F. GORGELLINO.

MOTION DEVICE FOR AUTOMATONS.

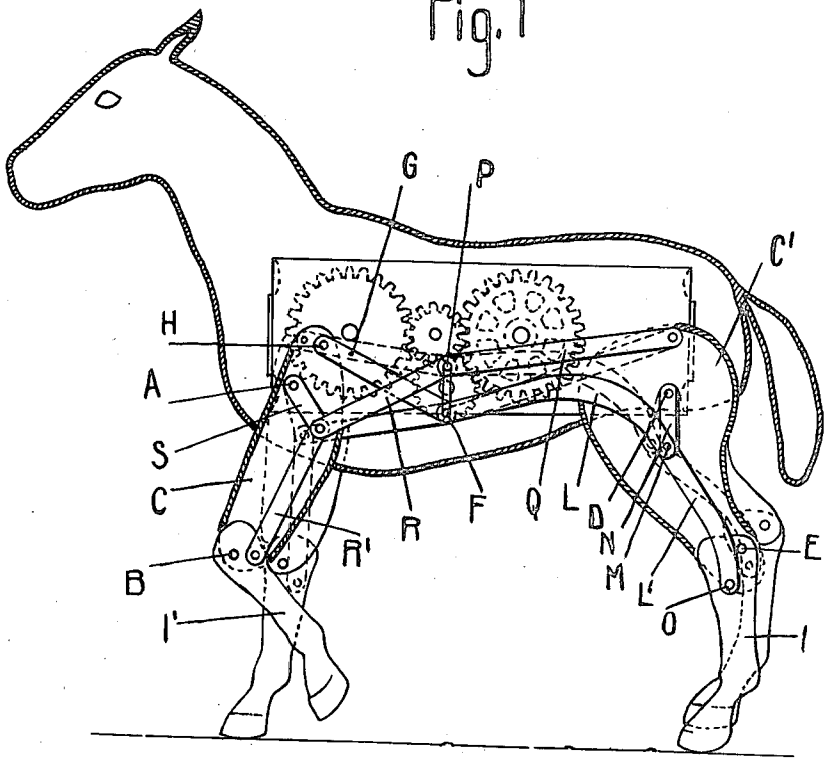
APPLICATION FILED NOV. 20, 1919.

1,422,436.

Patented July 11, 1922.

2 SHEETS—SHEET 1.

Fig. 1



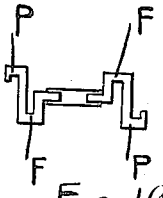


Fig. 1a

Fig. 2



Fig. 3



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2 SHEETS—SHEET 2.

Fig. 4

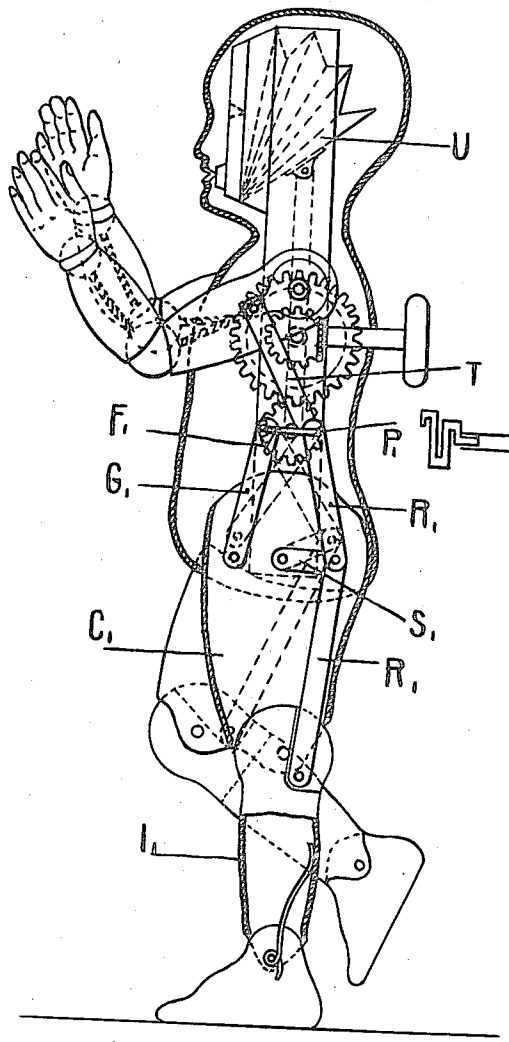


Fig. 4a

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UNITED STATES PATENT OFFICE.

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MOTION DEVICE FOR AUTOMATONS.

1,422,436. Specification of Letters Patent. Patented July 11, 1922.

Application filed November 20, 1919. Serial No. 339,412.

To all whom it may concern:

Be it known that I, FRANCESCO GORGELLINO, a subject of the King of Italy, residing in the city of Turin, Kingdom of Italy, have invented certain new and useful Improvements in Motion Devices for Automatons, of which the following is a specification.

This invention relates to mechanism for giving life-like motion to the legs or arms of mechanical toys.

In the accompanying drawings, illustrating two embodiments thereof, one as applied to a horse and the other to a doll.

Fig. 1 is a longitudinal section, partly fragmentary, showing the mechanism applied to a toy horse.

Fig. 1ª is a detached view of one form of crank shaft therefor.

Figs. 2 and 3 are detached views of crankshafts of modified form adapted for use in the mechanism of Fig. 1.

Fig. 4 shows the invention as applied to a mechanical doll.

Fig 4ª is a detached view of one form of a crank shaft therefor.

Having reference more particularly to the toy animal illustrated in Fig. 1, a crank P—F is preferably located between each front and rear leg and may be rotated by any suitable means, as, for example, a spring motor of any appropriate type, indicated conventionally in broken lines.

The upper or thigh portions C, C′, of the animal's legs may be pivotally secured to its body portion at points A, D, and the lower or fetlock portions of the legs may be pivotally connected to the thigh portions at points B, E.

A forwardly extending connecting link G, pivotally connects arm F of the rotating crank P—F with the upper leg portion C, at H, while a rearwardly extending link L connects the same arm of the crank P—F, at M, with one end of a second link L′, the other end of which is pivotally connected at O with the lower portion I of the rear leg. A depending link N, having its upper end pivotally secured at D, is connected at its lower end with the junction M of the links L, L′.

Arm P of the rotating crank P—F is connected, by a link R, to one end of a link R′, connected at its other end to the lower portion I′ of the front leg at a point near the pivotal point B. A link S, corresponding to link N of the rear leg, is connected at one end to the pivotal point A of the upper leg portion C, and at its other end to the point of pivotal connection between links R and R′. The arm P of the rotating crank P—F is also connected by a link Q with the upper portion C′ of the rear leg.

The front and rear legs on the other side of the toy may likewise be provided with crank arms and driving connections forming part of the same operating mechanism, as indicated in broken lines, so that all of the various leg portions will be co-ordinated for relative movement in a predetermined order.

A very important feature of the invention thus far described, which materially adds to the lifelike simulation of the leg movement of a living animal, is the specific form of mechanism herein disclosed as a means for operating the lower leg portion, whereby the common piviotal connection, between two of the three links emloyed, is caused to move in a circular arc about the pivotal connection between the third link and its pivotal connection with said body portion.

It will be obvious that, by varying the connections between the different cranks and leg portions, the movements of the legs may be caused to conform with those of an animal when trotting, cantering, galloping, etc., and, if desired, a separate crank arm may be provided for each leg portion, as indicated in Fig. 2, and these arms may be bent to different positions, as indicated in Fig. 3, whereby an ambling or stepping motion may be attained.

In Fig. 4 is illustrated a modification of the invention, as applied to a mechanical doll.

In this figure, the legs may be operated in a manner analogous to those of one pair of the legs of the toy illustrated in Fig. 1. The crank arms and operating links are, therefore, designated by reference characters corresponding with those of the forelegs of Fig. 1, but with subscripts added. If desired, each arm of the doll may be provided with a crank arm which may be connected by a bar T with an arm of the crankshaft, and the bellows U in the head of the doll may be similarly connected for operation.

What I claim is:—

1. In a device for producing life-like relative movement between the parts of mechanical toys, the combination with a body

portion, of an articulated leg, comprising an upper portion jointed to the body portion and a lower portion jointed to the upper portion, and an operating mechanism comprising a separate crank arm for each of said leg portions, a separate operating connection from each of said crank arms to its respective leg portion, and means for causing said crank arms to rotate in a predetermined relation.

2. In a device for producing life-like relative movement between the parts of mechanical toys, the combination with a body portion, of an articulated leg, comprising an upper portion jointed to the body portion and a lower portion jointed to the upper portion, and an operating mechanism comprising a double arm crank, and a separate connection from each arm of said crank to one of said leg portions.

3. In a device for producing life-like movement in mechanical toys, in combination, a body portion, a plurality of members jointed thereto, comprising articulated legs, each having an upper member jointed to said body portion and a lower member jointed to the upper portion, and an operating mechanism for said members comprising a plurality of crank arms, a separate operating connection from each member to the crank arm by which it is to be operated, and means for causing said crank arms to rotate in a predetermined relation.

4. A device, as specified in claim 1, in which the operating connection for the lower leg portion comprises a link pivotally connected at one end to said body portion, a second link pivotally connected at one end to the lower leg portion at a slight distance from its pivotal connection with the upper leg portion, and a third link pivotally connected at one end to the operating crank arm for the lower leg portion, the opposite ends of said three links being pivotally connected together, whereby the common pivotal connection between the three links forms a floating connection between the second and third mentioned links movable in a circular arc about the point of pivotal connection between the first mentioned link and said body portion.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

FRANCESCO GORGELLINO.

Witnesses:

FELIX BAZETTO,

FUGANT VINCA.