(No Model.)

F. ABERLE.

MECHANICAL TOY.

No. 289,491. Patented Dec. 4, 1883.

Fig. 1.

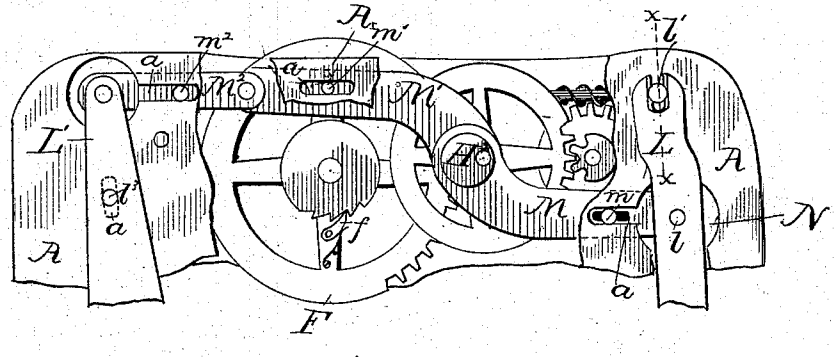


Fig. 2.

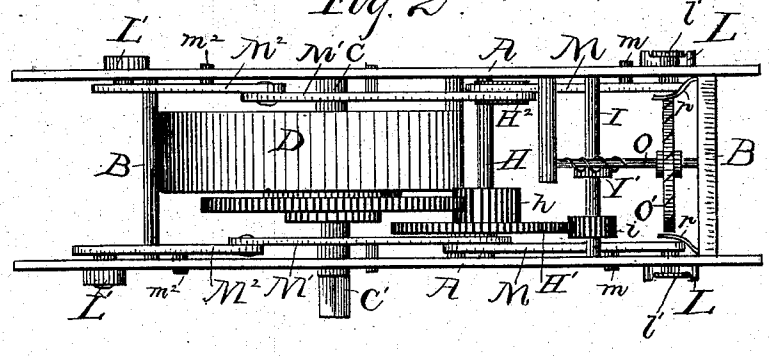
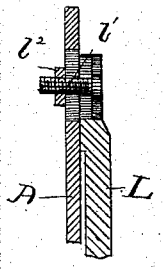


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

FREDRICK ABERLE, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS, TO FREDERICK EGGE, OF SAME PLACE.

MECHANICAL TOY.

SPECIFICATION forming part of Letters Patent No. 289,491, dated December 4, 1883.

Application filed August 4, 1883. (No model.)

To all whom it may concern:

Be it known that I, FREDRICK ABERLE, a citizen of Switzerland, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Mechanical Toys; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to toys; and it has for its object to imitate the running and walking movement of animals. With this end in view my invention consists in the construction and combination of elements hereinafter fully described, and then specifically designated by the claims.

For the purpose of enabling those skilled in the art to which my invention relates to understand and use my improved toy, I will proceed to describe the same, referring by letters to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation with one of the side plates partially broken away. Fig. 2 is a plan view of the operating mechanism, and Fig. 3 is a detail sectional view on line *x x* in Fig. 1, showing the manner in which I adjust the throw of the front feet.

Similar letters indicate like parts in all the figures.

A A are the side plates, which may or may not have the outline of the animal the toy is designed to represent. These side plates are held in proper position by cross-pieces B B.

C is the main shaft, which is journaled in the side plates, and provided with a winding-arbor, C'. The inner end of the main spring D is attached to this shaft, and the outer end to one of the cross-pieces.

E is a pinion rigidly attached to the main shaft. This pinion acts to drive the main wheel F by means of pawl *f*. H is a shaft likewise journaled in the side plates, and carrying a pinion, *h*, which meshes with the main wheel, and a gear-wheel, H', which meshes with a pinion, *i*, on shaft I.

L L are downwardly-projecting levers, the lower ends of which I usually fashion to represent the front legs of some animal; and L' L' are other levers, the lower ends of which I fashion to represent the hind legs of an animal. Two eccentrics, H^2, (one not shown,) are carried by shaft H. These eccentrics impart motion to two pairs of rocking levers, M and M'. Levers M operate the front legs and levers M' operate the hind legs. Upon the outer side of levers M are pins *m*, which work in slots *a* in the side plates. These pins act as sliding fulcrums upon which the levers vibrate.

l l are pivots which connect levers L (the front legs) to the forward ends of levers M. The upper ends of levers L are slotted, and engage with pins *l'* upon the side plates. It will thus be seen that the rotation of the eccentrics imparts to levers M both a longitudinal reciprocating and a vibratory motion, and levers M impart a vertical reciprocating and and a vibratory motion to levers L, (the front legs.) The side pieces are cut away, as shown at N, to allow free movement to pivots *l*. Pins *l'* may be made adjustable, as shown in Fig. 3, pin *l'* passing through a slot in the side plate and having a nut, l^2, to hold it in the desired position. The vibration of levers L, which is in fact the throw of the front feet, may be increased by lessening the distance between pivots *l* and pins *l'*, or decreased by increasing the distance between said pivots and pins. Likewise pins *m* may be made adjustable. Should it be desired to increase the vertical movement of levers L, which would be in fact lifting the front feet higher at each step, it could be done by moving pins *m* nearer to the eccentrics.

Levers M' are provided with pins *m'*, which also move in slots *a* in the side plates. Instead of being pivoted directly to levers L', (the hind legs,) I pivot levers M' to secondary levers M^2, having pins m^2, also working in slots *a* in the side plates.

To the rear end of levers M^2 are pivoted levers L', (the hind legs.) The effect of the use of the intermediate levers, M^2, is to cause one foot on each side to be free from the floor and moving forward while the other foot on the same side is making the backward movement. Levers L' are provided with pins l^2, also working in slots *a* in the side plates. It will thus be seen that by means of the eccentrics and the sliding fulcrum-pins *m'* the same motions are imparted to levers M' as have been de-

scribed in connection with levers M—that is to say, these levers have both a longitudinal reciprocating and a vibratory motion. It will also be apparent that levers M′ in turn impart exactly the same motion to levers M^2, which in turn impart vertical reciprocating and vibratory motions to levers L′, (the hind legs.) The throw of the hind feet may be regulated the same as that of the front feet—that is to say, by altering the distance between pins l^3 and the pivots connecting levers L′ with levers M^2. The vertical movement of levers L′—that is to say, the distance the hind feet are raised from the ground at each step—may be increased by moving either pins m' or m^2 nearer to the pivot connecting levers M′ with levers M^2, or may be decreased by moving either set of pins farther from said pivots. In assembling the parts they are so timed that the front leg and hind leg upon one side are at their positions nearest together at the time the opposite hind leg and front leg are farthest apart, the hind leg and the front leg upon each side approaching or receding from each other at the same time, the front foot going up as the corresponding hind foot goes down, so that one front foot and the opposite hind foot will be free from the floor and moving forward while the backward movement of the other two feet while in contact with the floor will carry the animal forward a distance equal to the throw of the feet at each step. The bottoms of the feet, particularly the front feet, should be roughened or covered with rubber pads. I am thus enabled to imitate mechanically the rising, falling, and forward movements of the legs of animals in a much simpler and more natural manner than has ever heretofore been accomplished.

I have also discovered that by using brakes made of cloth or felt in connection with a rubber fly-wheel I am able to control the operation of the train of gearing much more accurately than with metal brakes and without the slightest injury to the fly-wheel. I usually arrange these parts as follows: wheel I′ upon shaft I meshes with a worm upon shaft O, which carries fly-wheel O′.

P P are the brakes, which act upon the periphery of the fly-wheel. These brakes I make of felt or cloth, and have found them to work in a very satisfactory manner, as they do not wear the fly-wheel or wear themselves away.

The body and legs of the toy may be covered with metal, paper, cloth, wood, or any composition having the outlines of the animal the toy is designed to represent.

As the particular animal that my improved toy is fashioned to represent is not material to my invention, I have merely illustrated the operating mechanism, which forms the subject-matter of my invention.

I am aware that mechanical toys have been constructed prior to this invention which imitate to a certain extent the walking or running movements of animals—such, for instance, as illustrated in my former Patent No. 264,426, September 19, 1882, upon which my present invention proves to be a great improvement.

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

1. In a mechanical toy, levers operated by eccentrics and having reciprocating fulcrums, in combination with other levers, which represent the legs of animals, and to which the former levers impart a vertical reciprocating and a vibratory motion.

2. Levers M, operated by eccentrics and having fulcrum-pins m, working in slots in the side plates, in combination with levers L and pins l'.

3. In a mechanical toy, levers M′, in combination with levers M^2 and L′.

4. Levers M′, having sliding fulcrums m', and pivoted to levers M^2, which are provided with sliding fulcrums m^2, in combination with levers L′, having sliding fulcrums l.

5. Shaft H and eccentrics H^2, in combination with levers M, M′, M^2, L, and L′, all operating as described, and for the purpose set forth.

6. In a mechanical toy, fly-wheel O, in combination with brakes P, made of cloth or similar material.

7. Shaft H and eccentrics H^2, in combination with a system of levers, as described, and adjustable pins l' and m, whereby the lifting and the throw of the feet may be regulated.

In testimony whereof I affix my signature in presence of two witnesses.

FREDRICK ABERLE.

Witnesses:
A. M. WOOSTER,
S. S. WILLIAMSON.