

Feb. 18, 1969

S. JEFFEE

3,427,835

LOCKING ARRANGEMENT WITH INDICATOR

Filed Jan. 3, 1967

Sheet 1 of 3

FIG. 1

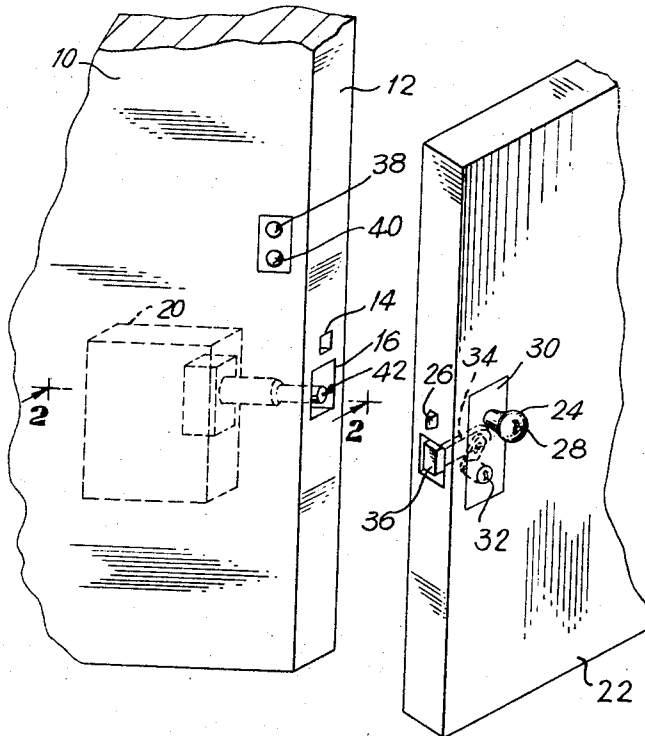


FIG. 4

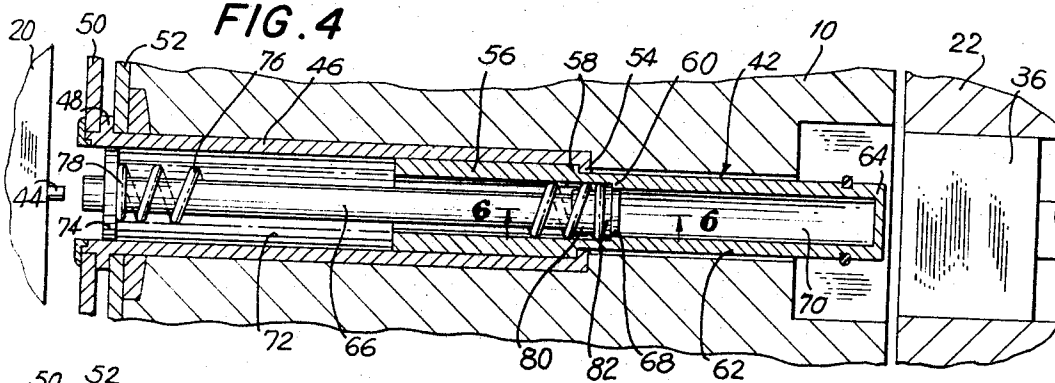
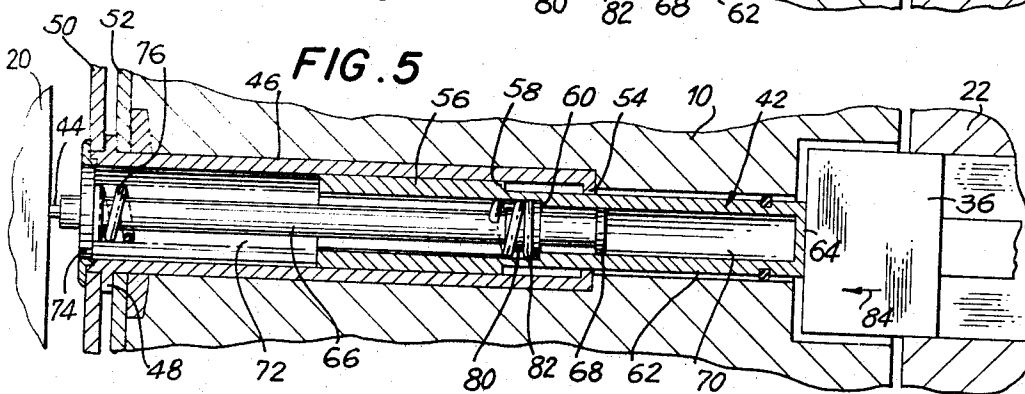


FIG. 5



Feb. 18, 1969

S. JEFFEE

3,427,835

LOCKING ARRANGEMENT WITH INDICATOR

Filed Jan. 3, 1967

Sheet 3 of 3

FIG. 8

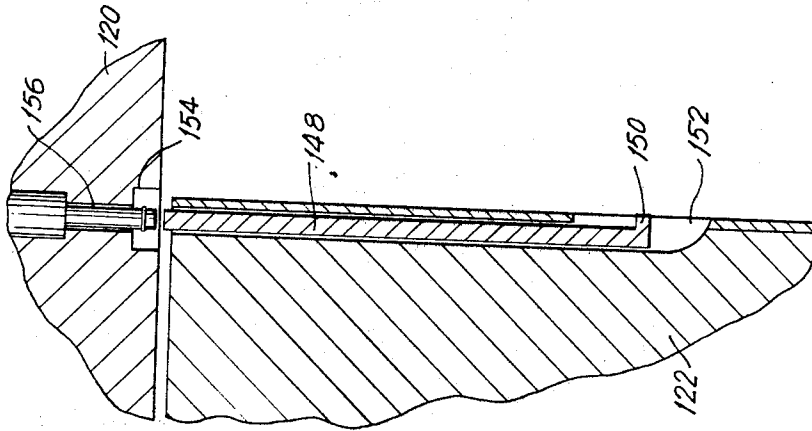
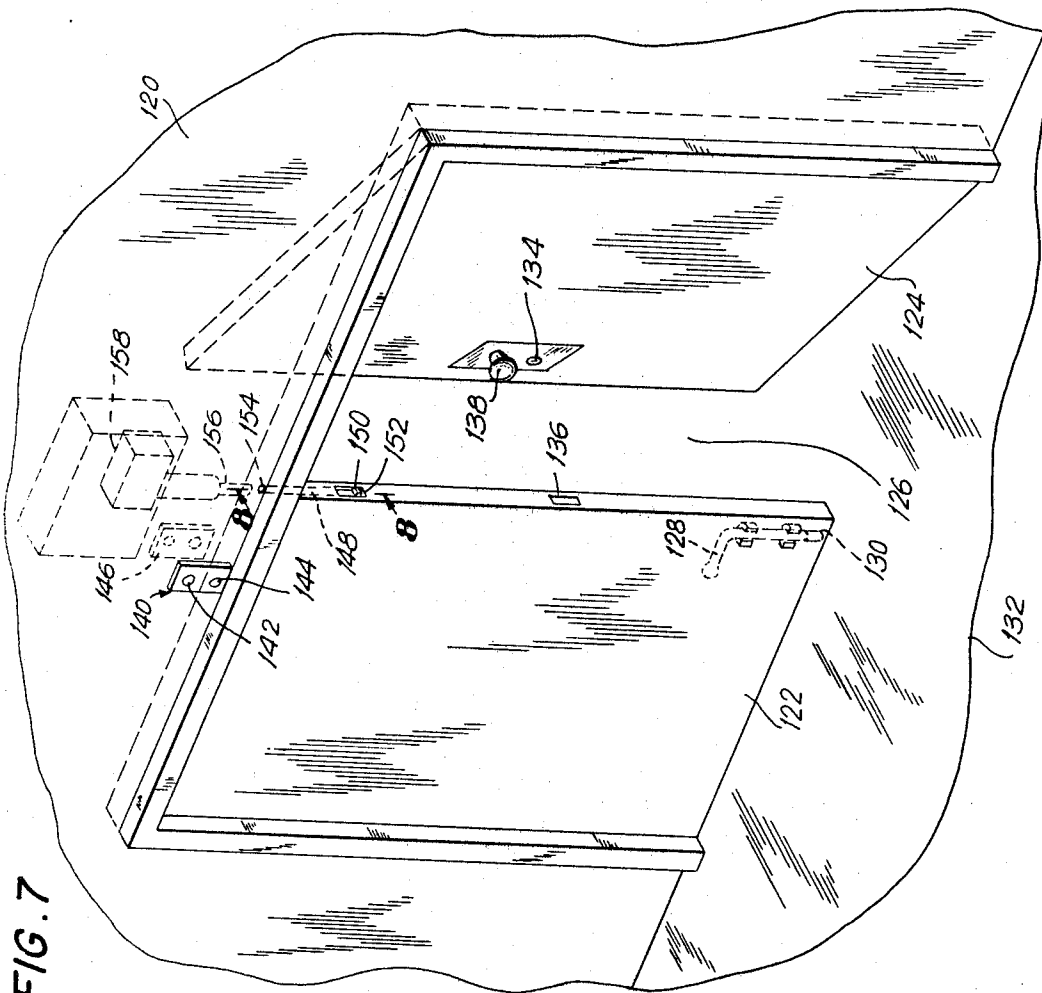


FIG. 7



1

2

LOCKING ARRANGEMENT WITH INDICATOR

Saul Jeffee, Scarsdale, N.Y.

(619 W. 54th St., New York, N.Y. 10019)

Filed Jan. 3, 1967, Ser. No. 606,763

U.S. Cl. 70-432

Int. Cl. E05b 41/00, 63/12, 65/48

4 Claims

ABSTRACT OF THE DISCLOSURE

A locking arrangement between a door and wall which includes two latchbolt and keeper means, one of which has lamp indicating means associated therewith. The lamp is actuated by engagement of one latchbolt against a compressible member located in the associated keeper recess to yieldably transmit force to a switch connected to the lamp.

This invention relates to locking arrangements and more particularly to locking arrangements provided with indicators to perform a function hereinafter described in greater detail.

In the maintenance and operation of offices, plants, warehouses and so forth, problems of security and security regulations are often encountered. It has now been found that, for two or more of the typical problems involved in security, there is a common solution which is readily employed.

One of these problems concerned with the type of security regulations in which access to a room is limited, for example, to two security classes of personnel such as those having clearance for secret and confidential matters and with respect to which room one of the security classes may be excluded from time to time. Such a room will be provided with two locks. One lock will be operable by one of said classes of personnel, whereas both locks will be operable by the other of said classes.

Although this security arrangement seems simple, it nevertheless leads to problems chiefly due to the fact that, in the absence of some type of indicator, one cannot readily determine that he cannot gain access to the room involved. This leads to inefficient operating conditions, loss of time, undesirable attempts to gain access accompanied by the generation of intolerable noise, emotional upset and so forth. It has been found that all of this can be avoided simply by providing an indication of whether one or both of two locks have been operated. Moreover, it has been found that this principle is applicable to another common security problem next discussed below.

In the use of double-wing doors, a lock is commonly employed to lock the wings together. One lock is, however, insufficient, and a second lock is generally employed to fix one of the wings to the adjacent wall. It is rapidly appreciated by persons having an eye for expedience that if the second lock is not operated, the first lock can be kept in locked condition and the wings readily swing open together. To many people this assumes the responsibilities inherent in security but, while obviously suitable for expedience, security clearly suffers in the execution.

An object of the invention is to apply the earlier disclosed solution to this second problem in order to obviate the same.

In achieving the above and other of its objectives and advantages, there is proposed in accordance with the invention a locking arrangement comprising a relatively stationary part, a relatively movable part associated therewith, first and second locking means effective to lock these parts together and indicating means coupled to one of the locking means only to indicate when the latter means is effected to lock the movable parts, at least partially, to the stationary part.

In accordance with one embodiment of the invention, the locking means may be individually effective to lock the stationary and movable parts together. In accordance with a second embodiment of the invention, the locking means may be cooperatively effective to lock the parts together.

More particularly, the stationary part referred to hereinabove may be a wall whereas the movable parts may be a door which is hinged relative to the wall. The first and second locking means in this case will include a member adapted for being extended from one of these parts into a corresponding receptacle in the other of the parts, the indicating means including a switch adjacent one of the receptacles and adapted for being operated by the corresponding member.

In accordance with the invention a multiplicity of lights may be connected to the aforesaid switch and may be alternately illuminated thereby to indicate the condition of the related locking means. The switch may be a micro-switch including a spring-loaded plunger which is adapted to be actuated by said corresponding member.

A feature of the invention involves the provision of certain details in respect of an intermediate means employed between the plunger of the microswitch and the latch member of the locking means. This intermediate means may comprise certain details as described hereinbelow which enable the locking means and the switch to cooperate in a manner most calculated to provide for extended usage without the need for unusual maintenance.

In another respect, the invention may involve the use of a double-wing door as the movable part, each wing which is hinged relative to the associated wall. In this case, the first locking means may include a member slidable in one of the wings to lock the same in a receptacle provided in the wall, the second locking means being effective to lock the wings together with the indicating means being responsive to the locking means which locks the first said wing to the wall.

The invention will be more clearly understood from the following detailed description of some preferred embodiments thereof, as illustrated in the accompanying drawing in which:

FIGURE 1 is a perspective broken away view of a wall and door embodying the locking and indicating features of the invention;

FIGURE 2 is a sectional view, on enlarged scale taken along line 2-2 of FIG. 1, illustrating the cooperation between a locking member and an indicator switch employed in accordance with the invention;

FIGURE 3 is a top view, partially broken away, of the structure illustrated in FIG. 2;

FIGURE 4 is a sectional view taken along line 4-4 of FIG. 3;

FIGURE 5 is a view corresponding to FIG. 4 but showing the lock in operated condition;

FIGURE 6 is a view on enlarged scale of a detail of FIGS. 4 and 5;

FIGURE 7 illustrates the environment for a second embodiment of the invention; and

FIGURE 8 is a cross-sectional view on enlarged scale taken along line 8-8 of FIG. 7.

The relatively fixed member in FIG. 1 is the wall 10 in the end 12 of which are provided receptacles 14 and 16. The wall 10 supports an indicator 18 and within the wall 10 is supported a switch 20 having electrical connection with indicator 18.

The relatively movable member illustrated in FIG. 1 is a door 22 having a knob 24 thereon adapted to control a spring-loaded latch 26 and having a key opening 28 by means of which the door may be locked. Knob 24 is associated with a plate 30 on which is mounted a second lock 32 connected by a system of levers 34 to a bolt

or latch 36 adapted to be accommodated in the receptacle 16.

The door 22 opens into a room to which there is limited security access. Nonclassified personnel are barred from said room and, for example, personnel having secrecy clearance will be admitted to this room at all times and will have keys to the locks 28 and 32, whereas personnel cleared for confidential material will have keys to the lock 28 only and thus will not be able to open the door 22 when the lock 32 has been operated.

The problem which occurs in connection with this security problem is that when the door 22 is closed and both locks 28 and 32 operated, it will not be normally possible for personnel cleared for confidential material only to know that lock 32 is operated and that they will not be able to gain access to the room by operation of lock 28. This leads to difficulties in that time will be lost by the latter classification of personnel trying to gain access to the room, although this is impossible, and further due to the emotional problems which arise under such circumstances. To this end the indicator 18 provides that one of the lights 38 or 40 will be selectively illuminated to indicate the status of locks 28 and 32, whereby it will be unnecessary for said latter class of personnel to waste their time and become emotionally involved with trying to open the door 22 when this is impossible, except in respect of personnel having secrecy security clearance.

The spring-loaded latch 26 is normally accommodated, with the door 22 closed, in the receptacle 14 and when the lock 28 has been actuated, it is impossible to turn the knob 24 so that access to the room is prevented. When the lock 32 is actuated the slidable member or plunger 36 is accommodated in the receptacle 16 and this acts to operate the plunger 42 to operate the switch indicated generally at 20 which is effected through electrical connections discussed hereinbelow to operate lights 38 and 40 in any desired manner.

The details of the indicator operating arrangement appear in FIGS. 2-6 wherein are generally indicated the wall 10, the door 22, the slidable member 36 of the lock 32, and the plunger 42 of the switch 20.

FIGS. 4 and 5 indicate most clearly that plunger 42 actually constitutes an intermediate member effective between the slidable member 36 and a plunger 44 constituting a part of the switch 20 itself.

The intermediate member includes a fixed tube 46 having an outwardly extending flange 48 sandwiched between supporting members 50 and 52 mounted in wall 10. Tube 42 also includes an inwardly directed flange 54. Within the tube 46 is positioned a slidable tube 56 including an outer shoulder portion 58 and an inner shoulder portion 60. Tube 56 includes an axial extension 62 extending outwardly from the tube 46 and including a closed extremity 64 which is normally located in a position to be engaged by the slidable member or latch 36.

Within the tubes 46 and 56 is located a displaceable rod 66. At one extremity of this rod is located an annular member or washer 68 which is accommodated within the bore 70 of extension 62. At the other extremity of rod 56 is located another annular member of larger diameter than member 68 and which is accommodated within the bore 72 of tube 46. This second annular member is indicated at 74.

A helical spring 76 encircles the rod 56 and bears at its extremity 78 against annular member 74. At the other end of rod 56 and encircling the same is a slidable member 80 having an outwardly extending flange 82 which normally seats against the annular member 68. Spring 76 is normally in compression between annular member 74 and flange 82 on the member 80.

As appears most clearly in FIG. 5, when the slidable member 36 is displaced in the direction of arrow 84 it abuts against extremity 64 of extension 52 and drives the same along before it, thus driving tube 56 to the left in FIG. 5. The shoulder portion 50 of the tube 56 drives

before it the member 80 through the intermediary of flange 82 and the force is transmitted via spring 76 to the annular member 74 which being affixed to the rod 56 displaces the same to the left. As a result, engagement is made with the plunger 44 of switch 20 and the switch 20 is operated. Upon return of the sliding member 36 to the position shown in FIG. 4, the spring 76 which is under compression is extended and as a consequence thereof member 80 is returned to the right to a position substantially the same as that indicated in FIG. 4.

As appears in FIG. 2, the switch 20 is a microswitch. It is effective to alternately operate the lights indicated at 38 and 40. More particularly, a conventional A.C. voltage source 90 is employed which is coupled across terminals 92 and 94 to the primary 96 of a transformer 98 whose secondary 100 is coupled via a line 102 to the switch 20 and via line 104 to lights 38 and 40, the circuit of which is returned to switch 20 via line 106. Switch 20 is a conventional switch which is adapted to illuminate either of lights 38 and 40 selectively, these lights perhaps being provided with different colors such as red and green, one of which indicates that slidable member 36 has been actuated, whereas the other light and associated color reveals that it has not been operated.

Attention is directed to the fact that in FIG. 2 two additional lights 108 and 110 are shown, it being indicated hereby that one set of lights can be provided on the inside of wall 10 whereas the other set of lights can be provided on the outside thereof.

In FIGS. 7 and 8 are indicated the second problem which has been discussed hereinabove and the structure in connection with the related embodiment of the invention involves the presence of a wall 120, as well as a double-wing door consisting of wings 122 and 124 hinged to the wall to control access through the door opening 126.

It is clear that if the wing 122 is held fast to the wall 120 as indicated by means of a locking element 128 accommodated in a receptacle 130 in the floor 132, a locking of the wing 124 to the wing 122 will be satisfactory to lock the wing 124 to the wall 120 as well. This latter locking operation can be effected by means of the lock 134 with which is associated a spring-loaded plunger which is accommodated in the receptacle 136 which plunger is operated by knob 138. It has been discovered, however, that if the wing 122 is not affixed to the wall 120 that an operation of the lock 134 will not be effective to give a secure locking result inasmuch as both wings 122 and 124 can be simultaneously opened together independently of whether or not the lock 134 has been operated.

In order to avoid the situation where the wing 122 is purposely or accidentally kept retained in an unlocked position relative to the wall 120, there is provided in accordance with the invention an indicator 140 having thereon lights 142 and 144 functioning in the same manner as has been indicated above for the preceding embodiment. As well, a second indicator 146 can be provided on the other side of wall 120.

In the illustrated embodiments there is provided within the wing 122 a conventional slidable bolt 148 having connected thereto a foot 150 exposed in the recess 152. Manual engagement of foot 150 is effective to push the bolt into the receptacle 154 in the wall 120, whereupon the wing 122 is locked to the wall 120.

Upon being raised to locking position the bolt 148 will engage the plunger 156 associated with the switch 158 which is electrically associated with indicator 140 in the manner which has been indicated hereinabove for the first embodiment of the invention.

As a result of provisions indicated in FIGS. 7 and 8, a means is provided for indicating whether or not the wing 122 is connected with the wall 120 so that a locking operation effected by means of lock 134 will be truly effective.

There will now be obvious to those skilled in the art

many modifications and variations of the structure set forth hereinabove.

What is claimed is:

1. A locking arrangement comprising a relatively stationary part, a relatively movable part associated therewith, first and second locking means effective to lock said parts together, indicating means operatively associated with one of said locking means only, to indicate when the latter said means is effective to lock the movable part and the stationary part in fixed relation, said stationary part being a wall and said movable part being a door hinged relative to said wall, said first and second locking means each including a member adapted for being extended from said one of said parts into a corresponding receptacle in the other of said parts, said indicating means including a switch adjacent one of said receptacles and adapted for being operated by the corresponding member, and intermediate means between said switch and corresponding member, said intermediate means being compressible whereby the force of said corresponding member is yieldably applied to said switch.

2. A locking arrangement as claimed in claim 1 wherein said indicating means includes two lights connected to the switch and alternately illuminated thereby.

3. A locking arrangement as claimed in claim 2 wherein the switch is a microswitch including a spring-loaded plunger adapted to be actuated through said intermediate means by said corresponding member.

4. A locking arrangement as claimed in claim 3 wherein said intermediate means comprises a fixed tube including an inwardly directed flange at one extremity thereof, a slidable tube within said fixed tube and including an extension out of the fixed tube towards said corresponding member by which it is engaged and an outer shoulder portion adapted to seat against said flange whereby move-

ment of the slidable tube is restricted, said slidable tube further including an inner shoulder portion, a displaceable rod within said slidable rod and extending towards the other extremity of said fixed tube, first and second annular members on said rod and respectively engaged in said fixed and slidable tubes for supporting said rod therein, a further member encircling said rod and slidable thereon and normally seated against the inner shoulder portion of said slidable tube, and a spring encircling said rod and effective in compression between said first annular member and further member so that movement of said corresponding member against said slidable tube is transferred by said inner shoulder portion to said further member and then via said spring yieldingly to said first annular member to said rod to operate said switch.

References Cited

UNITED STATES PATENTS

1,328,072	1/1920	Bechoff	200—50
1,810,468	6/1931	Doyle	70—433
2,620,213	12/1952	Keeler	292—147
2,953,668	9/1960	Bassett	200—167
3,168,636	2/1965	De Smidt	200—167
3,222,473	12/1965	Delhase	200—61.62

FOREIGN PATENTS

377,796 2/1932 Great Britain.

RICHARD E. MOORE, *Primary Examiner.*

R. L. WOLFE, *Assistant Examiner.*

U.S. Cl. X.R.

70—102, 441