

W. H. BAXTER.
APPARATUS FOR IMPARTING MOTION.

(Application filed July 17, 1900.)

2 Sheets—Sheet 1.

(No Model.)

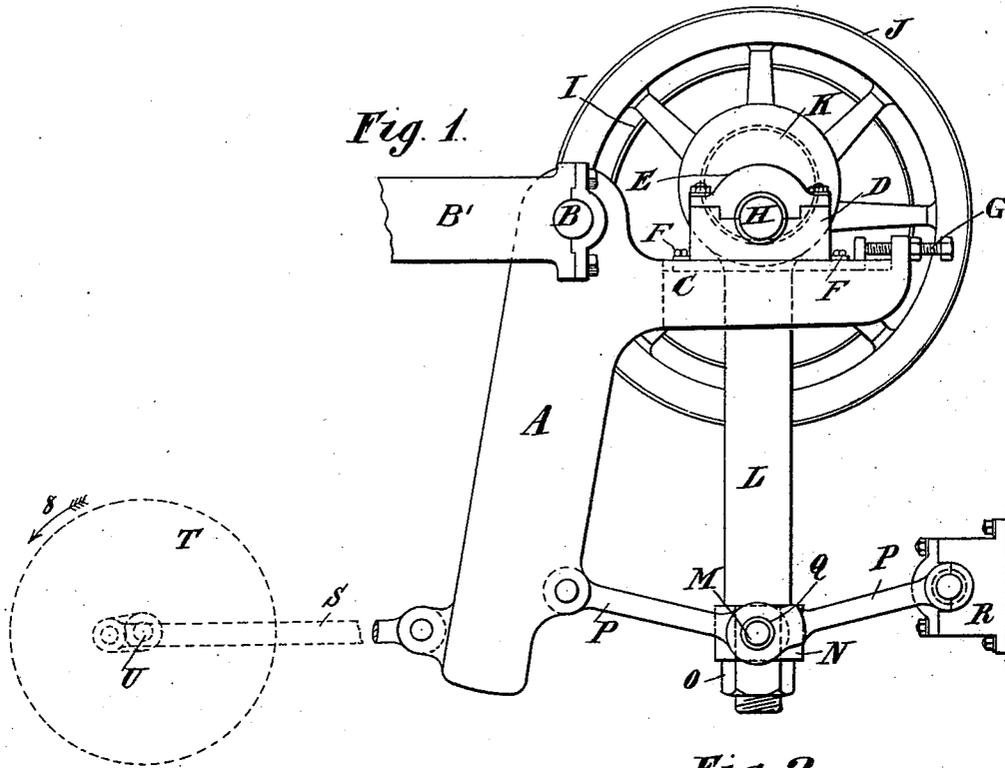
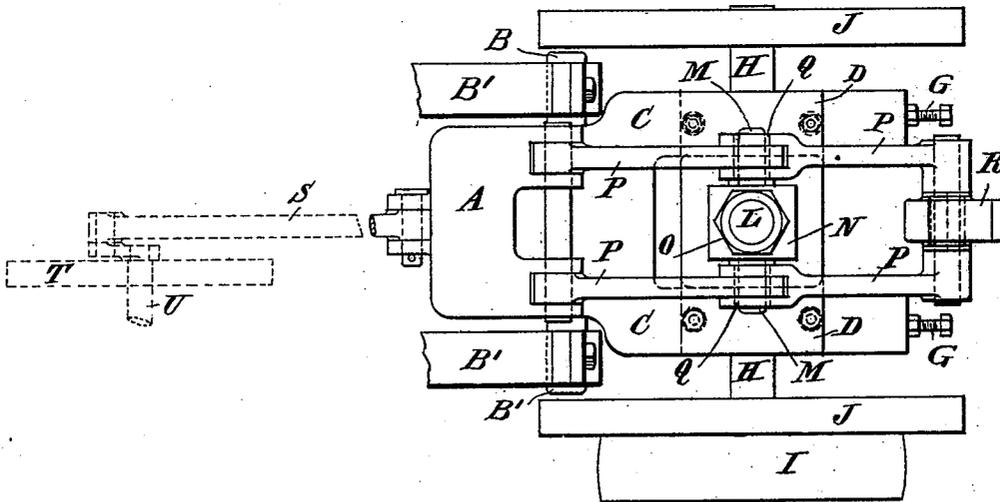


Fig. 2.



Witnesses:
 A. M. Parkins.
 J. A. McDonald.

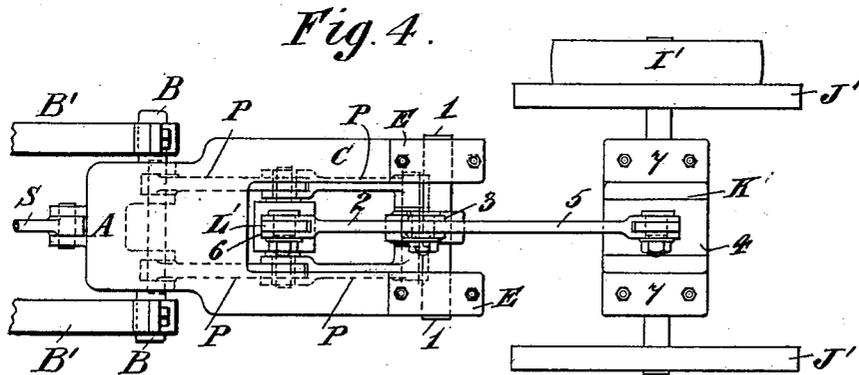
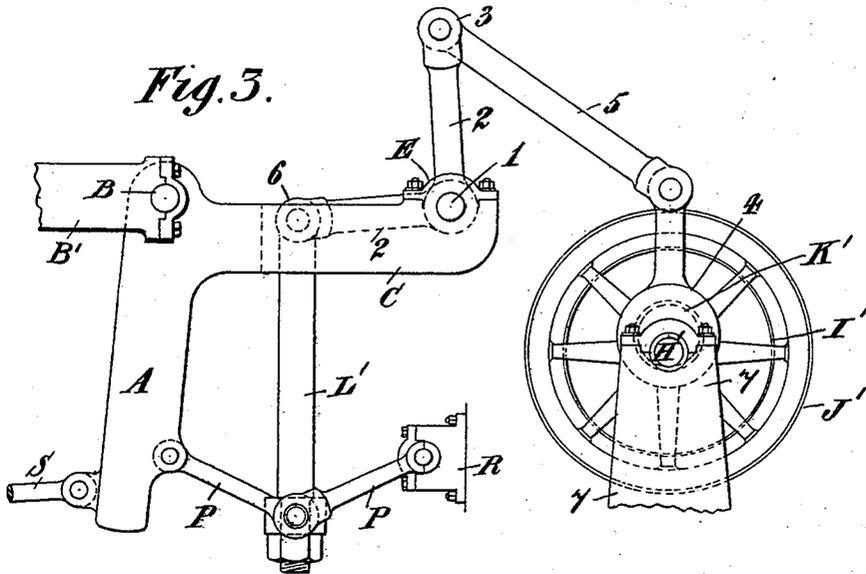
Inventor:
 William H. Baxter,
 by his attorney,
 Balch, Taubert & Night.

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2 Sheets—Sheet 2.



Witnesses:
 A. M. Parkins.
 J. A. Macdonald

Inventor:
 William H. Baxter,
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UNITED STATES PATENT OFFICE.

WILLIAM HENRY BAXTER, OF HARROGATE, ENGLAND.

APPARATUS FOR IMPARTING MOTION.

SPECIFICATION forming part of Letters Patent No. 689,454, dated December 24, 1901.

Application filed July 17, 1900. Serial No. 23,907. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY BAXTER, a subject of the Queen of Great Britain and Ireland, residing at Knapping Mount, Walker road, Harrogate, in the county of York, England, have invented a new and useful Improvement in Means or Apparatus for Imparting Motion to Various Kinds of Machinery, of which the following is a specification.

This invention relates to improvements in means or apparatus for imparting motion to various kinds of machinery; and it is particularly applicable to that class of machines in which a swinging or reciprocating portion thereof is actuated from a rotating shaft. It may also be adapted so as to be interposed between rotating portions thereof.

The objects of my invention are, first, to provide means whereby the driving-shaft and parts connected therewith employed for actuating the moving part of the machine may be mounted in bearings forming part of or rigidly fixed in advance of or in the rear of such moving part, so as to move therewith; second, to utilize the weight of such actuating parts for increasing the power without any appreciable or detrimental loss of movement, and, third, to dispense with the additional use of suspension levers or chains or intermediate toggles and parts connected therewith. I attain these objects by the mechanism illustrated in the accompanying drawings, which I desire to be taken as typical or illustrative examples of the means employed for carrying the invention into practice.

In the drawings, Figure 1 shows a front elevation of the mechanism for imparting motion to a machine with one of the fly-wheels removed. Fig. 2 shows a plan of the mechanism shown in Fig. 1 looking at the under side. Fig. 3 shows a part elevation of a modified form of the apparatus, and Fig. 4 shows a plan view thereof.

Similar characters refer to similar parts throughout the several views.

A is the swinging or reciprocating portion, which in the drawings is shown as a pendent lever and is hereinafter termed the "lever" A, and B the shaft or spindle upon which the lever A is mounted and fixed or upon which

it is hung, so as to swing freely thereon. In either case the lower end is free to reciprocate. The shaft is carried in bearings B', formed in or fixed to the framework of the machine.

In advance of or at the rear of the lever A is or are cast or otherwise formed or rigidly fixed thereon, so as to move therewith, one or more arms or projections C. Two of such arms are shown in the drawings, and they are hereinafter termed the "arms" C. A bearing D, with or without the cap or cover E, is either formed in the outer end of each arm or adjustably fixed thereto. When an adjustable bearing is employed, it may be in the form of a pedestal or block D, having a cap E and arranged, as shown in Fig. 1, to slide in guides on the upper surface of the arms C and to be fixed in position thereon by plates F and adjusted by screws G.

H is the driving-shaft, which is mounted in the bearings D of the arms C. On the shaft H is or are mounted and fixed one or more driving-pulleys I, fly-wheels J, and eccentrics K. In the drawings only one eccentric is shown at or about the center of the driving-shaft H, and it may be formed, if so desired, on the shaft H. Motion may be imparted to the driving-pulley from any suitable source of power by ordinary means.

Upon the eccentric K a connecting-rod L is pendently mounted. While it is preferred to mount only one connecting-rod upon a single eccentric, yet, if so desired, two or more eccentrics may be employed for each of said rods. When more than one connecting-rod is used, then a separate eccentric is employed for each connecting-rod. Instead of making the connecting-rod L as shown, it may be made in skeleton form, with an eye or bearing at each end to receive the shaft H and the trunnions or shaft M.

The lower end of the connecting-rod L or at a suitable distance therefrom is armed on each side thereof with a trunnion M, or a shaft may be arranged to pass through the connecting-rod and to project on each side thereof to form the trunnions, or the trunnions may be formed on or out of, as shown in the drawings, a separate block N and adjustably secured to the lower end of the connecting-rod by the nut O, as shown.

P represents toggle-levers arranged in the drawings on each side of the connecting-rod L; but, if so required, the connecting-rod may be so arranged that only one set of toggle-levers may be used, or the number may be increased, as circumstances require. The inner ends of each set of the toggle-levers are mounted on one of the trunnions M, which forms the pin or fulcrum for jointing them together. The hole in which the trunnion works may be, though not necessarily so, enlarged, as shown in the drawings, for receiving a bush Q. The outer ends of each set of toggle-levers are respectively attached to the lever A and to a pedestal R, capable of being fixed to the framework of the machine or a stationary portion thereof or to lugs formed thereon.

S is a rod for connecting the lower end of the lever A to the part of the machine to be actuated.

It will be readily understood that the same movement of the lever A may be obtained by mounting a shaft 1 on the arms C in place of the driving-shaft H, as shown in Figs. 3 and 4. On the shaft 1 is or are fulcrumed and fixed one or more double-ended levers 2. The driving-shaft H', with the pulleys I', fly-wheels J', and eccentric K', mounted thereon, is carried in the bearings 7, arranged at a suitable distance from, as well as below or above, the levers 2, so that the eccentric will act either directly on the outer end (or ends) 3 of said levers or, as shown in Figs. 3 and 4, the ends 3 of lever (or levers) 2 are connected to the eccentric-strap 4 by one or more suitable levers or rods 5. To the free and inner end 6 of said lever 2 is connected a pendent rod L', to which the inner ends of the toggle-levers P are attached, as previously described.

As an illustration of the application and action of the above mechanism it is shown applied to, say, a rotating disk or body T, mounted on a shaft U, as shown at Fig. 1. By pendently mounting the driving-shaft H in the bearings D of the arms C, forming part of or rigidly attached to the lever A, the whole weight of the fly-wheels J, pulleys I, and connecting-rod L, which is mounted, as previously described, upon the eccentric K on shaft H, is utilized for imparting and increasing the power of the lever A, from which the power or pressure is given off. Further, the connection of the toggle-levers P with the connecting-rod L not only assists in supporting the latter, but also aids in retaining it in position, and thereby dispensing with the use of suspension-chains or draw-back rods and intermediate toggles. When the shaft H is caused to rotate and the eccentric K is at its highest point, as in the drawings, then the toggle-levers P will by their connection to the said connecting-rod and to the lever A and pedestal R be simultaneously drawn upward and straightened, thus causing the lever A to swing or turn on its supporting-shaft and its

lower end to be moved forward for actuating the disk T and reciprocating it in the direction of arrow 8; but when the connecting-rod is caused to descend it will carry with it the inner ends of the toggle-levers, and the disk T will then be caused to rotate.

The speed at which the disk T revolves is controlled by the speed at which the driving-shaft is made to rotate and is also regulated by the throw of the eccentric and the difference between the centers of the point of suspension of the lever A and that of the driving-shaft H and rod S at its connection to the lever A.

The herein-described motion-imparting mechanism may be adapted to a variety of machines, such as for punching, shearing, brickmaking, and pumping, also windmills, bicycles, and the like.

It will be observed that the levers P are pin-jointed to the connecting-rod L, the pendent lever A, and the fixed pedestal R and that they serve to support, sustain, and operate the pendent lever A. The levers P operate the pendent lever A in both directions.

Having now described the nature of this invention, what I claim, and desire to secure by Letters Patent, is—

1. In motion-imparting mechanism the combination of a shaft mounted in fixed bearings; a lever mounted by its upper end pendently on said shaft; arms rigidly connected to and moving with said lever; a shaft carried in bearings on and rising and falling with said arms; means for operating said last-mentioned shaft; a connecting-rod; connections between the connecting-rod and said last-mentioned shaft; and sustaining and operating means for the rod and lever, comprising toggle-levers connected at their inner ends to the said connecting-rod and at their outer ends respectively to a fixed pedestal and to the moving end of said lever and serving to sustain said pendent lever and to move it positively in both directions.

2. The combination of a shaft mounted in fixed bearings; a lever mounted by its upper end pendently on said shaft; arms rigidly connected to and moving with said lever; a shaft carried in bearings on and rising and falling with said arms; an eccentric mounted on the last-mentioned shaft; a connecting-rod mounted on said eccentric; a main frame and sustaining and operating means for the rod and the pendent lever, comprising toggle-levers pin-jointed to the connecting-rod near its lower end and pin-jointed to the main frame and to the lower end of the said pendent lever.

3. The combination of a shaft mounted in fixed bearings; a lever mounted by its upper end pendently on said shaft; arms rigidly connected to and moving with said lever; a shaft carried in bearings and rising and falling with said arms; means for operating said last-mentioned shaft; a connecting-rod; means connecting it with the last-mentioned

shaft and sustaining and operating means for the rod and lever comprising toggle-levers pin-jointed to the connecting-rod near its lower end and also pin-jointed to the main frame and to the pendent lever, thus serving to sustain said lever and to move it in both directions.

4. The combination of a shaft mounted in fixed bearings, a lever mounted by its upper end pendently on said shaft, arms rigidly connected to and moving with said lever, a shaft carried in bearings on and rising and falling with said arms, means for adjusting said bearings on the arms, an eccentric mounted upon the last-named shaft, a connecting-rod mounted on said eccentric, toggle-levers connected at their inner ends to said connecting-rod and at their outer ends respectively to the main frame, and to the moving end of said lever and serving to suspend, retain and operate the lever substantially as described.

5. In motion-imparting mechanism, the combination of a shaft mounted in fixed bearings, a lever mounted by its upper end pendently on said shaft, arms rigidly connected to and moving with said lever, a shaft carried in bearings on and rising and falling with said arms, means for operating said shaft, a connecting-rod, connections between said connecting-rod and said last-mentioned shaft, toggle-levers jointed to the connecting-rod near its lower end, and jointed also to a fixed pedestal and to the pendent lever, and devices for adjusting the inner ends of the toggle-levers vertically.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM HENRY BAXTER.

Witnesses:

WILLIAM SADLER,
ADAM C. HART.