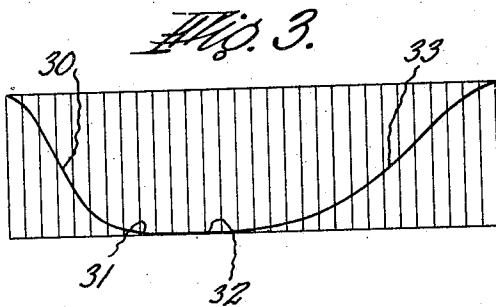
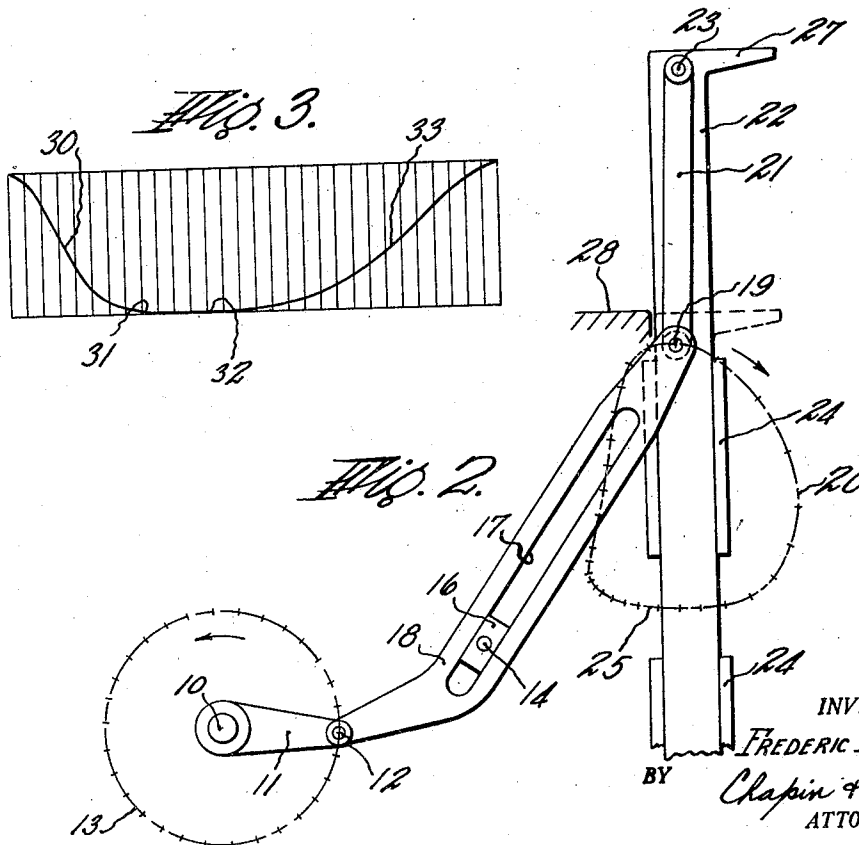
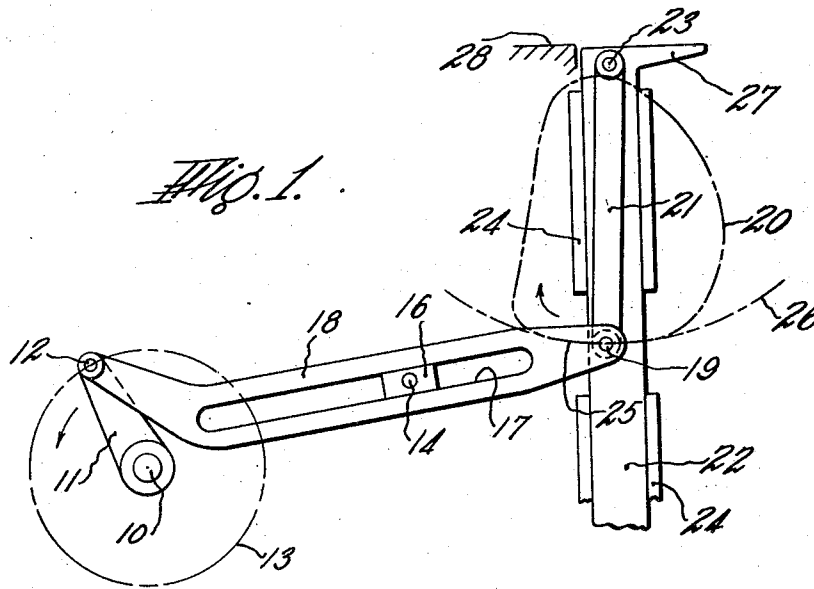


Jan. 6, 1931.

F. B. FULLER
MECHANICAL MOVEMENT
Filed Feb. 26, 1930

1,788,098



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MECHANICAL MOVEMENT

Application filed February 26, 1930. Serial No. 431,493.

This invention relates to a mechanical movement. One object is to provide a mechanism for converting a constant rotary movement into a reciprocating movement having a comparatively long period of dwell. A further object is to provide a mechanism of this general character in which a slow movement in one direction will be coupled with a faster movement in the reverse direction, the two movements being separated by a dwell where no reciprocation will take place in either direction. A further object is to accomplish these results without the use of cams and with a minimum number of moving parts.

Referring to the drawings:

Fig. 1 is a side elevation of my improved device;

Fig. 2 is a similar view with the parts in a different position of operation; and

Fig. 3 is a time motion chart of the driven element.

The principle upon which the device operates is the coupling of the driving shaft to the driven element through two mechanical stages; the first a linkage or equivalent device for giving to a movable pivot point a motion in a closed curve, a portion of which is substantially an arc of a circle, and the second a link having a length equal to the radius of that arc and joining the pivot point with the driven element. In the adaptation shown in the drawings the driving power is supplied from a shaft 10, preferably constantly rotating. A crank 11 is fixed upon this shaft, its crank pivot 12 traveling at a uniform rate around a circular path 13. Spaced from the shaft 10 is a fixed pivot 14 upon which is a swinging bearing block 16. Pivoted to the crank at 12, and provided with a slot 17 by which it may slide upon the block 16, is a lever 18 carrying at its end a pivot 19.

As the shaft 10 rotates, the pivot 19 will be caused to move through the path indicated by dot and dash lines 20 in Figs. 1 and 2, with a faster movement on the right hand side of this path than elsewhere. This is indicated by the short lines which intersect the path 20 at intervals. These lines are

spaced apart at distances corresponding to twelve degrees rotation of the crank 11, and of course a wide spacing of the lines represents a more rapid travel of the pivot 19 than a close spacing. The pivot 19 is joined by a link 21 with a driven member 22, to which the link is pivoted at 23, the driven member being here shown as guided for reciprocation in suitable ways 24. Due to the proportions of the crank and lever being about as shown, the lower part 25 of the path 20 will have a shape substantially that of an arc of a circle (indicated by 26 in Fig. 1), and the link 21 is taken of such dimensions that its effective length or the distance between the centers of pivots 19 and 23, is equal to the radius of this arc. During the entire passage of the pivot 19 through the arc-shaped portion 25 of its path, the link 21 will swing freely about its pivot 23 and will transmit no motion to the reciprocating driven member 22.

The utility of the device can be described most clearly with relation to its adaptation to one specific use. In the use chosen for illustration, the device is employed to operate the elevator of a wrapping machine. In certain machines for wrapping articles in paper, the articles are fed into position upon a flat-topped elevator which is then caused to rise, forcing the article against a piece of paper previously placed above it and introducing both article and paper into a folding mechanism. When the elevator is in its or article-receiving position it is desirable that it rest for a comparatively long period so as to give ample time for the article to be fed in and to become accurately positioned upon it. Various wrapping operations may be performed on the article and paper during the ascent of the elevator and this period of its motion is preferably steady and not too rapid. The descent of the elevator from its raised position is merely idle travel, and is preferably accomplished rapidly so as to leave the major part of the cycle for the operations of loading and transferring the article.

The device described accomplishes these desirable results without the use of cams or

of intermittently contacting parts. In Fig. 3 the displacement of the article-receiving top 27 of the elevator 22 has been plotted against the angular travel of the driving shaft 10. The vertical lines represent twelve degree periods in the steady angular motion of the shaft; and vertical distances represent relative displacements of the elevator above its lowermost position shown in Fig. 1. The path starts at the left of Fig. 3 with the elevator at its highest position. As the elevator descends from the position of Fig. 2, it moves rapidly, represented in Fig. 3 by the steep slope 30 of the path. The relatively rapid motion keeps up until the elevator has very nearly reached the bottom of its stroke, when it comes to rest smoothly at about the point 31. This lowermost position is preferably level with or slightly below a shelf 28 along which articles are fed onto the elevator. The dwell 32 resulting at this point, due to the passage of pivot 19 in an arc concentric with the pivot 23; continues for a very considerable period, equal with the proportion of parts shown to about sixty degrees of rotation of crank 11. Beginning again to rise, the elevator starts smoothly and continues with a lesser speed than during its descent. This is indicated by the slope of the rising portion 33 of the curve being less than the slope of the descending portion 30.

The device is of course equally adaptable to other uses and can be operated in different ways. For example, the whole mechanism could be inverted in cases where the dwell was desired at the top rather than at the bottom of the stroke. By leaving the arrangement of parts as shown and merely rotating crank 11 in the reverse direction, the elevator will be given a rapid rise and a slow descent, with a dwell at the bottom. Other adaptations will suggest themselves to those skilled in the art without further description.

What I claim is:

1. Mechanism for translating rotary motion into reciprocating motion comprising a crank, a bearing, a lever pivoted to the crank and slidably mounted on the bearing, a reciprocable driven member, and a link joining the driven member with the lever, constructed and arranged so that the point of connection between the link and the lever moves in a closed path having one portion in substantially the shape of a circular arc of a radius equal to the effective length of the link.

2. Mechanism for translating rotary motion into reciprocating motion comprising a rotatable driving member, a reciprocable driven member, a link pivoted to the reciprocable member, and mechanism coupling the driving member with the free end of the link, organized to cause said end to travel in

a closed path elongated in the direction of travel of the reciprocable member and having a portion lying in an arc of a circle having the link as its radius.

3. Mechanism for translating rotary motion into reciprocating motion comprising a rotatable driving member; a reciprocable driven member, a link pivoted to the reciprocable member, and mechanism coupling the driving member with the free end of the link, organized to cause said end to travel in a closed path elongated in the direction of travel of the reciprocable member, the speed of travel of the link on one side of said elongated path being substantially greater than the speed of travel along the other side thereof, said path sides being joined by a path lying substantially in an arc of a circle having the link as a radius.

4. Mechanism for translating rotary motion into reciprocating motion comprising a crank, a slide, a bearing positioned between the crank and the slide, a link pivoted to the slide, and a lever pivoted to the crank and to the link and slidable upon the bearing, substantially as and for the purpose described.

5. Mechanism for translating rotary motion into reciprocating motion, comprising a rotatable driving member, a reciprocable driven member, a link pivoted to the reciprocable member, and mechanism coupling the driving member with the free end of the link, organized to cause said end to travel in a closed path elongated in the direction of travel of the reciprocable member and having one end of said path formed as an arc of a circle having the link as its radius.

In testimony whereof I have affixed my signature.

FREDERIC B. FULLER.

CERTIFICATE OF CORRECTION.

Patent No. 1,788,098.

Granted January 6, 1931, to

FREDERIC B. FULLER.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, line 84, after the word "its" insert the word lower; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 27th day of January, A. D. 1931.

(Seal)

M. J. Moore,
Acting Commissioner of Patents.