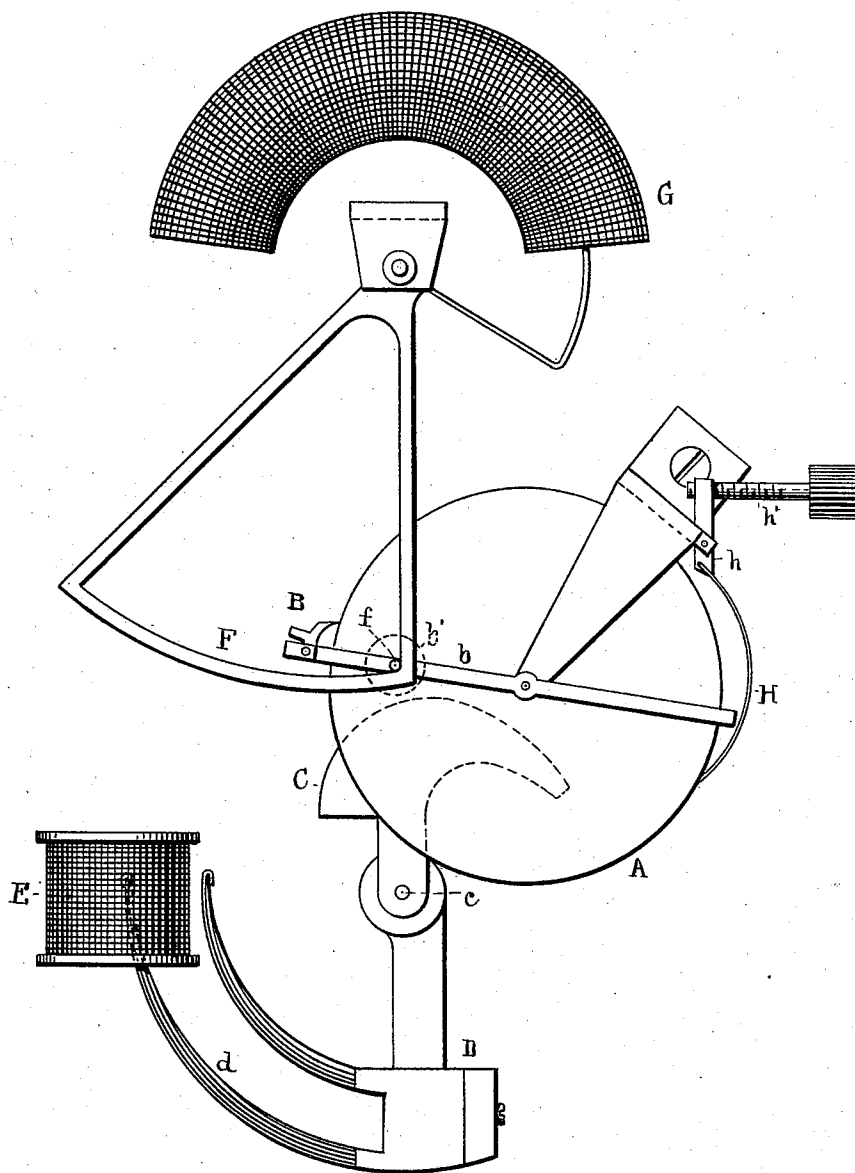


(No Model.)

W. D. MARKS.
DETENT FOR RATCHET WHEELS.

No. 571,050.

Patented Nov. 10, 1896.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM D. MARKS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
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DETENT FOR RATCHET-WHEELS.

SPECIFICATION forming part of Letters Patent No. 571,050, dated November 10, 1896.

Application filed August 22, 1896. Serial No. 603,591. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. MARKS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Detents for Ratchet-Wheels, of which the following is a specification.

The object of my invention is to provide a detent for ratchet-wheels which will prevent both overtravel and backlash of the ratchet-wheel without unduly interfering with the forward movement of the wheel; and my invention is mainly designed for use in electric meters wherein a cam and a chrono-electric motor are employed as the driving device for the ratchet-wheel, which ratchet-wheel is the primary wheel of the counting mechanism.

In registering-meters the primary or ratchet wheel, if large and heavy in comparison with the resistance against which it works, is very apt to overtravel, and this is particularly true if the actuating device is not always in engagement or contact therewith. When the actuating device is a slow-moving one, making but few oscillations or revolutions per minute, the tendency on the part of the ratchet-wheel to overtravel is slight, but as the number of oscillations or revolutions increases the tendency to overtravel becomes proportionately greater, and in apparatus of the character for which my invention is mainly designed such an objection is a serious one.

When the work done by the ratchet-wheel is so great that there is no tendency to overtravel, there is frequently a tendency to backlash. To prevent this, a detent is employed. Such a detent naturally acts as a brake and is usually a rigid piece of metal. However, when the speed of the ratchet-wheel is great during each forward stroke the detent, even when heavy, chatters and allows the wheel to overtravel. When the driving force is not greatly in excess of the work to be done, the friction and weight of this device may react on the motor and cause its motion to be less constant. On the other hand, a spring-detent is liable to changes of tension due to wear and differences in temperature. To overcome these objections, I have provided a de-

tent which possesses all the advantages of a spring-detent and the rigid gravity-detent and avoids all the disadvantages of both, and in carrying my invention into effect I employ a blade-spring detent which is preferably quite long and curved, and which spring is carried by a pivoted arm to which an adjustable weight is secured. In such a detent-spring the friction of the spring on the ratchet wheel causes the spring to hug the wheel and even follow it a short distance, partially straightening the spring, and in this way the reaction on the motor due to the friction of the detent is largely, if not wholly, overcome. Furthermore, changes in temperature and wear do not alter the tension of the spring, since this is regulated by the adjustable weight.

In the accompanying drawings, which illustrate my invention, A is the primary or ratchet wheel of the counting mechanism of a registering-meter, the counting mechanism being omitted.

B is the driving-pawl, carried by a pivoted pawl-arm *b*. This arm is moved upward or forward by means of a driving-cam C, engaging with a roller *b'*, carried by the pawl-arm *b*. The driving-cam is pivoted at *c* and is actuated by a pendulum D, carrying solenoid-cores *d*, which are acted upon by a solenoid E. The downward movement of the pawl-arm *b* is limited by the cam F by the engagement of the pin *f*, and this cam is adjusted by a current-indicator or ampere-meter G, as is now well understood.

H is the spring-detent for the ratchet-wheel, which, as shown, is a long curved blade-spring. This detent is carried by a pivoted arm *h*, which carries an adjustable weight *h'*. The ratchet-wheel A is provided with very fine ratchet-teeth, against which the free end of the detent-spring is made to bear with a degree of friction dependent upon the adjustment of the weight *h'* to prevent overthrow. The backlash of the ratchet-wheel is prevented by the engagement of the edge of the spring with the fine ratchet-teeth.

It will be readily seen that the wearing of the end of the detent-spring will not have any effect on the action of the detent, since the weight *h'* will always hold the detent in en-

gagement with the ratchet with the proper degree of friction.

What I claim is—

1. The combination with a ratchet-wheel
5 and an actuating device therefor, of a pivotal resilient detent for the ratchet-wheel adapted to slightly follow the wheel through friction and thereby reduce the effects of inertia on the actuating device, and a device for regu-
10 lating the pressure of said detent on the ratchet-wheel, substantially as set forth.

2. The combination with a ratchet-wheel, of a spring-detent therefor, and an adjustable weight for regulating the pressure of the de-
15 tent, substantially as set forth.

3. The combination with a ratchet-wheel, of a blade-spring detent therefor, and an ad-
justable weight for regulating the pressure of the detent, substantially as set forth.

4. The combination with a ratchet-wheel, of a blade-spring detent carried by a pivoted arm, and an adjustable weight carried by
20 said arm to regulate the pressure of the detent, substantially as set forth.

5. In a registering-meter, the combination
25 with a register or counter, of a primary driving or ratchet wheel, an actuating-pawl engaging therewith, a motor for driving said actuating-pawl, and a resilient detent for the
30 ratchet-wheel, adapted to slightly follow the wheel through friction and thereby reduce the effects of inertia on the actuating device, substantially as set forth.

6. In a registering-meter, the combination
35 with a register or counter, of a primary driving or ratchet wheel, an actuating-pawl engaging therewith, a motor for driving said actuating-pawl, and a detent for said ratchet-wheel consisting of a spring engaging there-
40 with and an adjustable weight for regulating the pressure of the detent, substantially as set forth.

7. In a registering-meter, the combination
45 with a register or counter, of a primary driving or ratchet wheel, an actuating-pawl engaging therewith, a chrono-electric motor for driving said actuating-pawl, and a detent for said ratchet-wheel consisting of a spring en-
50 gaging therewith and an adjustable weight for regulating the pressure of the detent, sub-
stantially as set forth.

8. In a registering-meter, the combination
with a register or counter, of a primary driv-
ing or ratchet wheel, an actuating-pawl en-
55 gaging therewith, a motor for driving said actuating-pawl, and a detent for said ratchet-wheel consisting of a blade-spring carried by a pivoted arm, and an adjustable weight car-
ried by said arm to regulate the pressure of
60 the spring-detent, substantially as set forth.

This specification signed and witnessed this
17th day of August, 1896.

WM. D. MARKS.

Witnesses:

THEO. BUCHHOLZ,
GEO. ROSS GREEN.