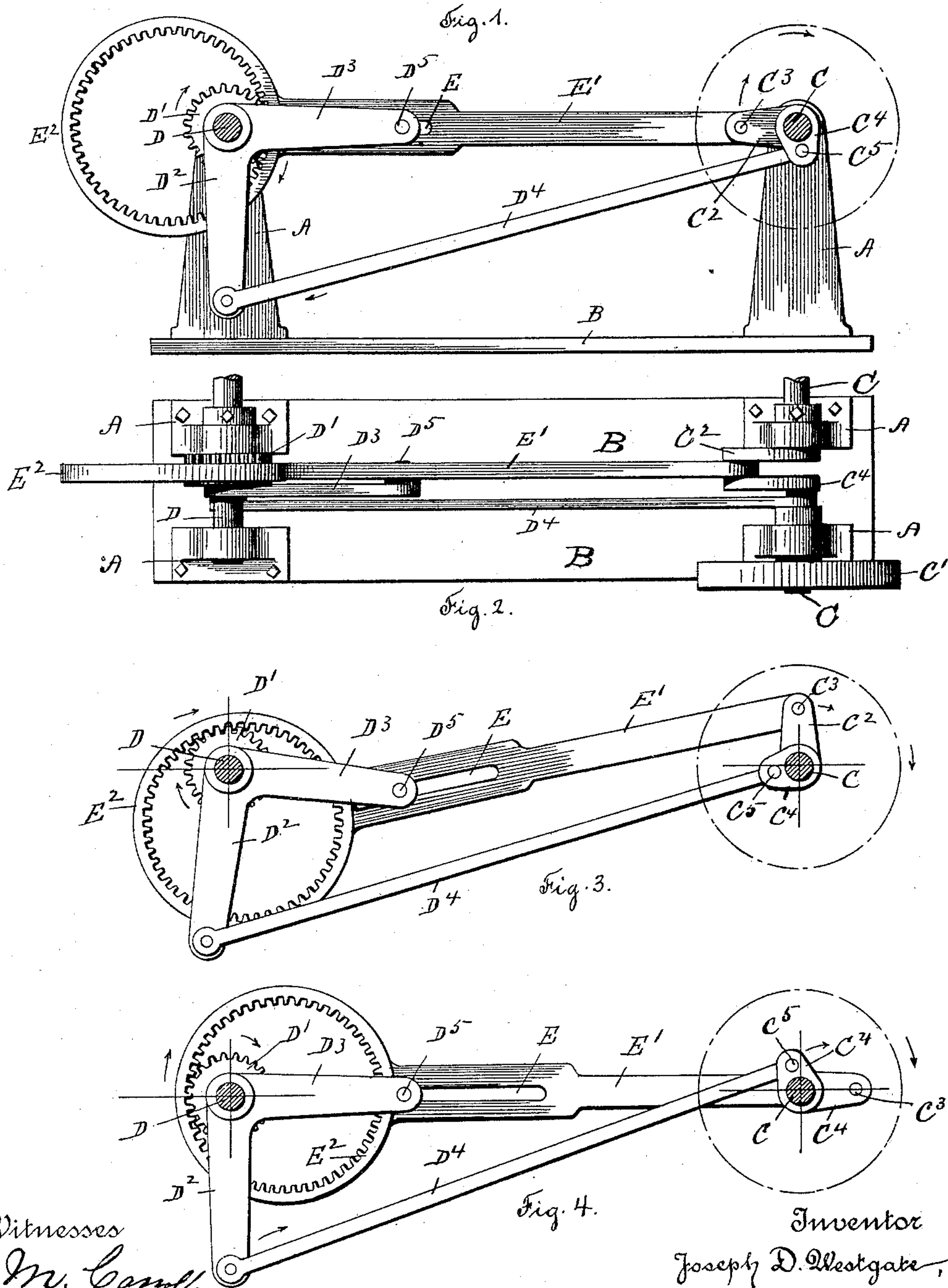


(No Model.)

J. D. WESTGATE.
MECHANICAL MOVEMENT.

No. 477,191.

Patented June 14, 1892.



Witnesses
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By his Attorney

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UNITED STATES PATENT OFFICE.

JOSEPH D. WESTGATE, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO
CHARLES H. WOODCOCK, OF SAME PLACE, AND GEORGE ANSON
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MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 477,191, dated June 14, 1892.

Application filed May 13, 1891. Serial No. 392,577. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH D. WESTGATE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Mechanical Movements, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of a mechanism embodying my invention. Fig. 2 is a top view of the same. Figs. 3 and 4 represent the operating parts of the mechanism in two different positions.

Similar letters refer to similar parts in the several figures.

The object of my invention is to provide a mechanism by which the rotary motion of one shaft may be communicated to a second and parallel shaft; and it consists of the several features illustrated in the accompanying drawings and hereinafter described.

Referring to the drawing, A A denotes the supporting-posts, mounted upon the base B, by which the two parallel shafts C and D are supported. The shaft C carries a belt-pulley C', by which rotary motion is imparted to the shaft, or, if required, a crank can be substituted for the belt-pulley. The shaft C is provided with a crank C², having a crank-pin C³, and also with a crank C⁴, having a crank-pin C⁵.

D denotes a shaft parallel with the shaft C and carrying a pinion D', and also having pivoted thereon a bell-crank having arms D² and D³. The arm D² is connected by a link D⁴ with the crank C⁴, so that the rotation of the shaft C will cause an oscillating movement of the arm D³. The arm D³ is provided with a stud D⁵, which enters a slot E in a lever E', connected at one end with the crank-pin C³ and carrying at the opposite end an annular gear E², preferably formed integrally with the lever E' and engaging the pinion D'. As the shaft C is rotated a rocking and a sliding motion will be imparted to the lever E' upon the stud D⁵. The sliding motion of the lever E' upon the stud D⁵ will be equal to twice the ra-

dus of the crank-pin C³ and will take place during the movement of the crank-pin C³ from one of its dead-centers to the other, and as the internal diameter of the annular gear less the diameter of the pinion D' is equal to twice the radius of the crank-pin C³ the opposite sides of the annular gear E² will be made to engage the pinion D' as the crank-pin C³ assumes the position shown in Figs. 1 and 4. At the same time a rocking movement is imparted to the lever E' upon the stud D⁵ in the movement of the crank-pin C³ past the "centers," the extreme of the rocking movement being reached as the crank-pin C³ reaches the quarter-throw, as shown in one position in Fig. 3. The rotation of the shaft C through the actuating-crank C⁴ and link D⁴ imparts an oscillating motion to the bell-crank, by which a compound motion is imparted to the annular gear E², causing its toothed edge to travel in a circular path and to remain in engagement with the teeth of the pinion D', causing the rotation of the shaft C to impart a rotary motion to the pinion D' and shaft D.

The mechanical movement forming the subject of my present invention is designed to effect the transmission of rotary motion from one shaft to another, and is especially designed to take the place of the sprocket-wheels and chain belt ordinarily used in bicycles, the shaft C representing the pedal-shaft, to which power is applied, and the shaft D representing the wheel-shaft. The mechanical movement is, however, adapted to the transmission of rotary motion between shafts placed too far apart to permit a train of gearing to be used and where a belt connection is undesirable.

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

1. The combination of a driving-shaft provided with a crank, a pivoted oscillating lever connected at one end with said crank and carrying an internal gear upon its opposite end, a driven shaft, a pinion on said driven shaft engaged by said internal gear, and a pivoted bell-crank carrying in one arm a pivot of said oscillating lever and having its other arm op-

eratively connected with said driving-shaft, whereby an oscillating motion is imparted to said bell-crank, substantially as described.

2. The combination, with a driven shaft and
5 a pinion on said shaft, of an internal gear carried by an oscillating lever and engaging said pinion, an oscillating bell-crank carrying a pin upon which said oscillating lever is pivoted, an oscillating lever carrying said internal gear and provided with a slot inclosing the
10 pivotal pin carried by said bell-crank, and a driving-shaft provided with a crank connected with said oscillating lever and having a second crank connected by a link with said bell-
15 crank, whereby said bell-crank is oscillated, substantially as described.

3. The combination, with a driving-crank, of an oscillating lever connected with said crank, an internal gear carried by said oscillating lever, a driven shaft, a pinion on said
20 driven shaft engaged by said internal gear, an oscillating arm pivoted at one end and carrying a pivotal pin upon which said oscillating lever is pivoted, and connected actuating
25 mechanism, substantially as described, where-

by a movement is imparted to said oscillating lever conjointly with the motion imparted to said oscillating lever by its connected driving-crank, substantially as described.

4. The combination of a driving-shaft C, 30 provided with cranks C² and C⁴, driven shaft D, provided with a pinion D', a pivoted bell-crank having arms D² D³, said arm D³ carrying a pin D⁵, serving as the fulcrum of an oscillating lever E', provided with a slot E and 35 pivoted upon the pin D⁵, an internal gear E², carried by said oscillating lever and engaging the pinion D', said oscillating lever being connected with and actuated by the crank C², and a link D⁴, connecting the crank C⁴ with 40 the arm D² of the pivoted bell-crank, whereby an oscillating motion is imparted to the pivotal pin D⁵, substantially as described.

Dated at Worcester, in the county of Worcester and State of Massachusetts, this 45 5th day of May, 1891.

JOSEPH D. WESTGATE.

Witnesses:

RUFUS B. FOWLER,

CHARLES H. WOODCOCK.