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E. E. LEHWESS

CLOCKWORK MECHANISM

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Fig. 1.

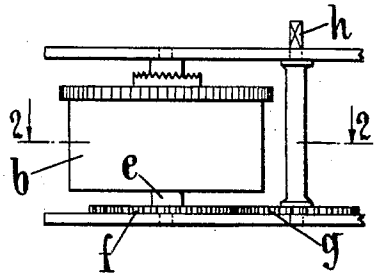
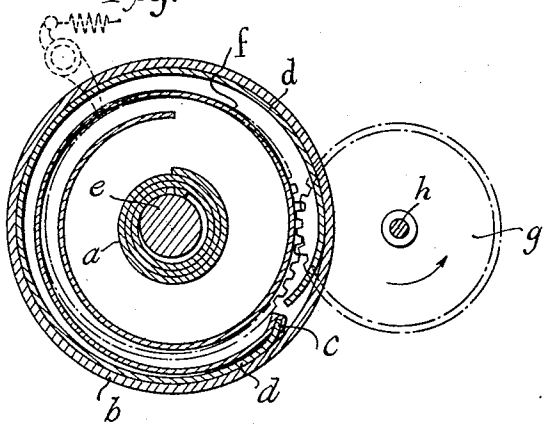


Fig. 2



INVENTOR
Edward Ernest Lehwess

BY
Gill & Jennings
ATTORNEYS

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EDOUARD ERNEST LEHWESS, OF PARIS, FRANCE.

CLOCKWORK MECHANISM.

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This invention relates to mechanism for preventing the overwinding of springs and is more particularly applicable to clockwork mechanism such as is used in mileage indicators, time recording mechanism and such like instruments of which the operating mechanism must be periodically wound and is driven by the unwinding of a spring.

It is the object of the present invention to provide a device which will prevent overwinding of the spring when this has been fully wound up.

A further object of the invention is to provide a device which will permit the main spring to slip after it has been fully wound.

These and other objects will appear more fully from the detailed description of the accompanying drawings, wherein—

Figure 1 is a plan view of a barrel or drum and of the mechanism for winding its spiral spring, and

Figure 2 is a section on the line 2—2 of Figure 1.

As illustrated in Figure 2 the spiral spring *a*, which is located in the interior of the barrel or drum *b*, is formed at its outer end with a hook *c* which is adapted to engage with the end of an annular blade spring *d*, which end is slightly bent inwardly. The annular spring *d* is entirely smooth on its outer surface as is also the internal surface of the drum and barrel. This annular spring, which as illustrated is in the form of an open ring bears frictionally with substantially the whole of its surface against the internal surface of the barrel. The thickness and strength of the annular spring are such as to produce the necessary friction between the annular spring and the internal surface of the barrel to prevent annular movement of the annular spring relatively to the barrel until the winding spring *a* has been fully wound. The length of the annular spring *d* is slightly less than the circumference of the surface of the barrel.

The inner end of the spring *a* is suitably secured to the winding spindle *e* which is driven by the winding train *f*, *g*, *h* (Figures 1 and 2).

The spring *a* is wound up by rotating the spindles *h* and *e* in the direction of the arrows (Figure 2).

As above described, the frictional force by which the blade spring *d* bears against the inner surface of the barrel *b* is such that it is more than sufficient to prevent the spring *d* from slipping on the inner surface of the barrel until after the spring *a* has been fully wound.

It will be seen that by means of the device above described that should the winding movement be continued after the spiral spring *a* has been completely wound, the winding force becomes greater than the frictional force or the braking action of the blade spring *d* so that the latter will slip on the inner surface of the barrel and there is no liability of breaking the spring *a* in consequence of overwinding. This danger is still further reduced by reason of the fact that the spring *a* is not weakened as it is provided with a hook and is not directly connected to the barrel or secured to a spring member by an eye or tongue which is adapted to engage with a spring member.

It will be understood that the spring *d* may be replaced by another member which will exert sufficient friction on the internal surface of the barrel or against any other surface thereof, the force exerted on this member by the hook end of the winding spring *a* being adapted to increase the friction.

The end of the spring *d* to which the spiral spring is hooked may also be of a shape other than above described. For example, the end of the spring *d* may be wound or coiled in any suitable manner.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In spring driving mechanism, a barrel, a winding spindle rotatable in the barrel, a blade spring frictionally gripping and extending substantially throughout the inner surface of the barrel, and a winding spring connected at its inner end to the spindle and coiled about the same within the barrel, the outer end of the winding spring being formed as a hook to engage over one end of the blade spring, the frictional engagement between the blade spring and barrel permitting the winding spring to be wound to a degree determined by such frictional engagement.

2. In spring driving mechanism, a barrel, a winding spindle rotatable in the barrel, a blade spring frictionally gripping and extending substantially throughout the inner surface of the barrel, one terminal of the blade spring being inwardly offset from the surface of the barrel, and a winding spring

removably connected at its inner end to the spindle and coiled about the same within the barrel, the outer end of the winding spring being formed as a hook to engage over the inwardly offset end of the blade spring, whereby to connect the blade spring and winding spring without reduction in the strength of either at the point of connection.

3. In spring driving mechanism, a barrel, a winding spindle rotatable in the barrel, a blade spring of open-ring form frictionally gripping and extending substantially throughout the inner surface of the barrel, one terminal of the blade spring being inwardly offset from the surface of the barrel, and a winding spring having its inner end removably connected to the spindle and coiled thereabout within the barrel, the outer end of the winding spring being bent to form a hook throughout substantially its full width to engage over the inwardly offset end of the blade spring to insure engagement between the blade spring and outer end of the winding spring throughout substantially the full width of both springs, the frictional cooperation of the blade spring with the barrel resisting movement of the blade spring and thereby of the hooked end of the winding spring during winding of the latter to substantially its maximum capacity, the blade spring thereafter yielding relative to the barrel to prevent breakage of the winding spring under further winding effort.

EDOUARD E. LEHWESS.