

July 31, 1934.

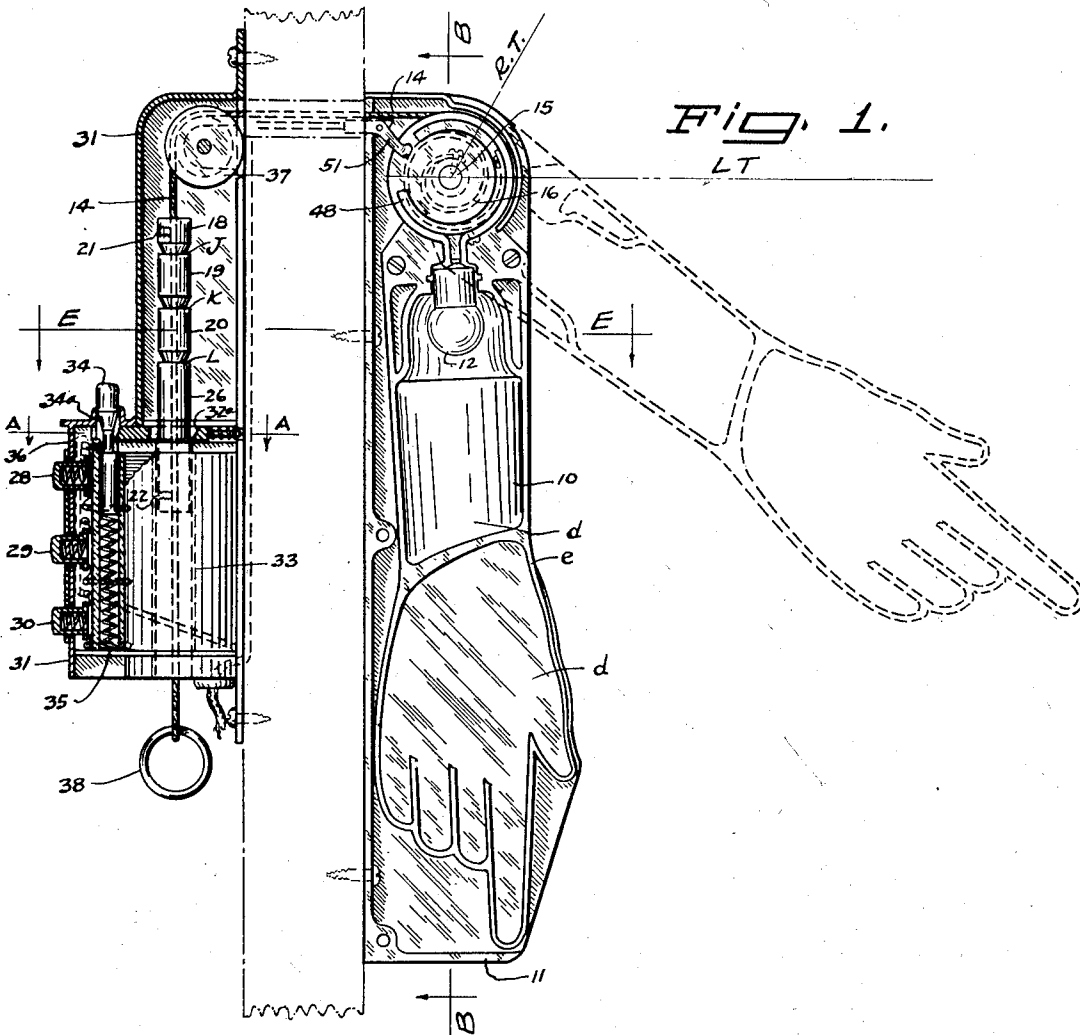
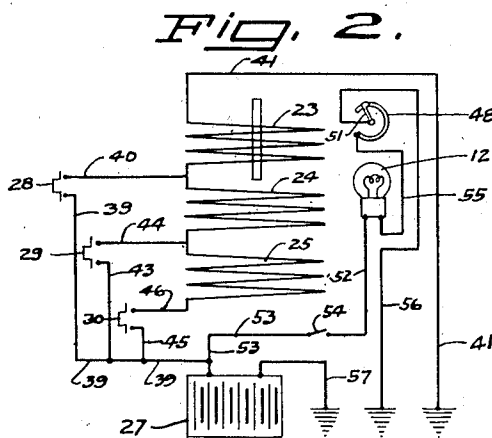
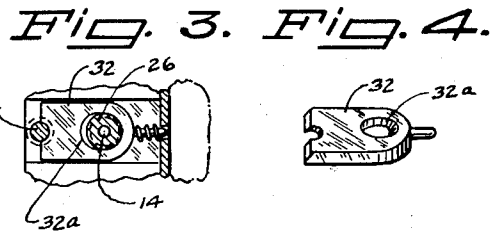
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1,968,554

AUTOMOBILE SIGNAL ARM

Filed Feb. 5, 1930

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

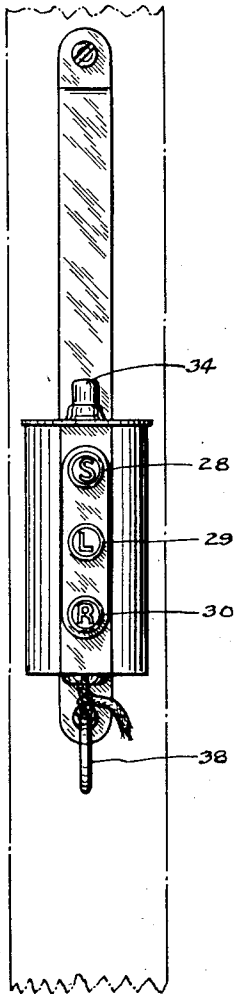


Fig. 5.

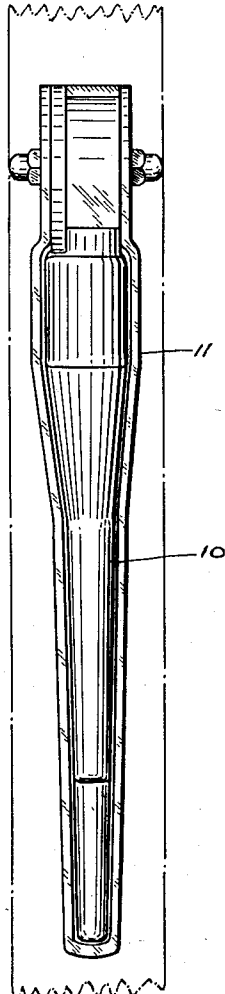


Fig. 6.

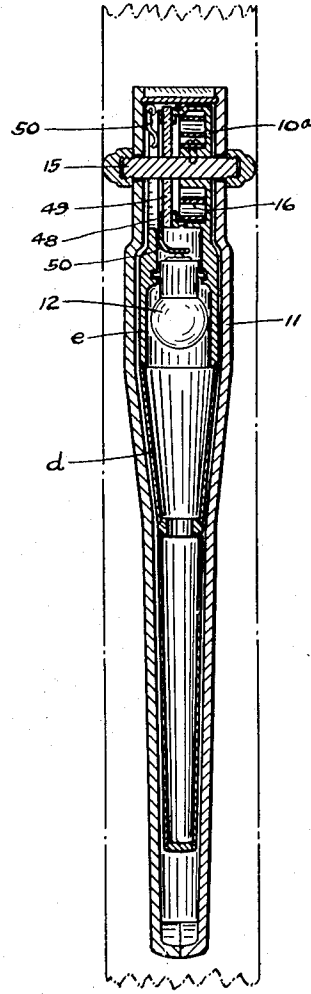


Fig. 7.

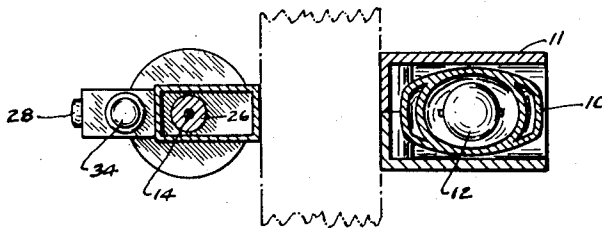


Fig. 8.

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UNITED STATES PATENT OFFICE

1,968,554

AUTOMOBILE SIGNAL ARM

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Application February 5, 1930, Serial No. 426,044

14 Claims. (Cl. 175—337)

This invention relates to an improved signalling arm to be used in connection with automobiles and especially relates to improved means for electrically operating and controlling the arm.

It is very important that the operation of a directional signalling device which is used in connection with automobiles be as simple as possible so as to require the least amount of labor to operate same. It is also important that the controlling of the arm be positive so as to eliminate any possibility of the arm not stopping in the correct signalling position and thus giving an incorrect signal. A further requirement to make an automobile directional signalling device practical is to illuminate the arm in a manner that will distinctly bring out the outline and features of the arm in such a way as to make it practically impossible for a driver of a following or an approaching car not to be attracted by the signal.

It is one of the objects of the present invention to provide an automobile signalling arm with improved electrical means for raising the arm to different signalling positions.

It is another object of the invention to provide means whereby the signal may be operated by merely pressing a button which designates the particular signal that is to be given.

It is another object of the invention to provide improved means for automatically locking the arm when it is raised to a certain signalling position and means whereby the arm can be unlocked by simply pressing a button which will then permit the arm to move back to its normal position.

It is a further object of the invention to construct the signalling arm with transparent sides and to provide an electric lamp between the sides and thus illuminate the side from the inside of the arm.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be made manifest in the following description of the preferred form of the invention that is illustrated in the drawings accompanying and forming part of the specification.

It is to be understood that it is not intended to limit the invention to the embodiment shown by said drawings and description as variations may be adapted within the scope of the invention as set forth in the claims.

In the accompanying drawings:

Figure 1 is a longitudinal sectional view of one type of device involved in the invention.

Figure 2 is a diagrammatic view of an electrical wiring system used in the invention.

Figure 3 is a sectional view taken on line A—A

of Figure 1, looking in the direction of the arrows.

Figure 4 is a perspective view of a catch used in the invention.

Figure 5 is side elevational view of the portion of the device that goes on the inside of the car and shows the signal buttons used to operate the invention.

Figure 6 is a side elevational view of the portion of the device that goes on the outside of the car.

Figure 7 is a longitudinal sectional view taken on line B—B of Figure 1, looking in the direction of the arrows.

Figure 8 is a sectional view taken through line E—E of Figure 1, looking in the direction of the arrows.

Referring in detail to the different parts involved in the invention, the numeral 10 designates the preferred type of signal arm and is preferably formed hollow as shown in Figure 1, having two sides *a* and *b* that are held together in any suitable manner. The arm is preferably provided with a metal frame as designated by *c*, and transparent material *d*, is provided on each side of the arm and fastened in the frame thereof in any suitable manner. An electric light 12 is mounted on the arm and is arranged between the two sides as shown in Figure 7. This is provided to illuminate the arm from the inside and thus have the rays of light show through the transparent material in each side of the arm. It is to be understood that glass, celluloid, or any suitable material that can be made transparent may be used in the sides of the arm. For example, such material as bakelite could be made thin enough to permit a certain amount of light to pass through it. Likewise, fine wire screen could be used. Also non-transparent material could be used and holes provided through the sides to permit the light to pass through. The arm is pivotally mounted on a frame 11 that is fastened to the outside of the car and is made in such shape as to provide a suitable housing for enclosing the arm when it is in its normal position, and is made open in front to permit the arm to swing outwardly. The upper portion 10*a* of the arm is made round and is provided with a circular groove for a flexible cord 14 to fit in. One end of this cord is fastened in said groove and another portion fastened to the operating mechanism which will hereinafter be explained. Any suitable method may be used to pivot the arm to the housing, Figure 7 showing a pin 15 mounted through the housing 11 and held thereon by lock nuts, and the arm is revolvably mounted on

said pin. A spring 16, preferably in the form of a standard clock spring is provided and one end is fastened to the pin 15 and the other end is fastened to the arm, as shown in Figures 1 and 7, to resiliently force the arm back to its normal position after it has been raised to a signalling position. This spring serves two purposes, first it is a positive means for forcing the arm back to its normal position and second, it resiliently holds the arm in its normal position and prevents same from vibrating when it is not being used.

The preferred means used for electrically operating the arm consists in providing a solenoid, and connecting the magnetic coil thereof to the battery of the car and the core to the flexible cord that is fastened to the arm. In Figure 1 there is illustrated four iron cores 18, 19, 20 and 26 that are mounted on the flexible cord 14 and fastened thereto by set screws 21 and 22. For illustration the magnetic coil is made in three divisions 23, 24, 25, all of which are electrically connected to the battery 27 of the car. Standard push buttons 28, 29 and 30 are provided and each, respectively, designated with its respective signal character S, L, R, and are mounted on the housing 31 that holds the magnetic coil as shown in Figures 1 to 5. The top of each of the cores is flat and the lower portion of the cores 18, 19 and 20 is tapered and forms shoulders J, K, L, as shown in Figure 1. A spring locking member 32, shaped as shown in Figures 3 and 4, is provided and slidably mounted in the housing 31, above the magnetic coil, and the cores are mounted through the tapered opening 32a in the locking member as shown in Figures 1 and 3. The cores are slidably supported in a cylinder 33 that extends through the magnetic coil. It will be seen that when the cores are moved downwardly, the locking member will be resiliently forced against the tapered portions of the cores and will catch over the shoulders J, K or L, depending on the distance the cores are moved down. Means for releasing the catch consists in providing a pin 34, having a tapered portion 34a and mounting the pin against the tapered end portion of the locking member 32 as shown in Figure 1. This pin is slidably supported in the housing 31 and rests on a compressed spring 35 as shown in Figure 1. The pin 34 is formed with a shoulder as shown in Figure 1 and a set screw 36 is provided in the housing 31 and arranged to abut against said shoulder to prevent the pin from being moved out of the housing. It will be seen that when it is desired to release the arm from a signalling position, the pin 34 is simply depressed and the locking member will be pushed to a position where the cores will be free. A pulley wheel 37 is revolvably mounted in the upper portion of the housing 31 and the flexible cord 14 is mounted over said pulley. The bottom of said cord preferably extends through the housing 31 and is provided with a ring 38 on the end thereof as shown in Figure 1.

The wiring diagram is illustrated in Figure 2, and from the foregoing it will be seen that if the stop signal button 28 is depressed, contact will be made with the electrical conductors 39 and 40 and electrical energy will flow from the battery 27 through conductor 39, contact button 28, conductor 40, section 23 of the magnetic coil, and grounded through conductor 41, thus energizing said part of the coil and causing a quick magnetic force to be exerted on the cores which will draw them downwardly to a distance where the shoulder L will catch in the locking member 32 and

the arm 10 move to its "stop" signalling position. Likewise when the left turn signal button 29 is depressed, contact will be made with electric conductors 43 and 44 and electrical energy will flow from the battery 27 through conductors 39, 43, contact button 29, conductor 44, magnetic coil sections 24 and 23 and grounded through conductor 41, thus energizing the coil sections 23 and 24 which will exert sufficient magnetic force on the cores to draw them downwardly to a distance where the shoulder K will catch in the locking member 32 and the arm 10 move to the left turn signalling position the center line of which is designated by the line LT. Likewise when the right turn signal button 30 is depressed, contact will be made with conductors 45 and 46 and electrical energy will flow from the battery 27 through conductors 39, 45, contact button 30, conductor 46, magnetic coil sections 25, 24, and 23 and grounded through conductor 41, thus energizing said magnetic coil sections which will exert sufficient magnetic force on the cores to draw them downwardly to a distance where the shoulder J will catch in the locking member 32 and the arm 10 move to the right turn signalling position, the center line of which is designated by the line RT. It is to be particularly noted that the distance between the locking member 32 and the shoulder L is the distance required to move the arm to its stop signalling position. Likewise the distances between the locking member 32 and the shoulders K and J are the distances required to move the arm to the left turn and right turn positions, respectively. When the pin 34 is depressed, the cores will become free from the lock and the spring 16 will force the arm back to its normal position.

Means for lighting the lamp 12 simultaneously with the movement of the arm consists in providing an arc-shaped metal member 48 and fastening same to the arm and insulating the said member 48 by an insulating piece 49 as shown in Figure 7. Another metal piece 50 is provided to connect the lamp to the arc. Another metal piece 51 is fastened to the housing 11 and is insulated therefrom and is connected to the lamp 12 by conductor 55 and said lamp is connected to battery 27 by electric conductors 52 and 53. A switch 54 is provided between the conductors 52 and 53 so that the lamp may be disconnected from the battery when desired. The metal member 51 is made in such shape and arranged in such relation to the arc member 48 that it will be free from the arc member when the arm is in its normal position as shown in Figure 1 and the arc member 48 will come in contact with the member 51 when the arm is moved to a signalling position and electrical energy will flow from the battery 27 through conductor 53, switch 54, conductor 52, lamp 12, lighting said lamp and is grounded through conductor 55, arc member 48, member 51 and conductor 56.

From the foregoing it will be seen that this signal is of the magnetic electric illuminated type and consists of an arm representing a human hand, and the upper part of the arm pivoted in the desired position and is controlled by means of the magnetic switch. Said switch is, as well as the signal arm itself, built into separate housings. To install the device, all that is necessary is to drill a $\frac{3}{8}$ " hole through the left front door frame for accommodating the flexible cord that is connected to the arm and the magnetic cores and also to drill the necessary holes so that the housings may be fastened by suitable screws

on the automobile door frame. To operate this signal, all that is necessary is to press the push button S for stop, L for left turn, and R for right turn. The hand will then immediately respond to the desired position and remain in such position until the release lock button located directly above the push buttons is depressed.

Having thus illustrated and described a certain form of construction and arrangement of parts pertaining to the invention, it is desired to include in this application for Letters Patent of the United States of America any and all patentable novelty that exists in the invention disclosed and all that comes within the fundamental principle of the invention as set forth in the claims hereinafter mentioned.

What is claimed:

1. A controlling unit for a solenoid having a plurality of windings axially juxtaposed and serially connected, a tap for each terminal and a tap for each connection; comprising, a core having a plurality of spaced annular engaging grooves formed therein, core engaging means and resilient urging means therefor, finger operated release means for releasing said core engaging means, and resilient urging means therefor, and a circuit closing switch for each connection tap to selectively complete a circuit from each connection tap to one terminal tap, and a housing for said controlling unit and said windings, said core engaging means consisting of a member slidably mounted in the upper end of the housing in a plane transversely related to the axis of the core and having an elongated beveled opening formed therethrough to receive the core, a spring, a spring retaining pin at one end and a beveled recess formed in the other end to cooperate with the finger release whereby the member is released from engagement with the core by the finger release against the urge of the spring.

2. A controlling unit for a solenoid having a plurality of windings axially juxtaposed and serially connected, a tap for each terminal and a tap for each connection; comprising, a core having a plurality of spaced annular engaging grooves formed therein, core engaging means and resilient urging means therefor, finger operated release means for releasing said core engaging means, and resilient urging means therefor, and a circuit closing switch for each connection tap to selectively complete a circuit from each connection tap to one terminal tap, and a housing for said controlling unit and said windings, said finger release operating in a plane parallel to the axis of the core and comprising a plunger having the end projecting above the housing and being slidably mounted within the housing and having a reduced portion formed intermediate the height thereof, the lower end of the reduced portion being formed at right angles to the axis of the plunger to cooperate with the core engaging means and be retained thereby, the upper portion having a divergent surface to urge the core engaging means to release position when the plunger is depressed, and a spring urging the plunger to its uppermost position.

3. A controlling unit for a solenoid having a plurality of windings axially juxtaposed and serially connected, a tap for each terminal and a tap for each connection; comprising, a core having a plurality of spaced annular engaging grooves formed therein, core engaging means and resilient urging means therefor, finger operated release means for releasing said core engaging means, and resilient urging means therefor, and a

circuit closing switch for each connection tap to selectively complete a circuit from each connection tap to one terminal tap, and a housing for said controlling unit and said windings, said grooves being conically formed to permit retention of the core by the engaging means against axial movement in only one direction, said finger release operating in a plane parallel to the axis of the core and comprising a plunger having the end projecting above the housing and being slidably mounted within the housing and having a reduced portion formed intermediate the height thereof, the lower end of the reduced portion being formed at right angles to the axis of the plunger to cooperate with the core engaging means and be retained thereby, the upper portion having a divergent surface to urge the core engaging means to release position when the plunger is depressed, and a spring urging the plunger to its uppermost position.

4. A controlling unit for a solenoid having a plurality of windings axially juxtaposed and serially connected, a tap for each terminal and a tap for each connection; comprising, a core having a plurality of spaced annular engaging grooves formed therein, core engaging means and resilient urging means therefor, finger operated release means for releasing said core engaging means, and resilient urging means therefor, and a circuit closing switch for each connection tap to selectively complete a circuit from each connection tap to one terminal tap, and a housing for said controlling unit and said windings, said core engaging means consisting of a member slidably mounted in the upper end of the housing in a plane transversely related to the axis of the core and having an elongated beveled opening formed therethrough to receive the core, a spring, a spring retaining pin at one end and a beveled recess formed in the other end to cooperate with the finger release whereby the member is released from engagement with the core by the finger release against the urge of the spring, said finger release operating in a plane parallel to the axis of the core and comprising a plunger having the end projecting above the housing and being slidably mounted within the housing and having a reduced portion formed intermediate the height thereof, the lower end of the reduced portion being formed at right angles to the axis of the plunger to cooperate with the core engaging means and be retained thereby, the upper portion having a divergent surface to urge the core engaging means to release position when the plunger is depressed, and a spring urging the plunger to its uppermost position.

5. A controlling unit for a solenoid having a plurality of windings axially juxtaposed and serially connected, a tap for each terminal and a tap for each connection; comprising, a core having a plurality of spaced annular engaging grooves formed therein, core engaging means and resilient urging means therefor, finger operated release means for releasing said core engaging means, and resilient urging means therefor, and a circuit closing switch for each connection tap to selectively complete a circuit from each connection tap to one terminal tap, and a housing for said controlling unit and said windings, said core engaging means consisting of a member slidably mounted in the upper end of the housing in a plane transversely related to the axis of the core and having an elongated beveled opening formed therethrough to receive the core, a spring, a spring retaining pin at one end and a beveled

recess formed in the other end to cooperate with the finger release whereby the member is released from engagement with the core by the finger release against the urgency of the spring, said switches being mounted serially in a vertical plane on the front of said housing and thereby being isolated from the finger release operable at the top of said housing, said switches each consisting of a plunger operable through an opening in the housing and a spring for projecting the plunger to normally maintain the circuit broken.

6. A controlling unit for a solenoid having a plurality of windings axially juxtaposed and serially connected, a tap for each terminal and a tap for each connection; comprising, a core having a plurality of spaced annular engaging grooves formed therein, core engaging means and resilient urging means therefor, finger operated release means for releasing said core engaging means, and resilient urging means therefor, and a circuit closing switch for each connection tap to selectively complete a circuit from each connection tap to one terminal tap, and a housing for said controlling unit and said windings, said finger release operating in a plane parallel to the axis of the core and comprising a plunger having the end projecting above the housing and being slidably mounted within the housing and having a reduced portion formed intermediate the height thereof, the lower end of the reduced portion being formed at right angles to the axis of the plunger to cooperate with the core engaging means and be retained thereby, the upper portion having a divergent surface to urge the core engaging means to release position when the plunger is depressed, and a spring urging the plunger to its uppermost position, said switches being mounted serially in a vertical plane on the front of said housing, and thereby being isolated from the finger release operable at the top of said housing, said switches each consisting of a plunger operable through an opening in the housing, and a spring for projecting the plunger to normally maintain the circuit broken.

7. A controlling unit for a solenoid having a plurality of windings axially juxtaposed and serially connected, a tap for each terminal and a tap for each connection; comprising, a core having a plurality of spaced annular engaging grooves formed therein, core engaging means and resilient urging means therefor, finger operated release means for releasing said core engaging means, and resilient urging means therefor, and a circuit closing switch for each connection tap to selectively complete a circuit from each connection tap to one terminal tap, and a housing for said controlling unit and said windings, said grooves being conically formed to permit retention of the core by the engaging means against axial movement in only one direction, said finger release operating in a plane parallel to the axis of the core and comprising a plunger having the end projecting above the housing and being slidably mounted within the housing and having a reduced portion formed intermediate the height thereof, the lower end of the reduced portion being formed at right angles to the axis of the plunger to cooperate with the core engaging means and be retained thereby, the upper portion having a divergent surface to urge the core engaging means to release position when the plunger is depressed, and a spring urging the plunger to its uppermost position, said switches being mounted serially in a vertical plane on the front of said housing and thereby being isolated

from the finger release operable at the top of said housing, said switches each consisting of a plunger operable through an opening in the housing, and a spring for projecting the plunger to normally maintain the circuit broken.

8. A controlling unit for a solenoid having a plurality of windings axially juxtaposed and serially connected, a tap for each terminal and a tap for each connection; comprising, a core having a plurality of spaced annular engaging grooves formed therein, core engaging means and resilient urging means therefor, finger operated release means for releasing said core engaging means, and resilient urging means therefor, and a circuit closing switch for each connection tap to selectively complete a circuit from each connection tap to one terminal tap, and a housing for said controlling unit and said windings, said core engaging means consisting of a member slidably mounted in the upper end of the housing in a plane transversely related to the axis of the core and having an elongated beveled opening formed therethrough to receive the core, a spring, a spring retaining pin at one end and a beveled recess formed in the other end to cooperate with the finger release whereby the member is released from engagement with the core by the finger release against the urgency of the spring, said finger release operating in a plane parallel to the axis of the core and comprising a plunger having the end projecting above the housing and being slidably mounted within the housing and having a reduced portion formed intermediate the height thereof, the lower end of the reduced portion being formed at right angles to the axis of the plunger to cooperate with the core engaging means and be retained thereby, the upper portion having a divergent surface to urge the core engaging means to release position when the plunger is depressed, and a spring urging the plunger to its uppermost position, said switches being mounted serially in a vertical plane on the front of said housing and thereby being isolated from the finger release operable at the top of said housing, said switches each consisting of a plunger operable through an opening in the housing and a spring for projecting the plunger to normally maintain the circuit broken.

9. A controlling unit of the character described comprising a solenoid provided with a plurality of axially spaced windings connected in series, a core for said solenoid provided with a plurality of notches, a locking member having an opening therein so positioned that the core may move through it in such manner that the edge of said opening may engage any of the said notches which comes in register therewith, means yieldably urging said locking member to notch-engaging position, and selective circuit closing means controlling said solenoid windings.

10. A controlling unit of the character described comprising a solenoid provided with a plurality of axially spaced windings connected in series, flexibly connected core members for said solenoid windings provided with a plurality of notches, a locking member having an opening therein so positioned that the core may move through it in such manner that the edge of said opening will engage any of the notches which may be in register therewith, means yieldably urging said locking member to notch-engaging position, manual means for disengaging said locking member, and selective circuit closing means controlling said solenoid windings.

11. A controlling unit of the character de-

scribed comprising a solenoid provided with a plurality of axially spaced windings connected in series, a core for said solenoid provided with a plurality of notches, a plate-like locking member 5 having an opening therein so positioned that the core may move through it in such manner that the edge of the opening will engage any of the notches which may be in register therewith, said locking member also having a beveled edge, means 10 yieldably urging said locking member to notch-engaging position, manually operated cam means engaging said beveled edge so as to move said locking member to a disengaged position, and selective circuit closing means controlling said 15 solenoid windings.

12. A controlling unit of the character described comprising a solenoid provided with a plurality of axially spaced windings connected in series, a core for said solenoid provided with a 20 plurality of notches, a plate-like locking member having an opening therein so positioned that the core may move through it in such manner that the edge of the opening will engage any of the notches which may be in register therewith, said 25 locking member also having a beveled edge, means yieldably urging said locking member to notch-engaging position, a spring pressed pin having a tapered portion in engagement with said beveled edge in such manner that depression of said pin 30 will move said locking member to disengaged position, and selective circuit closing means controlling said solenoid windings.

13. A controlling unit of the character described comprising a housing, a solenoid provided with a plurality of windings longitudinally 35 spaced within said housing and connected in series, a core for said solenoid provided with a plurality of notches, a locking member arranged to move transversely of said housing, said locking member having an opening therein so positioned that the core may move through it in such manner 40 that the edge of the opening will engage any of the notches that may be in register therewith, means yieldably urging said locking member to notch-engaging position, a release pin disposed longitudinally of said housing and projecting from the top thereof, said release pin having means constructed and arranged to move said 45 locking member to disengaging position, and a plurality of push buttons carried in a side of said housing and in longitudinal alignment, said buttons being so connected with said windings as to selectively control the circuits thereto.

14. A controlling unit of the character described comprising a housing, a solenoid provided with a plurality of windings longitudinally spaced within said housing and connected in series, a 50 core for said solenoid provided with a plurality of notches, a locking member arranged to move transversely of said housing, said locking member having an opening therein so positioned that the core may move through it in such manner 55 that the edge of the opening will engage any of the notches that may be in register therewith, said locking member also having a beveled edge, means yieldably urging said locking member to notch-engaging position, a release pin movable longitudinally with respect to the casing and projecting from the top thereof, said pin having a 60 tapered portion normally engaging the beveled portion of said locking member, a spring normally holding said pin in raised position, and a plurality of push buttons in one side of said housing and in longitudinal alignment, said buttons being so connected with said windings as to selectively control the circuits thereto. 65

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