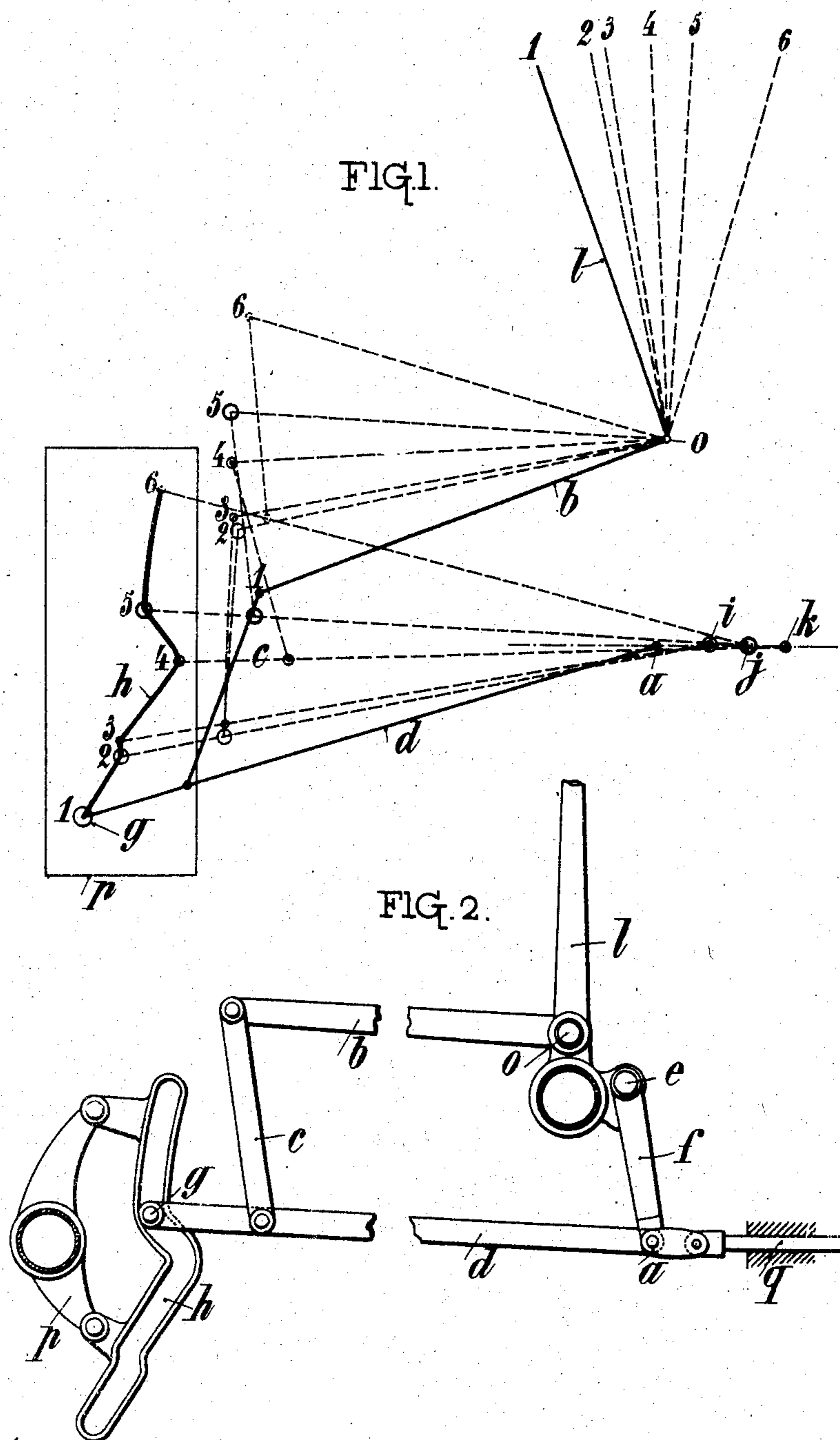


No. 790,174.

PATENTED MAY 16, 1905.

L. BOLLÉE.  
MECHANICAL MOVEMENT.  
APPLICATION FILED AUG. 3, 1903.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

LÉON BOLLÉE, OF LE MANS, FRANCE.

## MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 790,174, dated May 16, 1905.

Application filed August 3, 1903. Serial No. 168,006.

*To all whom it may concern:*

Be it known that I, LÉON BOLLÉE, a citizen of the Republic of France, residing at Le Mans, France, have invented certain new and useful Improvements in Mechanical Movements, of which the following is a specification.

This invention relates to an operating mechanism having for its object the transformation of regular into irregular movement, so that by uniformly moving an operating-lever it is possible to produce during the time from the beginning until the end of the movement of the lever in one and the same direction the movement with intermediate stationary periods of, say, a coupling-fork or of any other part—such as, for instance, a valve, slide, &c.

The device can be used generally for the purpose of transforming regular into irregular motion, but has more particularly been designed for use in connection with the operation of the change-speed gear of motor-cars.

A mechanism according to this invention is illustrated, by way of example, in the accompanying drawings.

Figure 1 is a diagrammatic view showing the various stages of the transmission of movement from the operating-lever to the part to be operated. Fig. 2 shows in elevation a construction of this device applied, by way of example, to operate a change-speed gear of a motor-car.

In this application a lever *l*, uniformly operated by hand, produces during the period from its first start to the end of its travel in the same direction displacement in a straight line of a point *a*, communicating to it several successive movements alternating with periods of rest. To that end the lever *l*, pivoted at a fixed point *o*, is provided with an arm *b*, connected by a rod *c* to a bar *d*. This bar is suspended at one of its ends, corresponding to the part to be operated, from a fixed point *e* by means of a depending rod *f*. At the other end the bar *d* is provided with a roller *g* or a simple projection engaging in a groove *h* or guide of suitable shape made in a

fixed plate or a fixed support *p*, of any suitable material.

The bar *d* is connected at the end opposite to the roller *g* to a sliding rod *q*, connected to the part to be moved. This part in the example illustrated is the disengaging-fork of the change-speed gear of a motor-car.

The shape of the groove *h* shown has been calculated in such manner that when the hand-lever *l* makes one oscillation, and consequently the bar *d*, which is moved by it, also makes one oscillation, the fork moves from the point *a* to the point *i*, Fig. 1, during the travel of the lever *l* from its position 1 to the position 2. The fork then stops still at the point *i*, while the lever passes from the point 2 to the point 3, and then moves from the point *i* to the point *j*, then to the point *k*, and finally moves from that point to the point *j* during the following stages of the movement of the lever *l*.

The combination of the oscillating bar *d* with the groove *h*, so as to enable the lever to stop still in the manner described, is effected by making the guide or groove along which the roller *g* travels in the shape of chords of a circle the center of which coincides with the point *a* during the whole time that it is required to stand still.

It must be pointed out that it is easy to make a non-reversible apparatus—that is to say, one in which a thrust on the point *a* would not result in any movement of the lever *l*—by making the groove *h* at the point where such thrust should take place at right angles to the bar *d* or at a lesser angle to it than the angle of friction.

If the same hand-lever is to operate several points *a* in various ways, it is very easy to arrange as many plates *p* and bars *d* as are necessary, rendering the movement of all these bars integral with the movement of the hand-lever *l*, so that they would all make their oscillation simultaneously. The ends of the connecting-rods would then move in different straight lines and produce movements depending on the shape of the guide-plates *p*. This would be useful in a motor-car where one hand-lever of the change-pulleys-speed

gear has to produce several movements of different sets of wheels at different times.

What I claim as my invention, and desire to secure by Letters Patent, is—

5 1. In a mechanism for transforming regular into irregular movement, a uniformly-operated lever, a reciprocatory and oscillatory bar, a lever connection between said bar and the operating-lever, a fixed cam-guide en-  
10 gaging the end of the reciprocatory bar, and a suspending link for the other end of the reciprocatory bar substantially as described.

15 2. In combination, in a mechanism for transforming regular into irregular movement, the uniformly-operated pivoted lever *l*, arm *b*, connected to the lever *b*, rod *c* pivoted to the arm *b*, a depending rod *l*, and oscillating bar *d* suspended at one end there-

from from the fixed point *e*, at another position pivoted to the rod *c* so as to be operated 20 by the movements of the lever *l*, and a fixed support having a groove *h*, the other end of the oscillating bar *d* engaging in said groove *h* which is appropriately shaped so as to influence the movements of the oscillating bar 25 *d*, and a rod *g* connected thereto and to the part to be moved, as required, substantially as described and illustrated.

In testimony whereof I have signed my name to this specification in the presence of 30 two subscribing witnesses.

LÉON BOLLÉE.

Witnesses:

AUGUSTUS E. INGRAM,  
JEAN ROBELET.