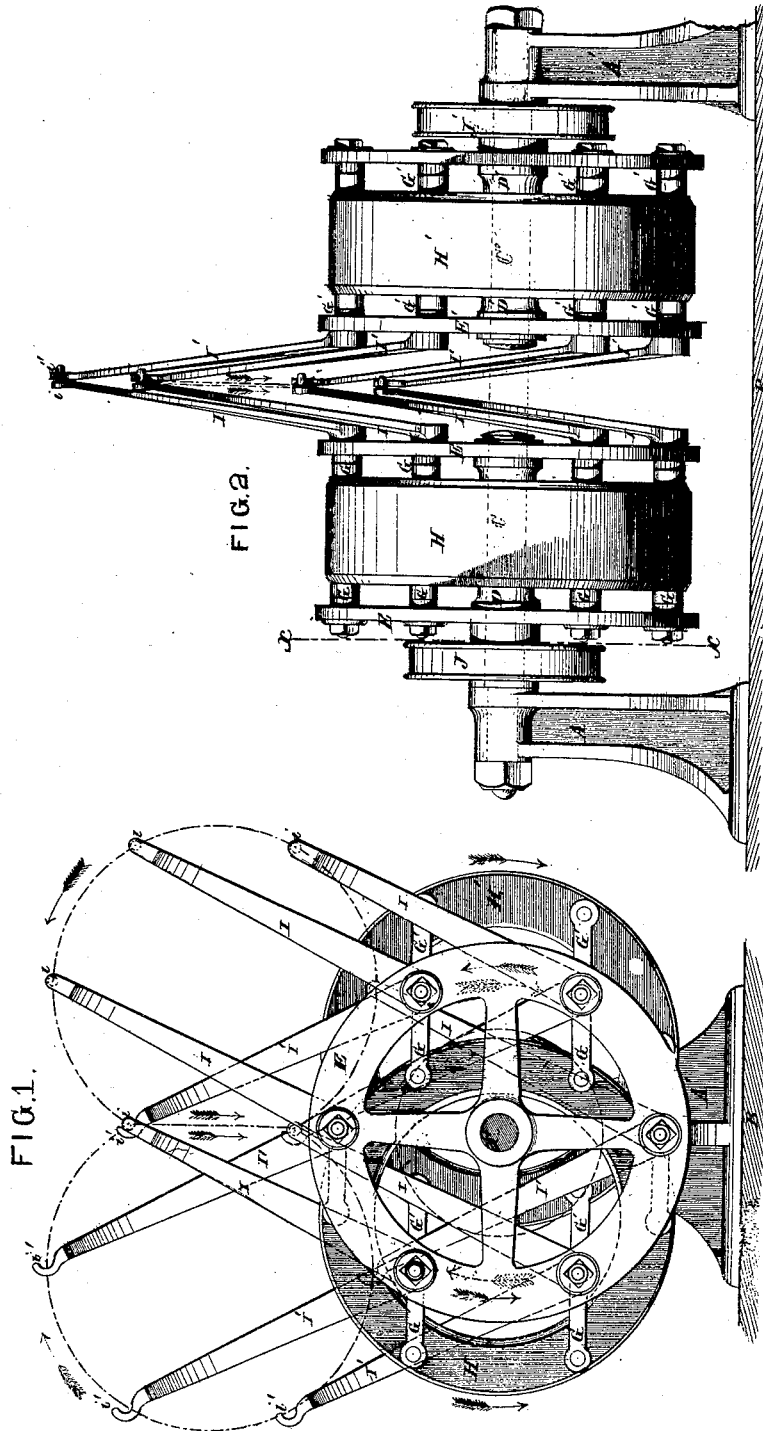


J. WOOLF.  
MECHANICAL MOVEMENT.

No. 110,185.

Patented Dec. 13, 1870.



WITNESSES  
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By Knight & Co. Attys

# United States Patent Office.

JACOB WOOLF, OF BURR OAK, MICHIGAN.

Letters Patent No. 110,185, dated December 13, 1870.

## IMPROVEMENT IN MECHANICAL MOVEMENTS.

The Schedule referred to in these Letters Patent and making part of the same.

I, JACOB WOOLF, of Burr Oak, in the county of St. Joseph and State of Michigan, have invented a new and useful Improvement in Mechanical Movements, of which the following is a specification.

### *Nature and Objects of the Invention.*

My invention relates, primarily, to the machinery described in my two patents of October the 18th and November the 29th, 1870.

My present improvement consists in a peculiar arrangement for connecting and combining two of the machines described in my aforesaid patents, so that they may be adapted to act in unison but in opposite directions.

### *Description of the Accompanying Drawing.*

Figure 1 is a sectional elevation of my combined apparatus, taken in the plane indicated by the line *x x* in fig. 2.

Figure 2 is a side elevation of the same.

### *General Description.*

A A' are two standards, which may be secured to a common bed, B, and each support a stationary longitudinal shaft, C C'; or a single shaft may extend from one standard to the other, as illustrated by dotted lines in fig. 2.

I shall proceed to describe the machine as made with two separate shafts, the only difference being that, with a continuous shaft, the levers hereinafter described must be made short enough for their ends to pass the said shaft, as will be understood when their operation is explained.

The sleeves D D', wheels E E', cranks G G', eccentric annular weights H H', and levers I I' may be constructed and arranged in each series as described in my patent of November 29, 1870; but the weights H

H' of the respective series are set eccentrically to the shaft, in opposite directions, as clearly shown in fig. 1, and the ends of the respective levers I and I' are made with pins *i* and hooks *i'*, or some equivalent means of adapting them to interlock, as represented.

J J' represent pulleys, to either or both of which driving-belts or brakes may be applied.

### *Operation.*

The dotted lines in fig. 1 and the arrows adjacent thereto represent the nearly circular path described by the end of each lever in the respective series when in operation.

As the ends come together at *a*, the pins *i* pass into the hooks *i'*, causing the levers to interlock, and they are thence carried downward in a straight vertical line to the point *b*, where they separate, and each follows its own orbit.

The effect upon the eccentric annular weights is as described in my patents hereinbefore referred to.

The rotation of each is indicated by the arrow placed thereon in fig. 1.

The wheels E E rotate in the direction indicated by the arrow shown in full lines in fig. 1, and the wheels E' E' in the opposite direction, as indicated by the dotted arrow.

### *Claim.*

I claim as my invention—

The combination of the two movements, running in opposite directions, with their levers interlocking automatically, in manner substantially as described.

JACOB WOOLF.

Witnesses:

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