Jan. 3, 1933. C. KREUTZER 1,893,173

DOUBLE ROPE SKIPPING TOY

Filed June 15, 1931 2 Sheets-Sheet 1

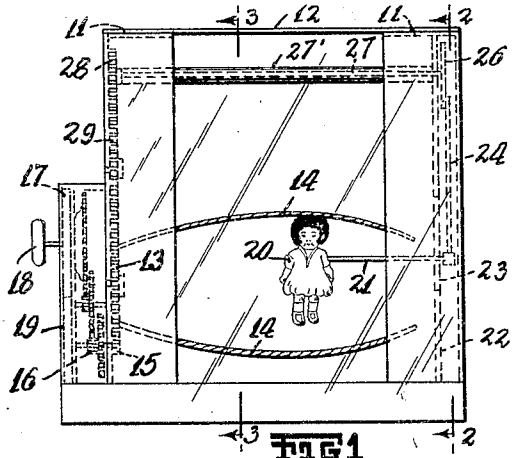


FIG 1

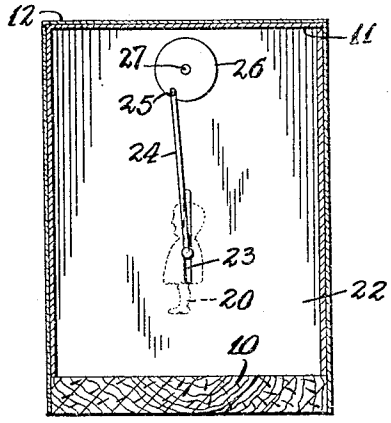


FIG 2

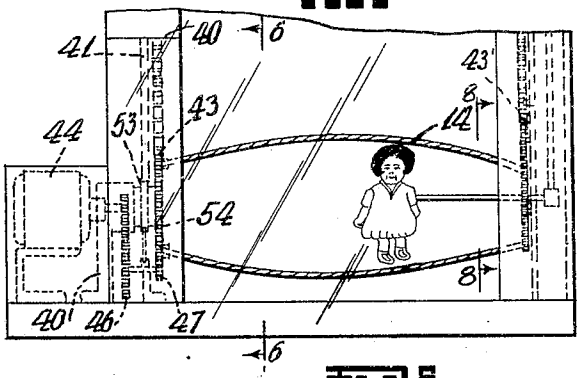


FIG 5

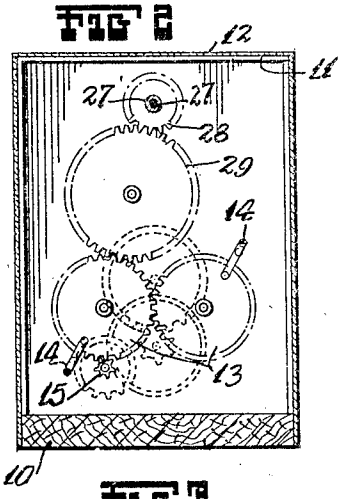


FIG 3

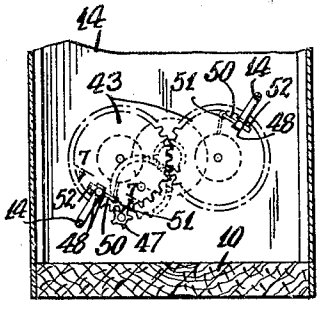


FIG 6

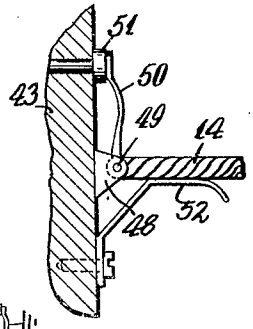


FIG 7

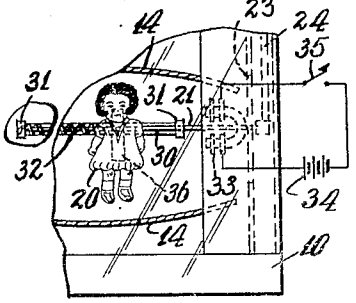


FIG 4

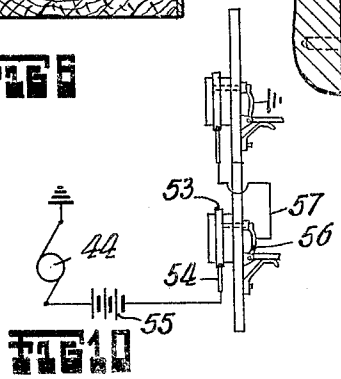


FIG 10

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Jan. 3, 1933. C. KREUTZER 1,893,173

DOUBLE ROPE SKIPPING TOY

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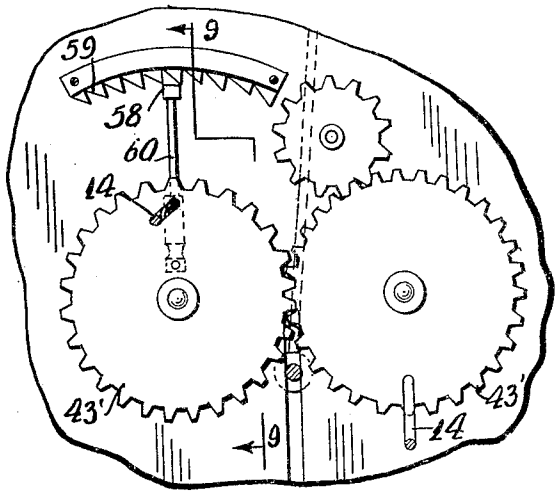


FIG. 1

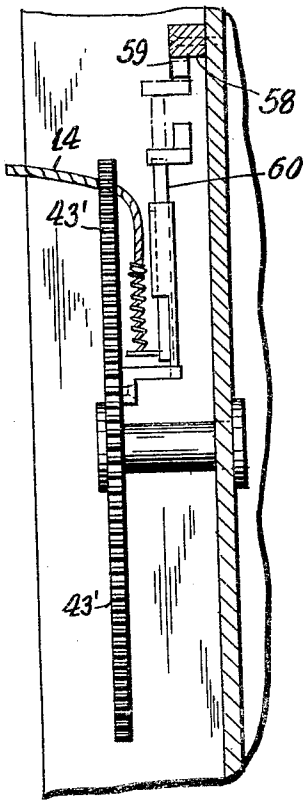


FIG. 2

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Patented Jan. 3, 1933

1,893,173

UNITED STATES PATENT OFFICE

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DOUBLE ROPE SKIPPING TOY

Application filed June 15, 1931. Serial No. 544,303.

This invention relates to new and useful improvements in a toy child skipping double rope.

The invention has for an object the construction of a toy of the class mentioned which is characterized by adjacent gears arranged upon one side of a transparent casing, and rigid arched shaped members simulating ropes attached upon the adjacent gears at one of their ends, eccentrically and on opposite sides from each other.

As a still further object of this invention, it is proposed to provide the casing with a celluloid cover, or the like, whereby the interior may be clearly viewable.

As another object of this invention, it is proposed to provide a means for driving the adjacent gears to cause the arched members to move as though the ropes were turned for skipping.

As another object of this invention, it is proposed to provide a doll within the casing within the vicinity of the arched members, and a means for reciprocating the doll vertically synchronized with the driving means so that the effect is obtained of the doll when skipping the ropes.

A still further object of this invention is the provision of means for moving the doll one way or the other, horizontally, during the jumping. The purpose of this is that a person jumping a rope cannot maintain a stationary position and moves naturally sideways.

A still further object of this invention is the construction of a device of the class mentioned which is of simple, durable construction, desirable in use, and efficient in action, and which can be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings, forming a material part of this disclosure:—

Fig. 1 is a front elevational view of a device constructed according to this invention.

Fig. 2 is a transverse sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a transverse sectional view taken on the line 3—3 of Fig. 1.

Fig. 4 is a view similar to a portion of Fig. 3 but illustrating a modified construction of the invention.

Fig. 5 is a side elevational view of a device constructed according to a modification of this invention.

Fig. 6 is a fragmentary transverse sectional view taken on the line 6—6 of Fig. 5.

Fig. 7 is a fragmentary enlarged sectional view taken on the line 7—7 of Fig. 6.

Fig. 8 is an enlarged sectional view taken on the line 8—8 of Fig. 5 but showing a modified form of the invention.

Fig. 9 is a vertical sectional view taken on the line 9—9 of Fig. 8.

Fig. 10 is a schematic wiring diagram of the device.

The toy, according to this invention, comprises a casing which consists of a base 10, spaced non-transparent transverse end members 11 and a celluloid cover 12 over the end members. The celluloid permits inspection of the interior of the casing while the non-transparent members 11 serve to house certain mechanism to operate the toy.

The mechanism referred to comprises a pair of adjacent meshing gears 13 rotatively mounted within one of the members 11. A rigid arched member 14 is attached at one of its ends upon each of the gears 13. These arched members are spaced eccentrically upon the gears at diametrically opposite phases, that is, when one is directly at the bottom, the other is directly at the top. The arched members 14 are arched in opposite directions as clearly shown in Fig. 1 to simulate a double rope in the act of being turned for skipping. For the purpose of making the arched members simulate a rope, they are formed with peripheral grooves simulating the strands of the rope.

A means is provided for driving the gears 13 to move the members 14 through their turning sections. This means is in the form of a pinion 15 meshing with one of the gears

13 and constituting the last gear of a train of gears 16 operated by a customary helical spring. The details of the gear system in its connection with the spring 17 will not be gone into since it comprises but the customary spring motor. Suffice it to say, that a winding key is provided for winding the spring as it runs down during the operation of the device. An auxiliary casing 19 of non-transparent material is attached upon one side of one of the members 11 for the purpose of housing the spring motor.

A doll 20 is disposed within the casing in a position so as to be capable of jumping the arched members 14 as the latter elements rotate. This doll is shown supported upon a horizontal rod 21. A means is provided for reciprocating the rod so that the doll jumps vertically. This means is synchronized with the driving means of the gears 13. More particularly, a transverse partition 22 is arranged within the end member 11 and is formed with a vertical slot 23 through which the rod 21 passes. The inner end of the rod connects with a link 24 pivotally mounted upon an eccentric pin 25 on a disc 26 fixed upon a shaft 27 which is rotatively supported within the casing and carries a gear 28 in mesh with an idler 29. The shaft 27 is provided with protecting sleeve 27'. The idler meshes with one of the gears 13 and has the same number of teeth, while the gear 28 has one-half the number of teeth so that the doll will go through two jumps on each rotation of the gears 13. The idea is that the doll jumps first over one of the arched members 14 and then over the other during each cycle of operation.

In Fig. 4 a modified arrangement of the device has been shown in which a means is provided for moving the doll 20 in one direction or the other during jumping. This means comprises, first of all, slidably mounting the doll upon the rod 21. For this purpose, the rod is provided with a squared section 30 so that the doll cannot rotate thereon but be restricted to sliding only. Collars 31 are attached upon the rod 21 to limit possible sliding. A coaxial spring 32 is arranged upon the squared portion 30 of the rod and is attached upon one of the collars 31 and upon the doll 20. An electro-magnet 33 is mounted within one of the casing ends 11 immediately to the side of the rod 21. This electro-magnet is in a circuit which includes a battery 34 or other source of power and a controlling switch 35. The doll 20 is formed with an iron core 36 so that when the magnet 33 is in operation it is drawn towards the side. As the device operates, the doll 20 will skip the rope and the child playing with the toy, may close the switch 35 to cause the magnet 33 to draw the doll against the restraining action of the spring 32. It is calculated that the doll will not jump in one step completely across the bar, but rather would do so in steps since as the doll moves it will become jammed due to binding and it will take a jerk to loosen it. After it has reached the right hand end of its travel, the switch 35 may be opened so that the spring 32 draws it back to its original position.

The operation of the device may be traced by first assuming it in an unwound condition. The key 18 should be turned to wind the spring motor. The device will then start operating, which operation consists in the gears 13 rotating so as to cause the arched members 14 to rotate around in circles. Simultaneously, rotations from one of the gears 13 will be transmitted to the disc 26 to reciprocate the doll 20 vertically. The simulation will thus be had of the doll skipping the rope.

In Figs. 5 to 10 inclusive, a modification of the invention has been disclosed in which the toy is of sufficient size so that a child may actually stand upon the platform of the toy and jump rope, that is, over the various arched members 14 as they pass around in their path. The device comprises a base 10 upon which a casing 40 is mounted at one end. This case is provided with a transverse partition 41. A pair of standards 42 is located within the casing 40 behind the partition 41 and rotatively supporting a pair of gears 43 located to the front of the partition 41 and meshing with each other. An electric motor 44 is mounted within the casing and has a pinion 45 on its shaft meshing with a speed reduction system 46 terminating in a pinion 47 meshing with one of the gears 43.

The arched members 14 are pivotally attached upon the front faces of the gears 43. The pivotal construction is such that they can swing in a plane which is at right angles to radial planes of the gears. These arched members are set so as to be 180° from each other. More particularly, a pair of lugs 48 project from the face of each of the gears and the arched members are mounted on these lugs by pintle pins 49. These pins are arranged radially so that the arms can only swing in a plane at right angles to the radius of the gears.

The other end of the arched members 14 may be free as in Fig. 1 or connected to gear drive 43'.

A means is provided for automatically shutting off the electric motor to stop operation of the device in the event that a child jumping the rope misses and causes one of the arched members to strike against its foot. This means is in the form of a contact finger 50 projecting from each of the arched members substantially at right angles to the plane of the arched member and normally contacting with contacts 51 upon the gears 43. Springs 52 act against the arched members 14 so as to hold them in their operative posi-

tions in which the contacts 50 engage the contacts 51. The contacts 51 are electrically connected with collector rings 53 upon the hubs of gears which engage with brushes 54 stationarily mounted.

Examining Fig. 10, it should be noticed that the device is provided with an electrical circuit which may be traced from the source of power 55, to one of the brushes 54, then one of the collector rings 53, to the contact 51 and next to the contact 50. This particular contact is provided with a piece of insulation 56 so as to insulate it from the other parts of the device. A lead 57 contacts the contact 50 with the other brush 54 so that the circuit may continue through the other collector rings 53 to the contact 51 and finally the contact 50 and the ground. The electric motor 44 is connected with the ground and with the source of current 55.

The operation may be traced by assuming a child jumping the arched members and the toy working. In the event that through a misstep either of the arched members strikes the child, it will automatically bend so as to substantially reduce the striking force due to the pivoting on the pintles 49. Such pivoting opens the electric circuit through the motor to cause its stoppage.

In Figs. 8 and 9 the brake arrangement 58 is shown consisting of an internal ratchet arrangement 59 engaged by plunger 60 which is pulled into operating position when a child steps on the arched member 14.

While I have shown and described the preferred embodiment of my invention, it is to be understood that I do not limit myself to the precise construction herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

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

1. A toy, comprising a pair of spur gears meshing with each other, a second pair of spur gears meshing with each other and spaced from said pair of spur gears and having both axes aligning with both axes of said first pair of spur gears, all of said gears being rotatively supported on the faces remote from the adjacent faces of said pairs of spur gears, a pair of rigid arched-shaped members attached at their ends on and between all of the opposed gears of said pairs of gears, said rigid arched-shaped members being at phases differing 180° from each other, that is, for example when one arched-shaped member is at the top the other is at the bottom, means for driving said spur gears including an electric motor so as to revolve the arched-shaped members, and means for cutting of the electric current through said motor when the rigid arch-shaped members engage against somebody, as the legs of a child skipping the arched members.

2. A toy, comprising a pair of spur gears meshing with each other, a second pair of spur gears meshing with each other and spaced from said pair of spur gears and having both axes aligning with both axes of said first pair of spur gears, all of said gears being rotatively supported on the faces remote from the adjacent faces of said pairs of spur gears, a pair of rigid arched-shaped members attached at their ends on and between all of the opposed gears of said pairs of gears, said rigid arched-shaped members being at phases differing 180° from each other, that is, for example when one arched-shaped member is at the top the other is at the bottom, means for driving said spur gears including an electric motor so as to revolve the arched-shaped members, and means for cutting of the electric current through said motor when the rigid arch-shaped members engage against somebody, as the legs of a child skipping the arched members, said rigid members being pivotally mounted upon the gears so as to be limited to swing in planes which are at right angles to radial planes of gears.

3. A toy, comprising a pair of spur gears meshing with each other, a second pair of spur gears meshing with each other and spaced from said pair of spur gears and having both axes aligning with both axes of said first pair of spur gears, all of said gears being rotatively supported on the faces remote from the adjacent faces of said pairs of spur gears, a pair of rigid arched-shaped members attached at their ends on and between all of the opposed gears of said pairs of gears, said rigid arched-shaped members being at phases differing 180° from each other, that is, for example when one arched-shaped member is at the top the other is at the bottom, means for driving said spur gears including an electric motor so as to revolve the arched-shaped members, and means for cutting of the electric current through said motor when the rigid arch-shaped members engage against somebody, as the legs of a child skipping the arched members, comprising pintle pins supporting said arch-shaped members to swing on the gears, contact fingers on the arch-shaped members normally engaging contacts to close a circuit through the motor, and resilient means for holding the arch-shaped members with the contacts in their engaged positions.

4. A toy, comprising a pair of spur gears meshing with each other, a second pair of spur gears meshing with each other and spaced from said pair of spur gears and having both axes aligning with both axes of said first pair of spur gears, all of said gears being rotatively supported on the faces remote from the adjacent faces of said pairs of spur gears, a pair of rigid arched-shaped members at-

tached at their ends on and between all of the opposed gears of said pairs of gears, said rigid arched-shaped members being at phases differing 180° from each other, that is, for example when one arched-shaped member is at the top the other is at the bottom, means for driving said spur gears including an electric motor so as to revolve the arched-shaped members and means for cutting of the electric current through said motor when the rigid arch-shaped members engage against somebody, as the legs of a child skipping the arched members, including contacts on the gears connected with collector rings, and brushes engaging said collector rings and included in a circuit for controlling the motor.

5. A toy, comprising a pair of spur gears meshing with each other, a second pair of spur gears meshing with each other and spaced from said pair of spur gears and having both axes aligning with both axes of said first pair of spur gears, all of said gears being rotatively supported on the faces remote from the adjacent faces of said pairs of spur gears, a pair of rigid arched-shaped members attached at their ends on and between all of the opposed gears of said pairs of gears, said rigid arched-shaped members being at phases differing 180° from each other, that is, for example when one arched-shaped member is at the top the other is at the bottom, means for driving said spur gears including an electric motor so as to revolve the arched-shaped members, and means for cutting off the electric current through said motor when the rigid arch-shaped members engage against somebody, as the legs of a child skipping the arched members, comprising pintle pins supporting said arch-shaped members, to swing on the gears, contact fingers on the arch-shaped members normally engaging contacts to close a circuit through the motor, and resilient means for holding the arch-shaped members with the contacts in their engaged positions, comprising leaf springs fixed upon the gears and engaging against the arch-shaped members.

6. A toy, comprising a pair of spur gears meshing with each other, a second pair of spur gears meshing with each other and spaced from said pair of spur gears and having both axes aligning with both axes of said first pair of spur gears, all of said gears being rotatively supported on the faces remote from the adjacent faces of said pairs of spur gears, a pair of rigid arched-shaped members attached at their ends on and between all of the opposed gears of said pairs of gears, said rigid arched-shaped members being at phases differing 180° from each other, that is, for example when one arched-shaped member is at the top the other is at the bottom, means for driving said spur gears including an electric motor so as to revolve the arched-shaped members, braking means operating by the stepping of a child upon the arched members and for stopping the device.

7. A toy, comprising a pair of spur gears meshing with each other, a second pair of spur gears meshing with each other and spaced from said pair of spur gears and having both axes aligning with both axes of said first pair of spur gears, all of said gears being rotatively supported on the faces remote from the adjacent faces of said pairs of spur gears, a pair of rigid arched-shaped members attached at their ends on and between all of the opposed gears of said pairs of gears, said rigid arched-shaped members being at phases differing 180° from each other, that is, for example when one arched-shaped member is at the top the other is at the bottom, means for driving said spur gears including an electric motor so as to revolve the arched-shaped members, means for stopping the device when a child using the device makes a misstep.

8. A toy, comprising a pair of spur gears meshing with each other, a second pair of spur gears meshing with each other and spaced from said pair of spur gears and having both axes aligning with both axes of said first pair of spur gears, all of said gears being rotatively supported on the faces remote from the adjacent faces of said pairs of spur gears, a pair of rigid arched-shaped members attached at their ends on and between all of the opposed gears of said pairs of gears, said rigid arched-shaped members being at phases differing 180° from each other, that is, for example when one arched-shaped member is at the top the other is at the bottom, means for driving said spur gears including an electric motor so as to revolve the arched-shaped members, braking means operating by the stepping of a child upon the arched members and for stopping the device, comprising plungers engaged by the arched members and engageable against ratchet teeth, and means for normally urging the plunger into an inoperative position.

In testimony whereof I have affixed my signature.

CASPER KREUTZER.