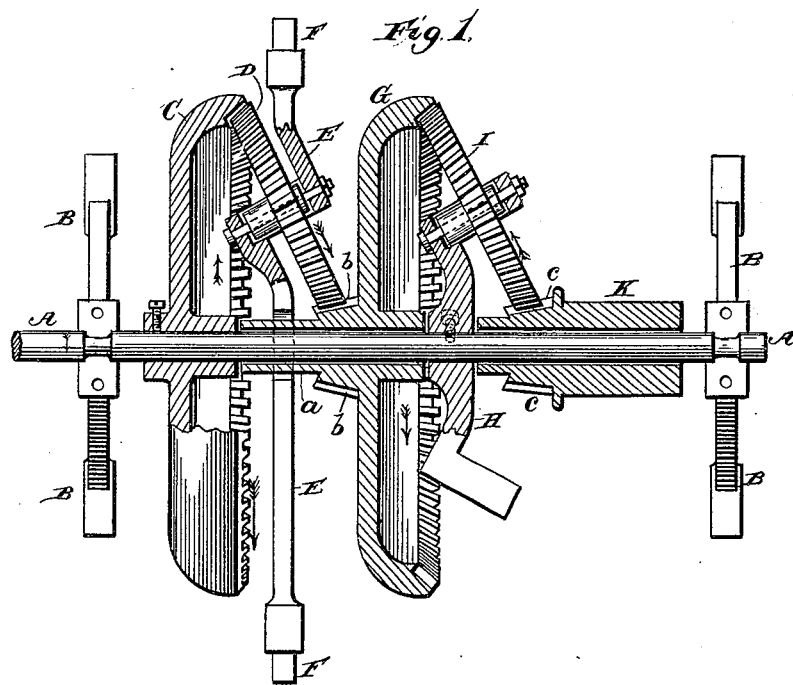


(No Model.)

L. S. FITHIAN.
MECHANICAL MOVEMENT.

No. 263,497.

Patented Aug. 29, 1882.



Witnesses.

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UNITED STATES PATENT OFFICE.

LEMUEL S. FITHIAN, OF MONTCLAIR, NEW JERSEY.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 263,497, dated August 29, 1882.

Application filed February 6, 1882. (No model.)

To all whom it may concern:

Be it known that I, LEMUEL S. FITHIAN, a citizen of the United States, residing at Montclair, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Mechanical Movements, of which the following is a specification.

My invention relates to an improved mechanical movement, the object being to obtain a high rate of speed from a moderate application of power, as hereinafter more fully set forth.

To this end the invention consists in the combination, with a main driving-shaft and gears mounted fast and loose thereon, of a lever fixed to said shaft and intermediate gears journaled in independent bearings at an inclination to the faces of the principal gears, whereby the initial power applied to the main shaft is adapted to impart an increased speed to a sleeve which is mounted loosely on said shaft and provided with means for transmitting its motion to any desired point.

The invention also consists in certain peculiarities in the construction and arrangement of gears, as hereinafter more fully described.

In the accompanying drawings, which fully illustrate my invention, Figure 1 is a plan, partly in section, showing the arrangement of parts comprised in my invention; and Fig. 2 is an end view of the same.

Like letters indicate like parts.

The letter A indicates a shaft, which is supported in bearings formed in the standards B B. Mounted firmly upon the shaft and secured thereto by any suitable means is an internally-beveled gear or cog wheel, C, which meshes with a smaller gear, D. This latter gear or cog wheel, D, is placed at an angle to the cog-wheel C, and is beveled to mesh properly therewith. The small gear D is journaled independently in fixed bearings formed in a horizontal bar, E, which is supported at a right angle to the shaft A on the standards F F. The fixed bar E is so constructed as to pass around the shaft A, being provided with a bend which is arranged either above or below it; or the bar may be mortised or perforated for the passage of said shaft. At the point where the gear D is journaled its supporting-bar E is so formed as to enable the gear to mesh with the gear C at the proper inclination, as shown in Fig. 1.

G indicates a large double gear, which may be of equal diameter with the gear C, and is mounted loosely on the shaft A, being provided with an elongated sleeve or hub, a, by which it is steadied on said shaft. Upon the hub of the gear G, and integral therewith, is a beveled pinion, b, with which the stationary intermediate gear, D, is arranged to mesh. The large gear G when put in motion is thus caused to revolve upon the shaft A in a direction opposite to that in which the shaft and gears C D are revolving.

Secured to the shaft A on that side of the gear G opposite to its pinion b is a lever, H, which is provided with a bent or slotted arm arranged to form a bearing for an intermediate gear, I, which may be of equal diameter with the small gear D, and is arranged at an inclination to the large gear G, with which it meshes. The movement of the gear G causes the gear I to revolve in the same direction therewith, or in a direction upon its own axis contrary to the revolution of the shaft A; but as the gear I is journaled in the lever H, which is fixed to the shaft A, it will be seen that as the shaft is revolved the gear I has also imparted to it a revolution around said shaft.

It will be seen by reference to Fig. 1 that the cogged wheels C and G are chambered so that the bearings of the gears D and I may be arranged close to said wheels C G without impeding their movements. The movable intermediate gear, I, meshes with a bevel-pinion, c, which is integral with an elongated hub or sleeve, K, that is mounted loosely on the shaft A. It will thus be seen that the sleeve or hub K is caused to revolve in the same direction with the shaft A, as shown in Fig. 2, but at a greatly-increased rate of speed.

To the sleeve or hub K may be attached a gear or a pulley for transmitting its motion to any desired point, and it may be also provided with a fly-wheel for equalizing its motion.

By journaling the movable gear I in a bearing adapted to revolve with the shaft A it is obvious that the gear I is enabled to exert a greatly-increased leverage upon the pinion c, which is attached to and forms part of the sleeve K, the fulcrum being gradually shifted as the shaft A revolves. The increase in the number of revolutions of the sleeve K, as compared with the number of revolutions imparted to the shaft A and gear C, will depend upon the relative diameters of the intermediate gears

and the number of cogs with which each gear is provided. It is obvious, for example, that one revolution of the large gear C will impart to the small gear D as many revolutions as the diameter of the small gear is contained in that of the large one, and that the large gear G will thus receive as many more revolutions as the diameter of its pinion *b* is contained in that of the gear D, and so on. It is also obvious that the number of gears and their relative diameters may be increased or diminished within proper limits, as found convenient, so as to impart any desired speed to the sleeve K without increasing the initial power. By this system of gearing the application of a moderate amount of power to the shaft A or cogged wheel C will result in imparting great speed to the revolutions of the sleeve K and its attached gearing.

The construction of the large chambered gears C and G is also such as enables the bearings of the intermediate gears, D and I, to be placed in close proximity to the large gears, thus economizing space without interfering in any way with the motion of the several gears.

What I claim is—

1. In a mechanical movement, the combination, with a shaft having cogged wheels connected by intermediate gears journaled in independent bearings, of a lever fixed to said shaft and forming a bearing for one of said intermediate gears, whereby the gear journaled in the said lever is adapted to have a revolution about the main shaft in one direction and a revolution upon its own axis in a contrary direction, substantially as described.

2. In a mechanical movement, the combination, with a shaft having a large double gear mounted loosely thereon and a lever fixed to said shaft, of a movable gear journaled in bearings in said lever at an inclination to the face of the large gear with which it meshes, and means, such substantially as described, for imparting motion to the large gear in a direction opposite to the revolution of the shaft, whereby the movable gear journaled in the said lever

is caused to revolve upon its axis in a direction contrary to its revolution about the main shaft, as set forth.

3. In a mechanical movement, the combination of a shaft mounted in suitable bearings, a chambered cog-wheel fixed to said shaft, a chambered cog-wheel having an elongated hub and pinion integral therewith, and a sleeve mounted loosely on said shaft and provided with a pinion, an intermediate gear journaled in an independent bearing and connecting one chambered cog-wheel with the pinion on the other chambered cog-wheel, a lever fixed to the shaft and adapted to revolve therewith, and a movable gear journaled in bearings formed in said lever and adapted to connect the large loosely-mounted cog-wheel with a pinion on the loose sleeve, whereby said sleeve is adapted to revolve with increased speed in the same direction as the main shaft, substantially as described.

4. In a mechanical movement, the combination of the main shaft A, journaled in suitable bearings, the cog-wheel C and lever H, fixed to said shaft, the cog-wheel G and sleeve K, mounted loosely thereon and provided respectively with suitable pinions, the bevel-gear D, journaled in independent bearings formed in a stationary bar, E, arranged at an angle to the main shaft, and the movable gear I, journaled in bearings formed in the lever fixed to the shaft, said gears D and I being inclined to the faces of the large gears and connecting respectively with the same and with a pinion on the loose sleeve, whereby the latter is caused to revolve in the same direction as the main shaft and with an increased speed, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LEMUEL S. FITHIAN.

Witnesses:

B. H. JESSUP,
R. B. FITHIAN.