Jan. 9, 1940. W. G. WAGENHALS 2,186,744

ANIMATED DISPLAY MOTOR

Filed Sept. 28, 1939

Fig. 1.

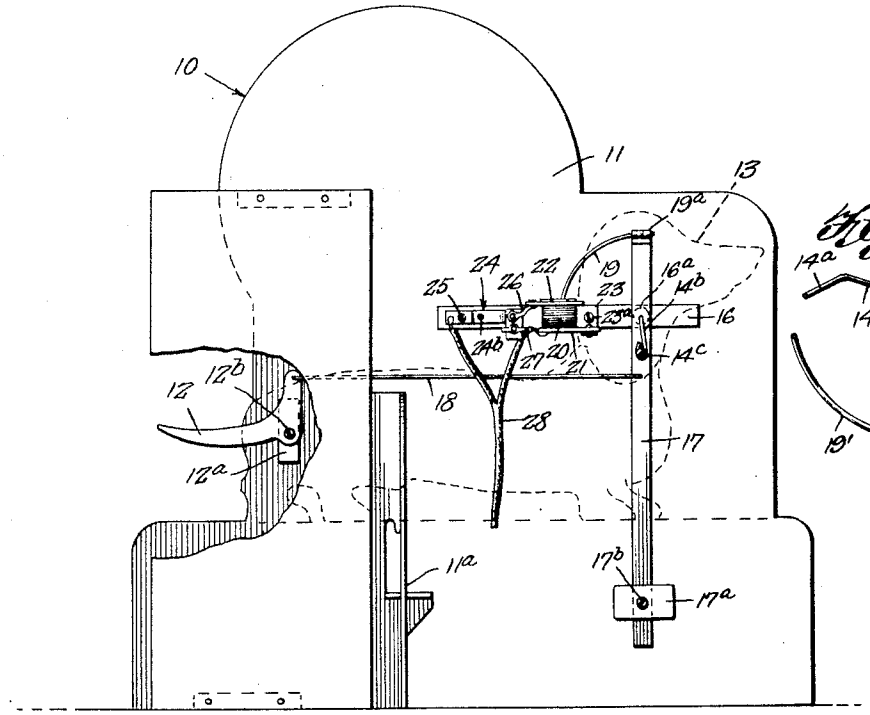


Fig. 5.

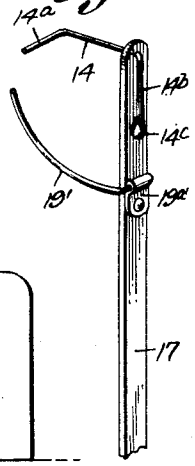


Fig. 2.

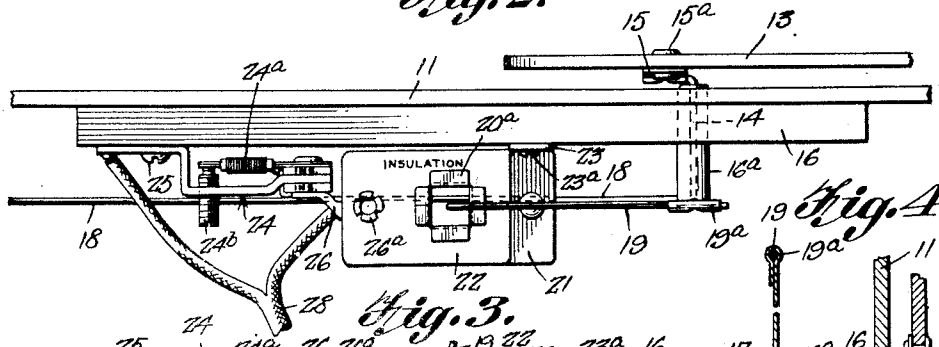


Fig. 4.

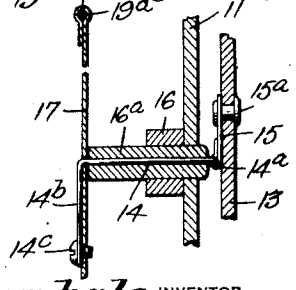
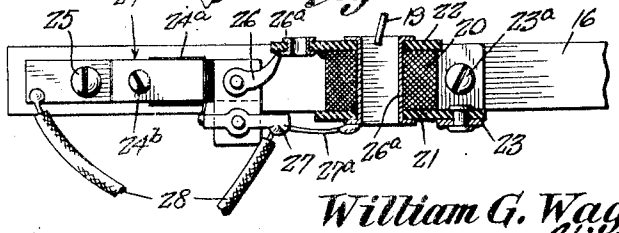


Fig. 3.



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WITNESS

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ANIMATED DISPLAY MOTOR

William G. Wagenhals, Detroit, Mich.

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2 Claims. (Cl. 40—51)

This invention relates to improvements in animated display devices and especially is concerned with a novel animated display motor.

It is an object of this invention to provide a motor suited to use in actuating animated dicplays which, by reasons of the economy of parts from which it is constructed, may be manufactured at low cost.

An advantage of the novel animated display motor according to the present invention over other or similar types of animated display motors now commonly in use is its comparative simplicity and ruggedness of construction, the former well suiting the device to the requirements of mass production and the latter minimizing necessity or likelihood of expensive upkeep of the device during ordinary conditions of use.

Other objects, advantages and features of the new and improved animated display motor according to the present invention will be apparent to those skilled in this art during the course of the following description.

Regarded in certain of its broader aspects, the novel animated display motor according to the present invention comprises in combination with a display board having stationary and movable elements, a swinging pendulum operably connected to said movable elements, a member of magnetically sensitive material mounted on said pendulum, and means for intrinsically creating magnetic disturbance in the vicinity of said pendulum which, acting upon the magnetically sensitive member, causes the pendulum to oscillate, thereby operating the movable elements of said display.

In order to facilitate a fuller and more complete understanding of the present invention a specific embodiment thereof herein illustrated will be hereinafter described, it being clearly understood, however, that the illustrated embodiment, although presently preferred, is provided solely by way of example of the practice of this invention and not by way of limitation thereof except insofar as the invention is recited in the subjoined claims.

Referring then to the drawing:

Figure 1 is a rear elevational view of a display panel including a motor according to the present invention,

Fig. 2 is substantially a top plan view of a portion of the structure shown in Fig. 1 emphasizing structural details of the motor,

Fig. 3 is a rear elevational view, partially in section of the motor,

Fig. 4 is substantially a vertical sectional view of a portion of the structure illustrated in Fig. 1 showing details of construction of the pendulum mounting, and

Fig. 5 is substantially a perspective view of a modified form of pendulum useful in a motor of the type according to the present invention.

Referring now to the drawing wherein the animated display is generally designated by the reference character 10, it will be noted that the device comprises a stationary panel 11 maintained in essentially vertical position by a support generally designated by the reference character 11a and movable display elements 12 and 13. The display element 12 is mounted upon the supporting block 12a by a pivot 12b whereby freely rotatable motion may be imparted to said display element by means hereinafter to be described.

The moving display element 13 is connected at its rear face with a bent end portion 14a of the rod 14 by means of a clip 15 attached to the element 13 by appropriate fastening means such as a staple 15a. The horizontal central portion of the rod 14 is received in a sleeve 16a mounted in an opening formed in a bar 16 which in turn is attached to the rear surface of the display panel 11. The sleeve preferably is made from oil soaked wood having self-lubricating qualities valuable in increasing the useful life of the device. It is to be understood that the sleeve 16a not only serves as a self-lubricating bearing for the rod 14 but also by projecting beyond the front surface of the display panel 11 spaces the stationary and moving display elements.

The opposite end 14b of the rod 14 passes through an opening formed in the pendulum bar 17 and, bent downwardly, is attached to said pendulum bar by fastening means such as, in this instance, the screw 14c. The lowermost end of the pendulum bar 17 carries a weight 17a slidable along the bar but fixable in position by a set screw 17b mounted in an opening in the weight and abutting against the bar. A connector link 18 mounted at one end in an opening in the pendulum bar 17 and attached at the other end to a portion of the moving display element 12 assures simultaneously movement of the moving display element.

A segmental magnetically sensitive member 19 mounted upon the top end of the pendulum bar 17 by appropriate mounting means 19a extends downwardly within the plane of movement of the pendulum, it being noted that the segmental member is positioned concentric with the axis of motion of the pendulum. The solenoid 20 hav-

ing end pieces 21 and 22, oppositely extending substantially as shown, is mounted upon the bar 16 by a bracket 23 attached to the bar by fastening means 23a, the bracket being connected to the solenoid end piece 21 essentially as is shown in Figs. 1 and 3. It is to be observed that during swinging motion of the pendulum 17 the magnetically sensitive member 19 moves within the solenoid 20. In the preferred embodiment of this invention the solenoid 20 is wound upon a core of magnetically insensitive material such as zinc, copper, brass or the like.

A thermostatic switch generally designated by the reference character 24 and comprising a thermostatic switch element 24a and adjusting means 24b is mounted upon the bar 16 by the fastening means 25 and is held rigidly in position by connection between the terminal 26 of the switch and the terminal 26a of the solenoid 20 mounted in the extended end portion of the solenoid end piece 22 as is shown in Fig. 3. The other terminal 27 of the thermostatic switch 24 is connected by a fusible link 27a with the other terminal of the solenoid 20, which, in this instance, is the metallic tube 20a hereinabove described. Wires 28 leading to a source of current are connected to the terminals of the thermostatic switch substantially as shown in Fig. 3 whereby the current supplied to the solenoid is interrupted by operation of the thermostatic switch.

In operation the thermostatic element 24a of the switch 24 intermittently connects the power source with the solenoid 20 whereby a magnetic field is set up in the vicinity of the solenoid effecting the magnetically sensitive member 19, thereby causing same to be drawn within the solenoid, with resultant swinging of the pendulum bar 17 and movement of the display elements 12 and 13. In the event of overheating of the solenoid 20 or nearby parts of the apparatus, the fusible link 27a connecting the solenoid with the current supply will be destroyed, thereby disconnecting the device and rendering the same inoperative.

Having thus described the present invention, what it is desired to secure by Letters Patent is:

1. In an animated display of the type including a display panel, cooperating freely swingingly mounted display elements on said panel, the improved means for causing swinging motion of said elements which comprise: a horizontally extending supporting bar mounted on the back of said panel; a pendulum, freely swingingly mounted on parts of said bar, operably connected to at least one of said display elements; a segmental magnetically sensitive member mounted on said pendulum concentric with the axis of motion thereof; a solenoid having end pieces oppositely extending; a bracket mounted on said bar, attached to one of said solenoid end pieces supporting the same in a manner such that during oscillation of the pendulum, said segmental member moves within the solenoid; and a thermostatic electric switch, mounted on the other end of said solenoid for controlling current supplied to the solenoid.

2. In an animated display of the type including a display panel, cooperating freely swingingly mounted display elements on said panel, the improved means for causing swinging motion of said elements which comprise: a horizontally extending supporting bar mounted on the back of said panel; a pendulum, freely swingingly mounted on parts of said bar, operably connected to at least one of said display elements; a segmental magnetically sensitive member mounted on said pendulum concentric with the axis of motion thereof; a solenoid having end pieces oppositely extending; a bracket, mounted on said bar, attached to one of said solenoid end pieces supporting the same in a manner such that during oscillation of the pendulum, said segmental member moves within the solenoid; a thermostatic electric switch, mounted on the other end of said solenoid for controlling current supplied to the solenoid; and a thermally fusible link connecting said thermostatic electric switch with said solenoid whereby overheating of the solenoid causes disconnection of the same from the current source.

WILLIAM G. WAGENHALS.