A. S. TODD.
Mechanical Movement.

No. 196,842. Patented Nov. 6, 1877.

Fig: 1.

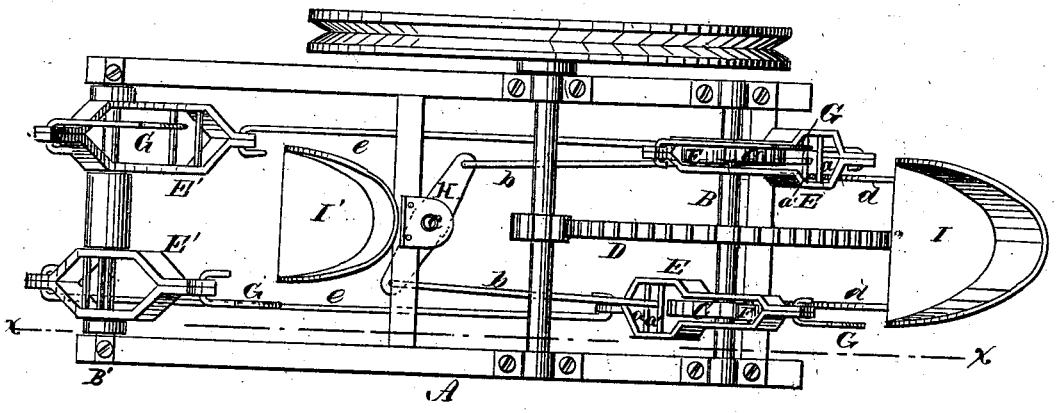
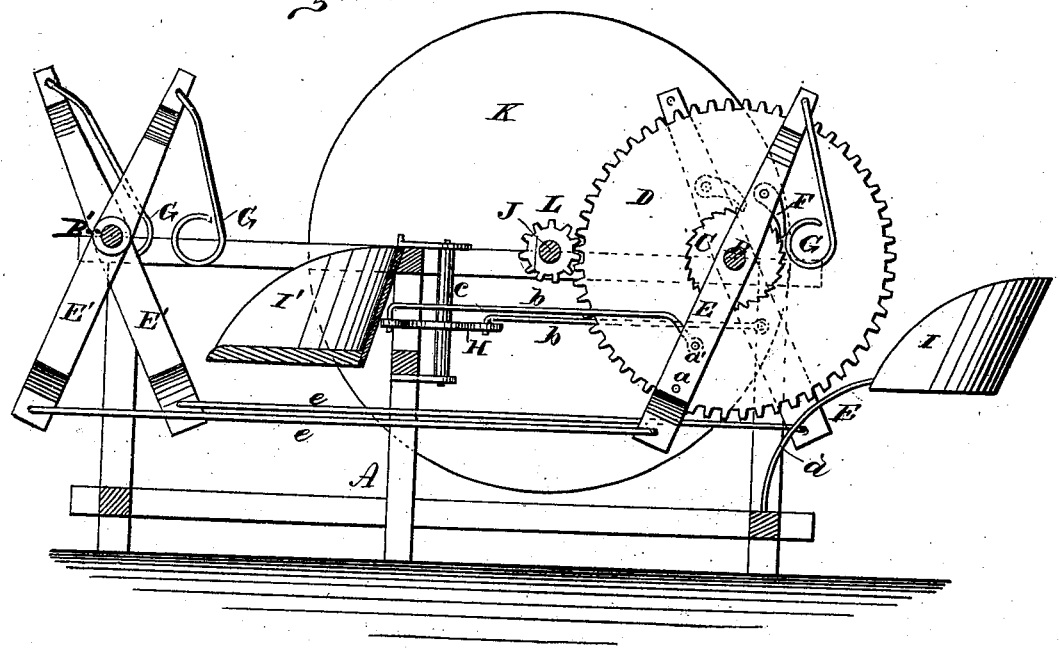


Fig: 2.



WITNESSES:

Chas. Nida.
J. W. Scarborough.

INVENTOR:

A. S. Todd.

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

ALBERT S. TODD, OF PULTNEYVILLE, NEW YORK.

IMPROVEMENT IN MECHANICAL MOVEMENTS.

Specification forming part of Letters Patent No. **196,842**, dated November 6, 1877; application filed August 24, 1877.

To all whom it may concern:

Be it known that I, ALBERT S. TODD, of Pultneyville, in the county of Wayne and State of New York, have invented a new and Improved Mechanical Movement, of which the following is a specification:

Figure 1 is a plan view of my improved mechanical movement. Fig. 2 is a side elevation, in section, on line *x x* in Fig. 1.

Similar letters of reference indicate corresponding parts.

The object of my invention is to provide a motive power that may be driven either by hand or foot, and by one or more persons, for driving machines, propelling boats and carriages, and for other purposes.

Referring to the drawing, A is a frame, in which is journaled a shaft, B, which carries, near each end, a ratchet-wheel, C, and at its center a spur-wheel, D. Split levers E are placed on the shaft B, one at each end, astride the ratchet-wheels C. In the upper ends of these levers pawls F are pivoted, which engage the teeth of the ratchet-wheels C, and handles G are jointed to the levers above the pawls.

The space between the two parts of the levers is widened near their lower ends, and two cross-bars, *a a'*, extend from one side to the other. The lower cross-bar *a* is designed for receiving the foot, and the upper cross-bar *a'* for receiving rods *b*, that are connected with a lever, H, having two equal arms, and secured to a rocking shaft, *c*, journaled in the frame A.

A seat, I, is placed conveniently near the levers E. In the present case they are supported by rods *d* from the frame A.

To operate the apparatus, the person occupies the seat I, and places his feet on the bars *a* of the levers E, and grasps the handles G, and moves the levers by the action of the arms and legs.

The levers E are made to move alternately in opposite directions by their connection with the lever H. The reciprocating movement thus secured is converted into rotary motion by the pawls F, which carry the ratchet-wheels C through a part of a revolution at each stroke of the levers.

A shaft, J, carrying the wheel K and the pinion L, is journaled in the frame A, and is driven by the spur-wheel D, which engages the pinion L.

When more force is required than can be exerted by a single person, another set of levers, E', which are similar to the lever E, are pivoted on a rod, B', and are connected with the levers E by rods *e*. A seat, I', is placed near them, and they are operated in the same manner as the levers E.

By extending the rods *e* any number of additional levers E' may be employed, and the power increased to any required extent.

The lever H may be dispensed with, if desired, when the limbs will be relied on to produce the alternate movement of the levers.

This apparatus is designed for driving machinery where a light power is required.

The upper cross-bar A is padded for the acting or contracting of the muscles of the leg, first, to give increased power; second, to relieve (in light form) the muscles of extension by change of action.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The pawl-levers E E, rigidly attached to ratchet-shaft B, and connected by rods with the middle-fulcrumed lever H, as shown and described, to enable a single lever, E', to turn the shaft at both the forward and backward stroke.

ALBERT STREET TODD.

Witnesses:
WM. CORNWALL,
H. AUCHAMPAUGH.