Sept. 24, 1957 A. R. ADAMS 2,807,489

SLIDING DOOR LOCK

Filed Oct. 21, 1953

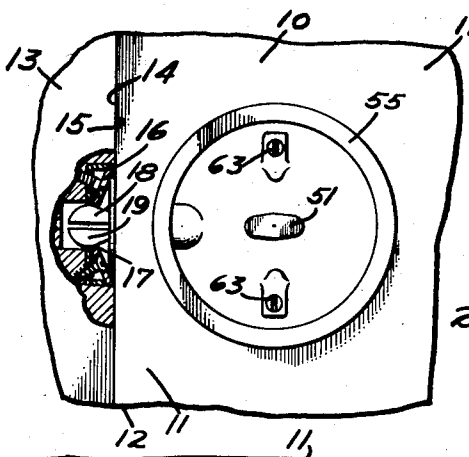


Fig. 1.

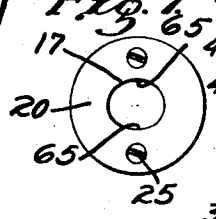


Fig. 7.

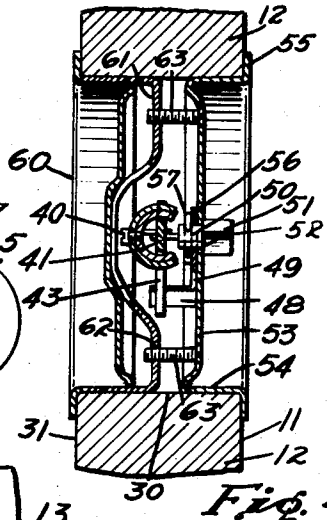


Fig. 4.

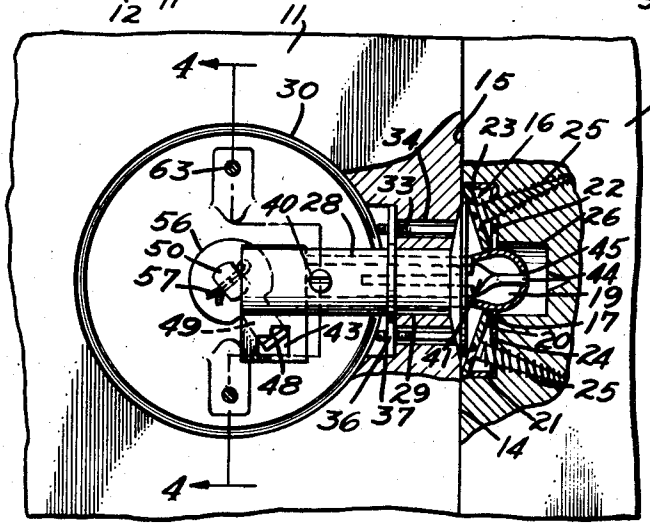


Fig. 2.

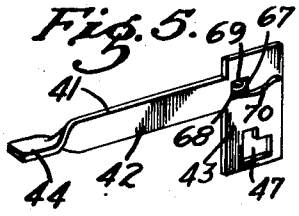


Fig. 5.

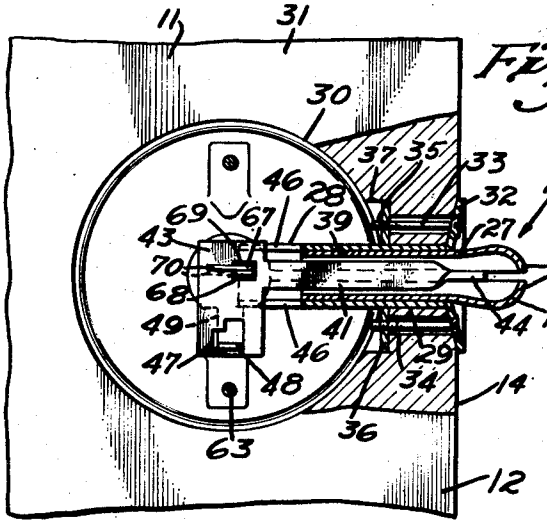


Fig. 3.

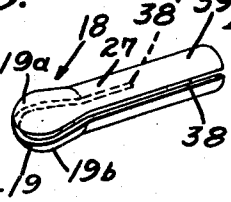


Fig. 6.

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2,807,489

SLIDING DOOR LOCK

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Application October 21, 1953, Serial No. 387,399

5 Claims. (Cl. 292—17)

My invention relates to separable means for holding parts together and relates in particular to a device for holding a sliding door in closed position in a door frame.

It is an object of the invention to provide a preferred embodiment of this invention in a form wherein it may be employed as a sliding door lock for either yieldably holding or locking a sliding door in closed position in its frame.

It is an object of the invention to provide a separable holding or locking device having a receptacle arranged to be mounted on one of the parts which are to be held together and a projection arranged to be mounted on the other of the two parts, this projection being arranged to enter the receptacle and having expansible parts for engaging walls or lips of the receptacle in such a manner that removal of the projection from the receptacle is resisted.

It is a further object of the invention to provide a device of the character referred to in the preceding paragraph having means for holding the parts of the projection in expanded condition, thereby locking the projection within the receptacle in order to effect a positive locking together of the parts. The invention lends itself to use with sliding doors or the like because of its novel form, simplicity of construction and ease of installation and operation.

It is also an object to provide a retaining and locking device of this character wherein the projection which serves as a part of the connecting means also serves as a door-moving knob positioned so that it may be grasped when the door is in fully opened position and which, with the exception of its edge face, is concealed within a wall recess.

In the simple embodiment of the invention disclosed herein, the projection referred to in the foregoing is a knob formed on the projecting end of a pin member and the receptacle is a plate having an opening to receive the knob.

It is a further object of the invention to provide a simple means for automatically effecting alignment of the projection and the receptacle parts of the device as they are brought into engagement with each other without requirement of separate aligning means.

Further objects and advantages of the invention may be brought out in the following part of the specification wherein I have described a preferred embodiment of the invention for the purpose of disclosing its details without limiting the scope of the invention which is defined in the appended claims.

Referring to the accompanying drawings which are for illustrative purpose only:

Fig. 1 is a front face view, to reduced scale, showing a portion of a door frame and the adjacent edge of a door having therein a preferred form of my retaining and locking means;

Fig. 2 is a partly sectioned view to substantially full scale showing the back face of the door and frame members of Fig. 1, with the back cover plate removed;

Fig. 3 is a view similar to a part of Fig. 2, showing the pin and knob portion of the connecting means sectioned on a median plane;

Fig. 4 is an enlarged sectional view taken as indicated by the line 4—4 of Fig. 2;

Fig. 5 is a perspective view of the locking bar;

Fig. 6 is a perspective view of the pin member which carries the knob member of the invention;

Fig. 7 is a face view of the dished plate or washer of the receptacle.

In Fig. 1, I show the edge portion **10** of the front face **11** of a sliding door **12** in engagement with a frame member **13**. The door **12** is shown in closed position. That is to say, its front edge face **14** is in engagement with the edge face **15** of the frame member **13**.

The frame member **13** has therein a receptacle **16** having an opening **17** which receives a projection **18** carried by the door **12** in a position projecting from its edge face **14**. In this embodiment of the invention the projection **18** is in the form of a rounded knob **19** arranged to expand in the receptacle **16** beyond the opening **17** so that removal of the knob **19** from the receptacle **16** requires contraction of the knob **19**.

As best shown in Fig. 2, the receptacle **16** comprises a dished washer **20** and means for supporting the washer **20** in a shallow recess **21** formed by a wood bit in the edge face **15** of the frame member **13**. The means for holding the dished washer **20** in the recess **21** comprises a circular shallow dished member **22** having a cylindrical wall **23** and a radially extending wall **24**, there being openings for the passage of screws **25** in both the members **20** and **22** so that the receptacle **16** will be firmly held in place. A hole **26** is drilled inwardly from the bottom of the recess **21** to accommodate that portion of the knob **19** which projects inwardly from the receptacle **16**.

As best shown in Figs. 3 and 6, the projection **18** comprises the head or knob **19** and a shank **27**, which shank **27** extends into a sleeve **28**, Figs. 2 and 3, which is extended through an opening **29** which connects the edge face **14** of the door **12** with a larger opening or chamber **30** which is bored through the edge portion **10** of the door from the front face **11** to the rear face **31** thereof as shown in Fig. 4, the axis of the opening **30** being perpendicular to the axis of the opening **29** and intersecting the same. The sleeve **28** has on its front end a dished flange **32** which is countersunk into the edge face **14** of the door **12**, and screws **33** are extended through the flange **32**, and through screw openings **34**, the inner threaded ends **35** being threaded into a plate **36** which rests in a recess **37** which extends from the circular wall of the opening **30** and surrounds the sleeve **28**. This prevents the pulling out of the sleeve **28** from the door except by breaking out of the wood between the edge face **14** of the door **12** and the opening **30**.

The knob **19** and the stem **27** are formed from sheet metal so as to provide a hollow pin structure having a diametral slot **38** which extends entirely along one side of the pin structure **39**, around the knob **19** and substantially halfway down the opposite side of the pin structure **39** as indicated by dotted lines **38'**. Stem **27** and sleeve **28** are attached by screw **40** as shown. The knob **19** is divided into several parts. In the present disclosure it is divided into two parts **19***a* and **19***b* which are resiliently supported in expanded condition. By contractile pressure applied thereto when the knob **19** is pushed into or pulled from the receptacle **16**, the parts **19***a* and **19***b* are moved toward each other so that the knob **19** will be contracted to an extent permitting it to pass through the opening **17** in the plate or washer **20** of the receptacle **16**.

Means **41** are provided for holding the knob **19** in ex-

panded condition so that it cannot be pulled out of the opening **17** of the receptacle **16**, thereby preventing the door from being opened from the position in which it is shown in Figs. 1 and 2. This locking means **41** is stamped from sheet metal and comprises a bar **42**, Fig. 5, having a plate **43** formed on its inner end and having its outer or front end twisted with relation to the rest of the bar **42** so as to provide a transverse pillar piece **44** arranged to enter the space between the lips **45** at the front ends of the knob parts **19***a* and **19***b* when the locking means **41** is moved from the position in which it is shown in Fig. 3 to the position in which it is shown in Fig. 2. Referring to Fig. 3, it will be noted that the sleeve **28** has vertically aligned slots **46** extending from the inner end of the sleeve **28** toward an intermediate portion of the sleeve. When the locking means **41** is operatively positioned within the pin structure comprising the members **28** and **39**, the plate **43** is slidably disposed in the slots **46**. For moving the locking member **41** between advanced and retracted positions as shown in Figs. 2 and 3, an opening **47** is provided in the plate **43** and the horizontally extended toe **48** of a lever **49** is arranged to extend into the opening **48**, so that by rotation of the lever **49** between the positions thereof shown in Figs. 2 and 3, the locking means **41** may be advanced and retracted as desired. The lever **49** is mounted on the inner portion of a stub shaft **50** which extends from a knob **51** through an opening **52** in the center of the bottom wall **53** of a front cover plate **54** which is seated in the front portion of the opening **31**, this cover plate **54** having a flange **55** extending outwardly over the adjacent portion of the front face **11** of the door **12**. The lever **49** includes a perforated plate portion **56** which fits around the stub shaft **50** and is held in place by a cotter pin **57**. The rear portion of the opening or cavity **30** is closed by a rear cover plate **60** in general similar to the front cover plate **54** but having therein a diametrally arranged bar **61** provided with threaded openings **62** to receive screws **63** which are extended across the intervening space from the bottom wall **53** of the front cover plate **54**. By the use of this transverse bar **61**, I make possible the securing together of the cover plates by use of transverse screws **63**, without the ends of the screws projecting through the bottom wall of the rear cover plate **60**.

In order that the two part knob **19**, such as shown, may pass through the opening **17** of the receptacle washer **20**, the opening **17** is laterally elongated as shown in Fig. 7 so as to have a width, measured horizontally, slightly greater than the horizontal width of the knob **19**. The upper and lower portions of the opening **17** are defined by arcuate walls or lips **65** to engage the diametrally opposed faces of the knob parts **19***a* and **19***b* when the largest diametral portion of the knob **19** has passed through the opening **17** and is expanded in that portion of the receptacle lying interiorly beyond the lips or walls **65** provided by the washer **20**.

A further feature of the invention is that it is adapted for use with doors of different thickness, within a reasonable range. The spacing of the cover plates **54** and **60** may be varied as required by different door thicknesses. The toe **48** of the lever **49** is originally furnished to the customer in a length to pass through the opening **47** of the plate **43** under maximum conditions of spacing of the cover plates **54** and **60**. As the spacing between the cover plates **54** and **60** is reduced in accordance with door-thickness requirements, the length of the toe **48** is reduced by cutting the required amount off from the end thereof. A further, and important feature of the invention consists in the provision of a knob arranged to engage a receptacle member which is conically dished toward the opening **17**. Therefore, if, when the door is moved toward closed position, the knob **19** is disaligned from the opening **17**, such knob will engage the sloping front surface of the washer **20** and the knob **19** will slide along this sloping surface into the opening **17**. In addition to this,

the knob **19** is in extended relation to the dished outer surface of the flange **32** which is formed on the front end of the sleeve **28**. The knob, being expanded to a larger diameter than the shank **27** may be manually grasped when the door is concealed, except for its edge face **14**, in a wall recess provided to receive the door when it is in fully opened position.

A spring member **67** is provided for retaining the locking member **41** in the positions to which it may be adjusted by rotation of the knob **51**. This spring member **67** has a coil portion **68** which rests in a small opening **69** in the plate **43**, and curved end portion **70** so as to provide resiliently supported parts to frictionally engage the inner wall surfaces of the sleeve **28**, thereby providing a frictional drag resisting movement of the locking member **41**.

I claim:

1. In lock means for use between an edge portion of a sliding door and the frame member associated therewith, which door has a cavity adjacent its front edge and a pin opening leading in from the edge face of the door to said cavity: a receptacle adapted to be secured on said frame member in a position facing said opening, said receptacle having walls defining a head receiving opening; a pin member extending in said opening of said door, said pin member having an expansible head positioned so as to enter said head receiving opening of said receptacle; locking means extended within said pin member and being movable from a retracted position to an advanced position wherein it will hold said head in expanded condition so that it cannot be withdrawn from said head receiving opening; a plate to cover said cavity; and means carried by said plate operative to actuate said locking means between advanced and retracted positions.

2. In lock means for use between an edge portion of a sliding door and the frame member associated therewith, which door has a cavity adjacent its front edge and a pin opening leading in from the edge face of the door to said cavity: a receptacle adapted to be secured on said frame member in a position facing said opening, said receptacle having walls defining a head receiving opening; a pin member extending in said opening of said door, said pin member having an expansible head positioned so as to enter said head receiving opening of said receptacle, said pin member having an axial opening extending from the interior of said head to the opposite end of said pin member; locking means extended within said pin member and being movable from a retracted position to an advanced position, said locking member having on the head end thereof a filler piece arranged to enter between parts of said head, when said locking member is in advanced position, and prevent collapse of said head and hold said head in expanded condition so that it cannot be withdrawn from said head receiving opening; a plate to cover said cavity; and means carried by said plate operative to actuate said locking means between advanced and retracted positions.

3. In lock means for use between an edge portion of a sliding door and the frame member associated therewith, which door has a cavity adjacent its front edge and a pin opening leading in from the edge face of the door to said cavity: a receptacle adapted to be secured in said frame member in a position facing said opening, said receptacle having walls defining a head receiving opening; a pin member extending in said opening of said door, said pin member having an expansible head positioned so as to enter said head receiving opening of said receptacle, said pin member having a flange thereon to engage the edge face of the door; a plate in said cavity aligned with said flange; screw means connecting said flange and said plate to hold said pin member in said pin opening of said door; locking means extended within said pin member and being movable from a retracted position to an advanced position wherein it will hold said head in expanded condition so that it cannot be withdrawn from said head

receiving opening; a plate to cover said cavity; and means carried by said plate operative to actuate said locking means between advanced and retracted positions.

4. In lock means for use between an edge portion of a sliding door and the frame member associated therewith, which door has a cavity adjacent its front edge and a pin opening leading in from the edge face of the door to said cavity: a receptacle adapted to be secured in said frame member in a position facing said opening, said receptacle having walls defining a head receiving opening; a pin member extending in said opening of said door, said pin member having an expansible head positioned so as to enter said head receiving opening of said receptacle, said head projecting from the edge face of said door so as to provide a knob which may be grasped for the purpose of moving said door; locking means extended within said pin member and being movable from a retracted position to an advanced position wherein it will hold said head in expanded condition so that it cannot be withdrawn from said head receiving opening; a plate to cover said cavity; and means carried by said plate operative to actuate said locking means between advanced and retracted positions.

5. In lock means for use between an edge portion of a sliding door and the frame member associated therewith, which door has a cavity adjacent its front edge and a pin opening leading in from the edge face of the door to said cavity: a receptacle adapted to be secured on said frame member in a position facing said opening, said receptacle having walls defining a head receiving opening and having a concave wall surface leading to said opening; a pin member extending in said opening of said door, said pin

member having an expansible head positioned so as to enter said head receiving opening of said receptacle, said pin member having an axial opening extending from the interior of said head to the opposite end of said pin member, and said head being adapted, when disaligned from said head receiving opening to be guided to said head receiving opening by said concave wall surface of said receptacle; locking means extended within said pin member and being movable from a retracted position to an advanced position, said locking member having on the head end thereof a filler piece arranged to enter between parts of said head, when said locking member is in advanced position, and prevent collapse of said head and hold said head in expanded condition so that it cannot be withdrawn from said head receiving opening; a plate to cover said cavity; and means carried by said plate operative to actuate said locking means between advanced and retracted positions.

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