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ELECTRICAL DRIVING PENDULUM DEVICE

Filed Oct. 22, 1924

Fig. 1.



Fig. 2.

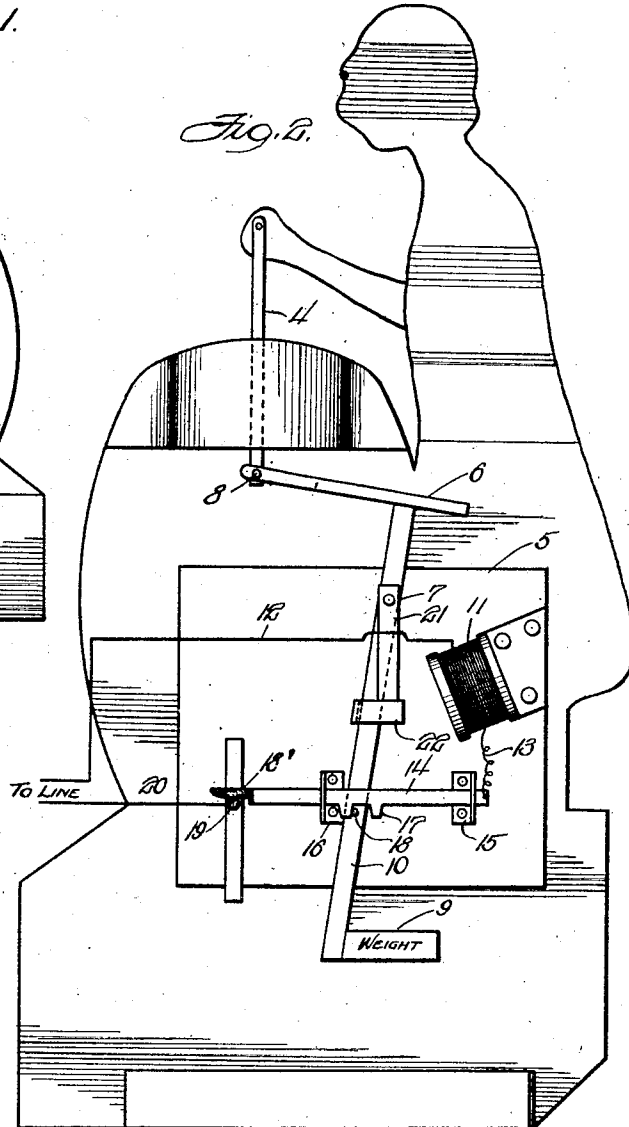
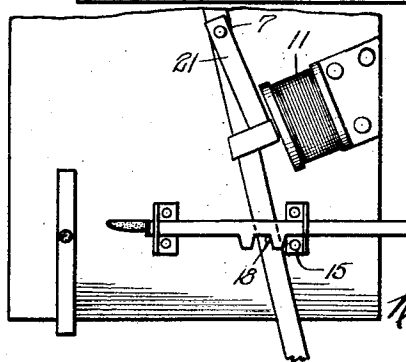


Fig. 3.



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ELECTRICAL DRIVING PENDULUM DEVICE.

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The main object of this invention is to provide an animated show card which can be connected to and operated by any commercial electrical circuit; to provide an improved electric mechanical mechanism for operating the show card; to provide a compound pendulum linked to the animated elements, and a second or impulse pendulum which delivers a driving impulse to the compound pendulum through the action of a fixed electro-magnet upon a moving armature secured to the impulse pendulum; to provide an impulse pendulum which is not connected in the electrical circuit, and which does not control the make and break contacts of the electrical circuit; to provide a simple inexpensive electrically driven, pendulum operated mechanism which will maintain itself in operation for an indefinite period without manipulation or adjustment; to provide a crude but substantial make and break contact which is operated by the compound pendulum when said pendulum is at its position of maximum velocity.

An illustrative embodiment of this invention is shown by the accompanying drawings in which:

Fig. 1 is a front perspective view of a show card in which the driving mechanism is concealed and the driven parts are visible.

Fig. 2 is a diagrammatic sketch of the rear view of Fig. 2 showing the driving mechanism in one position.

Fig. 3 shows the driving mechanism with the electrical contact broken.

In Fig. 1 the driven arm 1 is pivoted at a point 2 and at a point 3 and is connected by a link 4 with the driving mechanism shown in Fig. 2. In Fig. 2 the driving mechanism is assembled upon a board 5, and comprises a compound pendulum 6 mounted on a pivot or suspension 7. A projection on the compound pendulum carries the pivot 8 to which is secured the link 4. At the lower end of the pendulum 6 is fastened a weight 9 which operates as the lower bob of the compound pendulum. The position of the weight 9 is adjusted at the time of construction so that at the rest position of the compound pendulum 6 the suspension bar 10 hangs in a vertical line.

An electro-magnet 11 is secured to the board 5 in such position that the face of the electro-magnet 11 is in line with a radius drawn from the point of suspension 7. Current is supplied to the electro-magnet

from the main line by a circuit 12 which is completed by a light flexible wire 13 which is connected to a thin metal bar 14. The metal bar 14 is in turn carried by guide slots in brackets 15 and 16. Cams 17 forming an integral part of the bar 14 are arranged to coact with the pin 18 on the compound pendulum 6. One end of the bar 14 carries a pencil carbon 18' which rides over a fixed pencil carbon 19. The fixed pencil carbon 19 is electrically connected to the main line through wire 20. The outstanding feature of this invention is a second impulse pendulum 21 which is independent of the compound pendulum 6 but is supported in this illustrative embodiment on the same suspension 7.

The impulse pendulum 21 has a very much shorter period of oscillation than the compound pendulum and the impulse pendulum 21 carries an armature 22, which armature forms a clip which coacts with the compound pendulum 6 and through which a mechanical impulse is delivered by the impulse pendulum 21 to the compound pendulum 6 at a predetermined position of both pendulums.

The novelty of this invention resides in the fact that in operation the impulse pendulum 21 is acted upon by a magnetic flux from the electro-magnet 11 and that the impulse pendulum is free to swing under the impulse of the magnetic flux, and that when the impulse pendulum has reached the position of desired tractive effort between the electro-magnet 11 and the moving armature 22, that the combined tractive effort of the electro-magnet and the momentum of the pendulum 21 are delivered to the compound pendulum 6, the impulse being given at the time when the suspension bar 10 is in its vertical position and at its position of maximum velocity.

From construction, the electrical circuit through the solenoid 11 is completed at the carbon pencil contacts 18' and 19 before the suspension bar 10 reaches its full sway away from the solenoid 11. At the time of closure of the circuit the tractive effort of the solenoid 11 on the armature 22 is negligible because of the long air gap. The impulse pendulum 21 does not engage the suspension bar 10 to give an effective pull until the suspension bar is passing the central position toward the solenoid.

This simple arrangement of a separate

armature carrying pendulum controlled by an electro-magnet in a circuit in which the electrical contact is quickly broken with a snap switch effect by the compound pendulum gives a construction which is dependable in operation and eliminates all close adjustments. This result is secured by engagement of the pin 18 with the cam 17 which in turn breaks the contact between the carbon pencils 18 and 19, the position of the cam 17 being so arranged that the pin 18 strikes the cam 17 when the pendulum is at its center position or maximum velocity and when the impulse pendulum is at its nearest approach to the core of the electro-magnet 11, at which point the contact is sharply broken, the impulse pendulum is stopped by the impact and is free to oscillate. The compound pendulum in its return swing closes the electrical circuit by engagement of the pin 18 with the return cam 17, thus repeating the operation.

In operation, this invention provides a very positive and reliable electro-mechanical mechanism without requiring any close adjustments of any kind. The position of the cam 17 is located by the swing of the compound pendulum. The bend of the metal clip which forms the armature on the impulse pendulum sets the time of contact between the impulse pendulum and the compound pendulum at the position of maximum velocity of the compound pendulum and when once set requires no further adjustment or manipulation. Experience has proven that this simple arrangement will continue in operation for a long time with substantially no maintenance and entirely without adjustment. It will be apparent to those skilled in the art that

the illustrative embodiment of this invention, here disclosed, includes an animated show card, and that the same driving mechanism is adapted for use in any pendulum driving or regulating device where reliability of operation, economy of construction, and absence of fine adjustment is required.

Although but one specific embodiment of this invention has been herein shown and described, it will be understood that numerous details of the construction shown may be altered or omitted without departing from the spirit of this invention as defined by the following claims.

I claim:

1. An oscillating exhibition mechanism comprising a compound pendulum of long period, linkage between moving figures and said compound pendulum, a make and break contact controlled by said compound pendulum, an impulse pendulum of relatively short period, an armature on said impulse pendulum, means to deliver a mechanical impulse from said impulse pendulum to said compound pendulum, an electro-magnet in circuit with said make and break contact exerting a tractive force on said armature, when said compound pendulum is at the center of its swing.

2. An oscillating driving mechanism comprising a compound pendulum, an impulse pendulum, an armature on said impulse pendulum, means to deliver the momentum of the impulse pendulum to said compound pendulum at the position of the maximum velocity of said compound pendulum.

Signed at Chicago this 20 day of Oct. 1924.

JOHN H. GERAGHTY.