Feb. 2, 1971 R. S. WALLER 3,559,430

LOCKING MECHANISM

Filed Aug. 8, 1968 3 Sheets-Sheet 1

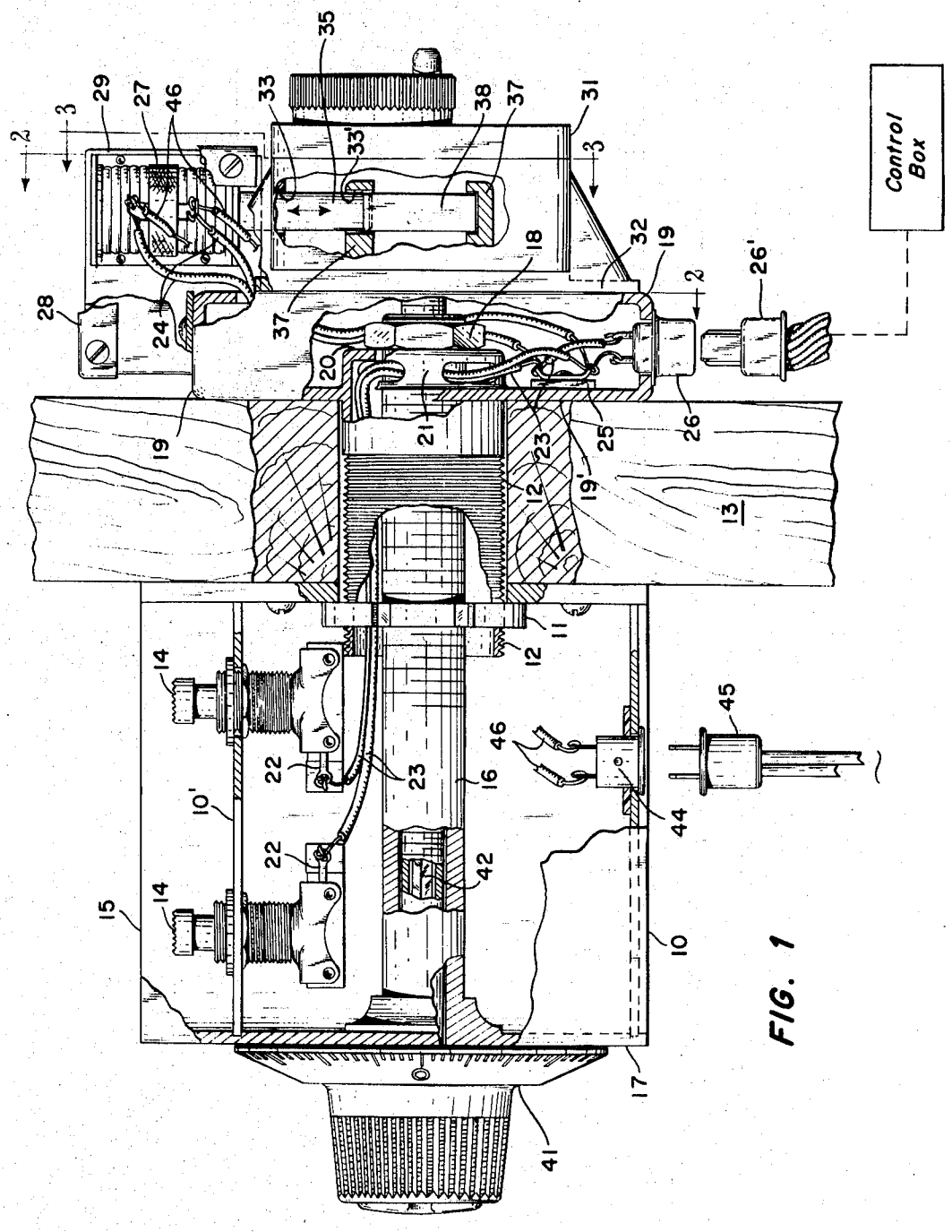


FIG. 1

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LOCKING MECHANISM

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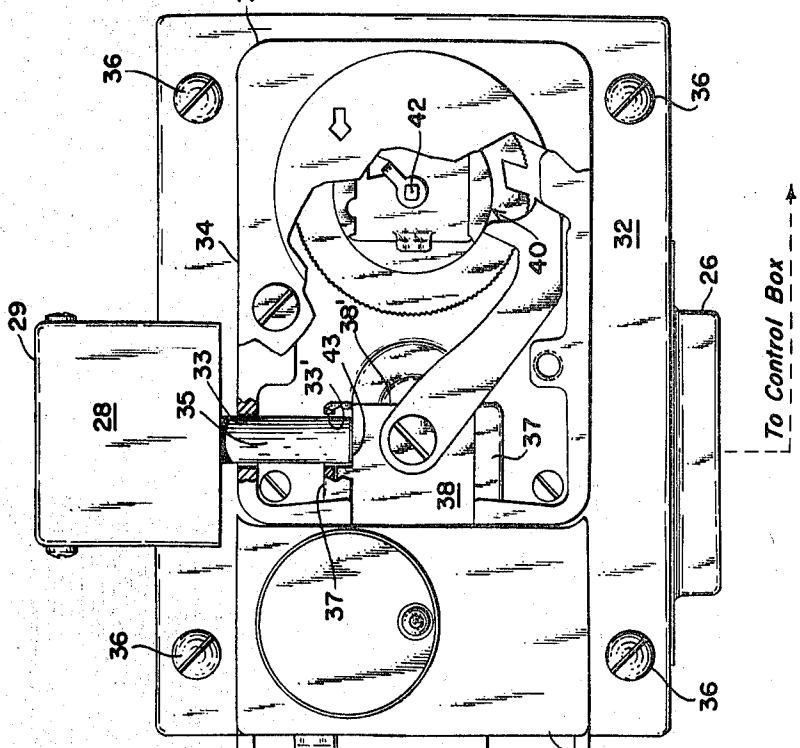


FIG. 3

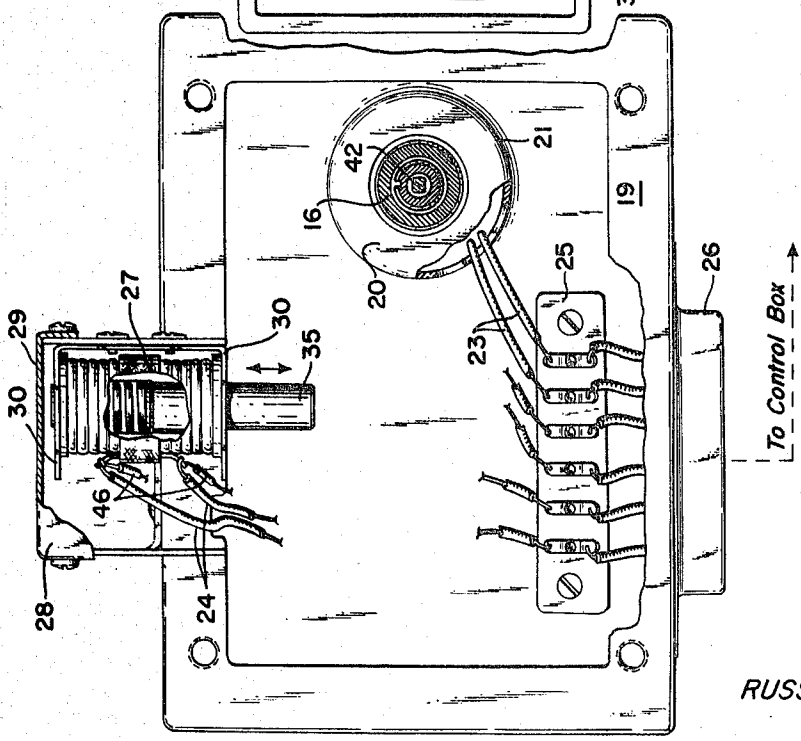


FIG. 2

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LOCKING MECHANISM

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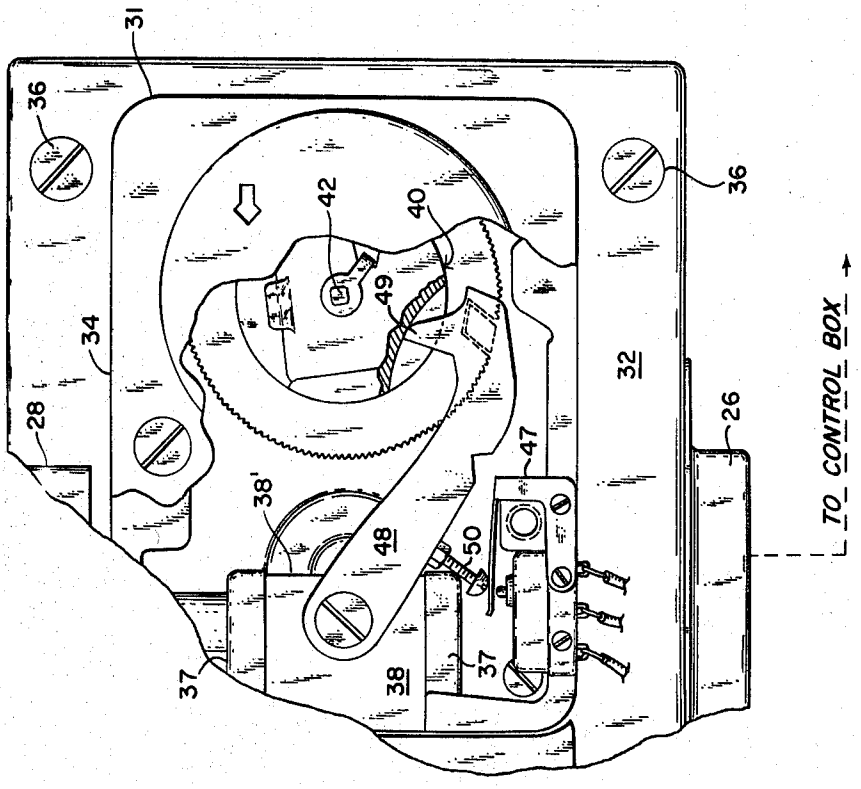


FIG. 5

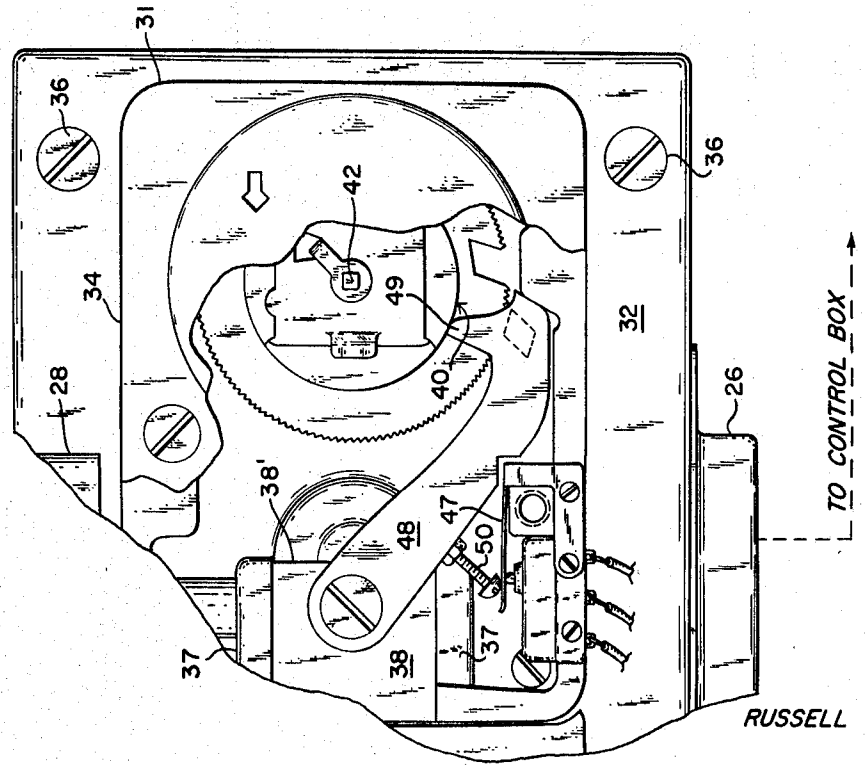


FIG. 4

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United States Patent Office 3,559,430 Patented Feb. 2, 1971

3,559,430

LOCKING MECHANISM

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Continuation-in-part of application Ser. No. 502,748, Oct. 22, 1965. This application Aug. 8, 1968, Ser. No. 756,718

Int. Cl. E05b 47/00

U.S. Cl. 70—277 8 Claims

ABSTRACT OF THE DISCLOSURE

A security lock construction which includes both a dial operated mechanical combination lock similar to the conventional type having plural, peripherally gated tumbler wheels, a reciprocative bolt, and a dial operated driver wheel for rotating the tumbler wheels and for activating a fence lever to retract and project the bolt, together with a cooperating push button operated electrical combination lock having electrical switches which must be activated in a preselected combination to energize a solenoid and retract its plunger from a normal position locking the bolt of the mechanical combination lock against retraction, and electrical means cooperating with the moving parts of the dial operated combination lock to prevent operation of the electrical switches when the dial operated lock is in closed position.

This application is a continuation-in-part of Ser. No. 502,748 filed Oct. 22, 1965 and now abandoned.

The invevntion described herein may be manufactured and used by or for the Government for governmental purposes without the payment of any royalty thereon.

This invention relates to a new and useful improvement in locks; more particularly, to an improved form of dual combination lock adapted to secure the doors or closures of restricted areas in Government buildings, or elsewhere, where maximum security controls are necessary or desirable.

The present method of securing doors of rooms and vaults, cabinets, bureaus, or other security closures, is to provide mechanically or electrically operated combination locks, constructed as provided by Government standards upon well known principles, the purpose of which is to insure that the locks can be operated only by persons having knowledge of a preselected code or combination of symbols in accordance with which the lock controls are set.

The present invention provides a dial operated code-combination locking device of conventional construction having a lock bolt, additional means for locking the bolt in its operative positions, and an electrically operated code-combination device for shifting the additional locking means. In a preferred embodiment, the additional locking means is a solenoid-operated plunger and energizing of the solenoid is controlled through one or more electrical switches operable by a predetermined selection of one or more of a plurality of switch operating push buttons. The solenoid may be energized by only an authorized person, such as a security officer, who has knowledge of the code-combination of switch push buttons to be operated. This code-combination may be changed from time to time by a security official.

Thus, at the close of a business day in a restricted area, the security officer could secure the door by preselecting a combination to set the combination lock, closing the door and locking it with the combination lock. He could then select a specific combination of push buttons to control the energizing of the solenoid and reset the wiring circuit, or circuits, according to that selection. Thus, in order to

gain entry to the restricted area, it would be necessary for a user both to dial a predetermined selected combination, and to operate a predetermined selection of buttons to release the lock bolt and open the door to gain access to the restricted area. When it is so desired the combination lock may be set and left in unlocked position so that authorized persons knowing the combination may release the bolt by pushing the proper buttons to energize the solenoid and thereby withdraw the plunger. Such persons need not know the dial combination selected to secure the door during non-working hours.

Thus, the number of persons having knowledge of the security lock's complete operation could be limited and only specifically authorized and informed persons could enter the restricted area when both locks were secured.

Another feature of the invention is the construction of the housings for the various elements of the invention. The housings cooperate to so accommodate the operating mechanisms of the lock that the push button activation of the electrical portion of the lock may be properly effected to control the manual operation of the bolt of the mechanically operated combination lock.

The housings may also be of any desirable size and shape to be determined by the requirements for the device to be secured. It is to be understood, however, that certain dimensions may be determined by the requirements of the structure of the electrical portion of the lock.

In one embodiment of the invention, it may comprise a combination lock mechanism of any acceptable conventional construction adapted to operate a lock bolt, the operating mechanism of which is accommodated in a housing preferably of metal. The housing may be of any suitable shape and may be provided where necessary with a conventional device to prevent spread-jacking of the bolt, or other known techniques for by-passing locks. The bar bolt of the combination lock is constructed so as to cooperate with a separate locking device. The housing in which the working mechanism of the combination lock is mounted may be of standard form but constructed to accommodate part of the operating mechanism of the separate locking device.

In one embodiment of the invention it may comprise a standard combination lock mechanism having a bar bolt riding in bolt-retaining channel members of conventional design, but preferably comprising upper and lower flanged rails of metal, so arranged that when the lock is closed the bar bolt will be in extended position, and will have moved in the retaining channels away from the rear edges of the channel members. A porthole or like aperture is provided in the top wall or rail of the retaining channel to permit passage therethrough of the plunger. Thus, when the bar bolt is in locking position, the plunger may be passed through the porthole and be seated behind the rear edge of the bar bolt, thereby preventing the bolt from being moved in the channel into the unlocked position until the plunger has been withdrawn from the retaining channel. An alternate method by which the locking mechanism may be adapted for the purposes of the invention is by having a portion of the top of the bolt adjacent the inner end thereof cut away to form a seat for a plunger. In either case, the lock operating mechanism is accommodated in a housing having a portion cut out to form a porthole above the bar bolt through which the plunger may slide into locking engagement with the bar bolt when it is in door locking position.

The lock elements are assembled with a threaded mounting tube adapted to extend through a suitable aperture in the door or other closure to be secured. The tube shall be so designed as to accommodate a push button housing, a wire housing, a connecting shaft, a combination lock spindle, and push button switch wiring. The

push button housing shall be adapted to accommodate any desired number of push buttons, the switches connected to and to be operated by the push buttons, an attachment shaft, to opposite ends of which the push button housing and the wire housing may be attached, and the spindle of the combination lock. The push button housing shall be adapted to be secured to the opposite end of the mounting tube from the wire housing, after the tube has been passed through the aperture in the closure to be secured by the present invention. Thus, in one embodiment of the invention, when assembled on a door with the mounting tube, one wall of the wire housing shall abut the inside wall of the door to be secured, the housing of the combination lock mechanism shall abut the opposite wall of the wire housing, while outside of the controlled area, the push button housing shall be so mounted as to abut outside wall of the door to be secured. A suitable lock bolt keeper of any usual type may be attached to the frame of the door in a position which will be adjacent the combination lock mechanism housing when the door is in closed position so that the keeper will receive the bolt of the combination lock when it is in locking position. The wire housing is adapted to contain any desirable number of electrical wires of selected gauge, the wires forming part of an electrical circuit for energizing the solenoid mounted on the wire housing.

The wiring for operation of the solenoid and plunger in a preferred embodiment is attached to the push button controlled switches in the push button housing, passes through the mounting tube to suitable guides on the inside of the wire housing, and is attached to a terminal strip of suitable electrical insulating material such as Bakelite which is secured in an accessible area within the housing.

In a preferred embodiment of my invention the guide for the wires is provided by a collar on the inside of the front wall of the wire housing. The collar is preferably of metal and of sufficient width to permit a series of slots or notches therein through which selected groups of wires may be threaded. The wires may be selectively connected to the mutiple contact plug to determine which of the push buttons shall operate the electric control unit, as required.

The wire housing is so associated with the mounting tube as to abut the housing of the lock mechanism. The solenoid and plunger mounted on the wire housing will, therefore, overhang the top wall of the lock mechanism housing. The porthole or aperture in the top wall of the lock mechanism housing is positioned in register with the bottom of the plunger. The cut away portion in the bar bolt is arranged to register with the aperture in the lock mechanism housing. Therefore when the plunger is depressed, it will pass through the aperture in the lock mechanism housing and be seated in the cut away portion of the bolt.

A cover for the solenoid and plunger may be removably attached to the wire housing.

A multiple contact plug of suitable construction may also be mounted in an accessible position on the outside of the wire housing to be used as a jack and plug arrangement for the electric unit that controls the solenoid in which the plunger is mounted.

The source of power for operation of the electric portion of the lock is preferably located within the controlled area. A female electrical connector may also be installed in an inconspicuous area of the push button housing for furnishing power to the electric unit from a source outside the controlled area should there be a power failure within that area.

An opening is provided in the front wall of the push button housing, through which the dial spindle of the combination lock dial is inserted. The spindle passes through the mounting tube to the lock mechanism, to which it may be connected to operate the combination tumblers, in any conventional manner.

The mounting tube may be connected to the lock mechanism housing and to the push button housing by means of a connecting shaft which is accommodated by the mounting tube and is secured at its opposite ends.

When the various elements of the invention are assembled, the desired combination to secure the combination lock may be selected, and the door to be secured may be locked. The lock bolt will then be seated in its locking keeper. In this position, the cut away portion of the bar bolt will be in register with the aperture in the lock mechanism housing.

A suitable code may be selected for energizing the solenoid by means of the switches attached to the push buttons. The plunger is adapted to be depressed and to pass through the aperture in the lock mechanism housing so as to be seated in the cut-out portion of the bar bolt. In this position the bar bolt cannot be withdrawn by operation of the dial combination alone, for the reason that the plunger is seated in the top of the bolt and prevents horizontal movement of the bolt to its retracted position.

An alternative type of plunger may be used which will reset upon the top of the bar bolt when the lock is open and will drop by force of gravity into the cut away portion when the bolt is moved into the locking keeper, and will remain seated there until withdrawn by operation of the solenoid.

To withdraw the plunger and permit the bolt to be moved to unlocking position it is necessary to push the correct buttons and energize the solenoid. When this has been done, the bolt may be withdrawn and the door opened.

Once the combination has been dialed, or otherwise adjusted to set the lock in open position, it may be left in that position. Then the bar bolt may be moved into and secured in locked position by means of the solenoid and plunger alone. This setting may be used during the day time, while there are persons in the security area, or whenever it is unnecessary that the combination lock be secured. Anyone authorized and having knowledge of the push button combination may now gain access to the security area. When it is desired to lock the door against anyone but certain authorized persons, however, the combination lock can be secured. Under such setting, knowledge of both the dial combination and the push button combination is required to obtain access to the secured area.

The foregoing and other advantages of the present invention will be more clearly understood from the following detailed description of a preferred embodiment of my invention and by reference to the drawings forming a part hereof as follows:

FIG. 1 is a side elevational view, with sections partly broken away, showing one embodiment of my invention installed on a door.

FIG. 2 is a vertical section taken on the line **2—2** of FIG. 1, showing the interior of the wire housing of my invention.

FIG. 3 is a vertical section taken on the line **3—3** of FIG. 1 showing a combination lock mechanism with the solenoid operated plunger of my invention depressed to control the bar bolt.

FIG. 4 is a vertical section taken on the line **3—3** of FIG. 1 showing a combination lock mechanism in open position with the microswitch of my invention closed by pressure of the drop lever.

FIG. 5 is a vertical section taken on the line **3—3** of FIG. 1 showing a combination lock mechanism is closed position with the microswitch of my invention open and out of contact with the drop lever of the combination lock.

Referring to the figures of the drawings, and particularly FIG. 1, a push button housing **10** is positioned on the outside of a door or closure **13** and is secured by the tube nut **11** to the threaded mounting tube **12**.

A plurality of push buttons **14** are seated in the top wall **10'** of the housing **10**. A frame **15** which may be integral with the front and side walls of the housing **10**

may be provided about the top of the wall **10'** to prevent the push buttons **14** from being injured or accidently manipulated. Any desired number of push buttons **14** may be used.

A hollow connecting shaft **16** which is secured at one end to the front wall **17** of the push button housing **10** in any suitable manner extends axially through the tube **12**. The connecting shaft **16** at one end is preferably integral with the front wall **17** and at its opposite end is externally threaded to receive an attaching nut **18** positioned inside the wire housing **19**. Preferably the attaching nut **18** will be adapted to be turned on the threaded end of the connecting shaft **16** until it is tightened against the rear wall **20** of the slotted collar **21** which is preferably integral with the adjacent wall of the wire housing **19** and projects therefrom into the housing. Thus, the push button housing **10** and the wire housing **19** are fastened together upon the connecting shaft **16**.

Each of the push buttons **14** mounted on the push button housing **10** is adapted to control a switch **22** (FIG. 1). Each switch **22** is connected to a wire **23**, which passes through the mounting tube **12**, through a slot in the collar **21** and to a terminal strip **25** secured in an accessible area within the housing **19** (FIGS. 1 and 2). The terminals of selected wires **23** may be connected to a multiple contact plug **26** which is mounted any desired manner in a wall of the housing **19** and connected to a power source. Wiring **24** extending from the terminal strip **25** to a solenoid **27** serves to energize the solenoid when a correctly selected push button or set of push buttons is operated.

The solenoid **27** is mounted on the housing **19** by means of a frame or support **28** which may be of any desirable shape and suitable material and which may be secured to the top wall of the wire housing **19** (as shown in FIG. 1). A member **29** of the support **28** extends away from the housing **19** and carries a cradle **30** in which the solenoid **27** is held. Thus, when a housing **31** for the locking mechanism **40** of the combination lock is installed in abutting relation (see FIG. 1) with the wire housing **19**, the solenoid **27** in its cradle **30** will overhang the top wall of the housing **31**.

The lock mechanism housing **31** may be of any conventional design and may contain the working mechanism of a conventional dial-operated combination lock, illustrated generally as mechanism **40** in FIG. 3. In the preferred arrangement of my device, the housing **31** may be adapted to serve as a closure for the rear wall of the wire housing **19**. Housing **31** may be attached to the housing **19** in any suitable manner as, for instance, by means of the screws **36** as shown in FIG. 3.

A porthole or opening **33** is provided in the top wall **34** of the housing **31** to receive a spring pressed plunger **35** which is mounted in and operated by the solenoid **27**.

The wire housing **19** and the lock mechanism housing **31** are so designed and arranged that when they are assembled the porthole **33** will be in register with the base of the plunger **35** and the plunger **35** may move freely into and out of the interior of the housing **31** as the solenoid **27** and its internal spring operate to depress or retract the plunger **35**.

As shown in the drawings, a conventional lock mechanism operates a bar bolt **38** which is mounted in bolt retaining channels **37** in any conventional manner. The bar bolt **38** is horizontally slidable in the channels **37** and through an aperture in the front wall **39** (FIG. 3) of the lock mechanism housing **31** into any suitable keeper (not shown). Such keeper would be disposed in a door frame adjacent to the lock mechanism housing **31** when the door is in closed position.

The locking mechanism designated generally by the numeral **40** in FIG. 3 may be operated by means of a combination lock dial **41** (FIG. 1), or by any other suitable device. As shown the dial **41** is mounted on the front wall **17** of the push button housing **10**. A spindle **42** attached to the dial **41** passes through the connecting shaft **16** to engage and operate the locking mechanism **40** (FIG. 3). When operated in the usual manner the lock mechanism **40** is manipulated by dialing a selected code with the dial **41** to slide the bar bolt **38** into a locking keeper. The bolt **38** will remain in locking position until the dial **41** is manipulated to retract the bolt **38** into unlocked or open position. The device of my invention is adapted to prevent retraction of the bolt **38** into unlocked position even when the combination is known and the dial **41** is correctly manipulated to release the bar bolt **38**. To this end any desired number of push buttons **14** may be selected to control the energizing of the solenoid **27**, when the combination lock code is selected and the bar bolt **38** is in locking position. For such purposes selected wires **23** may be connected with the contact plug **26** which is connected to a power source by any conventional means, as by the cord and plug **26'**. Manipulation of correctly selected buttons **14** will now energize the solenoid **27** and cause it to raise the plunger **35** and release the bolt **38** so that it may be retracted to door unlocking position. Release of the buttons **14** will permit the plunger to be lowered under spring action or to drop by force of gravity. The plunger **35** will pass through the portholes **33** and **33'** into contact with the upper edge of the bar bolt **38**. When aligned, the plunger **35** will be seated in the cut out recess **43** in the upper rear end of the bar bolt **38**. In this latter position horizontal movement of the bar bolt **38** will be prevented by the plunger **35** when manipulation of the dial combination releases the combination lock mechanism **40**. The bar bolt **38** will, therefore, remain in locked position until the correctly selected buttons **14** are depressed to activate the solenoid **27** and cause the plunger **35** to be withdrawn from contact with the bar bolt **38**.

Thus, an advantage of my invention is that it will be necessary, for the purpose of opening a closure locked by means of my device, to know both the combination which will release the bar bolt **38** by means of the locking mechanism **40** and the combination of buttons **14** necessary to be pushed to retract the plunger **35**.

Another advantage of my invention is that the dial combination lock mechanism **40** may be left in unlocked position and the bar bolt **38** may be secured against release by the plunger **35** which can only be retracted by correctly selecting push buttons **14** to energize the solenoid **27**. It will be understood that the code combination of buttons for this purpose may be readily changed by correspondingly changing the wiring between the button switches **22**, the units **25** and **26**, and the solenoid **27**. Thus, persons entitled during working hours to enter into the area secured by the locking device of my invention may be informed of the correct buttons **14** to push to release the bar bolt **38**.

As a further safeguard against unauthorized entry to the secured area and to insure that the door may be opened only during authorized periods, additional means may be provided to control operation of the electrical push-button lock. For this purpose a micro-switch may be provided inside the combination lock housing operable by contact with moving parts of the lock mechanism to control the flow of current between the power source and the switches of the push button lock.

In a preferred embodiment as shown in FIGS. 4 and 5, a micro-switch **47** may be installed by conventional means on the inside frame of the combination lock housing **31**, and may be so connected in the electrical circuit as to cut off the flow of current between the power source and the push button switches **22** when the micro-switch **47** is open. The micro-switch **47** will preferably be so placed with relation to the combination lock mechanism **40** that the drop lever **48** may be adapted to contact and close it when the fence **49** has fully engaged the wheel gates of the lock mechanism **40** in response to manipulation of a known combination code on the dial **41** to set

the lock mechanism **40** in open position, as illustrated in FIG. 4. Conversely, when the fence **49** is disengaged from the wheel gates by manipulation of the dial **41** to close the lock mechanism **40** the drop lever **48** will move out of contact with the micro-switch **47**, thus removing pressure from the switch, which will then be open, as illustrated in FIG. 5. With the micro-switch **47** open, the flow of current between the power source and the push button lock switches will be broken, and manipulation of the push buttons **14** will be ineffective to activate the solenoid **27** to retract the plunger **35** from the recess **43** in the bar bolt **38**.

To secure the area at night, a security officer may select a specific combination of push buttons **14** necessary to energize the solenoid **27** and raise the plunger **35**. This specific selection may be undisclosed to anyone else. He also may select a code to operate the dial controlled combination lock which code may be undisclosed to anyone else. Because the micro-switch **47** will have cut off the flow of current to the solenoid operating push buttons **14** when the combination lock is in closed position, the solenoid **27** cannot be operated to raise the plunger **35** until the correct combination has been dialed by the security officer to open the combination lock.

When the lock mechanism **40** is in open position, and the micro-switch **47** is closed, as illustrated in FIG. 4, the push buttons **14** may be operated by anyone knowing the selected combination to retract the plunger **35** from its seat in the bar bolt **38** by activation of the solenoid **27**. When the plunger **35** is retracted, the bar bolt **38** may be withdrawn from the locking keeper by manipulation of the handle **41**, or by any other conventional means. Thus, unauthorized entry to the secured area may be prevented by a dual locking combination.

Convenitonal means may be provided integral with the wire housing **19** or the lock mechanism housing **31** to prevent access to the bar bolt **38** from outside the door or closure upon which the locking unit is mounted and thereby prevent spread jacking and other known techniques for releasing locks on restricted doors.

There may be installed in an inconspicuous position on the push button housing **10** a female electrical connector **44**. Should there be a power failure within the secured area, such as to render the push buttons **14** inoperable to energize the solenoid **27**, electrical power from a source outside the secured area may be supplied to energize the solenoid **27** and operate the plunger **35**. As shown, such power may be supplied to the connector **44** by electrical wiring **45** extending from any available electrical current outlet. Electrical wires **46** (see FIG. 1) may be run from the connector **44** throcgh the mounting tube **12** into the wire housing **19** and through the notched collar **21** to the solenoid **27**.

It will be understood that the foregoing description is given by way of illustration and that various changes may be made within the scope of the appended claims without departing from my invention.

I claim as my invention:

1. Security lock construction for closures comprising in combination:

a movable bar bolt,

manually operable code combination locking mechanism normally adapted to control the movement of said bar bolt into locking or unlocking position,

separate code combination electrically operable means for preventing movement of said bar bolt when said manually operable code combination mechanism is in open position, and

means cooperating with moving parts of said manually operable code combination locking mechanism to cut off the flow of current to said electrically operable means to prevent operation of said electrically operable means when said manually operable code combination locking means is in locked position.

2. Security lock construction for closures comprising in combination:

a movable locking bar bolt,

a manually operable code combination locking mechanism for controlling the movement of said bar bolt into open or locked position,

separate means for controlling the movement of said bar bolt comprising

a solenoid actuated plunger normally adapted to engage a shoulder on said bar bolt when said bar bolt is in locked position to prevent movement of said bar bolt into open position,

a code combination push button mechanism adapted to operate electrical means for energizing said solenoid to retract said plunger out of engagement with said shoulder on said bar bolt,

means cooperating with moving parts of said manually operable locking mechanism to cut off the flow of current from the power source to said code combination push button mechanism while said manually operable code combination locking mechanism is in locked position,

said manually operable code combination locking mechanism and said electrically operable code combination push button mechanism being adapted to reciprocate to prevent movement of said bar bolt into open position until said manually operable code combination locking mechanism has been manipulated to open position, and said electrically operable code combination push button mechanism has been manipulated to retract said plunger from engagement with said shoulder on said bar bolt.

3. A locking device for closures comprising a mounting tube adapted to extend through an aperture in a closure structure, said tube at one end being threaded on its exterior surface, a housing for a push button control unit, said housing being mounted at one end thereof on the outside of said closure structure, a second housing mounted at one end thereof on the inside of said closure structure, a hollow connecting shaft secured at one end to the inside of the front wall of said push button housing, extending through said mounting tube and into said second housing, the surface of said shaft being threaded at its other end to receive an attaching nut, a third housing mounted on the inside wall of said second housing; lock mechanism in said third housing, a combination lock spindle, a combination dial secured to one end of said spindle, said spindle extending through said connecting shaft and being operatively connected to said lock mechanism, a plurality of push buttons on said push button housing, a solenoid mounted on one of said housings, a plunger aceuated by said solenoid, an aperture in the wall of said lock mechanism housing in register with the end of said plunger, a bar bolt in said lock mechanism housing adapted to slide horizontally into locking and unlocking positions upon operation of said lock mechanism, a recess in said bar bolt adapted to register with said aperture in the wall of said lock mechanism housing when said bar bolt is in locking position, switches controlled by said push buttons in said push button housing, electrical wires passing through said mounting tube from said push button housing to said second housing and connecting said switches to said solenoid, and means inside said second housing to selectively connect said wires to a power source to energize said solenoid; means including a micro-switch mounted on the inside of said third housing adapted to be operated by contact with a moving part of said combination lock mechanism to cut off the flow of current to said wires from said power source when said combination lock mechanism is moved into closed position, and to restore the flow of current from said power source to said wires when said combination lock mechanism is moved into open position.

4. A locking device for closures comprising a mounting tube adapted to extend through an aperture in a closure structure, said tube at one end being threaded on its exterior surface, a housing for a push button con-

trol unit, said housing being mounted at one end thereof on the outside of said closure structure, a second housing mounted at one end thereof on the inside of said closure structure, a hollow connecting shaft secured at one end to the inside of the front wall of said push button housing, extending through said mounting tube and into said second huosing, the surface of said shaft being threaded at its other end to receive an attaching nut, a third housing mounted on the inside wall of said second housing; lock mechanism in said third housing, a comination lock spindle, a combination dial secured to one end of said spindle, said spindle extending through said connecting shaft and being operatively connected to said lock mechanism, a plurality of push buttons on said push button housing, a solenoid mounted on one of said housings, a plunger actuated by said solenoid, an aperture in the wall of said lock mechanism housing in register with the end of said plunger, a bar bolt in said lock mechanism housing adapted to slide horizontally into locking and unlocking positions upon operation of said lock mechanism, a recess in said bar bolt adapted to register with said aperture in the wall of said lock mechanism housing when said bar bolt is in locking position, switches controlled by said push buttons in said push button housing, electrical wires passing through said mounting tube from said push button housing to said second housing and connecting said switches to said solenoid, means in said second housing to selectively connect said wires to a power source to energize said solenoid, and means in said lock mechanism housing adapted to cooperate with moving parts of said combination lock mechanism to cut off the flow of current between said power source and said switches when said combination lock mechanism is in closed position.

5. A locking device for closures comprising a mounting tube adapted to extend through an aperture in a closure structure, said tube at one end being threaded on its exterior surface, a housing for a push button control unit, said housing being mounted at one end thereof on the outside of said closure structure, a second housing mounted at one end thereof on the inside of said closure structure, a hollow connecting shaft secured at one end to the inside of the front wall of said push button housing, extending through said mounting tube and into said second housing, the surface of said shaft being threaded at its other end to receive an attaching nut, a third housing mounted on the inside wall of said second housing; lock mechanism in said third housing, a combination lock spindle, a combination dial secured to one end of said spindle, said spindle extending through said connecting shaft and being operatively connected to said lock mechanism, a plurality of push buttons on said push button housing, a solenoid mounted on one of said housings, a plunger actuated by said solenoid, an aperture in the wall of said lock mechanism housing in register with the end of said plunger, a bar bolt in said lock mechanism housing adapted to slide horizontally into locking and unlocking positions upon operation of said lock mechanism, a recess in said bar bolt adapted to register with said aperture in the wall of said lock mechanism housing when said bar bolt is in locking position, switches controlled by said push buttons in said push button housing, electrical wires passing through said mounting tube from said push button housing to said second housing and connecting said switches to said solenoid, and means in said second housing to selectively connect said wires to a power source to energize said solenoid.

6. A combination lock construction comprising a housing, selectively actuated switches mounted in said housing, a second housing, a solenoid mounted on said second housing and having electrical connections to said actuating switches, a plunger adapted to be actuated by said solenoid, means for selectively connecting said solenoid to said actuating switches, an additional housing mounted on said second housing, locking means in said additional

housing including a bar bolt horizontally slidable therein, said bar bolt having a retaining shoulder adapted to engage said plunger when said bar bolt is in locking position, a hollow connecting shaft secured to said first-mentioned housing and threaded at its opposite end, a mounting tube for and extending between said first and second-mentioned housings and adapted to receive said connecting shaft, a lock nut for securing said shaft to said second-mentioned housing, and additional locking means for securing said bar bolt in locking position, said additional locking means comprising a spindle rotatably positioned in said connecting shaft, and a dial for rotating said spindle to actuate said locking means in said additional housing to move said bar bolt into locking and unlocking positions.

7. A combination lock construction comprising a housing, selectively actuated switches mounted in said housing, a second housing, a mounting tube extending between said housings, a terminal strip mounted in said second housing, a solenoid mounted on said second housing and having electrical connections to said switches, said connections comprising a plurality of wires, passing from said first-mentioned housing through said mounting tube into said second-mentioned housing and to said terminal strip, and means in said second-mentioned housing for selectively connecting said wires to a power source, a plunger associated with said solenoid, an additional housing mounted on said second housing, locking means in said additional housing including a bar bolt horizontally slidable therein, said bar bolt having a retaining recess adapted to receive said plunger when said bar bolt is in locking position, a hollow connecting shaft secured at one end to said first-mentioned housing, extending through said mounting tube and threaded at its opposite end, a lock nut for securing said threaded shaft end to said second-mentioned housing, and additional locking means for securing said bar bolt in locking position, said additional locking means comprising a spindle rotatably positioned in said connecting sahft, a dial for rotating said spindle to actuate said locking means in said additional housing to move said bar bolt into locking and unlocking position.

8. A combination lock construction comprising a housing, selectively actuated switches mounted in said housing, a second housing, a solenoid mounted on said second housing and having electrical connections to said actuating switches, a plunger adapted to be actuated by said solenoid, locking means in said second housing including a bar bolt slidable therein, said bar bolt having a shoulder adapted to engage said plunger when said bar bolt is in locking position, a hollow connecting shaft secured to said first-mentioned housing and threaded at its opposite end, a mounting tube for and extending between said first and second-mentioned housings and adapted to receive said connecting shaft, a lock nut for securing said shaft to said second-mentioned housing, and additional locking means for securing said bar bolt in locking position, said additional locking means comprising a spindle rotatably positioned in said connecting shaft, and a dial for rotating said spindle to actuate said locking means in said second housing to move said bar bolt into locking and unlocking positions.

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