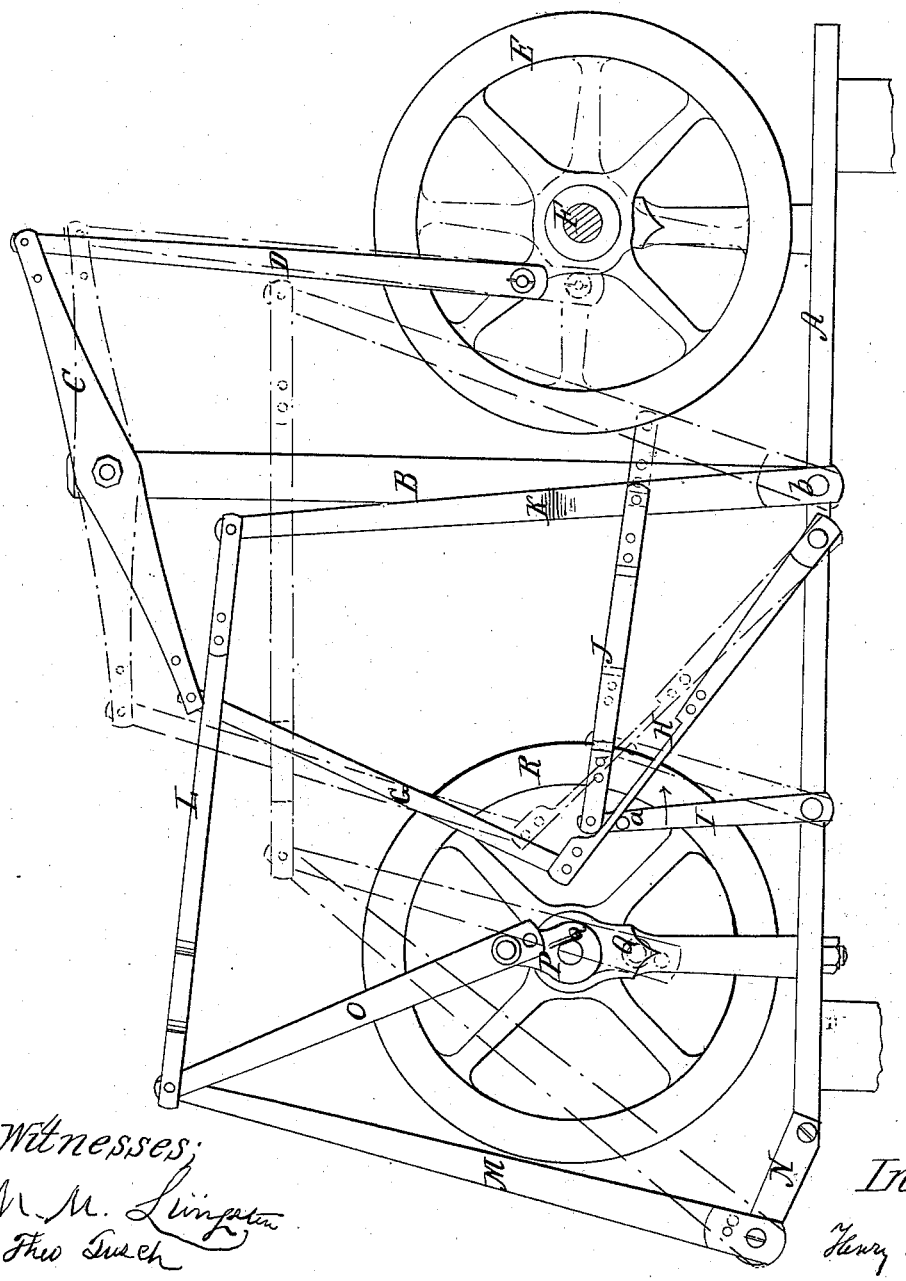
H. Bickel,

Motor.

No. 48,042. Patented July 6, 1865.



Witnesses;
M. M. Livingston
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UNITED STATES PATENT OFFICE.

HENRY BICKEL, OF ELIZABETH CITY, NEW JERSEY.

IMPROVEMENT IN POWER-GAINING MACHINES.

Specification forming part of Letters Patent No. **48,042**, dated June 6, 1865.

To all whom it may concern:

Be it known that I, HENRY BICKEL, of Elizabeth City, in the county of Union and State of New Jersey, have invented a new and Improved Power-Gaining Machine; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification.

The drawing represents a front elevation of this invention, showing the same in two different positions.

This invention consists in a combination of toggle-joints and levers for the purpose of moving any suitable machinery with increased force.

The construction of my machine will be easily understood from the following description.

A represents a platform or bed-plate from which rises a standard, B, that forms the fulcrum for the working-beam C. One end of this working-beam connects by a rod, D, with a big, heavy fly-wheel, E, that is mounted on a shaft, F, having its bearings in suitable standards or pillow-blocks rising from the bed-plate A. The other end of said working-beam connects by a rod, G, with a lever, H, which rests on the supporter I J. The rod G and lever H form a toggle-joint, and said lever is slotted and straddles the end of the lever I. Its lower surface forms an inclined plane, which rests on a stud, *a*, projecting from the sides of the lever I, and the rod J forms the connection between the lever I and another lever, K, which has its fulcrum on a pivot, *b*, secured in the platform A. This lever connects by a rod, L, with lever M, which has its fulcrum on the end of a link, N, that is pivoted to the platform A, and a rod, O, extends from the joint of the rod L and lever M to the crank P, which is secured to the end of a shaft, Q, on which is mounted a second fly-wheel, R. The rod L and lever M form a second toggle-joint, as will be presently explained. Any moving force applied to the supporter I in the direction of the arrow marked near it raises the rod G and the working-beam C, bringing the same from the position shown in black outlines to that shown in red outlines, and the fly-wheel E is set in motion with constantly-increasing power. By the toggle-joint L M N, attached to the lever K, I gain power and space in the same manner as by the first toggle-joint. The toggle-joint L M N is connected to the fly-wheel R, which may be set in motion by any suitable motive power.

In order to find the length of the crank P, I have to refer to the proportion given in explaining the motion of the first toggle-joint, G H. If the rod L has to travel thirty-six inches, the fulcrum of the toggle-joint passes through a space of twenty-four inches, and consequently the length of the crank must be twelve inches. From this description it is evident that I gain power and space without loss of velocity, for as soon as the fly-wheel R is set in motion the whole machine commences to work immediately.

The power gained by this machine can be readily ascertained by suspending weights from the fly-wheels E and R. It will be found that a weight of two ounces suspended from the fly-wheel R is capable of balancing a weight of one and one-half pound suspended from the fly-wheel E, or twelve times its own weight. Allowing one-third for friction, it will be seen that the gain in power is equal to eight times the force employed. This gain can, however, be still further increased by the addition of more toggle-joints, and my machine can be used with advantage for driving bellows of organs or melodeons, for hoisting-machines, or for the purpose of increasing the power of wind, water, horse, steam, or other motive power at the expense of motion.

I claim as new and desire to secure by Letters Patent—

The combination of the toggle-levers G H I J K L M, working-beam C, and fly-wheels E R, all arranged and operating as specified.

HENRY BICKEL.

Witnesses:

M. M. LIVINGSTON,

THEO. TUSCH.