W. S. BURNETT.

SELECTOR.

APPLICATION FILED AUG. 26, 1912.

1,110,418. Patented Sept. 15, 1914.

Fig. 1.

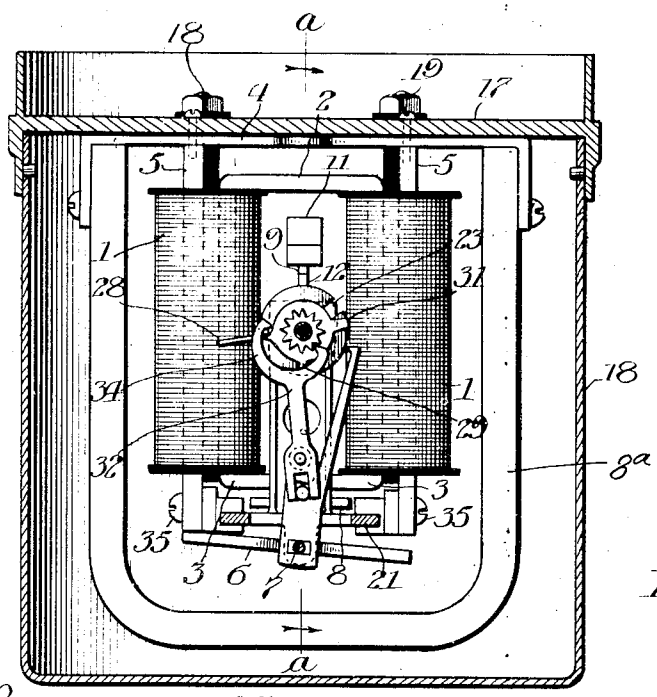


Fig. 2.

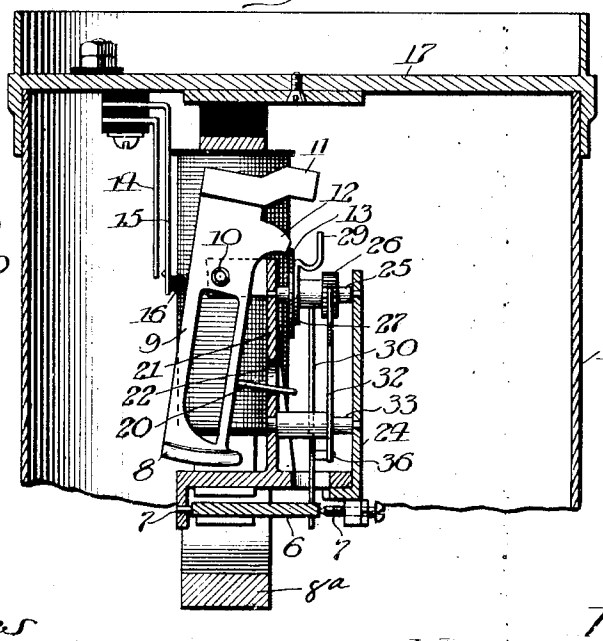


Fig. 3.

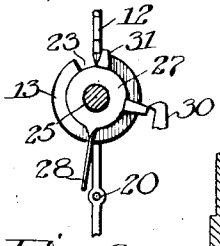


Fig. 4.

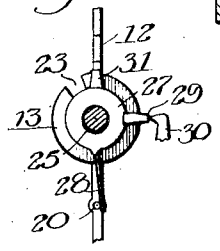


Fig. 6.

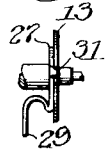
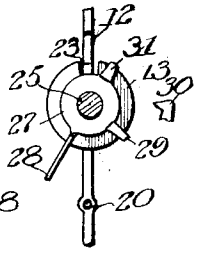


Fig. 5.



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UNITED STATES PATENT OFFICE.

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SELECTOR.

1,110,418. Specification of Letters Patent. Patented Sept. 15, 1914.

Application filed August 26, 1912. Serial No. 717,082.

To all whom it may concern.

Be it known that I, WILLIAM S. BURNETT, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a certain new and useful Improvement in Selectors, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to selectors for signaling and similar systems and has for its object the provision of an improved and simplified apparatus of this character.

My invention follows along the general lines set out in my previous Patent No. 970,180, issued Sept. 13, 1910, and is an improvement thereon.

My improved selector may, of course, be used in a great plurality of different ways and adapted to a great variety of different circuits and systems.

In this application I will set forth merely one form which my selector may take, not illustrating any particular system to which it may be applied. Of course, the specific description in this application of one form of carrying out the invention is naturally not intended to limit the invention, but this specific description is illustrative in character, from which the broad features of the invention may be readily deduced as pointed out in the appended claims.

I will describe this particular embodiment of my invention in connection with the accompanying drawing illustrating the same, in which

Figure 1 is a side view of an improved selector constructed in accordance with my invention, the casing whereof is shown in section; Fig. 2 is a partial sectional view on line *a*—*a* of Fig. 1, and Figs. 3, 4, 5 and 6 are views illustrating the various operative positions of a movable element of the device.

The selector herein comprises two coils 1, 1 forming a single winding which magnetize two separate and distinct magnetic circuits. The first magnetic circuit consists of the substantially C shaped core 2 whose legs pass interiorly of the coils 1, 1 and terminate in pole pieces 3, 3, and thus form one magnetic circuit; the other magnetic circuit comprises the heel piece 4 and the cores 5, 5 which project through the coils 1, 1. An armature 6 oscillatingly mounted upon pivots 7, 7 is associated with the cores 5, 5 and this armature is polarized by the permanent magnet 8^a so that this armature 6 occupies either one or the other of its two alternative positions, depending upon the polarity of the current last impressed on the coils 1, 1. An alternating current through the coils 1, 1, will of course oscillate the armature 6 with a frequency equal to the frequency of the impressed alternating current provided naturally the frequency is not too high to permit the said armature 6 to follow properly.

A second armature 8 is mounted in close proximity to the pole pieces 3, 3 and is secured to a swinging element 9 pivoted at 10, which swinging element by reason of its overweight 11 tends to normally occupy the position shown in Fig. 2. When any character of current, however, is impressed on the coils 1, 1, whether alternating or direct, the swinging element 9 is rotated contra-clockwise (Fig. 2) a few degrees sufficient to withdraw a projection 12 of this swinging element away from a rotatable plate 13, and likewise sufficient to close contact between springs 14 and 15 through the agency of the insulating button 16 preferably fastened to the spring 15 and abutting against this swinging element 9. This swinging element 9 has its central vertically arranged portion preferably plate shaped and the armature 8 forms a segmental piece at right angles to this plate shaped portion 9 so that this armature 8 is substantially parallel to the pole pieces 3, 3.

The magnetic elements above referred to are all suitably mounted upon a supporting plate 17 to which a hood 18 may be fastened so as to entirely inclose the working portions, binding posts such as 18 and 19 being provided to carry the circuit from without to within the inclosed portion of the device. The swinging element 9 likewise carries a pin 20 whose purpose will be explained later. A framework 21 of non-magnetic material is suitably secured between the cores 5, 5 by means of the screws 35, 35 and carries certain operating parts as will presently appear. An opening 22 in this framework permits the pin 20 to project therethrough freely.

The rotatable plate 13 is provided with a notch 23, which notch is angularly displaced in the different selectors corresponding to different sub-stations, to thereby control the selective feature of the device. This plate

13 is pivotally mounted between the framework 21 and an upright 24 secured to the framework 21, a shaft 25 being provided for this purpose. This shaft 25 likewise carries a toothed wheel 26 and a pronged plate 27, which plate 27, plate 13 and wheel 26 are securely fastened to the shaft 25. The plate 27 has three projecting elements, one an arm 28 which is used to come into contact with the pin 20 when the devices are being restored to their normal position; an arm 29 adapted to contact with a pointer 30 fastened to the armature 6 and movable therewith so as to prevent further operative rotation of the wheel 26 by the armature 6 when the arm 28 engages the pin 20; and an L shaped arm 31 projecting toward the periphery of the plate 13 and then downwardly therefrom so as to be engaged by the projection 12 after the entire signaling and restoring operation has ceased, so as to move the shaft 25 a space of one-half cycle into its initial starting position to thereby carry the arm 28 out of the path of the pin 20. The downwardly projecting portion of the arm 31 is more clearly illustrated in Fig. 6 from which it will be apparent that when this cam shaped projection of the arm 31 is engaged by the projection 12 of the movable element 9 that the movable elements carried by the shaft 25 are rotated a short space to bring them to their starting position.

In order to set the device an escapement lever 32 is provided which is secured to the shaft 33 pivotally mounted between the standard 24 and the framework 21. This lever 32 has the arms 34, 34, whereby an oscillation of this arm causes a rotation of the shaft 25 by reason of the engagement of the prongs of the arms 34 with the toothed wheel 26. This is along the general lines of well known escapement mechanism and need not probably be further explained here.

In the operation of my device I utilize preferably alternating currents or their equivalent and each cycle of current, that is, one positive and one negative impulse move the rotatable elements one step. Thus for each cycle there is one engagement between the wheel 26 and each one of the prongs carried by the arms 34. Naturally if but a half cycle is sent of such polarity to reverse the position of the armature 6, then the movable elements rotate but one-half step. This oscillating arm 32 is oscillated by means of a pin 36 carried by the arm 30. Thus whenever the armature 6 oscillates, the escapement arm 32 is oscillated and thereby the selective elements of the device are rotated therein.

Now assume that the device is in the position shown in Fig. 3 which is the starting position, assuming also that the armature 6 is in the position shown in Fig. 1 as the armature is always supposed to occupy a normal position on one side by reason of the fact that the last impulse always to be sent out is supposed to be of a given predetermined polarity. It is likewise assumed that the slot 23 is placed in such a position that two complete cycles must be sent in order for this particular device to respond. Assume then that two complete cycles, that is, two positive and two negative impulses are received by the armature, then each arm of the escapement mechanism will have engaged the wheel 26 twice and it will have moved four half steps. The initial impulse likewise rotates the swinging element 9 in a contra-clockwise direction so that its projection 12 is away from the periphery of the wheel 13 and it remains in this position during the sending of the impulses. After the impulses have finally ceased, this arm 9 swings around by reason of the weight 11 and the projection 12 enters the notch 23 in which position, circuit is closed between springs 14 and 15. Of course, only those devices respond in which the notches directly register with the projection 12 as shown in Fig. 5, because in the other devices the projection merely falls against the periphery of the wheel 13 and in such a position the contact between the springs 14 and 15 is not closed.

Assuming now that the station has been called and it is desired to restore the devices to normal, then additional impulses are sent to move the rotatable element progressively around so as to complete its rotation back to its starting point. The armature 6 is thereby oscillated by additional impulses, the first impulse having withdrawn the projection 12 from the notch 23 and these impulses are sent in a number exceeding the number required to complete the rotation back to the starting point of the wheel 26. The element 9, however, being in its attracted position has pushed the pin 20 into the path of the arm 28 as shown in Fig. 4 and thus the movable elements move only to the position indicated in Fig. 4, irrespective of the excessive number of cycles received. In this position illustrated in Fig. 4 the arm 30 likewise is opposite the arm 29 and even though excessive cycles are received the escapement element 32 no longer engages the teeth of the wheel 26 as the armature 6 is prevented from moving its required operative distance by the engagement of its arm with the stop 29. Finally, however, the impulses cease, leaving the armature 6 in the position shown in Fig. 1 and likewise permitting the swinging element 9 to assume the position shown in Fig. 2. While this element 9 is assuming this position, its projection 12 engages the cam shaped portion of the arm 31 and rotates the movable elements a half step into the position shown in Fig. 3, at which

time the arm 28 is beyond the pin 30 and the projection 12 again rests against the periphery of the wheel 13. The notch is so chosen so as to make the particular instrument responsive to a certain number of cycles.

From this description it is thought the general operation of my improved selector will be apparent as will also the fact that it is capable of use in a variety of different ways, and in connection with a plurality of different systems.

Having thus, however, described one form which my invention may take, what I claim as new and desire to secure by Letters Patent is:

1. A device of the character described having a winding, two armatures under the control of said winding in independent magnetic circuits, a circuit controlling device under the control of one armature, means under the control of the second armature to mechanically control the first aforesaid armature, and means under the control of said first armature to shift said means.

2. A device of the character described having a winding, two armatures under the control of said winding, a circuit controlling device under the control of one armature, and movable means under the control of the second armature to mechanically control the first aforesaid armature, said movable means having a projection and said second armature having an auxiliary arm adapted to engage said projection when said movable means is in a given position to prevent further operative movement of said second armature.

3. A device of the character described having a winding, two armatures under the control of said winding, a circuit controlling device under the control of one armature, movable means under the control of the second armature to mechanically control the first aforesaid armature, said movable means having means operable when said movable means is in a given position to control said second armature, and means whereby said first armature controls said movable means to release its control over the second aforesaid armature.

4. A device of the character described having a winding, two armatures under the control of said winding, a circuit controlling device under the control of one armature, means under the control of the second armature to mechanically control the first aforesaid armature, and means controlled by said first armature when said first aforesaid means is in a given position to shift said first aforesaid means to normal.

5. A device of the character described having a winding, two armatures under the control of said winding, a circuit controlling device under the control of one armature, means under the control of the second armature to mechanically control the first aforesaid armature, and a projection on said first armature to prevent the restoration of said first aforesaid means to normal during actuation of said first armature.

6. A device of the character described having a winding, two armatures under the control of said winding in two independent magnetic circuits, a circuit controlling device under the control of one armature, escapement controlled means under the control of the second armature to mechanically control the first aforesaid armature, and means under the control of said first armature to shift said means.

7. A device of the character described having a winding, two armatures under the control of said winding, a circuit controlling device under the control of one armature, and movable escapement controlled means under the control of the second armature to mechanically control the first aforesaid armature, said movable means having a projection and said second armature having an auxiliary arm adapted to engage said projection when said movable means is in a given position to prevent further operative movement of said second armature.

8. A device of the character described having a winding, two armatures under the control of said winding, a circuit controlling device under the control of one armature, movable escapement controlled means under the control of the second armature to mechanically control the first aforesaid armature, said movable means having means operable when said movable means is in a given position to control said second armature, and means whereby said first armature controls said movable means to release its control over the second aforesaid armature.

9. A device of the character described having a winding, two armatures under the control of said winding, a circuit controlling device under the control of one armature, escapement controlled means under the control of the second armature to mechanically control the first aforesaid armature, and means controlled by said first armature when said first aforesaid means is in a given position to shift said first aforesaid means to normal.

10. A device of the character described having a winding, two armatures under the control of said winding, a circuit controlling device under the control of one armature, escapement controlled means under the control of the second armature to mechanically control the first aforesaid armature, and a projection on said first armature to prevent the restoration of said first aforesaid means to normal during the actuation of said first armature.

11. A device of the character described

having a winding, two armatures under the control of said winding, a circuit controlling device under the control of one armature, means under the control of the second armature to mechanically control the first aforesaid armature, and means under the control of said first armature to shift said means.

In witness whereof I hereunto subscribe my name this twentieth day of July, A. D. 1912.

WILLIAM S. BURNETT.

Witnesses:
JOHN P. COYLE,
GEO. BAUER.