Nov. 26, 1935. E. R. AMMON 2,022,613

AUTOMATIC COUNTER FOR TEXTILES

Filed Sept. 4, 1930

Fig. 1.

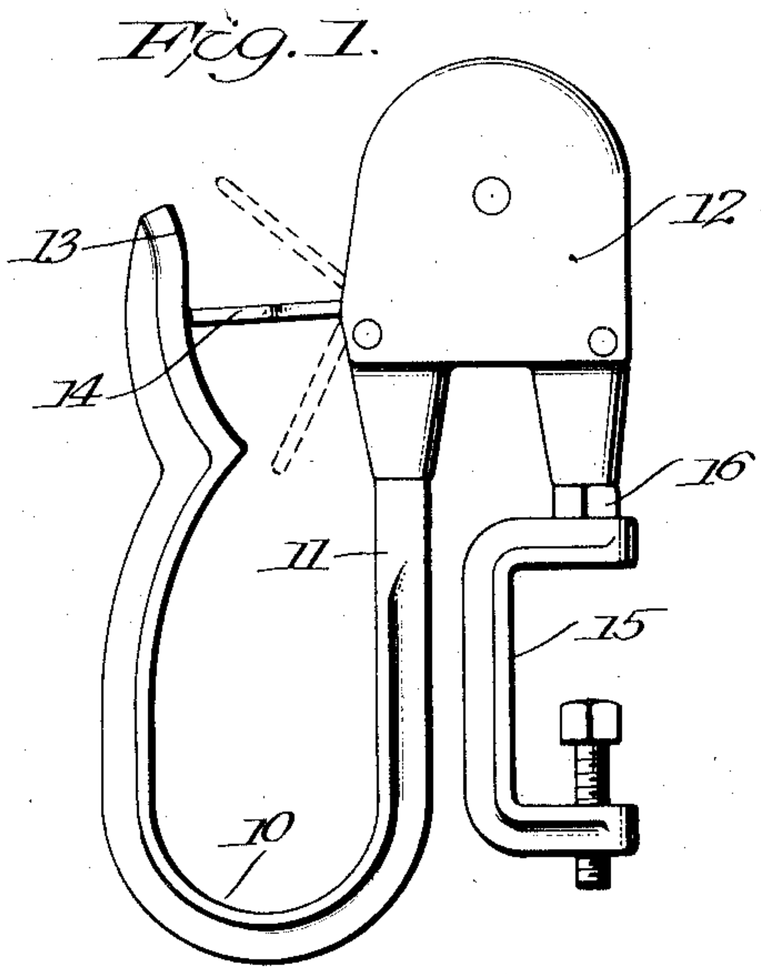


Fig. 2.

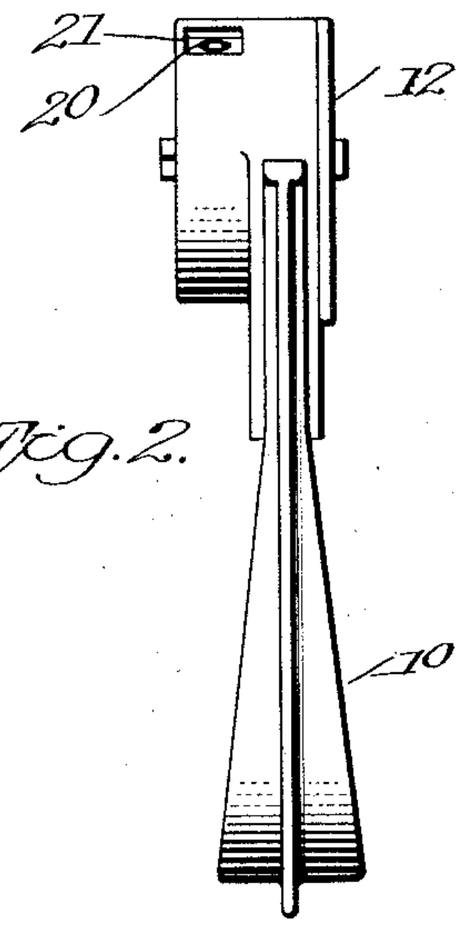


Fig. 3.

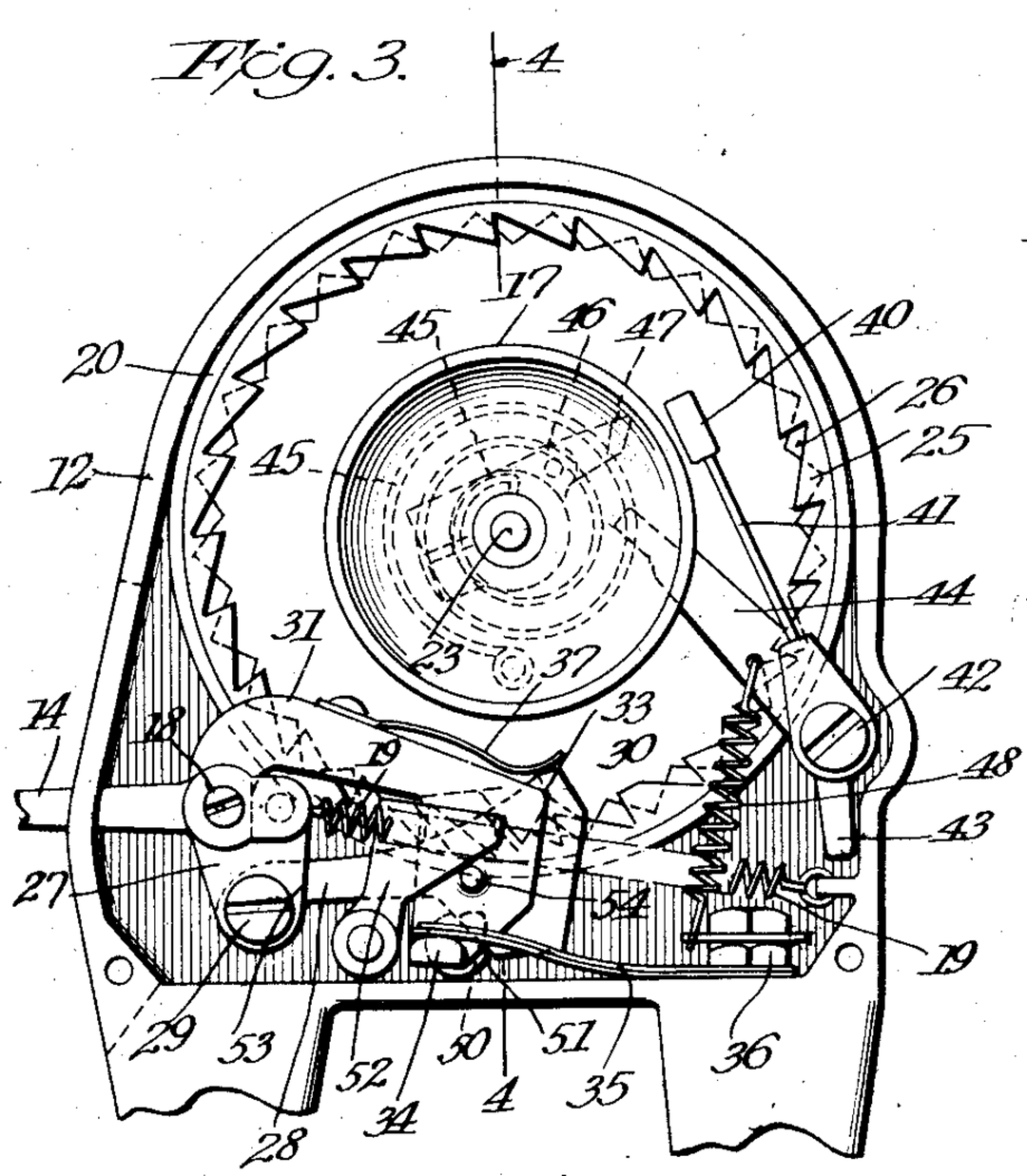
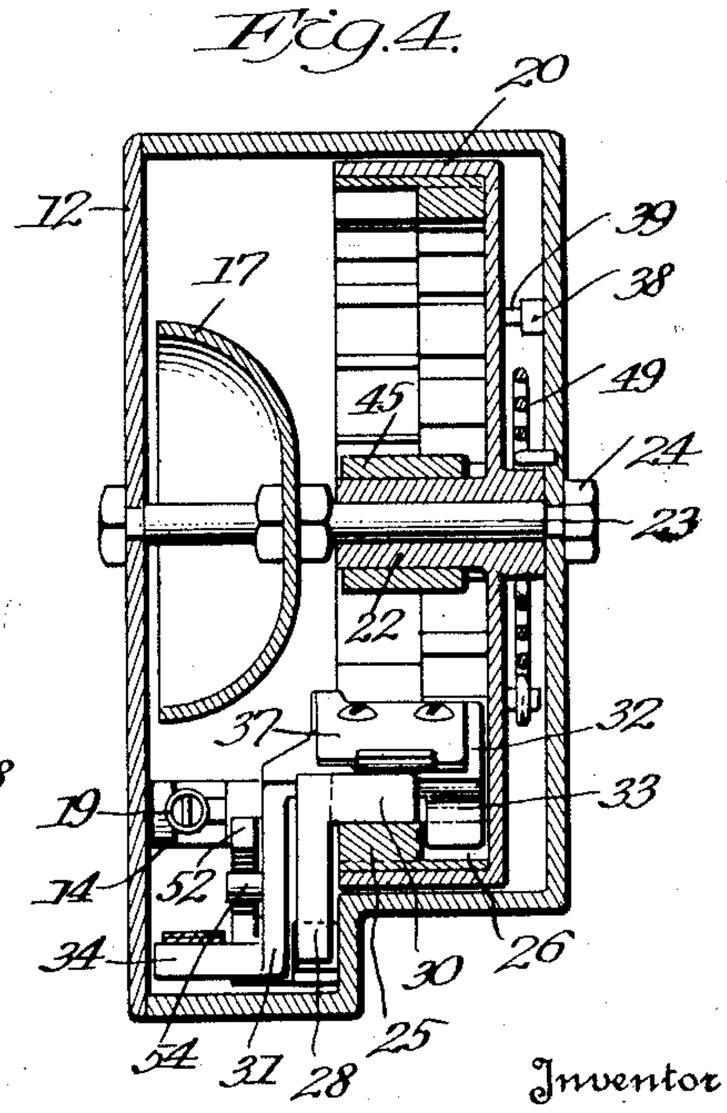


Fig. 4.



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AUTOMATIC COUNTER FOR TEXTILES

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14 Claims. (Cl. 235—98)

This invention relates to automatic counters for textiles, and has particular reference to novel actuating and controlling mechanism therefor.

In many textile industries it is essential to put up finished, or partially finished, garments, such as hosiery, in bundles containing the same number of articles. Much time is lost and many mistakes are made by packaging operators, who are untrained in mathematics, in an effort to maintain perfect count. I propose by my device to make it possible for operators to assemble garments into bundles of uniform quantity without any mental effort, or physical effort additional to what they have heretofore employed.

In general, it is the object of this invention to provide such a construction and arrangement of parts of a counter in a supporting structure as will constitute a device which will count articles as they are placed in the device, prevent more than a predetermined number of articles from being so positioned, and which will be brought to a zero-setting by the withdrawal of either the predetermined number or a lesser quantity of articles therefrom.

A further object of this invention is to provide a counter and associated actuating mechanism of such construction that after a predetermined number of counts have been registered, the registering and actuating mechanism will be locked against further registering movement, the locking parts being so arranged that the actuating parts may be reversely moved to free the registering part and enable the same to return to a reset, or zero, position.

A still further object of this invention is to provide a counter construction in which the registering parts may be automatically returned to a zero-setting by a single movement of the actuating mechanism, either after a predetermined number of counts have been registered and the registering parts locked against further registering movement, or, after any number of counts between zero and the predetermined number have been rung up.

Another object of this invention is to provide a counter which is accurate in operation and which will register only one count for each movement of the actuating mechanism. Specifically, it is my purpose to provide mechanism associated with the actuating and registering parts which positively eliminates danger of skipping or jumping of one or more counts by the registering parts due to momentum resulting from sudden or excessive movement of the actuating parts.

Other objects and advantages of my invention will in part be obvious and in part become apparent as the specification proceeds. The general nature and arrangement of parts of my device and the details of the preferred embodiment thereof may be understood from the accompanying drawing which forms a part of this specification and from the following description. It will readily become apparent that my invention is capable of a wide range of modification and equivalency without departing from the spirit thereof, with the result that I do not intend to be limited by the particular details of construction shown and described but, on the other hand, intend that the nature and scope of my invention should be limited and determined only by the appended claims.

In the drawing:

Fig. 1 is a side view of my counter together with the supporting structure which renders it admirably suited for use in counting textiles;

Fig. 2 is a front view of the structure shown in Fig. 1;

Fig. 3 is a view in front elevation of the upper part of the structure shown in Fig. 1 greatly enlarged and with the cover plate removed to disclose the details of construction of my counting mechanism; and

Fig. 4 is a view in sectional elevation taken through the line 4—4 of Fig. 3 showing certain parts of my counter mechanism.

Referring to the drawing, the numeral 10 indicates, generally, a hook-shaped arm adapted to receive garments, one leg of which, 11, is associated with a casing 12 which houses my counting mechanism. The other leg, 13, is so disposed and shaped with respect to the counter that as garments are placed in position on the arm they will necessarily depress a counting lever 14, and when the garments are withdrawn they will carry the lever upwardly until there is sufficient space between the end of the lever and the arm-leg 13 to permit their removal. After each upward or downward actuation, the lever will return to the position shown in full lines in Fig. 1, so that each garment will be counted as it is placed in position, and the withdrawal of any number will cause the counter to be reset to zero by mechanism hereafter to be described. Any suitable bracket may be provided to support the arm 10 and counter casing. I have shown in Fig. 1 a clamp 15 associated with the counter which is adapted to attach the device to a table or bench. It may be convenient for purposes of operation to have a pivotal connection between the clamp and counter, and to provide a lock-

ing nut 16 to hold the device in any adjusted position.

Lever 14 is connected with a suitable counting mechanism housed in the casing 12, and this mechanism is caused to function on each depression of the lever. After the desired number of garments have been inserted the lever 14 will be locked as hereafter described to prevent the insertion of additional garments, but may be unlocked by withdrawal of the garments which effects an upward movement of the lever to the position shown in dotted lines in Fig. 1. As the lever 14 becomes locked a bell 17, shown in Figs. 3 and 4, will ring to warn the operator that the full number of garments for a bundle has been inserted.

Turning now to the details of construction of my counting mechanism, as shown in Figs. 3 and 4, the inner end of the lever 14 is pivotally mounted on the side wall of the casing 12 by means of a pin 18. To hold the lever in the neutral position shown in full lines in Fig. 1, a spring 19 is provided connecting the lever to the opposite end wall of the casing. The central portion of this spring in Fig. 3 has been broken away to show other parts of the counting mechanism. A registering dial 20, on the outer periphery of which are numerical characters readable through an opening 21 in the casing 12 (see Fig. 2), is formed with a central bushing 22 through the center of which extends a supporting axle 23 upon which it is freely rotatable. The axle end is threaded and held securely to the casing 12 by a nut 24. Secured to the inner periphery of the dial are two sets of teeth 25 and 26. There is one tooth occupying a corresponding position in each set for each registering number on the outer periphery of the dial. Of course, any desired number may be used. For convenience I will designate set 25 as the actuating ratchet and set 26 as the centering ratchet, inasmuch as I propose to actuate the former by the lever to move the dial from one registering position to the next and I intend that the latter set be used to center the dial in each of such positions. It will be obvious that the teeth of the actuating ratchet should have one straight and one sloping surface and that those of the centering teeth should have two equally sloping sides in order to properly function in connection with cooperating pawls now to be described.

Abutting the inner end of the lever 14 and formed integral therewith is a wing 27 to which is pivotally secured one end of a reciprocating pawl 28 by means of a pin or screw 29. At the other end of the pawl, which, for convenience, I will term the actuating pawl, is a finger or tooth 30 adapted to engage the teeth of the ratchet 25 for intermittently moving the dial 20. With such construction, whenever the lever 14 is depressed the pawl 28 will effect a corresponding movement of the dial.

To center the dial and prevent backward movement thereof when the lever returns to its neutral position carrying back the actuating pawl 28, I have provided a pivoting pawl 31 which I shall term the centering pawl, since it coacts with the teeth of the ratchet 26 to center the dial. One end of the pawl 31 is pivotally mounted on the pin 18 which also forms the pivot for the lever 14, but the lever and pawl are arranged to move independently of each other. At the other end of the pawl 31 and at right angles thereto is a projection or bridging portion 32 sufficiently long to extend over the ratchet 25 and across the upper surface of the actuating pawl 28 to the ratchet 26. A tooth 33 on the projection which coacts with the teeth on ratchet 26 serves to retain the dial in successive registering positions after actuation by the lever 14 through the pawl 28 and actuating ratchet 25. To maintain the pawl 31 in position with respect to the ratchet 26, I prefer to provide the swinging end of pawl 31 with a side extension adapted to carry a pin or projection 34 against which may press a leaf spring 35, one end of which is anchored to the casing 12 as by a bolt and nut connection 36.

To insure proper engagement of the actuating pawl 28 with the ratchet 25 when the lever 14 is depressed, I prefer to provide pawl 28 with a curved edge against which a leaf spring 37 anchored to the pawl 31 may yieldingly press.

With the above-described actuating and centering mechanism, it will be apparent that the lever 14 on being depressed will actuate the pawl 28 and cause a corresponding change of position of the registering dial by coaction due to the spring 37 of the pawl-finger 30 with a tooth of the ratchet 25. During such movement, the tooth 33 of the centering pawl will ride upward between the teeth of the ratchet 26 and then downward between adjacent teeth under action of the spring 35, where it will remain to prevent further movement of the dial during the return movement of the pawl 28 as the lever 14 returns to its neutral position.

To prevent further movement of the dial after the desired number of counts have been registered by the dial and to lock the lever and actuating pawl against further registering movement, a suitable stop such as illustrated in Fig. 4 may be provided. As shown, such device comprises a projection 38 on the casing which coacts with a suitably-positioned pin 39 on the side of the dial.

In order that the operator may be warned when the maximum number of counts have been registered, I have provided a bell 17 which may be conveniently positioned on the axle 23. A ball 40 on an arm 41 is pivotally mounted in the case 12 by a bolt 42 and a projection 43 of the arm coacts with the casing to limit the movement of the ball. A second arm 44 movable with the ball arm extends towards the axle 23. Surrounding the bushing 22 of the dial and rotatable therewith is a collar 45 on the outer periphery of which is a bifurcated projection 46 between whose sides is pivotally supported a cam 47 in such manner as to have a limited movement with respect to the collar. As the dial moves to its maximum registering position the cam will move the arm 44 against tension of a spring 48 to pull the ball away from the bell. As the cam continues to move beyond the end of the arm 44 the spring will contract to cause the ball to ring the bell.

A particular feature of my invention is the zero setting mechanism whereby the dial may be reset to zero from any registering position by an upward actuation of the lever 14. A coil spring 49, the respective ends of which are anchored to the casing and the dial, is wound to contract during registering movement of the dial so that upon disengagement of the actuating and centering pawls from their coacting ratchets on the dial, the spring will unwind to return the dial to zero setting. The pin 39 on the dial and projection 38 on the casing which serve to prevent movement of the dial after reaching its maximum registering position may also serve as a zero stop, or other similar stops may be employed. To

enable the dial to return to its zero position, I have provided the actuating pawl **28** with a cam surface **50** which upon upward movement of the lever **14** rides upwardly on a pin **51** secured to the side of the casing, thus releasing the actuating pawl-finger **30** from the ratchet **25**. As the pawl finger moves upward and towards the lever end of the casing its top edge comes in contact with the end of the side projection or bridge portion **32** on the centering pawl to raise the same and release the tooth **33** of the centering pawl from engagement with the centering ratchet **26**, thus allowing the coil spring to return the dial to zero. As the lever returns from its upper releasing position to its neutral horizontal position, the cam **50** will ride down the pin **51** and allow the teeth of the actuating and centering pawls to assume their normal engagement with their corresponding ratchets on the dial.

Another important feature of my counting device is mechanism which insures only a single registering change of the dial for each actuation of the lever **14**, and makes it impossible for the dial to jump due to momentum arising from excessive or sudden actuation of the lever. Referring to Fig. 3, it will be seen that I have provided a locking finger **52**, pivotally mounted on the side of the casing **12**. One edge of such finger is adapted to coact with a cam surface **53** on the wing **27** of the lever **14**. The other edge of the finger is adapted to slide over a pin **54** on the centering pawl to lock the latter in a depressed position, so that the centering pawl tooth **33** will be held in position between adjacent teeth of the centering ratchet **26** and thus prevent movement of the dial. The cam surface **53** is designed to actuate the locking finger **52** to lock the centering pawl against movement just at the time the actuating pawl **28** has brought the dial to a new registering position. As above pointed out, the centering pawl **33** carries a spring **37** which bears against the upper surface of the actuating pawl **28**. When the centering pawl is locked as the actuating pawl reaches the end of its forward movement as just described, the pressure of the spring serves to maintain the actuating pawl finger **30** in a depressed position with reference to the ratchet **25**. With the centering pawl and actuating pawl both depressed, rotation of the dial beyond a new registering position is prevented. Thus, with the arrangement just described it will be obvious that no matter with how much force the lever **14** is impelled the actuating pawl will move the dial only to the next successive registering position, and as soon as that position is reached the centering pawl will be locked with respect to the centering ratchet by the locking finger and through the centering pawl the actuating pawl will be spring-pressed in engagement with the actuating ratchet to prevent further movement of the dial until the locking finger is released by return of the lever to its neutral position, whereupon the lever may again be depressed to move the dial to a new registering position through the agency of the actuating pawl and ratchet.

I claim:

1. A garment counter comprising a counting mechanism, a support for garments, a lever movable in one direction by garments as they are placed on the support and movable in the opposite direction by garments on withdrawal from the support, the lever having an operative connection with the counting mechanism such as to cause the counting mechanism to assume successive registering positions as successive garments are placed on the support, movement of the lever by withdrawal of garments being effective from any registering position to reset the counting mechanism to zero position.

2. A garment counter comprising a counting mechanism adapted to assume successive registering positions, a support for garments, a lever actuatable by garments as they are placed on or withdrawn from the support controlling the counting mechanism, and means actuatable by the lever upon withdrawal of garments from the support and operative from any registering position for resetting the counting mechanism to non-registering position.

3. A counter comprising a registering dial provided with a ratchet, an actuating arm controlling movement of the dial, an actuating pawl engageable with the ratchet and operative on successive movements of the actuating arm to move the dial to successive registering positions, a movable member having a surface portion engageable with the actuating pawl, and a locking finger engageable with and operable by the actuating arm after the dial has been moved from one registering position to the next to engage the movable member and through said member to press the pawl against the ratchet until the actuating arm becomes operative to move the dial to a new registering position.

4. A counter comprising a registering dial provided with a ratchet, an actuating arm controlling movement of the dial, an actuating pawl engageable with the ratchet and operative on successive movements of the actuating arm to move the dial to successive registering positions, a movable member having a surface portion engageable with the actuating pawl, a pin carried by said member, and a locking finger engageable with and operable by the actuating arm after the dial has been moved from one registering position to the next to engage the pin on the movable member and through the movable member to hold the pawl against the ratchet until the actuating arm becomes operative to move the dial to a new registering position.

5. A counter comprising a registering dial provided with a ratchet, an actuating arm controlling movement of the dial, an actuating pawl engageable with the ratchet and operative on successive movements of the actuating arm to move the dial to successive registering positions, a second pawl engageable with the dial to maintain the dial at each registering position, and locking means including a locking finger operable after the dial has been moved from one registering position to the next to hold both of said pawls in engagement with the dial until the actuating arm becomes operative to move the dial to a new registering position.

6. A counter comprising a registering dial provided with a ratchet, an actuating arm controlling movement of the dial, an actuating pawl engageable with the ratchet and operative on successive movements of the actuating arm to move the dial to successive registering positions, a second pawl engageable with the dial to maintain the dial at each registering position and including a portion engageable with the actuating pawl, and locking means including a locking finger acting through a projection on one of the pawls operable after the dial has been moved from one registering position to the next to hold both of said pawls in engagement with the dial

until the actuating arm becomes operative to move the dial to a new registering position.

7. A counter comprising a registering dial provided with a ratchet, an actuating arm controlling movement of the dial, an actuating pawl engageable with the ratchet and operative on successive movements of the actuating arm in one direction to move the dial to successive registering positions, a second pawl engageable with the ratchet and adapted to retain the dial in each new registering position, the actuating pawl and retaining pawl having coacting surfaces such that the release of one pawl from engagement with the ratchet will effect the release of the other pawl, and means engageable with one of the pawls during movement of the actuating arm in the other direction to effect the release of both pawls from the ratchet and permit the dial to be reset to non-registering position.

8. A counter comprising a registering dial, an actuating pawl movable from an initial position in one direction to engage and advance the dial to successive registering positions, said actuating pawl also being movable from its initial position in the opposite direction to release the dial, a second pawl adapted to center and retain the dial in each new registering position, teeth on the dial with which the actuating pawl and the centering and retaining pawl coact, the centering and retaining pawl being located in proximity to the actuating pawl and having a surface portion overlying the actuating pawl, and a releasing cam engageable with the actuating pawl by and during movement of said pawl in the opposite direction and operative to raise the actuating pawl and through the actuating pawl the centering and retaining pawl from engagement with the dial to permit the dial to return to non-registering position.

9. A contour comprising a registering dial provided with a toothed periphery, an actuating arm controlling movement of the dial, a plurality of independently mounted pawls both engageable with the teeth on the dial, one of the pawls being adapted to move the dial from one registering position to the next and the other pawl serving to maintain the dial in each new registering position, the several pawls being positioned side by side and one having a surface portion overlying and adapted to be engaged by the outer surface of the other pawl, and means operative under control of the actuating arm and coactive with the underlying pawl for releasing both pawls from engagement with the dial and enabling the dial to be reset to non-registering position.

10. A counter comprising a registering dial having a toothed periphery, an actuating arm controlling movement of the dial, a first pawl and a second pawl independently mounted and both engageable with said teeth, one of the pawls being adapted to move the dial from one registering position to the next and the other pawl serving to maintain the dial in each new registering position, the several pawls being positioned side by side and the first pawl having a bridging portion overlying and presenting a surface adapted to be engaged by the upper surface of the second pawl, the tooth-engaging portion of the first pawl being carried by said bridging portion and lying on the opposite side of the second pawl from the main portion of the first pawl so as to be disengaged from the dial when the second pawl is raised, and means for raising the second pawl so as to disengage both pawls from the dial and permit the dial to freely rotate.

11. An article counter comprising an article receiver, a pivoted counting arm mounted with respect to the receiver so as to be actuated around its pivot by each article as it is deposited in the receiver, a registering dial, dial actuating means connecting with the pivoted lever and operable by the lever upon successive actuations thereof to move the dial from one registering position to the next, and cam-controlled means engageable with and operated by the counting lever as the dial reaches each new registering position to lock the dial in said new registering position until the counting lever is released.

12. A counter comprising a registering dial, teeth on the dial, a pivoted counting lever, actuating means for the dial including a pawl connected to and operable by said counting lever to advance the dial from one registering position to the next, a pivoted locking finger also engageable with and actuatable by the pivoted counting lever and means engageable by said locking finger to hold the actuating pawl in engagement with the dial as the pawl advances the dial to each new registering position.

13. A counter comprising a registering dial provided with a ratchet, an actuating arm pivotally mounted for movement in a reciprocatory path controlling movement of the dial, a pawl engageable with the ratchet, a locking finger engageable by the actuating arm when said arm reaches one end of its path of movement and actuatable thereby to lock the pawl in engagement with the ratchet until the actuating arm moves toward the other end of its path.

14. A counter comprising a registering dial provided with a ratchet, an actuating arm pivotally mounted for movement in a reciprocatory path controlling movement of the dial, a pawl engageable with the ratchet, a locking finger engageable with the pawl to lock the same in engagement with the ratchet, and a cam carried by the actuating arm becoming operative as the actuating arm reaches one end of its path of movement to move the locking finger into engagement with the pawl and release said locking finger as the actuating arm moves away from said end of its path of movement.

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