G. I. WASHBURN.

DIFFERENTIAL LEVER.

No. 46,838. Patented Mar. 14, 1865.

Fig 3.

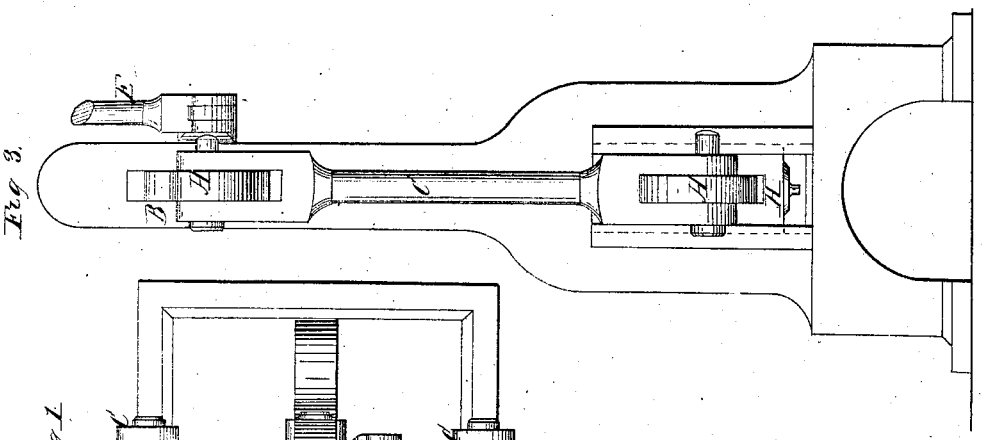


Fig 1.

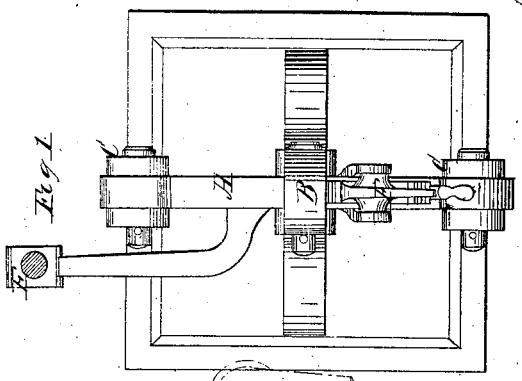
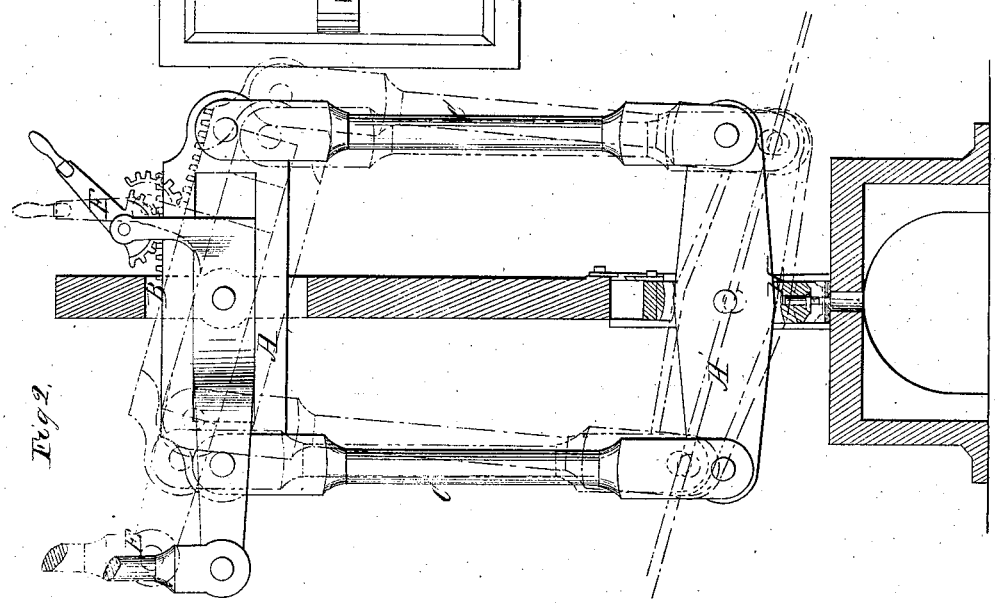


Fig 2.



Witnesses,
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UNITED STATES PATENT OFFICE.

GEORGE I. WASHBURN, OF WORCESTER, MASSACHUSETTS.

IMPROVED DIFFERENTIAL LEVER.

Specification forming part of Letters Patent No. **46,838**, dated March 14, 1865.

To all whom it may concern:

Be it known that I, GEORGE I. WASHBURN, of the city and county of Worcester, and State of Massachusetts, have invented a new and Improved Differential Lever; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification, inwhich—

Figure 1 is a top view of the machine. Fig. 2 is a front elevation, and Fig. 3 is a side elevation.

Similar letters of reference indicate corresponding parts in the several figures.

The object of my invention is to provide a method of transmitting power, especially in such cases as in slotting or punching, where it is desirable to have an intermittent action at the will of the operator and to any required extent, without stopping the driving machinery in the intervals. I merely mention the punching as a familiar operation to which my design is adapted, without inferring that its application is to be limited to that and kindred operations.

A A′ are two rock-shafts, or, as I prefer to call them, levers, suitably journaled, the upper lever to the frame B and the lower one to the plunger H. These levers are connected near their extremities with rods C C, by which simultaneous action of the levers is secured. It is not material to an intelligent description of the invention to determine how the driving-power is attached, but it may be supposed to be communicated by a rod, E, from a crank or otherwise.

Now, it will be apparent that as long as the centers upon which the levers vibrate are equidistant between the points of attachment of the rods C they may be vibrated without communicating any movement to the plunger B; but if one of the levers is slipped out to the right or left, so as to make one arm longer than the other, the center being immovably attached to the plunger B, (so far as lateral motion is concerned,) the plunger B will be raised and lowered by the vibration of the lever.

The state of rest of the combined lever (by which term I refer to the levers A A′ and their connecting-rods C) is shown in the drawings, Fig. 2, by black lines. Its position at its highest point with the levers in equilibrium is shown by red lines, and its position, when the upper lever is laterally projected, is shown in blue lines. This projection may be effected at will by a lever, F, with a cog segment-wheel and rack on the upper side of said lever, or it may be attained in any other suitable way. Thus, without interferring with the driving power, through the medium of the rod, the plunger B is caused to descend at will, and continue its strokes until, by the retraction of the lever to a position of equilibrium, the plunger is brought to a state of quiescence, for though the combined lever continues to vibrate on its two centers it does not impinge upon the plunger H, to whose foot the punch (in the application represented) is attached.

I believe I have sufficiently described my invention to enable those skilled in the art to manufacture and use the same, and I do not limit myself to matters of detail or adjustment, or in the particular forms it may assume in its application to varied purposes. The upper or lower lever may be made to protract or retract on either side, or both levers may be thus adjustable; but if one be retracted to the right and the other to the left to the same degree, no effect will follow, as the combined lever will be in equilibrium. If both be retracted to the same side, the effect will vary according as it is to one side or the other. The point of vibration of the upper lever is permanent, so far as the frame B is concerned, and the slotted lever slides back and forth, embracing a box attached to the frame B. The lower lever is pivoted to and passes through a large slot in the plunger H, which latter slides up and down inside the frame B, which is rigid and vertical.

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

So constructing a combined lever, A A′, that it may, by the projection of its parts from a state of equilibrium be made to communicate a reciprocating motion to a plunger or other mechanical appliance.

The above specification of my improved differential lever signed this 29th day of April, 1864.

GEO. I. WASHBURN.

Witnesses:

CHARLES D. SMITH,
OCTAVIUS KNIGHT.