

April 26, 1960

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2,934,006

INDEXING MECHANISM

Filed Sept. 12, 1955

4 Sheets-Sheet 1

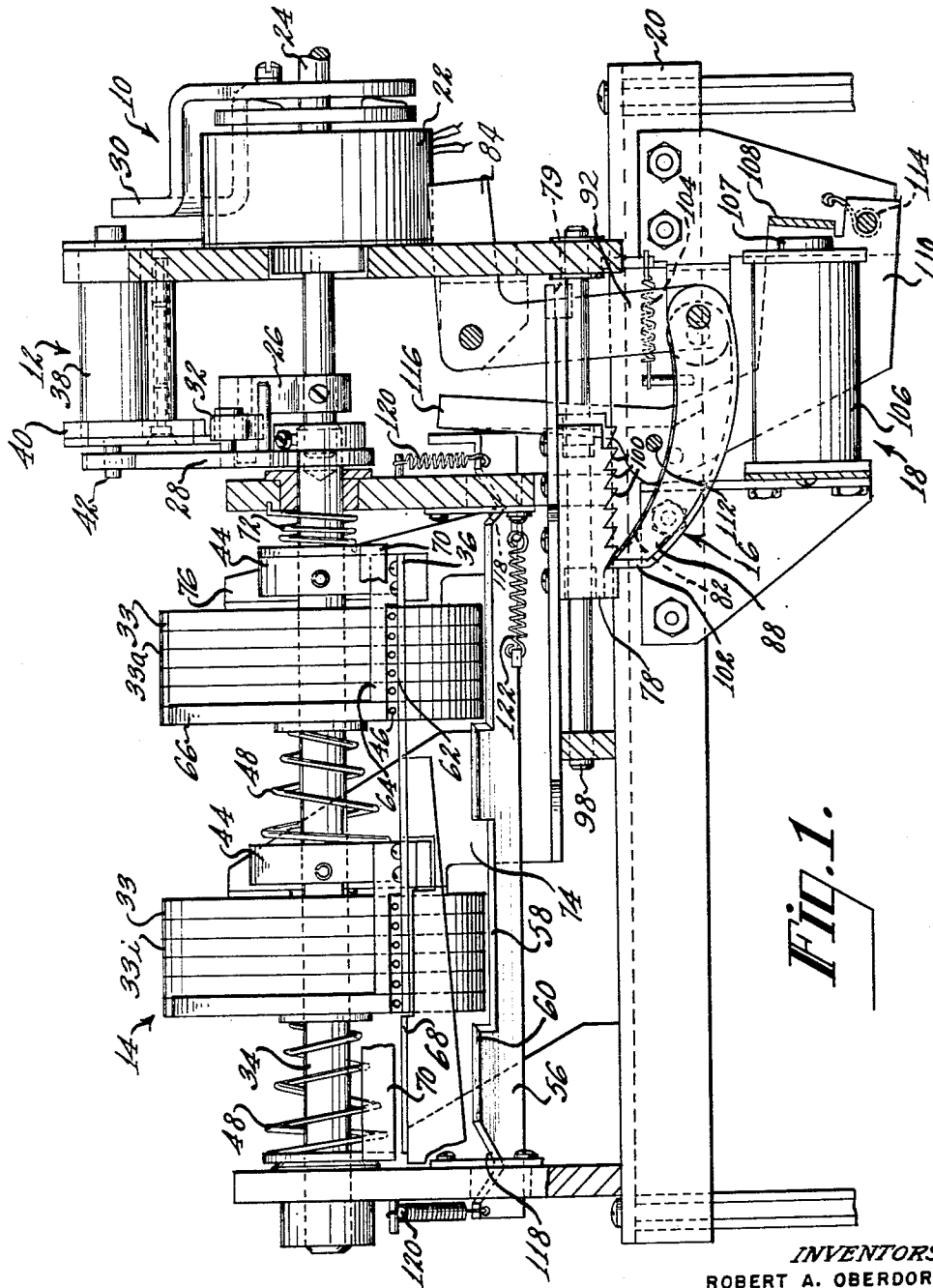


FIG. 1.

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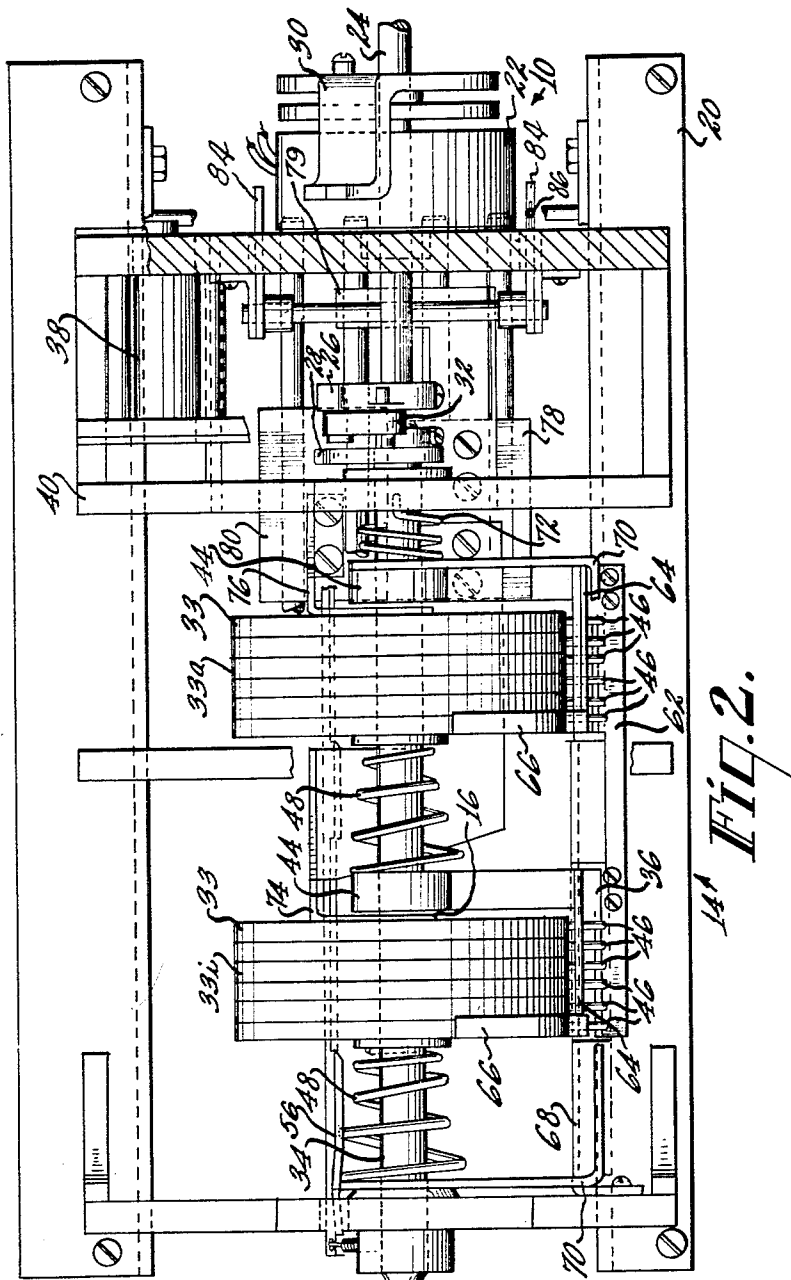
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INDEXING MECHANISM

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4 Sheets-Sheet 2



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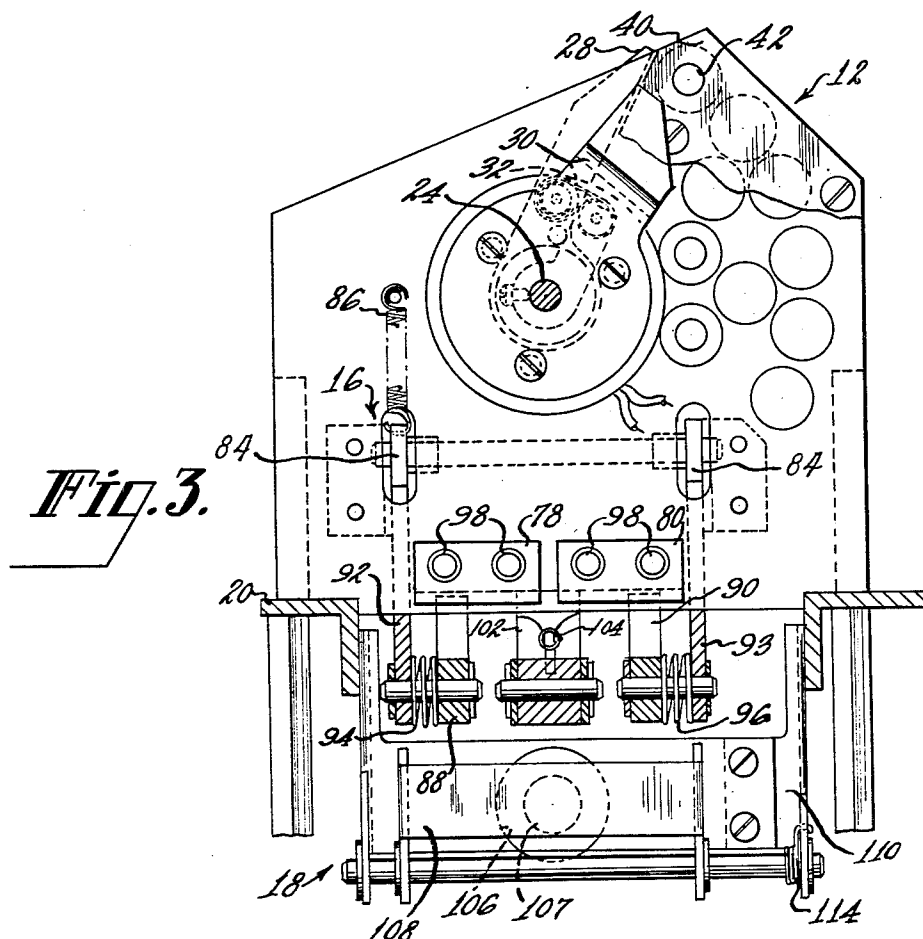
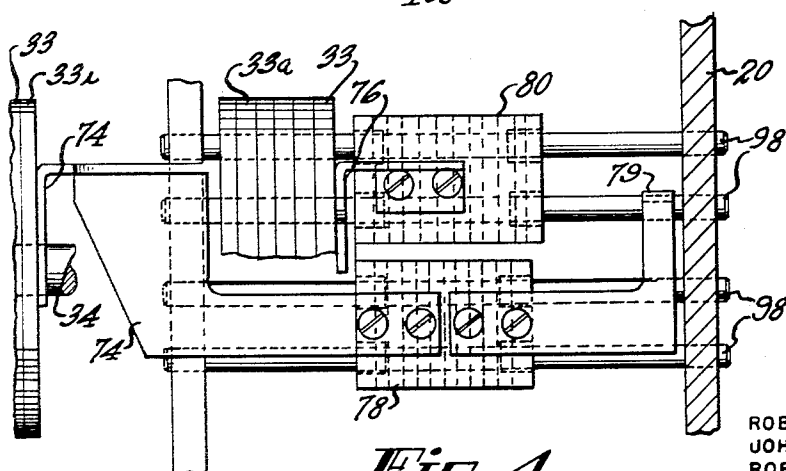
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INDEXING MECHANISM

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4 Sheets-Sheet 3



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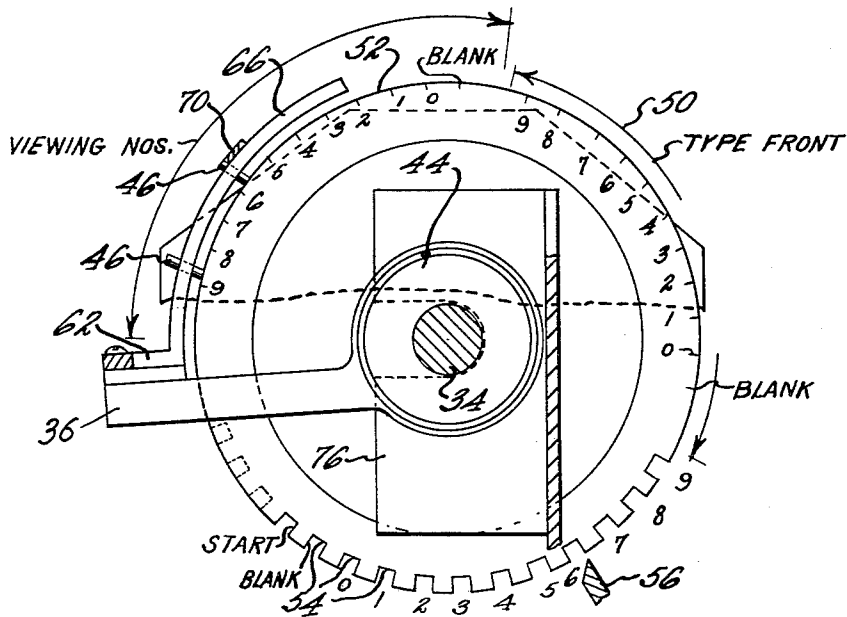
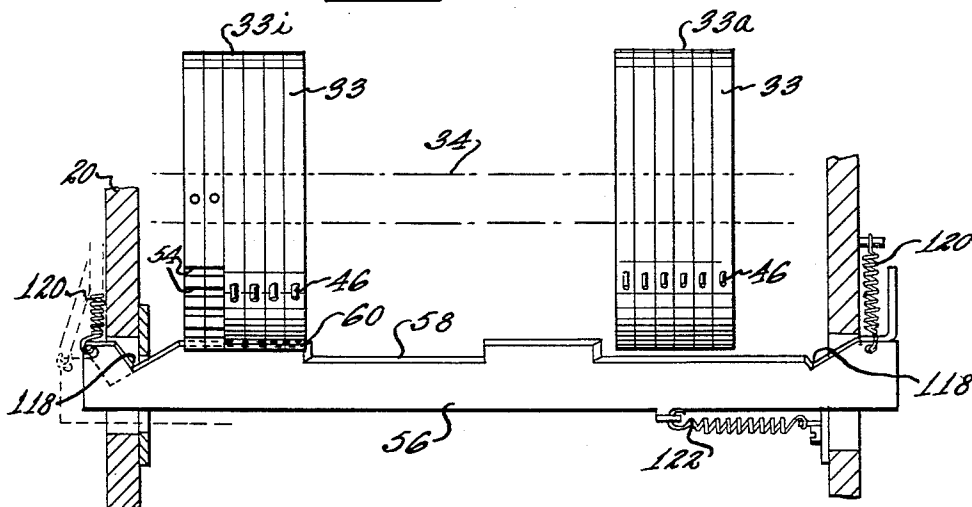
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INDEXING MECHANISM

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4 Sheets-Sheet 4



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2,934,006

INDEXING MECHANISM

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Application September 12, 1955, Serial No. 533,548

11 Claims. (Cl. 101—99)

This invention relates to indexing mechanisms, and particularly to indexing mechanisms such as those for setting type wheels or indicating wheels.

Indexing mechanisms may operate in response to manual or automatic signals. Included among such indexing mechanisms, for example, are settable indicating and printing mechanisms activated by a manual keyboard, such as the printing adding machine. Frequently it is desired to use a simple type of keyboard to operate an indexing mechanism. The "ten key" keyboard is one such simple type of keyboard in common use. Where a simple keyboard is used, it may be desired to align or "justify" the indexed members to a given margin or margins. If characters are to be printed it may be advantageous to have provision for a visual representation of the characters to be printed.

Therefore, an object of this invention is to provide an improved indexing mechanism which is simpler than the mechanisms of the prior art.

Another object of this invention is to provide an improved mechanism for setting print wheels, which mechanism provides a variety of features more economically than the mechanisms of the prior art.

A further object of this invention is to provide an improved mechanism for indexing printing members in response to sequentially provided signals, which mechanism is more compact and simpler than the mechanisms of the prior art.

An additional object of this invention is to provide an improved device for setting printing wheels, which device aligns groupings of characters to a given margin.

A further object of this invention is to provide an improved mechanism for simply and rapidly providing a selectable number of increments of angular movement for each of a plurality of rotatable numbers.

A still further object of this invention is to provide an improved mechanism for setting up and concurrently indicating sequentially entered characters, which mechanism is more economical and simpler than mechanisms heretofore known.

Another object of this invention is to provide an improved system for indicating multi-digit numbers, justifying the numbers registered, and a means for printing those numbers, which system has greater simplicity of operation than the systems of the prior art.

In accordance with the present invention, wheels containing printing and indicating characters are mounted on a central shaft. The wheels each have a peripherally mounted pin extending radially and a series of peripheral notches or slots which correspond to printing and indicating characters. The wheels are set to a selected position by a bail which engages the setting pins. The wheels are then slid along until a blocking bar engages one wheel at a particular indexing slot. The remaining wheels may then be returned to their initial rotational position and the operation may be repeated for setting the next wheel. Means for resetting may also be provided.

The novel features of the invention as well as the in-

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vention itself, both as to its organization and method of operation, will best be understood from the following description when read in connection with the accompanying drawings.

5 In the accompanying drawings:

Fig. 1 is a side elevation of one embodiment of the invention partly broken to show detail;

Fig. 2 is a top view of the embodiment of Fig. 1;

10 Fig. 3 is an end elevation view of the embodiment of Fig. 1 partly broken away to show detail;

Fig. 4 is a partial sectional view of the shift slide mechanism;

Fig. 5 is an enlargement of one of several indexing-printing wheels of the embodiment of Fig. 1; and

15 Fig. 6 is an enlarged view of a holding bar of the embodiment of Fig. 1 shown in operative engagement with the printing wheels.

Referring to Fig. 1, the system arrangement includes portions here called the drive mechanism 10, the selector mechanism 12, the setting mechanism 14, the advancing mechanism 16, and the resetting mechanism 18. The system, however, is an integral one and the terms applied are merely convenient notations for considering elements of the system. The system includes a central base structure 20, considered as fixed, to which the various members and mechanisms are coupled and mounted.

20 One embodiment of the invention is presented in which two groups of indexed wheels are shown. It may be seen that the principles of operation disclosed herein may be extended to a device which may use three or more groups of wheels.

30 The system operates in response to incoming selector signals and incoming reset signals, which signals may be produced manually or automatically. The drive mechanism includes a rotary solenoid 22 mounted on the base structure 20. The solenoid shaft 24 rotates a connected drive arm 26 which is coupled to a driven arm 28 by means of a constant tension spring 32. Arm 30 is also rigidly connected to shaft 24.

40 The selector mechanism 12 includes the driven arm 28 connected to the constant tension spring 32 and fixed to rotate with the storage shaft 34 and the indexing or setting bail 36, and also includes a number of selector solenoids 38 mounted in a crown portion 40 of the base structure 20. The selector solenoids 38 are arrayed at various angular positions about the axis of the central storage shaft 34. The selector solenoids 38 include selector pins 42 which, when moved, halt the movement of the driven arm 28. Each selector solenoid 38 is associated with a particular character on a printing and indexing wheel 33. The setting or indexing mechanism 14 operates from the central or storage shaft 34. The shaft 34 is rotatably mounted in the base structure 20. One end of the storage shaft 34 is coupled to the rotary solenoid 22 by means of the driven arm 28 and constant tension spring 32 (see especially Figs. 2 and 3) which holds the shaft 34 against rotation while the rotary solenoid 22 completes its advance. The other end of the shaft 34 is rotatably held by the end of the base structure 20. Fixed collars 44 are placed on the central shaft 34 to separate groups of printing or indexing wheels 33.

50 Several wheels 33 may be employed to provide printing and indicating of multi-digit numbers as in the present embodiment. For example, the wheels 33 may be arranged in two groups, for convenience called the item printing group 33i and the amount printing group 33a. In Fig. 1, all the wheels 33 are shown in their start position, that is, each wheel 33 is so positioned that its setting or indexing pin 46 is engaged by the setting or indexing bail 36. A central spring 48 urges the wheels 33 each against its associated holding collar 44 in the start location. As shown in greater detail in Fig. 5, each

printing wheel 33 includes a radially extending indexing pin 46, as shown in Fig. 6 (only two pins appearing in Fig. 5). Each wheel 33 has on its periphery a row of printing characters 50, a row of corresponding indicating characters 52, and a row of corresponding indexing slots 54, one associated with each character. For example, the printing characters 50 may be raised numerals in a succession from 0 to 9. The indicating characters 52 may be engraved characters corresponding to the raised characters, and there may be as many as eleven slots 54, one for each of these numerals, and one for a blank space.

At a radial distance, approximately the radius of the indexing wheels 33, a locking bar 56 is mounted on the base 20 and positioned in the axial plane of the wheels 33 at one of the indexing slots 54. The locking bar 56 in addition has two cut out portions 58 which are approximately the width of each group of wheels. At a locking portion 60 of the bar 56, the vertical wheel slot engaging edges are beveled or chamfered to facilitate indexing of the printing wheel 33 by the bar 56 at the indexing slot 54. The bevel permits engagement if the indexing slot 54 of wheel 33 is not in perfect alignment with the locking bar 56.

By way of illustration, six item wheels 33i and six amount wheels 33a are shown. In the start position the indexing pins 46 of all the wheels 33 rest against an indexing bar 62 which is a portion of the setting bail 36. Bail 36 is fixed to the central shaft 34 by a connection to the fixed collars 44. The setting bail 36 has two principal parts, the indexing bar 62 and a holding bar 64. The latter engages the indexing pins 46 of those wheels 33 not advanced and returns them to the start position on the return stroke of the rotary solenoid 22. The holding bar 64 is connected to the indexing bar 62 at its end nearest the driven arm 28 and terminates in an upward projecting guide arm 66 at the free end. The upward projecting arm 66 is shaped in an arc of a circle concentric with the print wheels 33.

An insert plate 68 is mounted on the base 20 with the indexing bar 62 at the start position, preventing rotation of any of the wheels 33 past the start position. A reset bail 70 is rotatably mounted on the central shaft 34 and is yieldingly connected to the base structure 20 by a spring member 72 which biases the reset bail 70 to the start position.

Interposed between the groups 33i and 33a of printing wheels 33 and their respective holding collars 44, are shifting arms 74 and 76 which urge the groups of wheels 33 against their respective springs 48. The item shifter arm 74 advances the item printing wheels 33i and similarly the amount shifter arm 76 advances the amount printing 33a.

The advancing mechanism 16 includes the item shifter arm 74 which is connected to the item shift slide 78 and the amount shifter arm 76 which is connected to the amount shift slide 80. The item shift slide 78 is provided with tab 79 which is positioned to engage amount shift slide 80 when item shift slide 78 has been advanced a predetermined amount. These arms are shown in Fig. 4. As the solenoid 22 traverses the last degrees of the rotary advance, the advance control arm 30 engages and depresses a pawl crank 84. The pawl crank 84 is biased counter-clockwise, as viewed in Fig. 1, by a spring 86 coupling the pawl crank 84 to the base structure 20 (best seen in Figs. 2 and 3). First and second stepping pawls which will be called the item stepping pawl 88 and the amount stepping pawl 90, respectively, are pivotally mounted on extended arms 92 and 93 of the pawl crank 84. The stepping pawls 88 and 90 are biased in a clockwise direction as viewed in Fig. 1 (see also Fig. 3) by springs 94 and 96, respectively, coupled to the pawl crank arms 92, 93. The item stepping pawl 88 and the amount stepping pawl 90 cooperate with the item shift slide 78 and the amount shift slide 80 (see also Fig. 4). The item shift slide 78 and the amount

shift slide 80 are each slidably mounted on guide shafts 98 extending longitudinally along the base structure 20. Each of the slides includes a row of teeth 100 which serve both as holding and as stepping teeth. The row extends in the direction of movement of the slide or along the guide shaft. As shown in Fig. 4, the stepping and holding teeth 100 may be separate portions of single teeth extending transversely across a slide 78, 80, or they may be separated sets of teeth (not shown). The slides 78 and 80 are mounted in the same plane and move along parallel lines. The rows of teeth 100 on the slides are adjacent each other. The spacings between the teeth 100 in each row correspond to the thickness of the printing wheels 33. The item stepping pawl 88 (Fig. 1) is in operative arrangement with the stepping teeth 100 on the item shift slide 78, and the amount stepping pawl 90 is in operative engagement with the stepping teeth 100 on the amount shift slide 80. A holding pawl 102 is mounted in the base structure 20 between the pawls 88 and 90 and is in operative engagement with the holding teeth 100 of both the item shift slide 78 and the amount shift slide 80. A spring 104 (see especially Fig. 3) coupling the holding pawl 102 to the base structure 20 tends to maintain the holding pawl 102 in engagement with the holding teeth 100.

The resetting mechanism 18 of the system comprises means for returning the print wheels 33 to their start positions. A return control solenoid 106 is mounted on the base structure 20 adjacent the advancing mechanism 16. A return control bracket 108 pivotally mounted in the base structure 20 acts as the armature of the return control solenoid 106. An extended arm 110 of the return control bracket carries a return control bail 112, interposed between the teeth 100 of the shift slides 78 and 80 and the item stepping pawl 88, the amount stepping pawl 90, and the holding pawl 102. The return control bracket 108 is biased in a clockwise direction (as viewed in Fig. 1) by a spring 114 coupled to the base structure 20.

The resetting mechanism 18 also includes the reset bail 70 rotatably mounted about the shaft 34 and extending into the path of the indexing pins 46 on the item and amount printing wheels 33i and 33a. A reset arm 116 attached to the return control bracket 108 is positioned to move the locking bar 56 in a direction parallel to the central shaft 34. Angular notches 118 are cut in the locking bar 56. The edges of the notches cam against the base structure and cause the locking bar 56 to move downward as the bar is moved by the reset arm 116. Springs 120 urge the locking bar 56 normally upward, as viewed in Fig. 1, to assure engagement of the bar 56 with the wheels 33 at their indexing slots 54. A return spring 122 is fastened to the locking bar 56 and restores the bar when the reset mechanism is released.

To reset the mechanism, the locking bar 56 is moved out of engagement with the indexing slots 54 by reset arm 116. The reset bail 70 under the influence of the return spring 72 engages the indexing pins 46 of all wheels 33i and 33a and returns them to the initial position. Springs 48 on the shaft 34 return all the wheels 33i and 33a, associated shift arms 76 and 78, and connected slides 78 and 80 to the initial or start location.

In operation the system may set up a number of characters successively, each in response to a specific selector signal. Referring to the Figures 1 and 2, the start position of the printing wheels 33 is as described above with all wheels 33 engaged by the setting bail 36; with the indexing pins 46 between the indexing bar 62 and the holding bar 64; and with the shift slides 76 and 78 at their right-hand limit of movement. The rotary solenoid 22 may also be energized by a source of selector signals (not shown). The rotary solenoid 22 provides a rotary drive movement of predetermined amplitude from its start position, which position is approximately that

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shown in Fig. 3. The rotary solenoid 22 actuates the selector, setting, and advancing mechanisms 12, 14, 16. The return movement of the rotary solenoid is effected by its internal spring (not shown) when the limit of its advance movement is reached. On returning to the start position, the rotary solenoid 22 awaits another character selection signal.

The rotary solenoid 22, when energized, effectuates the setting operation by rotating all wheels 33 by means of setting bail 36. The proper selector solenoid 38 is activated by the incoming character selection signal and the angular movement of the setting bail 36 is halted as the solenoid pin 42 stops the travel of the driven arm 28. The advancing arm 30 continues and, as explained more fully below, causes the item shift slide 78 to advance one notch. The item shifter arm 74 moves all of the item wheels 33*i* to the left and the wheel on the extreme left is engaged by the locking bar 56 in the proper or desired angular position. The rotary solenoid 22, having completed advance movement, now rotates back to the start position under the influence of the internal return spring, returning the setting bail 36 and all remaining wheels 33 back to the start position.

Each setting operation, as here defined, is complete when the printing wheel 33 is indexed to the desired position by the setting bail 36. An indexed item printing wheel 33*i*, for example, is then shifted into engagement with the locking bar 56 and others return to the start position.

The advancing operation is effected by the advancing mechanism 16 near the end of the advance stroke of the rotary solenoid 22. The advancing control arm 39 at the limit of its movement engages the pawl crank 84, urging it downward. The pawl crank 84 rotates in a clockwise direction, moving the tooth engaging tips 82 of both the item stepping pawl 88 and the amount stepping pawl 90 to the left, as viewed in Fig. 1. When the item shift slide 78 is in its start position, the stepping teeth 190 of the amount shift slide 80 are not in operative engagement with the amount stepping pawl 90. Only the item shift slide 78 is advanced one tooth pitch. The holding pawl 102 rides over the crest of the associated tooth 100 on the item shift slide 78 and engages the next tooth 100, thus holding the item shift slide 78 in the advanced position. The item shifter arm 74 extending from the item shift slide 78 advances the item printing wheels 33*i* by one incremental amount from the start position. The increment of movement of the slide 78 is equal to the width of a printing wheel 33. Thus all item printing wheels 33*i* are moved over one position and the first item printing wheel 33*i* is slid onto the locking bar 56. Note that the setting bail 36 is rotated only through a predetermined angular amount, depending upon the actuated selector solenoid 38. After any rotation, therefore, only one indexing slot 54 on the printing wheel 33 is in line with the locking bar 56.

Each succeeding setting and advancing cycle is similar to that described above. A selector solenoid 38 is actuated, depending upon the character desired. At the same time, the rotary solenoid 22 undertakes a rotary advance and return movement. The item printing wheels 33*i* are rotated to a position determined by the actuated selector solenoid 38. Thus indexed, one item printing wheel 33*i* is shifted onto, and held against rotation by, the locking bar 56. The operation of setting in the "item" is complete when all six item printing wheels 33*i* have been indexed, placed, and held against rotation on the locking bar 56. Thereafter, these item wheels 33*i* are retained for printing. The operator may check the indicating characters 52 to verify that the item has been entered correctly. Before an amount can be entered, the item shift slide 78 must be fully advanced, the item stepping pawl 88 having engaged the final stepping tooth 100 on the item shift slide 78. The item shift slide 78 is thus at the end of its travel. When the item stepping

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pawl 88 advances the item shift slide 78 to the last increment, however, a tab 79 on the item shift slide 78 moves the amount shift slide 80 forward so that the amount stepping pawl 90 engages the leading stepping tooth 100 on the amount shift slide 80. The next selector thus causes an advance of the amount shift slide 80, but not the item shift slide 78. Accordingly, the desired amount quantity may be set up. The selection and advance cycles are like that previously described, except that amount wheels 33*a*, and associated "amount" setting and advancing mechanism must be substituted for the equivalent "item" setting and advancing mechanism. Regardless of the number of digits in the amount, however, the amount is aligned, or justified, to one margin, the right-hand margin as viewed in Fig. 1.

When all the item printing wheels 33*i* have been indexed or advanced and those of the amount printing wheels 33*a* to be set, have been indexed, the printing action may take place. A platen (not shown) or other mechanism may be employed to derive printed character impressions from the printing characters 50 at the printing position. Suitable printing mechanisms are well known, and description of such mechanisms has been omitted to clarify the present description. An indicating wheel or printing wheel may be used for purposes other than printing and this invention is not thereby limited to a printing function.

When the printing operation is completed the system may be reset to begin another set up operation. A reset signal may be supplied manually, or automatically from the source of signals on the completion of the printing cycle. The incoming signal actuates the return control solenoid 106. The magnetizable core 107 of the return control solenoid 106 attracts the return control bracket 108, and the bracket 108 then pivots in the counter-clockwise direction, as viewed in Fig. 1. The return control bracket 108 moves the return control bail 112 downward and away from the teeth 100 on the shift slides 78 and 80 and into contact with the stepping pawls 88, 90 and the holding pawl 102 pivoting them counter-clockwise, as viewed in Fig. 1. The pawls 88, 90, 102 then disengage the associated teeth 100 on the shift slides 78, 80.

The return control bracket 108 also engages the locking bar 56 and moves it to the left. The motion to the left is also an outward motion thus releasing all of the printing wheels 33. During the setting cycle of the first item printing wheel 33*i* the reset bail 70 is rotated clockwise, as viewed in Fig. 5, by the indexing pin 46 on the item printing wheel 33*i* as the wheel is rotated. Because the item printing wheel 33*i* is held by the locking bar 56 on the shaft 34, the reset bail 70 does not return when the printing wheel 33*i* is shifted. The reset bail 70 is turned through an angle corresponding to that of the furthest rotated indexing pin 46 (best seen in Fig. 5). The reset bail 70 is held at this extended position until the resetting mechanism 18 is actuated. When the wheels 33 are released by the locking bar 56, the reset bail 70, under the influence of the reset bail spring 72 (Fig. 1) rotates all of the print wheels 33 to the start position. The setting bail guide arm 66 (see Fig. 5) prevents the wheels 33 from sliding back along the shaft 34 to the start location until the indexing pins 46 are returned to a starting position where they are no longer restrained by the guide arm 66. The printing wheels 33, shift arms 74, 76 and shift slides 78, 80 then may be urged toward the start position by the springs 48 (Fig. 1) concentrically mounted on the storage shaft 34.

When the pawls 88, 90, 102 are disengaged, the printing wheels 33 are free to slide across storage shaft 34, and the coupled shift slides 78, 80 may return to their start positions. The return control solenoid 106 may be energized for a sufficiently long time to permit the shift slides 78, 80 to reach the start position. Alternatively, a switch may be mounted which is activated when all

wheels have returned to the start position and location, thereby releasing the return control solenoid. The system is thus restored to the start condition, and a new operation may be begun.

As described, there has been provided a simple and efficient indexing mechanism for setting a member at one of a number of preselected points. An indexing mechanism is provided which may set printing wheels having additional indicating characters. The mechanism may be arranged to print two separate columns of characters, at least one column of which may be justified to a given margin. The selecting signals may be provided in a time succession, and need not provide a fixed number of characters.

What is claimed is:

1. A device for indexing a plurality of centrally apertured wheels mounted on a central storage shaft, said wheels having peripheral indexing notches and peripheral indexing pins, said device comprising means for rotating said wheels about said shaft, said means including a setting bail in operative engagement with said indexing pins coupled to and rotating with said central shaft, selector means including stopping means positioned to interrupt the rotational motion of said setting bail at a desired angular position, advancing means activated by said rotating means for incrementally advancing said wheels along said shaft, holding means positioned to receive and successively engage said indexing notches of said advanced wheels, and resetting means including means for moving said holding means out of engagement with said indexing notches, spring means coupled to a resetting bail cooperating with said indexing pins to rotate said wheels to a start position, and spring means coaxially mounted on said storage shaft to yieldingly resist the advance movement of said wheels.

2. A device for selectively indexing and aligning to a given margin a plurality of wheels each having peripheral indexing slots and a peripheral indexing pin, said device comprising a storage shaft for slidably supporting said wheels, a setting bail operatively positioned to cooperate with each said indexing pin and connected to said storage shaft, means including said storage shaft to rotate said setting bail through desired angles, holding means including a holding bar with a longitudinal projection to engage ones of said indexing slots for holding said wheels against rotation, and means coupled to said bail rotating means for advancing said wheels in incremental steps along said storage shaft and into operative engagement with said holding means.

3. A mechanism from providing rotational movements of selectable amplitude comprising drive means for providing repeated rotary movements from a start position, a central shaft, a wheel member to be given a rotational movement about the axis of said central shaft, means including a setting bail attached to said central shaft and positioned coextensive with said axis for turning said wheel member, a driven arm connected to said central shaft, a driving arm connected to said drive means and yieldingly coupled to said driven arm, a plurality of solenoid members arrayed at predetermined points in a plane normal to said axis, each of said solenoid members including a selectively movable solenoid pin, each said pin being positioned to engage said driven arm when the corresponding one of said solenoid members is energized.

4. A device for setting a plurality of wheels at desired index positions, said wheels being of a given thickness and each having a like peripheral indexing pin and a plurality of peripheral indexing slots, said device comprising a storage shaft for slidably supporting said wheels, a setting bail including a holding and a setting portion operatively positioned in engagement with said indexing pins, means including said storage shaft to rotate said setting bail through desired angles from a start position, holding means including a holding bar positioned adjacent said wheels and having a projecting portion of said

holding bar to engage said peripheral indexing slots for holding said wheels against rotation, a toothed slide slidably movable parallel to said storage shaft and coupled to said wheels, the teeth of said slide being spaced apart a distance corresponding to the thickness of one of said wheels, means biasing said wheels toward a start location on said storage shaft, and pawl means responsive to said rotating means and operatively engaged with the teeth on said slide to advance said wheels in increments along said storage shaft and into operative engagement with said holding means.

5. A device as claimed in claim 4 further including a resetting bail rotatable about said storage shaft and responsive to the position of said indexing pins, and biasing means responsive to the position of said resetting bail and said holding means to rotate said resetting bail to a start position.

6. A settable mechanism comprising a plurality of members to be set, a central shaft, means for storing said members on said central shaft, means for providing desired increments of rotation from a start position, means on said shaft responsive to said means for providing rotations for setting said members to desired positions, means operationally positioned parallel to said central shaft to hold said members at said desired positions, disengageable means including toothed elements responsive to said means for providing rotation for advancing said members from said storing means to said holding means, means urging said members toward said means for storing, means selectively to disengage said means for advancing, and means responsive to the position of said members to be set for resetting said members to a rotational start position.

7. A system for setting to a given margin a plurality of members each having a peripheral indexing pin and peripheral indexing notches, said system comprising a central storage shaft on a central axis for slidably supporting said members, means including a setting bail which engages said indexing pins for providing desired increments of rotation from a start position, said setting bail being connected to said central storage shaft, holding means positioned to engage said indexing notches, means concentric with said central axis for urging said members in a direction away from said holding means, a slide member including toothed elements to advance said members in incremental steps against said means for urging, pawl means responsive to said means for providing increments of rotation for advancing said slide member by engagement of said toothed elements, means selectively to disengage said pawl means from said toothed elements, and means responsive to the position of said members for rotating said members to a rotational start position.

8. A mechanism for setting two groups of printing wheels, each of said groups comprising a plurality of wheels and being aligned with a given margin, each of said wheels having peripheral characters and peripheral indexing notches, each wheel also including a radially extending indexing pin at an index position thereon, said mechanism comprising a central storage shaft slidably supporting said groups of printing wheels, a first setting bail connected to said storage shaft and rotating therewith adjacent to and cooperatively with the said indexing pins of the first of said groups of wheels, holding means including a first extended portion mounted parallel to said central shaft and positioned to engage said indexing notches of said first group of wheels holding said wheels against rotation, a second setting bail connected to said storage shaft and rotating therewith adjacent to and cooperatively with the said indexing pins of said second group of wheels, holding means including a second extended portion parallel to said central shaft and positioned to engage said indexing notches of said second group of wheels, first spring means concentrically mounted on said storage shaft urging apart said first and

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second groups of wheels, second spring means concentrically mounted on said storage shaft urging said second group of printing wheels towards said first group of printing wheels, means including a rotary solenoid to provide rotary movements of predetermined amplitude from a start position to a driving member mounted coaxially with said central shaft, a driven member, connected to said central storage shaft and coupled to said driving member by constant tension spring means to provide rotary movements to said central shaft, a plurality of selector solenoids arrayed at predetermined points in the plane of movement of said driven arm, each of said solenoids including a pin member movable in response to the actuation of the solenoid to limit rotary movement of said driven arm, a first slide member having toothed elements and movable parallel to said central shaft, said first slide member being coupled to said first group of printing wheels, a second slide member having toothed elements and movable parallel to said central shaft, said second slide member being coupled to said second group of printing wheels and including a tab member engaging said first slide member at a predetermined point of movement, first and second stepping pawls in operative engagement with the toothed elements of both said first and second slide members, respectively, a pawl crank member responsive to movement of said rotary solenoid and coupled to said stepping pawls, a holding pawl in operative engagement with the toothed elements of both said first and second slide members, a return control solenoid mounted adjacent said slide members, a return control arm pivotally mounted to disengage said stepping and holding pawls from said toothed elements, and further extended to urge said holding means out of operative engagement with said printing wheels in response to activation of said return control solenoid, and means including a reset bail rotatably mounted on said central shaft and cooperating with said indexing pins for rotating said printing wheels to a start position in response to the position of said printing wheels and to the releasing of said printing wheels by said holding member.

9. In a signal responsive system, a settable mechanism comprising at least one apertured member to be set, said member including a radially extending pin on the periphery of said member, a rotatable shaft, pin engaging means driven by said shaft for rotating said member about an axis through the aperture of said member, an arm mounted on said shaft, and a plurality of signal responsive interposing means each movable into the path

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of said arm in response to a different signal for limiting said member to an angular rotation determined by the signal.

10. In a system providing setting signals, a settable mechanism comprising at least one member to be set, said member including a radially extending pin at the periphery of said member and having incrementally spaced indentations about the periphery of said member, a central shaft, means driven by said central shaft for engaging said peripheral pin and rotating said member about said shaft, signal responsive means positioned adjacent said pin engaging means for halting said rotation at a preselected angular position, holding means axially displaced from the setting position of said member for engaging one of said peripheral indentations to hold said member against further rotation, and means for advancing said member from said setting position into engagement with said holding means.

11. In a system providing setting signals, a settable mechanism comprising a plurality of members to be set, each of said members including a radially extending element at the periphery of said member, a central shaft, said members being slidably mounted on said shaft, means cooperating with each said radially extending element to enable rotation of said members about said shaft as said shaft rotates, an arm mounted on and rotated with said shaft, signal responsive means arrayed at various angular positions about said shaft, each of said signal responsive means having a movable element that projects into the path of said arm when a signal is applied to that signal responsive means for halting said rotation at a preselected angular position, means mounted on said central shaft for restoring all of said members to an angular start position, and means for enabling each of said members to be set in sequence.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 2,934,006

April 26, 1960

Robert A. Oberdorf et al.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 7, line 50, for "from" read -- for --; column 10, lines 27 and 28, for "variout" read -- various --.

Signed and sealed this 1st day of November 1960.

(SEAL)

Attest:

KARL H. AXLINE
Attesting Officer

ROBERT C. WATSON
Commissioner of Patents