Feb. 7, 1967 J. K. BARRY 3,302,964

DOOR OR PANEL FASTENER

Filed Jan. 8, 1965 2 Sheets-Sheet 1

FIG. 1

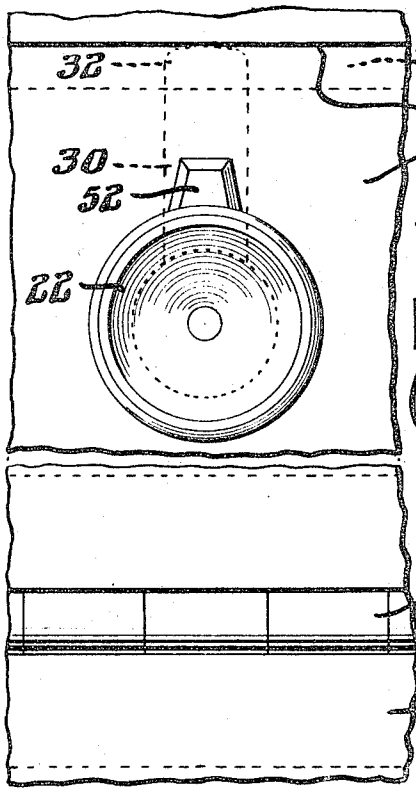


FIG. 2

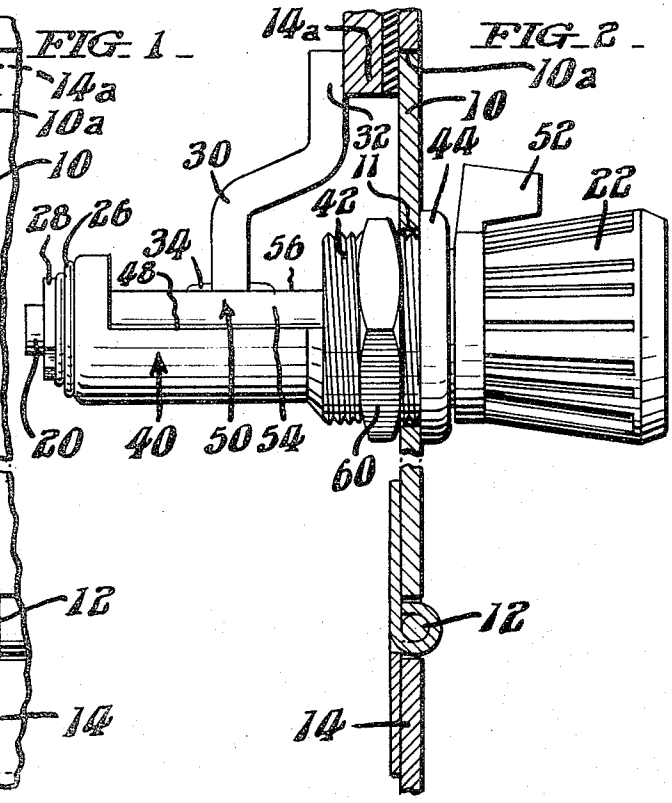


FIG. 3

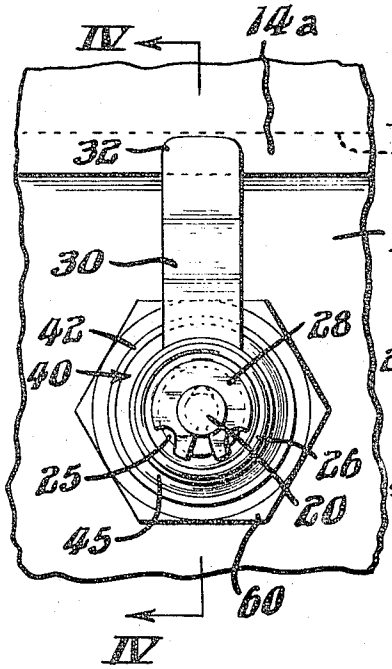
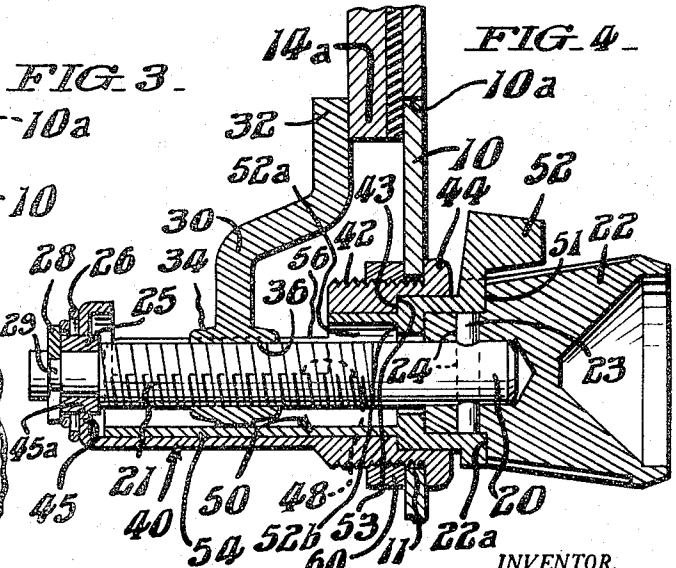


FIG. 4



INVENTOR.
John K. Barry,
BY
Paul & Paul
ATTORNEYS.

Feb. 7, 1967 J. K. BARRY 3,302,964

DOOR OR PANEL FASTENER

Filed Jan. 8, 1965 2 Sheets-Sheet 2

FIG. 6

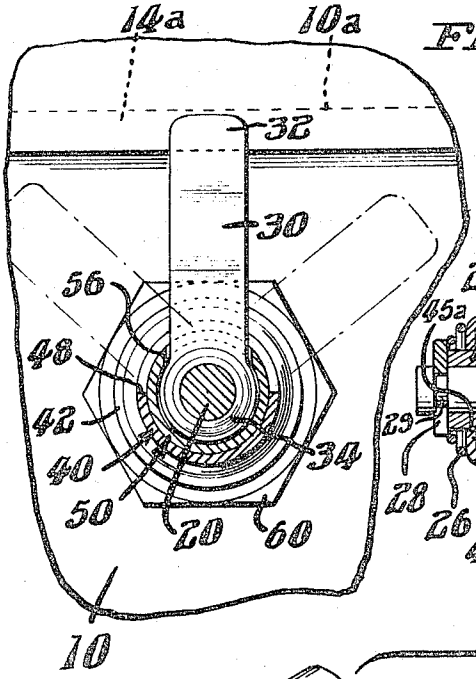


FIG. 5

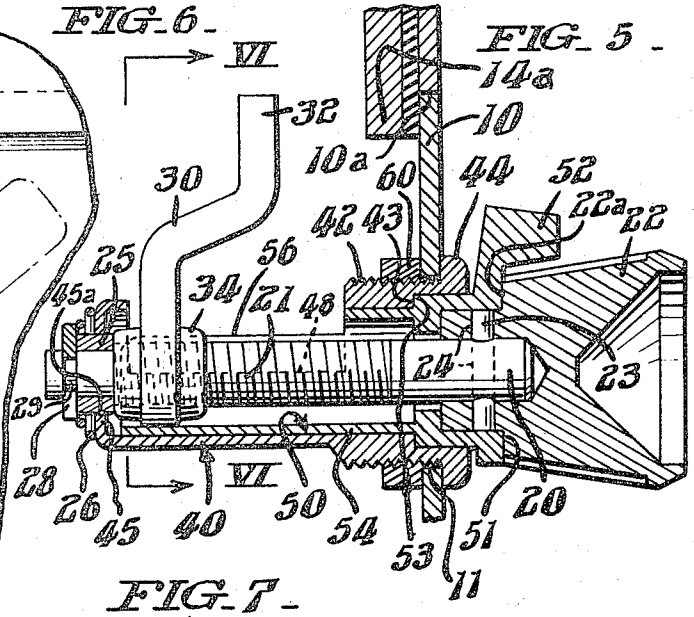
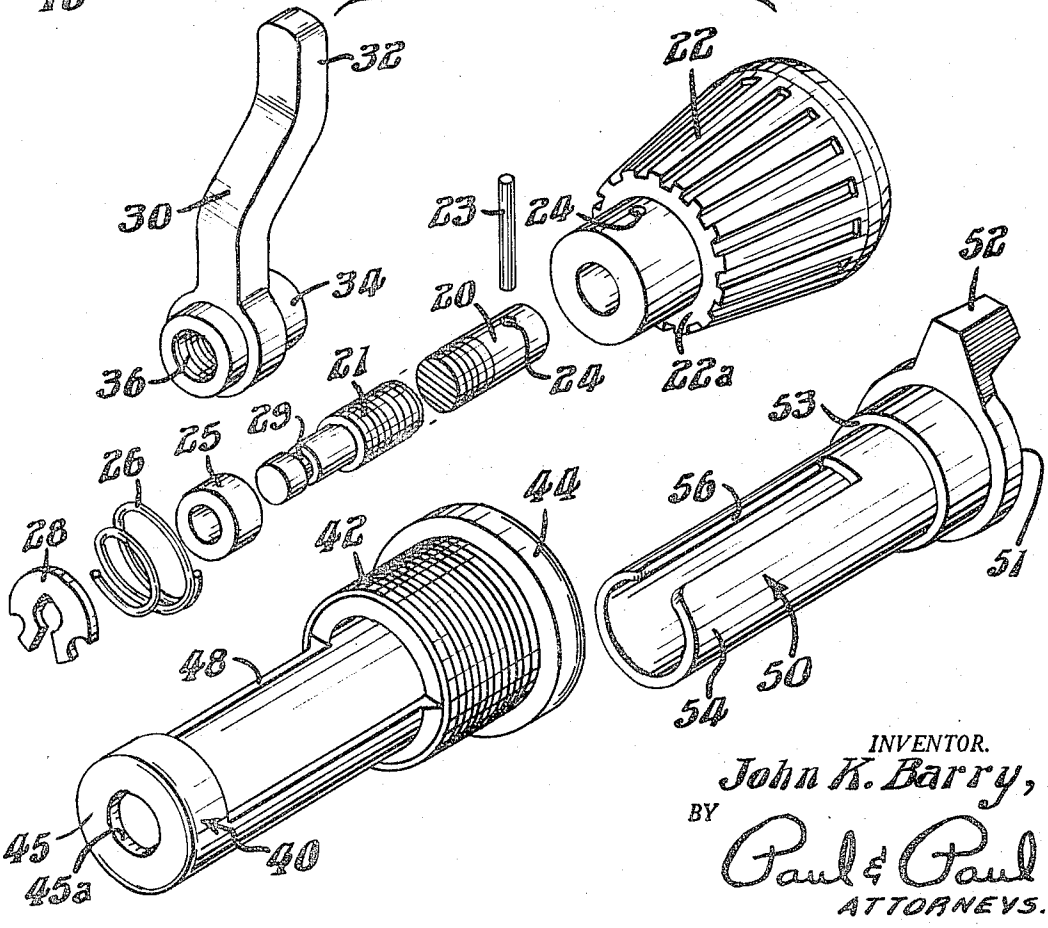


FIG. 7



INVENTOR.
John K. Barry,
BY
Paul & Paul
ATTORNEYS.

United States Patent Office

3,302,964

Patented Feb. 7, 1967

3,302,964

DOOR OR PANEL FASTENER

John K. Barry, Springfield, Pa., assignor to South Chester Corporation, Lester, Pa., a corporation of Delaware

Filed Jan. 8, 1965, Ser. No. 424,441
4 Claims. (Cl. 292—57)

This invention relates to door or panel fasteners and, more particularly, to fastening devices of a type adapted to be mounted along the edges of doors or panels which overlap a wall or frame and having latch fingers which are swingable over the inside frame of the door or panel openings so as to lock the panel against the frame.

This invention constitutes an improvement over the fastener disclosed in U.S. Patent No. 2,860,904 by John K. Barry which issued on November 18, 1948, to South Chester Corporation. In that patent, the latch finger or locking pawl was mounted on the actuating shaft by two nuts or by a nut and a spring thereby requiring preliminary adjusting of the locating nuts and locking pawl according to the thickness of the frame upon which the pawl engaged. This fastener also had the disadvantage of requiring three holes to be made in the door or panel to receive the fastener and required mounting from the inside of the panel. Other prior art fasteners require washers to support the fastener from being drawn through the hole in the panel and utilize springs which provide only partial control of the position of the latch finger during locking and unlocking movement of that member.

Therefore, it is the primary object of this invention to provide a fastener having a positive drive for both locking and unlocking the latching pawl and for tightening the pawl against the frame without the use of mere spring pressure.

It is another object of this invention to provide a fastener having the above advantages and including an indicating element which shows from the outside of the panel the radial position of the latch finger, thereby insuring proper and full engagement of the latch on the frame before the latch is tightened.

It is another object of this invention to provide support-means at the inner end of the threaded control shaft to prevent jamming of the shaft if some parts bind. The fastener is also shaped so as to minimize the size of the hole in the panel required for inserting the fastener from the front or outside.

Other objects and attendant advantages of this invention will appear from the description included hereinbelow and from the drawings, wherein:

FIG. 1 shows in front elevation one form of the fastener of this invention as seen from the front or outside of the panel taken partially;

FIG. 2 shows in side elevation the fastener shown also in FIG. 1 with the supporting panel in section;

FIG. 3 shows in rear elevation the fastener from the inside or back of the panel;

FIG. 4 shows a sectional view of the fastener taken along the lines and arrows IV—IV of FIG. 3;

FIG. 5 shows a sectional view of the fastener before the locking pawl is tightened against the frame;

FIG. 6 shows in sectional view the inner end of the fastener taken along the lines and arrows VI—VI as shown in FIG. 5; and

FIG. 7 shows in exploded view the disassembled fastener.

The preferred form of the fastener of this invention is utilized basically as shown in FIGS. 1 and 3 wherein the fastener is mounted within and through a panel **10** adjacent the edge **10***a* which overlaps the wall portion or frame **14***a*. The panel **10**, in this instance, has hinges **12** connecting it along the bottom edge to the main wall **14** and the fastener functions by pressing or latching

against the inside of the wall portion or frame **14***a* thus preventing the panel from being pulled outwardly or swung downwardly until the fastener is released. It should be understood that the fastener of this invention can be used singly or a number may be mounted at intervals along the edge of any type of panel or door **10** so as to lock or secure it to the structural member **14** as described hereinbelow.

The preferred form of the fastener of this invention is shown in exploded view in FIG. 7 and it can best be understood by preliminary reference to that figure. The fastener comprises a substantially uniform diameter threaded stud having a fluted knob **22** attached to the stud by pin **23** extending through holes **24** in the knob and stud. A bushing **25**, spiral spring **26** and retaining washer **28** are provided as shown for mounting on inner or rear end of stud **20**, the inner or rear end being that which is inserted first into the hole in the panel and is thereby fixedly mounted on the inside of the panel. A latch finger or locking pawl **30** is provided with a contact end or surface **32** which is tightened against a frame member and an enlarged base **34** having internal threads **36** which correspond to the threads **21** formed on the shaft **20** as shown. A generally cylindrically shaped housing bracket **40** is provided with a relatively large diameter threaded portion **42**, an outside annular flange **44**, and an inner end shaft supporting portion **45** as shown. Housing bracket **40** is also provided with an axial directed recess or opening **48** having an arc which can be varied and in the embodiment shown extends approximately 180° or one-half of the cylindrical surface of bracket **40**. An indicator sleeve **50**, shaped as shown, is equipped with an exterior indicator knob **52** and a cylindrical portion **54** in which is formed an axial directed guide slot **56** having an arc or width only slightly larger than the thickness of pawl **30** at a point adjacent its base.

The components as described above are assembled to form this invention as follows. Knob **22** is mounted on and then attached to threaded stud **20** by placing pin **23** through the holes **24**. Stud **20** is then slipped into indicator sleeve **50** from the outer or right-hand side as shown in FIG. 7 until knob shoulder **22***a* bears upon outwardly facing annular surface **51** of sleeve **50**. The sleeve and stud are then inserted into housing bracket **40** from the outer end or that shown to the right in FIG. 7. Pawl **30** is simultaneously placed in recess **48** of bracket **40** and threaded onto stud **20** as the stud is pressed inwardly and rotated by means of knob **22**. As pawl **30** is threaded on stud **20**, it passes into and along the guide slot **56** in the indicator sleeve **50**. When the indicator sleeve is fully inserted in the housing bracket, rearwardly facing annular surface **53** of sleeve **50** bears firmly against internal annular shoulder **43** of bracket **40** as shown in FIG. 5.

When the shaft and sleeve are fully inserted in the bracket, the inner or distal end of the shaft extends out of hole **45***a* formed in the end supporting portion **45**. Bushing **25** is then slipped over the end of shaft **20** to be positioned between the end of the threads **21** and the groove **29**.

The spring **26** is then compressed and placed on the bushing **25** (as shown in FIG. 5) between and against the bracket end portion **45** and a retaining washer **28** which is assembled into groove **29** of the shaft.

Assembly of the fastener shown in FIG. 7 is now complete and the thrust of the conical spring **26** against the retaining washer **28** is transmitted through shaft **20** to the knob **22** and hence by means of abutting surfaces **22***a* and **51** to the indicator sleeve and hence to the housing bracket by abutting surfaces **53** and **43**. In this way the fastener parts are held tightly together and sealing gaskets may be placed between the abutting surfaces to prevent fluid leaks.

The spring arrangement as described is also desirable so as to cause indicator knob **52** to turn with knob **22** when that knob is turned by hand. This occurs because the moment arm or effective radius of abutting surfaces **51** and **22***a* of the indicator sleeve and knob, respectively, is greater than the moment arm or effective radius of abutting surfaces **43** and **53** of the housing bracket and indicator sleeve, respectively.

The assembled fastener can then be inserted in a panel or door as follows. Referring to FIG. 5, a hole **11** is drilled or punched in panel **10** with a diameter slightly larger than the threads **42** of the housing bracket **40**. The hole **11** is preferably located at a determined distance from the supporting member **14***a* as indicated in FIG. 5 so that upon the vertical positioning of pawl **30** the pawl end portion **32** will overlap the member **14** as shown in FIGS. 2 and 4. However, if the location of the fastener in panel **10** is prescribed by other considerations, a longer or different shaped latching pawl **30** can be substituted for that shown. After hole **11** is drilled, the fastener with pawl **30** located at the inner end of shaft **20** will pass through the hole **11** when it is turned partially upright so that pawl **32** is pushed through the hole first. A mating nut **60** (FIG. 5) is then slipped over the end of pawl **30** and around the end of the bracket on the inner side of the panel so as finally to thread on the threads **42** of the housing bracket. The fastener is secured to the panel **10** by flange **44** on the outside and the locking nut **60** tightened on the inside.

Operation

After the fastener is installed in a panel, the first quarter revolution of gripping knob **22** will throw the latching pawl **30** from the full clear to full latching position or vice versa because of the frictional engagement between the knob and the indicator sleeve whose guide slot **56** controls the rotation of pawl **30** on stud **20**. If this frictional engagement is insufficient to move the sleeve, some pressure on indicator sleeve knob **52** will clear the pawl. Further rotation of knob **22** causes the pawl **30** to move axially along the shaft because rotation of the pawl is limited to the arc limits of recess **48** of the housing bracket and the location of indicator sleeve. In this way, latching pawl **30** is moved axially along thread stud **20** to press against the frame member **14** from the inside as shown in FIGS. 2 and 4 and hold the panel closed. To unlock the fastener and free the panel from frame member **14**, the knob is rotated in the direction required to move the pawl inwardly on the shaft. After the pawl is loosened, it is rotated by the spring tension between the knob and indicator sleeve or it may be positively rotated by means of the knob **52**. After the pawl is swung clear, as shown in dot and dash lines in FIG. 6, the panel is swung downwardly or otherwise removed. A multiple lead thread is preferably employed on the stud to cause the pawl to move axially with a minimum number of rotations of knob **22**.

It should be clear from the description above that the radial location or direction of latching pawl **30** in relation to stud **20** is continually indicated on the outside of the panel by indicating sleeve knob **52**. By means of this structure, it is easily determined from the outside whether pawl **30** is fully and properly engaged or disengaged with the frame member **14** and thus avoids the situation wherein latching pawl **30** only engages against a small surface area of member **14**, resulting in an insecure locking condition.

If the condition arose that latching pawl **30** were to bind on the inner side of the panel in either the locked or unlocked position, for example, if it came into contact with some large object within the panel or against some rough surface of the supporting member, a force could be applied on the outside against indicating knob **52** so as to force the pawl to rotate into the desired position.

The cylindrical design and mating arrangement of the exterior components is such that O-ring seals can be inserted between opposing surfaces to completely seal all passages through the fastener between the interior and exterior of the panel. As bushing **25** supports the threaded shaft for rotation at the inner end of the bracket, the shaft will not jam or bind in the bracket when extra force is applied to the gripping knob in order to tighten the latch or overcome some friction. This fastener only requires a single, relatively small diameter hole in the supporting panel and so is adaptable for relatively limited areas in small panels. In addition, as locking pawl **30** may be positioned at any point along stud **20**, this assembly is quite adaptable to panels and supporting members of varying thicknesses and it does not require prior adjustment of the parts or different size parts to be useful in these situations. The size of knob **22** may be varied to increase the gripping power without requiring further changes in the assembly itself.

A compression spring may be fitted on shaft **20** between the base **34** of pawl **30** and against the base **52***b* of the indicator sleeve **50** within the recess **52***a* so that the knob **22** and indicator **52** are pressed more firmly into contact. This construction insures that, under normal conditions, indicator knob **52** and pawl **30** will turn when knob **22** is turned.

Although this invention has been disclosed with reference to specific forms and embodiments thereof, it will be appreciated that a great number of variations may be made without departing from the spirit or scope of this invention. For example, parts may be reversed, equivalent elements may be substituted for those specifically disclosed, and certain features of the invention may be used independently of other features, all without departing from the spirit and scope of this invention as defined in the appended claims.

I claim:

1. A fastener for locking a perimetrically lapping panel against the outer surface of a wall, said fastener comprising

a generally cylindrical housing bracket having means for attachment to a panel through a hole therein, the main portion of said bracket being located on the inside of the panel and having an axially directed recess located along a portion of its surface,

an indicator sleeve positioned within and concentric to the bracket for movement independently thereof, said sleeve having an indicator knob located on the outer side of the panel and an axial directed guide slot on the inner side of the panel similar in length but of smaller arc than that of the bracket,

a threaded shaft mounted for rotation within the bracket and sleeve, said shaft having hand gripping means located on the outer side of the panel,

a locking pawl for engaging the inner surface of the wall having an internally threaded base mouted on the threaded shaft on the inner side of the panel for axial movement thereon, said pawl extending through the recess in the bracket and the guide slot in the sleeve so that the radial location of the pawl is controlled by the indicator sleeve knob on the outside of the panel and the pawl is moved axially to tighten or loosen against the inner surface of the wall by rotation of the shaft gripping means, and a bushing mounted on the inner end of said shaft to prevent binding contact between the inner end of said housing bracket and said locking pawl.

2. The fastener as defined in claim **1** wherein the arc of the indicator sleeve guide slot is only slightly greater than the width of the pawl at a location adjacent the threaded base.

3. The fastener as defined in claim **1** wherein the threaded shaft is supported on the inside of the panel by the bushing in the bracket and a spring is mounted between a retaining ring on the shaft and the end of the

housing bracket so as to press the shaft gripping means into contact with the indicator sleeve and hence the sleeve into contact with the housing bracket.

4. The fastener as defined in claim 1 wherein the housing bracket is provided with means for attaching it to the panel comprising a threaded cylindrical portion having a diameter smaller than the diameter of the hole in the panel and having a flange of larger diameter whereby the bracket is inserted from the outside and a nut having an outside diameter greater than said hole and capable of being passed over the bracket from the inside and threaded on the threaded portion to lock the surface of the panel adjacent the hole between the nut and the flange.

References Cited by the Examiner

UNITED STATES PATENTS

270,126	1/1883	Ridgway.	
1,729,879	10/1929	Krantz et al.	292—256.75
2,283,304	5/1942	Williams	292—212
2,334,012	12/1943	Koch et al.	292—212 X
2,860,904	11/1958	Barry et al.	292—256
3,146,010	8/1964	Dellith	292—212

EDWARD C. ALLEN, *Primary Examiner.*

RICHARD E. MOORE, *Examiner.*