

**March 3, 1953**

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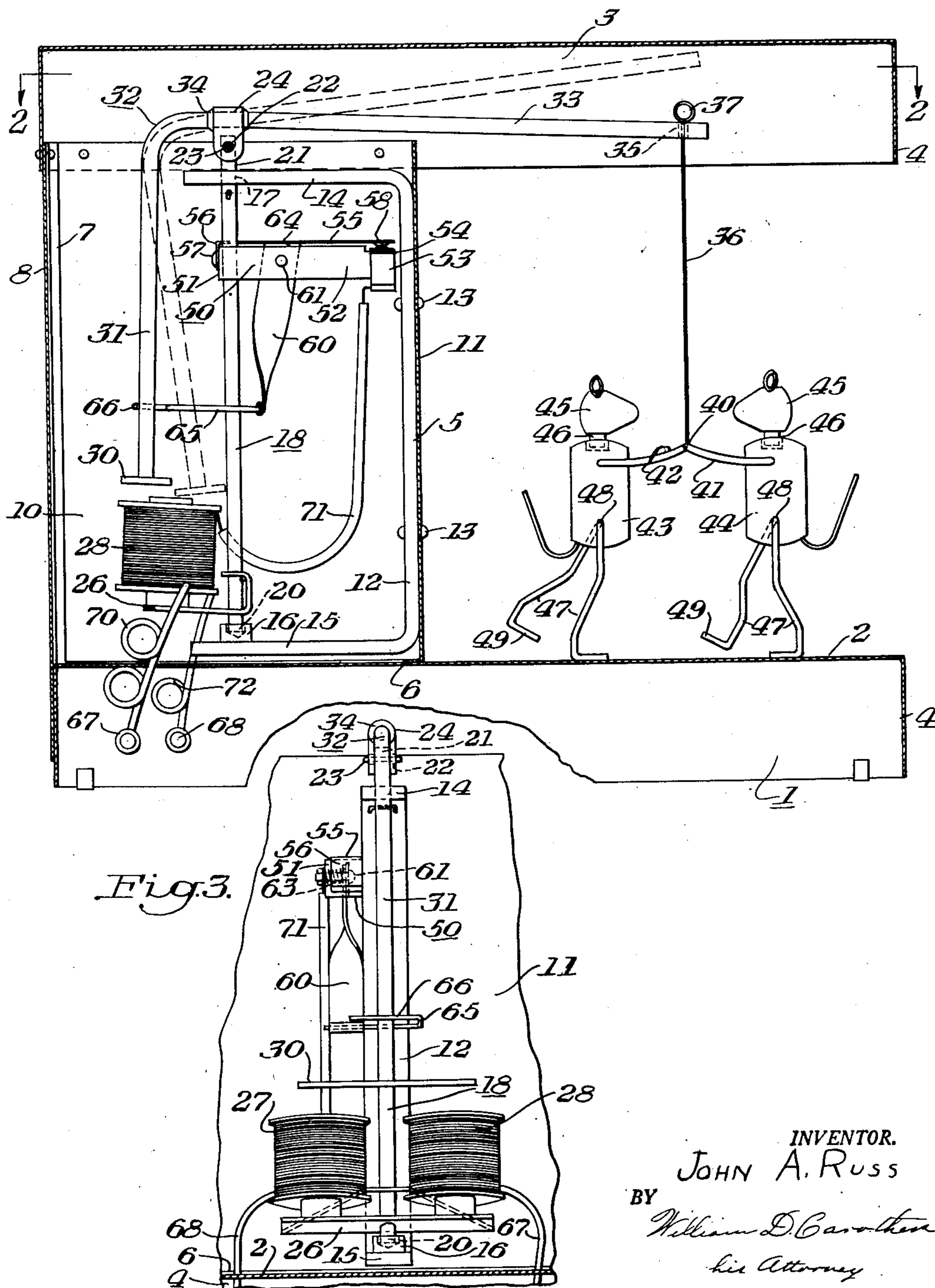
**2,629,966**

ANIMATED DANCING DOLL

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4 Sheets-Sheet 1

*Fig.1.*



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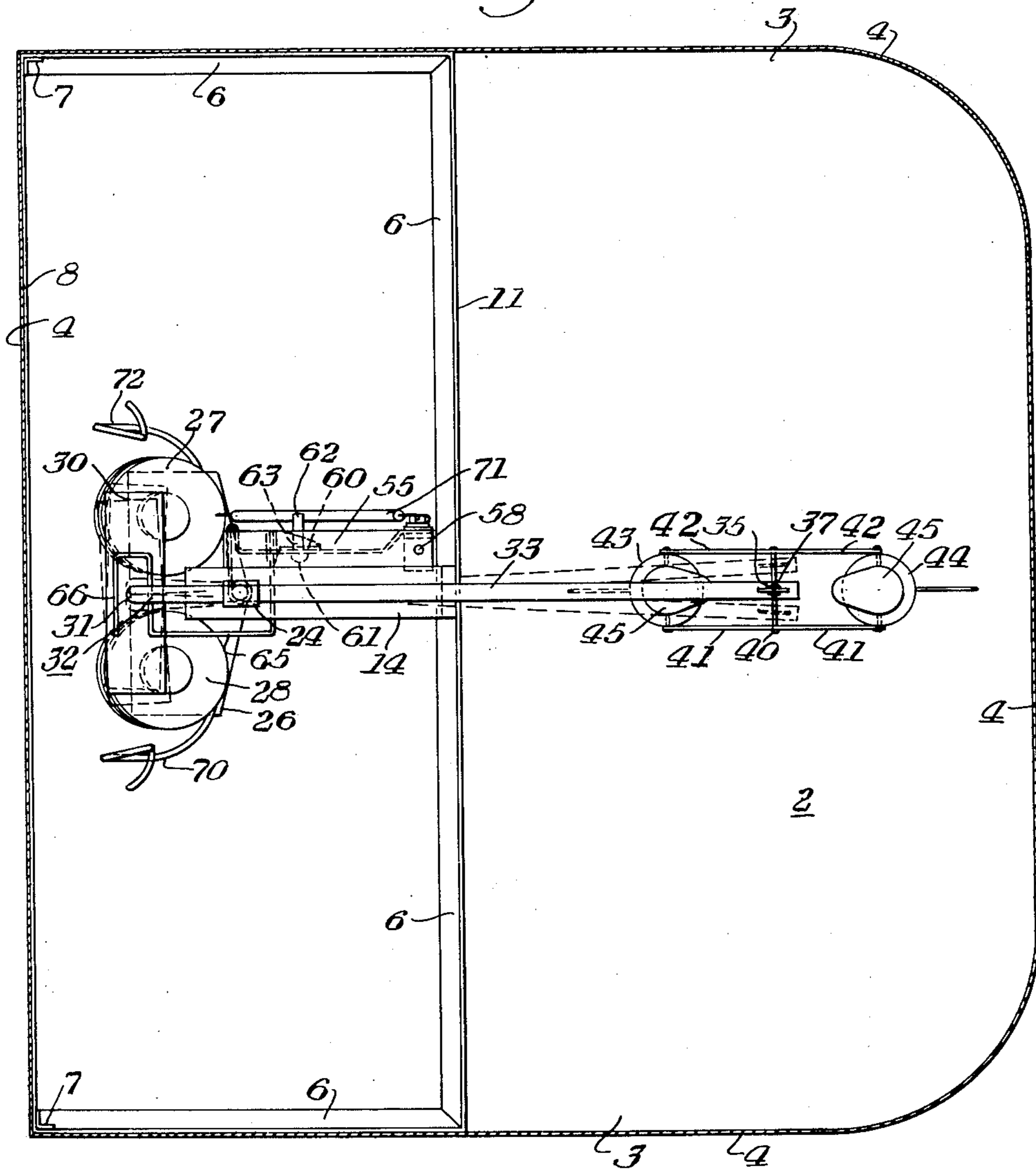
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Fig. 2.



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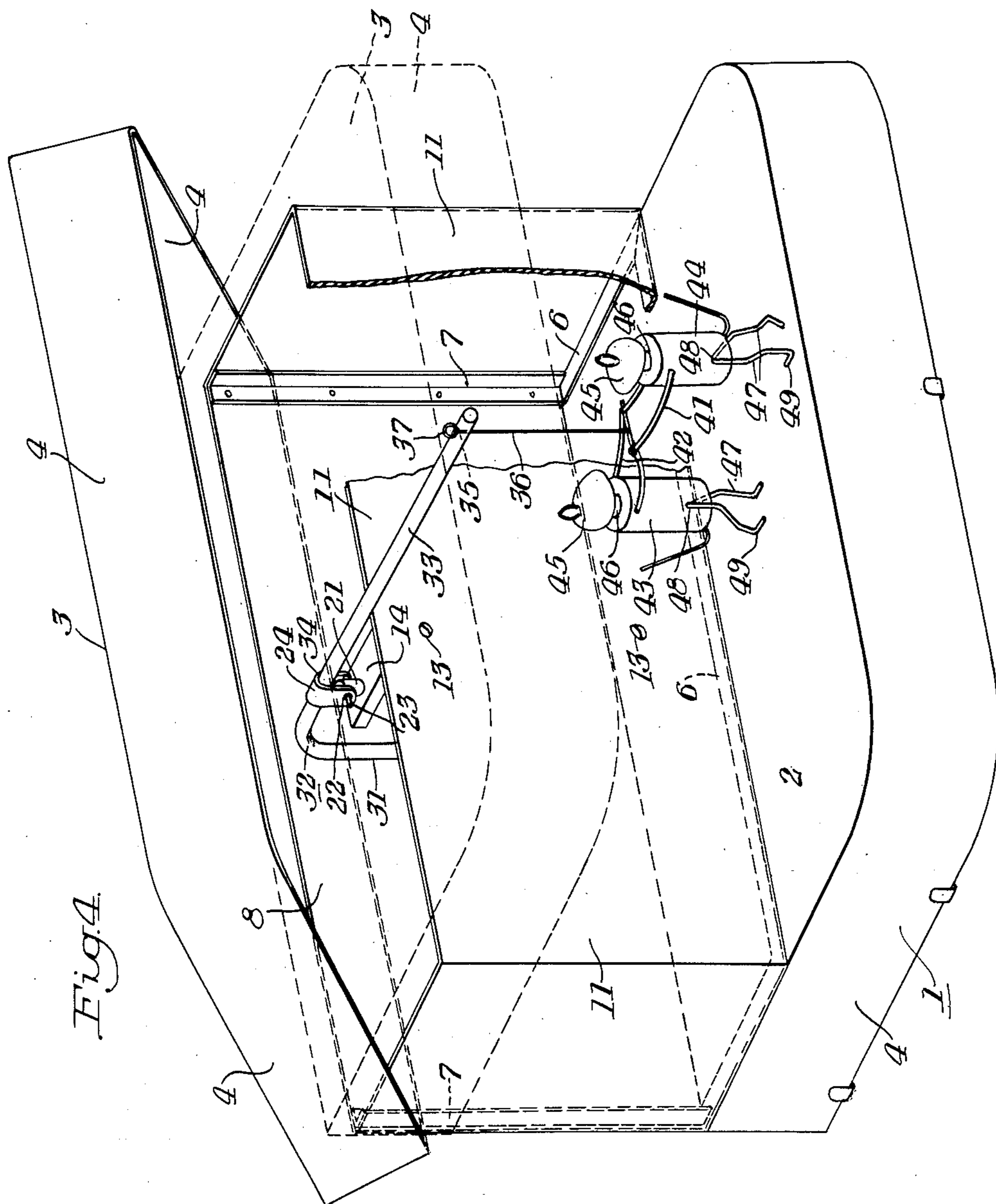
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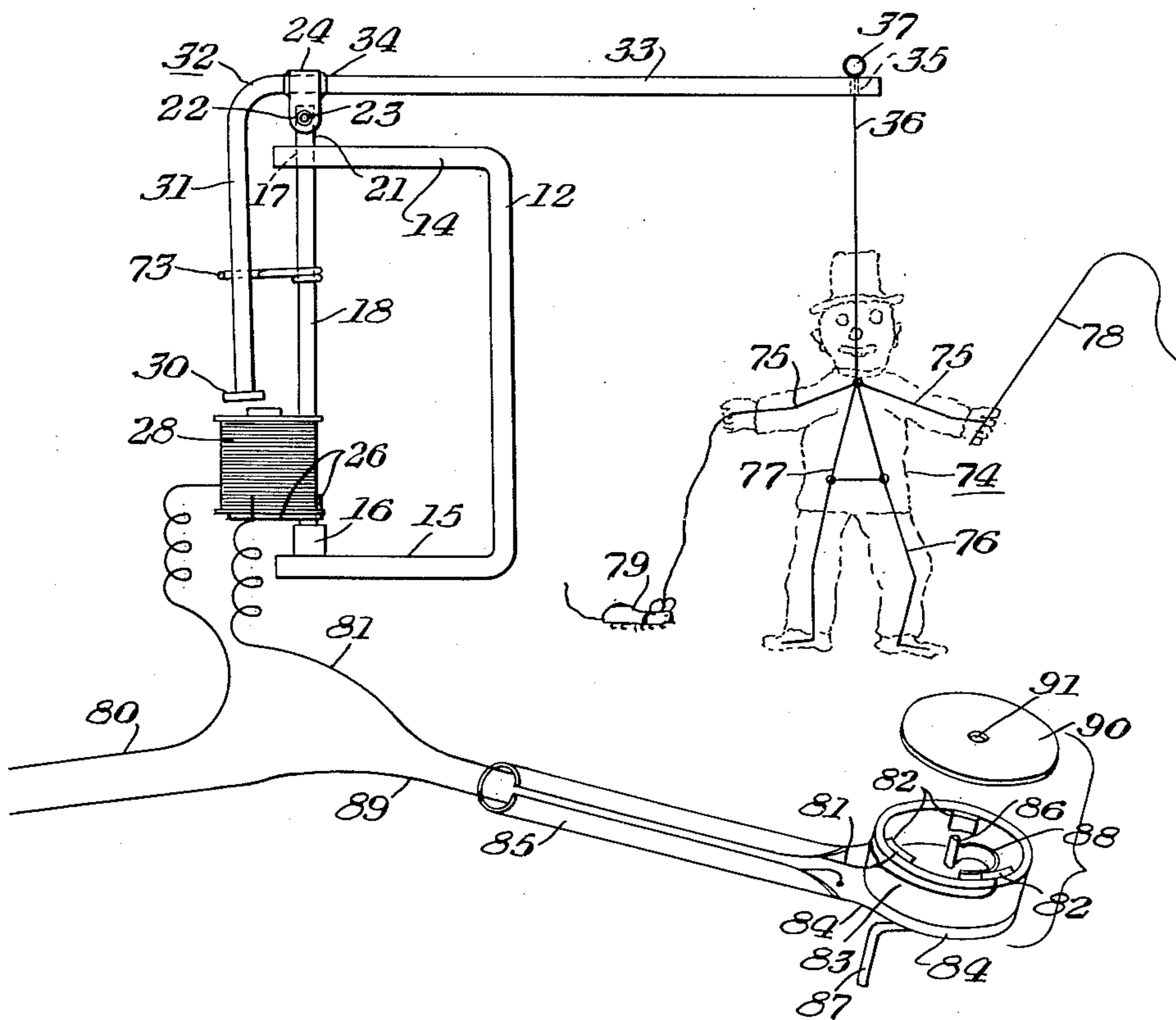
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*Fig. 5.*



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## UNITED STATES PATENT OFFICE

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## ANIMATED DANCING DOLL

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5 Claims. (Cl. 46—45)

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This invention relates generally to toys simulating the form of an animate being and more particularly to an animated toy, the action of which simulates dancing.

This invention provides one or more dolls arranged to be animated by means of a motor to produce an action simulating a dance. The reaction of the movement of the dolls on a platform combined with the characteristics of a motor actuating the dolls imparts a haphazard motion thereto causing them to simulate a dance with lifelike characteristics. This haphazard action of the dolls causes them to dance continuously without repetition of the action that they perform.

The toy comprising this invention may be constructed in the form of a small display toy or be arranged to operate large marionettes for window displays and the like.

The principal object of this invention is the provision of a motor operated animated toy having a haphazard action simulating a dance.

Another object is the provision of a motor having variable characteristics which are affected by the reaction of the object which it operates to produce a haphazard action of the object.

Another object is the provision of an electromagnetic motor for operating an animated object, the energization of the motor being intermittent in a haphazard manner resulting from the unpredictable action of the object.

Another object is the provision of a rotatably mounted electromagnetic motor arranged to be energized in a haphazard manner for imparting a dancing motion to an object, the action of the object reacting to aid in rotating the motor and the object.

Other objects and advantages appear hereinafter in the following description and claims.

A practical embodiment illustrating the principles of this invention is shown in the accompanying drawings wherein:

Fig. 1 is a view partly in section and partly in elevation showing the animated toy comprising this invention.

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

Fig. 3 is a rear view of the electromagnetic motor comprising this invention.

Fig. 4 is a perspective view of the stage with the ceiling raised.

Fig. 5 is a view in side elevation of an animated toy with a manually controlled electromagnetic motor.

Referring to Figs. 1 and 2 of the drawings, the toy may be referred to as a base which comprises

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the stage 1 made up of two identical pan members 2 and 3. Each pan member has a rim which is preferably rounded at the front and is provided with a circumferentially depending flange 4.

The lower pan member 2 forms the deck of the stage and the upper pan member 3 forms the ceiling of the stage and is supported from the lower pan member 3 by the U-shaped partition wall 5 which has the intumed flange 6 around its bottom edge which is fastened to the deck of the stage 2 in any suitable manner as by welding or riveting. The partition 5 extends upwardly into the ceiling member 3 and is secured to its depending flange 4. The vertical ends of the partition 5 are also provided with the intumed flanges 7 arranged to be secured to the back panel 8 which also extends upwardly into the ceiling pan 3 being fastened to the rear section of the flange 4 and extends downwardly over the rear flange 4 of the stage 2 and is secured thereto. Thus the whole of the stage comprises the pan sections 2, 3, the partition 5 and the back 8 which when assembled provide the enclosed chamber 10. The face 11 of the partition may be advantageously rounded and decorated as an upstage cyclorama to simulate an orchestra or other scene depicting caricatures related to the dancing figure or figures.

A bracket 12 is secured in any suitable manner such as by means of the screws 13 to the back of the center of the partition 5 and is provided with spaced rearwardly projecting upper and lower arms 14 and 15, the latter of which is preferably raised above the stage deck. An upwardly open bearing socket 16 is mounted on the arm 15 in alignment with an opening 17 in the upper arm 14 for the purpose of receiving the rotatably mounted support 18 which comprises a stem, the lower end 20 of which is preferably spherically shaped and stepped in the bearing socket 16 for the purpose of rotatably mounting the support. The upper end 21 of the support 18 is provided with the hole 22 for receiving the transverse pin 23 on which the saddle 24 is pivotally supported.

Adjacent its lower end the support 18 is provided with a bracket 26 on which is mounted a pair of spaced electromagnetic coils 27 and 28 preferably having soft iron cores and suitably insulated from one another. The upwardly extending cores of the electromagnets are positioned to attract the armature 30 when energized. The armature 30 is sufficiently long to cover both pole faces of the electromagnets 27 and 28 when brought in alignment therewith.

The armature 30 is supported on the lower end

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of the vertically disposed leg 31 of the bell crank beam 32, the horizontal leg 33 of which is secured as by welding or soldering, as indicated at 34, to the saddle 24 above the pivot pin 23. The pivot pin opening 22 in the stem top 21 is materially larger than that of the diameter of the pivot pin 23 so as to permit the bell crank beam 32 to have lateral as well as oscillating movement in a vertical plane relative to the support 18 as indicated by the different positions of the leg 33 shown in dotted lines in Fig. 2. The leg 33 extends forwardly within the stage ceiling 3 and is provided with a vertically disposed hole 35. A suspension wire 36 having a loop 37 formed in the upper end thereof is arranged to pass down through the hole 35, the loop 37 being sufficiently large to prevent the wire from being drawn any further. The lower end of the wire is arranged to be secured to the central portion of the bar 40, the ends of which have the arms 41 and 42 of the dolls 43 and 44 pivoted thereon. The arms 41 and 42 are rigid and are pivotally attached at their ends to the bodies of the dolls 43 and 44. Each doll is provided with a weighted head 45 pivotally supported by any suitable means such as a wire or spring to the upper part of the body of the doll as indicated at 46. Each doll is provided at its lower end with a pair of legs 47, each leg of which is independently pivoted to the doll as indicated at 48. Each leg is provided with a foot 49 arranged to strike and react with the stage platform 2.

Without the weight of the dolls, the substantially horizontally disposed leg 33 of the bell crank beam 32 is weighted sufficiently to overbalance the leg 31 and its armature 30 so as to draw the latter in its extreme clockwise position as shown in Fig. 1. The vertically disposed leg 31 is limited in its arcuate movement owing to the fact that it may strike the support 18 in its other extreme position as illustrated in dotted lines in Fig. 1.

A bracket 50 is secured to the support 18 below the arm 14. This bracket has a laterally extending section 51 and an outwardly extending section 52 which is arranged to carry the stationary contact support 53 at its outer end insulated therefrom. The top of the contact support is provided with the contact member 54. A flexible contact finger 55 has one of its ends bent downwardly, as indicated at 56, and is provided with an opening to receive the fastening means 57 for securing the contact finger to the laterally extending section 51. The contact finger extends over the bracket 50 and is provided with the contact member 58 at its free end which is arranged to engage and close an electric circuit with the stationary contact member 54.

A substantially vertically disposed control lever 60 is pivotally supported to the bracket 50 by means of the pivot pin 61 which extends through the bracket and the control lever and is provided with a cap 62 secured to the outer end of the pin 61 and arranged to hold the helical spring 63 in compression between the cap 62 and the control arm 60 for the purpose of providing a frictional load to retard the movement of the control lever 60.

The upper end of the control lever 60 is cut at an angle to provide the cam 64 arranged to engage the underface of the contact spring 55 and raise it to open the contacts when the control lever is moved in a counterclockwise direction as viewed in Fig. 1. The intermediate portion of the lever 60 is twisted to dispose its lower end at ninety degrees to the upper portion. The lower

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end of the control lever has the arm 65 secured thereto which extends rearwardly passing on one side of the support 18 and is provided with a U-shaped hook 66 which encircles the vertically disposed leg 31 just above the position where the armature 30 is attached thereto and is opened sufficiently to permit lost motion therebetween.

When the motor is at rest or de-energized the horizontal leg 33 of the bell crank beam 32 is sufficiently weighted to move the vertically disposed leg 31 to its rearmost position as shown in Fig. 1 causing the leg 31 to engage the hook 66 and swing the control lever 60 so as to permit the contact 58 of the finger 55 to engage the contact 54 thereby closing an electrical circuit to energize the electromagnetic coils 27 and 28. The electrical circuit may be energized from a suitable source of electricity such as a battery or the low voltage secondary of a transformer, either source of which may be connected to the eyelets 67 and 68. The current travels from the eyelet 67 through the lead 70, the coils 27 and 28 which are connected in series, the flexible lead 71, the stationary contact support 53, the contact 54 to the contact 58 of the finger 55, the bracket 50, the support 18 and thence through the flexible lead 72 to the return circuit eyelet 68.

Upon energizing the coils 27 and 28, the armature 30 is magnetically attracted thereto causing the vertically disposed leg 31 to move in a counterclockwise direction. Before the armature reaches the position above the cores of the electromagnets the leg 31 engages one of the other sides of the hook 66 and rocks control lever 60 in a counterclockwise direction causing the cam 64 to raise the contact finger 55 and withdraw the contact 58 from engagement with the contact 54 to open and de-energize the circuit of the electromagnets 27 and 28. However the momentum of the magnetic pulling force on the armature 30 causes the leg 31 to travel approximately the full distance of its travel thereby raising the outer end of the horizontal leg 33 and lifting the dolls 43 and 44 from the deck of the stage 2. Owing to the fact that the circuit energizing the electromagnet is almost immediately interrupted when motion is imparted to the bell crank beam 32, the dolls 43 and 44 are raised with a jerking motion causing the bodies thereof to pivot relative to the arms 41 and 42 and the legs 47 to swing to other positions. As the horizontal bell crank leg 33 descends the feet 49 of the dolls engage the deck of the stage in another position causing a reaction relieving the bell crank beam of its load in such a manner as to produce a different reaction permitting the bell crank beam to repeatedly and rapidly oscillate in a haphazard manner. This action not only permits the dolls 43 and 44 to dance in a haphazard manner but also permits them to rotate about the axis of the suspension wire 36 and cause the horizontal leg 33 of the bell crank beam to swing in either direction relative to the support 18 due to the clearance between the pin 23 in the hole 22. This permissible relative lateral movement of the bell crank beam allows the momentum of the dolls to swing the beam and the momentum carries the beam beyond the play of the pivot pin 23 which results in swinging the whole of the support 18 about its axis on the bearing 16. This action is also indeterminate and the dolls stay in one position for a while or move back and forth across the stage as they continue to dance and turn about the axis of the suspension wire 36. The combined function of these several structures thus produce

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an animated action of the dolls simulating a dance wherein they almost never repeat the same dance, which is haphazard in nature, and their action carries them from one side of the stage to the other and causes them to rotate. At times the reaction of the dolls is insufficient to close the contacts which add to the indeterminate action of the dolls. Thus the dance that the dolls perform provides a very amusing and unusual dance which is extremely fascinating to watch.

The structure of Figs. 1 to 4 is automatic owing to the fact that the action of the electromagnetic motor together with the reaction of the dolls on the deck of the stage determines the frequency and duration that the electric circuit is interrupted. However in the structure of Fig. 5 the circuit is interrupted by a manually operated means.

Referring to Fig. 5 the support 18 has the stationary hook member 73 secured thereto. This hook encircles the vertical leg 31 of the bell crank beam 32 and is set to limit the oscillatory motion of the beam. The suspension wire 36 is shown supporting a single doll 74 in the form of a ringmaster, the arms 75 of which are preferably made of flexible material such as springs and the jointed legs 76 are pivotally connected to the triangular body 77. The feet of the doll are arranged to react with the stage in the same manner as the dolls previously described. The left hand of the ringmaster doll is arranged to hold the whip 78 and a cord is suspended from the right hand to a creature such as the mouse 79. The weight of the whip 78 and the mouse 79 aid in balancing the doll and to increase the vibratory action of the arms 75 of the doll to produce the animated effect of the ringmaster putting his trained animal through its tricks.

The electromagnetic coils 27 and 28 are connected in series and are supplied with current from a suitable source of electric supply such as a battery or transformer which current flows through the wire 80, the coil 27, the coil 28, the wire 81 to the several switch contacts 82 disposed on the inner surface of the drum 83 made of suitable insulating material. The drum 83 is mounted on the metal disk 84 which has an outwardly projecting portion 85 the sides of which are turned up to form a tubular handle for the purpose of receiving the wires and holding the drum. The disk 84 is provided with a centrally disposed bearing for rotatably receiving the shaft 86 which is provided with the crank handle 87. The shaft is disposed axially of the bore of the drum and is provided with the brush member 88 arranged to intermittently engage the contacts 82 for the purpose of making and breaking the circuit through the solenoids 27 and 28. The current travels from the contacts 82 through the brush 88, the shaft 86, the disk 84 to the wire 89 which is soldered thereto and thence to the return circuit side of the supply current. The rotary switch drum is closed at its other end by the disk 90 which is preferably made of insulating material and provided with the central bearing 91 for receiving the end of the shaft 86. The disk 90 may be formed integral with the drum or attached thereto by any suitable means.

When the crank 87 is rotated, the brush 88 engages the contacts 82 in turn thereby intermittently energizing the electromagnets causing the doll 74 to jig. The speed of rotation of the switch determines the frequency of the animated actions of the doll and it may be made to respond

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somewhat in accordance to the manner in which the operator rotates the switch. However the doll is apt to respond entirely different to that which is expected owing to the reaction of its feet on the stage and the effect of the weighted articles such as the whip 78 and the mouse 79.

I claim:

1. An animated doll display comprising a base having a horizontally disposed platform, a beam, pivot means carried by said base to pivotally support the beam intermediate of its ends to have limited vertical movement relative to the platform, an armature secured adjacent one end of the beam, an electromagnet, means to mount said electromagnet on the base to produce a magnetic coupling with and to attract the armature and swing the beam in a vertical plane when energized, make and break means to interrupt the electrical energization of the electromagnet, and doll means loosely suspended from the other end of the beam and overlying the platform, said doll means substantially balancing the beam and causing an unbalance thereof when the doll means forcibly engages the platform to provide varied vertical movement of the beam and produce a haphazard dance of the doll means.

2. An animated doll display comprising a base having a horizontally disposed platform, a beam, pivot means carried by said base to pivotally support the beam intermediate of its ends to have limited vertical and lateral movement relative to the platform, an armature secured adjacent one end of the beam, an electromagnet, means to mount said electromagnet on the base to produce a magnetic coupling with and to attract the armature and swing the beam in a vertical plane when energized, make and break means actuated by the movement of the beam before traveling its full stroke to interrupt the electrical energization of the electromagnet, a lost motion connection between the beam and the contact means to produce a time delay period in the operation of the contact means for the de-energization of the electromagnet and assure good movement of the beam, means to hold the make and break means against movement when the beam is traversing the time delay period, and doll means loosely suspended from the other end of the beam and overlying the platform, said doll means substantially balancing the beam and causing an unbalance thereof when the doll means forcibly engages the platform to provide varied vertical movement of the beam and produce a haphazard dance of the doll means.

3. An animated doll display comprising a base having a horizontally disposed platform, a support carried by the base and rotatably mounted relative to the platform, a beam, pivot means attached to said beam intermediate of its ends and carried by said support to pivotally mount said beam with limited vertical movement relative to said support, an armature secured adjacent one end of the beam, an electromagnet, means to mount said electromagnet on said support and position it to attract the armature and swing the beam in a vertical plane when energized, make and break means to interrupt the electrical energization of the electromagnet, and doll means with movable limbs loosely suspended from the other end of the beam and overlying the platform, said doll means substantially balancing the beam and causing an unbalance thereof when the limbs of the doll means forcibly engages the platform to provide varied vertical movement of the beam and varied horizontal movement of

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the support to produce a haphazard dance of the doll means.

4. An animated doll display comprising a base having a horizontally disposed platform, a support carried by the base and rotatably mounted relative to the platform, a beam, pivot means attached to said beam intermediate of its ends and carried by said support to pivotally mount said beam with limited vertical and horizontal movement relative to said support, an armature secured adjacent one end of the beam, an electromagnet, means to mount said electromagnet on said support and position it to attract the armature and swing the beam in a vertical plane when energized, make and break means actuated by the movement of the beam before traveling its full stroke to interrupt the electrical energization of the electromagnet, a lost motion connection between the beam and the contact means to produce a time delay period in the operation of the contact means for the de-energization of the electromagnet and assure good movement of the beam, means to hold the make and break means against movement when the beam is traversing the time delay period, and doll means with movable limbs loosely suspended from the other end of the beam and overlying the platform, said doll means substantially balancing the beam and causing an unbalance thereof when the limbs of the doll means forcibly engages the platform to provide varied vertical movement of the beam and varied horizontal movement of the support to produce a haphazard dance of the doll means.

5. An animated doll display comprising a base having a horizontally disposed platform, a support carried by the base and rotatably mounted relative to the platform, a bell crank beam having a vertical and horizontal leg, pivot means attached to said beam intermediate of its ends and carried by said support to pivotally mount said

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beam with limited vertical and lateral movement relative to said support, an armature attached to the vertical leg of the beam, an electromagnet, means to mount said electromagnet on said support and positioned to attract the armature and swing the horizontal leg of the beam in a vertical plane when energized, make and break means to interrupt the electrical energization of the electromagnet, and doll means rotatably and loosely suspended from the horizontal leg of the beam and overlying the platform, said doll means with movable limbs substantially balancing the beam and causing an unbalance thereof when the movable limbs of the doll means forcibly engages the platform to provide varied vertical and lateral movement of the beam and varied horizontal movement of the support to produce a haphazard dance of the doll means.

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