

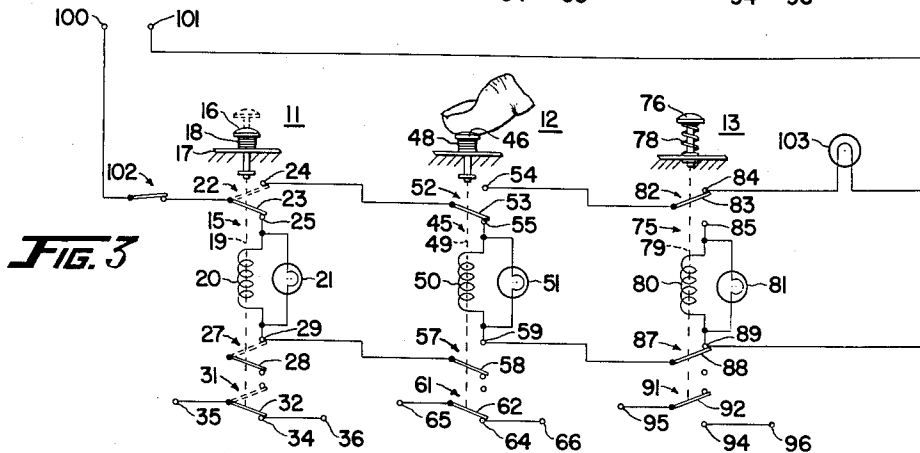
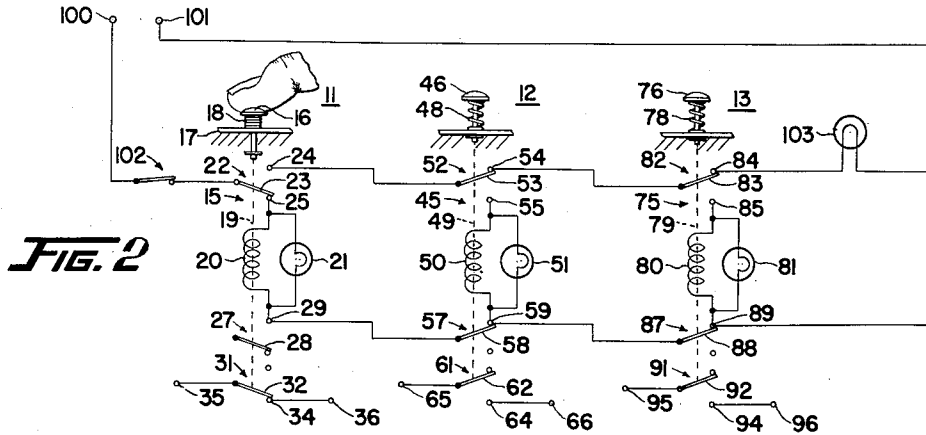
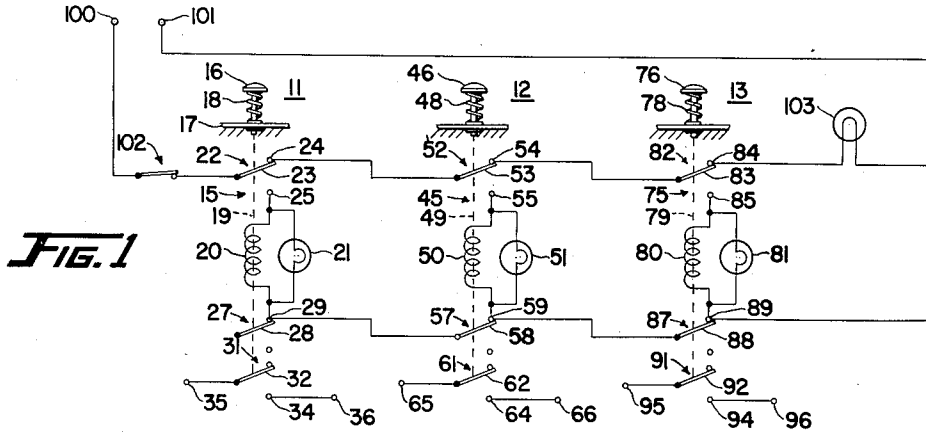
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SWITCH ARRANGEMENT

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SWITCH ARRANGEMENT

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The present invention is directed to an arrangement including a plurality of inter-related electrically operated devices, only one of which can be maintained in an actuated condition at any given moment.

There are presently available many arrangements wherein a plurality of devices are inter-related so that but a single one of the devices can be maintained in an actuated condition at any given moment. These arrangements take many forms.

There are mechanical arrangements wherein mechanical inter-locks are utilized to maintain a given one of the devices in an actuated condition until a second one of the devices is actuated, whereby the first device is released and allowed to return to a normal position.

Electrical arrangements are also available which function to maintain but a single one of a plurality of inter-related electrically operated devices in an actuated condition. One example of the last mentioned type is an arrangement wherein an electromagnet is associated with each of a plurality of inter-related devices so that should a first device be actuated a circuit is established including the associated electromagnet resulting in the energization of the electromagnet and thereby causing continued maintained actuation of the first device. Further, the first device is released to assume a normal position upon the actuation of a second device, establishment of a second circuit, and energization of the electromagnet associated with the second device because of the energization of a further electromagnet placed in series with the aforementioned electromagnets. The further electromagnet has an energization level such that the current flowing through the electromagnet of the first actuated device is insufficient to cause the energization of said further electromagnet. However, the current flowing through the electromagnets of the first and second actuated devices is sufficient to cause energization of the further electromagnet and consequent opening of the circuits including the first and second devices. Upon this occurring, each of the electromagnets becomes de-energized and the first and second devices are allowed to return to a normal position and the circuits are again established to the extent that subsequent actuation of one of the devices will result in maintained actuation thereof.

Another form of an electrical arrangement of the type under consideration includes both an energization circuit and a holding circuit inter-related so that actuation of one of the devices results, initially, in setting up an energization circuit and movement of a portion of the device to set up a holding circuit and subsequent opening of the energization circuit. Further, upon actuation of a second device, the holding circuit of the first device is opened and an energization circuit and subsequent holding circuit for the second device is established.

Each of the aforementioned arrangements are complicated either mechanically or electrically. The invention disclosed herein while accomplishing the same result as the arrangements set forth above is directed to a far simpler arrangement. Essentially, the present invention

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includes a plurality of electrically operated devices only one of which can be maintained in an actuated condition at any given moment in that at most only one of the devices can be connected to a source of voltage at any given time. Each of the devices include first switch means which are inter-related with each other and which are associated with a first terminal of an electrically operated holding means of the respective devices. Upon actuation of a first device, the first switch means is positioned to establish a first electrical circuit including the holding means thereby causing energization of the holding means and maintained actuation of the first device. Further, each of the devices includes second switch means which are inter-related with each other and which are associated with the second terminal of the holding means of the respective devices. Upon actuation of the second of the devices, and with the first device in the actuated position, the first and second switch means associated with the second device are positioned so that the first electrical circuit is interrupted due to the position of either the first switch means or the second switch means, dependent upon the relative circuit relationship of the first and second devices, resulting in the first device being returned to a normal position and the establishment of a second electrical circuit and the energization of the holding means associated with the second device causing continued actuation of the second device. Thus, the first switch means and the holding means of each device are so associated and the first switch means are so inter-related, and the second switch means and the holding means of each device are so associated and the second switch means are so inter-related that the actuation of a first device results in a continued maintained actuation thereof due to the positioning of the first switch means associated therewith and the consequent establishment of an electrical circuit, while the device is returned to a normal position by the positioning of the first switch means or the second switch means of a second device depending, as was mentioned previously, on the relative circuit relationship of the first and second devices.

It is therefore an object of this invention to provide an arrangement including a plurality of electrically operated devices only one of which can be actuated and maintained in an actuated condition at any given moment.

This and other objects will become apparent from a reading of the following specification and appended claims in which:

Figure 1 is a schematic view of an arrangement including the subject matter of the present invention shown in a normal condition;

Figure 2 is a schematic view of the arrangement with a first of the electrically operated devices being actuated; and

Figure 3 is a schematic view of the arrangement with the first of the electrically operated devices in a maintained actuated condition and with a second electrically operated device being actuated.

Referring to Figures 1, 2, and 3, electrically operated devices 11, 12, and 13 are inter-related with each other and disposed in an electrical network.

Electrically operated device 11 is comprised of an actuator member 15 which includes a plunger portion 16 positioned from a fixed surface or wall 17 by a spring 18. The actuator member 15 includes an armature portion 19 which is associated with an electrically operated holding means or coil 20. The coil 20 has an electric light 21, or similar indicator, placed in parallel therewith. A first switch means 22 includes a first switch comprised of a movable switch blade 23 and a fixed contact 24 and a second switch comprised of the movable switch blade 23 and a fixed contact 25. The fixed contact 25 is associated with a first terminal of the coil

20. A second switch means 27 includes a movable switch blade 28 and a fixed contact 29. Fixed contact 29 is associated with the second terminal of the coil 20. A third switch means 31 includes a movable switch blade 32 and a fixed contact 34. Terminals 35 and 36 associated with the third switch means 31 may be connected to a load device, not shown. The actuator member 15 is operatively connected to the movable switch blades 23, 28, and 32 of the switch means 22, 27 and 31, respectively.

Like electrically operated device 11, electrically operated device 12 is comprised of an actuator member 45 including a plunger portion 46 and an armature portion 49 associated with a coil 50 across which a light 51, or similar device, is placed in parallel. A spring 48 is provided to position the plunger 46. A first switch means 52 including a movable switch blade 53 and fixed contacts 54 and 55 is provided as well as a second switch means 57 including a movable switch blade 58 and fixed contact 59. Similarly, a third switch means 61 comprised of a movable switch blade 62 and fixed contact 64 is provided. A load device, not shown, may be connected to the terminals 65 and 66.

Similarly, electrically operated device 13 is comprised of an actuator member 75 which includes a plunger portion 76 associated with a spring 78 and an armature portion 79 associated with a coil 80 across which a light 81, or similar device, is placed in parallel. A first switch means 82 is comprised of a movable switch blade 83 and fixed contacts 84 and 85, while a second switch means 87 is comprised of a movable switch blade 88 and a fixed contact 89. A third switch means 91 includes a movable switch blade 92 and a fixed contact 94. Terminals 95 and 96 may be connected to a load device, not shown.

A source of voltage, not shown, is connected to the input terminals 100 and 101. A switch 102 is disposed between and electrically connected to the terminal 100 and the switch blade 23 of the electrically operated device 11. An electric light 103, or similar device, is disposed between and electrically connected to the contact 84 of the electrically operated device 13 and the terminal 101.

Electrical conductors are disposed between the contact 24 of the electrically operated device 11 and the switch blade 53 of the electrically operated device 12 and the contact 54 of the electrically operated device 12 and the switch blade 83 of the electrically operated device 13.

Further, electrical conductors are disposed between: the contact 29 of the electrically operated device 11 and the switch blade 58 of the electrically operated device 12; the contact 59 of electrically operated device 12 and the switch blade 88 of electrically operated device 13 and the contact 89 of electrically operated device 13 and the terminal 101.

As shown in Figure 1 with the switch 102 in a closed position, and the electrically operated devices 11, 12, and 13 in a normal or first position and with the switches formed by switch blade 23 and contact 24, switch blade 53 and contact 54, and switch blade 83 and contact 84 in a closed position, a series circuit is established across the terminals 100 and 101, thereby causing illumination of the light 103 indicating the arrangement is ready for use.

Now should it be desired to actuate one of the electrically operated devices and to maintain such actuated device in an actuated or second position, all that is required is that the plunger associated with that device be moved from the normal or first position to the depressed or second position. Referring to Figure 2, it can be seen that the plunger 16 and hence actuator member 15 of the electrically operated device 11 has been moved from a normal to a depressed position. This results in the switch blade 23 being moved from the contact 24 to the contact 25. Similarly, switch blades 28

and 32 are moved in a downward direction. The movement of the switch blade 23 away from the contact 24 results in opening of the previously described series circuit across the terminals 100 and 101, which circuit included the light 103. With the electrically operated device 11 in the position shown in Figure 2, a series circuit is established across the source of voltage, not shown, between: terminal 100; switch 102; switch blade 23, contact 25, through the parallel legs formed by the coil 20 and light 21, terminal 29 of the device 11; switch blade 58 and contact 59 of the device 12; switch blade 88 and contact 89 of the device 13; and the terminal 101. The establishment of this circuit causes a field to be set up by the coil 20 which results in the armature 19, and hence actuator member, being maintained in the depressed position after the actuating force has been removed from the plunger 16. Likewise, the light 21 becomes illuminated indicating that the device 11 is in an actuated condition. Closure of the switch means 31 results in an electrical circuit being set up including the load device associated therewith, not shown. A similar process would be obtained had electrically operated device 12 or electrically operated device 13 been actuated. That is, the series circuit including the light 103 would have been interrupted and a series circuit would have been established including the coil and light of the particular actuated device. Similarly, the load device associated with the particular actuated device would have been connected into an electrical circuit.

Now should it be desired to actuate a second of the electrically operated devices with the previously actuated device being in the actuated condition, another of the plungers is depressed. Referring to Figure 3, electrically operated device 11 is shown in a transitory actuated condition with electrically operated device 12 being actuated. Movement of the plunger 46 to a depressed position results in the switch blade 53 being disengaged from the contact 54 and engaged with the contact 55. Likewise, switch blades 58 and 62 are moved in a downward direction. The movement of the switch blade 58 out of engagement with the contact 59 results in an interpretation of the series circuit set up by the actuation of the device 11. Thus, the electrical path between contact 59 of device 11 and switch blade 88 of device 13 is interrupted and current ceases to flow through the coil 20 and light 21 of the device 11, thereby eliminating the field set up by the coil 20 and removing the attraction between the coil and the armature portion 19 and extinguishing the light 21. Under the action of the spring 18, the actuator member 15 returns to the position shown in Figure 1. For ease in explanation with respect to Figure 3, the switch blades of the switch means 22, 27 and 31 are shown in phantom to correspond with the position they assume when the device 11 is in a normal position. With the device 11 in a normal position and with the plunger 46 of device 12 still in a depressed position, an electrical circuit is set up across the source of voltage, not shown, and between: terminal 100; switch 102; switch blade 23 and the contact 24 of device 11; switch blade 53, contact 55, through the parallel paths formed by coil 50 and light 51, contact 59, switch blade 88 and contact 89 of device 13; and terminal 101. Here again the passage of current through the coil 50 results in a field being set up which causes the armature 49, and hence the actuator member 45, to remain in a depressed position. Further, passage of current through the light 51 illuminates the same.

With the electrically operated device 12 in an actuated condition either electrically operated device 11 or electrically operated device 13 can be actuated thereby resulting in the opening of the series circuit containing the holding coil 50 and the initiation of a series circuit including the coil of the device actuated.

Thus, should the device 13 be actuated by depressing plunger 76 the switch blade 83 would be disengaged from

the contact 84 and engaged with the contact 85 and the switch blade 88 would be disengaged from the contact 89. The latter switch movement would interrupt the series circuit containing the coil 50 of the device 12 by opening the circuit between the fixed contact 59 of the device 12 and the terminal 101. This of course would result in the device 12 being returned to its normal position under the influence of the spring 48 whereby switch blade 53 would again engage contact 54. In this condition, a series circuit would be set up across the source of voltage, not shown, between: the terminal 100; switch 102; switch blade 23 and contact 24 of the device 11; switch blade 53 and contact 54 of the device 12; switch blade 83, contact 85, through the parallel paths formed by the coil 80 and the light 81, the fixed contact 89 of the device 13 and terminal 101. Here again a field would be set up by the coil 80 which would maintain the armature 79 and hence the actuator member 75, in a depressed position.

Instead of the device 13 having been actuated with the device 12 in an actuated condition, had the device 11 been re-actuated by depressing plunger 16, it would assume the position shown in Figure 3. Thus, the series circuit including the coil of the device 12 would be interrupted due to the position of the switch blade 23 in that it would open the circuit between the switch 102 and the switch blade 53 of the device 12. As has been explained previously, the device 12 would return to its normal position under the influence of the spring 48 and the switch blades 53 and 58 would once again engage the contacts 54 and 59, respectively, thereby setting up a series circuit including coil 20 which circuit was described with respect to Figure 2.

From the foregoing it can be appreciated that actuation of one of the electrically operated devices results in a maintained actuation of that device until a subsequent actuation of a second electrically operated device occurs. Of course, switch 102 can be opened at any time and the devices will all assume the position shown in Figure 1.

With respect to the above explanation, it will be appreciated that movement of the switch blade associated with the switch means 22, 52 and 82 of the devices 11, 12 and 13 respectively, performs one or two functions depending upon whether a previous device has been actuated and the relative circuit relationship between the previously actuated device and the subsequently actuated device. The switch means 27, 57 and 87 of the devices 11, 12 and 13, respectively, perform at best one function, again depending upon whether a device has been previously actuated and the relative circuit relationship between the previously actuated device and the subsequently actuated device. To explain, with respect to Figure 3, with the device 12 in an actuated condition, subsequent actuation of device 13 interrupts the series circuit of the coil 50 of the device 12 due to the movement of the switch blade 88 of the second switch means 87 of the device 13 away from the contact 89. The initiation of the circuit for the device 13 is brought about by the movement of the switch blade 83 of the first switch means 82 of the device 13, from the contact 84 to the contact 85. In this particular instance, movement of the second switch means 87 interrupts the previously established circuit and movement of the first switch means 82 prepares the device 13 for establishment of a series circuit therethrough. Still with respect to Figure 3 with the device 12 in an actuated condition, subsequent actuation of the device 11 results in an interruption of the series circuit including the coil 50 of the device 12 due to the movement of the switch blade 23 of the first switch means 22 of the device 11 from the contact 24 to the contact 25. Further, the aforementioned movement of the switch blade 23 results in establishment of the series circuit for device 11. Movement of the switch blade 28 of the second switch means 27 of the device 11 away from the contact 29 has

nothing at all to do either with the energization of the coil 20 of device 11 or the de-energization of the coil 50 of the device 12. Thus, in this particular instance, movement of the first switch means 22 interrupts the previously established circuit and prepares the device 11 for establishment of a series circuit therethrough while the movement of the second switch means 27 performs no function.

From the above it can be seen that the switch formed by the switch blade 23 and the contact 24 of the device 11 and the related switches of the devices 12 and 13, along with the switch formed by the switch blade 28 and the contact 29 of the device 11 and the related switches of the devices 12 and 13 interact in such a manner so that actuation of one of the devices and movement of the associated aforementioned switches always result in interruption of any previously established circuit in that one or the other of the switches is included in the previously established circuit prior to the actuation of the device with which is associated. Thus, the aforementioned switches of each device can be thought of as being one switch means comprised of two switches.

While device 11 has been shown with a switch means 27, it is apparent that such is not required for the arrangement shown in the drawing. This switch means has been included merely to show that other devices could be included in the arrangement by interrupting the conductor disposed between the switch 102 and the switch blade 23 and inserting and connecting such devices in the appropriate manner.

While each of the devices has included a separate switch means for inclusion of a load device, it is apparent that the load device could be connected in parallel with the various coils of the devices.

In view of the above, it can be seen that the present invention is directed to a very simple arrangement for providing for the single actuation and continued maintenance of the actuation of any one of a plurality of electrically operated switches. While only one embodiment has been shown there are obvious modifications, and therefore, the following claims are to be taken as a measure of the invention.

I claim:

1. In apparatus for the selective manual actuation of and the continued maintenance of the actuation of but a single one of a plurality of inter-related devices, the arrangement comprising: a source of voltage having a first terminal and a second terminal; a plurality of electromagnetically held devices; a first of said devices including first switch means having a switch blade and a first contact and a second contact, a holding coil having a first terminal connected to the first contact of said first switch means and having a second terminal, a combined manual plunger and armature having a normal position and a depressed position, means for biasing said plunger and armature toward the normal position, said plunger and armature being operatively connected to the switch blade of said first switch means and operatively associated with said holding coil; a second of said devices including first switch means having a switch blade and a first contact and a second contact, second switch means having a switch blade and a contact, a holding coil having a first terminal connected to the first contact of said first switch means and having a second terminal connected to the contact of said second switch means, a combined manual plunger and armature having a normal position and a depressed position, said plunger and armature being operatively connected to each of the switch blades of said first and second switch means and operatively associated with said holding coil, means for biasing said plunger and armature toward the normal position; and means associated with each of said electromagnetically held devices and operable according to the position of the plunger and armature thereof; the switch blades of said first switch means being engaged with the second contact thereof

and the switch blade of said second switch means being engaged with the contact thereof with said plurality of plungers and armatures in a normal position; the switch blades of said first switch means being engaged with the first contacts thereof and the switch blade of said second switch means being disengaged from the contact thereof with said plurality of plungers and armatures in a depressed position; the switch blades of said first switch means being connected in electrical series relation and being connected to the first terminal of said source of voltage with said plurality of plungers and armatures in a normal position; the second terminal of the holding coil of said first device and the switch blade of said second switch means being connected in electrical series relation and being connected to the second terminal of said source of voltage with the plunger and armature of said second device in a normal position; manual movement of a first plunger and armature to a depressed position and consequent movement of the switch blade of the switch means associated therewith resulting in the establishment of a first electrical series circuit including the holding coil associated with said depressed plunger and armature thereby causing energization of said holding coil and maintenance of said plunger and armature in a depressed position; subsequent manual movement of a second plunger and armature to a depressed position and consequent movement of the switch blade of the switch means associated therewith resulting in interruption of said first circuit, de-energization of said holding coil, and movement of the first plunger and armature and consequent movement of the switch blade of the switch means associated therewith to the normal position due to the action of said biasing means, thereby resulting in the establishment of a second electrical series circuit including the holding coil associated with said displaced plunger and armature thereby causing energization of said holding coil and maintenance of said plunger and armature in a depressed position.

2. In apparatus for the selective actuation and the continued maintenance of the actuation of but a single one of a plurality of inter-related devices, the arrangement comprising: a source of voltage having a first terminal and a second terminal; a plurality of electromagnetically held devices; a first of said devices including a holding coil having a first terminal and a second terminal, a first switch means associated with the first terminal of said holding coil, a plunger having a normal position and a depressed position and including an armature portion operatively associated with said holding coil, said plunger being operatively associated with said first switch means; a second of said devices including a holding coil having a first terminal and a second terminal, a first switch means associated with the first terminal of said holding coil, a second switch means associated with the second terminal of said holding coil, a plunger having a normal position and a depressed position and including an armature portion operatively associated with said first and second switch means; means associated with each of said plungers for biasing said plungers toward said normal position; and means associated with each of said electromagnetically held devices and operable according to the position of the armature thereof; said first switch means being connected in electrical series relation and being connected to a first terminal of said source of voltage with the plurality of plungers in said normal position; the second terminal of the holding coil of said first device and said second switch means being connected in series relation and being connected to a second terminal of said source of voltage with the plurality of plungers in said normal position; movement of the first of said plungers from a normal to a depressed position resulting in establishment of a first electrical series circuit including the first switch means and the holding coil associated with said first plunger, the second terminal of said holding coil and the second switch means associated with said second

device; actuation of the second of said plungers from a normal to a depressed position resulting in establishment of a second electrical series circuit including the first switch means associated with said first device, the first switch means and the holding coil associated with said second plunger and the second terminal of said holding coil; movement of either of the plungers from a normal to a depressed position of said first and said second devices further resulting in the interruption of a previously established series circuit initiated by movement of the other plunger.

3. In apparatus for the selective actuation of and the continued maintenance of the actuation of but a single one of a plurality of inter-related devices, the arrangement comprising: a source of voltage having a first terminal and a second terminal; a plurality of electrically operated devices; a first of said devices including an electrically operated holding means having a first terminal and a second terminal, a first switch means associated with the first terminal of said holding means, actuator means having a first position and a second position and including a portion operatively associated with said holding means, said actuator means being operatively associated with said first switch means and normally biased towards said first position; a second of said devices including an electrically operated holding means having a first terminal and a second terminal, a first switch means associated with the first terminal of said holding means, a second switch means associated with the second terminal of said holding means, actuator means having a first position and a second position and including a portion operatively associated with said holding means, said actuator means being operatively associated with said first and second switch means and normally biased towards said first position; and means associated with each of said electrically operated devices and operable according to the condition of the holding means thereof; said first switch means being connected in electrical series relation and being connected to a first terminal of said source of voltage with the plurality of plungers in said first position; the second terminal of the holding means of said first device and said second switch means being connected in series relation and being connected to a second terminal of said source of voltage with the plurality of actuator means in said second position; movement of the first of said actuator means from said first position to said second position resulting in establishment of a first electrical series circuit including the first switch means and the holding means associated with said first actuator means, the second terminal of said holding means and the second switch means associated with said second device; movement of the second of said actuator means from said first position to said second position resulting in establishment of a second electrical series circuit including the first switch means of the first device, the first switch means and the holding coil associated with said second actuator means, and the second terminal of said holding coil; movement of either of the actuator means of said first and second devices from said first position to said second position further resulting in the interruption of a previously established series circuit initiated by movement of the other of the actuator means.

4. In apparatus for the selective manual actuation of and the continued maintenance of the actuation of but a single one of a plurality of inter-related devices, the arrangement comprising: a source of voltage having a first terminal and a second terminal; a plurality of electromagnetically held devices each including first switch means having a switch blade and a first contact and a second contact, second switch means having a switch blade and a contact, a holding coil having a first terminal connected to the first contact of said first switch means and having a second terminal connected to the contact of said second switch means, a combined manual plunger

and armature having a normal position and a depressed position and means for biasing said plunger and armature towards the normal position; and means associated with each of said electromagnetically held devices and operable according to the position of the plunger and armature thereof; said plunger and armature being operatively connected to each of the switch blades of said first and second switch means and operatively associated with said holding coil; the switch blade of said first switch means being engaged with the second contact thereof and the switch blade of said second switch means being engaged with the contact thereof with said plunger and armature in a normal position, the switch blade of said first switch means being engaged with the first contact thereof and the switch blade of said second switch means being disengaged from the contact thereof with said plunger and armature in a depressed position; the switch blades of said first switch means being connected in electrical series relation and being connected to the first terminal of said source of voltage with said plurality of plungers and armature in a normal position, the switch blades of said second switch means being connected in electrical series relation and being connected to the second terminal of said source of voltage with said plurality of plungers and armatures in a normal position; manual movement of a first plunger and armature to a depressed position and consequent movement of the switch blades of said first and second switch means associated therewith resulting in the establishment of a first electrical series circuit including the holding coil associated with said depressed plunger and armature thereby causing energization of said holding coil and maintenance of said plunger and armature in a depressed position, subsequent manual movement of a second plunger and armature to a depressed position and consequent movement of the switch blades of said first and second switch means associated therewith resulting in interruption of said first circuit, de-energization of said holding coil and movement of the first plunger and armature and consequent movement of the switch blades of said first and second switch means associated therewith to the normal position due to the action of the biasing means associated therewith, thereby resulting in the establishment of a second electrical series circuit including the holding coil associated with said displaced plunger and armature thereby causing energization of said holding coil and maintenance of said plunger and armature in said depressed position.

5. In apparatus for the selective actuation of and the continued maintenance of the actuation of but a single one of a plurality of inter-related devices, the arrangement comprising: a source of voltage having a first and second terminal; a plurality of electromagnetically held devices each including a holding coil having a first terminal and a second terminal, a first switch means associated with the first terminal of said holding coil, a second switch means associated with the second terminal of said holding coil, a plunger having a normal position and a depressed position and including an armature portion operatively associated with said holding coil, said plunger being operatively associated with said first and second switch means, and means for biasing said plunger toward said normal position; and means associated with each of said electromagnetically held devices and operable according to the position of the armature portion thereof; said first switch means being connected in electrical series relation and being connected to a first terminal of said source of voltage with the plurality of plungers in said normal position, said second switch means being connected in electrical series relation and being connected to a second terminal of said source of voltage with the plurality of plungers in said normal position; movement of a first of said plungers from a normal to a depressed position resulting in establishment

of a first electrical series circuit comprising the first switch means including the first switch means associated with said first plunger disposed between the first terminal of said source of voltage and said last named switch means, the holding coil associated with said first plunger and the second switch means associated between the second terminal of said holding coil and the second terminal of said source of voltage thereby causing the energization of said holding coil and maintenance of said plunger in said depressed position; subsequent movement of a second plunger from a normal to a depressed position resulting in interruption of said first circuit, de-energization of said holding coil, and movement of the first plunger to said normal position due to the action of the biasing means associated therewith, thereby resulting in the establishment of a second electrical series circuit including the holding coil associated with said second plunger thereby causing energization of said holding coil and maintenance of said plunger in said depressed position.

6. In apparatus for the selective actuation and the continued maintenance of the actuation of but a single one of a plurality of inter-related devices, the arrangement comprising: a source of voltage having a first and a second terminal; a plurality of electrically operated devices each including an electrically operated holding means having a first terminal and a second terminal, a first switch means associated with the first terminal of said holding means, a second switch means associated with the second terminal of said holding means, actuating means having a first position and a second position and including a portion operatively associated with said holding means, said actuating means being operatively associated with said first and second switch means and being normally biased towards said first position; and means associated with each of said electrically operated devices and operable according to the condition of the holding means thereof; said first switch means being connected in electrical series relation and being connected to a first terminal of said source of voltage with the actuating means of said devices in said first position, said second switch means being connected in electrical series relation and being connected to a second terminal of said source of voltage with the actuating means of said devices in said first position, movement of a first of said actuating means from said first position to said second position resulting in establishment of a first electrical series circuit comprising the first switch means including the first switch means associated with said first actuating means disposed between the first terminal of said source of voltage and said last named switch means, the holding means associated with said first actuating means and said second switch means associated between the second terminal of said holding means and the second terminal of said source of voltage thereby causing energization of said holding means and maintenance of said actuating means in said second position; subsequent movement of a second actuating means from said first position to said second position resulting in interruption of said first circuit and de-energization of said holding means and movement of said first actuating means to said first position, thereby resulting in establishment of a second electrical series circuit including the holding means associated with said second actuating means thereby causing energization of said holding means and maintenance of said actuating means in said second position.

7. In apparatus for the selective actuation of and the continued maintenance of the actuation of but a single one of a plurality of inter-related devices, the arrangement comprising: a source of voltage having a first terminal and a second terminal; a plurality of electromagnetically held devices each including first normally open switch means, second switch means including a first and a second normally closed switch, a holding coil, said first and second switch means being operatively associated with said holding coil, a plunger having a first position and a

second position and being operatively associated with said first and second switch means so that said first and second switch means are in the open and closed position respectively with said plunger in said first position, said plunger including an armature portion operatively associated with said holding coil, and means for biasing said plunger towards the first position; and means associated with each of said electromagnetically held devices and operable according to the position of the armature thereof; the first normally closed switches of said second switch means being connected in electrical series relation and being connected to a first terminal of said source of voltage with the plurality of plungers in said first position, the second normally closed switches of said second switch means being connected in electrical series relation and being connected to a second terminal of said source of voltage with the plurality of plungers in said first position; movement of a first of said plungers from said first position to said second position resulting in closure of the first switch means and opening of the first and second switches of the second switch means associated therewith thereby causing establishment of a first electrical series circuit including the first switches of said second switch means disposed between said first terminal and the first switch of said second switch means associated with said first plunger and the first switch means and holding coil associated with said first plunger, and the second switches of said second switch means disposed between the second switch of said second switch means associated with said first plunger and the second terminal of said source of voltage with the consequent energization of said holding coil resulting in maintained actuation of said first plunger; subsequent movement of a second of said plungers from said first position to said second position resulting in closure of the first switch means and opening of the first and second switches of the second switch means associated therewith thereby interrupting said first circuit and causing de-energization of the holding coil associated with said first plunger and movement of said plunger from said second position to said first position due to the action of said biasing means thereby resulting in the opening of the first switch means and closing of the first and second switches of the second switch means associated with said first plunger thereby establishing a second electrical series circuit including the first switch of said second switch means disposed between said first terminal and the first switch of said second switch means associated with said second plunger, the first switch means and holding coil associated with said second plunger and the second switches of said second switch means disposed between the second switch of said second switch means associated with said second plunger and the second terminal of said source of voltage with the consequent energization of said holding coil resulting in maintained actuation of said second plunger.

8. An apparatus for the selective actuation of and the continued maintenance of the actuation of but a single one of a plurality of inter-related devices, the arrangement comprising: a source of voltage; a plurality of electromagnetically held devices each including first normally open switch means, second normally closed switch means, a holding coil, said first and second switch means being operatively associated with said holding coil, a plunger having a first position and a second position and being operatively associated with said first and second switch means so that said first and second switch means are in the open and closed position respectively with said plunger in said first position, said plunger including an armature portion operatively associated with said holding coil, and means for biasing said plunger toward a first position; and means associated with each of said electromagnetically held devices and operable according to the position of the armature thereof; said plurality of electromagnetically held devices connected to said source of voltage and each of said first and second switch means

associated with each of the respective holding coils so that actuation of a first electromagnetically held device and movement of the plunger associated therewith from said first position to said second position results in closure of the first switch means associated therewith and opening of the second switch means associated therewith thereby causing establishment of a first electrical series circuit including the first switch means associated with the devices, including the first actuated device, disposed between a first terminal of said source of voltage and the first actuated device, the holding coil associated with said first actuated device, and the second switch means associated with the devices, not including the first actuated device, disposed between the first actuated device and the second terminal of said source of voltage with the consequent energization of said holding coil resulting in maintained actuation of said first actuated device; subsequent actuation of a second electromagnetically held device and movement of the plunger associated therewith from said first position to said second position resulting in closure of the first switch means associated therewith and opening of the second switch means associated therewith thereby interrupting said first circuit and causing de-energization of the holding coil associated with said first actuated device and movement of the plunger associated therewith from said second position to said first position due to the action of said biasing means thereby resulting in an opening of the first switch means and closing of the second switch means associated with said first actuated device thereby establishing a second electrical series circuit including the first switch means associated with the devices, including the second actuated device, disposed between the first terminal of said source of voltage and the second actuated device, the holding coil associated with said second actuated device and the second switch means associated with the devices, not including the second actuated device, disposed between the second actuated device and the second terminal of said source of voltage with the consequent energization of said holding coil resulting in maintained actuation of said second actuated device.

9. In apparatus for the selective actuation of and the continued maintenance of the actuation of but a single one of a plurality of inter-related devices, the arrangement comprising: a source of voltage; a plurality of electrically operated devices each including first normally open switch means, second normally closed switch means, electrically operated holding means, said first and second switch means being operatively associated with said holding means, and actuating means having a first position and a second position and being normally biased toward said first position said actuating means being operatively associated with said first and second switch means so that said first and second switch means are in the open and closed condition respectively with said actuating means in said first position said actuating means including a portion operatively associated with said holding means; and means associated with each of said electrically operated devices and operable according to the condition of the holding means thereof; said plurality of electrically operated held devices connected to said source of voltage and each of said first and second switch means associated with each of the respective holding means so that actuation of a first electrically operated device and movement of the actuating means associated therewith from said first position to said second position results in closure of the first switch means associated therewith and opening of the second switch means associated therewith thereby causing establishment of a first electrical series circuit including the first switch means of the devices, including the first actuated device, disposed between a first terminal of said source of voltage and the first actuated device, the holding means associated with said first actuated device, and the second switch means associated with the devices, not including the first actu-

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ated device, disposed between the first actuated device and the second terminal of said source of voltage with the consequent energization of said holding means resulting in maintained actuation of said first actuated device; subsequent actuation of a second electrically operated device and movement of the actuating means associated therewith from said first position to said second position resulting in closure of the first switch means associated therewith and opening of the second switch means associated therewith thereby interrupting said first circuit and causing de-energization of the holding means associated with said first actuated device and movement of said actuating means from said second position to said first position thereby resulting in opening of the first switch means and closing of the second switch means associated with said first actuated device thereby establishing a second electrical series circuit including the first switch

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means of the devices, including the second actuated device, disposed between the first terminal of said source of voltage and the second actuated device, the holding means associated with said second actuated device, and the second switch means associated with the devices, not including the second actuated device, disposed between the second actuated device and the second terminal of said source of voltage with the consequent energization of said holding means resulting in maintained actuation of said second actuated device.

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