March 22, 1949. M. L. NELSON 2,465,258

COUNTER

Filed April 7, 1944

Fig. 1.

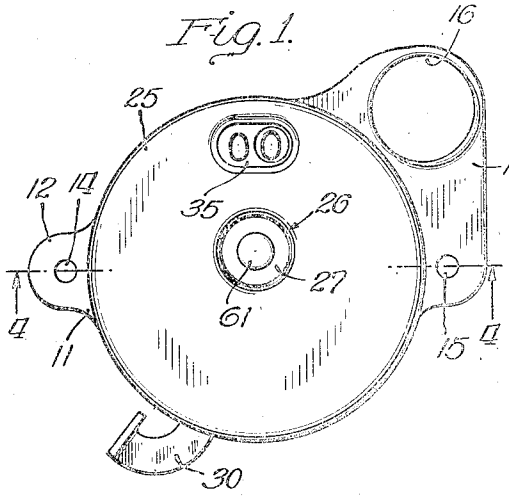


Fig. 3.

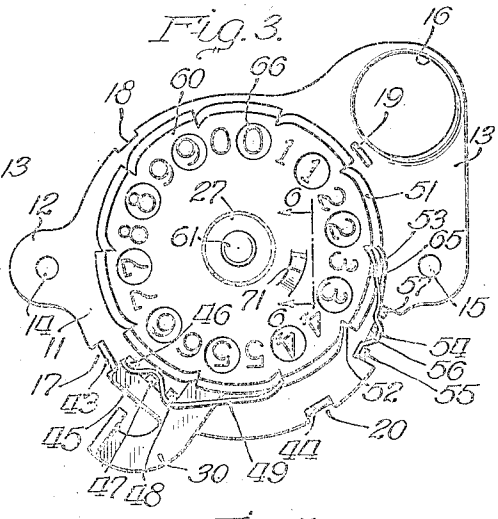


Fig. 2.

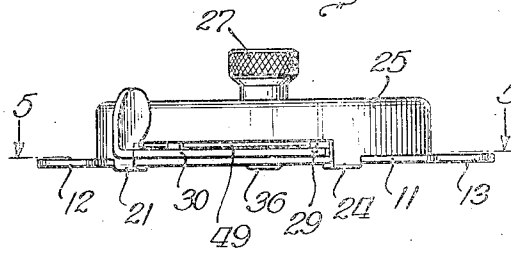


Fig. 4.

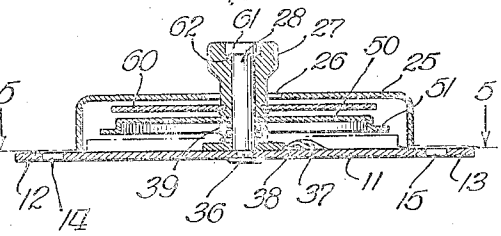


Fig. 5.

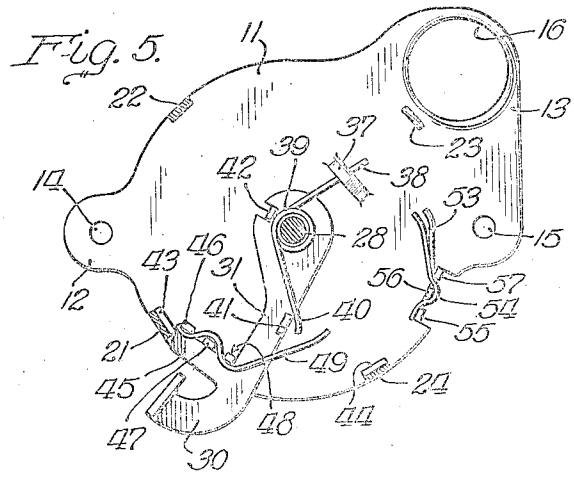
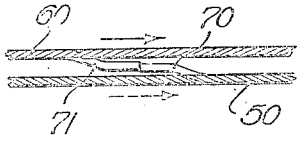


Fig. 6.



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2,465,258

COUNTER

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Application April 7, 1944, Serial No. 529,955

3 Claims. (Cl. 235—116)

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This invention relates to counting devices, and is particularly concerned with a novel single shaft counter adapted for manual operation and provided with zero setting means, that is to say, with means for setting the counter to zero position from any numerical position to which it may have been operated.

The various objects and features of the invention are best described with reference to an embodiment illustrated in the accompanying drawings. In these drawings,

Fig. 1 represents an embodiment of the new counter in top plan view;

Fig. 2 is a side view;

Fig. 3 shows the counter with the cover removed;

Fig. 4 illustrates the counter in section taken approximately along lines 4—4 in Fig. 1;

Fig. 5 shows a top plan view of the base plate and certain operating parts mounted thereon, the shaft of the counter and the legs of the cover being shown in section; and

Fig. 6 represents a section through the number disks along lines 6—6, Fig. 3, showing certain elements provided for setting the counter to zero.

The counter comprises a base plate 11 having sections 12 and 13 integral therewith. The section 12 is provided with a hole 14 and the section 13 with a companion hole 15 for suitable attachment of the counter to a desired fixed object, for example, a work bench. The section 13 is enlarged and is in addition provided with an opening 16 which may be used as a finger hole for permitting a firm grip on the counter if it is to be held in the hand while performing the counting operations.

The base plate 11 is provided with cutouts indicated in Fig. 3 at 17, 18, 19 and 20, for the purpose of accommodating legs 21, 22, 23 and 24, depending from the shell 25 of the cover, as shown in Figs. 2 and 5. The legs are inserted in the cutouts and their ends are bent over as shown in Fig. 2. The cover is thus firmly secured in place and encloses the various mechanical elements of the counter.

These elements include a finger lever 30—31 and a first (units) number disk 50, which are rotatably mounted on the post 28. A second (tens) number disk 60, of smaller diameter, is provided which is fixedly attached to the inner end of a bushing-like knob or journal member 27 for coaction with the first noted number disk axially adjacent thereto. The knob 27 projects through a hole 26 in the cover to the outside. It is peripherally knurled to provide for a firm

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grip thereon when it is desired to rotate the second noted (tens) counter disk 60 relative to the first noted (units) number disk 50, e. g., for the purpose of resetting the counter to zero position, or for the purpose of advancing it in a decade progression, as will be presently described. The knob 27 is rotatably mounted on the post 28 which is attached to the base plate as shown in Fig. 4 at 36, and its axial displacement on the post is limited by the enlargement 61 at the outer end of the post which is disposed within the recess 62 in the knob. It should be noted that the hole 26 in the cover 25 is off-center for the purpose of providing space within the cover which accommodates certain operating parts such as the pawl 49 and the detents 53 and 65.

The face of the cover shell 25 is also provided with a beveled sight or index opening 35 through which readings may be taken of the numbers set by the mechanism.

The outer end 30 of the finger lever 31 extends through a cutout 29 in the side wall of the cover, as particularly shown in Fig. 2. The inner end of the finger lever is rotatably disposed on the shaft 28, as previously described. A loop 37 (Figs. 4 and 5) is punched or pressed out from the material of the base plate, as shown in Figs. 4 and 5. Inserted in this loop is one end 38 of a spring which is coiled around the shaft 28, as indicated in Figs. 4 and 5 at 39. The free end 40 of the spring engages a projection 41 which is integral with the finger lever and is bent over to extend upwardly therefrom, as shown in Fig. 5. The inner end of the finger lever is also provided with another angularly upwardly extending projection 42 for keeping the coiled portion 39 of the spring in place. The finger lever is thus biased by this spring in clockwise direction (as seen in Fig. 5) for angular displacement on the base plate. Its angular displacement is limited by the stops 43 and 44 formed by angularly upwardly projecting extensions of the base plate, all as shown in Fig. 5.

The outwardly extending portion 30 of the finger lever carries an extension 45 which is provided with three tooth-like projections 46, 47, 48 angularly upwardly extending therefrom in a direction perpendicular to the plane of the drawing Figs. 3 and 5, for the purpose of fastening on the finger lever the rear end of the pawl 49 which is laced through the spaces between the projections 46—48. The pawl is thus firmly attached to the finger lever, but is easily removable therefrom and is easily assembled therewith. Whenever the finger lever is operated in

counter-clockwise direction, as seen in Figs. 3 and 5, the pawl will move with the lever in the same direction.

Superimposed above the base plate and finger lever assembly just described is the units number disk 50. This disk is made in the form of a shallow disk having a radially extending rimmed edge or flange 51 which is particularly apparent from the drawing Fig. 4. The disk is rotatable on the shaft or post 28. It carries on its flat upper face, near the periphery thereof, numerals from "0" to "9" placed thereon in clockwise sequence. The flange or rim 51 of the units number disk 50 is provided with ten peripherally uniformly spaced notches shown in Fig. 3. One of these notches, designated at 52 in Fig. 3, is deeper than the other notches.

The units number disk 50 is engaged by a detent 53 and is thereby prevented from rotating in clockwise direction. The detent extends from a common member 54 (see Figs. 3 and 5) which is laced through the spaces between three tooth-like mounting projections 55, 56, 57 punched out of the material of the base plate and projecting upwardly therefrom, as shown. The fastening of the detent is similar to the fastening of the pawl 49 on the finger lever. The pawl 49 is adapted to rotate the units number disk 50 in counter-clockwise direction by successively engaging the peripheral notches in the rim or flange-like portion 51.

As previously described, the tens number disk 60 is attached to the inner end of the shank of the knob 27 which is rotatably mounted on the shaft 28. Upon the upwardly projecting face of the tens number disk, near the periphery thereof, are provided the numerals from "0" to "9" in clockwise sequence. Holes such as 66 (Fig. 3) are provided between adjacent numerals for displaying the numerals carried by the units number disk. The spring 39, which acts radially resiliently on the finger lever, is also used in the nature of a resilient axially acting pressure member in coaction with the units number disk 50, holding the units number disk axially resiliently in operative position in close proximity with respect to the tens number disk 60. In other words, the units number disk 50 is rotatably mounted on the post 28 in floating relation with respect to the tens number disk 60, and the spring 39 acts axially resiliently on the units disk to keep it in operative position axially adjacent the tens number disk. A washer may be interposed between the spring and the units disk if desired.

The tens number disk 60 is peripherally provided with ten equally spaced notches just like the notches on the flange 51 of the units number disk. The detent 65 extending from the common member 54 provides a means for preventing rotation of the tens number disk in clockwise direction.

Assuming now that the device is in the zero position in which it is shown in Figs. 1 and 3 and that the finger lever is actuated in counter-clockwise direction, thus displacing it angularly between the stops 43 and 44, it will be clear that the result of the displacement will be an advance of the units number disk, from the position shown in Fig. 3, in counter-clockwise direction, through a sector corresponding to the distance between two notches. The number "1" on the units number disk is thus caused to travel in counter-clockwise direction underneath the tens number disk, until it is positioned below the opening 66 in the tens number disk, displacing the unit numeral "0" now visible therethrough. The number which will then appear through the sight or index opening 35 of the cover will therefore be "01." Repeated angular displacements of the units number disk, step by step, results in displaying through the index opening 35 successively the numbers "02" to "09." At that moment the deep notch 52 in the flange 51 of the units number disk is aligned with the pawl 49. The next (tenth) actuation of the finger lever therefore is effective to both the units and the tens number disks. Both disks are moved in counter-clockwise direction, displaying in the index opening the number "1" on the tens disk and "0" on the units disk, in other words, displaying the number "10." Further operations of the finger lever rotate the units disk as before described, increasing in arithmetical progression the number displayed through the index opening. A transfer is effected at every tenth step by the deep notch in the units disk, as described in connection with the transfer from the first decade to the second decade.

The zero setting means comprises the parts co-acting as noted below:

The units number disk 50 is provided with an upwardly extending tooth-like projection 70, shown in Fig. 6, and the tens number disk 60 is provided with a similar but oppositely downwardly bent projection 71. These projections are in edgewise engagement, as shown in Fig. 6, in any relative numerical position of the counter corresponding to the setting shown in Fig. 3; that is to say, they are in engagement whenever the numerals "00," or "11" or "22," etc., are displayed through the index opening.

During the normal counting motion of the units number disk 50, in counter-clockwise direction, indicated by the dotted arrow in Fig. 6, the projection 70 moves away from the projection 71 depending from the tens disk 60. At the time when transfer is effected, the projection 70, being moved underneath the tens disk 60 to the right, slips under the downwardly extending projection 71 on the tens number disk and again is in the position shown in Fig. 6. It will be seen, therefore, that the projections 70 and 71 do not interfere with the operation of the device. The proper operation is maintained by the axially floating action of the units number disk.

If it is desired to reset the counter to zero position from any given numerical position to which it may have been advanced, e. g., from the numeral "29" displayed through the index opening, it is merely necessary to rotate the bushing-like knob 27 in counter-clockwise direction. Such operation advances the tens number disk step by step to display through the index opening successively the numbers "39," "49," "59," etc., until the number "99" is reached, when the projections 70, 71 are in edgewise engagement, as shown in Fig. 6. Further counter-clockwise rotation of the knob 27 advances both the units and the tens disks simultaneously and as a result the number "00" is next displayed through the index opening. The counter is then in zero position. In other words, rotation of the knob in counter-clockwise direction results in rotation of the tens number disk for the purpose of effecting driving engagement of its projection 71 with the projection 70 of the units disk, and further rotation of the knob in counter-clockwise direction, after such driving engagement of the projections 70, 71, therefore carries along the units number disk 50, advancing it simultaneously with the

tens disk 60, and the number "00" or any other number in arithmetical decade progression, that is, "11," "22," "33," etc., may be disposed for display underneath the index opening 35. After obtaining the desired setting, as described, the counter may again be operated in the usual manner. It is understood that this feature is not only useful in connection with the zero setting operation, but generally in connection with quick counting by decades.

Changes may be made within the scope and spirit of the accompanying claims which define what is believed to be new and desired to have protected by Letters Patent of the United States.

I claim:

1. In a counter, a base plate, a post secured to said base plate and projecting therefrom, a units number disk rotatably disposed on said post above said base plate, a bushing rotatably mounted on said post above said units number disk, a tens number disk secured to the inner end of said bushing for coaction with said units number disk, an actuating lever carrying a pawl for rotating said number disks to record a count, a single spring disposed on said post for maintaining said actuating lever in normal angular position and for resiliently pressing said units number disk in axial direction to hold it in coacting position relative to said tens number disk, a knob associated with the free end of said bushing for independently rotating such bushing and therewith said tens number disk secured thereto, and coacting means carried by said number disks for resetting said number disks to zero position incident to rotation of said tens number disk responsive to rotation of said bushing by said knob.

2. In a counter, a base plate, a post secured on said base plate and projecting therefrom, a disk-like member made in the form of a shallow dish having a radially extending rimmed edge, said member being rotatably disposed on said post above said base plate and forming the units number disk of the counter, a bushing-like journal member rotatably mounted on said post at the free end thereof, a tens number disk carried by said journal member at the inner end thereof for coaction with said units number disk, an actuating lever carrying a pawl for rotating said

number disks to record a count, spring means disposed on said post between said actuating lever and said units number disk, said spring means having the dual purpose of holding the units disk floatingly on said shaft in axially resilient engagement with the inner end of said bushing-like journal member and of maintaining said actuating lever in normal angular position, operating means carried by said journal member to permit rotation thereof and therewith rotation of said tens number disk independent of said actuating lever, and coacting means carried by said number disks for resetting said disks to zero position responsive to rotation of said tens disk by said operating means.

3. The structure and combination defined in claim 2, wherein said coacting means comprises a pair of tongue-like projections, one punched out from the tens number disk along a radius about midway between its center and its periphery and the other punched out from the units number disk along a corresponding radius, the rotation of said tens number disk by said operating means effecting driving engagement of said tongue-like projections for the purpose of resetting said number disks to zero position, said coacting projections on said number disks being constructed and arranged for by-pass engagement when the number disks are rotated by said actuating lever.

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