

UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN AUTOMATIC APPARATUS FOR WALKING FIGURES.

Specification forming part of Letters Patent No. 35,886, dated July 15, 1862.

To all whom it may concern:

Be it known that I, ENOCH R. MORRISON, of the city, county, and State of New York, have invented a new and useful Improvement in Automatic Apparatus for Walking Figures; and the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a side view of the machinery to operate the stepping apparatus. Fig. 2 shows the outside view of the stepping machinery. Fig. 3 is an inside part of the stepping apparatus, showing two eccentric cams. Fig. 4 shows a cross section of the driving-shaft with the double eccentric cams on both ends.

My invention consists in the construction and peculiar arrangement of the double eccentric-cam joints, in connection with the vertical levers, giving reciprocating and alternating movements to the pedal extremities; also, the concave winged fly and endless screw for regulating the speed of the mechanism and controlling the locomotion. Likewise the automatic stepping movements in combination with the clock-work, which operates silently.

To enable others skilled in the art to make and apply my invention to the various purposes for which it is designed to be used, I will proceed to describe its construction and operation more fully, referring to the drawings and to the letters marked thereon.

In the application of power to operate my walking figures, I design to use a simple clock-work, consisting of a mainspring and series of cog-wheels and pinions sufficient to run a considerable length of time at one winding; and in order that the movement shall operate silently I dispense with a scapement and regulate the motion by an endless screw, *a*, and a concave-winged fly, *b b*, the same being put in motion by the gear-wheel *d*, the cogs of which fit in the threads of the screw *a*. The power then to be applied to the stepping movements is through the aid of another pinion-wheel, *d*, and shaft D, on the ends of which, outside of the bearings, are two eccentric cams, *c* and *e*. On these cams (both sides of the figure) is fitted the walking mechanism, which consists of a leg and foot, A, two vertical oscillating sliding levers, B C,

having at the knee or hip-joint round holes, in which the cams *c* and *e* fit so as to turn freely, the one cam partly lapping over the other, so that the motion of the supporting slide-lever C and the vertical walking-lever B, to which the leg and foot A are attached, are alternately changing their position—*i. e.*, when the foot and sliding lever B are being raised, moved forward, and set down, the supporting-lever C will be stationary and resting on the floor. The foot A has a slight oscillating motion produced by the action of an eccentric-pin, *i*, in the cam *e*, which works in a slit, *f*, at the joint. The bottom of the foot A is kept parallel with the floor, while the levers B C, working on the eccentric cams *c e*, have a tendency to rock the figure back and forth, and would be more liable to upset. By this arrangement a very uniform and natural stepping motion is produced.

The principal object of my invention is to be applied to toys for amusement, and is particularly adapted to dolls of various sizes, and also to quadrupled of various kinds—such as the elephant, the camel, horse, ox, sheep, dogs, &c.—to give them locomotion which is life-like in appearance. The power and motion being stored up and contained within itself may also be applied so as to perform other automatic graceful motions, which contribute greatly to the amusement of children and not a little to that of adults.

Automatic figures have in all ages had their attractions with the masses, and even sages, nobles, and princes have taken recreation and pastime with them.

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

1. The double eccentric cam joints *c e*, in combination with the levers B C, which give alternate reciprocating movements to the pedal extremities for walking figures, in the manner as and for the purposes specified.

2. The automatic stepping movement consisting of the shaft D, the cams *c e*, pin *i*, vertical levers B C, and foot A, in combination with clock-work, substantially as and for the purpose herein described.

E. R. MORRISON.

Witnesses:

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