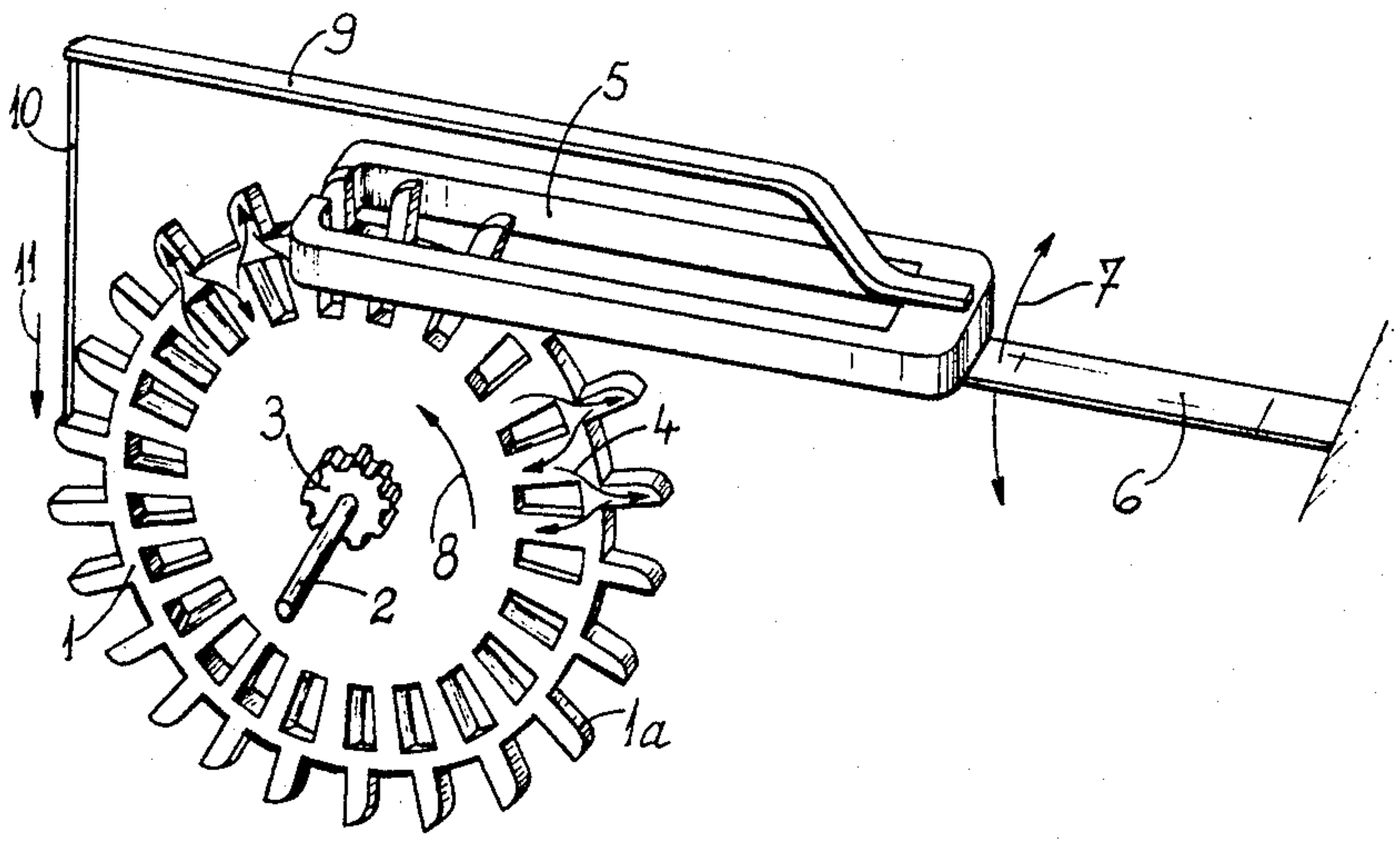
Nov. 19, 1968 A. SCHNEITER 3,411,368

MAGNETIC DRIVING DEVICE

Filed Dec. 5, 1966




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# United States Patent Office

3,411,368

Patented Nov. 19, 1968





3,411,368


## MAGNETIC DRIVING DEVICE


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Filed Dec. 5, 1966, Ser. No. 599,208

Claims priority, application Switzerland, Dec. 10, 1965, 17,093/65

2 Claims. (Cl. 74—142)



### ABSTRACT OF THE DISCLOSURE

A magnetic driving device comprising, a bifurcated member, a rotatable member, a toothed member rigid with said rotatable member and positioned between the bifurcations of the rotatable member, the oscillating member and toothed member being formed from magnetic material and constituting a magnetic way, and a pawl carried by said oscillating member and drivingly engageable with the toothed member only on initial actuation of the device to drive the wheel.


The present invention relates to a magnetic driving device in which an oscillating member drives step-by-step, through a magnetic way, a rotatable member.

Such devices, which are known per se, are generally used as counting devices, in electric timepieces comprising a motor regulating member, the counting wheel being connected to the indicating members of the time, which are driven by this wheel.

When the operation is starting, it can occur that the oscillations of the oscillating member do not produce the starting of the rotatable member, which remains stationary. The object of the present invention is to remove this drawback.

The device according to the invention is characterized by the fact that the oscillating member carries at least a pawl intended to cooperate with the toothing of a member rigid with the rotatable member, when the device is starting its operation, while operating light bearing contact, without producing any pull effect on the said toothing, when the normal run of the device is reached.

The drawing shows, by way of example, one embodiment of the object of the invention.

The figure is a perspective view of a magnetic counting device for an electric timepiece.

The device represented comprises a counting wheel **1**, constituted by a perforated disc provided with teeth **1***a*, mounted on a shaft **2** carrying a gear **3** driving the gears and wheels, which in turn drive the indicating members (hands) of the timepiece which indicate the hours and the minutes, none of which are shown.

The peripheral part of the disc **1** is made of magnetic material so as to constitute a magnetic track, along the line indicated by the arrows **4**, with which cooperate the two branches of a permanent magnet **5** rigid with a vibrating member constituted by an elastic blade **6**. The device which effects the vibrations of the blade **6** has not been represented, being out of the scope of the present invention.

During the movements of the vibrating member **6** and



of the magnet **5** in the direction of the arrow **7**, the wheel **1** is magnetically driven step-by-step in the direction of the arrow **8**.

However, when the device is starting, it could occur that the wheel **1** is not driven. In order to be sure the wheel **1** starts to rotate, the oscillating member is provided with an arm **9** secured to the magnet **5**, at the extremity of which is mounted a thin elastic blade **10** the free extremity of which is situated on the path of the extremities of the teeth **1***a*. When the device starts to operate, the free extremity of the elastic blade **10** exerts a push in the direction of the arrow **11** on the teeth **1***a*, producing the starting of the wheel **1**. When the device is in normal running condition, the relative position of the several elements is such that the elastic blade **10** oscillates only slightly, its extremity accompanying the teeth **1***a* of the wheel **1** without reaching them, so that it does not exert any pull on the wheel. During its movements in the direction opposite to the arrow **11**, the blade **10** slides on the back of the teeth **1***a*. The length of the blade **10** and its elasticity are chosen in such a way that the pressure, directed substantially radially, exerted by the blade on the top of the teeth, has no troubling effect on the running of the device.

It is to be noted that, since the counting device stops always in a determined position of the wheel **1** relatively to the magnet **5**, by reason of the magnetic effect of the magnet on the wheel, it is possible to determine the length of the blade **10** in such a way that, when the device starts to operate, the magnet **5** can come in vibration freely, without the blade acting on the teeth **1***a*, the push of the blade on these teeth occurring only after a certain amplitude of the oscillations of the vibrating member and being interrupted as soon as the normal running is reached.

As a modification, it will be possible to provide the arrangement in such a way that the blade **10**, or any other pawl rigid with the oscillating member, does not act directly on the wheel **1**, but on a ratchet wheel rigid with the wheel **1**.

What I claim is:

**1**. A magnetic driving device comprising, a bifurcated oscillating member, a rotatable member, a toothed member rigid with said rotatable member and positioned between the bifurcations of the rotatable member, the oscillating member and the toothed member being formed from magnetic material and constituting a magnetic way, and a pawl carried by said oscillating member and drivingly engageable with the toothed member only on initial actuation of the device to drive the wheel.

**2**. A magnetic driving device according to claim **1**, wherein said pawl comprises a resilient blade secured at one of its ends to said oscillating member, the opposite free end of said blade acting on said toothed member when the device starts its operation.


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