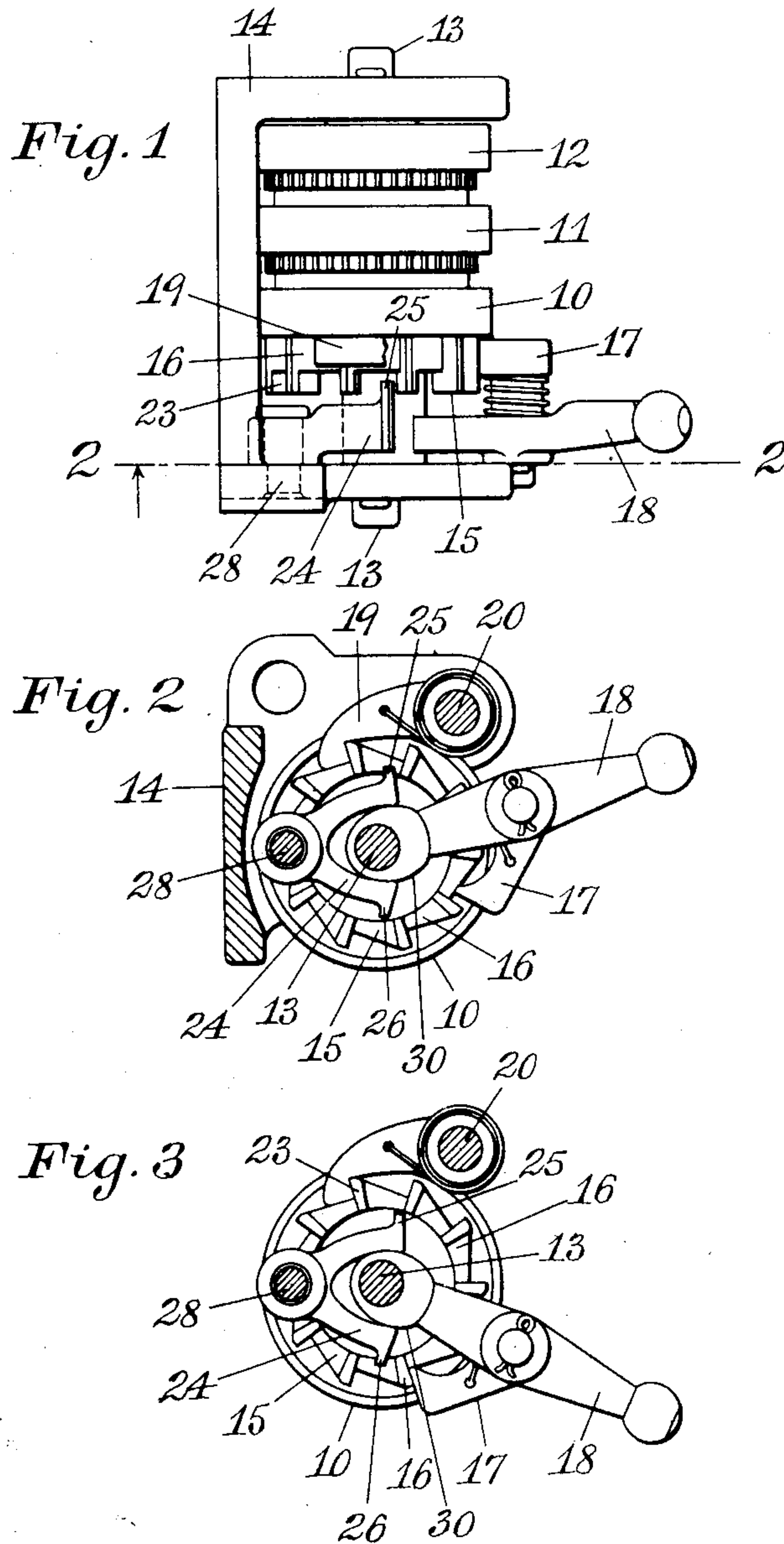


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STOP DEVICE FOR REGISTERING MECHANISMS.
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Patented Dec. 21, 1909.



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UNITED STATES PATENT OFFICE.

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STOP DEVICE FOR REGISTERING MECHANISMS.

944,242.

Specification of Letters Patent.

Patented Dec. 21, 1909.

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To all whom it may concern:

Be it known that I, CHARLES F. LITTLEJOHN, a citizen of the United States, and resident of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Stop Devices for Registering Mechanism, of which the following is a full, clear, and exact specification.

This invention relates to cash and fare registers, adding machines, calculators, and to registering machines generally.

Many of these machines are liable to error through improper working, due to over-running of the registering wheels or other advanceable parts, especially when operated with considerable rapidity. Some of these registering devices are also liable to be tampered with, either mischievously or maliciously, by advancing some of the wheels, particularly the units wheel, especially where this wheel is advanced step by step by a reciprocating movement. Such wheels, when accessible, may usually be advanced by pushing them around on their axis, either when the operating lever is in a particular position, or in some cases at any position of the operating lever.

The object of the invention is to provide means for positively controlling the movement of the advanceable parts of such machines, and to prevent them from being advanced at a greater rate than is intended, either by the momentum of the parts, due to their rapid operation, or as a result of attempts to tamper with the mechanism, and falsify its registration.

Figure 1 of the drawings is a plan view of a portion of a registering train, showing my improved devices in connection therewith. Fig. 2 is a front view in section taken on the line 2—2 of Fig. 1, showing the advancing or registering lever in its retracted position. Fig. 3 is a view similar to Fig. 2, but showing the advancing lever in its forward or advanced position, at the opposite end of its stroke from that which is shown in Fig. 2.

This invention is herein shown in connection with a familiar type of registering train. The units wheel 10 and tens wheel 11 and the hundreds wheel 12 are mounted to turn upon the axial shaft 13, the ends of which are supported in the frame 14. These

three wheels may be connected together in various well-known ways, by gearing, including the well-known Geneva stop device, but this connection between these wheels forms no part of the present invention, it being assumed that they are positively geared together in any well-known way.

The units wheel 10, which is the primary advanceable member in the train, is provided with a ratchet wheel 15, provided with indexing teeth 16, generally ten in number, spaced in conformity with the extent of the desired advancing movement, which is generally one tenth of a revolution in the ordinary registering train. In the drawing herein shown, these teeth 16 are upon the peripheral surface of the ratchet. This units wheel is advanced in a well-known way, by means of the feed pawl 17, pivoted upon the operating arm 18, which in turn is pivotally mounted upon the shaft 13. The return movement of the ratchet and its units wheel is prevented by means of the detent 19, which is pivotally mounted at 20, and engages one of the teeth 16 of the ratchet.

As thus far described, the device is of ordinary well-known construction, providing for a step by step forward movement, and preventing backward movement. But these devices as thus far described, permit the overrunning of the units wheel, due to their momentum under rapid operation, and also permit the pushing forward of the units wheel, either by accident or mischievously or maliciously. The means whereby this advancement of the units wheel is prevented, and which forms the subject of my present invention will now be described.

The units wheel 10, which for convenience, is herein designated the index wheel, is provided with a circular series of teeth 23, which, in the present embodiment, extend at the front side of the bracket wheel 15, these teeth corresponding in number with the number of steps required to advance the wheel one complete rotation. For convenience in manufacture, the front faces of these teeth are, as herein shown, made coincident with the front faces of the indexing teeth 16 of the ratchet wheel, although this is not a necessary feature, and these teeth may, if desired, be a circular series of pins. For convenience of reference these teeth are here-

in designated the stop teeth, to distinguish them from the indexing teeth 16. The stop pawl 24 is mounted for oscillation upon the pivotal support 28, and is provided with projections 25 and 26, which extend into the circular pathway of the revolving series of stop teeth 23. These projections are preferably so proportioned and disposed that one or the other of them is at all times within the pathway of the rotating teeth, so that at no time can the index wheel be revolved, without carrying one of the stop teeth against one of the projections 25 or 26, it being necessary, in order to advance the index wheel, to oscillate the pawl, and thereby carry the projections alternately out of the pathway of the said teeth, the disposition of those projections, with relation to the circular spacing of the teeth, being such that when the projection is drawn out of the pathway to allow the adjacent stop tooth to pass, the other projection is carried between two of the stop teeth, and vice versa, so that by advancing the index wheel, and oscillating the stop pawl in suitable time relation, the stop teeth will in the normal operation of the device, pass the projections 25 and 26, alternately.

As a simple, convenient and compact means of oscillating the stop pawl to a suitable extent and in suitable time relation to the advancing index wheel, the hub of the arm 18 is made cam-shaped, of a suitable contour to impart movement to the pawl, and preferably engages directly therewith. The pawl may be held into contact with the cam surface by means of a spring, but for positiveness of action, as well as for economy of space and materials, I prefer to make the stop pawl bifurcated, as herein shown, with its bifurcations engaging the opposite sides of the cam-shaped hub, the contour of which is shaped to oscillate the pawl positively back and forth, as the arm 18 is rotated to advance the index wheel. Obviously however, the form of the pawl, the disposition of its projections relative to the stop teeth, and its connection with the indexing arm may be modified in many ways to suit different environments, and different conditions of service.

In the operation of this device, starting from the position shown in Fig. 2, the arm 18, suitably connected with the devices which operate it, is moved downwardly, thereby advancing the index wheel. The tooth 23 immediately adjacent to the lower projection 26 of the stop pawl, passes by that projection before the latter is moved downwardly into the pathway of the stop teeth, after which the upper projection 25 is moved out of the circular pathway in time to allow the succeeding adjacent stop tooth to pass by, as shown in Fig. 3. Upon arriving at the latter position, which represents the forward

end of the stroke, the arm 18 is moved back to the position shown in Fig. 2, thereby also carrying the stop pawl back to the position shown in that figure.

In the arrangement shown herein, in which the projections of the stop pawl are alternately withdrawn inside of the circular pathway of rotation of the stop teeth, the distance apart of the points of the said projections is preferably somewhat greater than the inside diameter of the teeth, so that one or the other of the projections is always within the pathway of the stop teeth.

Although it is a desirable feature of the present invention that one or the other of the projections 26 shall at all times thus extend into the pathway of the stop teeth, in order to prevent improper advancing of the index wheel at all portions of the stroke, yet that is not an essential feature. In most instances, it is considered sufficient to block the forward movement of the index wheel, while the index arm is at rest at each end of its stroke, whether in the position shown in Fig. 2, or that shown in Fig. 3. In such cases the projections 25 and 26 might be short enough, so that both would be out of the pathway of the stop teeth 23 at the middle of the stroke, in which case the index wheel might be improperly advanced at that particular period. But at that particular time there is little liability of tampering with such devices, hence for many uses the projections 25 and 26 might be short enough to clear the stop teeth 23 at the said middle position of the arm. But for complete security of operation I prefer to make the projections 25 and 26 long enough, so that one or the other of them will be at all times in the pathway of revolution of the stop teeth.

I claim as my invention:—

1. In a registering machine, the combination of an advanceable registering member provided with stop teeth, a stop pawl having projections mounted to swing into and out of the pathway of the teeth of the advanceable member, and arranged to have one or the other of its projections at all times in the said pathway, and means for advancing the registering member, provided also with means for moving the stop pawl to carry its projections alternately out of the pathway of the teeth of the advancing member.

2. In a registering machine, the combination of an advanceable member provided with teeth, a stop pawl provided with projections extending into the pathway of the said teeth, and means for advancing the advanceable member, provided also with means for moving the stop pawl to first carry one of its projections into, and then its other projection out of the pathway of the said teeth at each advancing movement.

3. In a registering machine, means for controlling and limiting its advance move-

ment, having in combination an advanceable member provided with teeth arranged in approximate conformity with the desired advance movement, a stop pawl provided with
 5 projections extending into the pathway of the said teeth, and means for advancing the advanceable member, provided also with means for engaging the pawl to move its
 10 projections alternately into and out of the path of the said teeth at each advancing movement, keeping one or the other of said projections at all times in the said pathway.

4. In a registering machine, means for positively controlling and limiting the advance movement, having in combination an
 15 index member provided with a circular series of teeth, a pivotally mounted stop pawl provided with projections having a distance between them less than the diameter of the
 20 circular pathway of the said teeth, an arm mounted for oscillation and provided with means for advancing the index member and with means for oscillating the stop pawl to
 25 nately out of the pathway of said teeth at each advance movement.

5. In a registering machine, means for positively advancing the registering devices, and limiting their advance movement, having
 30 in combination an index wheel mounted for rotation and provided with a series of teeth, a stop pawl mounted for oscillation, and provided with projections extending into the pathway of the revolving teeth, an
 35 arm mounted for oscillation, having means for advancing the index wheel, and provided also with a cam for oscillating the stop pawl to carry its projections alternately into and out of the pathway of the revolving teeth.

6. In a registering machine, means for positively controlling and limiting the advance movement of the registering train, having in combination an index wheel connected with the said train, provided with a
 45 series of teeth, a stop pawl mounted for oscillation on an axis at one side of the axis of the index wheel, and provided with projections extending into the pathway of the revolving teeth of said wheel, an arm mounted
 50 for oscillation concentrically with the said wheel and provided with means for advancing the wheel one step for each oscillation of the arm, and provided also with a cam engaging with and oscillating the said
 55 pawl to carry its projections alternately out of the pathway of the said teeth, at each advancing movement.

7. In a registering machine, mechanism for positively controlling and limiting the
 60 advance movement of the registering train,

having in combination an index wheel mounted for rotation, and connected with the registering train, and provided with a peripheral series of teeth for the advancing
 65 movement, and with a series of stop teeth projecting at the side of the said wheel, a stop pawl mounted for oscillation at one side of the axis of the index wheel, and having
 70 projections extending into the pathway of the said sidewise projecting teeth of the index wheel, and an arm mounted for oscillation in substantially concentric relation to the index wheel, and provided with a pawl
 75 for engaging with the peripheral teeth of said wheel, the arm being also provided with a cam for oscillating the said pawl to carry its projections alternately into and out of the pathway of the stop teeth of the wheel.

8. In a registering machine, means for positively controlling and limiting the advance movement of the registering train, having in combination an index wheel connected with the said train, and provided with
 80 a circular series of stop teeth, a stop pawl mounted for oscillation upon an axis situated at one side of the axis of the said wheel, and provided with oppositely disposed projections extending outwardly into the pathway of the said stop teeth at approximately opposite portions of their path-
 85 way, and means for advancing the index wheel, provided with means for oscillating the pawl to withdraw its said projections alternately inside of the circular pathway of the said teeth at each advancing move-
 90 ment.

9. In a registering machine, the combination of an index wheel mounted for rotation and provided with a circular series of teeth, an advanceable member for the index wheel
 100 mounted for oscillation within the circular pathway of the said teeth, and a bifurcated stop pawl mounted for oscillation upon an axis at one side of the axis of the index wheel, with its bifurcations extending upon
 105 opposite sides of the axis of the advancing member, and having projections extending into the circular pathway of the said teeth, the advancing member being provided with a cam for oscillating the said stop pawl to
 110 carry the said projections alternately inward out of the pathway of the said teeth.

In witness whereof I have signed my name to this specification in the presence of two subscribing witnesses, this 27th day of
 115 November, 1905.

CHARLES F. LITTLEJOHN.

Witnesses:

A. N. WHEELER,

M. E. W. SANFORD.