

(No Model.)

W. B. MUNGER.

MACHINE FOR CONVERTING MOTION.

No. 262,685.

Patented Aug. 15, 1882.

Fig. 1.

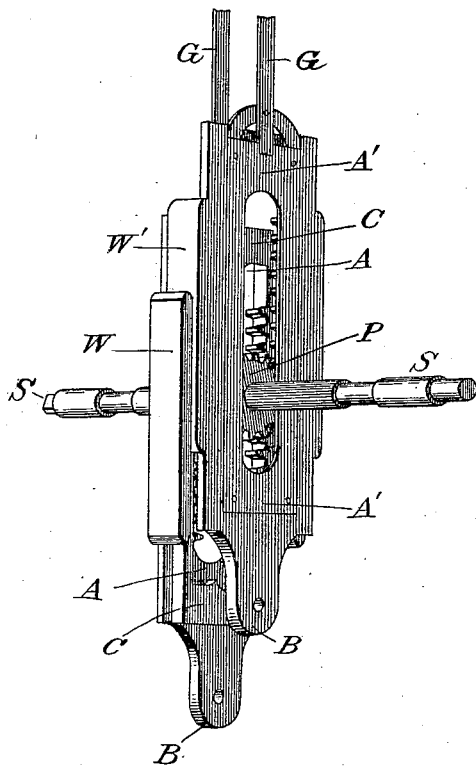


Fig. 2.

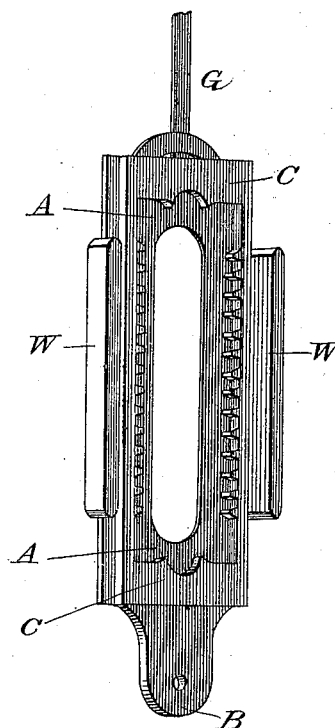


Fig. 3.

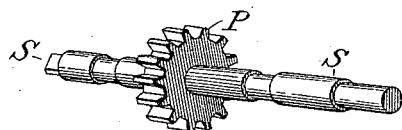
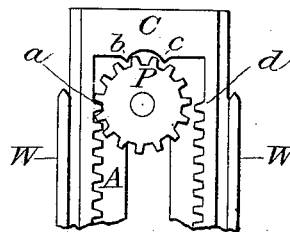


Fig. 4.



Witnesses:

Edwin Regal.
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Inventor.

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UNITED STATES PATENT OFFICE.

WILLIAM B. MUNGER, OF OBERLIN, OHIO.

MACHINE FOR CONVERTING MOTION.

SPECIFICATION forming part of Letters Patent No. 262,685, dated August 15, 1882.

Application filed June 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, WM. B. MUNGER, a citizen of the United States, residing at Oberlin, in the county of Lorain and State of Ohio, have
5 invented a new and useful machine for the conversion of motion from rotary to reciprocating; and the reverse, of which the following is a specification.

My invention relates to improvements in machines for changing rotary to reciprocating motion, or the reverse, in which reciprocating racks are moved simultaneously in opposite directions, operated by a single pinion; and the objects of my improvement are, first, the easy
15 and certain transfer of the racks to opposite sides of the pinion at the end of each stroke; second, the securing of the racks to the pinion without slipping of cogs in any part of the stroke; and, third, to save the loss of power
20 from oblique action and too great leverage. I attain these objects by the mechanism illustrated in the accompanying drawings, in which similar letters refer to similar parts throughout the several views.

Figure 1 is a perspective view of the entire machine. Fig. 2 is a perspective view of one of the essential parts of the machine, a frame with rack-teeth on both its inner edges and at the ends. Fig. 3 is the pinion and shaft
30 which power is applied in changing rotary to reciprocating motion. Fig. 4 shows the pinion engaged with the rack at the moment when the rack has run its length.

The rack, Fig. 2, consists of a frame, C C, whose length is about three and one-half times its breadth, having cogs cut on both of its inner edges and at least two sharper-edged cogs at each end. Each machine has two such racks. The frame is backed by a plate of metal, A A, extending in width beyond the frame a distance equal to the length of a cog, and carrying on each of its outer edges a wing or guide, W W. A groove is thus left on each side of the frame between the frame C C and the
45 guide W W, into which the guide of another rack similar in all respects to the one described will exactly fit if placed face to face upon it. A wing of each rack will fit in the corresponding groove of the other rack.

Fig. 3 shows the shaft and pinion, the axial length of the latter being double the thickness of the frame of either rack, or long enough to

receive the teeth of both racks when in position. The diameter of the pinion, including the cogs, is just sufficient to allow the pinion to be
55 engaged with the teeth on one side of the frame and not to touch those on the other side.

When all the parts are in position, as in Fig. 1, the pinion P is inclosed, as in a box, the shaft S S protruding through a slot cut in the back-
60 ing A' A'. The guide W' moves in the groove between the guide W W and the frame C C. A right-handed revolution of the pinion would now carry the frame A' A' upward and the frame C C downward until the end of each
65 frame touches the pinion, when instantly the frame A' A', by a small lateral movement to the left, and the frame C C, by an equal movement to the right, will be in position to make
70 the contrary stroke. The guide W' would then descend outside the guide W W, the latter taking the groove between W' and its frame.

Fig. 4 shows how the lateral movement of the two racks is secured. Left-handed revolution of the pinion P on a fixed axis would
75 throw the frame C to the left and engage the rack at d. Right-handed revolution, on the contrary, would move the frame upward, the guides W' and W W always holding the racks in gear with the pinion in ascending or de-
80 scending.

The guides G G, Fig. 1, or an equivalent device, serve to hold the frames together and prevent them from sliding on the pinion in the direction of the axis.
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The lugs B B or an equivalent device is necessary for attaching the machine to the weight to be moved—*e. g.*, in pumping water from a well by means of a wind or steam motor.

The accompanying drawings are intended to represent a machine which shall reverse the direction of the racks at the end of each complete revolution of the pinion.

In a machine for running a metal-planer or doing other work where great length of stroke
95 is required the rack can be of any desired length as compared with the circumference of the pinion, and when the object of the machine is to convert reciprocating motion to rotary the pinion may be of greater circumference
100 than the length of the rack.

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

1. The double rack geared to a single pin-

ion so as to work simultaneously on opposite sides of it, substantially as described, and for the purpose set forth.

2. The two cogs at each end of each rack, 5 formed and spaced as described, and for the purpose of producing lateral motion of the racks, substantially as set forth.

3. The wings or guides automatically adjusted, holding the racks always in gear with

the pinion, substantially as described, and for the purpose set forth.

4. The combination of the self-adjusting racks, pinion, and guides, substantially as described, and for the object set forth.

WM. B. MUNGER.

Witnesses:

P. G. AKERS,

FRED WEBSTER.