Sept. 5, 1967 R. S. LINT 3,339,958

DOOR LATCH

Filed April 12, 1966

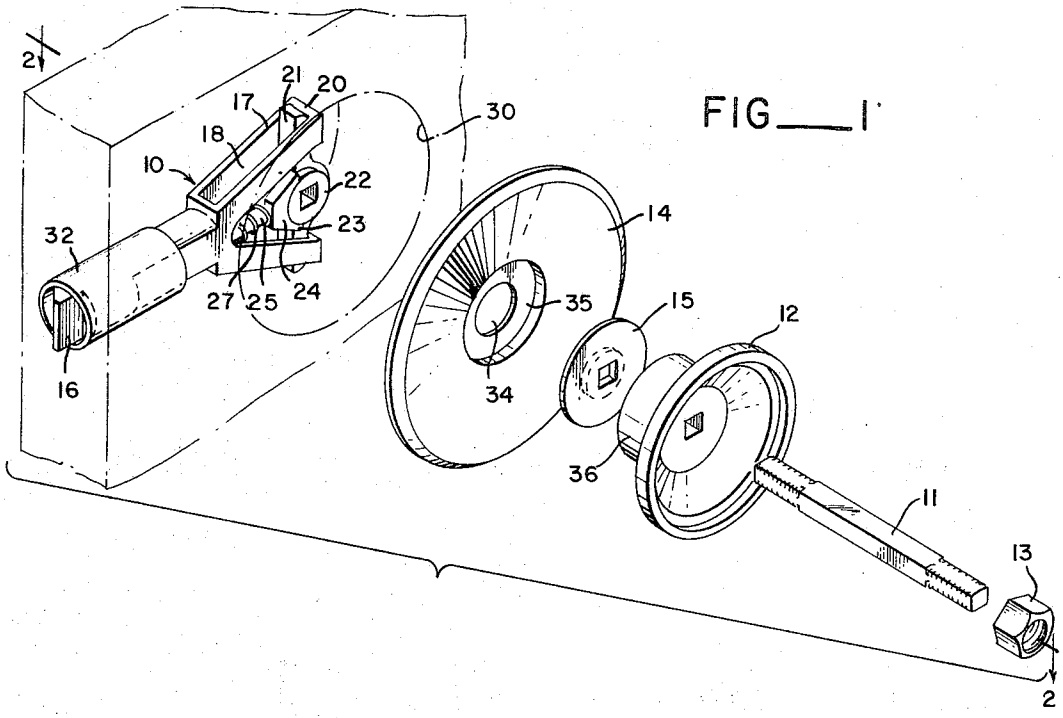


FIG. 1

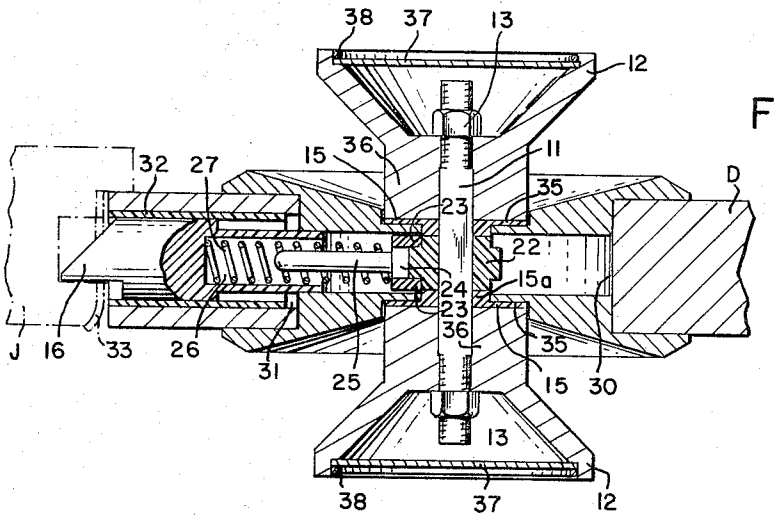


FIG. 2

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DOOR LATCH

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This application is a continuation-in-part of my copending application Ser. No. 443,256, filed Mar. 29, 1965, which is in turn a division of my Patent No. 3,179,459, issued Apr. 20, 1965.

The present invention relates to door latches of the general type in which a slide bolt is retracted by turning of a handle in opposition to a spring and is returned by the spring to an extended position.

An important object of the invention is to provide a latch that is not only of simple and economical construction and easily installed, but which is quiet in operation and can be readily adjusted to vary the speed of bolt extension.

Another object is to provide a latch that can be used on several thicknesses of doors without modification.

Other more particular objects and advantages of the invention will, with the foregoing, appear and be understood in the course of the following description and claims the invention consisting in the novel construction and in the adaptation and combination of parts hereinafter described and claimed.

In the accompanying drawing:

FIG. 1 is an exploded perspective view of a latch mechanism embodying the present invention; and

FIG. 2 is a horizontal sectional through the latch installed in a door.

Referring to the drawings, the latch of the present invention has a bolt and rollback assembly **10** presenting a square-bodied shaft **11** threaded at its ends to extend into a pair of handles **12** and receive nuts **13**. The handles **12** are in turn journal mounted in escutcheons **14**, and as part of the invention, washers **15** sleeved on the spindle **11** serve as bearings between the handles and escutcheons, and may be made as an integral part of the handles when the handles are formed of a suitable plastic bearing material such as nylon.

The assembly **10** may be of the type disclosed in my prior Patent No. 3,179,459, and namely one having its slide bolt **16** formed with inner diverging fork arms **17** each of which is longitudinally slotted at **18** and has an abutment at its free end defining the respective end wall of the slot. A pair of oppositely extending rollbacks **21** project through the slots **18** from an integral boss **22** which is sleeved on the shaft **11** and extends endwise of the sides of the rollbacks **21** to fit within a pair of spaced forks **23**. These forks are presented by a head **24** on one end of a guide rod **25** having its other end projecting between the fork arms **17** on the bolt **16** into a bore **26** formed in the bolt along part of the length thereof. A bolt-return compression spring **27** is sleeved on the guide rod **25** to seat against the fork head **24** and bear against the closed end wall of the bore **26**. This spring force yieldingly urges the rollbacks **21** against the abutments **20** at the free ends of the fork arms **17**.

The escutcheons **14** are each formed at the back with a boss for interfitting with the respective end portion of a round opening **30** bored through the swinging door D adjacent the jamb J to receive the rollback mechanism. This opening **30** is intersected by a horizontal radial hole **31** that extends to the edge of the door facing the jamb and is somewhat larger in diameter than the bolt **16** so as to permit the bolt, rollbacks **21**, guide rod **25**, and spring **27**, to be installed as a unit in the door by inserting the bolt through the opening **30** into the inner end of the hole

31 with the unit slightly cocked toward one face of the door until the fork arms **16** reach the rim of the opening **30** to clear the door face and become completely housed in the opening **30**. Then a bushing **32** is force-fitted in the hole **31** through the outer end thereof to provide a slide journal for the bolt **16**. The jamb J is fitted with a strike plate **33** opposite the hole **31** having a keeper opening to receive the bolt when extended.

Returning to the escutcheons **14**, the outer faces thereof may be somewhat dished, and each is formed with a center through opening **34** which is somewhat larger in diameter than the diagonal dimensions of the square cross-section of the spindle **11**. The outer face of the escutcheons is centrally counter-bored to provide annular bearing seats **35** surrounding the center opening **34** in the escutcheons for receiving the washers **15**. These washers have a square center opening to sleeve on the spindle **11** and have a boss extension **15*a*** at the back that mates with the center opening **34** in the escutcheons.

The depth of the counter-bores to the bearing seats **35** is greater than the thickness of the main body of the washers **15** so as to provide space for housing a free end portion of flat-headed stems **36** projecting from the back of the handles **12**. It will be noted that the handles are hollow to house the outer threaded ends of the spindle **11** and the associated nuts **13**, and that the stems **36** have a bore of square cross-section to sleeve onto the shaft. The handle cavities are closed with cover plates **37** which may be retained by snap rings **38**.

It will be apparent that after the bolt and rollback mechanism have been inserted as a unit in the door in the manner above described, assembly of the latch can be readily completed, after inserting the spindle **11** through the rollback boss **22**, by fitting the escutcheon bosses in the hole **31** in the door, sleeving the washers **15** and handles **12** onto the ends of the shaft, screwing on the nuts **13**, and then applying the cover plates **37**.

The washers **15** are made of nylon or some other suitable durable bearing material of similar characteristics whose frictional resistance to turning relative to the seats **35** can be varied in a controlled manner by selectively changing the axial pressure on the washers through adjustment of the nuts **13**. These nuts are preferably self-locking, as for example, the plastic insert type; so that they will hold adjusted positions.

For quiet operation it is preferred that the strike plate **33** be formed of nylon or some other suitable synthetic plastic material which is strong, tough, durable, and has superior impact resistance, and yet will be quiet during impact. With the described arrangement the handles **12** and escutcheons **14** can be metal or plastic. If the handles are made of nylon or some other suitable bearing material, the washers **15** can be incorporated on the stems of the handle as an integral part thereof. It has been found that the shaft **11** may be formed from an aluminum alloy bar stock having good corrosion resistance and torsion strength and the guide rod **25** and head **24** may be molded as a one-piece plastic member.

Because the nuts **13** can be minutely adjusted on the spindle **11**, the frictional resistance of the washers **15** to turning on the seats **35** during extension of the bolt **16** responsive to the return action of the spring **27** can be adjusted so that the bolt will extend (after retraction for opening of the door) smoothly without a noisy snap-back, and in fact, can be adjusted so that the bolt will extend in visual slow motion. This adjustment is thus very fine and the setting can be easily changed at will after the latch has been installed, merely by removing one of the cover plates **37** to gain access to one of the nuts **13**. Regardless of the adjustment of the nut pressure, the boss portion **15*a*** of the washers **15** working in the openings **34** provides an excellent bearing for the spindle **11** in the escutcheons

and transfers the thrust exerted by the spring **27** against the shaft, through the escutcheons **14** to the door.

It is important to note that the above described latch can be used without modification on a wide selection of door thicknesses since there is provided a wide range of adjustment of the nuts **13** along the shaft **11**.

It is believed that the invention will have been clearly understood from the foregoing detailed description of the now-preferred illustrated embodiment. Changes in the details of construction may be resorted to without departing from the spirit of the invention and it is accordingly my intention that no limitations be implied and that the hereto annexed claims be given the broadest interpretation to which the employed language fairly admits.

What is claimed is:

1. A latch assembly comprising, a slide bolt slidable between extended and retracted position, spring means urging said bolt into extended positions, rollback means including a boss having a non-circular opening for retracting said bolt in opposition to said spring means, a pair of escutcheons with alined round central openings surrounded by a pair of recessed annular seats, a non-circular spindle extending freely through said central openings and rollback boss for operating said rollback means responsive to turning of the spindle, said spindle being slidably adjustable along its longitudinal axis relative to said rollback means, handles and bearing means slidably sleeved on the spindle to turn in unison therewith, said bearing means being seated against said recessed annular seats and having respective boss-like protrusions extending into and having a bearing interfit with said central openings in the escutcheons and in substantial contact with

said rollback boss, means resisting outward endwise movement of one of said handles relative to the respective end of the spindle, the other end of the spindle being threaded, a nut screwed on said threaded end of the spindle and bearing against the other handle to adjustably hold said bearing means against said seats by pulling said handles toward one another, said other handle having an outwardly opening cavity housing said nut, and a removable cover plate on said other handle for said cavity.

2. A latch assembly according to claim **1** in which said bearing means comprises a pair of washers sleeved on the spindle.

3. A latch according to claim **2** in which said handles have rearwardly projecting flat-headed stems pressing against said washers and occupying part of the depth of the recesses to said seats.

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