Sept. 29, 1970 H. PFEIFFER 3,531,047

RESET DEVICE FOR COUNTERS

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Fig 1

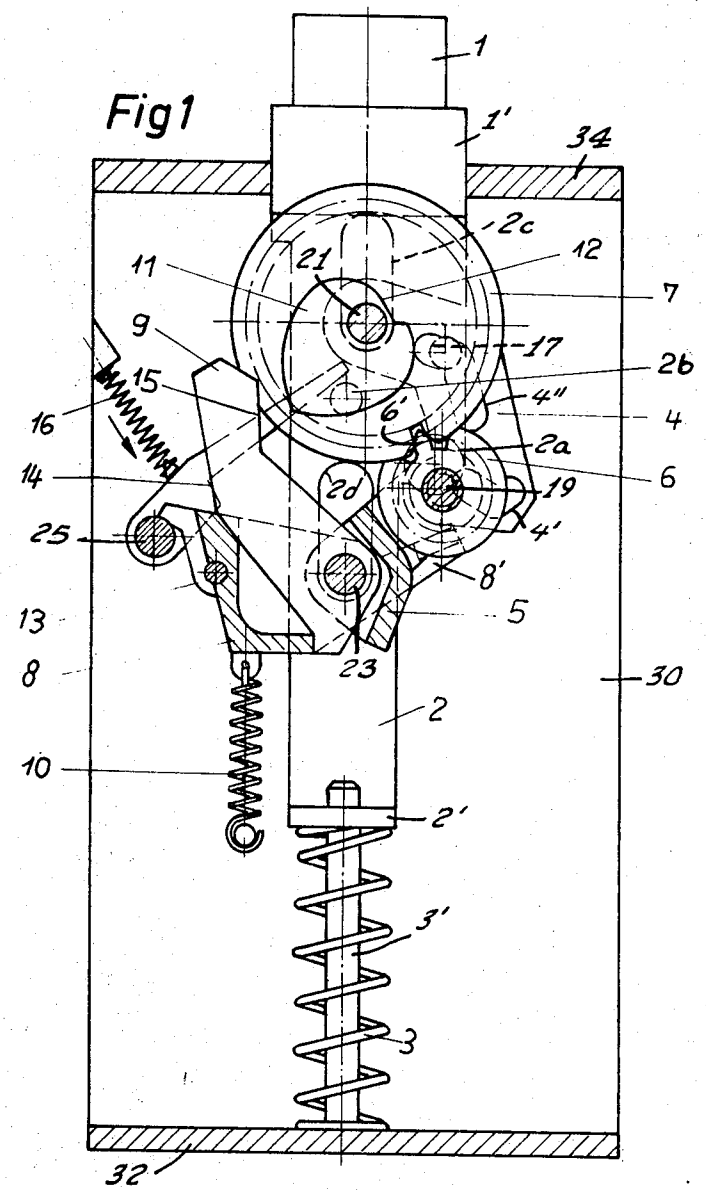

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Fig 2

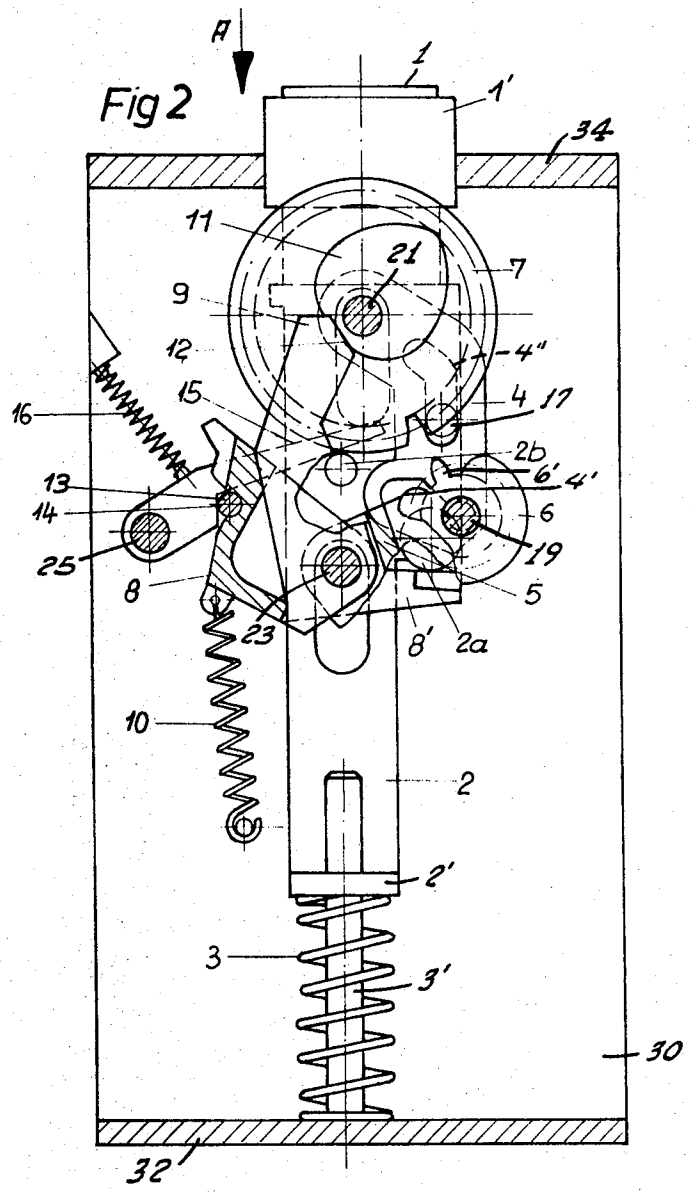

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Fig 3

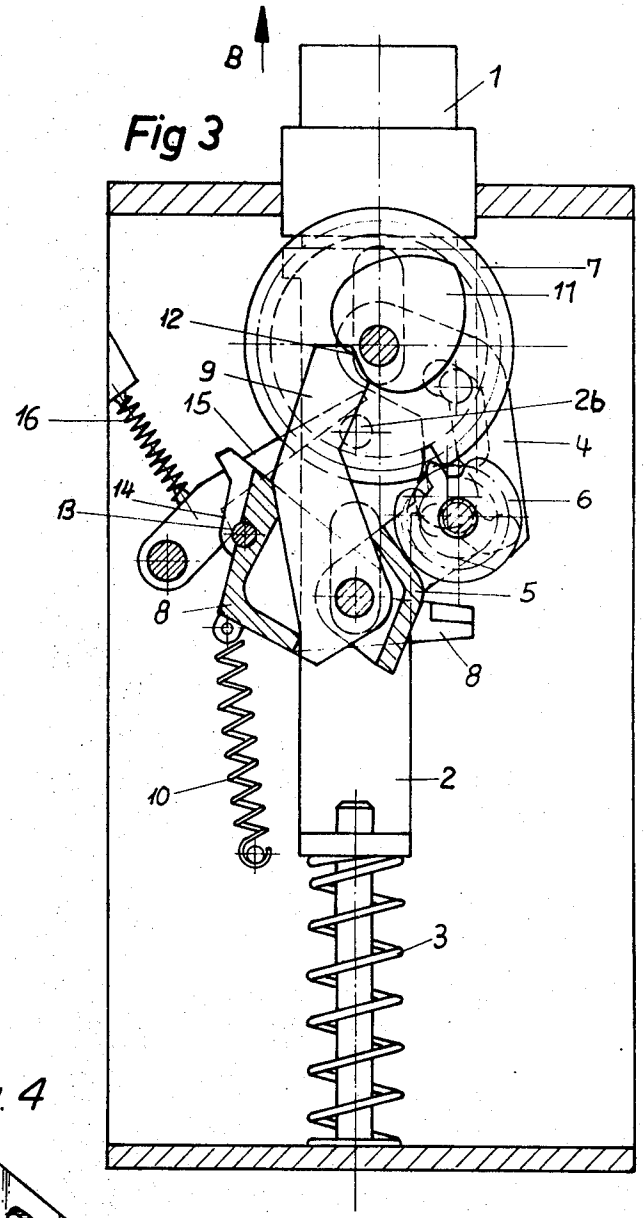
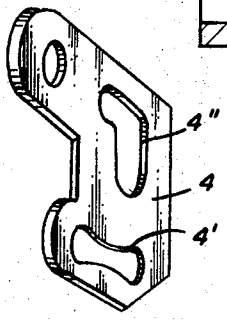


Fig. 4



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United States Patent Office 3,531,047 Patented Sept. 29, 1970

3,531,047

RESET DEVICE FOR COUNTERS

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Filed June 26, 1968, Ser. No. 740,171
Claims priority, application Germany, Feb. 8, 1968, H 65,254
Int. Cl. G06c 15/42
U.S. Cl. 235—144 5 Claims

ABSTRACT OF THE DISCLOSURE

A reset device for counter wheels comprises a longitudinally movable reset-slide control having means for moving pinions which drive the counter wheels. The pinions are moved laterally by a pivotable lever out of engagement with the counter wheels before the counter wheels are turned to reset position. The counter wheels are turned by action of reset fingers on heart cams fixed with respect to the counter wheels. The pinions are carried on a pinion bridge which is retracted by the lever actuated by a fixed pin on the reset-slide. The reset fingers are held in engagement with the heart cams by a spring loaded pawl. The pawl engages a reset bridge carrying the reset fingers. When the reset slide is returned to original position the pivotable lever first returns the pinions to engagement with the counter wheels. Then another pin on the reset-slide releases the pawl which releases the reset fingers from the cams to release the counter wheels.

The present invention relates to a reset device for counters with reset-slide control.

An essential requirement of a reset or zero setting mechanism for digital counter wheels is that the pinions which drive the counter wheels be brought safely out of engagement with these wheels before they are reset by the action of the mechanism. During the re-engagement of the pinions with the counter wheels, the counter wheels must be held stationary while the pinions are brought into complete engagement with the counter wheels. Then the mechanism can release the counter wheels. In this way no undesired rotation of the counter wheels can occur from the reset or zero setting.

The prior art has not always provided with absolute certainty that no displacement of the counter wheels would occur from the zero position at the end of the reset operation. This undesirable condition is avoided in the present invention by a simplified mechanism operated simply by forward and reverse longitudinal movements of a reset-slide control.

According to the present invention, a plurality of pinions which drive digital counter wheels are carried on a pivotable pinion bridge. The pinion bridge and pinions are moved laterally by means of a pivotable lever actuated by a fixed pin carried by a longitudinally movable reset-slide advanced in one direction. The lever has an aperture with curved camming edges which engage a shaft carrying the pinions. The pinions are moved safely away from the counter wheels during the initial movement of the reset-slide. The pinion bridge moves with the pinions. After the pinions are safely clear of the counter wheels, a spring loaded reset bridge carrying reset fingers is engaged by a projection on the reset-slide. The reset bridge turns on a fixed pin or shaft which also supports the pinion bridge. The reset fingers engage heart cams fixed with respect to the counter wheels respectively on a common shaft. The heart cams with their associated counter wheels are turned to zero or reset position. Then the reset bridge and reset fingers are locked in position by a spring loaded pawl so

that all the counter wheels are held stationary. When the reset-slide is moved in opposite direction, the reset-slide first turns the pivotable lever which turns the pinion bridge and restores the pinions to engagement with the counter wheels which are being held in the reset zero position by the reset fingers. After the pinions are safely engaged with the counter wheels, another pin on the retracting reset-slide moves the pawl to release the spring loaded reset bridge so that the reset fingers disengage the cams and release the counter wheels.

A preferred embodiment of the invention is shown by way of example in the drawings, wherein:

FIG. 1 is a sectional view partially diagrammatic in form showing a digital counter device in initial unset position of the counter wheels, with reset-slide fully retracted.

FIG. 2 is a sectional view similar to FIG. 1, showing the device at a stage of operation where the reset-slide operated by a push button is fully advanced and counter wheels are reset.

FIG. 3 is a sectional view similar to FIGS. 1 and 2, showing the reset-slide being retracted, with pinions again engaging the counter wheels, but with reset fingers holding the counter wheels in reset position.

FIG. 4 is an oblique view of the pivotable lever which actuates the pinion bridge.

Referring to the drawing, the device comprises a frame plate **30** having mutually perpendicularly disposed base plate **32** and top plate **34**. In the top plate is secured a sleeve **1'**. A push button **1** moves axially in sleeve **1'**. The pushbutton is secured to the top of a longitudinally slidable reset-lever **2**. The reset-slide has a foot **2'** provided with a hole through which extends a shaft **3'** secured in upright position to base plate **32**. A coil spring **3** on shaft **3'** extends between the base plate and foot **2'** and urges the reset-slide upwardly to the position shown in FIG. 1. A rod **21** extends transversely through a slot **2c** in reset-slide **2** and is carried by frame plate **30**. The rod or shaft **21** carries rotatable counter wheels **7** of which only one is shown in the drawings. A heart cam **11** is mounted on shaft **21** and is fixed with respect to counter wheel **7**. Only a single cam is shown but it will be understood that there is one heart cam associated with each counter wheel **7**. Reset-slide **2** carries a first fixed pin **17** which is engaged in a slot **4''** of a pivotable lever **4** carried by shaft **21**. A second fixed pin **2b** is mounted on the reset-slide below pin **17**. At the bottom end of a shoulder of reset-slide **2** is a knob-like projection **2a**.

Pivotable lever **4** has a hole or slot **4'** punched out near its bottom end. This hole has curved camming edges shown most clearly in FIG. 4. Shaft **19** which is supported by a pinion bridge **5** extends through hole **4'** in lever **4**. Shaft **19** carries the pinions **6** only one of which is shown in the drawings. Only a single tooth **6'** of pinion **6** is shown engaged with one of the notches between teeth of counter wheel **7**, in FIGS. 1 and 3. Pinion bridge **5** is pivoted clockwise as seen in FIGS. 1 and 2 when lever **4** is turned clockwise by pin **17** which is engaged in slot **4''**.

Pinion bridge **5** is rotatably supported by a shaft **23** carried by frame plate **30** and extending through a slot **2d** in the reset-slide **2**. Shaft **23** also carries a reset bridge **8**. This reset bridge has a finger **8'** disposed for engagement by projection **2a** of the reset-slide. The reset bridge carries a plurality of reset fingers **9**, one for each cam and reset wheel. One such reset finger is shown in the drawings. A pin **13** is set in one side of reset bridge **8** which is disposed in a retracted position and held by spring **10** shown in FIG. 1. The spring is anchored on a pin secured to frame plate **30**.

A pawl **15** is pivotally supported by a shaft **25** which supports a plurality of like pawls. The shaft **25** extends

through plate **30**. The pawl is biased downward by a coil spring **16** and rests on the reset bridge as shown in FIG. 1. The pawl has a shoulder **14** normally disposed out of engagement with pin **13**.

In operation of the mechanism, push button **1** is depressed axially from its position in FIG. 1. This lowers the reset-slide **2** which causes the lever **4** to turn clockwise as viewed in FIG. 1 to the position of FIG. 2. The lever is guided by pin **17** on the moving reset-slide. At the same time shaft **19** guided by the camming edge of hole **4'** in lever **4** turns downwardly. The pinion bridge **5** turns clockwise and the pinions **6** are all moved well clear of the counter wheels **7**. The reset-slide continues its downward movement until projection **2***a* engages finger **8'** of the reset bridge and turns this clockwise along with the reset fingers **9**. The reset fingers engage the heart cams **11** and turn them all until the points of the fingers engage in the notches **12** of the cams. The counter wheels turn with the cams and assume the predetermined reset or zero position.

While the reset bridge is turning clockwise, the pawl **15** also turns clockwise to the position of FIG. 2 where pin **13** is engaged on the step or shoulder **14** of the pawl. This holds the reset bridge stationary and the reset fingers are held in engagement with the cams at notches **12**. This is the position shown in FIG. 2.

If the push button **1** is now released, spring **3** expands to return or retract the reset-slide upwardly. Initially the lever **4** is turned counterclockwise as viewed in FIG. 3 being guided by pin **17**. Lever **4** moves shaft **19** engaged in camming hole **4'** upwardly while the pinions **6** reengage the counter wheels. The counter wheels are at this time being held stationary by the reset fingers. As the reset-slide continues upward movement, pin **2***b* comes up and turns the pawl **15** counterclockwise until pin **13** clears shoulder **14**, whereupon spring **10** draws down the reset bridge and the reset fingers move away from the cams **11**. This leaves the counter wheels in zero or reset position reengaged by the pinions.

By the structure and operation described, it positively insured that the counter wheels are all in zero position when the push button **1** returns to starting position along with the reset-slide.

While I have shown and described what I believe to be the best embodiment of my invention, it will be apparent to those skilled in the art that various changes and modifications may be made therein without departing from the spirit and scope of the invention as defined in the appended claims.

What is claimed is:

1. A reset device for digital counter wheels, comprising a support; a push button operated longitudinally movable reset-slide carried by said support; a first shaft mounted on said support and carrying at least one rotatable counter wheel; a cam fixed with respect to the wheel to rotate therewith; a lever pivotally mounted on said shaft and movable by said reset-slide; a second shaft carried by said support and rotatably supporting both a pinion bridge and a reset bridge; a third shaft carried by said pinion bridge; at least one pinion rotatably carried by the third shaft and engageable with said counter wheel for driving the same, said third shaft being engaged with said lever for alternately disengaging said pinion from said counter wheel and for engaging the pinion with the counter wheel; and at least one reset finger carried by said reset bridge and normally held out of engagement with said cam by a spring engaged with said reset bridge, whereby longitudinal movement of said reset-slide by said push button in one direction turns said lever and disengages said pinion from the counter wheel, and whereby further movement of said reset-slide in said one direction rotates said reset bridge so that the reset finger engages and turns said cam to reset the counter wheel.

2. A reset device as defined in claim **1**, further comprising a pawl loaded by another spring and bearing on the reset bridge, said pawl being arranged to hold the reset bridge and reset finger in a fixed position with the reset finger engaging the cam while the reset-slide is retracting in opposite direction to turn said lever and reengage said pinion with said counter wheel.

3. A reset device as defined in claim **2**, further comprising means on the reset-slide to disengage the pawl from the reset bridge while the reset-slide retracts further to its initial position, so that the reset finger disengages from said cam only after the pinion is reengaged with the counter wheel.

4. A reset device as defined in claim **3**, further comprising a further spring carried by said support and engaging said reset-slide for retracting the same in opposite direction when the push button is released.

5. A reset device as defined in claim **1**, wherein said lever has a hole formed with a camming edge, said third shaft extending through said hole in the lever and contacting said camming edge so that the third shaft moves in response to pivotal movement of the lever to engage the pinion with the counter wheel and to disengage the pinion from the counter wheel.

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