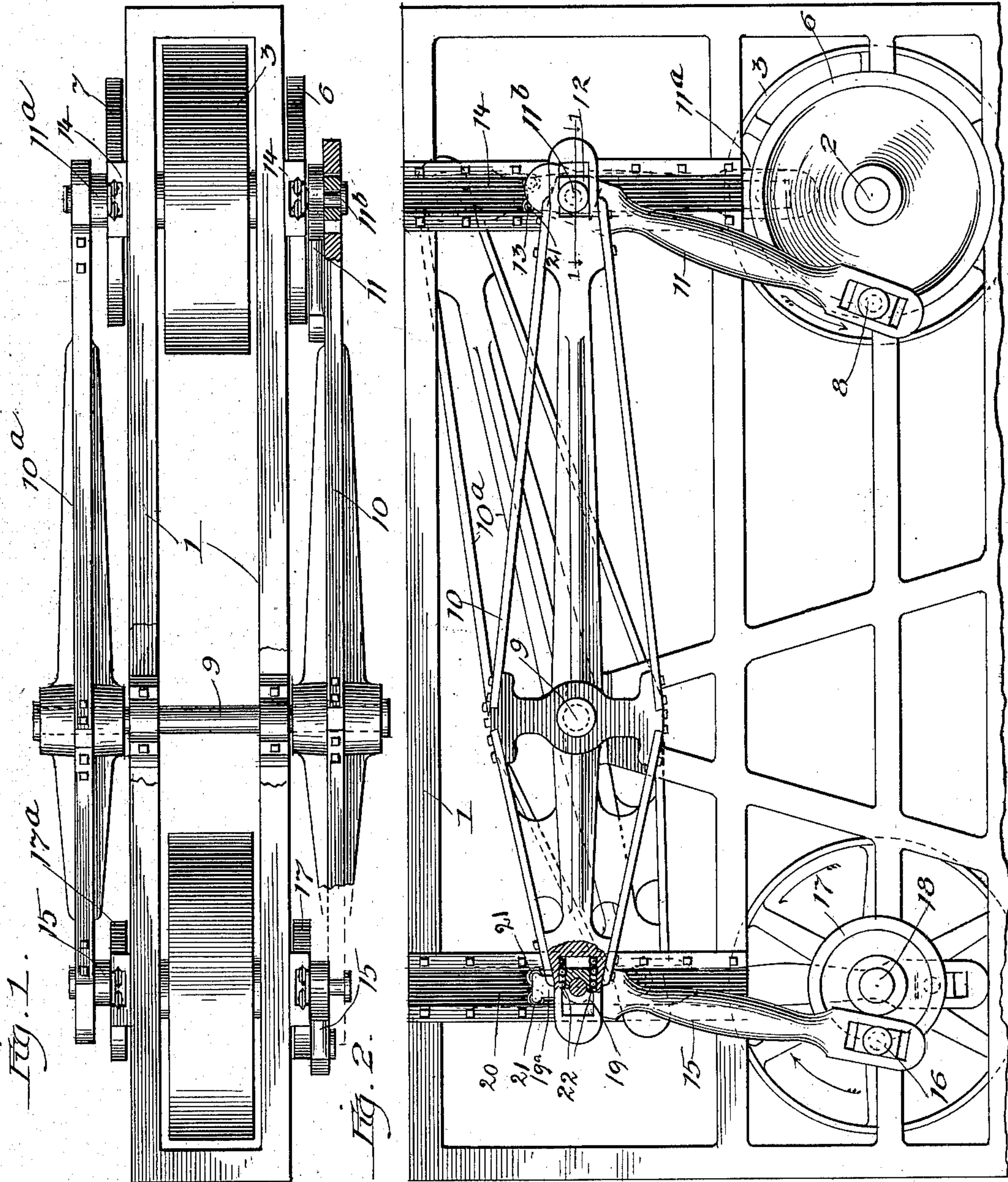


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PATENTED JUNE 23, 1903.

J. & F. KLOBOUCNIK.  
MECHANICAL MOVEMENT.  
APPLICATION FILED MAR. 2, 1903.

NO MODEL.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

JOSEPH KLOBOUCNIK AND FRANK KLOBOUCNIK, OF CHICAGO, ILLINOIS.

## MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 731,915, dated June 23, 1903.

Application filed March 2, 1903. Serial No. 145,678. (No model.)

*To all whom it may concern:*

Be it known that we, JOSEPH KLOBOUCNIK, residing at No. 568 West Seventeenth street, and FRANK KLOBOUCNIK, residing at No. 574 Blue Island avenue, Chicago, in the county of Cook and State of Illinois, subjects of the Emperor of Austria-Hungary, have invented new and useful Improvements in Mechanical Movements, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention is designed to transmit rotary movement by means of cranks and pitmen in such manner as to avoid dead-center and to reduce or multiply the range of the movement without use of belts or chains or other endless transmitting means.

It consists of the features of construction set out in the claims.

In the drawings, Figure 1 is a top plan showing one of the pivot-bearings in section at the line 1 1 on Fig. 2. Fig. 2 is a side elevation of a mechanism embodying the features of our invention, showing another pivot-bearing broken away and in section transverse to the pivot.

In a rigid frame 1 there is journaled a shaft 2, which derives rotary motion from any source of power, as by belt over the pulley 3. At the opposite ends of the shaft outside the supporting-frame there are rigid with it crank-wheels 6 and 7—that is, disks having crank-wrists 8 8. These crank-wrists are ninety degrees apart about the axis of the shaft. On the frame there are fulcrumed on a shaft 9 parallel with the shaft 2 walking-beams or levers 10 10<sup>a</sup>. Pitmen 11 11<sup>a</sup> connect the crank-wrists 8 8 with the corresponding ends of the levers 10 10<sup>a</sup>, such connection being made in each instance by means of a pivot-pin 11<sup>b</sup>, which passes through two trammel-blocks 12 and 13, the former of which is mounted in the lever and adapted to slide longitudinally therein, while the latter is guided vertically in a guide-bar 14, mounted rigidly on the frame. The range of sliding movement of the trammel-block 12 is sufficient to accommodate the movement of the lever swinging about its fulcrum, as necessary to permit the pivot-pin to travel in a vertical path when actuated by the pitman following the circular

path of its crank-wrist. At the opposite end of the levers they are connected, respectively, by pitmen 15 15<sup>a</sup> with the crank-wrists 16 16 on the crank-wheels 17 17<sup>a</sup>, which are fast on the shaft 18 parallel with the shaft 2, journaled on the same frame. The crank-wrists 16 16 are ninety degrees apart about the axis of the shaft 18. If it is desired to have the shaft 18 rotate in the same direction as the shaft 8, the wrist connected with the pitman 15<sup>a</sup> will be at the opposite side of the shaft 18 from the wrist 8, connected with the corresponding pitman 11<sup>a</sup>; but if it is desired to rotate the shaft 18 in the opposite direction from the shaft 8 the corresponding wrists will be arranged in the same order about the two shafts, respectively.

The pitmen 15 15<sup>a</sup> are connected to the levers 10 10<sup>a</sup> by trammel-blocks 19 19<sup>a</sup>, operating, respectively, in the levers and in vertical guides 20, the construction being precisely the same as at the opposite end of the levers. The trammel-blocks 12 13 and 19 19<sup>a</sup> may be provided with ball or roller bearings in their guideways, respectively, if desired to reduce the friction to minimum. These guide-bearings are seen in detail in Fig. 2, anti-friction rolls or wheels 21 21 being journaled on the vertical trammel-blocks 13 and 19<sup>a</sup>, and anti-friction-balls 22 being provided retained in proper grooves between the trammel-blocks 12 and 19 and their guideways, respectively.

The levers 10 10<sup>a</sup> are shown with longer and shorter arms, the longer arms being connected with the actuating-pitmen 11 11<sup>a</sup> and the shorter arms connected with the pitmen 15 15<sup>a</sup>, the crank distance of the wrists 16 16 being to the distance of the wrists 8 8 in proportion to the two arms of the levers.

It will be understood that the expedient shown for preventing dead-center in the crank movement may be utilized when the lever is operated in any manner to give the desired oscillating motion and that the utility of the device is not limited to a construction in which the lever is both actuated by and actuates the cranks at the opposite ends respectively. The applicability of the device both to transmit movement from the rotating crank to the lever and from the lever or other oscillating or reciprocating element to such crank is de-



signed to be shown by converting motion both ways from rotary through the oscillating and back to rotary movement.

The expedient of providing vertical and horizontal guides or trammel-blocks on the pivot-pins, which connect the pitmen to the levers, is adopted in order to accommodate the variation in the movement which would be transmitted from the crank-wrists ninety degrees apart about the guide-shaft, for it will be understood that the same angular movement of two crank-wrists ninety degrees apart will not produce degree for degree the same rocking movement of the lever and that the angle through which the pitman moves about its pivot to the lever being different at the two ends of the lever would cause the two levers to give slightly-different rotary action to the driven wheel if the pitmen were connected directly to the levers without the provision for vertical guidance, but that the direct vertical movement is the same notwithstanding the differences of angle above mentioned, and by confining the pivots which connect the pitmen to the levers to their vertical paths perfectly synchronous action of the driven wheel results from both levers.

We claim—

1. A device for transmitting movement, comprising a pair of parallel levers having the axes of their fulcrums coincident; two parallel shafts, each having two crank-wrists ninety degrees apart; pitmen connecting the crank-wrists of one shaft to the correspond-

ing ends of the two levers respectively, and pitmen connecting the two crank-wrists of the other shaft to the opposite ends of the levers respectively, the pivots which connect the pitmen to the levers respectively having fixed guideways transverse to the length of the levers, and having also a range of sliding movement in the levers longitudinally with respect thereto.

2. A mechanism for transmitting movement, comprising a pair of levers having the axes of their fulcrums coincident; a pair of parallel shafts having each two crank-wrists ninety degrees apart; pitmen connecting the crank-wrists of one shaft with the corresponding ends of the two levers respectively; pitmen connecting the crank-wrists of the other shaft with the opposite ends of the lever respectively; two trammel-blocks on the pivots which connect the pitmen to the levers respectively, one of such trammel-blocks having a guideway transverse to the length of the levers, and the other having a guideway in the lever longitudinally with respect thereto.

In testimony whereof we have hereunto set our hands, in the presence of two witnesses, at Chicago, Illinois, this 23d day of February, 1903.

JOSEPH KLOBOUCNIK.  
FRANK KLOBOUCNIK.

In presence of—

CHAS. S. BURTON,  
FRED. G. FISCHER.