March 31, 1936. M. L. JEFFREY 2,035,891

RESETTING DEVICE FOR COUNTERS

Filed Aug. 27, 1931 2 Sheets-Sheet 1

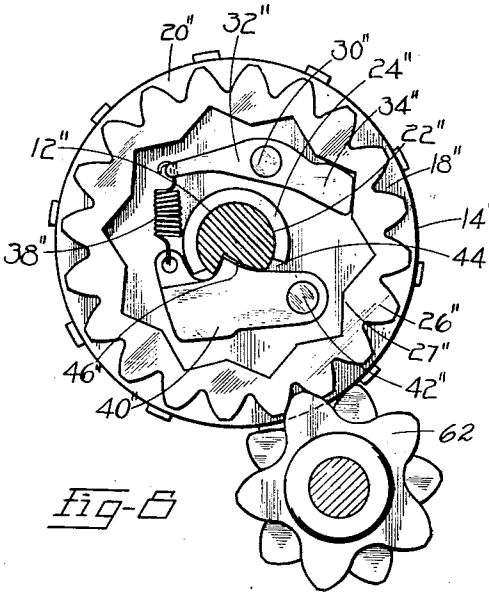


Fig-6

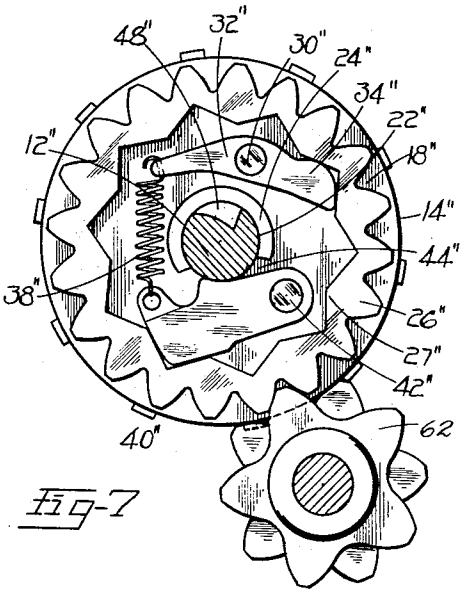


Fig-7

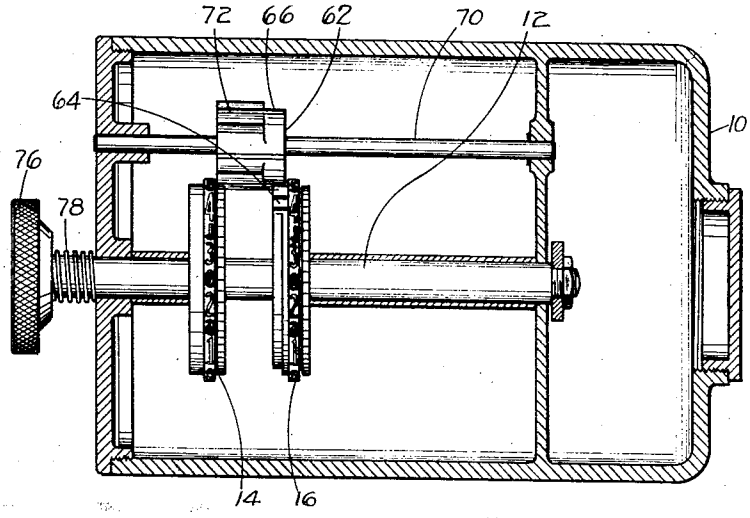


Fig-1

Inventor

MAX L. JEFFREY

By Richey & Watts

Attorneys

March 31, 1936. M. L. JEFFREY 2,035,891

RESETTING DEVICE FOR COUNTERS

Filed Aug. 27, 1931 2 Sheets-Sheet 2

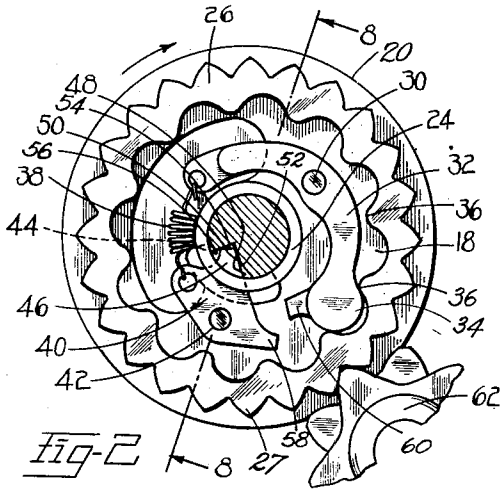


Fig-2

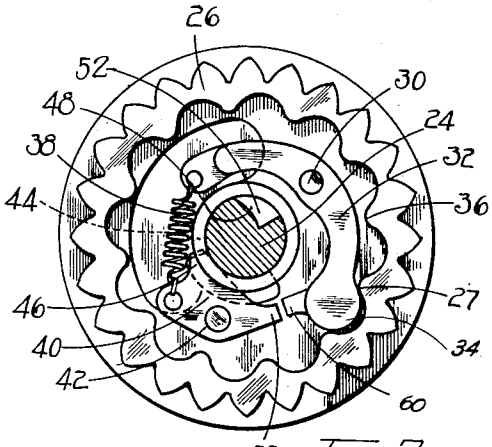


Fig-3

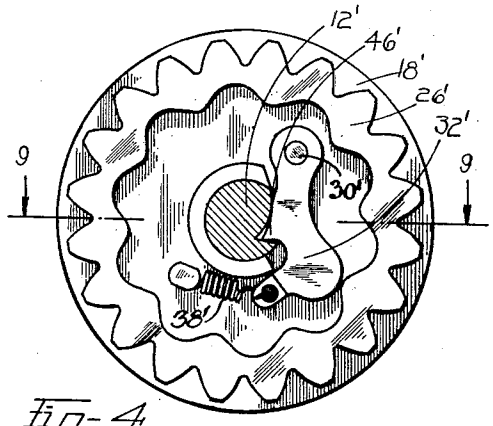


Fig-4

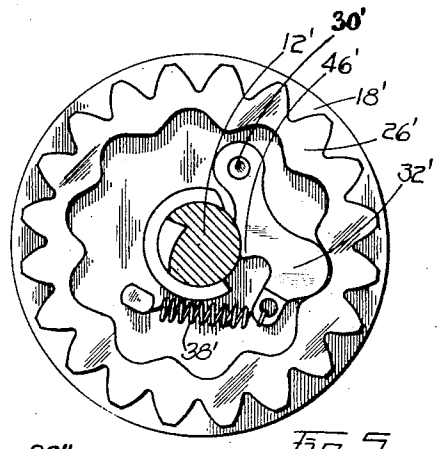


Fig-5

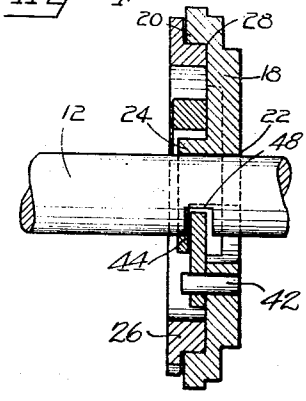


Fig-6

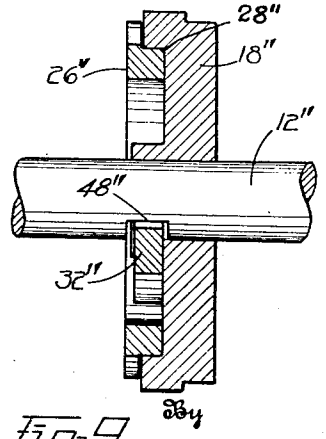


Fig-9

Inventor
MAX L. JEFFREY

By Richey & Watts
Attorneys

Patented Mar. 31, 1936 2,035,891

UNITED STATES PATENT OFFICE

2,035,891

RESETTING DEVICE FOR COUNTERS

Max L. Jeffrey, Shaker Heights, Ohio, assignor, by mesne assignments, to The M. L. Jeffrey Corporation, Cleveland, Ohio, a corporation of Ohio

Application August 27, 1931, Serial No. 559,689

7 Claims. (Cl. 235—144)

The resetting device comprising the present invention is adapted for use in connection with rotary dial counters of the type disclosed in my copending application Serial No. 443,052 filed April 10, 1930, now Patent No. 1,835,220, for a recording apparatus but the principles of the invention are applicable to all manner of rotary counters or registering devices. The principal object of the present invention is to provide a resetting device which by a single manual operation will cause a plurality of dial counters which have completed their registering or counting operation to be automatically returned to their initial starting point for performing a subsequent registering or counting operation.

A still further object of the invention is to provide a resetting device which, in its operative position, will not interfere with the high speed operation of a registering device.

Yet another object of the invention is to provide a resetting device which is extremely simple in its construction and one which is comprised of a minimum number of moving parts and which is therefore unlikely to get out of order.

Other objects of the invention not at this time more particularly enumerated will become more readily apparent as the nature of the invention is better understood and the same consists in the novel construction, combination and arrangement of parts shown in the accompanying single sheet of drawings in which,

Figure 1 is a sectional view taken transversely through one form of the assembled resetting device and showing a plurality of counters associated therewith.

Fig. 2 is a sectional view illustrating the mechanism of this invention. That figure illustrates the resetting mechanism in one position of operation.

Figure 3 is a sectional view similar to Figure 2 showing the resetting device in another position of operation.

Figure 4 is a sectional view similar to Figure 3 showing a slightly modified form of resetting device in its inoperative position.

Figure 5 is a sectional view similar to Figure 4 showing modification of Fig. 4 and illustrating another position of operation.

Figures 6 and 7 are views similar to Figures 4 and 5 showing a still further and preferred form of the invention in which the resetting device is shown in its inoperative and in its operative positions respectively.

Figure 8 is a sectional view taken substantially along the line 8—8 of Figure 2.

Figure 9 is a sectional view of Fig. 6 similar to Fig. 8.

In all of the above described views like connections of reference are employed to designate like parts throughout.

Referring now to Figures 1, 2, 3 and 8, a portion of the casing of a registering device (not shown) is shown at 10. Rotatably journaled across the walls of this casing is an operating shaft 12. Mounted upon the shaft 12 are a plurality of indicia carrying dials or counters generally indicated at 14 and 16. These counters comprise assemblies which are substantially identical and a description of one will suffice for the other. Each dial consists in a disc 18 having a lateral circumferential flange 20 formed thereon.

The disc 18 is provided with a pin 30, on which pin is centrally pivoted a curved pawl member 32 having a ratchet engaging portion 34 formed thereon. This ratchet engaging portion 34 is adapted to selectively engage inner teeth 36 formed on the gear member 26. The disc 18 is provided with a central opening 22 from which there projects an integrally formed sleeve 24 providing a bearing for the disc 18 on the shaft 12. A gear 26 which controls the indexing of the counter 14 is provided with an annular flange 28 which is received within the annular flange 20 of the disc 18 and thus the gear 26 is rotatably mounted with respect to the disc 18 and is held in spaced relation from the shaft by means of the disc 18. The end of the pawl member 32 opposite the pawl engaging surface 34 has secured thereto, at one end, a tension spring 38. The other end of the tension spring is secured to a locking pawl 40, which latter pawl is centrally pivoted on a pin 42 carried by the disc 18. The sleeve 24, integral with disc 18, is provided with a cut away portion 44 which permits a projecting portion 46 of the locking pawl 40 to enter a notch 48 formed in the shaft 12. The shaft 12 is movable endwise in the walls of the casing 10 to permit the notch 48 to be moved into and out of registering position with respect to the projecting portion 46 of the locking pawl 40. The pawl member 32 is so designed that regardless of the position of the locking pawl 40 this member is normally urged into engagement with the inner teeth of the gear member 26. The gear member 26 is rotatable with respect to the disc 18 in the direction of the arrow shown in Figure 2, the inner teeth on this gear member forcing the pawl inwardly as each tooth is encountered. The gear member 26 is locked against rotation with

respect to the disc 18 in the reverse direction by the abutting end of the pawl member 32 on the sides of these inner teeth.

It will be seen that only when the projecting portion 46 of the locking pawl 40 is received within the groove or cut-out portion 48 of the shaft 12 is the pawl member 32 permitted this sliding engagement with the inner teeth of the gear member 26. The projecting portion 46 of the locking pawl 40 is provided with a cam surface 50 which bears against a complementary cam surface 52 in the notch 48.

This projecting portion 46 is also provided with an abutting surface 54 which is adapted to engage a complemental abutting surface 56 in the notch 48. Thus the shaft 12 may have rotational movement in the direction of the arrow shown in Figure 2 with respect to the disc 18 and gear 26. Rotation of the shaft in the opposite direction with respect to these members is prohibited by the abutting surfaces 54 and 56.

If the shaft 12 as shown in Figure 2 is turned in the direction of the arrow indicated in this figure to the position shown in Figure 3 the projecting portion of the locking pawl 40 is forced out of the notch 48 by virtue of the camming surfaces 50 and 52. If the projecting portion 46 is moved outwardly from the notch 48 the locking pawl 40 is turned about its pivot 42 and a locking projection 58 on this member is moved into the path of a lug 60 formed on the pawl member 32. The pawl member 32 is then locked against pivotal movement and since the portion 34 of this pawl member is held in position between the two adjacent teeth on the inner side of the gear 26 the entire unit will turn freely on the shaft 12. By moving the shaft 12 longitudinally, the notch 48 may be thrown out of register with the projection 46 on the locking pawl 40 and the unit, as an entirety, may be turned on the shaft in either direction without releasing the pawl 32 from ring gear 26 at any time.

The outer teeth on the gear 26 are adapted to be engaged by a gear 62 similar to that shown in my above mentioned patent. The gear 62 serves to advance the tens and the hundreds and like wheels one digit with a complete revolution of the preceding units, tens discs and so forth. The gear 62 remains constantly engaged with the outer serrations of the ring gear 26. The gear 62 is held from rotation except when it is advanced by a preceding disc that has completed a revolution. Therefore the gear 62 serves to hold the serrated ring 26 against rotation except when it is advanced by a disc 18 representing a lesser series of digits upon completing a single revolution. When the shaft 12 is in such longitudinal position that the notch 48 receives the projection 46 on the locking pawl 40, rotation of the shaft 12 in a direction opposite to the direction indicated by the arrow in Figure 2 will set the disc 18 to any desired position inasmuch as the gear 62 will hold the gear 26 stationary and the disc 18 may be moved with respect to this gear. When the operating mechanism is to be set into motion the shaft is moved endwise to a position so that the projection 46 of the locking pawl 40 contacts with a round portion of this shaft. The operating mechanism may then be set into motion and the disc 18, having the dial thereon, will commence to function in its normal manner.

The above description has been specifically applied to the unit 14 and the unit 16 is constructed substantially identical with the unit 14. The side of the disc 16 opposite the gear 26 is provided with a pair of teeth 64 which mesh with elongated teeth 66 on idler gear 62 mounted on a counter shaft 70. The idler gear 62 is provided with short teeth 72 interposed between the longer teeth 66 to provide intermeshing teeth that engage the teeth on the outer surface of the gear 26 of the unit 14. When an operating pawl (not shown) which is provided to advance the units dial, causes the unit 16 to perform a complete revolution during normal operation, the teeth 64 of this unit 16 engage one of the elongated teeth 66 on the idler gear 62 and causes this gear to impart limited movement to the gear 26 of the unit 14 thereby causing the dial on the disc 18 to advance one unit. In other words, the dial on the disc 18 of unit 14 advances one unit for every ten units of advancement made by the dial on the disc 18 of the unit 16.

To effect simultaneous resetting of both dials the shaft 12 is provided with a knurled head 76 and disposed between this head and the forward end of the casing 10 is a coil spring 78 normally urging the shaft in one direction. When it is desired to set the dials on both units 14 and 16 to initial starting point the knurled head 76 is depressed, thereby sliding the shaft 12 endwise to cause the notch 48 to register with the projection 46 of the locking pawls 40 of both units 14 and 16. The shaft 12 may then be rotated a complete revolution, during which movement the gears 26 remain stationary and the dials are brought to their initial starting position. By giving the shaft 12 a partial reverse turn, the locking pawls 40 are cammed out of notch 48, and the shaft returns to its original axial position, leaving the counters free to rotate thereon.

The disc 18 has provided on its periphery a plurality of printing numbers which are in the form of projecting type integrally formed on the surface of this member. Also formed on the periphery of the disc are a plurality of reading numbers, which are preferably cut into the periphery of the disc. The printing numbers are adapted to be engaged by a paper marking sheet behind where there is a printing plate which forces this sheet against a selected printed number. The printing mechanism has not been shown in this application. The numbers are so arranged with respect to each other that when one of the reading numbers becomes visible the printing platen is directly adjacent the printing number corresponding to the visible reading number.

In the form of the invention shown in Figures 4, 5 and 9 the gear 26' and the disc 18' are substantially identical with the gear 26 and disc 18 shown in Figures 2 and 3. In this form of the invention, however, the pawl member 32' is normally held in engagement with the inner teeth on the gear 26' by a locking projection 46' formed on this pawl member 32' instead of on a separate locking pawl as in the other form of the invention. This projection 46' normally engages a round portion of the shaft 12. When the notch 48 in the shaft 12 is encountered by the projection 46' the pawl 32' is drawn inwardly about its pivot 30' by the spring 38' so that the disc 18' and shaft are locked together for movement in one direction. Rotation of the shaft 12 in the other direction, however, will force the pawl outwardly into engagement with the inner teeth on the gear 26' to permit normal operation of the unit.

Referring to Figures 6 and 7, an improved and preferred form of resetting device is shown. This

resetting device is mounted upon the shaft 12''. The resetting device is in the form of a dial consisting of a disc 18'' having a lateral circumferential flange 20'' formed thereon. The disc 18'' is provided with a central opening 22'' from which there projects an integrally formed sleeve 24'' providing a bearing for the disc 18'' on the shaft 12''. A gear 26'' which controls the indexing of the dial or counter 14'' is provided with an annular flange 28'' (note Fig. 9) which is received within the annular flange 20'' of the disc 18''. The gear 26'' is, therefore, rotatably mounted with respect to the disc 18'' and is held in spaced relation wtih the shaft 12'' by means of the disc 18''. The gear 26'' is provided with external ratchet teeth which are adapted to be engaged by suitable means (not shown) for controlling the indexing of the counter. The disc 18'' is provided with a pin 30'' on which pin is centrally pivoted a pawl member 32'', having a ratchet engaging portion 34'' formed thereon. This ratchet engaging portion 34'' is adapted to selectively engage inner teeth 27'' formed on the gear 26''. The end of the pawl member 32'', opposite the gear engaging end 34'', has secured thereto at one end a tension spring 38'', the other end of which tension spring is secured to a locking pawl 40''. This latter pawl 40'' is provided at one end with a pin 42'' carried by the disc 14''. The sleeve 24'' is provided with a cut away portion 44'' which permits a projection 46'' on the locking pawl 40'' to enter a notch 48'' formed in the shaft 12''. When this notch is brought into register with the projection 46'' by endwise movement of the shaft 12'', the tension spring 38'' connected to the respective ends of the pawls 32'' and 40'' serves to normally urge the ratchet engaging portion 34'' of the former pawl into engagement with the inner teeth of the gear 26'' and the projection 46'' of the locking pawl 40'' inwardly into the notch 48'' formed in the shaft 12''. The pawl member 32'' is so designed that it will permit rotation of the gear 26'' in one direction but will prevent rotation of the gear in the other direction. This pawl is at all times normally urged into engagement with the inner teeth of gear 26''. The locking pawl 40'' is normally retracted so that it does not engage the inner teeth of the gear member 26''. In this position the projection 46'' is received within the notch 48'' formed in the shaft 12''. Upon turning of the shaft 12'' in one direction, the edge of the notch 48'' forces the projection outwardly so that the locking pawl 40'' engages the inner teeth of the gear 26'' to lock the gear to the disc 12'' and prevent relative rotation between these two parts.

The invention is not to be limited to the exact arrangement of parts shown in the accompanying drawings or described in this specification as various changes in the details of construction may be resorted to without departing from the spirit of the invention. Only in so far as the invention has been particularly pointed out in the accompanying claims is the same to be limited.

I claim:

1. The combination with a shaft, of a counter assembly including a disc rotatable on said shaft, a member rotatable about said shaft, means for locking said member to said disc for rotation therewith, said means being rendered inoperative by endwise movement of the shaft with respect to said counter assembly.

2. The combination with a shaft, of a counter assembly including a disc journaled on said shaft, a member journaled for rotation on said disc, means for locking said member to said disc for rotation therewith about said shaft, and means actuated by endwise movement of said shaft for rendering said first-named means inoperative.

3. The combination with a shaft, of a counter assembly including a disc journaled on said shaft, a member rotatable about said shaft, means for locking said member to said disc for rotation therewith, means operable by endwise movement of said shaft for rendering said first-named means inoperable to lock said member to said disc and operable upon rotation of said shaft in one direction to render said first-named means operable to lock said member to said disc.

4. The combination with a shaft having a notch therein, of a disc rotatably mounted upon said shaft, said shaft being slidable with respect to said disc, a rotatable member mounted on said disc for rotation about said shaft, said member having teeth thereon, a pawl pivoted on said disc and movable into and out of engagement with said teeth to lock said member to said disc, and a projection on said pawl adapted to be received in said notch upon endwise movement of said shaft.

5. The combination with a shaft having a notch therein, of a disc rotatably mounted upon said shaft, said shaft being slidable with respect to said disc, a rotatable member mounted on said disc for rotation about said shaft, said member having teeth thereon, a pawl pivoted on said disc and movable into and out of engagement with said teeth to lock said member to said disc, and a projection on said pawl adapted to be received in said notch upon endwise movement of said shaft and adapted to be moved out of said notch upon rotational movement of said shaft in one direction.

6. The combination with a shaft having a notch therein, of a disc rotatably mounted on said shaft, a member mounted on said disc for rotation about said shaft, said member being capable of rotation independently of said disc, a pawl on said disc adapted to engage said member to lock the same to said disc for rotation therewith, said pawl having a projection thereon adapted to be received in said notch to disengage said pawl from said member and permit independent rotation thereof, said projection and notch permitting rotation of said shaft in one direction with respect to said disc and preventing rotation of said shaft in the other direction with respect to said disc whereby when said shaft is rotated in the latter direction said disc will be moved therewith.

7. The combination with a shaft, of a plurality of counters therefor, said counters being substantially identical and comprising each a disc, a member rotatably mounted in said disc, means including a locking pawl adapted to engage said member for locking the latter to said disc for simultaneous rotation therewith, and means operable by endwise movement of said shaft with respect to the discs of each counter for disengaging the respective pawls from said members and rendering said locking means inoperable.

MAX L. JEFFREY.