Nov. 18, 1952 Z. MAAR 2,618,117

DRIVING MECHANISM FOR TIMEPIECES IN VEHICLES

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Fig. 1.

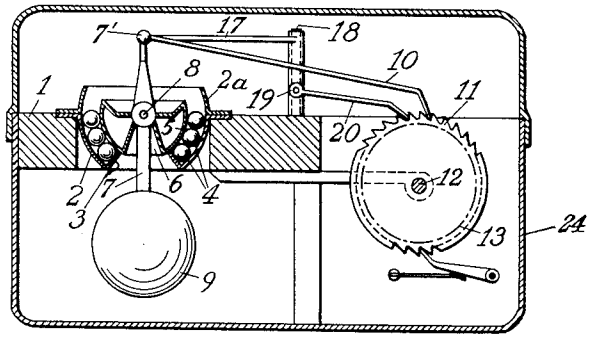


Fig. 2.

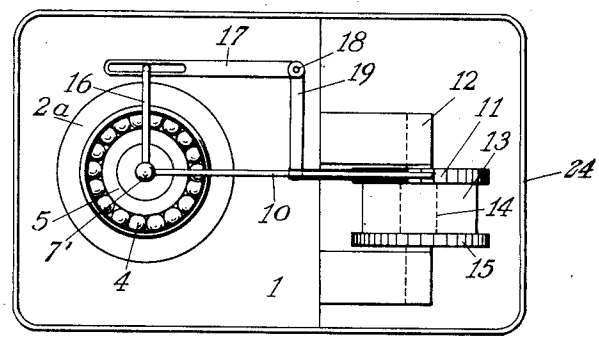


Fig. 3.

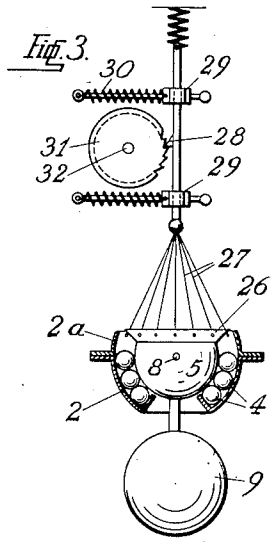


Fig. 4.

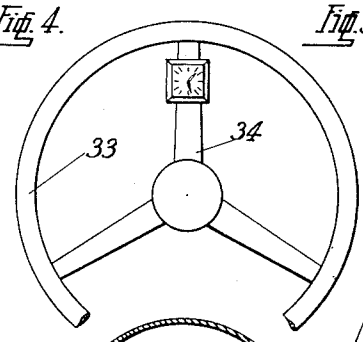


Fig. 5.

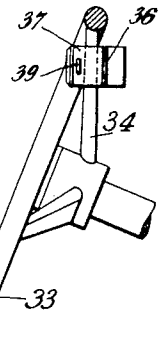
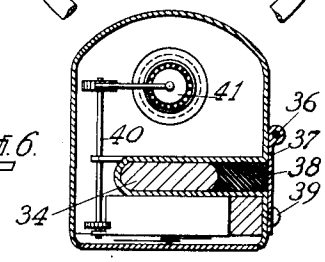


Fig. 6.



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DRIVING MECHANISM FOR TIMEPIECES IN VEHICLES

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In Switzerland January 13, 1947

5 Claims. (Cl. 58—46)

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This invention relates to winding mechanisms for watches or like apparatus for vehicles, and more particularly to winding means which act automatically upon such apparatus, when the same is agitated by movements and vibrations of the vehicle.

It is an object of the invention to provide a winding mechanism for watches and like apparatus for vehicles, which comprises a pendulum which is suspended from a bearing mounted on the vehicle or on a part thereof; so as to be set in pendulous motion by movements and vibrations of the vehicle, said pendulum being adapted to swing universally in any direction, and motion transmitting means connected to said pendulum which are adapted to act upon the winding-up device of a watch, apparatus, or the like, in order to wind up its main or drawing spring subsequent to swinging or driving motion of said pendulum.

Other objects and features of novelty will be apparent from the following specification when read in connection with the accompanying drawing in which two preferred embodiments of the invention are illustrated by way of example.

In the drawing:

Figure 1 is a sectional elevation of a first embodiment of a driving mechanism according to the present invention.

Figure 2 is a plan view to Fig. 1.

Figure 3 is a sectional elevation of a second embodiment of the driving mechanism.

Figure 4 is a front view of a motor car steering wheel having a watch attached thereto.

Figure 5 is a lateral elevation, partly in section, to Fig. 4, and

Figure 6 shows an enlarged section across a spoke of the steering wheel and the casing attached thereto, containing the watch and its automatic driving mechanism.

The driving mechanism shown in Figs. 1 and 2 is mounted on a frame 1 having a circular opening wherein is located a substantially semi-spherical bearing cup 2 which has a central bottom opening 3. This cup 2 contains three ball bearing rings 4 which are arranged above one another and applied on their outer side to the inner cup surface. A piece 5 having the form of a segment of a sphere is turnably supported in the middle of these ball bearing rings 4 and has a central hole 6 through which extends a rod 7 which is connected to the piece 5 at the center 8 of the spherical bearing surfaces. The rod 7 carries at its lower end swingable weight means in the form of a pendulum bob 9 and extends upward beyond piece 5, the upper end having formed

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thereon a ball-shaped head constituting a part of a ball and socket joint 7', by the intermediary of which a click 10 is articulated thereto. This click 10 engages a ratchet wheel 11 turning with the axle 12 of a barrel 13 which contains the main or drawing spring of a watch or other time piece. This drawing spring (not shown) has spiral form and is secured with its inner end to the axle 12, while the other end is attached to the barrel 13 which is provided with a toothed rim 15 engaging a pinion of the time piece to be driven and thus transmitting the rotation upon the same. The pendulum 9 must substantially swing in perpendicular plane relative to the axle 12 of the ratchet wheel 11, that the click 10 drives the latter by steps. However, on account of its suspension and of the impulses acting thereon, the pendulum may swing parallelly to the axle 12, in which case no driving step will be achieved by click 10. To drive ratchet wheel 11 even when the pendulum swings parallelly to axle 12, a rod 16 is connected with one end to the pendulum rod 7 and engages with its other end a slot of one arm 17 of an angular lever which is turnable about a vertical pin 18. The other arm 19 of this lever is articulated to a click 20 which engages the same ratchet wheel 11. This system of rods or driving mechanism transmits oscillations of the pendulum in any direction and of different amplitudes as driving steps upon the ratchet wheel, whereby, according to the direction of the pendulum oscillations at the time, both clicks or only one thereof will operate. Shock absorbing stops may be provided on the inside of the casing 24 containing the pendulum in order to limit the amplitudes of the latter.

A ring 2a is secured on the bearing cup 2, which narrows the upper opening, to prevent the pendulum from leaving with its piece 5 the bearing, when intensive shocks occur. Where it is desirable that the watch or like apparatus is also going, when the vehicle is not used for a certain time, there may be provided a hand winding device on the watch besides the self acting pendulum mechanism which will perform further winding-up as soon as the vehicle is used. A pawl 23 is pivotally mounted to engage ratchet wheel 11 for preventing the latter from rotating backward under the action of the tensioned drawing spring. Of course, there is no need of a particular barrel 13 in the described driving mechanism, as the clicks actuated by the pendulum may directly act upon a ratchet wheel and barrel of the watch or apparatus to be driven.

The described driving mechanism is enclosed

in a casing 24 which protects the same. This casing may be secured at any place to the vehicle or a part thereof and will be submitted to the movements and vibrations of that place, which set the pendulum in motion. A watch, for instance, may be combined with this pendulum mechanism and attached to a spoke of the steering wheel of a motor car (Figs. 4 and 5).

The pendulum receives then, besides the ordinary shocks caused by the movement of the motor car, additional impulses through the rocking of the steering wheel. Moreover, it may be very useful that the car driver has constantly a watch in front without being compelled to make other physical movements than to look on the steering wheel. The watch may be detachably pushed on the steering wheel.

In a second embodiment of the invention, shown in Fig. 3, the pendulum 9 is again suspended by means of a semi-spherical piece 5 in the spherical bearing cup 2 on ball bearing rings and is adapted to swing universally in any direction. A disc 26 is secured on said semi-spherical piece 5, having an upwardly bent rim which is connected by a plurality of regularly spaced pulling strings to a vertically guided click 28 which is resiliently held in engagement with a ratchet wheel 31 by means of pulling springs 30 acting on the horizontally slidable guideways 29 of the click 28. The shaft 32 of the ratchet wheel 31 may be coupled with the barrel of a watch or other apparatus.

Fig. 6 shows a section through a spoke 34 of the steering wheel of a motor car, having a watch and pendulum mechanism attached thereto. The casing 35 may be detachably pushed from one side on the spoke 34 and secured in its position by means of a strap 37 which is hinged to the casing at 36 and carries a rubber piece 38 which will be pressed against the spoke, when the strap 37 is locked to the casing at 39, while the three other walls of the slit are rigid. The watch or clock 42 is located on the front of the casing and a shaft 40 extends therefrom to the pendulum mechanism 41, which is located behind the spoke and winds up the watch movement. The whole apparatus may thus temporarily be removed from its place.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent, is:

1. In a step-by-step winding mechanism for clocks and like timepieces mounted on the steering wheel of an automotive vehicle; a pendulum rod, a pendulum weight at one end of said rod, a pawl carried by the other end of said rod, a ratchet wheel, said pawl being operatively connected to and adapted to actuate said ratchet wheel, and ball bearing means through which said pendulum rod extends, and an element to which said pendulum rod is fixed and adapted to swing about said ball bearing means whereby said pendulum rod may swing in a direction perpendicular to the axis of said ratchet wheel as well as parallel to the plane of said axis so that oscillations imparted to said pendulum weight by vibrations of said vehicle and by movements of said steering wheel in any direction and of different amplitude may thus be transmitted to said ratchet wheel for winding said timepiece.

2. A step-by-step winding mechanism for a clock having a winding-up device, comprising a ratchet wheel rotatable about a first axis and adapted to be operatively connected to said winding-up mechanism of the clock, a weighted pendulum rod, bearing means swingably mounting said rod for universal movement, first pawl means operatively connected to said rod and engaging said ratchet wheel for imparting a step-by-step movement to the latter in response to movement of said rod in a direction normal to said first axis, a bell crank mounted for pivotal movement about a second axis substantially perpendicular to said first axis, linkage means connecting said rod to said bell crank for pivoting the latter about said second axis in response to movement of said rod in a direction parallel to said first axis, and second pawl means operatively connected to said bell crank and engaging said ratchet wheel for imparting a step-by-step movement to the latter in response to pivotal movement of said bell crank.

3. A step-by-step winding mechanism according to claim 2, including ball and socket means for operatively connecting said first pawl to said rod.

4. A step-by-step winding mechanism according to claim 2, including means for mounting said mechanism on the steering wheel of a vehicle at a location spaced outwardly of the center of the steering wheeel.

5. The combination, in an automotive vehicle, of a steering wheel, and a clock mechanism including a winding-up device mounted on said wheel, with a winding means for said clock mechanism operable in response to movement of said steering wheel, said winding means including a ratchet wheel rotatable about a first axis and operatively connected to said wind-up device of said clock mechanism, a support, a weighted pendulum mounted on said support for universal movement, a first pawl engaging said ratchet wheel and actuatable to impart a step-by-step movement to said ratchet wheel, universal means connecting said first pawl to said pendulum for actuating said first pawl in response to the component of said universal movement normal to said first axis, a lever mounted on said support for pivotal movement about a second axis substantially perpendicular to said first axis, means operatively connecting said lever to said pendulum for pivotal movement in response to the component of said universal movement parallel to said first axis, and a second pawl operatively connected to said lever and engaging said ratchet wheel for imparting a step-by-step movement to the latter in response to pivotal movement of said lever.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,332,870	Gill	Mar. 2, 1920
1,340,013	Canale et al.	May 11, 1920
1,435,003	Harris	Nov. 7, 1922
1,655,074	Sharples	Jan. 3, 1928
1,794,622	Jacot	Mar. 3, 1931
2,234,527	Hollingsworth	Mar. 11, 1941