

June 17, 1930.

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1,763,788

RADIO TOY

Filed Oct. 19, 1929

2 Sheets-Sheet 1

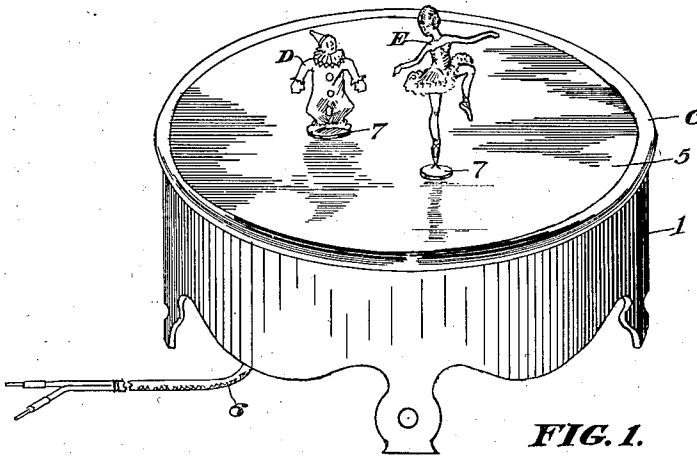


FIG. 1.

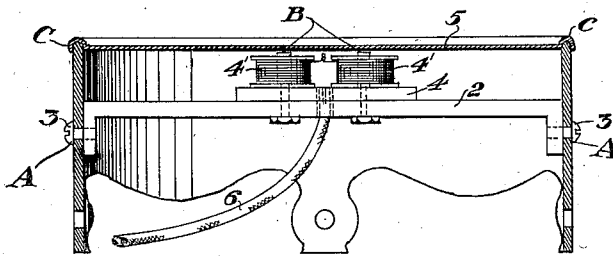


FIG. 2.

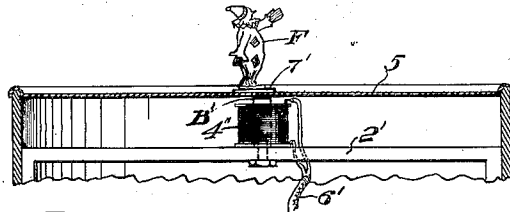


FIG. 3.

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2 Sheets-Sheet 2

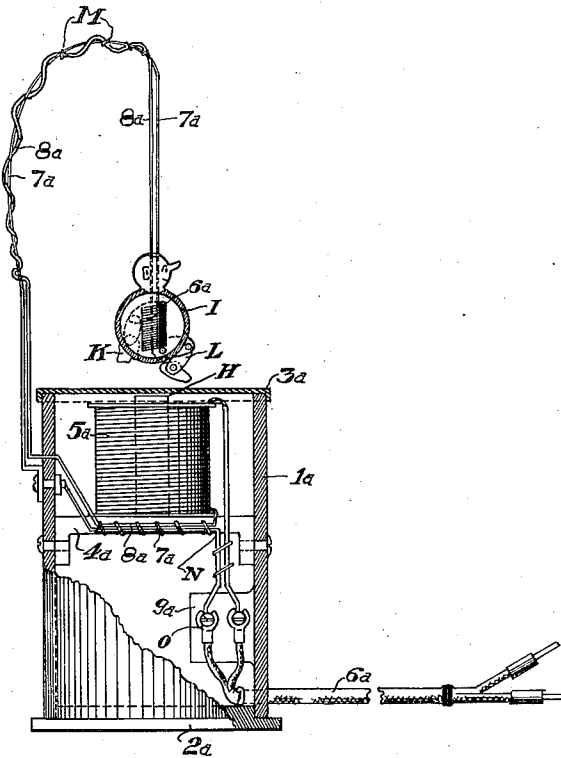


FIG. 4.

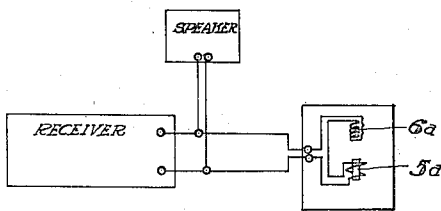


FIG. 5.

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RADIO TOY

Application filed October 19, 1929. Serial No. 400,873.

My invention relates to a radio toy.

The object of my invention is to provide a toy arranged to be connected to the audio frequency circuit of a radio receiver for the purpose of causing miniature figures and puppets positioned on a plane surface, to move in simulation of dancing.

A further object of my invention is to provide a toy of the kind described comprised of a steel diaphragm mounted over an electromagnet of the U-type. The steel diaphragm functions as the plane surface upon which puppets are placed. The vibrations of the diaphragm, when the electromagnets are connected in the audio frequency circuit of a radio receiver, acting as a means to move the puppets.

A still further object of my invention is to provide in a toy of the kind described a non-metallic diaphragm placed over and adjacent an electromagnet, the latter being connected to the audio frequency circuit of a radio receiver and puppets placed thereon having a steel or iron base plate. The movement of the base plate, actuated by the magnet flux of the electromagnet as it is varied in its intensity by the power output of the audio frequency circuit, to cause the puppet to dance.

A still further object of my invention is to provide in a toy of the kind described, as a modification of my invention, a nonmetallic diaphragm placed on a base over and adjacent the core of an electromagnet in combination with a solenoid positioned in a puppet and suspended by means of a spring member above and directly in line with the said core. The solenoid in the puppet being electrically connected to the circuit of the electromagnet or separately excited for the purpose of making the puppet dance up and down.

These and other objects will hereinafter be more fully explained, reference being had to the accompanying drawings which form a part of this specification and in which like characters will apply to like parts in the different views.

Referring to the drawings:

Fig. 1 is a perspective view of the toy showing two puppets in place.

Fig. 2 is a longitudinal sectional view of Fig. 1.

Fig. 3 is a longitudinal sectional view showing the use of a nonmetallic diaphragm as applied to the device shown in perspective in Fig. 1.

Fig. 4 is an elevation of a modified form of the invention with parts shown in section and parts removed for the purpose of illustration.

Fig. 5 is a schematic diagram of the wiring connections of the toy with regard to a radio receiver and speaker.

A cylindrical member 1 formed as shown and preferably composed of a nonconducting material such as wood, fiber, or rubber, has a bridge member 2 diametrically positioned across its interior and intermediate to its axial length. The bridge member 2 is affixed to the member 1 by reason of the screws 3 as shown at A in Fig. 2. Firmly affixed on the upper surface and intermediate to the ends of the bridge 2 is an electromagnet assembly comprising a U-magnet 4 having windings 4'. The upper ends of the electromagnet as shown at B are in close proximity to a metal diaphragm 5, preferably of steel, annular in shape, and with the outer edge formed as shown at C to fit the upper edge of the member 1 as illustrated. The windings 4' of the electromagnet are connected to the flexible cord 6 by which means electrical connection is made with the output circuit of the audio frequency side of a radio receiver. This may be made with or without a speaker connection and the speaker connection may be in series or parallel with the electromagnet depending upon the requirements and the conditions of operation.

The puppets illustrated in Fig. 1 at D and E have in this instance bases 7 formed of either metal or fibrous material. The metal being preferably nonmagnetic.

The vibrations of the diaphragm 5 as actuated by the power output of the audio-frequency circuit cause the puppets to move about in the simulation of dancing.

Referring to Fig. 3 the diaphragm 5' in this instance is nonmetallic. It being preferably of a thin fibrous material or of skin or hide composition similar to a drum head.

The electromagnet in this instance is of the open core or bar type and is firmly affixed on the upper surface of the bridge 2'. The upper extremity of the core of the magnet is set adjacent to the diaphragm 5' as shown at B'.
 5 In this instance the puppet F has a base 7' of magnetic material such as steel or iron. The winding 4'' of the magnet is connected to the flexible cord 6', which functions in a manner
 10 similar to the cord 6 with regard to a radio receiving set.

The vibrations of the diaphragm 5' result from the movement of the base 7' in the field of the electromagnet as that field is
 15 varied in intensity by the audio frequency output of the receiver.

It should be noted that the sound effect of the toy when used as illustrated in Fig. 3 with the nonmetallic diaphragm and the
 20 metal base on the puppet is not so evident as in the arrangement shown in Figs. 1 and 2, however, its use is justified under certain conditions.

A modification of my invention is shown in Fig. 4. I use the dynamic action of a solenoid in an electromagnetic field. A cylindrical housing 1^a has a base member 2^a and a cap or diaphragm member 3^a on its upper extremity. The housing 1^a, the base 2^a and the cap 3^a
 30 are formed preferably from a nonconducting material. A bridge member 4^a is positioned intermediate to the axial length of the housing 1^a across its interior and supports on its upper surface an electromagnet 5^a, the core
 35 of which is in close proximity to the under surface of the cap 3^a as shown at H. A puppet I, being hollow at its center and having arms and legs as shown at K and L respectively, contains the solenoid 6^a. The solenoid and puppet are suspended from a resilient member 7^a directly above and in line with the core of the electromagnet.
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An insulated wire 8^a is connected to one side of the solenoid 6^a and is carried on the resilient member 7^a as shown at M. The wire 8^a and the resilient member 7^a, the latter being
 45 connected to the other terminal of the solenoid, form the electrical connections between the solenoid and the other parts of the circuit.
 50 The solenoid connections, in the instance illustrated, are in series with the electromagnet as at N.

A terminal block 9^a is formed integral with the member 1^a and has connection means for
 55 the ends of the flexible cord 6^a as shown at O.

Referring to the wiring diagram in Fig. 5. This is a schematic arrangement of the electrical connections shown, in which the toy is
 60 connected in parallel with the speaker.

I do not confine myself strictly to these connections, as various arrangements may be made with regard to the operation of the toy. The electromagnet may be excited from a
 65 source independent of the audio frequency

circuit and the solenoid only be connected to the audio frequency circuit of the receiver.

The variation of the intensity of the field and the different resultant fields set up between the solenoid and the electromagnet
 70 cause the puppet illustrated to move in more or less of a vertical direction which results in the waving of the arms and legs of the puppet, in the simulation of dancing.

I do not restrict myself to any particular connections or relative position of the coils
 75 but use the arrangement that will give the most activity and amusing movement of the puppet under the conditions encountered with the various types of receiving sets.

The principle of my invention lies in the actuation of the puppets to simulate dancing in rhythm with the power pulsations of the audio frequency circuit of a radio receiving set and such modifications may be employed as lie within the scope of the appended
 80 claim.

What I claim as new and desire to secure by Letters Patent is:

In a dancing toy in combination with an audio frequency circuit a steel diaphragm
 90 an electromagnet adjacent to the diaphragm as vibrating means therefor, the said magnet having windings connected to a source of pulsating energy, a puppet positioned on the diaphragm and slidable thereon, the diaphragm
 95 vibrating to the pulsations of the circuit and actuating the puppet to movement.

In testimony whereof I affix my signature.

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