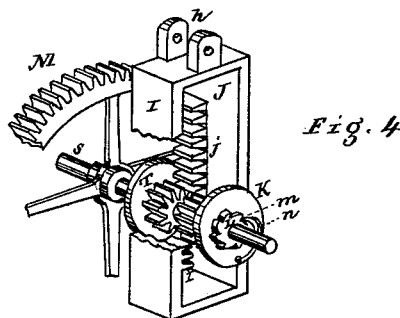
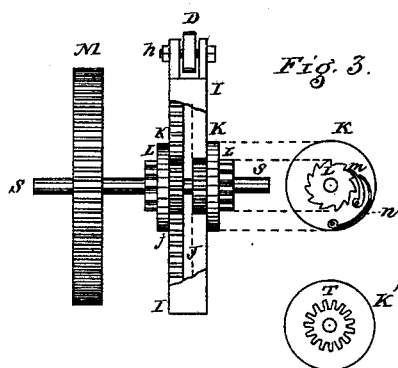
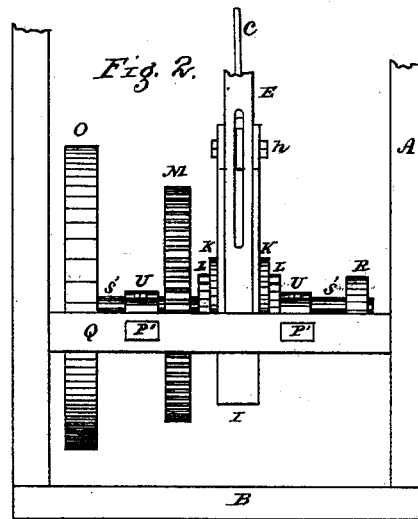
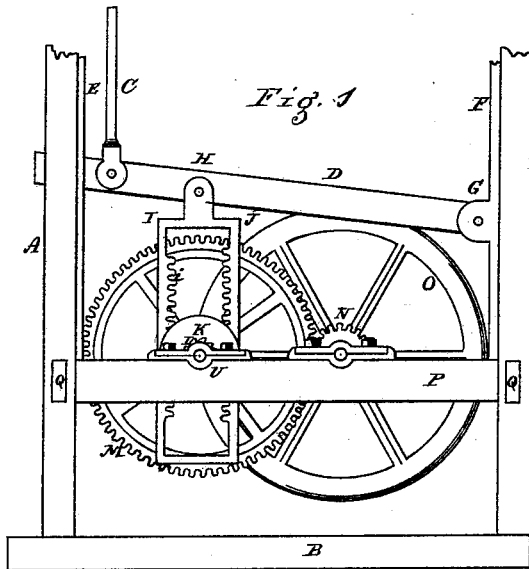


D. Z. LANTZ.
Double Rack-and-Pinion Movement.
No. 218,819. Patented Aug. 26, 1879.



WITNESSES.

A. Fleming
C. S. Kauffman

INVENTOR.

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DAVID Z. LANTZ, OF NEAR GAP P. O., PENNSYLVANIA.

IMPROVEMENT IN DOUBLE RACK-AND-PINION MOVEMENTS.

Specification forming part of Letters Patent No. **218,819**, dated August 26, 1879; application filed February 13, 1879.

To all whom it may concern:

Be it known that I, DAVID Z. LANTZ, residing near Gap P. O., in Lancaster county, State of Pennsylvania, have invented certain Improvements in Double Rack-and-Pinion Movements, of which the following is a specification.

The object of this invention is to utilize a rectilinear or vertical up-and-down motion by converting it into that of a rotary motion by means of a double rack actuated and guided in its vertical motion between the projecting flanges of a pair of pinions, &c., on the same shaft and appliances, herein more fully set forth.

The accompanying drawings and letters of reference, with a brief description, will enable those skilled in the art to make and use the same, in which—

Figure 1 is a side elevation of the combined parts; Fig. 2, a rear or end elevation of the same. Figs. 3 and 4 illustrate certain portions detached.

Any suitable frame-work may be used. I show corner-posts A, having cross-pieces Q on two opposite sides, connected by two parallel box-supports, P P.

The journal-boxes U support two shafts, S S', parallel to each other, with the operating-gearing.

Motion is imparted by connecting with the vertical pump-rod C, actuated by its connection, say, with a wind-engine and crank-arm, in the ordinary manner. This rod C is connected near one end to a lever-bar, D, which has its pivot-bolt at G in the upright F. The outer free end enters a guide-slot in the upright E, in which it has its up-and-down motion from the rod C aforesaid.

The lever D is connected at H by a pivot-bolt to perforated lugs *h* on the top of a two-sided box or double rack.

The inner faces of the sides marked I and J have each a vertical series of cogs, *i j*. These cogs extend nearly to the center of the respective sides I and J. Those, say, on the side J receive the cogs of a pinion, T, on one side, and those on the opposite side enter the cogs of the other pinion. This box-rack or sides I J are equal in width, to embrace both pinions T T, which have a flange, K, affixed

or cast with them, the rack-box having its motion between the flanges which form guides to the double rack and pinions to prevent lateral motion and to keep the reversed series of cogs engaged in the cogs of its respective pinion. These pinions, with their flanges, being loose upon the shaft *s*, will turn either way alternately as the rack-box moves up or down.

In order to produce a continuous rotary motion in one direction I employ a stout ratchet-wheel, L, firmly keyed to the shaft. Close to the outer face of each flange K, on this face of the flange, I affix a stout pawl, *m*, with a strong spring, *n*, bearing upon it, making it a part of the flange. Thus the pawl engages the teeth of the ratchet when turned in one direction, and revolves the shaft. The reverse movement of the flanged pinion allows the pawl or click to run over, as is well known. Thus the alternate action of the up-and-down motion of the rack on opposite sides, engaging alternately their respective pinions, always causes the one or the other pawl to hold and give motion to the shaft in rapid succession, the other pinion revolving freely for the time being until the motion is reversed. Thus a continuous rotary motion in one direction is established.

Ordinary gearing will suggest various connections. I show a cog-wheel, M, on the same shaft, driving a pinion, N, on another shaft, S. This latter shaft is provided with a fly-wheel, O, at one end. The other may be provided with a belt-pulley, R, or other gear for turning a grindstone, churn, corn-sheller, or the like.

There are numerous wind-engines used on farms for pumping water, and a strong desire exists for some means or attached machinery by which a rotary motion could be obtained on the ground level to be utilized, as before named. To supply this want has led me to devise the foregoing arrangement.

I am aware that racks and pinions and ratchets and pawls are variously employed in printing-presses, and in themselves nothing new. For converting reciprocating into rotary motion, as shown in the patent of A. S. Underhill, dated September 20, 1859, No. 25,550, he claims "The arrangement and combination of

a frame and four guards," elements I neither use nor claim.

The flanges of my pinions constitute the guide and guard; nor is my arrangement so calculated that the shaft may be reversed, the object and arrangement, as well as the combination, differing substantially.

What I claim as new, and desire to secure, is—

The combination of the guide-flanges K,

cast with the pinions T, and to which flanges the pawl and spring *m n* are attached, and the double rack-bar J I, when embraced between said guide-flanges on each side, the whole arranged and operating as and for the purpose specified.

DAVID Z. LANTZ.

Witnesses:

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C. L. KAUFFMEN.