E. VICAIRE.

Devices for Transmitting Motion.

No. 210,478. Patented Dec. 3, 1878.

Fig. 1.

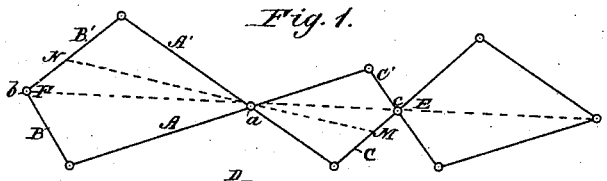


Fig. 2.

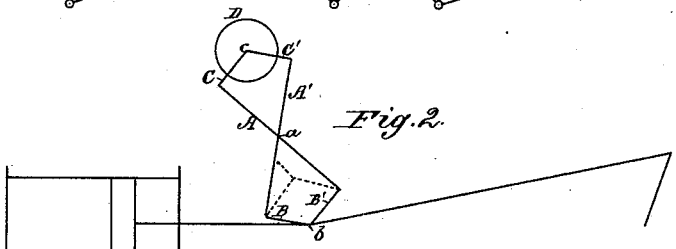


Fig. 3.

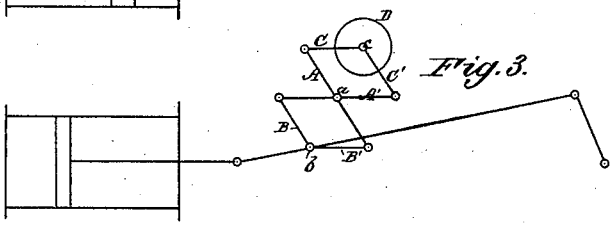
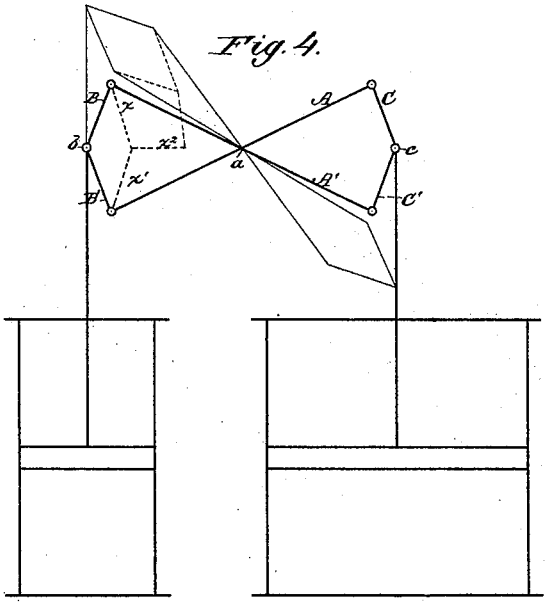


Fig. 4.



WITNESSES:

Edw. W. Byrn.

Solon C. Kemon

INVENTOR:

Eugene Vicaire

BY Munn & Co.

ATTORNEYS.

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE

EUGÈNE VICAIRE, OF PARIS, FRANCE.

IMPROVEMENT IN DEVICES FOR TRANSMITTING MOTION.

Specification forming part of Letters Patent No. **210,478**, dated December 3, 1878; application filed June 7, 1878; patented in France, June 14, 1877.

To all whom it may concern:

Be it known that I, EUGÈNE VICAIRE, of Paris, France, have invented a new and Improved Mechanical Movement; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to certain improvements in the transmission of motion, designed to destroy more nearly the impeding effect produced by the inertia of the moving parts. Among the efforts to overcome this difficulty counterpoises have been placed upon the wheels (of a locomotive, for instance;) but this method only acted as a counterpoise for the parts moving circularly, and even then only imperfectly, and did not destroy the effects of inertia in the parts having a reciprocating movement—such as the piston and piston-rod.

My invention consists in a peculiar form of compound beam or lever, provided with a counter-weight, designed to overcome the effects of inertia in these reciprocating parts, as hereinafter more fully described.

In the accompanying drawings, which represent diagrams illustrating my invention, A A′ represent two bars pivoted upon the same fulcrum, *a*. To the ends of these bars are attached the links B B′ C C′. One end of each of these links is attached to the ends of the bars, and the other ends of each set B B′ or C C′ are jointed together at *b* and *c*. There is thus formed a compound lever composed of six bars.

This device possesses the following properties or functions: When its fulcrum *a* is attached to an immovable object, any movement imparted to one of the ends, *b*, for instance, will reproduce at the opposite end, *c*, a movement in the reverse direction which is precisely the same as the first, both as to extent and velocity. Taking advantage of this fact for balancing the moving parts which reciprocate, I fix (see Fig. 2) the fulcrum *a* to a stationary part, and *b* I attach to the joint between the piston-rod and connecting-rod. At the other part, *c*, I locate a counter-weight, D, which will have the reverse movement of point *b*, of equal extent and velocity, and will exactly counterpoise the piston-rod and its attached reciprocating parts.

It is not necessary that the point *b* should be attached to the joint between the connecting-rod and piston-rod; but it may be attached, as in Fig. 3, to any point on the connecting-rod, the motion given to the point *b* still imparting to the counter-weight a movement of corresponding extent and direction, the small vertical movement of the counterpoise serving to balance the vertical reaction produced by the slight vertical movement of the connecting-rod.

This compound lever or jointed beam may also be used to advantage in the place of the common working-beam, as in Fig. 4, where it is required to transmit the reciprocating movement of one part to another which is to reciprocate in parallel position. In this case, if one of the points, *b*, be guided to move in a straight line by any means, the other point, *c*, will also move in a straight line parallel therewith, and this arrangement secures a great economy of space as well as material, and gives a greater range or amplitude of stroke.

To dispense with the ordinary guides for controlling the outer ends of the jointed beam, bars x x^1 x^2 may be employed, as shown in dotted lines of Fig. 4. Now, x^2 being pivoted at its inner end to a fixed point, as the beam rises it exerts a traction on x and x^1, causing a projection of B B′ to compensate for the increased length of beam when near the ends of its stroke. This same arrangement may be employed, as shown in dotted lines in Fig. 2, to dispense with the cross-head guide-bars.

Sometimes it may be desirable to employ a series of these jointed bars, as in Fig. 1, and so long as the diagonal line E E passes through the end joints the quadrangles formed by the bars need not be equal. The points from which the motion is taken need not be necessarily at the end joints, but may be taken on any straight line passing through the fixed fulcrum, as at N M.

Having thus described my invention, what I claim as new is—

1. As a new mechanical movement, a compound beam or lever composed of six bars,

two of which, A A′, are pivoted between their ends upon a common fixed fulcrum, and the other four, B B′ C C′, of which are pivoted to the outer ends of A A′, and have their own outer ends jointed together, substantially as shown and described.

2. The combination, with the reciprocating parts of an engine having reaction due to the inertia of the moving parts, of the bars A A′ B B′ C C′, the said bars A A′ being pivoted upon a common fixed fulcrum, and one of the end joints being provided with a counterweight, D, having a reverse movement from the part of the machine attached to the other end, as described.

EUGÈNE VICAIRE.

Witnesses:
ROBT. M. HOOPER,
EUGÈNE HEBÈRT.