

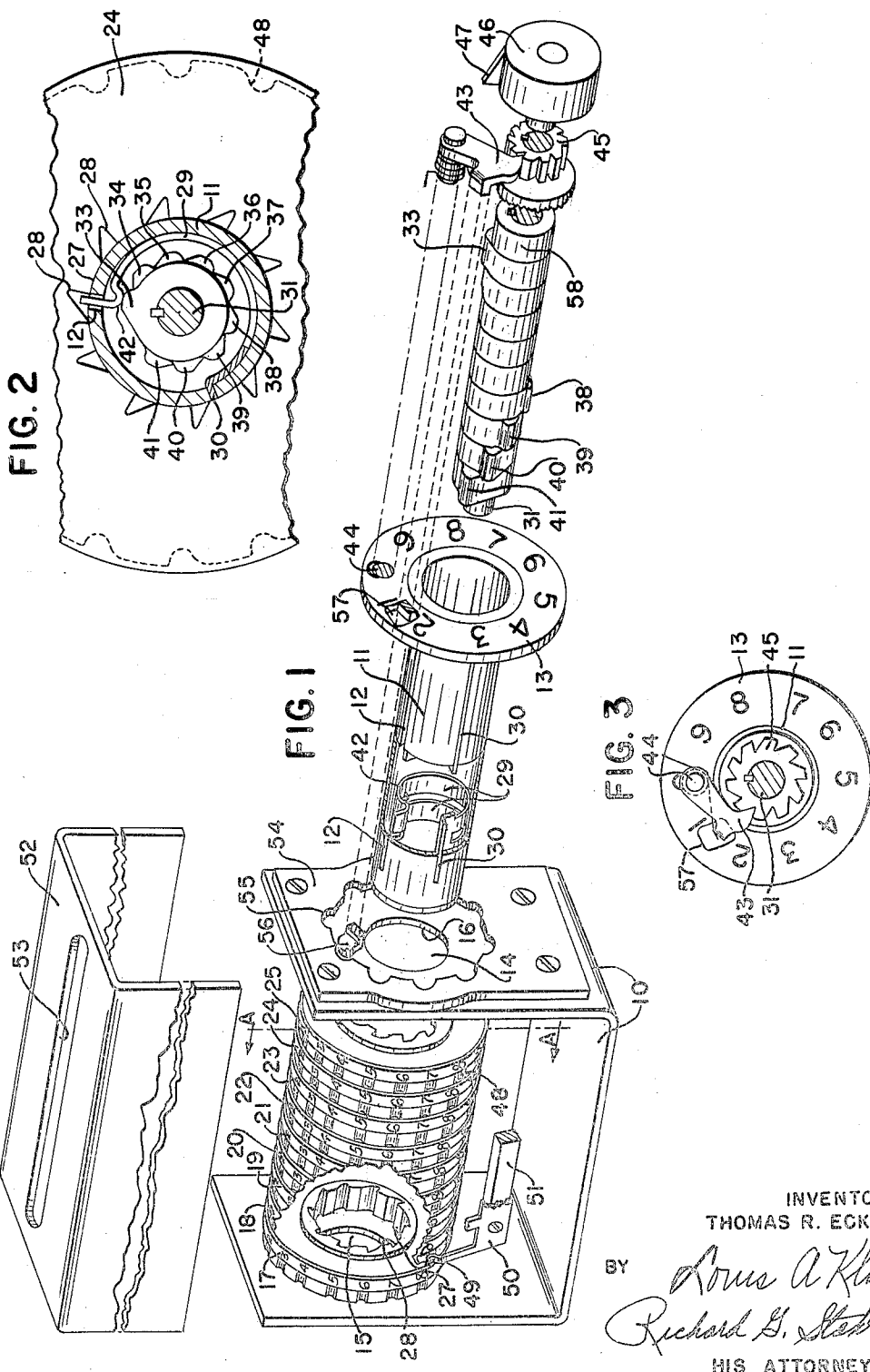
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MULTIPLE ROTATABLY SETTABLE MEMBER SETTING MEANS

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MULTIPLE ROTATABLY SETTABLE MEMBER SETTING MEANS

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The present invention relates to setting means for multiple rotatably settable members and, more specifically, to devices of this type in which each settable member may be selected and set by a single operating element.

In a variety of applications, it is necessary that rotatably settable members be pre-set to specific positions for the purpose of effecting a desired result at some future time. For example, it may be desired to set type wheels with certain ones of the type wheels in printing position; also, with certain machinery employed in the manufacture of a variety of elements, it is frequently desirable to automatically stop the machine when the desired number of pieces have been completed. This may be done by pre-setting a mechanical counter and reducing the pre-set count by "one" as each piece is finished and closing a "stop" circuit as the counter reaches zero.

It is, therefore, an object of this invention to provide an improved setting mechanism.

It is another object of this invention to provide an improved device having a plurality of rotatably settable members each of which may be selected and set by rotating a single operating element in a "select" and "set" direction, respectively.

In accordance with this invention, a multiple rotatably settable member indicating or printing device is provided wherein a plurality of rotatably settable members are independently mounted upon a rotatable hollow sleeve member. Within the sleeve member are contained a driving member, rotatable with the sleeve member, for each settable member, and a rotatable selector member having a cam lobe for each settable member. The selector member is mechanically interconnected with the sleeve member by a unidirectional engaging link assembly arranged to provide rotation of the sleeve member with the selector member in the "set" direction only. Each driving member may be placed in driving relationship with its corresponding settable member when engaged by its respective cam lobe when the selector member is rotated in the "select" direction and may drive the selected settable member with the sleeve member as the selector member is rotated oppositely in the "set" direction.

For a better understanding of the present invention, together with further objects, advantages, and features thereof, reference is made to the following description and to the accompanying drawing, in which:

Figure 1 is an exploded perspective view of the device of this invention,

Figure 2 is a fragmentary cross section view taken along line A—A of Figure 1, looking in the direction of the arrows, and

Figure 3 is a partial end view of Figure 1 with the operating knob removed.

Without intention or inference of a limitation thereto, the operation of the device of this invention will be described relative to the pre-setting of the indicating wheels of a mechanical counter. It is to be specifically

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understood, however, that the principles herein outlined may also be employed with other similar devices, of which print and date wheels are two examples.

Referring to the drawing, in which like elements have been given like characters of reference in the several views, Figure 1 is an exploded perspective view of the device of this invention.

Rotatably mounted upon frame member 10, herein illustrated as a U-member of strap material but which may be of any convenient form or material, which supports the assembly, is a hollow sleeve member 11, having a longitudinal slot 12, which extends nearly the entire length thereof. Rigidly secured to one end of hollow sleeve member 11 is a circular flange 13, the specific purpose of which will be brought out later. The opposite end of sleeve member 11 extends through aperture 14 of frame member 10, terminating within a similar aperture 15 on the opposite end of frame 10. Respective ends of sleeve 11, therefore, may be rotated relative to frame member 10 upon bearing surface 16 of aperture 14 and the similar bearing surface, not shown, of aperture 15.

Independently mounted upon and supported by sleeve member 11 are a plurality of rotatably settable members, herein indicated by reference characters 17 through 25, inclusive. For purposes of illustration only, these rotatably settable members have been indicated as nine circular discs. It is to be specifically understood, however, that more or fewer members of a circular or other suitable cross section may be used without departing from the spirit of the invention. Concentric with the center of each rotatably settable member is a bearing surface, typically indicated with member 17 by reference numeral 27, to provide for the rotatable mounting of the settable members upon sleeve member 11. The bearing surface of each settable member is provided with a plurality of driving detents, typically illustrated at reference character 28, the specific purpose of which will be brought out later.

Located within and rotatable with sleeve member 11 is a driving member, typically illustrated at 29, for each settable member. Although any suitable form may be employed, the driving members are herein indicated as the teeth of a special comb-type spring, which are curved to fit within sleeve 11 and rigidly secured thereto along line 30, with their free ends terminating adjacent to longitudinal slot 12 but normally out of engaging relation with the driving detents of the settable members. With this arrangement, each driving member may be placed in driving engagement with the driving detent in the bearing surface of the corresponding settable member by forcing the free end through longitudinal slot 12 of sleeve member 11 in a manner to be described later.

Also rotatably mounted within sleeve member 11 is a selector member 31, having a cam lobe, reference characters 33 to 41, inclusive, for each settable member. It may be noted that each driving member 29 has a cam surface, typically shown at 42, which is engaged by the lobes 33 to 41, inclusive. The lobes 33 to 41, inclusive, are arranged in a spiral pattern about selector member 31, so that the cam surface of each driving member is located over the high portion of its respective lobe only in one position of the selector member 31 and at a different angular position from every other. Accordingly, whenever the cam surface of any driving member is located over the high portion of its respective cam lobe, that driving member is placed in driving engagement with a driving detent in the bearing surface of the corresponding settable member through slot 12, as illustrated in Figure 2. With this arrangement, therefore, each of the several cam lobes of selector member 31 places the driving member corresponding to the same set-

table member in driving engagement with a driving detent in the bearing surface of that member. Selector member 31 may be operated to effect selection by manually turning knob 46 in the "select" direction.

Mechanically interconnecting sleeve member 11 and selector member 31 is a unidirectional engaging link assembly consisting of a pawl element 43, rigidly secured to flange 13 at 44, and a ratchet wheel 45, secured to selector member 31. Ratchet 45 has a position for each settable member, in this instance nine. As the main feature of this invention is the provision of a "select-set" feature by a single operating element, the unidirectional engaging link assembly is arranged to permit selector member 31 to rotate independently of sleeve member 11 in the "select" direction, herein shown to be counter-clockwise, for selecting one of the settable members, but to become engaged and rotate the sleeve member 11 with the selector member 31 in the "set" direction, herein shown to be clockwise, for setting the chosen settable member to a selected set position.

In operation, selector member 31 is rotated in the "select," or counter-clockwise, direction by knob 46 to select the settable member to be set. As pawl 43 is arranged to be disengaged during revolution in this direction, merely passing from tooth to tooth in ratchet wheel 45, selector member 31 revolves independently. When pointer 47 of knob 46 is opposite the index number on flange 13 of the settable member to be selected, the cam lobe on selector member 31 corresponding to that settable member has placed the respective driving member in driving engagement with a driving detent in the bearing surface thereof through slot 12 of sleeve 11. Of course, because of the spiral arrangement of the cam lobes on selector member 31, no other driving member is now in driving engagement. By now rotating selector member 31 in the "set," or clockwise, direction, pawl 43 engages a tooth in ratchet wheel 45. As pawl 43 is rigidly secured to flange 13, and flange 13 is rigidly secured to sleeve 11, sleeve 11 is rotated with selector member 31 in this direction. The driving members 29 are also rotated along the sleeve 11, as they are secured thereto at line 30; however, only the driving member in driving engagement with its corresponding settable member causes that member to also revolve with sleeve 11 and selector member 31. As the selected settable member is set to the desired position, selector member 31 may be independently rotated in the "select," or counter-clockwise, direction until the next settable member to be set is picked up. At this time, the revolution of selector member 31 along with the sleeve member 11, the driving member 29, and the selected settable member may be effected in the "set" direction.

It may be noted that the section 58 of selector member 31 has no cam lobe. With the pointer 47 of operating knob 46 at the zero position, none of the cam surfaces 42 are located over the high portion of their respective cam lobes of selector member 31. In this position, therefore, all of the settable members may be revolved about sleeve member 11 by external driving devices, not shown. This arrangement is, of course, mandatory with mechanical counters in which the count wheels are driven by an external motivating source.

As each settable member is rotatably mounted upon sleeve 11, a locating detent arrangement for each member may be required for the purpose of preventing unselected members from revolving with the sleeve member 11 in the "set" direction. For this purpose, a retaining detent, typically illustrated at 48, is provided for each position of each member. Engaging these retaining detents are the respective teeth, typically illustrated at 49, of a comb spring shown partially at 50, Figure 1, held in place by positioning bar 51.

Frame member 10 may be provided with a cover

52, having a window 53, through which the positions of the settable members may be visually ascertained.

In the event a selected settable member is not properly set during the revolution of selector member 31 in the "set" direction, the slot 12 in sleeve member 11 and, hence, the driving member 29 may be aligned with the respective bearing surface of the several settable members, rather than with the driving detents therein. Should the selector members 31 be revolved in the "select" direction at this time, the cam lobes thereon would engage the respective driving members and would tend to raise them through slot 12 of sleeve 11 against the respective bearing surfaces. This, of course, would result in severe damage to the unit. As a safety feature, a plate 54, having a detent position, typically illustrated at 55, for each cam lobe, may be attached to frame 10. An auxiliary pawl 56, rigidly secured to pawl 43, passes through aperture 57 of flange 13 and engages the detents 55 in the plate 54 which are indexed relative to the several drive detent positions. Should selector member 31 be stopped at a position out of index as it is revolved in the "select" direction, pawl 43 would be prevented from stepping to the next tooth of ratchet wheel 45, as auxiliary pawl 56 would be between the detents 55 of plate 54. Sleeve 11, therefore, would be revolved in the "select" direction with selector member 31 under these conditions until auxiliary pawl 56 reaches a detent 55 on plate 54. In this position, the slot 12 in the sleeve 11 is properly indexed relative to the drive detents 28, and pawl 43 is free to step from tooth to tooth of ratchet wheel 45 as auxiliary pawl 56 moves into one of the detents 55.

Although the device of this invention has been herein illustrated as having nine settable members, it is to be specifically understood that more or fewer members may be used, with, of course, correspondingly more or fewer drive members, cam lobes, and drive detents per member.

While a preferred embodiment of the present invention has been shown and described, it will be obvious to those skilled in the art that various modifications and substitutions may be made without departing from the spirit of the invention, which is to be limited only within the scope of the appended claims.

What is claimed is:

1. The setting means for multiple rotatably settable members of the type in which each settable member may be independently chosen and revolved to a selected one of a plurality of set positions by a single operating element comprising a frame member for supporting the assembly; a longitudinally slotted hollow sleeve member rotatably mounted upon said frame member; a plurality of rotatably selectable members each having a bearing surface concentric with the center thereof independently mounted upon and held in location by said sleeve member; a plurality of driving detents in the bearing surface of each of said selectable members; a driving member for each of said selectable members located within and rotatable with said sleeve member arranged to be placed in driving engagement with any one of the said driving detents of the corresponding selectable member through the said longitudinal slot of said sleeve member whereby only the engaged selectable member may be rotated with the said sleeve member; a selector member rotatably mounted within said sleeve member and having a cam lobe thereon for each of said selectable members, said cam lobes being arranged in such a manner that each places the said driving member corresponding to the same selectable member in driving engagement with a said driving detent of that member at a different angular position of said selector member as it is rotated in the select direction; and a unidirectional engaging link assembly mechanically interconnecting said sleeve member and said selector member in such a manner that said selector member rotates independently of the said sleeve

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member in the select direction for selecting one of said settable members and rotates said sleeve member therewith in the opposite set direction for setting the chosen settable member to a selected position.

2. The setting means for multiple rotatably settable members of the type in which each settable member may be independently chosen and revolved to a selected one of a plurality of set positions by a single operating element comprising a frame member for supporting the assembly; a longitudinally slotted hollow sleeve member rotatably mounted upon said frame member; a plurality of rotatably selectable members each having a bearing surface concentric with the center thereof independently mounted upon and held in location by said sleeve member; a plurality of driving detents in the bearing surface of each of said selectable members; a driving member for each of said selectable members located within and rotatable with said sleeve member arranged to be placed in driving engagement with any one of the said driving detents of the corresponding selectable member through the said longitudinal slot of said sleeve member whereby only the engaged selectable member may be rotated with the said sleeve member; a selector member rotatably mounted within said sleeve member and having a cam lobe thereon for each of said selectable members, said cam lobes being arranged in such a manner that each places the said driving member corresponding to the same selectable member in driving engagement with a said driving detent of that member at a different angular position of said selector member as it is rotated in the select direction; and a means for interconnecting said sleeve member and said selector member in such a manner that said selector member rotates independently of the said sleeve member in the select direction for selecting one of said settable members and rotates said sleeve member therewith in the opposite set direction for setting the chosen settable member to a selected position.

3. The setting means for multiple rotatably settable members of the type in which each settable member may be independently chosen and revolved to a selected one of a plurality of set positions by a single operating element comprising a frame member for supporting the assembly; a longitudinally slotted hollow sleeve member rotatably mounted upon said frame member; a plurality of rotatably selectable members independently mounted upon and held in location by said sleeve member; a driving member for each of said selectable members located within and rotatable with said sleeve member arranged to be placed in driving engagement with the corresponding selectable member through the said longitudinal slot of said sleeve member whereby only the engaged selectable member may be rotated with the said sleeve member; a selector member rotatably mounted within said sleeve member and having a cam lobe thereon for each of said selectable members, said cam lobes being arranged in such a manner that each places the said driving member corresponding to the same selectable member in driving engagement therewith at a different angular position of said selector member as it is rotated in the select direction; and a unidirectional engaging link assembly mechanically interconnecting said sleeve member and said selector member in such a manner that said selector member rotates independently of the said sleeve member in the select direction for selecting one of said settable members and rotates said sleeve member therewith in the opposite set direction for setting the chosen settable member to a selected position.

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4. The setting means for multiple rotatably settable members of the type in which each settable member may be independently chosen and revolved to a selected one of a plurality of set positions by a single operating element comprising a frame member for supporting the assembly; a longitudinally slotted hollow sleeve member rotatably mounted upon said frame member; a plurality of rotatably selectable members independently mounted upon and held in location by said sleeve member; a driving member for each of said selectable members located within and rotatable with said sleeve member arranged to be placed in driving engagement with the corresponding selectable member through the said longitudinal slot of said sleeve member; a selector member rotatably mounted within said sleeve member and having a cam lobe thereon for each of said selectable members, said cam lobes being arranged in such a manner that each places the said driving member corresponding to the same selectable member in driving engagement therewith at a different angular position of said selector member as it is rotated in the select direction; and a unidirectional engaging link assembly mechanically interconnecting said sleeve member and said selector member in such a manner that said selector member rotates independently of the said sleeve member in the select direction for selecting one of said settable members and rotates said sleeve member therewith in the opposite set direction for setting the chosen settable member to a selected position.

5. In a device including a plurality of independently rotatably settable members, the selecting and setting means therefor comprising a rotatable hollow sleeve member for locating and supporting said settable members, a driving member corresponding to each of said settable members mounted within and rotatable with said sleeve member, a selector member rotatably mounted within said sleeve member and arranged to individually place each of said driving members in driving engagement with its respective settable member at a different angular position thereof during a single revolution in one direction, and means for interconnecting said sleeve member and said selector member in such a manner that said selector member may be revolved independently of said sleeve member in the select direction for selecting a settable member and rotates said sleeve member therewith in the opposite set direction for setting the chosen settable member to a selected position.

6. In a device including a plurality of independently rotatably settable members, the selecting and setting means therefor comprising a longitudinally slotted rotatable hollow sleeve member for locating and supporting said settable members, a driving member corresponding to each of said settable members mounted within and rotatable with said sleeve member, a selector member rotatably mounted within said sleeve member and arranged to individually place each of said driving members in driving engagement with its respective settable member through the longitudinal slot of said sleeve member at a different angular position thereof during a single revolution in one direction, and means for interconnecting said sleeve member and said selector member in such a manner that said selector member may be revolved independently of said sleeve member in the select direction for selecting a settable member and rotates said sleeve member therewith in the opposite set direction for setting the chosen settable member to a selected position.

No references cited.