Dec. 29, 1942. P. L. POFFET 2,306,901

DISPLAY DEVICE

Filed April 2, 1942 3 Sheets-Sheet 1

Fig. 1.

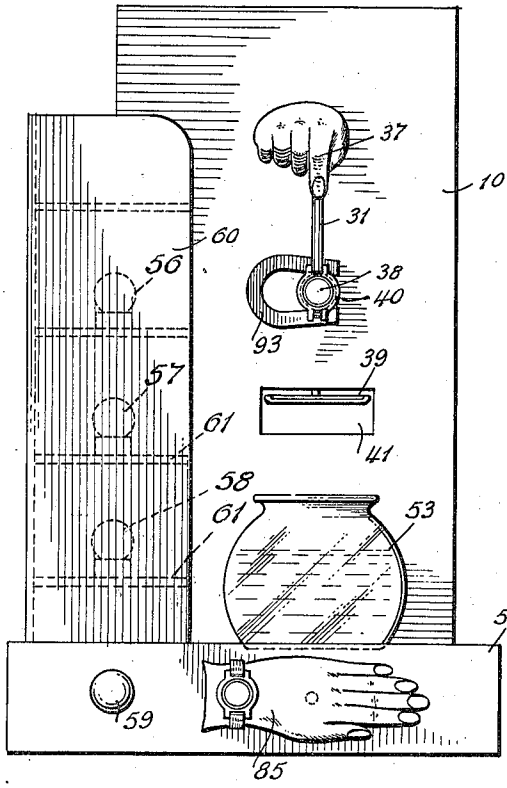
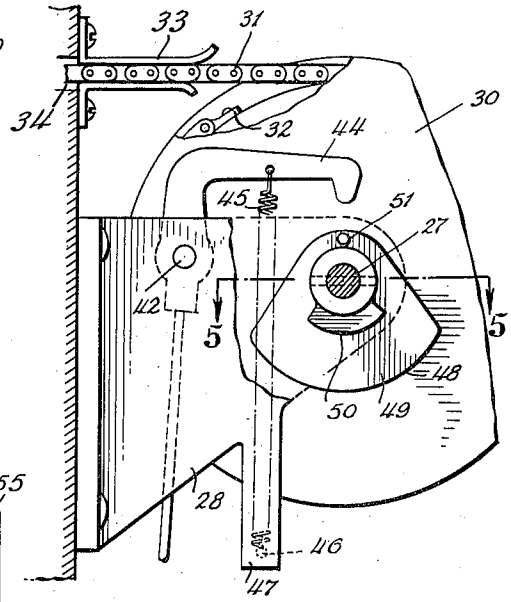


Fig. 4.



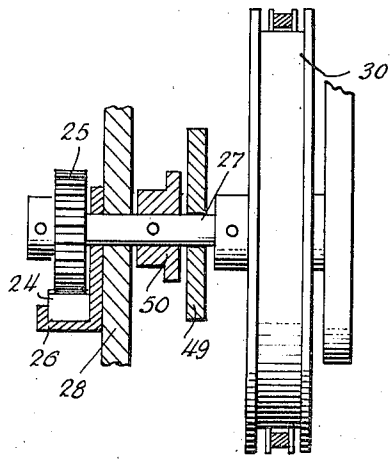


Fig. 5.

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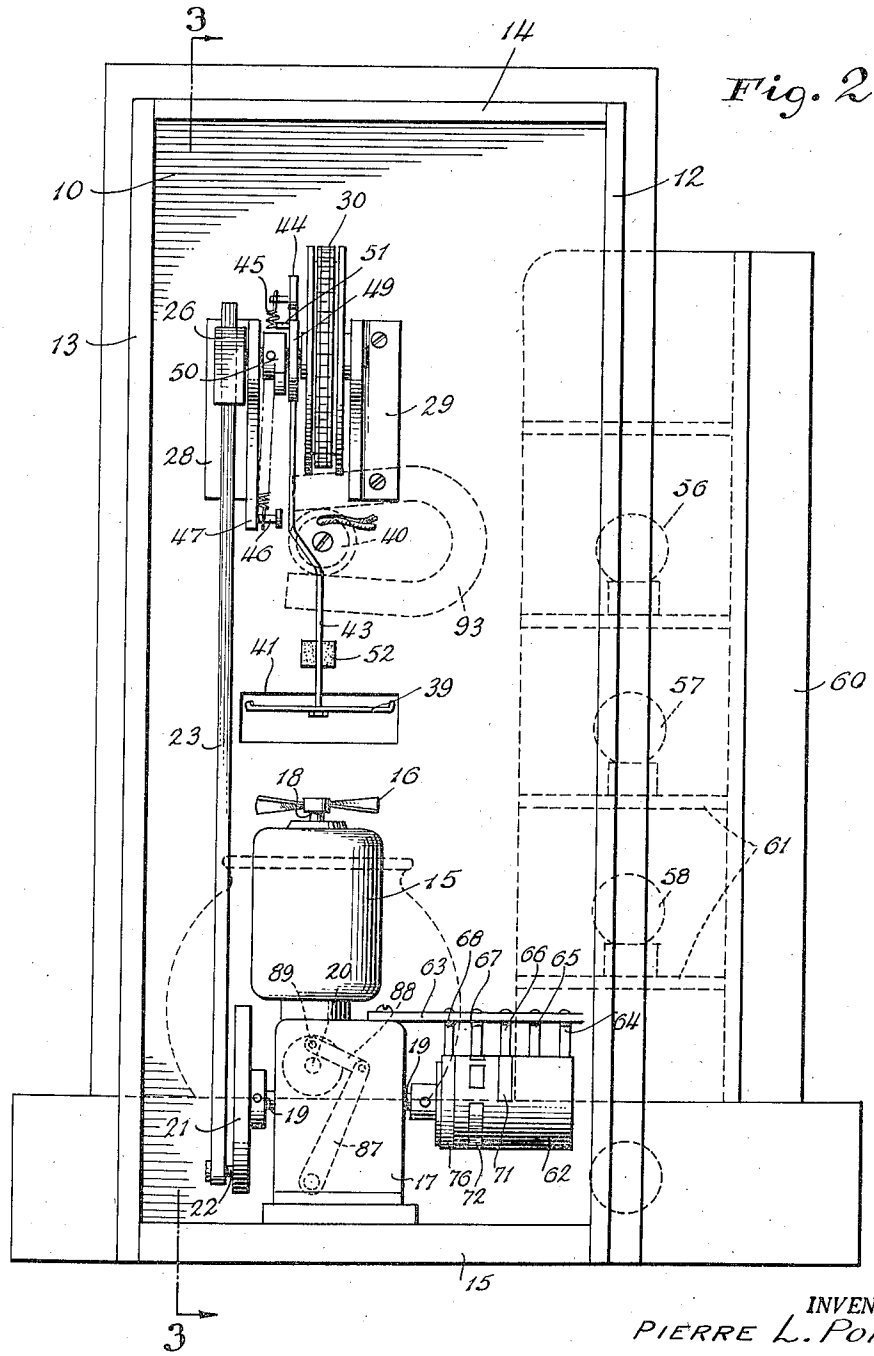


Fig. 2.

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DISPLAY DEVICE

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Fig. 6.

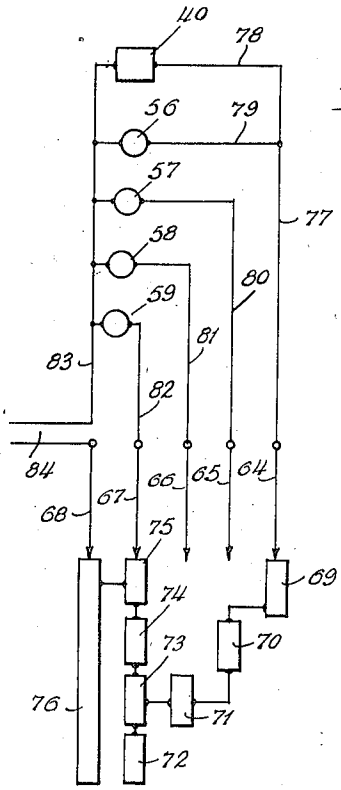
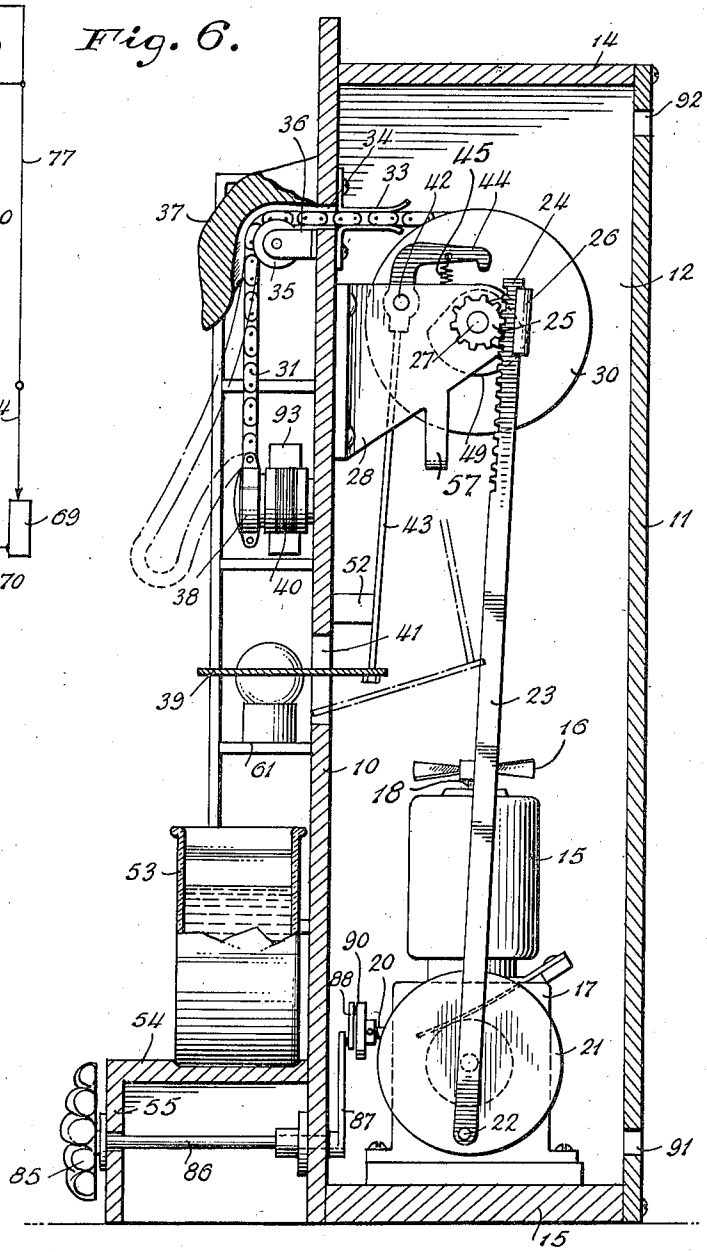


Fig. 3.



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UNITED STATES PATENT OFFICE

2,306,901

DISPLAY DEVICE

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Application April 2, 1942, Serial No. 437,376

4 Claims. (Cl. 35—49)

This invention relates to a display device.

In advertising or demonstrating an article or a merchandise to the public, it is often necessary to emphasize its sturdiness, its resistance to shock and the facility with which it withstands a fall or similar accidents. An object of the present invention is the provision of a display device having an inexpensive, simple and effectively operating mechanism capable of impressively demonstrating these qualities to observers.

If the article of manufacture the sturdiness of which is to be demonstrated, is a watch or similar timepiece, it is more advisable to combine this demonstration of its sturdiness with a demonstration of some of its other qualities, such as the fact that it is protected against shock, that it is non-magnetic, that it is waterproof and that it winds itself automatically in the course of a normal wearing. Another object of this invention is, therefore, the provision of a single display device which may be used for effectively demonstrating the aforesaid qualities of a watch.

Other objects of the present invention will become apparent in the course of the following specification.

In accomplishing the objects of the present invention it was found advisable to provide a motor drive reciprocating a rack and thereby oscillating a chain wheel carrying one end of a chain, while the watch or other article which is being demonstrated is attached to the other end of the chain. The watch may be placed by the chain upon a support which is withdrawn by a cam device associated with the oscillating chain wheel to allow the watch to fall or drop. This drop may be used to demonstrate not only the sturdiness of the watch but also the fact that it is waterproof, since a container filled with water may be placed in the path of the falling watch. The cam device must be so constructed that the support actuated thereby will not interfere with an upward movement of the chain pulling the watch back to its original position.

On the other hand, the dropping of the watch may be conveniently used for demonstrating two of its qualities, namely, that it is non-magnetic and that it is protected against shock. For that purpose, the motor drive may be used for periodically energizing a magnet located above the support and holding the watch for a short time while the full length of the chain is being released by the chain wheel, whereupon the watch drops upon the support.

The motor drive may be connected with electrical switches for periodically switching on and off electrical lamps or advertising signs and for actuating other movable display objects.

The invention will appear more clearly from the following detailed description when taken in connection with the accompanying drawings showing, by way of example, a preferred embodiment of the inventive idea.

In the drawings:

Figure 1 is a front view of the display device.

Figure 2 is a rear view with the rear wall removed.

Figure 3 is a section along the line 3—3 of Figure 2.

Figure 4 shows the cam device on a larger scale.

Figure 5 is a section along the line 5—5 of Figure 4.

Figure 6 is a diagram showing the electrical connections.

The display device shown in the drawings comprises a casing having a front wall 10, a rear wall 11, side walls 12 and 13, a cover 14 and a base 15 (Figures 2 and 3). The rear wall has vents 91 and 92.

A motor 15 which may be provided with a ventilating fan 16, is situated within the casing and is connected with a gear reducing box 17. The motor shaft 18 is connected by the gears within the box 17 with a primary driving shaft 19 and a secondary driving shaft 20.

The primary driving shaft 19 carries at one end a disc 21 which is keyed thereon. The disc 21 carries an eccentrically located pin 22 upon which one end of a connecting rod 23 is mounted. The opposite end of the rod 23 has the form of a rack 24 which meshes with a pinion 25 and which is held in place by a bent portion of a support 26 freely mounted upon a shaft 27 (Fig. 5). The pinion 25 is keyed upon the shaft 27, which is carried by brackets 28 and 29 situated upon the rear surface of the front wall 10 (Fig. 2).

A reel or chain wheel 30 is also keyed upon the shaft 27. A chain 31 extends over the wheel 30 and has one end which is firmly connected to the wheel at 32 (Fig. 4). The other end of the chain 31 extends out of the casing through a guide 33 and a passage 34 provided in the front wall 10. Then the chain passes over a roller 35 supported in front of the wall 10 by brackets 36.

The roller 35 and a part of the chain 31 extending over the roller may be concealed from an observer by a figure 37 which is carried upon the outer surface of the wall 10 and which may have the form of a hand. Then the illusion is created that it is a hand which holds the chain 31 (Fig. 1).

The opposite end of the chain 31 carries a watch 38 or other article which is to be demonstrated.

A movable plate or support 39 is located directly below and in the path of movement of the watch 38.

An electromagnet 40 is situated in front of the wall 10 and between the roller 35 and the support

38. The electromagnet 40 is periodically energized by means of contacts actuated by the main drive, as will be described in detail hereinafter. For exhibition purposes, the magnet 40 is represented by an object 93 which is an imitation horse shoe magnet.

The support or plate 39 extends through an opening 41 provided in the front wall 10. A pivot 42 carries a two-armed lever one arm of which consists of a rod 43 carrying the plate 39, the other arm having the form of a hook-shaped cam follower 44 engaged by one end of a spring 45, while the other end of the spring is attached at 46 to an extension 47 of the bracket 28 (Fig. 4).

The cam follower 44 may be engaged by a surface 48 of a cam 49 which is loosely mounted upon the shaft 27. The cam 49 is actuated by means of a driving member or sleeve 50 which is keyed upon the shaft 27 and which has a projecting portion engaging at predetermined intervals a pin 51 carried by the cam 49.

The described mechanism is used to reciprocate or swing the support 39 in and out of the path of movement of the watch 38, the forward position of the support 39 being determined by an elastic stop 52 which is carried upon the inner surface of the wall 10 above the opening 41 (Figs. 2 and 3).

A container 53 filled with water may be placed upon a platform 54 which is connected to the front wall 10 and is supported by vertical walls 55.

The illumination of the display device may consist of electric lamps 56 to 59 which are carried by shelves 61 one above the other in a supplementary casing 60 which is situated in front of the wall 10 and to one side thereof. The light of the lamps may be visible to an observer through suitable windows provided in the casing 60.

Electricity is intermittently supplied to the lamps by a commutator drum 62 which rotates along with the driving shaft 19. The drum 62 is made of insulating material and carries conducting strips 69 to 76 which are shown more clearly in Figure 6. The strip 69 is conductively connected with strips 70, 71 and 73, the strips 72 to 75 are connected with each other and the strip 75 is connected with the strip 76.

The gear casing 17 carries one end of an insulating arm 63 which carries contacts 64 to 68 adapted to engage the conducting strips 69 to 76. The contact 64 is connected by wires 77 and 78 to the magnet 40. A wire 79 connects the wire 77 with the lamp 56 which is to be energized when the magnet is actuated. The lamp 57 which is energized when the watch drops upon the shelf 39, is connected by a wire 80 with contact 65. The lamp 58 which is energized when the watch drops into water is connected by a wire 81 with contact 66.

Another lamp 59 used for calling attention to the self-winding quality of the watch 38 is connected by a wire 82 to a contact 67.

The magnet 40 and the lamps 56 to 59 are connected by a wire 83 to a main line 84 to which the contact 68 is also connected.

The self-winding quality of the watch 38 is best demonstrated by a watch-carrying display article 85 having the form of a hand (Fig. 3). The article 85 is situated in front of a wall 55 and is swung to and fro by a shaft 86 which extends through the wall 10 and the inner end of which is connected with a lever 87. The lever 87 is pivotally connected with a link 88 mounted upon a pin 89 which is carried by a disc 90. The disc 90 is keyed upon the secondary driving shaft 20 and is rotated thereby.

The machine is operated as follows:

The rotation of the motor shaft 18 of the motor 15 is transmitted through the gear box 17 to the primary driving shaft 19 which rotates the disc 21 carrying the pin 22. Thus the connecting rod 23 is reciprocated. The upper end of the rod 23 which is held in place by the holding member 26, has the form of a rack 24 which meshes with a pinion 25 so that the reciprocatory movement of the rod 23 is transmitted into an oscillatory turning movement of the pinion 25. The shaft 27 and the chain wheel 30 turn along with the pinion 25. The turning of the chain wheel 30 in one direction will release the chain 31 carrying the watch 38, so that the watch can move downwardly by gravity.

During the movement of the chain wheel 30 in the opposite direction the chain 31 is wound upon the wheel 30 and the watch 38 is pulled upwardly.

As the chain 31 is being released by the wheel 30, the watch 38 will move downwardly from its uppermost position until it is brought opposite the magnet 40 (Fig. 3).

The conducting strip 69 is so arranged upon the drum 62 which rotates along with the shaft 19, that at that time the strip 69 is moved into contact with the contacts 64 (Fig. 6).

Then a circuit is established through one of the main lines 84, a contact 68 and strips 76, 75, 74, 73, 71, 70 and 69 to the contacts 64 and the wires 77, 78, and 79 to the magnet 40 and the lamp 56, returning to the other one of the main lines 84 through the wire 83.

Thus the magnet 40 is energized and holds the watch 38, while the chain 31 continues to move downwardly forming a loop shown by broken lines in Figure 3. The lit lamp 56 may be used to draw the attention of an observer to the fact that the operation of the watch is not affected by the magnet.

The lamp 56 will be extinguished and the magnet 40 will be deenergized as soon as the strip 69 is moved out of engagement with the contacts 64. Then the watch 38 will be released by the magnet and will fall upon the support 39. This drop of the watch 38 is made possible due to the additional length of the chain 31 which was released by the wheel 30. At that time, the conducting strip 70 will engage the contacts 65 thereby establishing an electrical circuit which will illuminate the lamp 57. The electrical circuit lighting the lamp 57 is easily traceable in the diagram shown in Figure 6. The lamp 57 will direct the attention of the observer to the feature that the watch is protected against shock.

Thereafter, the plate or shelf 39 is required to carry out a retracting or withdrawing movement. As already stated, the actuating sleeve 50 keyed upon the shaft 27, has a projecting portion which engages the pin 51 of the cam 49 during the unwinding movement of the chain and the chain wheel (Fig. 4). Then the sleeve 50 and the cam 49 will move jointly for awhile. The various parts are so located that the cam surface 48 will move under the cam follower 44 after the watch 38 has been lying for awhile upon the plate 39. Then the cam follower 44 will move upwardly, thereby expanding the spring 45 and causing the rod 43 and the support 39 to swing inwardly to the position indicated by broken lines in Figure 3. This movement of the plate 39 will cause the watch 38 to drop into the

container 53 which is filled with water. In the meantime, the lamp 57 will be extinguished and the strip 71 will be brought into engagement with the contacts 66, thereby closing the circuit which illuminates the lamp 58, to draw the attention of an observer to the fact that the watch is water-proof.

Thereafter, the movement of the shaft 27 and the wheel 30 is reversed and the wheel 30 will begin to pull upwardly the chain 31. The cam surface 48 will remain in engagement with the cam follower 44. The actuating sleeve 50 which moves along with the shaft 27, will move out of engagement with the pin 51 and will remain out of engagement with the pin until its opposite surface contacts the pin. Thereafter, the cam 49 is moved by the sleeve 50 in the opposite direction until the cam surface 48 is moved out of engagement with the cam follower 44. In the meantime, the upward movement of the chain 31 has moved the watch 38 above the opening 41. As soon as the cam follower 44 is released, the spring 45 will swing the rod 43 and move the plate 39 to the forward position. The cam 49 which is freely mounted upon the shaft 27, may drop by gravity to the position shown in Figure 4.

The secondary driving shaft 29 swings to and fro the display article 85 by means of the rotating disc 90, the link 88, the arm 87 and the shaft 86. At the same time, the lamp 59 situated close to the article 85 (Figs. 1 and 6) may be illuminated intermittently by the engagement of contacts 67 with any one of the conducting strips 72 to 75.

Throughout all these manipulations, the dial of the watch is turned toward the onlooker, who can observe that the watch continues to run and indicate the correct time, so that the running of the watch is not affected by any of the treatments to which it is subjected.

It is apparent that the specific illustrations shown above have been given by way of illustration and not by way of limitation, and that the structures above described are subject to wide variation and modification without departing from the scope or intent of the present invention, all of which variations and modifications are to be included within the scope of the present invention.

What is claimed is:

1. In a mechanism for displaying a watch or similar object having a magnetisable casing, a driving shaft, a reel, means wound upon said reel and holding the display object, means connecting said driving shaft with said reel for continuously turning said reel first in one direction and then in the opposite direction, and thereby causing said means continuously to first unwind and thereby release said object, which moves by gravity, and then causing said means to be wound and thereby pull said object in the opposite direction, an electromagnet situated close to the path of said object during its movement by gravity, and means actuated by said driving shaft for energising said electromagnet for a time period during said object's movement by gravity, whereby said object is first attracted and held by sad electromagnet and is then released.

2. In a mechanism for displaying a watch or similar object, a driving shaft, a reel, means wound upon said reel and holding the display object, means connecting said driving shaft with said reel for continuously turning said reel first in one direction and then in the opposite direction, and thereby causing said means continuously to first unwind and thereby release said object, which moves by gravity, and then causing said means to be wound and thereby pull said object in the opposite direction, a support, a pivoted two armed lever having one arm carrying said support, a turning shaft firmly connected with said reel and movable therewith, a cam carried by said turning shaft and having a cam surface adapted to engage the other arm of said lever and swing the same to move said support from a forward position in the path of the movement by gravity of said object to a retracted position, and means actuated by said turning shaft and operating said cam to maintain said support in its forward position during a part of the movement by gravity of said object, whereby said object reaches said support and rests upon it, and whereby the movement of said support to the retracted position causes a drop of said object.

3. In a mechanism for displaying a watch or similar object, a driving shaft, a reel, means wound upon said reel and holding the display object, means connecting said driving shaft with said reel for continuously turning said reel first in one direction and then in the opposite direction, and thereby causing said means continuously to first unwind and thereby release said object, which moves by gravity, and then causing said means to be wound and thereby pull said object in the opposite direction, a support, a pivoted two armed lever having one arm consisting of a rod carrying said support and another arm consisting of a cam follower, a turning shaft firmly connected with said reel and movable therewith, a cam mounted for rotation upon said turning shaft and having a cam surface adapted to engage said cam follower and swing said lever to move said support from a forward position in the path of the movement by gravity of said object to a retracted position, a spring maintaining said cam follower in engagement with said cam, a pin carried by said cam, and an actuating sleeve keyed upon said turning shaft and having surfaces adapted to engage and operate said cam to maintain said support in its forward position during a part of the movement by gravity of said object, whereby said object reaches said support and rests upon it, and whereby the movement of said support to the retracted position causes a drop of said object.

4. In a mechanism for displaying a watch or similar object, a driving shaft, a reel, means wound upon said reel and holding the display object, a disc keyed upon said driving shaft, a pin eccentrically mounted upon said disc, a connecting rod having one end mounted upon said pin, the other end of said connecting rod constituting a rack, a turning shaft, said reel being keyed upon said turning shaft, a pinion keyed upon said turning shaft and meshing with said rack, a supporting member mounted for rotation upon said turning shaft and maintaining said rack in engagement with said pinion, means connecting said driving shaft with said reel for continuously turning said reel first in one direction and then in the opposite direction, and thereby causing said means continuously to first unwind and thereby release said object, which moves by gravity, and then causing said means to be wound and thereby pull said object in the opposite direction, and means holding said object for a time period during its movement by gravity and then releasing it to cause a drop of said object.

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