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Schwartz

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[54] **DOUBLE DOOR LOCK**

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[52] **U.S. Cl.** **70/134**, 70/380, 70/DIG. 60

[51] **Int. Cl.** **E05b 65/06**

[58] **Field of Search** ..... 70/134, 379 R, 380, 70/DIG. 60; 292/139, 165, 167

[56] **References Cited**

UNITED STATES PATENTS

2,797,570	7/1957	Fresard et al.	70/129
1,929,985	10/1933	Main	70/357
3,606,422	9/1971	Hennessy	292/139

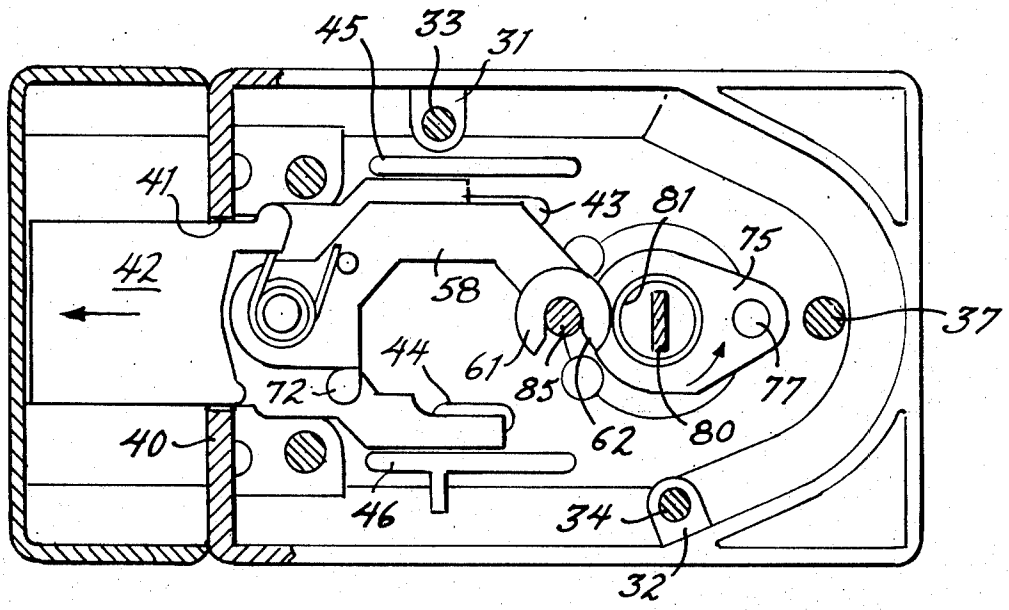
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[57] **ABSTRACT**

A double cylinder door lock wherein a bolt is slidable in a housing for extension and retraction, the bolt's sliding being effected by operating means within the housing carrying a receiver, and a pair of separate key controlled mechanisms having respective engaging means selectively entering the receiver to effect a desired bolt movement with the nonentering engaging means permitting the desired bolt movement.

9 Claims, 9 Drawing Figures



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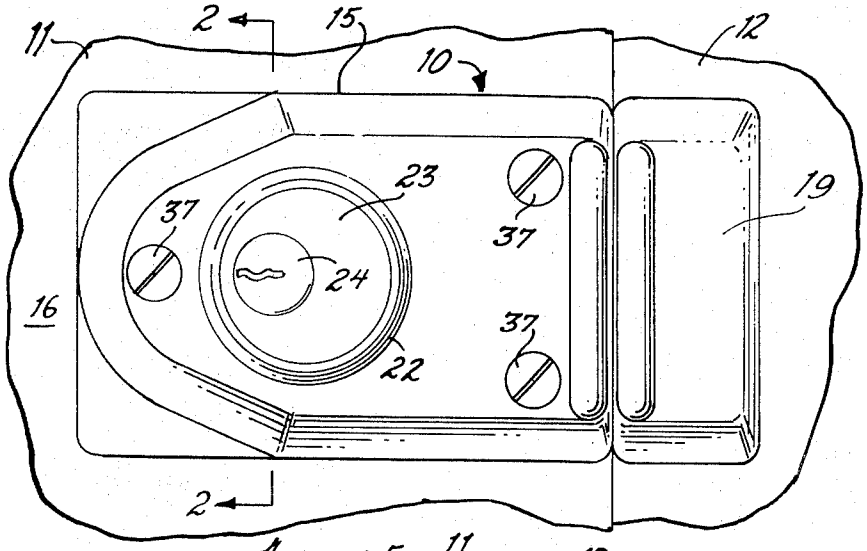


Fig. 1.

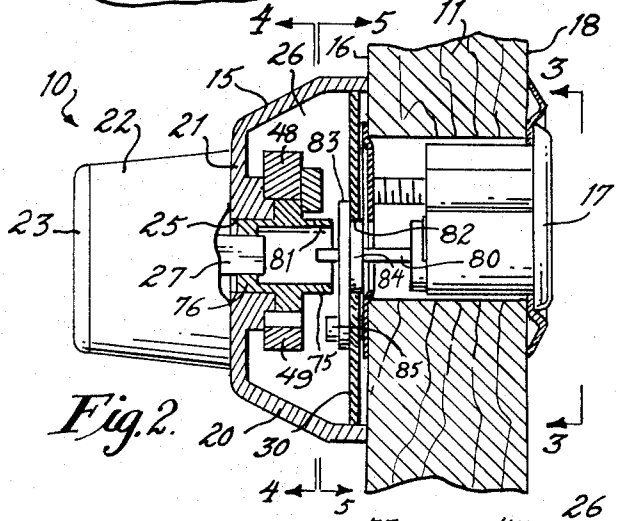


Fig. 2.

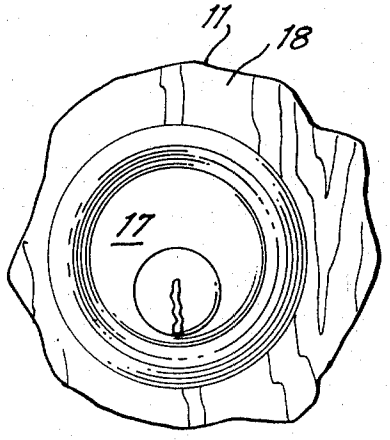


Fig. 3.

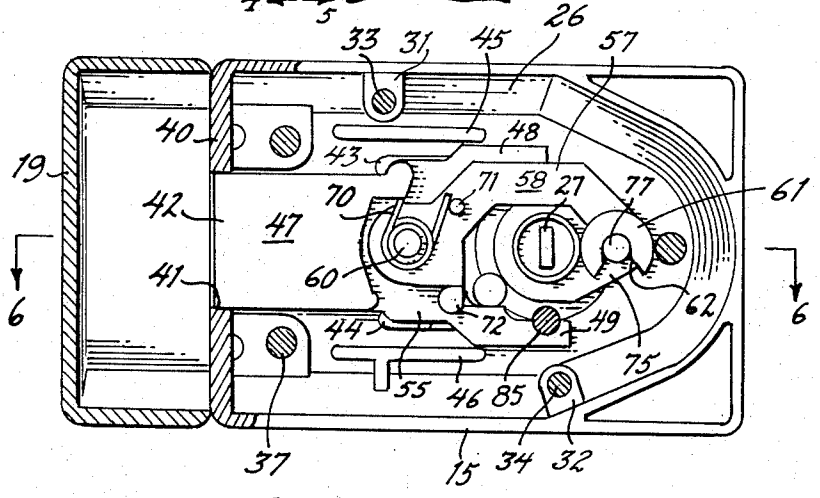


Fig. 4.

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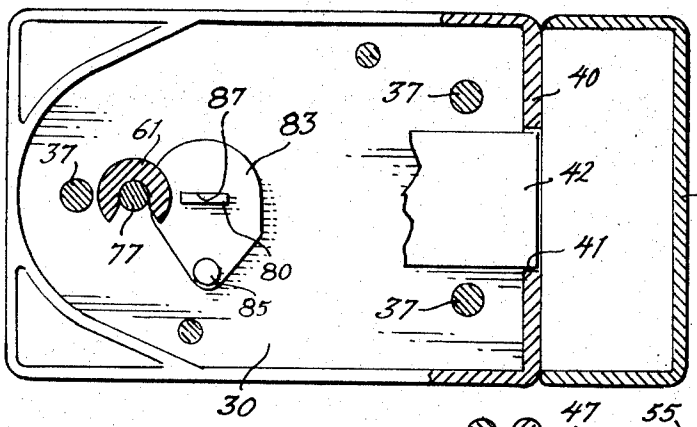


Fig.5.

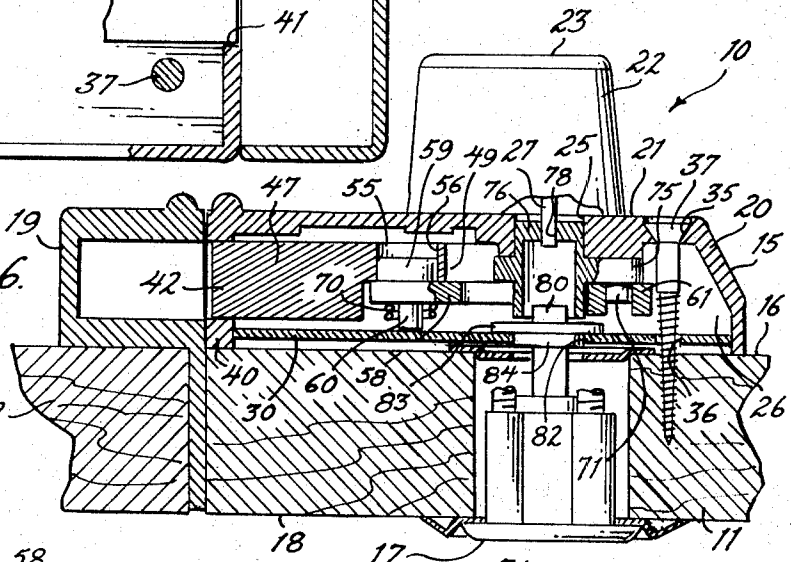
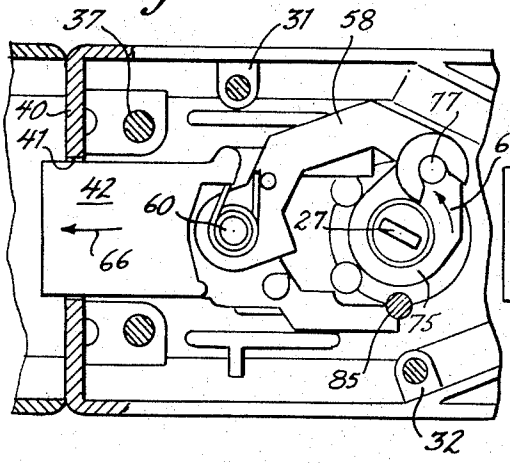


Fig.6.

Fig.7.



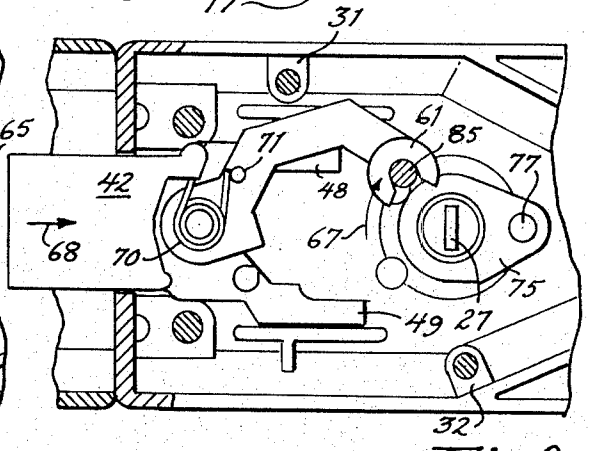


Fig.9.

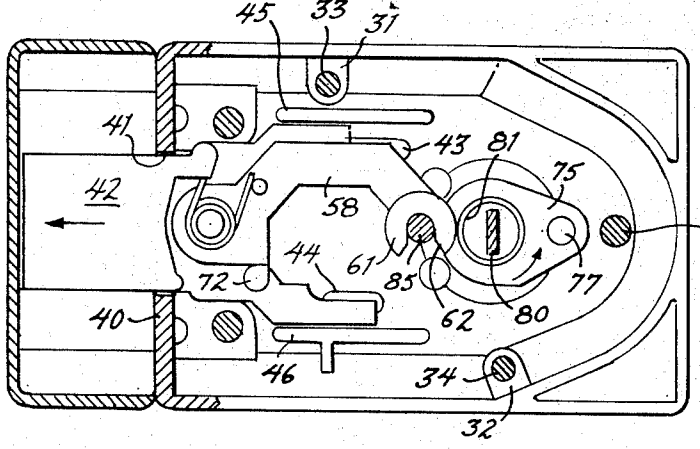


Fig.8.

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DOUBLE DOOR LOCK

BACKGROUND OF THE INVENTION

As is well known to those versed in the art, double cylinder door lock devices, providing separate key controlled mechanisms on opposite sides of a door, are not broadly new. Such mechanisms, hereinafter referred to as double door locks, have in the past presented certain problems in engineering, design and manufacture, for example in high cost of assembly, interdependence of operation between the separate actuating mechanisms, and relative complexity of construction.

SUMMARY OF THE INVENTION

Accordingly, it is an important object of the present invention to provide a double door lock construction which overcomes the above mentioned difficulties, produces substantial economies in manufacture by permitting assembly of separate parts without fixed securement therebetween, results in a complete independence between the separate key controlled mechanisms such that the lock may be operated by each key controlled mechanism without reference to the other, and wherein substantial simplification in design has been achieved to effect considerable savings in manufacturing costs.

It is still another object of the present invention to provide a double door lock device having the advantageous characteristics mentioned in the preceding paragraphs, which is staunch and durable in structure, entirely reliable throughout a long useful life, and which can be simply and easily installed without special skill or training.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a partial interior elevational view showing a door and door jamb having a lock construction of the present invention applied thereto.

FIG. 2 is a sectional elevational view taken generally along the line 2—2 of FIG. 1.

FIG. 3 is a partial external elevational view taken generally along the line 3—3 of FIG. 2.

FIG. 4 is a sectional elevational view taken generally along the line 4—4 of FIG. 2.

FIG. 5 is a sectional elevational view taken generally along the line 5—5 of FIG. 2.

FIG. 6 is a horizontal sectional view taken generally along the line 6—6 of FIG. 4.

FIG. 7 is a sectional elevational view similar to FIG. 4, but illustrating an intermediate condition of operation from the unlocked position of FIG. 4 toward a locked condition.

FIG. 8 is a sectional elevational view similar to FIG. 4, but illustrating the fully locked condition of operation.

FIG. 9 is a partial sectional elevational view similar to FIG. 4, but illustrating an intermediate condition of operation from the locked condition of FIG. 8 toward an unlocked condition.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more particularly to the drawings, and specifically to FIG. 1 thereof, a double door lock is generally designated 10, and is shown applied to a door 11 and door jamb 12, on the inner sides thereof. That is, a housing 15 is applied to the interior surface or side

16, see FIGS. 1 and 2, and a key controlled mechanism or cylinder 17 is exposed beyond the outer door side or surface 18. A keeper is designated 19, and suitably fixed to the door jamb 12 for receiving a bolt in locked position.

The housing 15 may be of hollow, elongate generally rectangular overall configuration, including a peripheral wall 20 of closed configuration outstanding from the inner surface 16 of the door 11. Extending across and in closing relation with the peripheral wall 20, in parallel inwardly spaced relation with the door 11 is an inwardly facing wall 21. The inner wall 21 and peripheral wall 20 may advantageously be integrally formed, as by die casting, or otherwise manufactured, as desired. Projecting from the housing wall 21, outstanding away from the interior of the housing 15, may be a hollow, generally cylindrical or conical boss or auxiliary housing 22 for containing a key controlled mechanism or cylinder 23. The key controlled mechanism or cylinder 23 may be provided with a rotary key slotted plug 24 exposed through the distal end of the boss 22. The boss 22 opens through a hole 25 to the hollow interior 26 of the housing 15. The key controlled cylinder mechanism 23 may be a conventional tumbler type cylinder lock, or other suitable rotary mechanism, and may be provided with a rotary extension, tail piece or bar 27 projecting into the opening or hole 25 through the wall 21. Thus, the tail piece or bar 27 is rotated about a longitudinal axis upon rotation of the cylinder mechanism 23 by a key in the slotted plug 24.

The interior hollow 26 of the housing 15 may be closed on its side toward the door 11, as by a closure member or plate 30 conformably engaged within the peripheral wall 20. Internal bosses or lugs may be provided within the hollow 26 of housing 15, as at 31 and 32 (see FIGS. 4 and 7–9) which receive and hold threaded fasteners or other suitable fastening elements 33 and 34, removably retaining the closure plate 30 in its housing closing position. Further, the housing wall 21 and the closure plate 30 may be suitably formed with aligned openings, as at 35 and 36 (see FIG. 6) for receiving fasteners 37 extending into the door 11 and securing the housing to the door.

One portion 40 of peripheral wall 20, adjacent to and facing toward the interior of keeper 19, is formed with a through opening 41 slidably receiving an elongate bolt 42 for longitudinal shifting movement of one end into and out of the keeper 16. Also, the housing 15 is provided in the hollow thereof, on the housing wall 21 with guiding formations or way means for guiding the bolt 42 in its shifting movement. In particular, the housing wall 21 is formed with a pair of lands or bosses on the wall 21 facing into the housing interior 26, as at 43 and 44, see FIGS. 4 and 8, on which the bolt 42 rides, and an additional pair of guide members, ridges or rails 45 and 46 also formed on the housing wall 21 and between which the bolt 42 is constrained to its longitudinal sliding movement.

The bolt 42 may advantageously be of an integral formation, including a bar-like locking portion 47 which may be of generally rectangular cross-sectional configuration for shifting retraction and projection through the opening 41 of housing wall portion 40. Within the hollow interior 26 of the housing 15, extending longitudinally from the bar-like bolt portion 47, there is provided a generally U-shaped formation including a pair of laterally spaced legs 48 and 49 projecting longitudi-

nally of the bolt 42, being of a thickness less than that of the bolt portion 47 (see FIG. 6) in the direction between housing walls 21 and 30, and extending laterally beyond the bolt portion 47 for a sliding, constrained relation with the way means or bosses 43-46.

An intermediate portion of the bolt 42, as between the bolt portion 47 and legs 48 and 49, is of reduced thickness, as at 55 (see FIGS. 4 and 6), and provided with a through hole or opening 56. Bolt operating means 57 are defined by an elongate, generally C-shaped link 58 having one end provided with a circular boss or pintle 59 rotatably engaged in the opening 56 of the intermediate bolt region 55. On the opposite side of the link 58 as the boss 59, there is provided a projection or pin 60. Thus, the link 58 is located between the intermediate bolt region 55 and the housing closure or wall 30, while the pin or lug 60 projects toward and terminates proximate to the wall 30, so that the boss 59 cannot escape from the opening 56 unless the wall 30 is removed.

The C-shaped or generally semicircular link 58 of the bolt operating means 57 extends generally longitudinally of the bolt 42 beyond the ends of bolt legs 48 and 49, there terminating in a receiver or eye 61 having one side open, as at 62, see FIG. 4. In the latter figure it will be observed that the arcuate or generally semicircular link 58 extends along and overlies the leg 48, passing beyond the free end of the latter, and extends thence laterally inwardly to terminate at the eye or receiver 61. In the condition shown in FIG. 4, the receiver or eye 61 is generally aligned with the pintle or boss 59 longitudinally of shifting movement of the bolt 42. Further, the receiver or eye 61 has its opening 62 facing generally transversely of or normal to the direction of bolt shifting movement.

The link 58 of the bolt operating means 57 is swingable about the axis of pintle 59 relative to the bolt 42 in the counterclockwise direction, as indicated by arrow 65 in FIG. 7 while the bolt 42 shifts leftward to a closed or locked position in the direction of arrow 66. A fully locked condition is shown in FIG. 8, the bolt operating link 58 having returned clockwise to its generally longitudinal disposition relative to the bolt 42 with the latter fully extended. Reversal of the above described operation and return to the open bolt position is shown in FIG. 9, the receiver or eye 61 moving arcuately in the direction of arrow 67 and simultaneously shifting with the bolt 42 in the direction of arrow 68.

Suitable resilient means may be employed to urge the bolt operating arm 58 in the clockwise direction of rotation about pintle 59, such as a coil spring 70 circumposed about the pin 60 having projecting ends respectively engaging the bolt portion 47 and a lug 71 on the link 58. A stop member or lug 72 projects from the intermediate bolt region 55 for limiting engagement with the link 58 to stop the latter in its longitudinally aligned positions of FIGS. 4 and 8.

An engaging member is generally designated 75 and may include a pintle or boss 76 rotatably received in the hole 25 of the housing wall 21. That is, the engaging member is located in the housing interior 26, and its boss 76 projects into the opening 25 from the housing interior. The engaging member may be a generally flat plate projecting radially from the boss 76, and is provided with an additional boss, lug or engaging element 77, say in the form of a pin parallel to the boss 76. The pin 77 projects from the engaging member 75 in the opposite direction as the boss 76, and extends parallel thereto, so that the engaging member may be considered as a crank shaft or equivalent thereto. Upon rotation of the engaging member 75, the eccentric pin 77 is engageable in the receiver 61 to shift the latter between the positions of FIGS. 4 and 8. Further, the boss 76 is diametrically slotted, as at 78, or otherwise configured to nonrotatably receive the bar 27. In this manner, the key actuated mechanism or cylinder 23 serves to effect rotation of the engaging member 75 in the manner described hereinbefore.

The additional key controlled mechanism of cylinder 17 is mounted in the door 11 with the rotary key slotted plug 24 in generally axial alignment with the key slotted plug 79 of key controlled mechanism 23 and the latter is provided with a rotary tail piece or bar 80 extending into the housing interior 26 toward and terminating short of the tail piece 27.

More specifically, the engaging member 75 may be recessed, as at 81, facing toward and spacedly receiving the bar 80. The closure plate or wall 30 is formed with a generally circular through opening 82 in alignment with the opening or hole 25. An additional engaging member is designated 83, and includes a circular projection or boss 84 rotatably received in the opening 82 and mounting the engaging member 83 for rotation coaxially with the engaging member 75. The engaging member 83 extends radially from the axis of boss 84 and is there provided with an offset or eccentric pin or engaging element 85. The engaging element or pin 85 is swingable about the same arc as the engaging element or pin 77. Further, both engaging elements or pins 77 and 85 are each of a length less than the thickness of receiver 61, so as to both be engageable in the receiver for independently effecting actuation of the bolt operating means. That is, the bolt 42 can be shifted in either direction between its opposite positions of extension and retraction by each of the key controlled mechanisms 17 and 23. For example, as shown in FIG. 7, the bolt 42 is being closed by operation of the key controlled mechanism 23 to rotate the engaging member 75. In the condition shown in FIG. 8, the engaging member 75 has been rotated to return to its original position of FIG. 4, while the engaging member 83 and its engaging element 85 is engaged in the receiver 61, and rotation of the latter engaging member effects return of the bolt 42 through its position shown in FIG. 9 to its original unlocked condition of FIG. 4.

While the engaging members 75 and 83 are independently actuable to effect the above described operation, it is apparent that they are readily assembled and retained in their assembled relation without the need for permanent and expensive fastening means. Thus, the engaging member 75 is held in position by engagement of its rotary boss 76 in hole 25, and similarly engaging member 83 is held in position by engagement of its rotary boss 84 in hole 82. The thicknesses of the engaging member 75 and 83 are such that they cannot, without removal of closure plate 30, fall from their receiving openings. The bolt operating means 57 is similarly assembled and maintained in position. Of course, the engaging member 83 is slotted, as at 87 to nonrotatably receive the tail piece 80 of the key controlled cylinder mechanism 17.

From the foregoing, it is seen that the present invention provides a double door lock construction which is extremely simple to effect substantial economies in

manufacture and assembly, which is highly secure and reliable throughout a long useful life, and which otherwise fully accomplishes its intended objects.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention.

What is claimed is:

1. A double door lock comprising a housing to be carried by a door and having spaced outer and inner walls, a bolt mounted in the housing between said walls for shifting movement between locked and unlocked positions, bolt operating means for effecting said shifting movement, a receiver carried by said bolt operating means and opening transversely of the direction of shifting movement, a pair of key controlled mechanisms for location on opposite sides of a door, and a pair of engaging means in said housing respectively associated with said key controlled mechanisms and each selectively engageable into said receiver to effect a desired bolt movement and disengageable from said receiver to permit said desired bolt movement effected by the other engaging means, said pair of engaging means being mounted for independent axially aligned rotation in respective housing walls and retained therein by limiting engagement with each other.

2. A double door lock according to claim **1,** said operating means comprising an arcuate link having one end pivotally connected to said bolt for movement therewith and having its other end extending generally longitudinally of bolt movement and partially about said engaging means in one bolt position, and said receiver being on the other end of said link for shifting movement with said bolt and swinging movement relative thereto.

3. A double door lock according to claim **2,** said engaging means each being rotatable about an axis generally parallel to the pivotal connection of said link for effecting said link shifting and swinging movement and said engaging means axis intersecting the path of movement of said pivotal connection with said bolt, for maximum bolt movement by said engaging means.

4. A double door lock according to claim **3,** said receiver being arranged with its opening facing circumferentially of said engaging means rotation when said bolt is in its locked and unlocked positions, for receiving said engaging means upon rotation thereof.

5. A double door lock according to claim **3,** in combination with resilient means urging said link in one direction of rotation, and stop means carried by said bolt limiting link rotation in said one direction to a position with said receiver located to receive said engaging means.

6. A double door lock according to claim **3,** said key controlled mechanisms each comprising a rotary cylinder, and a noncircular shank extending from each cylinder for operative association with a respective engaging means.

7. A double door lock according to claim **6,** said receiver comprising a generally U-shaped member, and said engaging means comprising generally parallel pins rotatable about a single axis parallel to said pins for movement into and out of the opening of said U-shaped member.

8. A double door lock according to claim **6,** said housing having a pair of aligned openings coaxial with said cylinders and spaced on opposite sides of said receiver, and said engaging means each comprising a stub shaft independently rotatable in a respective one of said aligned openings, said parallel pins being respectively carried in eccentric relation with respect to said stub shafts for engagement into and withdrawal from said receiver, said noncircular shanks extending in nonrotative relation through respective stub shafts for rotating the latter.

9. A double door lock according to claim **8,** said housing comprising a generally flat hollow body having one side closed defining said outer wall and the other side open, and a separate closure member defining said inner wall engaged in closing relation with said other open body side, said pair of aligned openings being formed respectively in said closed body side and said closure member, one of said engaging means being inserted rotatably in said body side opening and enlarged inwardly thereof to prevent withdrawal therethrough, said receiver link overlying and retaining said one engaging means, and the other engaging means overlying said link and said one engaging means and rotatably entering said closure member opening, whereby said closure member effectively retains said engaging members in said assembled relation.

* * * * *