

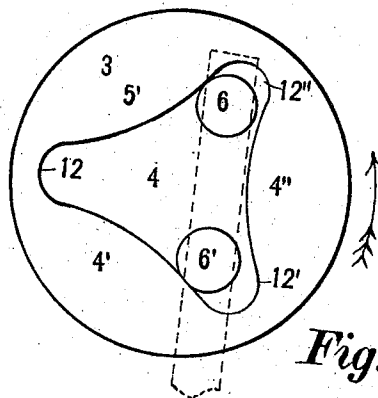
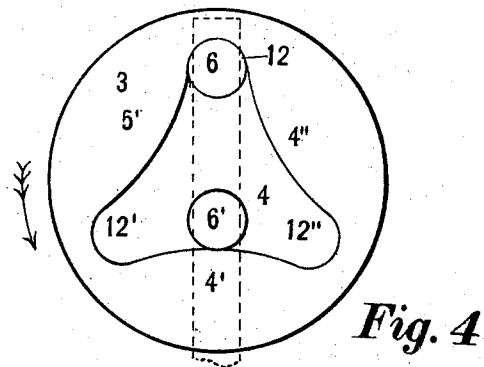
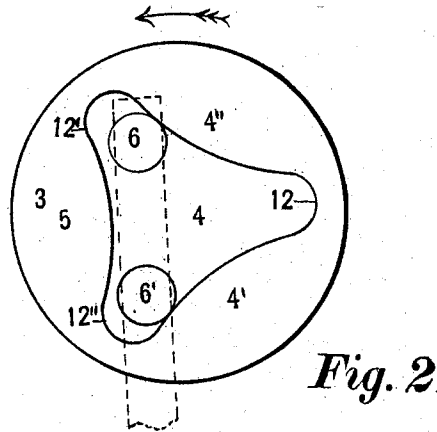
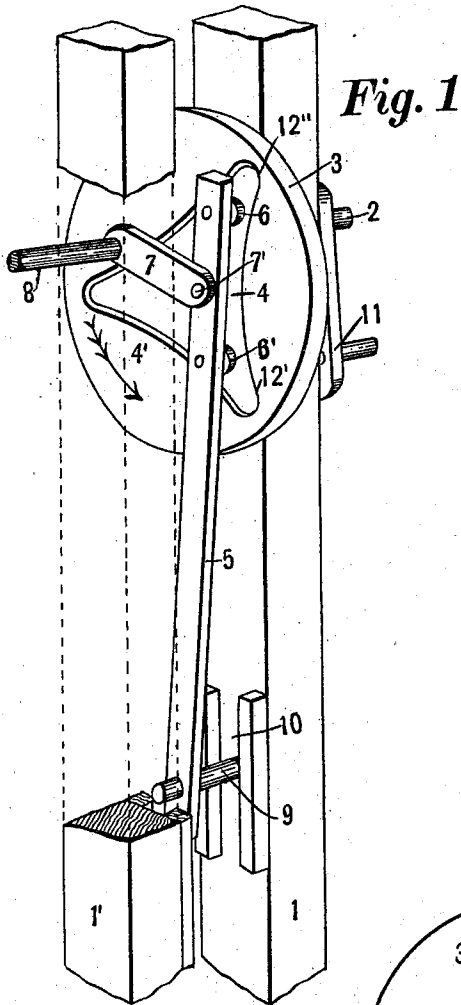
(No Model.)

2 Sheets—Sheet 1.

C. B. JUDD.  
MECHANICAL MOVEMENT.

No. 604,010.

Patented May 10, 1898.



WITNESSES.

F. S. Wheeler.  
C. P. Luckan.

*INVENTOR.*

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*Fig. 3* Chas. Bela Judd,  
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 Attorney

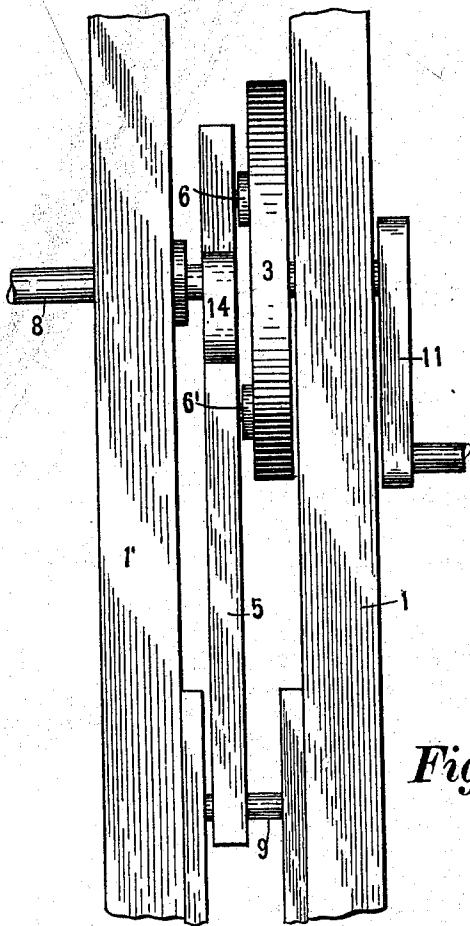
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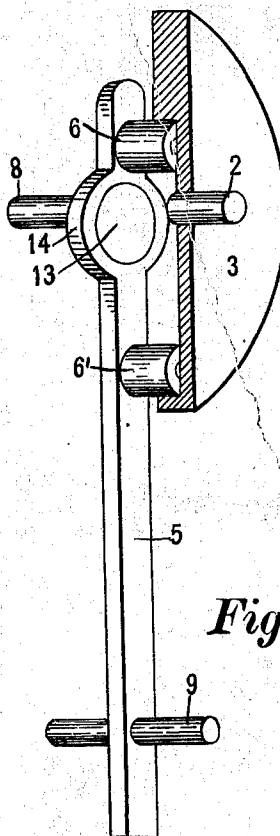
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*Fig. 5*



*Fig. 6*

WITNESSES.

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INVENTOR.

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*By H. Roscoe Wheeler*  
Attorney

# UNITED STATES PATENT OFFICE.

CHARLES BELA JUDD, OF DETROIT, MICHIGAN.

## MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 604,010, dated May 10, 1898.

Application filed January 27, 1897. Serial No. 620,991. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES BELA JUDD, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Mechanical Movements; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to mechanism for producing mechanical movements; and it consists in the formation and arrangement of parts, as hereinafter fully set forth, and pointed out particularly in the claims.

The object of the invention is to produce a mechanism wherein a disk or wheel, having a recess of peculiar formation in its face, is employed, in which recess rollers journaled to a bar are adapted to travel to impart a reciprocating movement to said bar, and also wherein a crank, having pivotal connection with said bar, is adapted to transmit revolutions to a shaft connected therewith, the arrangement being such that the length of said shaft or spindle shall lie in or out of direct alinement with the axis of said disk, as desired, and wherein said shaft shall have a greater number of revolutions than said disk, said increased number being determined by the number of bearing edges or points in the recess of said disk; which object is attained by the construction illustrated in the accompanying drawings, in which—

Figure 1 is a general perspective view of a mechanism made in accordance with my invention, a portion of the framework thereof being broken away to more clearly show its operative parts. Figs. 2, 3, and 4 are diagram views showing various positions attained by the bar and rollers in a single rotation of the disk. Fig. 5 is a plan view of a slight modification in the mechanical embodiment of the invention illustrated in Fig. 1, in which an eccentric is employed in lieu of the crank. Fig. 6 is an enlarged detail in perspective of the operative parts.

Referring to the numerals of reference, 1 1'

designate the rails of a suitable bed or frame. Journaled in frame 1 and extending there-through is a shaft 2. Mounted upon the inner end of said shaft and adapted to rotate adjacent to said rail is a disk 3, said disk having a recess 4 of a general triangular formation in its inner face.

5 indicates a bar of suitable size and length having rollers 6 and 6' journaled upon its rear face and a crank 7 pivoted to its outer side at 7' intermediate of said rollers, said crank being in turn rigidly connected with a spindle or driven shaft 8, which shaft extends through rail 1' and in which it is journaled.

9 represents a sliding head which extends transversely through bar 5, or is otherwise secured thereto, which head is constrained in its movements by a suitable guideway 10.

It will now be seen that if power be applied to shaft 2, as by a hand-winch 11, a rotary motion will be transmitted to disk 3, and if said disk be rotated in the direction of the arrow shown in Fig. 1, the portion 4' of recess 4 being located near the axis of said disk, the upper roller 6 being free from contact or obstruction will receive an upward impulse or movement and bring the parts into the positions shown in the diagram illustrated in Fig. 4, in which view said bar is shown as being in its uppermost extension or position, said upward movement being limited by the roller 6, riding into the extremity 12 of recess 4. It will also be seen by reference to Fig. 4 that roller 6 will remain in cavity 12 until the high side 4' is carried around to the right, so that roller 6' may drop into cavity 12", which at the same time brings the high point 4" to bear upon roller 6 and forcing the bar and rollers downward, as indicated in Fig. 2. The roller 6' will remain in cavity 12" until the high side 4" shall have passed roller 6 in the revolution of the disk, when high side 5' will be forced under roller 6' and again raise the bar into the position illustrated in Fig. 4. The continued revolution of said disk causes the bar and rollers to operate, as set forth.

It will be understood that the upper end of bar 5 travels in a circular movement, in consequence of which a rotary motion may be transmitted from a crank pivoted thereto, and that the upper end of said bar and crank

will have three distinct revolutions to one turn of disk 3 and its lower end a corresponding number of reciprocations.

By the particular formation of the bearing 5 faces or edges of the recess it will be seen that great power may be applied to raise or depress the bar by reason of the distance between the cavities 12, 12', and 12'' and the short stroke imparted to said bar on account 10 of the slight raise in the high points 4', 4'', and 5'.

While I have shown and described the driven shaft 8 as being in direct alinement with the driving-shaft 2, it will be apparent 15 that the motion imparted to said bar is such that a crank may be pivoted thereto at any point between its upper end and the cross-head 9 and a rotary motion imparted thereto; but at the same time it will be understood 20 that the length of said crank must be shortened in proportion as it approaches said cross-head.

Fig. 5, as aforesaid, represents a plan view of a slight mechanical modification in the 25 mechanism set forth, in which an eccentric 13 is made fast upon spindle or driven shaft 8 and an enlarged portion, equivalent to an eccentric-strap, formed in bar 5, which strap is adapted to surround said eccentric, the 30 operation of which, as is evident, will be the same as that of crank 7.

It will also be understood and readily seen that disk, as 3, may be journaled in the lower 35 portion of the framework shown in Fig. 1, another set of rollers 6 6 and a crank 7 pivoted thereto, a shaft united to said crank, and power transmitted therefrom, all of which arrangement is within the contemplation of my invention.

40 Having thus fully set forth my invention,

what I claim as new, and desire to secure by Letters Patent, is—

1. In a mechanism for producing mechanical movements, the combination of a shaft 45 having a disk rigidly mounted upon one end thereof, said disk having a triangular recess in that face lying farthest from the shaft, the sides of said triangle being curved inward and uniting with the side walls of the angles 50 to form guides, a bar adapted to extend across said triangular recess, rollers mounted upon said bar adapted to engage two sides of said triangle at each angle thereof, a crank-shaft supported in axial line with said main shaft, 55 a crank rigidly secured to said shaft and having its free end pivoted to a point in said bar substantially midway between the two rollers, and means for guiding the opposite end of said bar, substantially as described.

2. In a machine for the purpose set forth, 60 the combination of the driven shaft journaled in bearings, a disk secured to said driven shaft, said disk having an angled recess in its face opposite the side to which said shaft is secured, a vibrating lever having friction- 65 rollers pivoted thereto, said rollers adapted to travel in said angled recess, a cross-head secured to said bar, a guideway in which said head is adapted to reciprocate, a crank-arm secured to said bar between said friction-rollers, 70 and the driven shaft suitably journaled in the frame and fastened to said crank-arm, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES BELA JUDD.

Witnesses:

H. ROSCOE WHEELER,  
FRANK S. WHEELER.