

[54] **PERCENTAGE COUNTER**
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[22] Filed: **Sept. 3, 1970**
[21] Appl. No.: **69,310**
[52] U.S. Cl.**235/92 EA, 235/92 QC, 235/92 PE, 235/92 R, 340/378, 235/92 CC**
[51] Int. Cl.**H03k 21/18**
[58] Field of Search.....235/92 K, 92 EA, 235/92 QC, 92 PE, 235/92 DM, 92 PK, 132, 92 CC; 328/48; 340/378

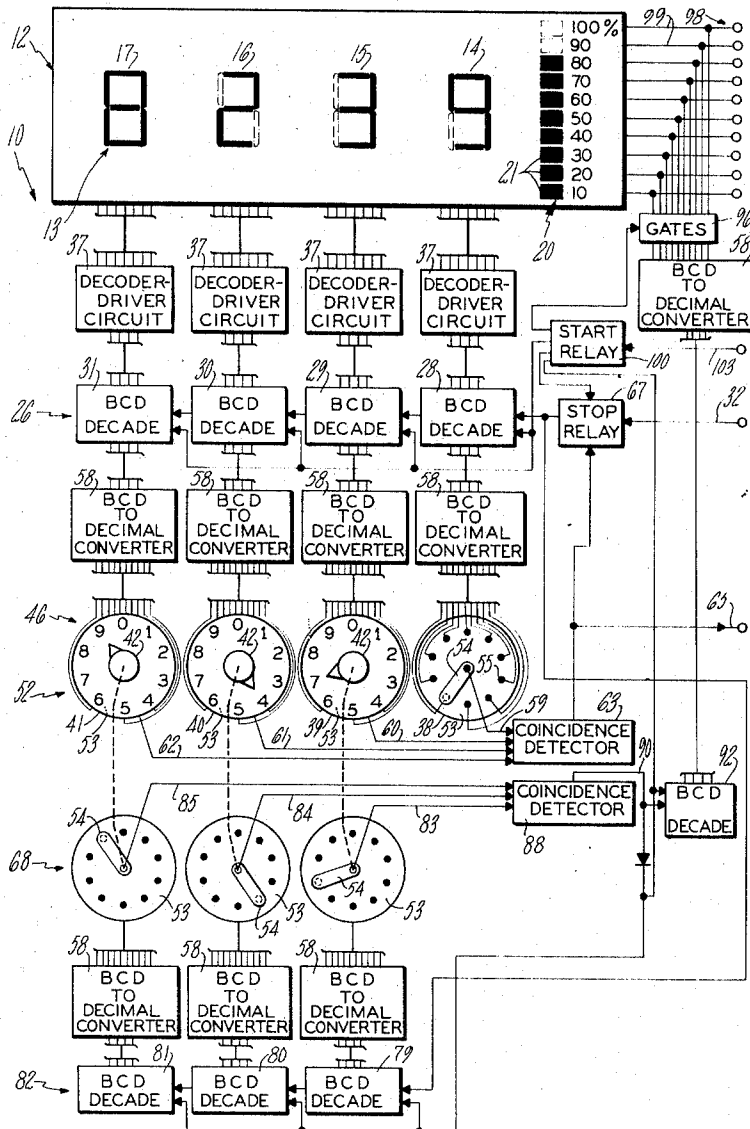
3,112,395 11/1963 Lien.....235/92 EA
3,413,452 11/1968 Schlein.....235/92 DE

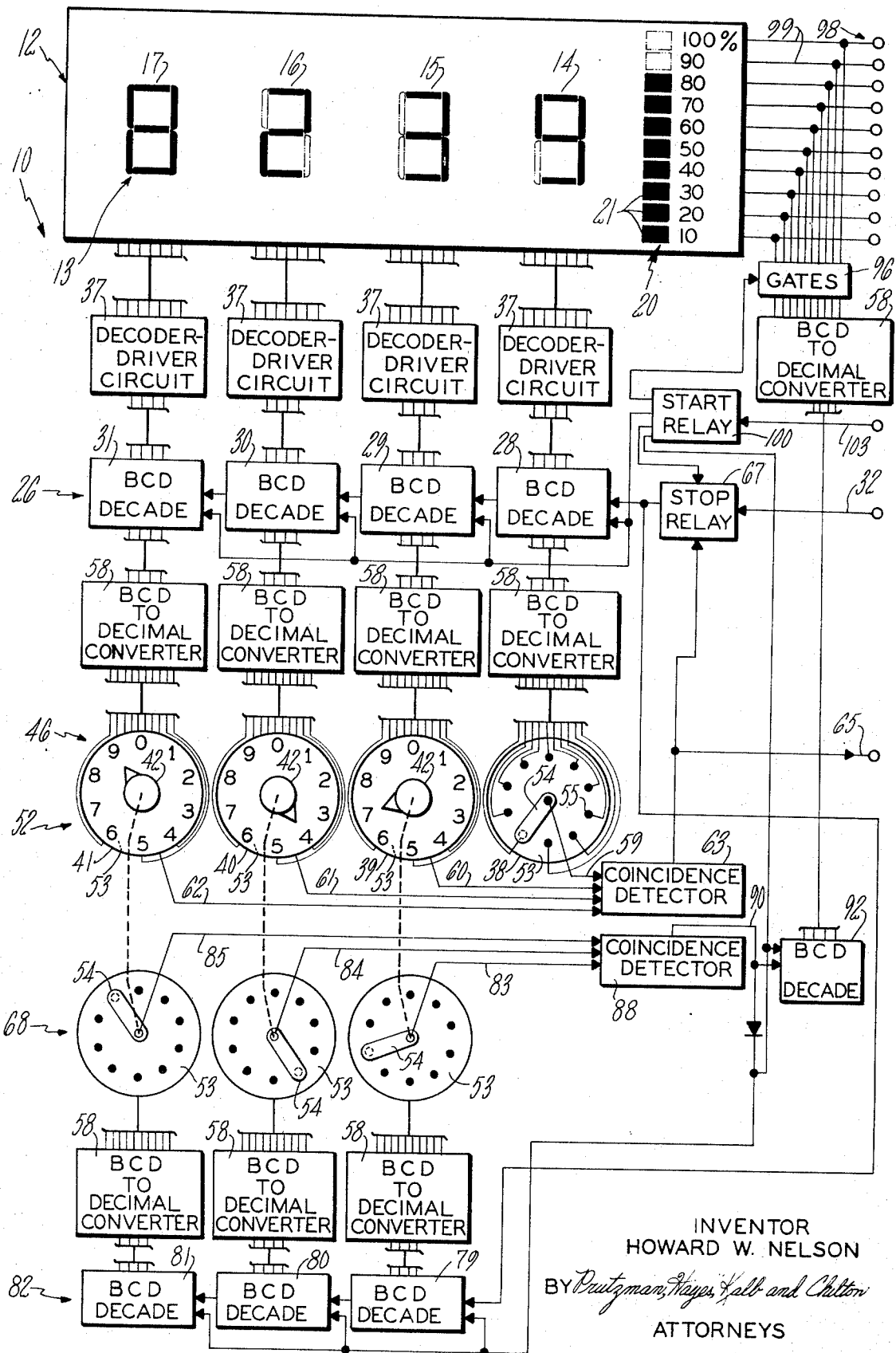
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[57] **ABSTRACT**
An electronic counter having primary and percentage counters connected to be indexed together and a count selector connected to the primary counter for generating a “predetermining” signal when the accumulated count of the primary counter reaches a preselected count and connected to the percentage counter for generating a “percentage” signal and for resetting the percentage counter after each approximately 10 percent increment of the selected count. A numeral indicator is provided for indicating the accumulated count of the primary counter, and ten separate segments of a bar indicator are operable in succession by the “percentage” signals to provide an analog display of the proportion of the selected count accumulated in the primary counter.

[56] **References Cited**
UNITED STATES PATENTS
2,952,777 9/1960 Barnothy.....235/92 QC
2,827,626 3/1958 De Motte 235/92 EA
2,970,763 2/1961 Freeman 235/92 EA
2,997,234 8/1961 Hughes.....235/92 DM

10 Claims, 1 Drawing Figure





PERCENTAGE COUNTER

BRIEF SUMMARY OF THE INVENTION

The present invention relates generally to counters and more particularly to a new and improved percentage counter providing "percentage" signals as an accumulated count reaches predetermined percentages of a preselected count.

It is a primary aim of the present invention to provide a new and improved percentage counter settable for generating a "predetermining" signal when an accumulated count reaches a preselected count and for generating "percentage" signals when the accumulated count reaches certain percentages of the preselected count.

It is another aim of the present invention to provide a new and improved percentage counter for generating a signal for each incremental increase of an accumulated count equalling approximately 10 percent of a preselected count.

It is a further aim of the present invention to provide a new and improved percentage counter for generating control signals after each preselected incremental increase of an accumulated count.

It is another aim of the present invention to provide a new and improved percentage counter having a numeral indicator providing a numeral registration of an accumulated count and an analog indicator providing an analog registration of the accumulated count as a proportion of a preselected count.

Other objects will be in part obvious and in part pointed out more in detail hereinafter.

A better understanding of the invention will be obtained from the following detailed description and the accompanying drawing of an illustrative application of the invention.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing:

The FIGURE is a schematic representation of a percentage counter incorporating an embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawing in detail wherein like numerals represent like parts, a percentage counter 10 incorporating an embodiment of the present invention is shown comprising an indicator 12 having a numeral indicator 13 with four seven-bar, FIG. 8 type digit indicators 14-17 and a vertical bar indicator 20 comprising a stack of 10 indicator segments or bars 21. The indicator 12 may, for example, be a liquid crystal indicator of the type shown and described in U.S. Pat. No. 3,505,804 of S. R. Hofstein, entitled "Solid State Clock" and dated Apr. 14, 1970.

The numeral indicator 13 is connected to provide a visual readout of the accumulated count of a primary electronic counter 26 having four BCD decades 28-31 of ascending order and connected to be stepped by electrical pulses in an input lead 32. The BCD decades 28-31 are connected to the digit indicators 14-17 respectively via suitable decoder-driver circuits 37 such that each digit indicator provides a numeral display of the decimal count of the corresponding BCD decade.

The percentage counter 10 comprises a selector or predeterminer 46 having four selector decades 38-41 of ascending order with individual selector knobs 42 and cooperating identifying numeral indicia for preselecting a "predetermining" count within a four place decimal range. The selector decades 38-41 provide a primary selector 52 with four 10-position selector switches 53 each having a contact arm 54 (settable by the respective selector knob 42) and 10 equiangularly spaced contacts 55. The ten contacts 55 of each selector decade 38-41 are connected to a corresponding BCD decade 28-31 of the counter 26 via a suitable BCD-to-decimal converter 58 to be individually energized by the counter decade in accordance with its decimal count. The contact arms 54 of the primary selector 52 are connected via leads 59-62 to a coincidence detector 63 which functions to generate a "predetermining" signal in the output lead 65 when all four contact arm leads 59-62 are energized and therefore when the accumulated count of the primary counter 26 corresponds to the preselected count established by the four selector knobs 42.

The "predetermining" signal generated in the output lead 65 may if desired be suitably used to control any apparatus with which the percentage counter 10 is associated. For example, the percentage counter 10 may be associated with a coil winding machine to provide for terminating the winding operation (with the "predetermining" signal) when the number of windings is equal to the number manually established by the primary selector 52, in which case the coil winding machine would be suitably adapted to generate an input pulse for indexing the counter 26 one step for each winding. The "predetermining" signal is also shown used to operate a "stop" relay 67 to disconnect the input lead 32 from the counter 26 to prevent any additional or spurious pulses from operating the counter 26.

The three highest order selector decades 39-41 have additional 10-position selector switches 53 which provide a percentage selector 68. The percentage selector 68 is therefore shown to be an integral part of the selector 46 and the contact arms 54 of the percentage selector 68 are connected to be set by the selector knobs 42 (at the same settings as the three highest order switches 53 of the primary selector 52) such that the percentage selector 68 is set at a count (within a three place decimal range) equal to the count established by the three highest order switches 53 of the primary selector 52 and therefore at a count which is approximately 10 percent of the count established by the primary selector 52.

The percentage selector switches 53 are connected (via suitable BCD-to-decimal converters 58) to three BCD decades 79-81 respectively of a percentage counter 82 such that all three output leads 83-85 of the percentage selector 68 are energized when the accumulated count of the percentage counter 82 is equal to the count preselected by the percentage selector 68. The percentage counter 82 is connected to be stepped (by the input pulses in the input lead 32) along with the counter 26, and a percentage coincidence detector 88 is connected to be operated by the percentage counter output leads 83-85 to generate a "percentage" signal in lead 90 when all three output leads 83-85 are energized.

The "percentage" signal so generated provides for resetting the percentage counter 82 to "0" and indexing a BCD decade or sequencing circuit 92 one step. Thus, the percentage counter 82 is operated to repetitively count to the count established by the percentage selector 68 and therefore to an amount which is approximately a fixed percentage of 10 percent of the count established by the primary selector 52.

The sequencing circuit 92 is connected via a BCD-to-decimal converter 58 and a suitable gate circuit 96 for energizing the 10 indicator segments 21 in succession and to provide percentage or control signals in a bank 98 of 10 control leads 99. Preferably the gate circuit 96 is designed to maintain the indicator segments energized after they are initially energized by the "percentage" signals such that the indicator 20 forms a bar indicator which increases in length in increments representing approximately 10 percent of the amount manually preselected with the selector 46.

The "percentage" signals provided by the bank 98 of control leads 99 may be selectively used in accordance with each particular installation to control the associated equipment. For example, where the percentage counter 10 is connected to control a coil winding machine, the machine can be selectively connected to be operated by the "percentage" signals for timely stopping the machine for adding center taps to the coil. Also, the machine operator can use the percentage indicator 20 for running the coil winding machine at full speed until approximately the desired number of windings have been wound. The machine can then be run at a slower speed with the operator either manually stopping the machine at the proper number of windings or permitting the appropriate "percentage" signal to stop the machine.

The counter circuit is also shown comprising a "start" relay 100 connected to be operated by a "start" signal in input lead 103 to condition the percentage counter 10 for a subsequent predetermining operation by resetting the counters 26, 82 and BCD decade 92 to "0" and by operating the "stop" relay 67 for connecting the input lead 32 to the counters 26, 82.

As will be apparent to persons skilled in the art, various modifications, adaptations and variations of the foregoing specific disclosure can be made without departing from the teachings of the present invention.

I claim:

1. A predetermining counter comprising a primary counter operable for being stepped to accumulate a first count, a resettable percentage counter connected in parallel with the primary counter for being stepped substantially simultaneously with the primary counter to accumulate a second count, selector means for selecting a first primary count and a second percentage count less than the first primary count, the selector means being connected to the primary counter to generate a predetermining signal when the accumulated count of the primary counter reaches said selected primary count and being connected to the percentage counter to both generate a percentage signal and automatically reset the percentage counter each time the accumulated count of the percentage counter reaches said selected percentage count.

2. A predetermining counter according to claim 1 wherein the selector means comprises a first primary

selector manually operable for selecting said first primary count and connected to the primary counter to generate said predetermining signal when the accumulated count of the primary counter reaches said selected primary count and a second percentage selector manually operable for selecting said second percentage count and connected to the percentage counter to generate said percentage signal and reset the percentage counter each time the accumulated count of the percentage counter reaches said selected percentage count.

3. A predetermining counter according to claim 2 wherein the primary selector comprises n decade selectors of ascending order operable for selecting the amounts of the places respectively of an n decimal place primary count and wherein the percentage selector comprises $n-a$ decade selectors of ascending order operable for selecting the amounts of the places respectively of an $n-a$ decimal place percentage count wherein n and a are positive whole numbers and a is less than n .

4. A predetermining counter according to claim 3 wherein the $n-a$ decade selectors of the percentage selector are connected to be set with the $n-a$ highest order decade selectors respectively of the primary selector such that the percentage count selected by the percentage selector is approximately a fixed percentage of the primary count selected by the primary selector.

5. A predetermining counter according to claim 4 wherein said fixed percentage is 10 percent.

6. A predetermining counter comprising a primary electronic counter operable for being stepped to accumulate a primary count, a resettable percentage electronic counter connected in parallel with the primary counter for being stepped substantially simultaneously with the primary counter to accumulate a percentage count, a multiple digit numeral indicator connected to the primary counter for displaying the accumulated count thereof, selector means for preselecting a first primary decimal count within a multiple decimal place range and a second percentage decimal count, the selector means being connected to the primary counter to generate a predetermining signal when the accumulated count of the primary counter reaches the preselected primary decimal count and being connected to the percentage counter to both generate a percentage signal and automatically reset the percentage counter each time the accumulated count of the percentage counter reaches the preselected percentage decimal count, and an analog indicator having a plurality of separate segments connected to be operated in succession by successive percentage signals respectively for displaying the amount accumulated in the primary counter as a proportion of the preselected primary decimal count.

7. A counter comprising a primary counter operable for being stepped to accumulate a primary count, a resettable percentage counter connected in parallel with the primary counter for being stepped substantially simultaneously with the primary counter to accumulate a percentage count, means for displaying the accumulated count of the primary counter, selector means for preselecting a percentage count which is a predetermined percentage of a predetermined count

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and connected to the percentage counter to both generate a percentage signal and automatically reset the percentage counter each time the accumulated count of the percentage counter reaches the preselected percentage count, and an analog indicator having a plurality of separate segments operable in succession by successive percentage signals for displaying the amount accumulated in the primary counter as a percentage of said predetermined count.

8. A counter according to claim 7 wherein the selector means provides for preselecting said predetermined count and for thereby automatically preselecting a percentage count which is a predetermined percentage of the preselected primary count.

9. A percentage indicating system comprising a primary counter operable for being stepped to accumulate a primary count, an indicator having a numeral indicator portion for registering the accumulated count of the primary counter and an analog indicator portion with a line of a plurality of separate indicator segments adapted to be individually activated to present an analog registration, a percentage counter connected in parallel with the primary counter for being stepped substantially simultaneously with the primary counter to accumulate a percentage count, the percentage counter being manually settable for preselecting a percentage count which is a predetermined percentage of a predetermined count and means for both automatically resetting the percentage counter and activating an indicator segment each time the accumulated count of the percentage counter reaches said preselected percentage count to activate the indicator segments in succession for displaying the amount accumulated in the

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primary counter as a proportion of said predetermined count.

10. A predetermining counter comprising a primary counter operable for being stepped to accumulate a first count, a resettable percentage counter connected for being stepped with the primary counter to accumulate a second count, selector means for selecting a first primary count and a second percentage count less than the first primary count, the selector means being connected to the primary counter to generate a predetermining signal when the accumulated count of the primary counter reaches said selected primary count and being connected to the percentage counter to generate a percentage signal and reset the percentage counter each time the accumulated count of the percentage counter reaches said selected percentage count, the selector means comprising a first primary selector manually operable for selecting said first primary count and connected to the primary counter to generate said predetermining signal when the accumulated count of the primary counter reaches said selected primary count and a second percentage selector manually operable for selecting said second percentage count and connected to the percentage counter to generate said percentage signal and reset the percentage counter each time the accumulated count of the percentage counter reaches said selected percentage count, the first primary selector and the second percentage selector being connected to be jointly manually operated such that the second percentage selector is operated to select a percentage count which is an approximately fixed percentage of the primary count selected by the primary selector.

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