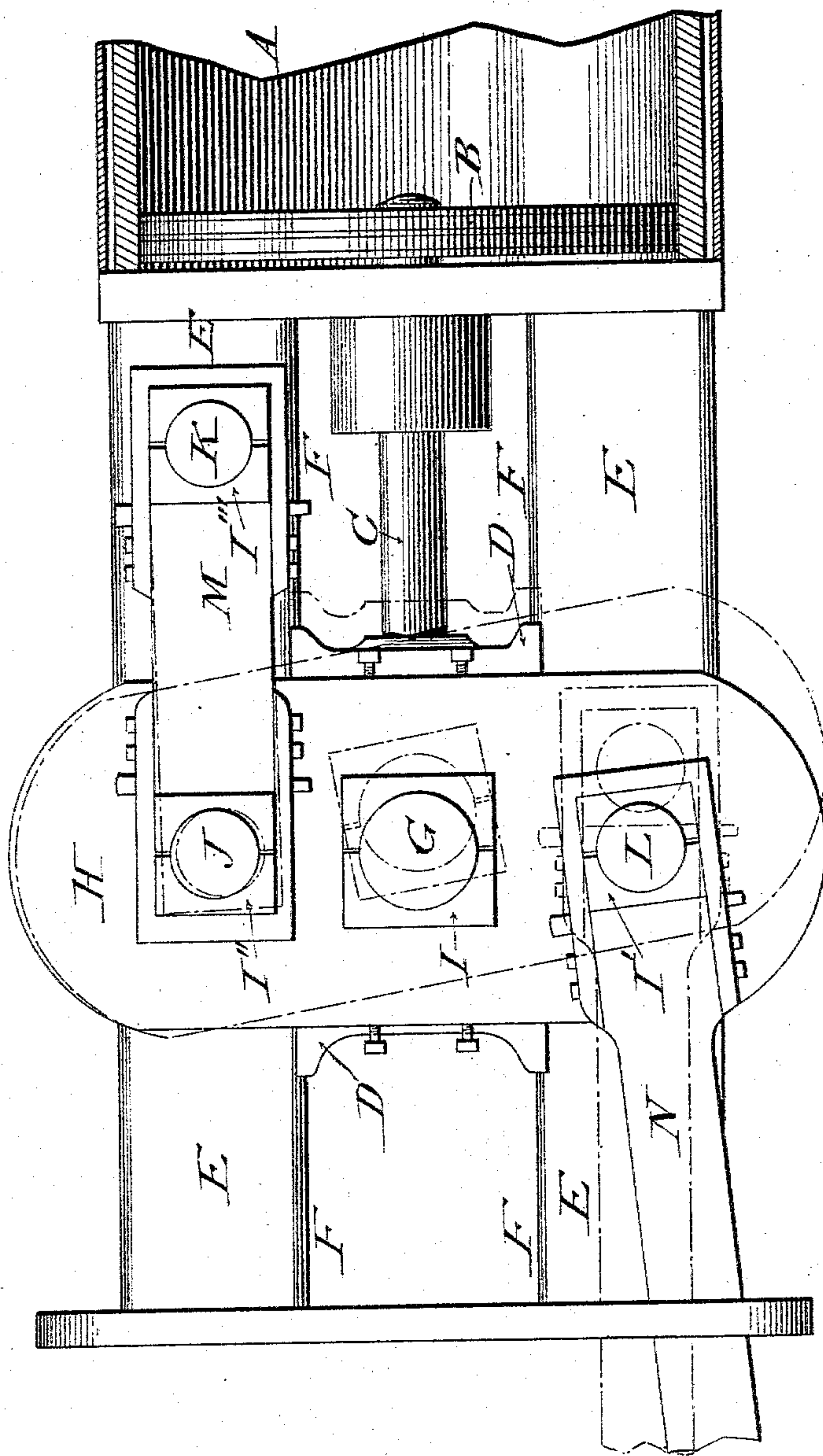


(No Model.)

R. CAMPBELL.
DIFFERENTIAL LEVER.

No. 494,756.

Patented Apr. 4, 1893.



Witnesses:

F. W. Campbell
J. M. Meloney

Inventor.

Robert Campbell

UNITED STATES PATENT OFFICE.

ROBERT CAMPBELL, OF ALLEGHENY, PENNSYLVANIA.

DIFFERENTIAL LEVER.

SPECIFICATION forming part of Letters Patent No. 494,756, dated April 4, 1893.

Application filed October 24, 1890. Serial No. 369,242. (No model.)

To all whom it may concern:

Be it known that I, ROBERT CAMPBELL, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a Differential Lever, of which the following is a specification, reference being had to the accompanying drawing, in which the figure represents a side elevation of my improved motor connection arranged to be actuated by an ordinary cylinder and piston.

My invention relates to the conversion of reciprocatory into rotary motion, and more especially to the transmission of piston force furnished by pistons of large areas with low speed, and its conversion into high crank speed; and to that end it consists in a lever which crosses the reciprocatory piston-rod or other reciprocatory part, and is provided on the one side thereof with a movable fulcrum upon a link and upon the other side is pivotally connected with the connecting-rod.

In the drawing, in which similar numerals indicate like parts, A indicates a motive cylinder of large area in which moves the piston B, having the piston-rod C. Upon a cross-head D at the outer end of the piston rod is a pivot pin G, upon which is hung a cross-lever H provided at each end with pivot pins J and L, respectively. A link M pivoted about a stationary pin K takes about the pivot pin J, this link extending from the cross lever toward the source of power, while to the pin L is pivoted the connecting rod which extends in the opposite direction. The cross-head D moves between guides F, F, upon the frame E E, and it is evident that as the cross-head reciprocates between the guides under the action of motive force applied to the piston-rod,

the lever H will oscillate upon its movable fulcrum pin J, and the motion communicated to the connecting rod will depend upon the relative distances of the pins G and L from the fulcrum at J, the link M oscillating upon its pivot pin K, and the pin L moving in an elliptical arc.

The advantages of my construction are apparent. The device is simple, strong and effective, a low piston speed with great power being converted into a high crank speed, dependent upon the positions of the pivot pins upon the lever H, which differentiates the motion of the piston in any desired degree.

What I claim is—

1. As a connection between a reciprocatory piston-rod or part and a crank-pin, a cross-lever hung upon the reciprocatory part, a link whose point of support is in a different horizontal plane from that of the piston-rod pivoted to the cross-lever, and a connecting-rod pivoted to the cross-lever and crank-pin; substantially as and for the purposes described.

2. As a connection between a reciprocatory piston-rod or part and a crank-pin, a cross-lever hung upon the reciprocatory part, a link whose point of support is in a different horizontal plane from that of the piston rod pivoted to the cross-lever, and a connecting rod pivoted to the cross-lever, and crank-pin, said link having such a relation to the lever that when the lever is vertical the link extends at right angles thereto; substantially as and for the purposes described.

ROBERT CAMPBELL.

Witnesses:

J. M. MELONEY,
SAM. MC. CLURE.