Dec. 19, 1933. M. B. RICHTER 1,940,230

STEP WISE ADVANCING COUNTER

Filed April 24, 1930

Fig. 1.

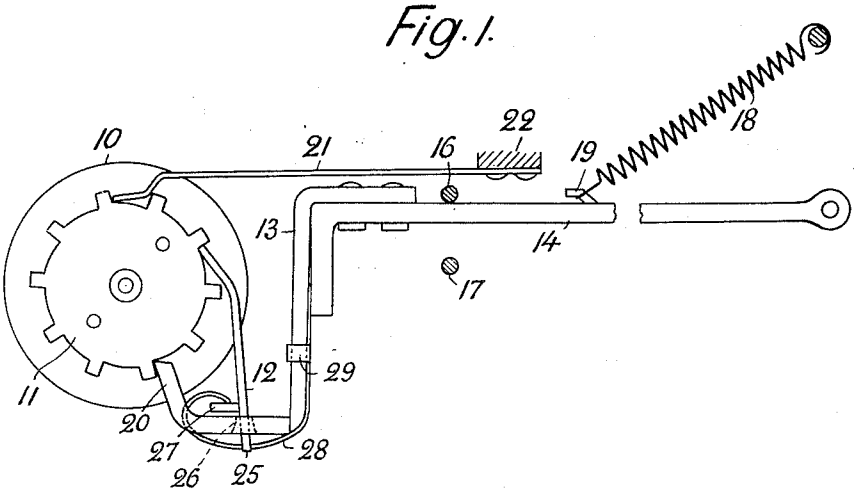
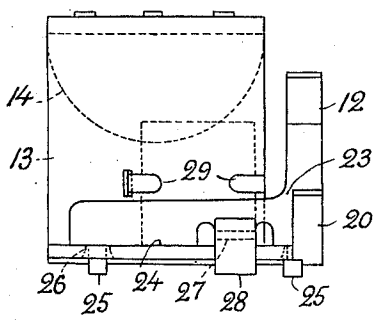


Fig. 2.



Inventor
Morten Balthazar Richter
by Knight Bros
Attorneys

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STEP-WISE ADVANCING COUNTER

Morten Balthazar Richter, Copenhagen, Denmark

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4 Claims. (Cl. 74—54)

This invention relates to a device for step-wise advancing counters of the kind comprising a ratchet wheel and a pawl co-acting therewith and arranged swingably on a reciprocating member from which the counter is operated.

The object of the invention is to provide a device of the class described which is adapted to mass-production and with this object in view the different parts of the device are so constructed that they may be produced mainly by stamping and bending operations.

In the drawing:

Figure 1 shows a side view of a counter and an advancing device for the same constructed in accordance with the invention,

Figure 2 is a front view of the advancing device seen from the left hand side in Figure 1.

To the unit drum of the counter 10 is secured a ratchet wheel 11 which is advanced step-wise by a pawl 12 supported by a member 13 performing a reciprocating movement. This movement may be a rectilinear movement or a swinging movement as in the embodiment shown in which the member 13 is secured to a lever 14 pivoted on a fixed pin. The movement of the lever 14 in either direction is restricted by fixed abutments 16 and 17 respectively. Normally the lever is held against the abutment 16 by the action of a spring 18, one end of which is secured to a projection 19 on the lever 14, the other end of the spring being fixed.

Integral with the member 13 is formed a projection 20 which normally projects in approximately radial direction into the path of the teeth of the ratchet wheel 11 and prevents movement of the latter in the anti-clockwise direction. Movement of the ratchet wheel in the clockwise direction is prevented by a detent 21 formed by a leaf spring secured to a fixed part 22.

The pawl 12 is formed as an angle shaped plate 23, one branch of which is bent slightly near the free end thereof and forms the pawl proper. The other branch of the plate 23 serves for supporting the pawl, this branch being provided with an edge 24 resting on the member 13.

At the edge 24 the plate 23 is provided with two projections or studs 25 projecting through tapered holes 26 in the member 13 and serving for guiding the pawl 12. Furthermore the plate 23 is provided with a projection 27 formed by a flap on the plate which is bent at an approximately right angle thereto. On this projection rests the free end of a curved leaf spring 28 secured to the member 13 by means of flaps 29, one of which embraces the edge of the member 13, while the other is carried through a hole in this member, both flaps being bent in U-shape. The spring 28 acts upon the pawl 12 with a pressure eccentrical in relation to the edge 24, so that the latter is held against the member 13 and at the same time the pawl 12 is held in engagement with the ratchet 11.

The spring 28 can be substituted by a spring of another shape or kind, for example, a helical spring arranged between the pawl 12 and the member 13 in a suitable manner.

When the lever 14 is swung about the pivot 15 from the abutment 16 to the abutment 17 the member 13 is lowered. During this movement the free end of the pawl 12 slides along the periphery of the ratchet wheel 11 and over the next succeeding tooth thereof and then enters the space behind this tooth owing to the action of the spring 28 which holds the pawl yieldingly in engagement with the wheel. The detent 21 prevents clockwise rotation of the wheel 11 during this movement. When the downward movement of the member 13 commences the projection 20 is withdrawn from the wheel 11.

When the lever 14 is released the spring 18 carries the lever to the position shown in the drawing and at the same time the ratchet wheel 11 is by the pawl 12 advanced a step equal to the pitch of the wheel. During the last part of this movement the projection 20 projects into the path of the teeth and positively restricts the movement thereof so that the wheel will be advanced exactly the distance between the foremost edges of succeeding teeth, viz. the pitch of the wheel as above mentioned.

Various modifications of the embodiment described and shown on the drawing may be made without departing from the scope and range of the invention. The edges about which the pawl swings may be a continuous edge or it may consist of two or more spaced parts of arbitrary length. The invention also covers the case that the edge is substituted by two or more spaced points.

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

1. A device for step-wise advancing counters comprising a ratchet wheel provided with teeth, a driving member movable to and fro, a pawl oscillatably engaging the said driving member on an edge parallel to the axis of the said ratchet wheel, a spring operating eccentrically on the pawl to hold the latter against the said driving member in engagement with the said ratchet wheel, and a spring acting upon the said driving

member, the said pawl being provided with studs articulately engaging said driving member for guiding the said pawl during its swinging movement, the said driving member being provided with a projection adapted near the end of the step-wise movement of the ratchet wheel by the action of the spring acting upon said driving member to project into the path of the teeth on the ratchet wheel to positively restrict the movement thereof.

2. A device for step-wise advancing counters comprising a ratchet wheel, a member movable to and fro and provided with apertures, a pawl movable on said member, said pawl being provided with a bearing edge oscillatably engaging said movable member substantially along a line parallel to the axis of the ratchet wheel and resilient means acting upon the said pawl for maintaining continuous bearing contact between said bearing edge and said movable member, said pawl being provided with studs projecting through said apertures in the said movable member.

3. A device for step-wise advancing counters comprising a ratchet wheel, a member movable to and fro, a pawl coacting at one end with the ratchet wheel, said pawl being provided at its other end with an edge bearing on said movable member in a line substantially parallel to the axis of the ratchet wheel and a spring acting eccentrically and independently of friction on said pawl for simultaneously constantly pressing said pawl endwise against said movable member along its bearing edge while pressing the ratchet coacting end of said pawl radially inwards toward the axis of said ratchet wheel.

4. A device for step-wise advancing counters comprising a ratchet wheel provided with teeth, a member movable to and fro, a pawl oscillatably engaging the said movable member on an edge parallel to the axis of the said ratchet wheel, a spring operating eccentrically on the pawl to hold the latter against the said movable member in engagement with the said ratchet wheel, and a spring acting upon the said movable member, the said pawl being provided with studs projecting through tapered holes in the said movable member for guiding the said pawl during its swinging movement, the said movable member being provided with a projection adapted near the end of the step-wise movement of the ratchet wheel by the action of the spring acting upon said movable member to project into the path of the teeth on the ratchet wheel to positively restrict the movement thereof.

MORTEN BALTHAZAR RICHTER.