

July 10, 1934.

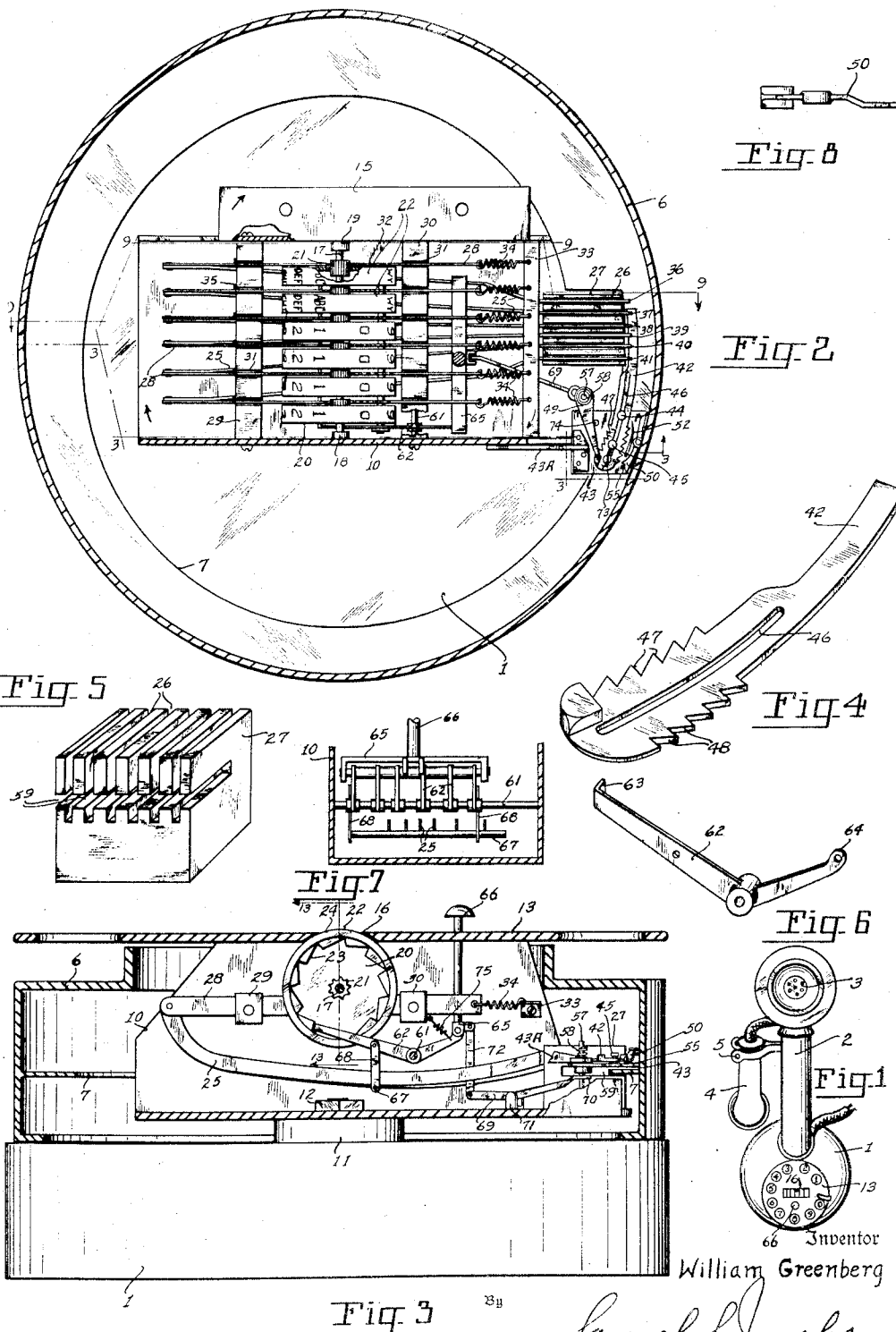
W. GREENBERG

1,966,118

INDICIA INDICATOR AND REGISTER FOR IMPULSE TRANSMITTING DEVICES

Filed Nov. 18, 1932

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

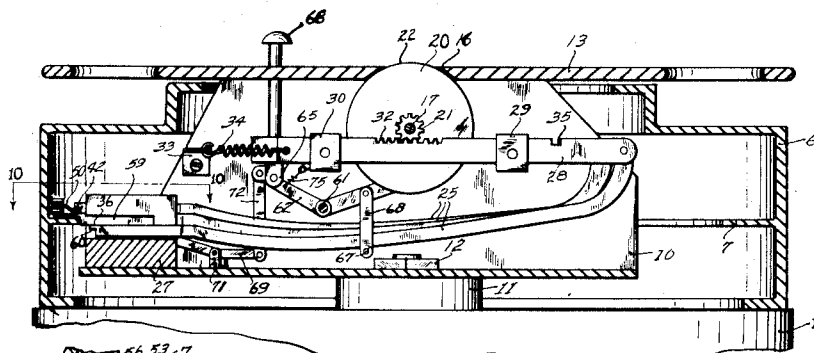


Fig. 9

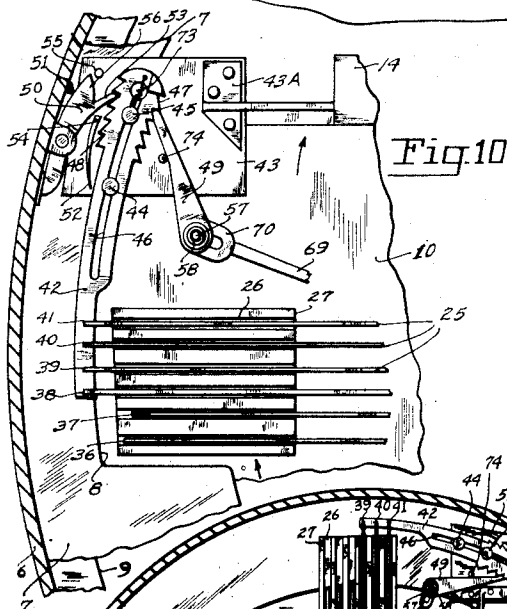


Fig. 10

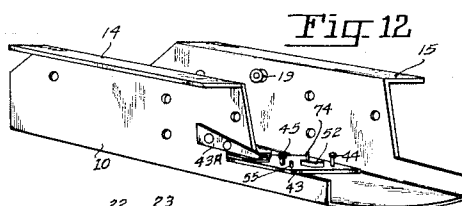


Fig. 12

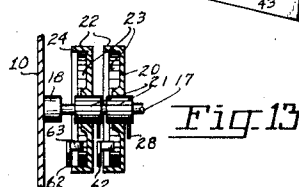


Fig. 13

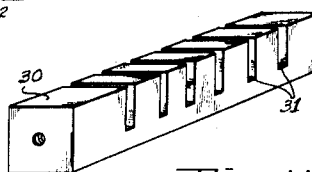


Fig. 14

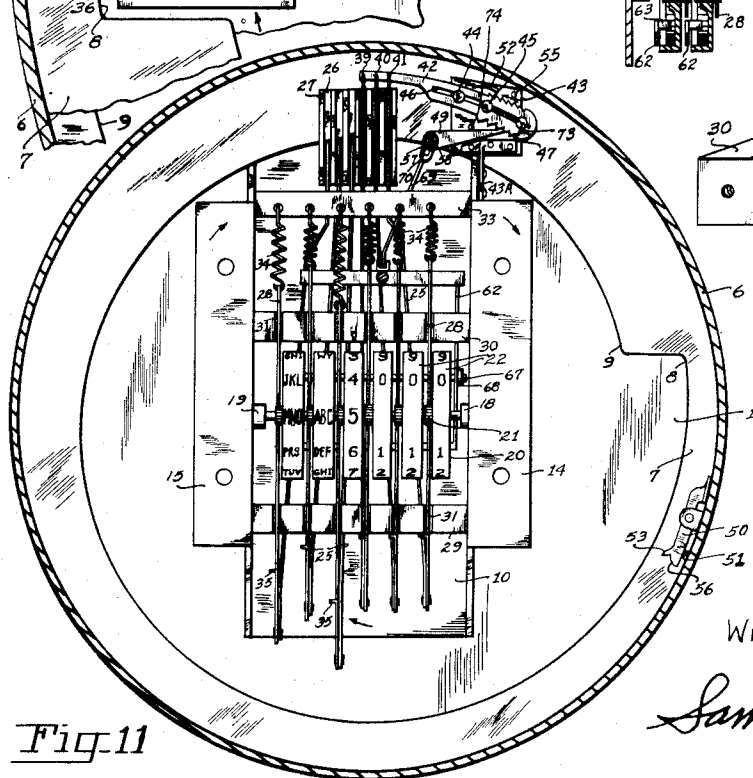


Fig. 11

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UNITED STATES PATENT OFFICE

1,966,118

INDICIA INDICATOR AND REGISTER FOR
IMPULSE TRANSMITTING DEVICES

William Greenberg, Portland, Oreg.

Application November 18, 1932, Serial No. 643,187
In Great Britain May 7, 1932

8 Claims. (Cl. 179—90)

This invention relates generally to devices for indicating and registering indicia. The invention may be used in conjunction with any impulse-transmitting-device which is adapted for setting up electrical or mechanical impulses between two or more points and the invention is particularly adapted to be used in conjunction with the type of impulse-transmitting-device that is connected to switches which automatically respond to interruptions of a metallic circuit in order to transmit a series of impulses.

The important object of my invention is to bring indicia into view which represents the impulses that have been set up by the impulse-transmitting-device to which my invention is applied and to remove from view such indicia when desired.

Another object of my invention is to provide a compactly arranged indicia indicator and/or register that is adapted to be easily attached to or made an integral part of any impulse-transmitting-device or which may be operated independently of such transmitting devices if desired, said indicia indicator and/or register being efficient, comparatively cheap and easy to operate.

It is well to note that as the present automatic telephone is constructed, it is impossible to determine whether or not the individual who is dialing a number is dialing the correct letters and/or numerals during the dialing operation. It often happens that a wrong number is dialed unintentionally. By the use of my invention, such occurrences cannot happen since the individual who is dialing can observe what he has dialed and thereby he is able to detect any error he might make while dialing. Sometimes an individual dials the correct number but finds the line busy. With the present type of telephone he must remember the telephone number until he tries to dial again. However, by the use of my invention, the number previously dialed remains recorded until he desires to call it again. It is evident, therefore, that the telephone user is aided materially without decreasing the efficiency or materially altering the construction of the telephone.

This invention is closely related to my Letters Patent No. 1,884,663 granted on October 25, 1932, upon "Number indicators and registers for automatic telephones", and to my Letters Patent No. 1,932,965 granted Oct. 31, 1933, upon an improvement in "Indicia indicators and registers for automatic telephones". The objects and advantages, pointed out in the two patents above referred

to, apply, in a large measure, with equal force to the present invention. However, there is presented in this invention an entirely new mechanism to produce the results desired as will hereinafter be pointed out in detail.

The invention is directed to other objects and possesses other features of novelty and advantage and consists in the new and useful provision, formation, construction, combination and interrelation of parts, members and features, all of which will become more apparent from the following detailed description, having reference to the accompanying drawings which illustrate but one embodiment by which the invention may be realized and which is shown in conjunction with an automatic telephone of the present construction merely for more graphically setting forth the application of the invention, and in which:

Figure 1 is a front view in perspective of a telephone having associated therewith one of my indicia indicating and registering devices.

Figure 2 is a plan view of one of my indicia indicating and registering devices, portions of which are broken away to show the manner of assembly, and the working relationship between some of the elements. The housing is shown in cross-section and a portion of the indicating and registering frame is shown in cross-section.

Figure 3 is a side view, partially in section, illustrating, in part, some of the elements used in my indicia indicating and registering device, the view being taken on line 3—3 of Figure 2, looking in the direction indicated.

Figure 4 is a perspective, plan view of a selector containing a plurality of serrated-surfaces which play an important part in selecting the indicia indicating and registering members which are a part of my invention.

Figure 5 is a perspective, front view of a guide-member in which a plurality of actuating-members move.

Figure 6 is a perspective, side view of one of the locking-ratchets which is a part of my invention.

Figure 7 is a fragmentary, side view, partially in section, of a portion of my invention, illustrating the position of the locking-ratchets, one of which is shown in Figure 6, relative to a common-release-member and their position relative to other elements of the release-mechanism.

Figure 8 is a side view of an actuating-ratchet secured to the housing and operatively associated with the selector which is secured to the support extending from the frame.

Figure 9 is a fragmentary, side view, partially in section, illustrating, in part, some of the ele-

ments used in my indicia indicating and registering device and showing some of the actuating-members disposed within the guide-members, the view being taken on line 9—9 of Figure 2, looking

5 in the direction indicated.

Figure 10 is a fragmentary, plan view, partially in section, of a portion of my invention, illustrating the relationship between the selector, the actuating-members, the guide-member, the support,

10 the actuating-ratchet and the locking-pawl.

Figure 11 is a plan view of the indicia indicating and registering device as it appears during its rotation relative to the housing and the cam associated therewith. The housing is shown in

15 cross-section.

Figure 12 is a perspective, side view of the frame forming a part of my invention.

Figure 13 is a fragmentary, sectional, end view of some of the indicia indicating and registering members illustrating their position relative to each other and to the frame, the view being

20 taken on line 13—13 of Figure 3, looking in the direction indicated.

Figure 14 is a perspective, side view of still other guide-members secured to the frame and adapted to hold the actuating-rack-members

25 in position.

Like reference characters refer to corresponding parts throughout the several views.

30 While one of my indicia indicating and registering devices is shown in use with a definite type of desk telephone (see Figure 1), I do not want this disclosure, however, to be taken as a limitation since my device is capable of being used with any type of telephone instrument in use

35 either in the United States or in any foreign country.

In Figure 1 is shown base 1 of the automatic telephone illustrated which has column 2 extending upwardly therefrom, and transmitter-head 3 rests upon the free end of the column. Receiving-hook 5 extends from the side of column 2 upon which rests receiver 4. The indicia indicating and registering mechanism is enclosed in housing

40 6 which may be secured to base 1 in any desirable manner. A spiral-cam 7 which has substantially a narrow beginning as shown at 8 and ends with a materially greater width as shown at 9. The function of cam 7 will be explained in detail

45 later.

A frame 10 is removably secured to dialing-shaft 11 of the automatic telephone illustrated in any well known manner, as by nut 12. A dialing-disk 13 is secured to shoulders 14 and 15 of the frame 10. An opening 16 is disposed through the dialing-disk 13 through which a portion of the indicia-carrying-members, shortly to be described, may be viewed. A shaft 17 is journaled within bearings 18 and 19 secured to the side-

50 walls of the frame 10. A plurality of indicia-carrying-wheels 20, each having a gear-hub 21, are rotatably mounted upon shaft 17. Each of the indicia-carrying-wheels has indicia, such as letters, numerals or other symbols on its outer

55 periphery 22 and each of the indicia-carrying-wheels also has an internal-ratchet 23 disposed upon the inner periphery 24.

A guide-member, as guide-block 27 illustrated in Figure 5, is secured in any well known manner to one end of the frame 10. Guide-block 27 has a plurality of parallelly disposed guide-wells or slots 26 and a guide-well or slot 59 intersects slots 26 and lies at right angles thereto parallel to the base of the guide-block. Spiral-cam 7 is

60 in registerable alignment with slot 59.

A plurality of uniquely shaped actuated-bars 25 have one of their ends hingedly secured to corresponding gear-rack-members 28 in any well known manner and they have their free ends 36, 37, 38, 39, 40 and 41 respectively disposed

80 within corresponding slots 26. Each of the actuating-bars 25 have near the ends 36 to 41 inclusive notches 60 (see Figure 9). The actuating-bars 25 are of sufficient depth to permit the periphery of the spiral-cam 7 to contact the

85 notches 60 when the spiral-cam enters into slot 59. There are as many gear-rack-members 28 and slots 26 as there are actuating-bars 25.

Guide-blocks 29 and 30 are secured to the sides of the frame 10 in any suitable fashion in spaced

90 relationship with each other. Each of the guide-blocks 29 and 30 has a plurality of slots 31, the slots in guide-block 29 being in direct alignment with the slots in guide-block 30. Gear-rack-

95 members 28 are disposed within and are guided by slots 31. Each gear-rack-member 28 has a plurality of gear-teeth 32 on one of its faces. Each gear-rack-member 28 is maintained at all times in direct alignment with its corresponding

100 gear-hub 21 associated with the indicia-carrying-wheels 20, because they are guided by the slots 31. The teeth 32 of each of the gear-rack-members are at all times in mesh with the teeth of its corresponding gear-hub 21. A cross-member,

105 as a bar 33, is secured at one end of and to the side-walls of frame 10 in a suitable manner. Cross-bar 33 is spaced from the guide-blocks 29 and 30 and has a plurality of reacting elements, as coil-springs 34, secured thereto and

110 the free ends of the coil-spring are secured to the corresponding gear-rack-member 28. As long as coil-springs 34 are not tensioned, the indicia-carrying-wheels 20 remain in normal dormant position. The horizontal movement of the

115 gear-rack-members 28 away from the coil-springs tensions the springs, so that when the gear-rack-members are freed the tension on the coil-springs 34 is released, so that the gear-rack-members may return to their normal dormant position. In order to prevent the teeth 32 of the gear-rack-

120 members 28 from getting out of mesh with the teeth of the corresponding gear-hubs 21, there is provided upon each of the gear-rack-members a stop 35 which checks the return of the gear-rack-members when the tension is released from

125 coil-springs 34.

A selector 42, shown in detail in Figure 4, has a slot 46 disposed longitudinally thereof. A plurality of ratchet-teeth 47 are disposed upon one side of the selector 42 and a like number of

130 ratchet-teeth 48 are disposed directly on the other side of the selector in direct alignment with ratchet-teeth 47.

A support, as a plate 43, is secured to the frame 10 opposite guide-block 27 by any suitable means, as bracket 43A. The plate is positioned relative to the base of the frame 10, so that it rides above the spiral-cam 7. Selector 42 is slidably disposed relative to the plate 43 and is guided in its movements by pins 44 and

135 45 that are secured to the plate and pass through slot 46. A cam-guard 52, whose function will be presently explained, extends upwardly from plate 43 and pins 55 and 74, whose functions will also be explained later, extend upwardly

140 from the plate. A reacting element, as a spring 73, has one of its ends secured to the selector 42 and the other of its ends to pin 45. When the selector is moved away from the pin 45 the spring 73 is tensioned.

A selector-actuating-member, as a ratchet 50, is pivotally secured to housing 6 in any well known manner. Selector-actuating-ratchet 50 has a camming-surface 56 and a catch 53 outwardly extending therefrom. A reacting element, as a coil-spring 51, which is at all times under compression, is disposed between and engages the housing 6 and the selector-actuating-ratchet 50. The catch 53 of the selector-actuating-ratchet is in working alignment with ratchet-teeth 48 and cam-guard 52 and the camming-surface 56 is in working alignment with pin 55 extending upwardly from the plate. A shaft 61 is journaled to the side-walls of the frame 10. A plurality of locking-ratchets 62 are mounted about shaft 61. Each of the locking-ratchets 62 has a dog 63 at one end which is adapted to engage the internal ratchet-teeth 23 disposed upon the inner periphery 24 of each of the indicia-carrying-wheels. A release-bar 65 is secured to the free end 64 of each of the locking-ratchets 62 in any suitable manner. A push-rod 66 is secured to and extends upwardly from the release-bar 65 and through dialing-disk 13. A reacting element, as a spring 75, has one of its ends secured to release-bar 65 and the other end to one of the locking-ratchets 62. When downward pressure is applied to push-rod 66, the spring 75 is tensioned, therefore, when pressure is removed from the push-rod, the spring forces the push-rod 66 back to normal dormant position. A supporting-rod 67 extends immediately beneath the actuating-bars 25 and is maintained in position relative thereto by links 68 secured to the ends of the supporting-rod 67 and to the outside locking-ratchets 62.

A lever-beam 69 is pivotally secured within a yoke 71 that is secured to the base of the frame 10. A link 72 has one of its ends secured to the release-bar 65 in any suitable manner and the other of its ends to the lever-beam 69. The free end of the lever-beam 69 has a slot 70 therein. A stub-shaft 57 extends upwardly from the base of the frame 10. Lever-beam 69 has its slotted-end 70 disposed about stub-shaft 57. A reacting element, as a spring 58, is disposed between and secured to the free end of the stub-shaft 57 and to the upper surface of the locking-pawl 49 and is normally held under compression as well as under tension. The locking-pawl 49 is in working alignment with ratchet-teeth 47 and normally rests upon the plate 43 and pin 74, extending therefrom.

Modus operandi

This completes the detailed description of the various elements which form a part of the invention. However, in order to more fully explain the steps necessary to bring into view a group of characters, such as letters and numbers, forming a call number, and in order to show the precise manner of removing the characters from view whenever desired and of placing the mechanism in normal dormant position ready for a new dialing cycle, the following mode of operation is presented:

It is well to note at this time that most of the mechanism comprising the invention is supported upon the frame 10 which rotates about the dialing-shaft 11. The selector-actuating-ratchet 50 and the spiral-cam 7 are the only elements that are secured to the housing 6. Let us first assume that a call number has been dialed, thereby placing and retaining all of the indicia-indicating-wheels 20 in their selected position. In order to

return the indicia-indicating-wheels and all the rest of the mechanism to their initial starting position ready for a new dialing cycle, push-rod 66 is pressed downwardly. This causes the dogs 63 to be removed from the internal-ratchet-teeth 23, consequently permitting the coil-springs 34 to seek their normal tension and thereby move the gear-rack-members 28 in the direction of the springs 34. Since the indicia-carrying-wheels 20 have gear-hubs 21 and since these gear-hubs are in mesh with teeth 32 of the gear-rack-members, the indicia-carrying-wheels will return to their normal dormant position. Since the supporting-rod 67 is indirectly connected with the two outside-locking-ratchets 62, the supporting-rod will be raised at the same time that the dogs 63 are removed from the internal-ratchet-teeth 23 and by raising the supporting-rod all of the actuating-bars 25 are lifted. The lever-beam 69 is also indirectly connected with push-rod 66, so that when pressure is applied to the push-rod, the slotted-end 70 of the lever-beam disengages the locking-pawl 49 from the ratchet-teeth 47, thus permitting the selector to return to its normal dormant position. The ends of the actuating-bars 25 may then be placed on the selector 42 as shown in Figure 2.

Figure 2 shows the position of the various elements prior to the initial stage in the dialing cycle. In this stage the selector-actuating-ratchet 50 is maintained out of engagement with the ratchet-teeth 48 by pin 55 contacting cam-surface 56. The selector 42 is now in normal dormant position and has disposed thereupon ends 37 to 41 inclusive of actuating-bars 25 and in this manner keeping these actuating-bars in slots 26 but away from slot 59. The end 36 of the first actuating-bar is positioned upon the upper-surface of the spiral-cam 7, so that the actuating-bar is within slot 59. As the dialing-disk is rotated clockwise, the frame, to which it is attached, also moves clockwise, and since the spiral-cam 7 is in registerable alignment with the slot 59 in which the actuating-bar 25, having end 36, is located, the periphery of cam 7 will contact the notch 60 of said actuating-bar and cause it to be moved horizontally and since it is hingedly secured to the corresponding gear-rack member 28 it too will move horizontally. Consequently, the corresponding indicia-carrying-wheel, by virtue of its gear-hub 21 being in mesh with teeth 32 of the gear-rack-member, is rotated. The corresponding locking-ratchet 62 maintains the indicia-carrying-wheel in the selected position to which it has been rotated. Each of the other actuating-bars are progressively selected, so that upon the second clockwise movement of the dialing-disk, the notch 60 of end 37 will be in operative engagement with spiral-cam 7 and the corresponding indicia-indicating-wheel will be rotated and maintained in its selected position. Prior to the initial clockwise movement locking-pawl 49 engages the first tooth of ratchet-teeth 47 of selector 42. It will be understood then that prior to the initial clockwise movement, the selector is in normal dormant position with locking-pawl 49 disposed within the first tooth of ratchet-teeth 47 and end 36 of the first actuating-bar is in operative engagement with spiral-cam 7.

It will be seen that when the elements are actuated in the manner related, not only are the indicia-carrying-wheels rotated to their selected positions, but they are also retained in said selected position during the clockwise or counter-clockwise movement of the dialing-disk and as-

sociated elements. It is only when the release mechanism is actuated by pressing downwardly push-rod 66 that the indicia-indicating-wheels and associated elements return to their normal dormant position.

During the counterclockwise movement of the dialing-disk the free ends of the actuating-bars which are not maintained upon the selector are permitted to fall below the slot 59 and under the spiral-cam 7. The precise manner of selecting and placing the next indicia-indicating-wheel in condition for rotation is clearly illustrated in Figure 10 which shows that two of the indicia-indicating-wheels have already been rotated and the actuating-bar associated with the third indicia-indicating-wheel is about to have its end 38 placed upon the spiral-cam 7, so that its notch will be engaged by the periphery of the spiral-cam, and thereby begin the third stage in the dialing cycle.

Figure 10 illustrates the position of the various elements associated with the selector 42 just before the frame 10 and associated elements have returned to their normal dormant position. In this position locking-pawl 49 is shown engaged to the second tooth of the ratchet-teeth 47. It will be seen that the catch 53 slides along the cam-guard 52 until it reaches the end 54 thereof at which time the catch engages the second tooth of the ratchet-teeth 48 and forces the selector 42 to be moved away from pin 45 against the action of the spring 73, so that locking-pawl 49 is made to engage with the third tooth of ratchet-teeth 47. Immediately thereafter, the pin 55 contacts cam-surface 56 and forces the catch to disengage from the ratchet-teeth 48. The cam-guard 52 and pin 55 are placed upon the plate 43 in such a manner, and the selector-actuating-ratchet 50 is so constructed and placed in such position upon the housing 6 that the selector 42 is moved a slight distance away from the pin 45 against the action of spring 73, and consequently, the end 38 of the third actuating-bar is permitted to fall upon the spiral-cam 7. The mechanism is now in readiness for the third stage in the dialing cycle. As was heretofore related, by rotating the dialing-disk clockwise, rotation is imparted to the third indicia-indicating-wheel. The remaining indicia-indicating-wheels have rotation imparted thereto and are retained in exactly the same manner. As it has been stated before, the selector 42 is moved away from pin 45 against the action of spring 73 a sufficient distance to permit the ends of the actuating-bars to fall, one at a time, upon the surface of the spiral-cam 7 thus placing the actuating-bars in working relation with the spiral-cam. It is believed to be obvious that the indicia-carrying-wheels and their associated elements together with the selector and its associated elements can be placed in normal dormant position by simply pressing downwardly the push-rod 66 in the manner heretofore explained. This can be done either at the completion of all the stages of the dialing cycle or during any stage of the dialing cycle.

From the description it will be noted that the invention is believed to satisfy the objects set forth hereinbefore.

Having thus described my invention, what I claim as new and upon which I desire to secure Letters Patent is:

1. In a device of the class described, in combination with an automatic telephone, a housing secured to the base of the telephone, a spiral-

cam inwardly extending from the housing, a frame, carrying indicating elements, mounted upon the dialing-shaft of the telephone, means associated with said frame for coaxing with the spiral-cam, said coaxing elements being adapted for progressively indicating the number being dialed, and manually manipulative means carried by the frame for releasing the indicating elements while a connection is maintained or at any time desired.

2. In a device of the class described, in combination with an automatic telephone, a housing fixedly secured to the telephone, a spiral-cam associated with the housing and inwardly extending therefrom, a frame fixedly secured to the dial-shaft of the telephone, means associated with and carried by the frame and coaxing with the spiral-cam for visually and progressively indicating the number being dialed, and means for clearing the dialed number at any time desired and while a connection is being maintained.

3. In a device of the class described, in combination with an automatic telephone, a housing adapted for being secured to a telephone instrument, a spiral-cam secured to the inner surface of the housing and inwardly extending therefrom, a frame fixedly secured to the dialing-shaft of the telephone, indicating mechanism associated with the cam and carried by the frame for automatically indicating the number that is being dialed, and means associated with the indicating mechanism for automatically returning the indicating mechanism to dormant position when manually released and while a telephonic connection is maintained.

4. In combination with an automatic telephone, apparatus for indicating and registering the call number as it is dialed, including, a housing, a frame secured to the dialing-shaft of the said telephone, a shaft journaled within the frame, means associated with the shaft to visibly indicate and register the degree of rotation of the dialing-disk of said telephone on successive dialing operations, means for rotating said first mentioned means including a plurality of gear-rack-members in mesh with a plurality of gear-hubs, a support secured to the housing, a selector slidably disposed thereupon, means for moving the selector at the completion of each stage of the dialing cycle, means for progressively selecting the first mentioned means, means for retaining the first mentioned means in selected position after rotation thereof, and means for returning the first mentioned means and the selector to normal dormant position at any time desired.

5. Apparatus as characterized in claim 4 including, a guide-block disposed upon the frame, a plurality of actuating-bars disposed therein, and a spiral-cam associated with the housing in registerable alignment with the guide-block.

6. An indicia indicating and registering device comprising a base, a dialing-shaft extending therefrom, a housing secured to the base, a frame secured to the dialing-shaft, a dialing-disk secured to the frame, indicia-carrying-members rotatably disposed within the frame, gear-hubs secured to said indicia-carrying-members, a plurality of gear-rack-members in mesh with the gear-hubs, a guide-block disposed upon the frame, said guide-block having a plurality of slots therein, a plurality of actuating-bars secured to the gear-rack-members and disposed within the slots of the guide-block, a plurality of locking-pawls associated with the indicia-carrying-members and adapted to retain the same in their selected

position, a support secured to the frame opposite the guide-block, a selector slidably disposed relative to said support adapted to hold the free ends of the actuating-bars, a selector-actuating-ratchet secured to the housing adapted to intermittently engage with the selector, a spiral-cam secured to the housing, said spiral-cam adapted to coact with the free ends of the actuating-bars when said free ends are permitted to fall thereupon by the selector, and means for returning the indicia-carrying-members and selector to normal dormant position.

7. In a device of the class described, in combination with an automatic telephone having a dial rotatably mounted thereupon, a housing adapted for being secured to a telephone instrument, a spiral-cam secured to and extending inwardly from the inner side wall of said housing, a frame fixedly secured to the dialing shaft of said telephone, a plurality of graduated indicating elements mounted within said last-mentioned frame, means for independently rotating the indicating members to thereby visibly register the amount of rotation imparted to the dialing disc, means for actuating said first-mentioned means, said second means adapted for manipulation by the

said spiral-cam, means for locking the indicating members in their respective rotated position, and manually operable means for returning the indicating members to their normal dormant position while a connection is maintained or at any time desired. 80

8. In a device of the class described, in combination with an automatic telephone having a dial rotatably mounted thereupon, a housing upwardly extending from and removably secured to the base of said telephone, a frame attachable to the dial shaft of said telephone, a plurality of graduated indicating members rotatably mounted within said frame, means for progressively rotating said indicating members to thereby visibly register the number dialed, a cam secured to the housing and adapted to co-act with said means, means for locking each indicating member after it registers its selected position to thereby maintain in view the number dialed, means for returning said indicating members to their normal dormant position when released and means for releasing said indicating members during the time when a telephonic connection is being maintained or at any time desired. 100

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