

Oct. 8, 1929.

J. METTLER

1,730,674

DEVICE ON WINDING MECHANISM

Original Filed Feb. 25, 1922

Fig. 1

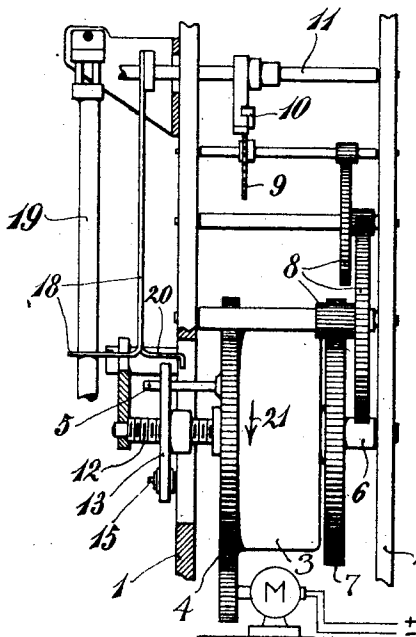


Fig. 2

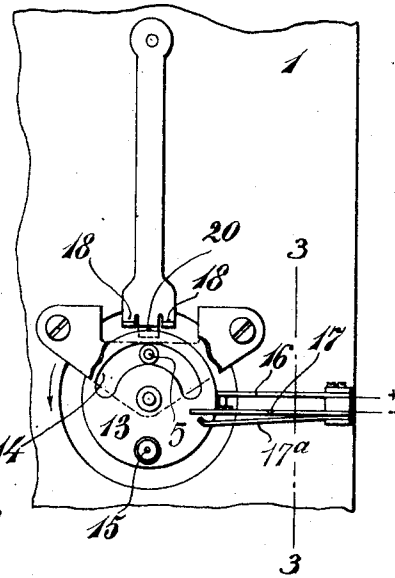
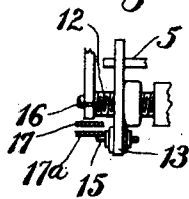


Fig. 3



Inventor
Josef Mettler
By B. Amiger
Att.

UNITED STATES PATENT OFFICE

JOSEF METTLER, OF ZUG, SWITZERLAND

DEVICE ON WINDING MECHANISM

Original application filed February 25, 1922, Serial No. 539,332, and in Switzerland February 21, 1921.

Divided and this application filed April 13, 1923. Serial No. 631,939.

The invention refers to such devices in winding mechanisms in which a nut is displaced on a screw-threaded spindle, whereby, in accordance with the invention, the nut in one of its end positions stops the winding motor, and in its other end position prevents the movement from completely running down.

The stopping of the winding motor, which may be of the Ferraris type or any other kind of small electrical motor is, as shown in Figs. 1 and 2, made by electrical means.

This invention is a division of my copending application for Letters Patent of the United States for improvements in devices on winding mechanisms, filed February 25, 1922, Serial No. 539,332.

In the accompanying drawings:—

Fig. 1 is an elevation of the winding mechanism constructed and arranged in accordance with my invention.

Fig. 2 is a view of the electric stopping device.

Fig. 3 is a detail side elevation of the disc 13 and the section through the contacts 16, 17 and spring arm 17^a on the plane indicated by the line 3—3 of Fig. 2.

Positioned between plates 1 and 2 is a spring housing 3, the spring of which forms the drive for a clock work. For this purpose the spring is connected at its inner end with an axis 6 on which a gear 7 is rigidly mounted. The outer end of the spring is rigidly attached to housing 3 and this latter has a gear 4 which is connected with an electric motor, indicated at M. The gear 7 is connected by a gear train 8 with an escapement wheel 9 of the clock work, said escapement wheel acting on the pallets 10 mounted on a spindle 11. Rigidly attached to said spindle is a fork 18 which is connected with the pendulum rod 19 of the clock work and has an elbow 20.

A portion 12 of axis 6 is threaded and extends from the spring housing 3 toward the pendulum rod 19 is provided with threads on which a nut 13 is loosely rotatable. This nut is in the form of a disc, having a segment-like slot 14 and opposite this a pin 15, which latter is attached to and insulated from the nut. Normally, by gravity the disc nut 13

remains in the position particularly shown on Figure 2. A tappet pin 5, which is rigidly attached to spring housing 3, extends through the segment-like slot 14. A key switch consisting of contact members 16, 17 is interposed in the circuit of the electric motor. A spring arm 17^a is arranged under the arm 17 to prevent excessive movement of the latter. Contact 17 is resilient and extends so far toward the threaded part 12 of axis 6 that pin 15 on rotation and movement of the disc 13 toward pendulum rod 19 by means of its threaded engagement with the part 12, strikes this contact 17.

The operation of the invention described, starting with the position shown on the drawing, is as follows:

The circuit of the electric motor is closed by contact of members 16, 17, whereby the spring housing is rotated in the direction of the arrow in Fig. 1. The spring in the housing is hence wound up. Rotation of the housing thereby advances the pin 5 and, when it passes to an end of slot 14 which end also forms a tappet, carries along disc 13 and sets it in motion until the center of gravity thereof passes beyond the upper dead point and thus the disc by its own weight moves on in the same direction. If the disc 13 has not moved far enough on its axis to engage contact 17, the same procedure takes place in the following rotation of the spring housing. Since disc 13 is mounted on thread 12, there is a lateral displacement or movement of disc 13 in the direction toward contacts 16, 17 until pin 15, disc 13 being again moved over the top center, strikes said end of contact member 17 and depresses it from contact member 16, thus shutting off the current of the motor. Spring housing 3 thereby comes to a standstill.

Since the disc 13 is prevented from rotation by the pin 15 being applied on contact part 17, while the axis 6 rotates with threaded member 12 as the spring gradually unwinds, disc 13 is moved by its threaded connection with said part 12 toward spring housing 3, until pin 15 slides laterally from contact member 17, whereby the circuit of the electric motor is again closed in contacts 16 and 17,

thus starting said motor and causing the spring to be rewound.

If for any reason the current should be shut off for a longer period of time, nut 13 is screwed up further toward spring housing 3 until it contacts with the shoulder-like end of extension 20. This checks the movement of the spindle fork 18 by the resulting friction, and thereby brings the clock work to a standstill, so that complete unwinding of the spring is prevented. On the contrary a desired reserve power is retained.

Having now described and ascertained the nature of my said invention and the manner in which same is to be performed, what I claim is:—

Stop mechanism for a clock work, including a threaded spring arbor, a spring barrel, a nut rotatable with the spring barrel, and axially movable on the arbor thereby, escapement mechanism for said clock work, said escapement mechanism including a detent element in the path of movement of said nut toward said spring barrel so that said escapement mechanism is stopped to cause said clock work to also stop operating when the nut has moved toward the spring barrel a predetermined amount.

In witness whereof I affix my signature.

JOSEF METTLER.