R. P. BOWDOIN.

Device for Converting Motion.

No. 215,872. Patented May 27, 1879.

Fig. 1.

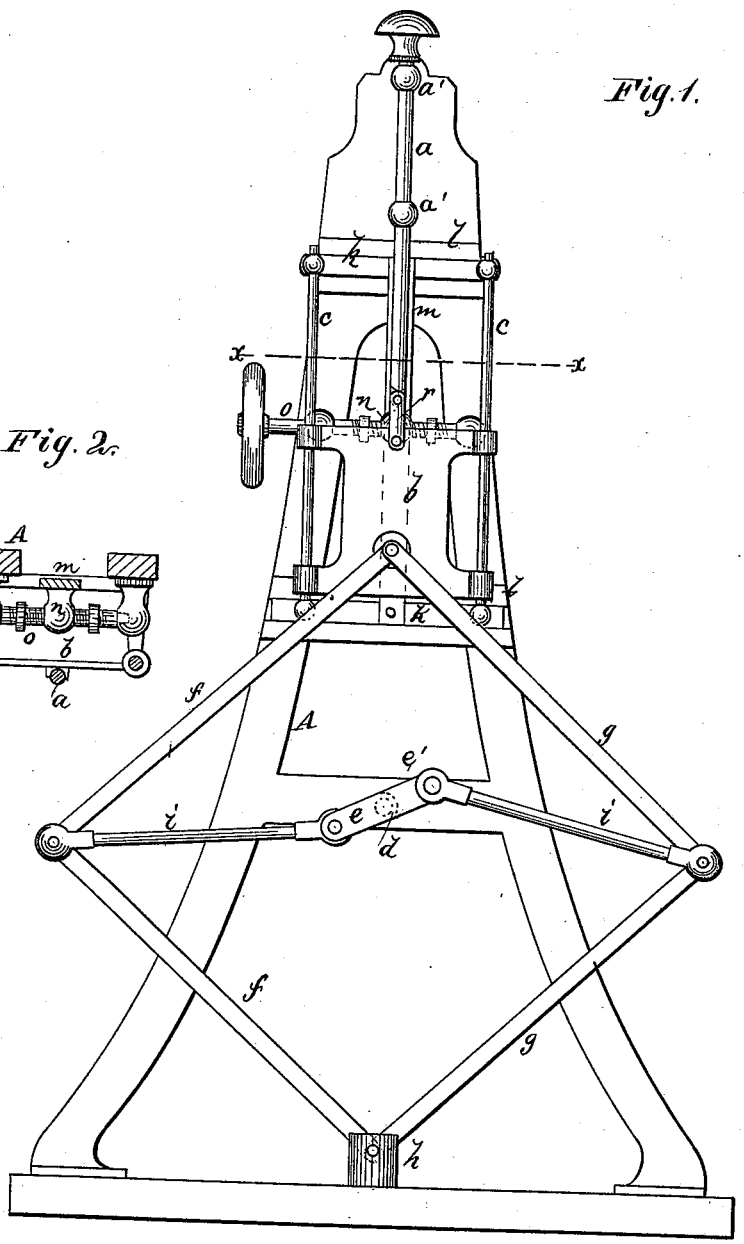
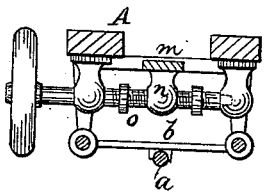


Fig. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

RUFUS P. BOWDOIN, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN DEVICES FOR CONVERTING MOTION.

Specification forming part of Letters Patent No. **215,872**, dated May 27, 1879; application filed April 25, 1879.

To all whom it may concern:

Be it known that I, RUFUS P. BOWDOIN, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Device for Converting Motion, of which the following is a specification.

My invention relates to devices for converting reciprocating into continuous rotary motion, and is especially intended for use in connection with steam-engines.

The invention consists in the combination, with a reciprocating slide and a shaft fitted with diametrically opposed cranks, of toggle-bars and link-rods, whereby the motion of the slide is imparted to the shaft, and by sidewise adjustment of the slide the shaft is revolved in the direction desired, as more particularly set forth in connection with the accompanying drawings, wherein—

Figure 1 is a front elevation of apparatus embodying my invention. Fig. 2 is a cross-section on line *x x*.

Similar letters of reference indicate corresponding parts.

A may represent the supporting-frame of a vertical engine, of which *a* is the piston-rod and *b* the cross-head, that is fitted to slide on the rods *c c*. *d* is the shaft, which is provided with cranks *e e'*, which I prefer should be at opposite sides of the shaft.

To the cross-head *b* is connected one end of the two pairs of toggle-bars *f f* and *g g*, and the other end of these toggle-bars is pivoted to a fixed support, *h*, at the bottom of frame A. The joints of the toggle-bars *f f* and *g g* are about on a line horizontally with shaft *d*, and each pair of toggles is connected by a link or rod, *i*, to one crank of the shaft. The rods *f* are connected to crank *e*, and rods *g* to crank *e'*.

It will be seen that the reciprocation of the cross-head *b* imparts movement to the toggles, which movement by rods *i'* will impart rotary motion to the shaft.

To insure movement of the shaft in the desired direction and enable the cranks to pass the centers without the use of a balance-wheel, the described parts are fitted as next described.

The slide-rods *c c* of the cross-head *b* are rigidly attached at their upper and lower ends to cross-plates *k*, that are fitted in slideways *l* on frame A. The plates *k* are connected together by a plate, *m*, upon which, midway between the plates *k*, is a nut, *n*. A screw, *o*, boxed on frame A, passes through the nut *n*, and upon the outer end of screw *o* is a hand-wheel for turning the screw, by which means the rods *c* and cross-head *b* are moved bodily in either direction at right angles to the direction of reciprocation.

The piston-rod *a* moves in guides *a'*, and to allow of the described movement of the cross-head without binding of the piston the connection of the latter to the cross-head is made by a link, *r*.

The described adjustment of the cross-head throws the connection of the toggle-bars thereto to the right or left of the center line of reciprocation, which has the effect of shortening one pair of toggle-bars and lengthening the other pair.

This change of relative position permits the cranks to pass the center before the cross-head reaches its extreme movement in either direction, and consequently the rotary movement of the shaft will be continuously in one direction, according to the adjustment.

A balance-wheel may be used upon the shaft if desired, and the device used for reversing the engine.

The invention is particularly adapted to marine engines.

I do not limit myself to the details of construction exactly as set forth, nor to the relative arrangement of the parts, as shown, as these may be varied without departing from my invention.

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

1. As an improvement in means for converting motion, the combination, with a reciprocating slide or cross-head, that is fitted for adjustment in a direction at right angles to its reciprocation, and a shaft provided with two cranks, of toggle-bars *f f* and *g g* and rods *i*, substantially as described and shown, and for the purposes set forth.

2. In combination with the adjustable cross-head or slide *b* and its toggle-connections to the crank-shaft *d*, the nut *n* and screw *o*, substantially as and for the purposes specified.

R. P. BOWDOIN.

Witnesses:
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