Aug. 24, 1926. 1,597,080

T. H. LEWIS

MECHANICAL MOVEMENT

Filed May 13, 1925

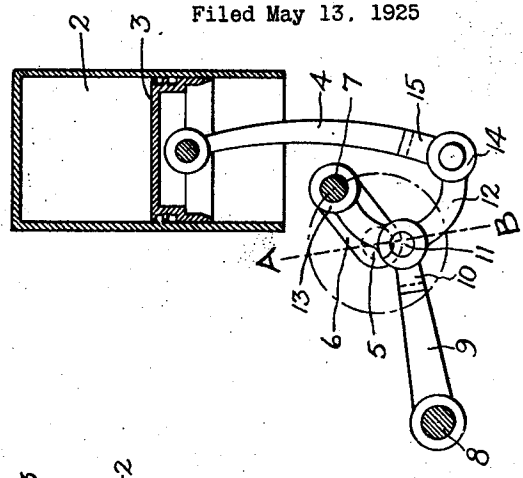


Fig. 3

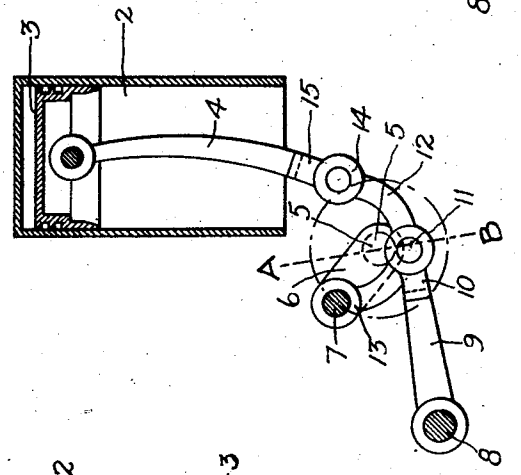


Fig. 2

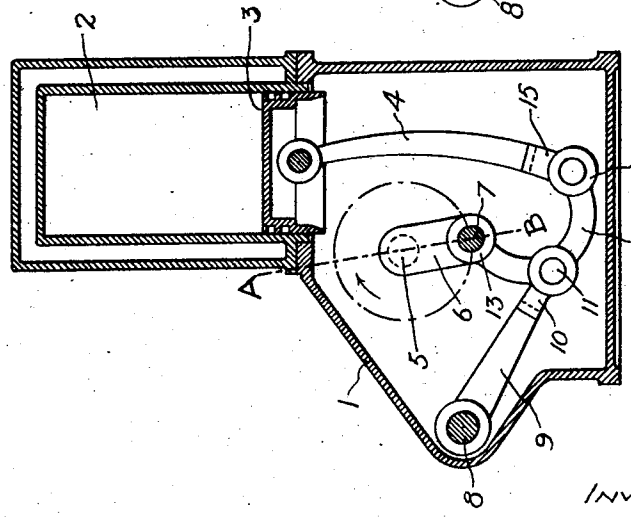


Fig. 1

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Patented Aug. 24, 1926. 1,597,080

UNITED STATES PATENT OFFICE.

THEODORE H. LEWIS, OF VANCOUVER, BRITISH COLUMBIA, CANADA.

MECHANICAL MOVEMENT.

Application filed May 13, 1925. Serial No. 30,040.

My invention relates to improvements in mechanical movements the particular objects of which are to provide means where the power stroke of a single acting piston may be applied to more than one half the cycle of rotation of the crank pin to which it is connected and in a like manner to utilize more than half of the cycle of rotation of a crank in moving a single acting piston along its working stroke.

The invention consists essentially of a bell crank pivotally connected to one end of a rocker arm which is interposed and rockingly connected between a crank pin and the big end of a connecting rod of a piston, as will be more fully described in the following specification, in which:—

Fig. 1 is a sectional view of a single acting engine equipped with my invention, showing the piston at the bottom of its stroke.

Fig. 2 is a view showing the position of the crank with the piston at the top of its stroke.

Fig. 3 is a view showing the piston half down on the power stroke and the crank carried over its top centre.

In the drawings like characters of reference indicate corresponding parts in each figure.

The numeral 1 indicates a crank case having suitable bearings in which the several parts are journalled. The numeral 2 indicates an engine cylinder having a piston 3 to which is fitted a connecting rod 4 for imparting rotation to a crank shaft 5 in a clockwise direction. The crank shaft is provided with a crank 6 and a crank pin 7. As a means of more clearly showing the movement accomplished the centre line of the crank cycle is indicated by the dotted line A—B, the upper end A representing the top crank centre and the lower end B representing the bottom centre.

The numeral 8 indicates a rocker arm shaft upon which is fulcrumed a rocker arm 9 having a fork 10 at its free end in which is carried a pivot pin 11. A bell crank 12 is rockingly mounted intermediately of its length to the pin 11, the outer ends 13 and 14 of the bell crank are connected respectively to the crank pin 7 and the big end bearing 15 of the connecting rod 4.

Having thus described the several parts of my invention I will now briefly explain its operation.

On the up or return stroke of the piston 3 the outer end 14 of the bell crank 12 is raised, causing a rocking movement of the bell crank about the pin 11 at the free end of the rocker arm 9. This movement during the entire upstroke of the piston continues until the bell crank is disposed with its outer ends 13 and 14 in a substantially horizontal plane and the crank 6 is rotated about its center to a point well under its top centre or A position as shown in Figure 2, the pin 11 of the bell crank being carried along the arc described by the outer end of the rocker arm 9 to its uppermost position. On the down or power stroke of the piston being commenced the outer end 14 of the bell crank 12 is depressed causing the crank to rock in a clockwise direction and to carry the crank pin 7 over the top centre, the piston on its downward movement reaches a point (see Figure 3) where the outer ends of the bell crank becomes disposed in a substantially vertical plane when the rocking movement of the bell crank is reversed. The further movement downwards of the piston rocks the rocker arm about the pivot pin 11 until the crank pin 7 is brought to its bottom centre or B position, when the momentum of the shaft 5 is sufficient to carry the crank beyond the bottom centre and return the piston to its power stroke.

What I claim as my invention is:

1. A mechanical movement comprising in combination with a piston connecting rod and a shaft having a crank and crank pin, of a rocker arm fulcrumed at one end, a bell crank pivotally connected, at the juncture of its arms, to the free end of the rocker arm one end of the bell crank being pivoted to the crank pin and the other end to the big end of the connecting rod.

2. In a mechanical movement, the combination of a piston equipped with a connecting rod, a rocker arm located at one side of the connecting rod and fulcrumed at one

end with the other end extending toward the connecting rod, a shaft located between the connecting rod and the fulcrum of the rocker arm and in a plane above said fulcrum, said shaft being equipped with a crank, and a bell crank lever pivoted, at the juncture of its arms, to the free extremity of the rocker arm, one arm of said bell crank being terminally pivoted to said crank and the other arm of said bell crank being terminally pivoted to the free end of the connecting rod.

Dated at Vancouver, B. C., this 4th day of May, 1925.

THEODORE H. LEWIS.