Oct. 7, 1958 C. L. EADS 2,855,234

LOCK MECHANISM FOR SLIDING DOORS

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Fig. 3.

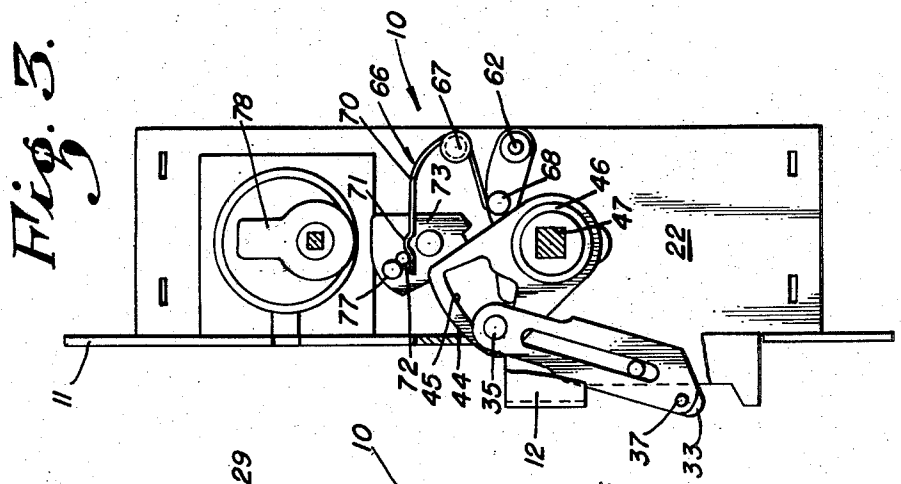
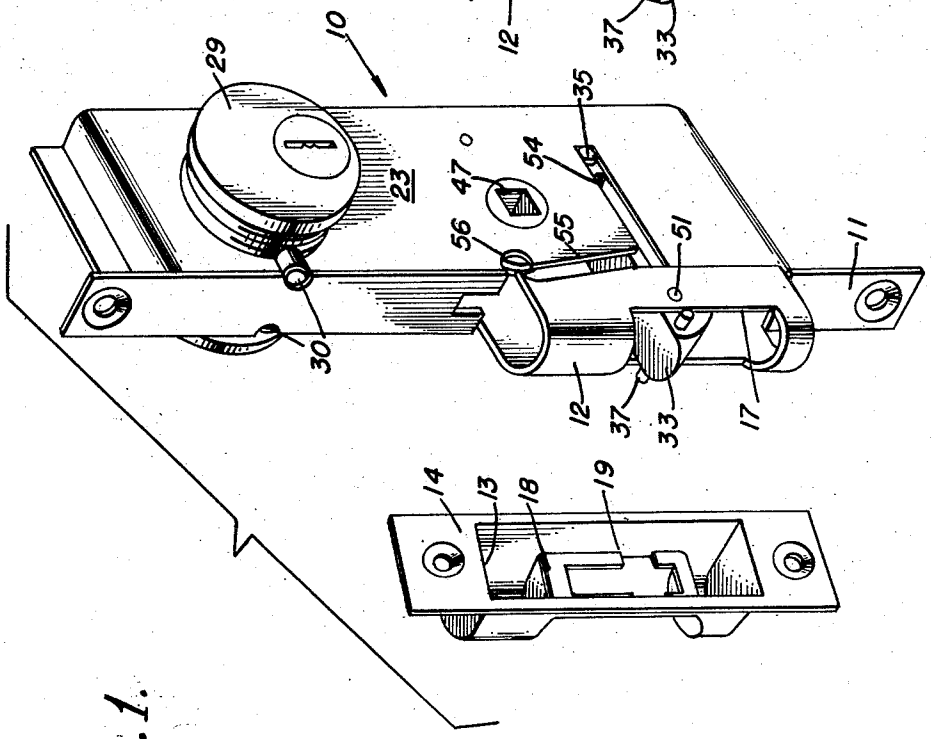


Fig. 1.



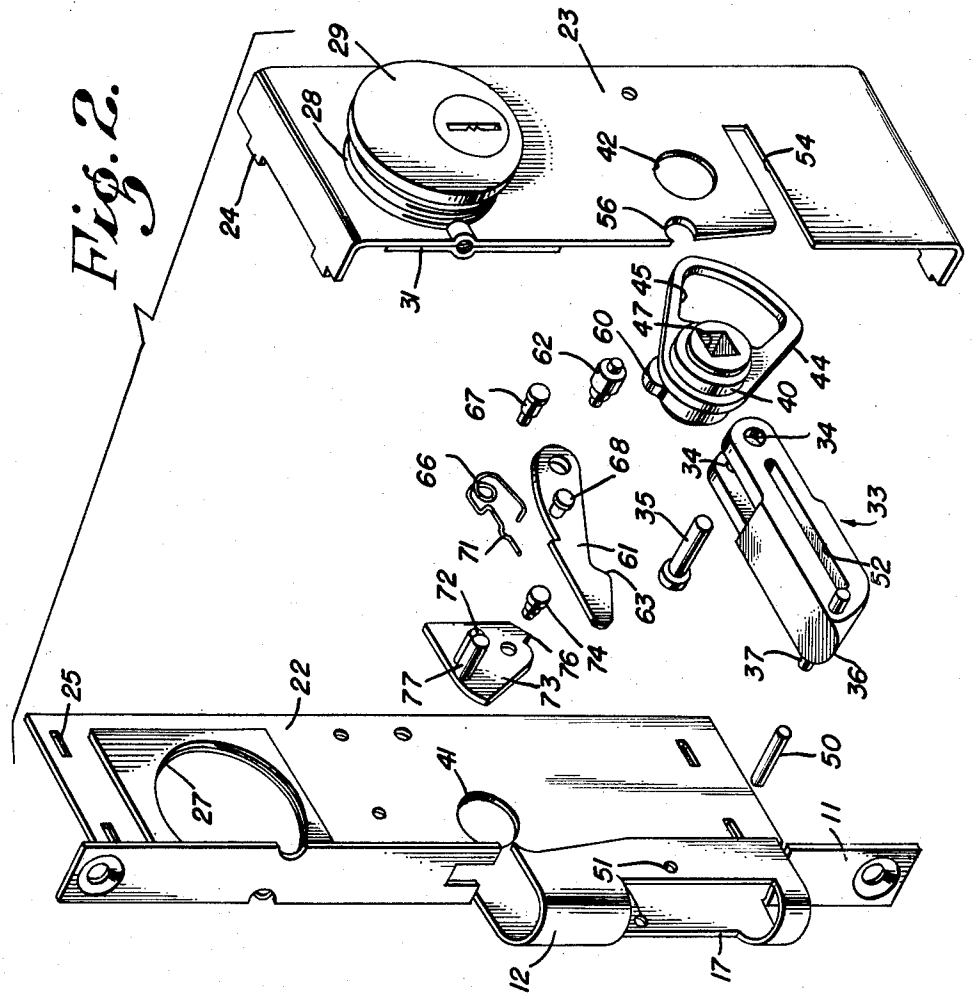
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Fig. 2.



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Fig. 4.

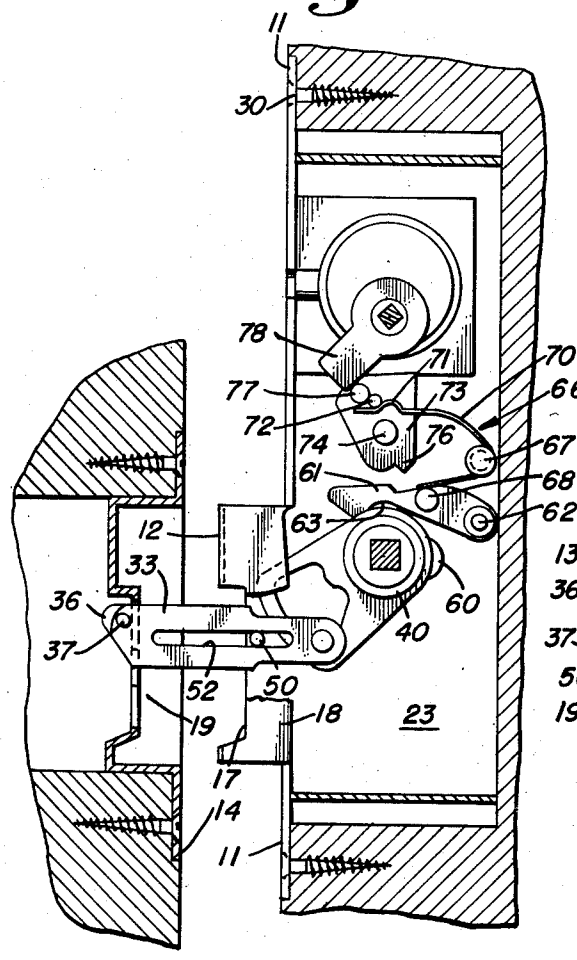
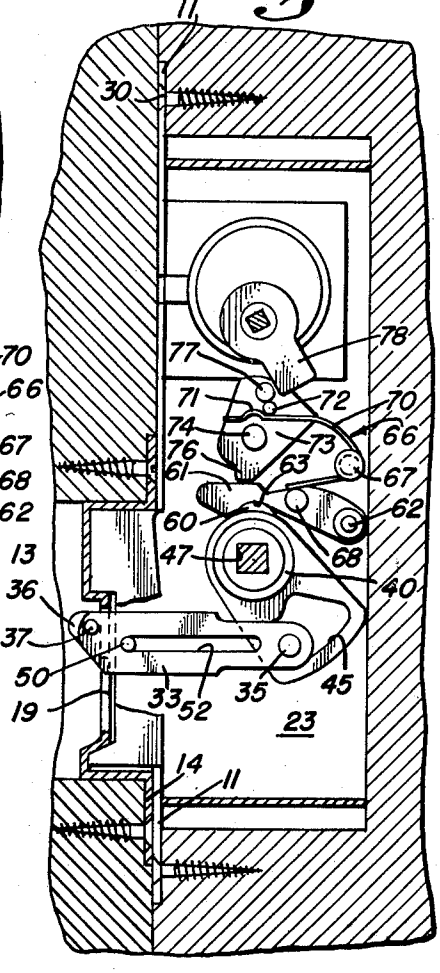


Fig. 5.



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LOCK MECHANISM FOR SLIDING DOORS

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Application July 5, 1955, Serial No. 520,065

1 Claim. (Cl. 292—66)

This invention relates to a lock mechanism, the lock being particularly adapted for use with sliding doors in that the lock features the characteristic that it operates to draw the doors snugly together and to retain them. The lock is particularly adapted for use with sliding doors of the accordion or folding type. In the prior art, difficulty has been experienced with locks used with sliding doors in that at times it is difficult to draw the doors close enough together to operate the lock, and also at times the doors are not brought closely together when locked.

The lock of this invention features a novel lock mechanism adapted for use with sliding doors wherein a bolt is extended from one door, engages the other, and firmly and positively draws the doors together and locks them when the mechanism is operated. The mechanism involves a novel movement wherein the desired linear and rotary movement of the bolt is accomplished by a simple rotating handle or the equivalent thereof. The mechanism incorporates positive locking means wherein the doors can be positively locked after being brought together by a key lock mechanism, that is, a conventional lock cylinder operable by a key.

The lock assembly is of a nature providing for maximum ease of manufacture of parts, fabrication, assembly and installation.

It is accordingly, a primary object of the invention to provide a lock adapted for use with sliding doors embodying a bolt mechanism operated by a handle and characterized in that the bolt extends out from one door to engage the other door, and when operated moves to draw the doors together and lock them.

Another object of the invention is to provide a lock for use with sliding doors embodying a bolt arranged for sliding and rotary movement and having an operating handle associated therewith, whereby to cause the bolt to extend from one door to engage the other door and to then be rotated about an intermediate pivot point whereby to draw the doors together and lock them.

Another object is to provide a lock as in the foregoing object, wherein the bolt is slidably mounted on a pivot about which it may rotate, and one end of the bolt is further guided in order to give it a linear reaching out movement and then a rotary movement providing leverage for drawing two doors together and locking them.

Another object of the invention is to provide in combination with the mechanism of the foregoing objects a positive locking device wherein the operating mechanism for the bolt may be positively locked by a key lock in a locked position.

Further objects and numerous advantages of the invention will become apparent from the following detailed description and annexed drawings, wherein:

Fig. 1 is a perspective view of the lock of the invention;

Fig. 2 is an exploded view of the lock showing its various parts;

Fig. 3 is an interior view of the lock mechanism showing the parts in various operative positions;

Fig. 4 is a view similar to Fig. 3, showing the parts in another operative position; and

Fig. 5 is a view similar to Fig. 3 showing parts in a further operative position.

Referring now to Figs. 1, 2 and 3 of the drawings, the lock comprises a housing designated generally at **10**, which may be assembled in the outer edge of one of the sliding doors in a conventional manner. At the front of the housing **10** is a plate or panel **11** having holes as shown, adapting it for attachment to the edge face of the door. Extending from the plate **11** is a curved housing portion **12** which forms a housing for the end of the bolt, as will be described, and which fits into a recess **13** forming a receptacle in the edge face of the other door **14**. Housing portion **12** is cut out to form an opening as shown at **17**, to accommodate movements of the bolt, as will be described. At the back or bottom of the recess or receptacle **13** is a strike plate **18** having a T-shaped slot or opening **19** adapted to receive the bolt, as will be described presently.

The housing **10** may be formed from sheet metal plates **22** and **23** as shown in Fig. 2, which may be attached by tongues **24** fitting in openings as shown at **25**. The plate **11** may be attached to the housing by screws as shown at **30**, which engage between the side plates and reinforcing plates as shown at **31**. The plates **22** and **23** have openings as shown at **27** and **28**, adapted to receive a key lock cylinder **29** of conventional type.

The bolt of the lock is designated at **33**. At its right end the bolt **33** is bifurcated as shown, and the legs thus formed have openings as shown at **34** in which are received a pin **35**. The pin **35** will be referred to again presently. The bolt **33** has a slanting nose formation **36** at its left end, and extending transversely therethrough is a pin **37**. When the bolt **33** is extended as will be described, the pin **37** engages in the transverse portion of the T-slot **19** and then as the nose **36** of the bolt **33** is moved inwardly, the ends of the pin **37** engage the shoulders adjacent the vertical part of the T-slot **19**.

The operating mechanism for the bolt **33** includes a hub **40**, the ends of which are journaled in openings **41** and **42** in the side plates **22** and **23**. The hub **40** has an extending lever arm **44** having an arcuate opening **45** therein; the arm **44** extends between the legs or bifurcations of the bolt **33** with the pin **35** extending through the opening **45** so that a lost motion connection is formed between the lever arm **44** and the bolt **33**. The hub **40** has a square socket **47** in its end and this socket is adapted to receive the square shaft of an operating handle of any conventional design.

Numeral **50** designates a shaft of pin which extends between openings **51** in the sides of the housing portion **12**, and through a longitudinal slot **52** in the bolt **33**. From the foregoing it can be seen that there is a lost motion connection between the lever arm **44** and the bolt **33**; that the bolt **33** is adapted for sliding linear transverse movement inwardly and outwardly with the pin **50** moving in the slot **52**. The bolt **33** is also adapted to rotate about the intermediate pivot formed by the pin **50**.

As may be seen in Fig. 1, the plate **23** has a slot **54** formed in it, and the end of the pin **35** engages in this slot to thereby guide the movement of the right end of the bolt **33**. The slot **54** communicates with a generally vertical slot **55** formed between the front edge of plate **23** and one edge of the housing portion **12**, the upper end of this slot terminating in circular portion **56**.

Figs. 3, 4 and 5 show three positions A, B and C, of the operating mechanism for the bolt **33**. When the

hub 40 is rotated counterclockwise from the position A in Fig. 3, the bolt 33 moves outwardly angularly with the pin 50 moving relatively to the slot 52. During this movement the pin 35 moves in and is guided in the slot 55 so that the bolt 33 pivots about pin 50. The nose 36 of the bolt causes the transverse pin 37 to engage the T-slot 19 in the receptacle of the other door 40. As the parts move from position B to position C the right end of the bolt 33 is moved inwardly; the pin 35 moving in the slot portion 54 and being guided thereby. The pin 37 is now in engagement with the shoulders formed by the vertical part of T-slot 19 and as the bolt 33 moves to position C the two doors are drawn together and can be brought into a snug fitting relationship, the housing portion 12 moving into the receptacle 13. When the doors are drawn apart the mechanism moves into position B and the bolt can then be fully retracted by rotating the parts to position A. The various movements of the bolt 33 are permitted and accommodated by the lost motion connection between the bolt and the lever arm 44.

The doors can be positively locked in closed position by a conventional key lock cylinder as previously referred to. To accommodate locking, the hub 40 has a small raised portion as shown at 60. Numeral 61 designates a locking lever mounted on a pivot pin 62. The lever 61 has an arcuate depression 63 adapted to fit and engage with the raised portion 60 on the hub 40. Numeral 66 designates a spring mounted from and coiled about a pin 67, and having an extending portion engaging with a pin 68 extending from the lever 61. The spring normally biases the lever 61 in a counterclockwise direction. The spring 66 has another extending portion 70 having a nib 71 cooperating with a pin 72 extending from a locking cam 73. The nib 71 and pin 72 form a spring detent as will be described. The locking cam 73 is rotatably mounted on a pivot 74 and has the shape as shown in Fig. 2, having a downwardly extending toe 76 which is adapted to engage the upper part or top of lever 61 when the cam 73 is rotated in a clockwise direction to prevent upward movement of the lever 61 and to therefore lock the parts. That is, when lever 61 cannot rotate upwardly against the spring 66, by reason of its engagement with the raised portion 60 of hub 40, the hub cannot rotate and the parts are thus locked. The spring detent as described, provides two positive positions for the locking cam 73, that is, locked and unlocked positions. The locking cam 73 is operated by an extending pin 77 which cooperates with a cam member 78 which is operated by the key lock cylinder. The key lock cylinder is rotatable after inserting

the key in the usual manner, and as may be seen in Fig. 3 when the cam member 78 is rotated counterclockwise through substantially 180° it engages the pin 77, and the locking cam 73 is moved clockwise to its locking position as shown in Fig. 5. When the cam 78 is substantially completely rotated in the opposite direction it engages the pin 77 to move the locking cam 73 to its unlocked position.

From the foregoing, those skilled in the art will observe that the invention provides a novel lock having the characteristic that when adapted to sliding doors will firmly pull the doors together into snug engagement, making it unnecessary to otherwise attempt to pull the doors into close engagement before locking. The arrangement of parts is such as to be simple but positive in operation and such as to provide appropriate leverage in pulling the doors together. Additionally, positive locking means are provided, operative by a conventional key cylinder for positively locking the doors after they have been brought together.

The foregoing disclosure is illustrative of a preferred form of the invention, and it is to be understood that various modifications and alternatives may be adopted by those skilled in the art, all coming within the scope and spirit of the invention. The scope of the invention is accordingly intended to be as determined by the claim appended hereto.

I claim:

In a lock adapted for use with sliding doors, in combination: a bolt, said bolt having a longitudinal slot therein; a tranverse pivot pin extending through said slot adapting the bolt to slide linearly relative to the pivot pin; actuating means for the bolt comprising a lever arm having lost motion connection with the inner end of the bolt; and guide means for the inner end of the bolt having a conformation providing for initial linear angular and extending movement of the bolt and then linear retracting movement of the bolt, said lever arm having a hub, a projection extending from the hub, a lever shaped to engage said projection to prevent rotation of the hub, and a locking cam arranged to be positioned to retain said lever in engagement with said projection to positively lock the parts.

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