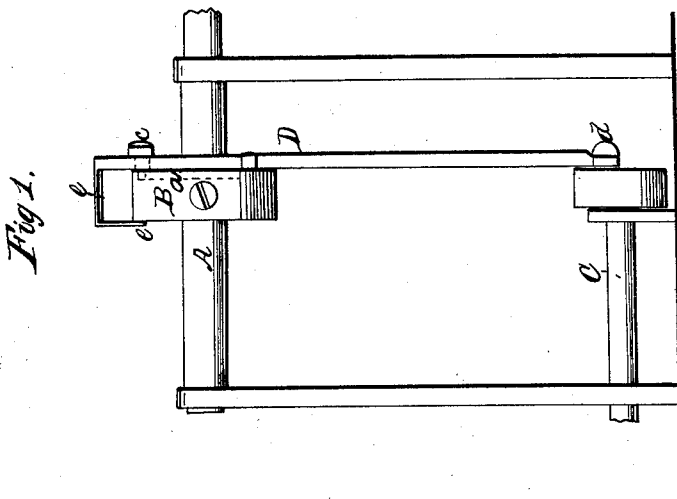
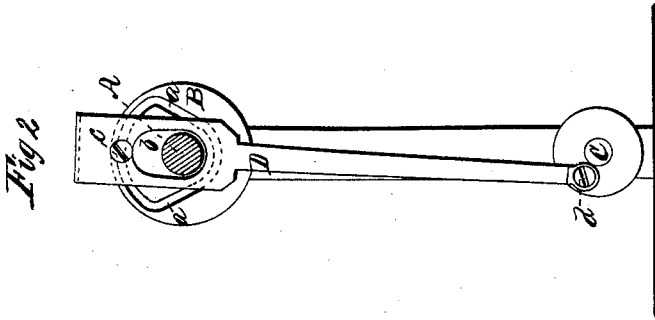


*S. C. Ketchum,  
Converting Motion.*

*N<sup>o</sup> 38,311.*

*Patented Apr. 28, 1863.*



*Witnesses.  
J. W. Loombs  
W. Reed*

*Inventor:  
S. C. Ketchum  
per Wm. H. G.  
Attorneys*

# UNITED STATES PATENT OFFICE.

STEPHEN C. KETCHUM, OF WINCHENDON, MASSACHUSETTS.

## IMPROVED MODE OF CONVERTING MOTION.

Specification forming part of Letters Patent No. 38,311, dated April 28, 1863.

*To all whom it may concern :*

Be it known that I, STEPHEN C. KETCHUM, of Winchendon, in the county of Worcester and State of Massachusetts, have invented a new and improved device for converting rotary into regular or irregular reciprocating motion; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figures 1 and 2 are elevations at right angles to each other of my improved device.

Similar letters of reference indicate corresponding parts in both figures.

My improved device for converting rotating into reciprocating motion is composed of a rotating shaft, a grooved disk secured to the said shaft, and a slotted hooked rod carrying a pin which enters the groove of the disk, the whole combined as hereinafter described.

A is the rotating shaft fitted to suitable fixed bearings, and having rotary motion given to it by any suitable means. C is a shaft to which a reciprocating or alternate circular motion is to be given, also arranged in fixed bearings. B is the grooved disk of uniform thickness, firmly secured to the shaft A, and having in one side a cam-groove, *a*, of such form as the character of the reciprocating motion to be produced may require, according as it is to be regular or more or less irregular or intermittent. D is the rod, straight for the greater portion of its length, but having its upper part bent over in the form of a square hook, *e*, the width of which is such that it will just receive the thickness of the disk B within it, as shown in Fig. 1, and allow a free movement of rod and disk. The hook and a portion of the rod below it are made broad and flat that they may have a good bearing against both sides of the disk, and in the flattened

portion of the rod below the hook there is a slot, *b*, the width of which is such that the shaft just passes freely through, and the length of which is sufficient to permit the rod to move longitudinally to the extent of the length of the reciprocating motion required. Above the slot *b* there is secured in the rod the pin *c*, which enters the cam-groove *a* of the disk. This pin *c* may, however, be below the slot. The lower end of the rod D is connected with a crank-wrist, *d*, carried by the shaft C. The rotary motion of the shaft A causes the cam-groove *a* of the disk to act upon the pin *c* in such manner as to produce a longitudinal reciprocating movement of the rod D, and the said rod is thereby made to impart to the crank-wrist *d*, and through it to the shaft C, an oscillating or alternate circular motion, the upper part of the rod being kept in place by the slot *b* working upon the shaft and the hook *e* working upon the disk. The rod D, operated in the same manner, may be made to impart a reciprocating rectilinear motion to any body working in straight guides by being connected at its lower end with such body.

This device constitutes a very simple means of obtaining an irregular reciprocating motion, as it dispenses with extra guides in proximity to the shaft, the disk and shaft themselves constituting the only guides necessary. It may be arranged with the rod horizontal or inclined as well as vertical.

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

The combination of the rotating shaft A, disk B, hooked and slotted rod D, and pin *c*, the whole arranged and operating substantially as and for the purpose herein specified.

STEPHEN C. KETCHUM.

Witnesses:

E. PITKIN,  
E. S. MERRILL.