

H. L. BROWER.
Automatic Toys.

No. 140,883.

Patented July 15, 1873.

Fig. 1.

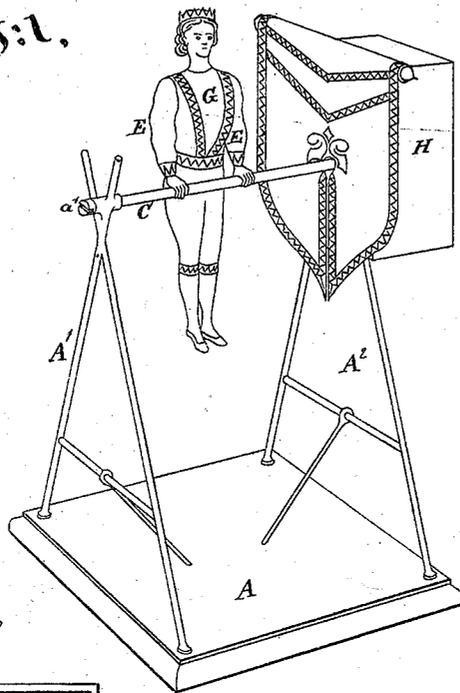


Fig. 2.

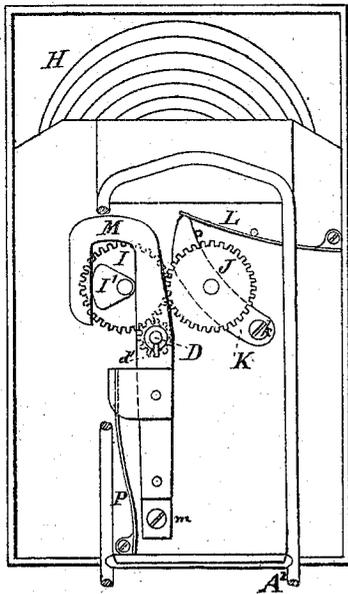


Fig. 3.

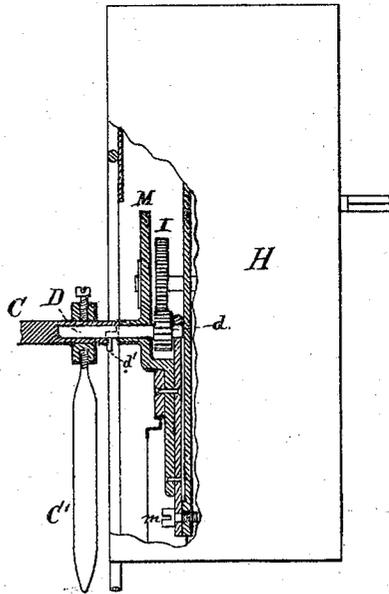


Fig. 6.

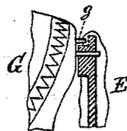


Fig. 4.



Fig. 5.



Witnesses:

Arnold Kornmann.
Wm. C. Dey

Inventor:

H. L. Brower
by his attorney *T. S. Eaton*

UNITED STATES PATENT OFFICE.

HENRY L. BROWER, OF NEW YORK, N. Y.

IMPROVEMENT IN AUTOMATIC TOYS.

Specification forming part of Letters Patent No. 140,883, dated July 15, 1873; application filed May 24, 1873.

To all whom it may concern:

Be it known that I, HENRY L. BROWER, of New York city, State of New York, have invented a certain new and Improved Toy, called an "Acrobat," of which the following is a specification:

I make a toy image of an athlete with a bar capable of being revolved and oscillated, and combine therewith clock-work and peculiar gearing which gives the bar such motions as induces a variety of fantastic movements. The figure is formed with a catch at the junction of one or both the arms with the body, so as to prevent an unnatural backward movement. The figure actuated by the mechanism performs partial or complete revolutions alternately in opposite directions around the bar under conditions which cause the movements to vary irregularly at nearly or quite every oscillation.

The following is a description of what I consider the best means of carrying out the invention. The accompanying drawings form a part of this specification.

Figure 1 is a perspective view of the toy in operation, an ornamental shield or decorated device being provided to hide a portion of the mechanism.

The additional figures show portions of the mechanism on a larger scale.

These drawings represent the novel parts with so much of the ordinary parts as serves to indicate their relation thereto.

Fig. 2 is a face view, by which I mean, a view of the mechanism from the side nearest the athlete. Fig. 3 is a side view, showing the entire case with a portion of the spring-bar on which the athlete performs, and the balance-weight. A portion of the casing is broken away, showing the interior mechanism in section. Fig. 4 is a side view of the shoulder of the athlete. Fig. 5 is a view of the inside of the arm adjacent the shoulder. Fig. 6 is a cross-section through the shoulder.

Similar letters of reference indicate like parts in all the figures.

A is a firm platform, and A¹ A² are upright frames fixed thereon adapted to support the revolving and oscillating bar C and its connection. One end of the bar C is supported by the screw-pin *a'* tapped through the frame

A¹. The other end of the bar C is supported on the short shaft D, through which the peculiar motions are transmitted. The arms E of the athlete are soldered, or otherwise firmly fixed, at the hands of the bar C, which I will hereafter call a spring-bar, while the other end of each is jointed to the body G, which is made more or less flexible by joints, and provided with flexibly-jointed legs. A pin, *g*, fixed in the body near the joint of the shoulder, serves as a catch or stop which strikes against one of the arms, or an equivalent false arm fitted on the same joint, so that the body is stiffly connected to the arms when it has revolved so far as to bring the stop *g* in contact therewith. The shoulders are formed by causing the joints of the arms E to embrace a wire or shaft extending across the figure through the shoulders. These connecting-arms being elastic may be readily sprung apart with the thumb and finger to allow the stop *g* to be brought on one side or the other of the arms. Thus the figure may be made stiff for forward movements or stiff for backward movements, while it is flexible in the movements in the opposite direction.

I attach much importance to the peculiarity of the mechanism which induces the irregular motions of the bar C in opposite directions. A main spring and multiplying gear is provided with a fan-wheel to serve as a regulator, the whole of which I will indicate by the single letter H. This clock-work, being wound up by a key, furnishes the motive power and gives a moderate rotary motion to two equal spur-wheels, I J, geared together, as indicated. On the outer face of the wheel I is a cam, I', of a suitable form to always fill the yoke which is fitted upon it. The yoke is marked M, and turns on a fixed pivot, *m*. It is pressed constantly to the left by a spring, P. The short shaft D has its bearing in this yoke M alone, and carries a small spur-gear wheel, *d*, which gears with either the wheel I or the wheel J, according to the position of the yoke M. The spring-bar C carries an adjustable weight, C', which tends to balance the weight of the acrobat G. The ends of the spring-bar C are bored or hollowed out so that one end will fit over and revolve upon the bearing *a'* and the other will fit loosely over the end of the shaft D, to which

it may be keyed or locked by the pin d' . This latter end of the spring-bar C is provided with slots, into either one of which the pin d' may be inserted at will in order to vary the motions of the figure. These slots are unequal in width, one being made to embrace the pin closely, so that the spring-bar will be carried around and make a complete revolution at each revolution of the shaft D; the other embracing pin d' loosely, so as to allow an independent oscillating movement of the spring-bar at each revolution of the shaft D derived from the momentum imparted to it by said shaft, which will give the figure a series of movements independent of the vaulting movement imparted by the shaft.

It will be observed that by this arrangement two entirely different series of motions are attained.

The clock-work H turns the wheels I J constantly, and the rotation of the cam I' vibrates the yoke M. When the yoke is left of its central position the wheel d gears into the wheel I and partakes of its motion. When it is to the right of its central position the wheel d gears into the wheel J which, turning in the opposite direction, induces a corresponding change in the motion of the wheel d , and consequently of the spring-bar C and its attached acrobat. There is necessarily a brief period in each change of motion during which the wheel d is out of gear with both wheels I and J. This period will vary in practice according to the position and momentum of the acrobat at the time, and various other circumstances, so that it tends to engage itself in a new position each time.

Many modifications may be made in many of the parts without sacrificing the advantages of the invention. It may be found of advantage to provide elastic joints instead of flexible ones in the acrobatic figure, to make an elastic instead of a loose connection between the shafts D and the spring-bar C, and to provide for a slight elastic yielding of the supports of one or both the wheels I J on the fixed frame-work or of the support of the shaft D on the yoke M.

The spring P serves to prevent all lost motion, when the cam I' fails to quite fill the yoke M, by keeping it always pressed over to one side. I have in my experiments sometimes

made the spring P to possess sufficient force to hold the part M in constant contact with the cam I', and thus causing it to perform exactly as above described without being made in the yoke form, but only in the form of the simple set pressing against one side only of the cam I'. I prefer, however, to give it the yoke form, so that it shall be compelled to move by the rotation of the cam I', and to use the spring P merely as a means of preventing noise and lost motion.

The wheel J is shown in Fig. 2 as pivoted on a lever, K, which turns on a pivot k , and is actuated by a spring, L. This construction allows it to yield when, as is always liable to occur, the teeth of the small pinion d strike on the points instead of between the teeth of the wheel J.

I claim as my invention—

1. The toy, composed of a flexible figure mounted on an oscillating bar operated by clockwork, in such manner as that said bar will make a complete revolution in one direction and a subsequent complete revolution in the opposite direction, substantially as specified.

2. The gears I J, with suitable operating means, and pinion d mounted on a support moved relatively to the said wheels so as to gear alternately with each, and arranged to give motions in opposite directions to a toy figure from a constant motion of the wheels, as specified.

3. The stop g arranged as shown relatively to the flexible arms E of a toy acrobatic figure in combination with suitable operating means to induce a motion of the shaft or spring-bar C alternately in opposite directions, as specified.

4. The spring-bar C, slotted at the end, as described, and arranged in combination with shaft D, so that it may be keyed, either tightly or loosely upon it, at will, in order to vary the movements of the automaton, as described.

In testimony whereof I have hereunto set my hand this 20th day of May, 1873, in the presence of two subscribing witnesses.

HENRY L. BROWER.

Witnesses:

WM. C. DEY,
ALFD. WESTBROOK.