

Nov. 24, 1953

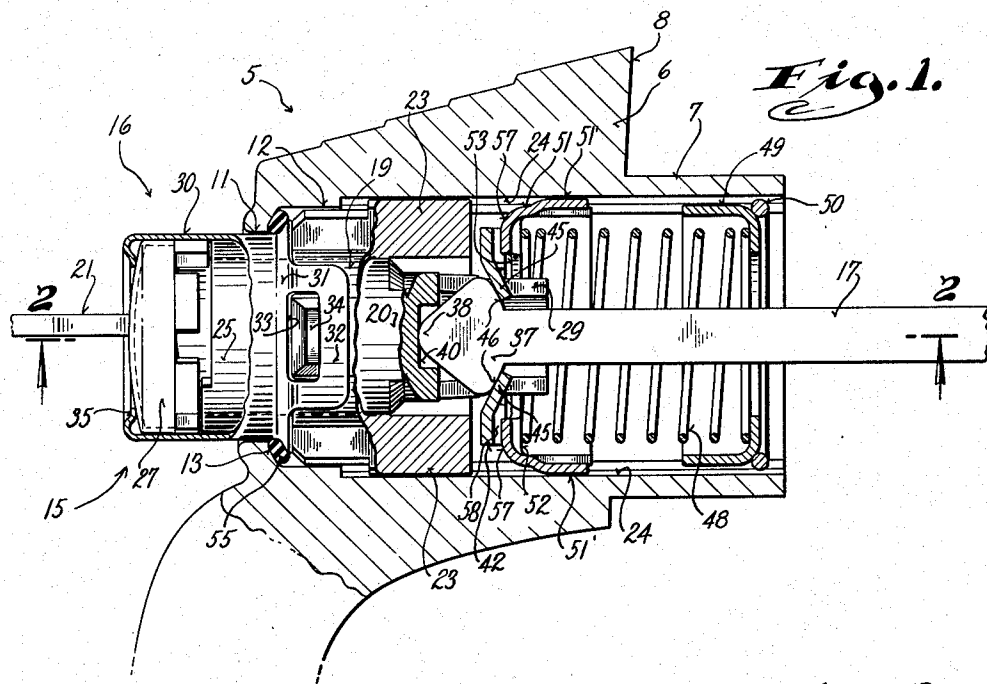
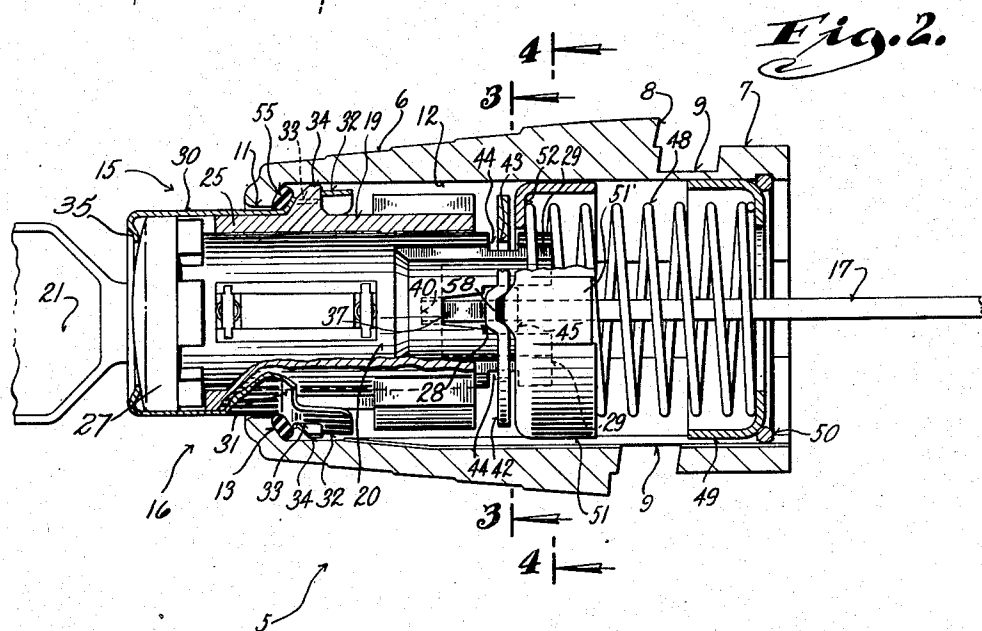
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2,660,046

DOOR LATCH OPERATING MECHANISM

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DOOR LATCH OPERATING MECHANISM

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Fig. 3.

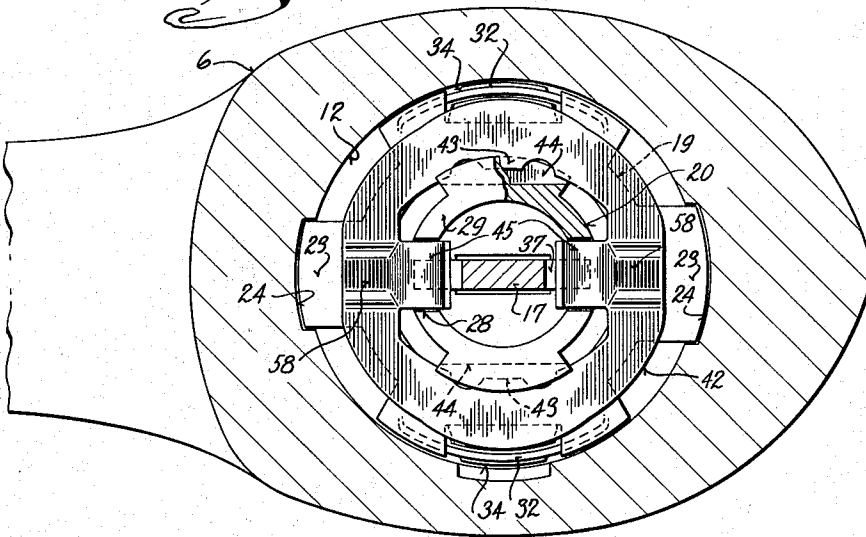
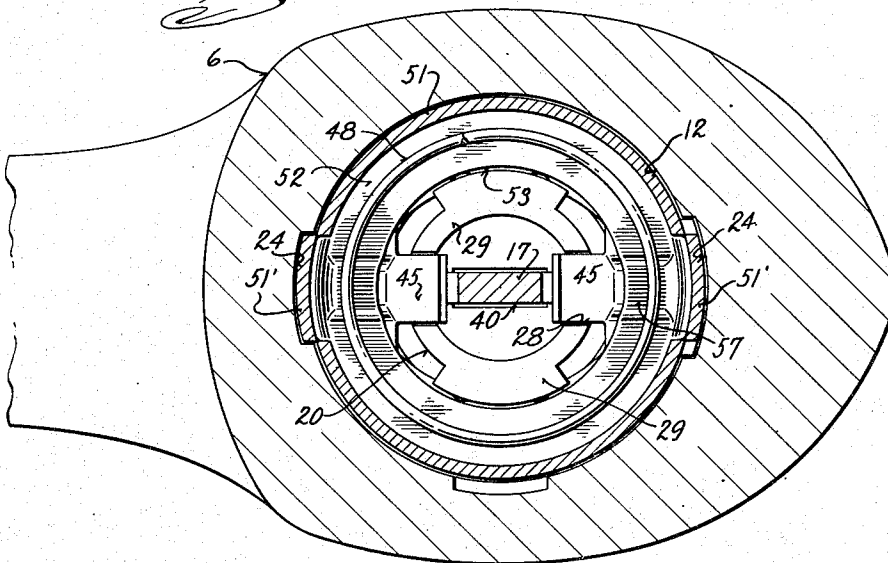


Fig. 4



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DOOR LATCH OPERATING MECHANISM

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This invention relates to door latch operating mechanisms and has more particular reference to an improved latch operating mechanism for use on automobile doors.

The primary purpose of this invention is to provide push button actuating means by which the latch mechanism of a door may be operated.

For use on automobile doors it is also essential that the latch operating mechanism be capable of being locked so that the door latch mechanism cannot be released. Hence it is another purpose of this invention to provide push button actuating means of the character described wherein the push button is in the nature of a key controlled lock cylinder.

Still another purpose of this invention is to provide push button type latch operating mechanism which may be conveniently mounted in the handle for the automobile door, and wherein depression of the push button actuator effects release of the door latch through an operating shaft having a novel connection with the actuator.

Another purpose of this invention is to provide door latch operating mechanism of the character described which utilizes the thrust of a single spring confined in the door handle to eliminate rattling of the parts of the push button actuating means as well as to effect a moisture-proof seal between the actuating means and the door handle.

Still another purpose of this invention is to provide push button door latch operating mechanism capable of withstanding extremely rough usage and in which safety means is incorporated to prevent forcing of the lock mechanism.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the herein disclosed invention may be made as come within the scope of the claims.

The accompanying drawings illustrate one complete example of the physical embodiment of the invention constructed in accordance with the best mode so far devised for the practical application of the principles thereof, and in which:

Figure 1 is an enlarged view of a portion of an automobile door handle with parts thereof broken away and shown in longitudinal section to illustrate the latch operating mechanism of this invention in place therein;

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Figure 2 is a longitudinal sectional view taken through Figure 1 along the plane of the line 2-2;

Figure 3 is a cross sectional view taken through Figure 2 along the plane of the line 3-3; and

Figure 4 is a cross sectional view taken through Figure 2 along the plane of the line 4-4.

Referring now more particularly to the accompanying drawings in which like numerals designate like parts throughout the several views, the numeral 5 generally designates a handle for an automobile door. The handle is of the type which is adapted to be mounted on the exterior of one of the doors of an automobile. For this purpose the handle has a mounting post 6 thereon, the inner end of which is turned down to provide a neck 7 adapted to enter a suitable hole in the exterior surface of the door (not shown) a distance such as to bring the shoulder 8 on the post flush with the exterior surface of the door.

In order that the post may be secured in position upon the door the neck 7 is provided with opposite anchoring slots 9 in its exterior surface rearwardly of the shoulder 8, and which are adapted to be engaged by suitable anchoring means behind the outer wall of the automobile door. As will appear from Figure 1 the mounting post is at one end of the handle, and the other end of the handle, not shown, may also be provided with suitable means for fastening it to the exterior wall of the automobile door so that the handle is rigid or immovable on the door.

The mounting post 6 is provided with a short bore 11 at its front end and a long counterbore 12 leading from the bore 11 to the extreme rear of the neck 7. These bores, of course, are coaxial with the neck, and the bottom 13 of the counterbore which lies at the junction between the bores defines an annular abutment inside the mounting post adjacent to the front end thereof and facing the rear of the post, for a purpose to be later described.

The latch operating means of this invention, generally designated 15, comprises push button actuating mechanism 16 and an operating shaft 17. The actuating mechanism has one portion thereof inside the counterbore 12 and has a portion projecting forwardly therefrom through the bore 11 to be accessible at the front of the post for manual actuation.

The operating shaft 17 has one end inside the counterbore and its other end portion projects rearwardly out of the counterbore for engagement with the latch mechanism, not shown, on

the automobile door. As will be brought out in greater detail shortly, the actuating mechanism is connected with the operating shaft so that endwise and rotative movements may be imparted to the shaft from the front of the mounting post 6.

In the present case the door latch mechanism, not shown, is constructed so that release thereof requires rotation of the operating shaft 17 in one direction from a "neutral" position followed by retrograde rotation of the shaft to said "neutral" position and rearward endwise motion of the shaft, in the order given. The door is adapted to be locked by a sequence of operations consisting of rotation of the operating shaft in the opposite direction from its "neutral" position followed by return thereof to "neutral" position.

The push button actuating mechanism 16 includes a lock sleeve 19 and a lock cylinder 29 rotatable inside the sleeve by means of a suitable key 21. The sleeve and lock cylinder may be of conventional design wherein the cylinder is locked against rotation relative to the sleeve when the key 21 is withdrawn from the cylinder, but is freed for rotation inside the sleeve whenever the key is inserted into the mouth of the keyway at the front of the cylinder. In the present case also the lock mechanism is of the type wherein the cylinder may be rotated in either direction from a "neutral" key inserting and removing position thereof.

The lock sleeve 19 has an enlarged inner end received within the bottom portion of the counterbore 12 and has a sliding splined connection with the mounting post 6 effected by the engagement of ribs 23 on the exterior of the sleeve in diametrically opposite longitudinal grooves 24 in the wall of the counterbore 12. The front end portion 25 of the sleeve is reduced and projects forwardly through the bore 11 to extend a slight distance from the front of the post.

The lock cylinder 20 is rotatably received inside the sleeve 19 and has an enlarged head 27 at its front of the same diameter as the front end of the sleeve and cooperable therewith to limit insertion of the cylinder into the sleeve. The rear end portion of the cylinder projects rearwardly of the sleeve and has a slot 28 there-through providing a pair of laterally spaced rearwardly extending jaws 29.

The lock cylinder is maintained assembled with the lock sleeve by means of a push button cap 30 comprising a thin sheet metal shell encircling the projecting front portion 25 of the sleeve and the enlarged head 27 on the cylinder. The cap 30 has an outwardly and rearwardly flared skirt 31 at its rear portion inside the counterbore 12 and a pair of diametrically opposite ears 32, each provided with an aperture 33. These ears extend rearwardly from the outer edge portions of the flared skirt 31 and over the sleeve 19 to have lugs 34 on the exterior of the sleeve engage in their apertures 33 to retain the shell in place on the sleeve.

At the front end of the shell an inwardly curled flange 35 engages the front of the enlarged head 27 on the cylinder to preclude forward displacement of the cylinder from its sleeve. Thus the enlarged head 27 is more or less confined between the front end of the sleeve 19 and the inwardly curled flange 35 on the shell or push button cap.

From the description thus far it will be apparent that the lock cylinder 20 may be rotated by its key 21 in opposite directions from its key removing and inserting position shown; and that

the entire lock mechanism may slide axially back and forth in the bore 11 and counterbore 12. Such rotative and endwise sliding motion of the lock cylinder is adapted to be translated into rotative and endwise movement of the operating shaft 17. For this purpose the operating shaft has a novel connection with the rear or inner end of the lock cylinder.

This connection comprises an enlarged flat head 37 on the inner end of the operating shaft received in the slot 28 in the rear of the lock cylinder between the opposite jaws 29 formed by the slot. The opposite flat sides of the head 37 are thus substantially embraced by the jaws to provide a rotation transmitting connection between the cylinder and the shaft. However, the jaws are spaced apart a distance greater than the thickness of the head 37 so as to allow the shaft a degree of universal tilting motion relative to the cylinder about the point of engagement between the rounded front extremity 38 on the shaft and the bottom 40 of a relatively shallow well opening to the slotted rear of the cylinder.

The operating shaft is maintained assembled with the lock cylinder by means of a retaining washer 42 mounted on and encircling the slotted rear end of the cylinder. This washer has opposite inner marginal portions 43 contracted into diametrically opposite cross slots 44 in the exterior sides of the jaws 29 to maintain the washer assembled with the cylinder. Attention is directed to the fact that the slots 44 have sufficient width, lengthwise of the axis of the cylinder, as to allow a limited degree of axial sliding movement of the washer relative to the cylinder.

The lock cylinder 20 also has a rotation transmitting connection with the retaining washer 42 which connection is established by opposite lugs 45 on the washer projecting radially inwardly from its inner edges and entering the slot 28 in the rear of the cylinder from opposite sides thereof. These lugs fit the slot 28 rather closely and lie directly behind the enlarged head 37 on the shaft to engage the underside of the head and thus prevent axial displacement of the operating shaft from the rear of the lock cylinder. Since the lugs 45 also extend inwardly toward the portion of the shaft immediately under the enlarged head 37 it follows that the lugs also prevent lateral displacement of the shaft from between the jaws 28 on the cylinder.

It is important to note that the underside of the enlarged head 37 on the operating shaft has convex surfaces 46 which are adapted to be engaged by the lugs 45 on the retaining washer to allow the aforesaid universal tilting motion of the operating shaft about the point of engagement between its rounded front end 38 and the bottom of the well in the inner end of the lock cylinder.

Inward depression of the push button actuating mechanism is yieldingly resisted by a plunger spring 48 which encircles the operating shaft 17 inside the rear portion of the counterbore 12. The rear end of the plunger spring is seated in a cup member 49 in the counterbore, and a retaining ring 50 snapped into an annular groove in the wall of the counterbore near the back end of the mounting post serves to anchor the cup member 49 against rearward displacement from the counterbore. The forward end of the plunger spring is received in a similar cup-like part 51 and bears against the bottom 52 thereof. The

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cup-like part 51 is slidably splined to the mounting post by means of ribs 51' pressed outwardly of its side wall and engaging in the longitudinal grooves 24 in the wall of the counterbore 12.

The bottom wall of the cup-like part 51 has a central aperture 53 therein slightly larger than the slotted rear end of the lock cylinder to enable it to pass over the rear of the cylinder. The plunger spring 48 thus propels the cup-like part 51 forwardly against the retaining washer 42 on the cylinder, and by the engagement between the lugs 45 on the washer with the enlarged head on the operating shaft maintains the rounded front extremity 38 on the operating shaft engaged with the rearwardly facing surface 40 on the lock cylinder. Thus, the shaft transmits the thrust of the plunger spring to the lock cylinder, urging the same forwardly to force its enlarged head against the inwardly curled flange 35 on the push button cap. This in turn propels the push button cap and the lock sleeve 19 forwardly with respect to the mounting post, and maintains the rearwardly and outwardly flared skirt 31 on the push button cap tightly engaged with a sealing ring 55 in the bottom of the counterbore 12, lying against the annular shoulder 13.

Inasmuch as the sealing ring 55 has resilient characteristics, preferably being made of a relatively soft rubber and more or less snugly encircles the shell 30 of the cap, it follows that the joint between the push button actuating mechanism and the door handle mounting post is securely sealed against ingress of moisture. It also follows that the force of the plunger spring 48 is utilized to react successively on the retaining washer 42, the operating shaft, the lock cylinder, the push button cap and the lock sleeve to eliminate any tendency for the parts to rattle in the mounting post.

It should be observed that the bottom wall 52 of the cup-like part 51 has opposite forwardly depressed nubs 57 which bear against the rear side of the retaining washer 42 under the force of the plunger spring 48 and which enter depressions 58 in the retaining washer with a detent action in the key inserting and removing position of the lock cylinder shown to define said position of rotation of the cylinder. Thus, rotation of the lock cylinder by its key 21 in either direction from the position shown in Figure 2 may be effected only by exerting sufficient rotative force on the cylinder to overcome the detent action described.

It is also important to note that the retaining washer 42 rather closely overlies the rear end of the lock sleeve 19 and since the washer is confined in the slots 44 in the exterior of the lock cylinder, the washer serves as an additional precaution against the lock cylinder being pulled forcefully from the front of the sleeve in an effort to defeat the lock.

Another important feature of the mechanism described is that the pressure of the plunger spring is employed to hold the head of the operating shaft frictionally clamped between the washer 42 and the lock cylinder so that the shaft may be maintained at any angle of tilt at which it may be placed. This facilitates connection of the shaft with the latch mechanism on the door. Also the ability of the shaft to tilt universally enables it to accommodate variations in the alignment of the door handle with the door latch mechanism.

With the mechanism described it will be clear that the push button actuating mechanism can

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be depressed inwardly into the mounting post at any time, that is, whether the key 21 has been inserted into the lock cylinder or not. Unless the key 21 has been inserted into the lock cylinder and the cylinder rotated in an unlocking direction, from its key inserting and removing position, and then returned to said position the inward depression of the push button actuating mechanism will not effect release of the latch mechanism on the door. The door may be locked closed merely by rotating the lock cylinder by its key in the opposite or locking direction, returning the cylinder to its key inserting position, and removing the key therefrom.

From the foregoing description taken in connection with the accompanying drawings it will be readily apparent to those skilled in the art that this invention provides push button latch operating mechanism which is not only simple in construction but which is well constructed to withstand the rough handling to which it may be subjected in use.

What I claim as my invention is:

1. Latch operating mechanism of the character described, comprising: actuating mechanism including a rotatable member having an axial slot in its rear end; a shaft having one end received loosely in said slot; a rearwardly facing shoulder on said end of the shaft; a shaft retaining washer loosely encircling the rear end of said rotatable member; cooperating abutments on said washer and the rear of the rotatable member for holding the washer against rearward displacement from the rotatable member; a lug on the washer extending inwardly therefrom into said slot behind the shoulder on the shaft so as to constrain the washer to rotate with the rotatable member and prevent axial separation on the shaft therefrom; an enlarged head on the front end of said rotatable member; a sleeve in which the rotatable member is rotatably journaled, said sleeve being confined between said head and the washer on the rotatable member; and a rotation transmitting connection between said rotatable member and the shaft inside said slot.

2. Latch operating mechanism of the character described, comprising: an actuator including a rotatable member having an axial slot through its rear end; a shaft having one end loosely received in said slot; diametrically opposite rearwardly facing shoulders on said end of the shaft and inside the slotted end of the rotatable member; a shaft retaining washer loosely encircling the rear end of the rotatable member; abutments on the rear of the rotatable member at opposite sides of said washer and spaced apart axially of the rotatable member a distance greater than the thickness of said washer to hold the washer in place on the rear of the rotatable member while permitting the washer a limited degree of axial sliding motion thereon; lugs on the washer projecting inwardly therefrom into said slot from opposite sides of the rotatable member and lying behind the shoulders on the shaft so as to constrain the washer to rotate with the rotatable member and prevent axial separation of the shaft therefrom; and a rotation transmitting connection between the rotatable member and the shaft inside said slot.

3. The latch operating mechanism of claim 2 wherein said washer is contracted radially inwardly to have inner edge portions thereof engaged between the abutments on the rear of the rotatable member.

4. The latch operating mechanism of claim 2

wherein the extremity of said end of the shaft is rounded to allow rocking of the shaft upon a rearwardly facing surface at the bottom of said slot in the rear of the rotatable member, and wherein said rearwardly facing shoulders on the shaft have convex surfaces engageable by the lugs on the retaining washer.

5. Push button type latch operating mechanism, comprising: an actuator including an outer sleeve member, an inner member rotatable in said sleeve member and projecting from both ends thereof, said inner member having a slot in its rear end providing rearwardly extending laterally spaced jaws; means connecting said members to preclude relative axial motion therebetween, said means including a shell fixed to the sleeve member and extending therefrom over the projecting front of the rotatable member and an intumed flange on the front of said shell engaged over the front of the rotatable member to preclude forward displacement thereof from the sleeve member; an operating shaft projecting axially from the rear of the rotatable member and having a portion engaged between said jaws thereof to provide a rotation transmitting connection between the rotatable member and the shaft; a retaining element mounted on the rear of said rotatable member; and means on said retaining element projecting into the slot in the rear of the rotatable member for engagement with a part on the shaft to preclude axial separation of the shaft from the rotatable member and to drivingly connect the retaining element with the rotatable member for rotation therewith.

6. The latch operating mechanism set forth in claim 5 wherein said means connecting the inner and outer members includes apertured ears on the shell overlying exterior portions of said sleeve member; and lugs on said exterior portions of the sleeve member engaged in the apertures of said ears to hold the shell against motion relative to the sleeve member.

7. Door latch operating mechanism of the character described, comprising: a door handle having a bored mounting post thereon; a lock sleeve constrained to axial sliding motion in said bore; a lock cylinder in said sleeve constrained to slide axially therewith but rotatable relative to the sleeve upon insertion of a proper key into the cylinder, said cylinder projecting from the front of the post to provide a push button; an extension on the rear of said cylinder having a pair of jaws defining between them an outwardly divergent slot opening to the rear of said extension; a shaft projecting from the rear of said post and having an enlarged head at its front end confined between said jaws to be thereby constrained to rotate with the cylinder, said head on the shaft having a rounded front surface engaged with a rearwardly facing surface at the front of said slot between the jaws and having rounded rearwardly facing shoulders; a retaining member having a splined connection with said extension on the lock cylinder permitting limited axial motion of the retaining member with respect to the cylinder, said retaining member having abutments engaging said rounded rearwardly facing shoulders on the rear of the shaft to thereby preclude rearward displacement of the head of the shaft out of said jaws while permitting the shaft to have a limited degree of freedom for angular adjustment; a compression spring at the rear of the bore in the post; means defining a forwardly facing abutment at the rear of the bore in the post against which the rear of said spring

reacts; and a reaction member between the front of said spring and said retaining member to receive reaction of the spring and transmit the same to the retaining member to thereby frictionally hold the head of the shaft at any angle of tilt at which it may be placed.

8. The door latch operating mechanism of claim 7 further characterized by a splined connection between the mounting post and the reaction member; and cooperating detent means on said retaining member and said reaction member, rendered operative by reaction of the spring against said reaction member to define a key receiving position of the lock cylinder.

9. The door latch operating mechanism of claim 7 further characterized by cooperating shoulders in the bore of the mounting post and on the lock sleeve, near the front thereof, to preclude forward displacement of the lock sleeve out of said bore; and resilient sealing means interposed between said shoulders and normally held in sealing engagement with them by the forward pressure exerted upon said lock sleeve by the spring.

10. Latch operating mechanism of the character described, comprising: a stationary lock guide having a bore opening to its front and a counterbore opening to its rear, with the junction of said bore and counterbore defining a rearwardly facing shoulder; a push button lock including a sleeve axially slidable in the counterbore and a lock cylinder rotatable in said sleeve and projecting forwardly therefrom, into the bore, to be accessible at the front of the guide; spring means reacting between the push button lock and a part fixed with respect to the guide to bias the lock forwardly; and a tubular shell surrounding said sleeve and lock cylinder, said shell being secured at its rear to the sleeve to preclude rearward axial displacement of the sleeve with respect to the shell, said shell having a forwardly facing shoulder engageable with said rearwardly facing shoulder in the guide to preclude forward displacement of the shell, and having an inwardly turned annular flange at its front overlying and intimately engaged with the front of the lock cylinder to preclude forward axial displacement of the lock cylinder in response to bias of said spring and to provide a seal whereby foreign matter is kept out of the lock mechanism.

11. Latch operating mechanism of the character described, comprising: a stationary bored lock guide having a rearwardly facing shoulder in the bore; a push button lock in said bore including a sleeve axially slidable in the bore and a lock cylinder rotatable in said sleeve with its front end portion projecting forwardly out of the bore; means for precluding forward displacement of the lock cylinder out of the sleeve and for sealing the lock mechanism against the entry of foreign matter comprising a shell encircling the projecting front end portion of the lock cylinder and extending rearwardly into the bore beyond said shoulder therein, said shell having an inwardly turned annular flange at its front overlying and intimately engaged with the front face of the lock cylinder; a forwardly facing shoulder on the rear of the shell engageable with the rearwardly facing shoulder in the bore to preclude forward displacement of the shell out of the bore; and a push button return spring reacting between the stationary lock guide and the push button lock to yieldingly urge the same forwardly and thereby hold the front face of

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the lock cylinder in firm sealing engagement with said flange on the shell.

12. Latch operating mechanism of the character described, comprising: a stationary bored lock guide having a rearwardly facing annular shoulder in its bore adjacent to the front of the guide; a push button lock in said bore, including a sleeve axially slidable in the bore and a lock cylinder rotatable in said sleeve and having its front end accessible at the front of the guide; means for precluding axial forward displacement of the lock cylinder out of the sleeve and for sealing the lock mechanism against the entry of foreign matter comprising a shell encircling the front end portion of the cylinder and having an inwardly turned annular flange at its front engaged over the front face of the lock cylinder; a forwardly facing annular shoulder on the rear of the shell engageable with the rearwardly facing annular shoulder in the bore to preclude forward displacement of the shell out of the bore; a push button return spring reacting between the stationary lock guide and the push button lock to yieldingly urge the same forwardly and thereby hold the front face of the lock cylinder in firm sealing engagement with said flange on the shell; and a resilient annular gasket interposed between said annular shoulders on the guide and the shell to afford a seal against the entry of foreign matter into the bore of the guide, said gasket being normally held clamped between said annular shoulders in sealing engagement therewith by the bias of the push button return spring.

13. Latch operating mechanism of the character described comprising: a stationary lock guide having a bore therethrough opening to the front and to the rear thereof; a push button lock in the bore including a sleeve axially slidable in said bore and a lock cylinder rotatable in said sleeve and having its front end accessible at the front of the bore; cooperating means on the lock guide and the push button lock for precluding axial forward displacement of the lock out of the bore; a shaft extending rearwardly from the rear of the lock and beyond the bored guide for actuation of a latch mechanism; a universal joint coupling between the lock cylinder and said shaft comprising a pair of spaced apart rearwardly extending jaws on the rear of the lock cylinder, an enlarged head on the front of said shaft loosely received between said jaws, said shaft having a convex front surface abutting the rear of the lock and having convex rear surfaces, and an annular retaining member encircling the jaws and having tangs projecting into the space between the jaws to abut the convex rear surfaces on the head of the shaft; and means for frictionally retaining said shaft tilted at any desired angle to the bore axis within its range of universal motion comprising a compression spring in said bore in the lock guide, at the rear thereof, with its front end reacting against said annular retaining member, and means at the rear of the bore fixed with respect to the lock guide and against which the rear of said spring reacts to bias the retaining member forwardly to thereby effect frictional engagement of said head on the shaft between the rear of the lock and said tangs on the retaining member, said spring thereby reacting upon the push button lock through the shaft so as to also serve as a return spring for the push button lock.

14. The latch operating mechanism of claim 13, further characterized by a reaction member in

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said bore having a splined connection with said stationary lock guide and interposed between said spring and said retaining member; and cooperating detent means on said reaction member and said retaining member rendered operative by reaction of the spring against said reaction member to define a key receiving position of the lock cylinder.

15. Latch operating mechanism of the character described comprising: a stationary lock guide having a bore therethrough opening to the front and to the rear thereof; a push button lock in the bore including a sleeve axially slidable in said bore and a lock cylinder rotatable in said sleeve and having its front end accessible at the front of the bore; a shaft extending rearwardly from the rear of the lock and beyond the bored guide for actuation of a latch mechanism, said shaft having an enlarged head at its front providing convex forwardly and rearwardly facing shoulders, the forwardly facing shoulder on the shaft abutting the rear of the lock; a pair of spaced apart rearwardly extending jaws on the rear of the lock cylinder extending behind the sleeve and between which the head of the shaft is loosely received; an annular retaining member encircling the jaws and having tangs projecting into the space between said jaws to abut the convex rear surfaces on the head of the shaft so that the head of the shaft is confined between said tangs and the rear of the lock, said retaining member having parts projecting into cross slots on the exterior of the jaws to enable the retaining member to have limited axial movement with respect to the lock cylinder while precluding rearward displacement of the head of the shaft from between said jaws and forward displacement of the lock cylinder out of the sleeve; means defining a forwardly facing abutment at the rear of the bore in said guide; a compression spring reacting between said abutment and the retaining member to bias the latter forwardly so that its tangs frictionally engage said surfaces on the head of the shaft and hold the forwardly facing shoulder on the shaft in frictional engagement with the rear of the lock to thus enable the shaft to be adjustably held in different positions tilted at an angle to the bore axis, said spring also imparting forward bias to the push button lock through said retaining member and the shaft; and cooperating abutments on said sleeve and in the bore to preclude forward displacement of the sleeve out of the bore.

16. The latch operating mechanism of claim 15, further characterized by the fact that said cooperating abutments in the bore and on the sleeve comprise annular shoulders; and further characterized by a resilient annular gasket interposed between said annular shoulders and normally clamped between them in consequence to forward bias exerted upon said sleeve by said spring to afford a seal against entry of foreign matter into the bore.

17. Door latch operating mechanism of the character described, comprising: a door handle having a bored mounting post thereon; an operating shaft projecting from the rear of the post and having one end thereof inside said bore; actuator means for imparting rearward endwise motion to said shaft including a member slidable axially in said bore, an extension on said member projecting forwardly out of the bore and accessible at the front of the post, and a part connected with said member to slide axially there-

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with and abutting said end of the operating shaft; yieldable biasing means in said bore acting on the shaft to yieldingly urge the shaft against said part on the actuator means to preclude rattling of the shaft thereagainst, and whereby the biasing means urges the actuator means forwardly of the post; and cooperating annular sealing means on the post and the actuator means adjacent to the front of the post providing abutments for precluding forward displacement of the actuator means from the post and normally held in engagement with one another by the force of the biasing means acting on the shaft, to seal the bore in the post.

18. Door latch operating mechanism of the character described, comprising: a guide means having a bore therethrough; lock mechanism axially slidable in said bore and including a rotatable lock cylinder projecting forwardly out of the bore; an operating shaft projecting rearwardly out of the bore and having its forward end adjacent to the rear of the lock cylinder; cooperating means on the lock mechanism and the shaft providing an axial thrust and rotation transmitting connection between the cylinder and shaft affording the shaft a limited degree of universal motion relative to the cylinder; cooperating stops on the guide and the lock mechanism defining the forward limit of sliding motion of the lock mechanism; a compression spring confined in said bore; means providing a rearwardly facing surface on the forward end portion of the shaft; and means connected with the cylinder and interposed between said spring and said rearwardly facing surface on the operating shaft for preventing axial separation of the shaft and cylinder, said last named means receiving the expansive force of the spring and translating said force into forward thrust on the lock mechanism through the shaft and its axial thrust transmitting connections with the cylinder so that said spring yieldingly holds the lock mechanism in its forward position in the bore defined by the cooperating stops on the guide and the lock mechanism and prevents rattling resulting from movement of the shaft with respect to the lock mechanism.

19. Door latch operating mechanism of the character described, comprising: guide means having a bore therethrough; lock mechanism axially slidable in said bore and including a rotatable lock cylinder projecting forwardly out of the bore; an operating shaft projecting rearwardly out of the bore and having its forward end adjacent to the rear of the lock cylinder; cooperating means on the lock mechanism and the shaft providing an axial thrust and rotation transmitting connection between the cylinder and shaft; cooperating stops on the guide and the lock mechanism defining the forward limit of sliding motion of the lock mechanism; a compression spring confined in said bore behind the lock mechanism; means providing a rearwardly facing abutment on the forward end portion of the shaft; and means connected with the cylinder and interposed between said spring and said abutment on the shaft for preventing axial separation of the shaft and cylinder, said last named means receiving the expansive force of the spring and translating said force into forward thrust on the lock mechanism through the shaft and its axial thrust transmitting connection with the cylinder so that said spring yieldingly holds the lock mechanism in its forward position in the bore defined by the cooperating stops on the

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guide and the lock mechanism and prevents rattling resulting from movement of the shaft with respect to the lock mechanism.

20. Door latch operating mechanism of the character described, comprising: a door handle having a bored mounting post thereon; an operating shaft projecting from the rear of said post and having its forward end inside the bore thereof; actuator means slidable axially in the bore for imparting rearward endwise motion to said shaft, said actuator means projecting from the front of the post to provide a push button, and a connection between the shaft and the inner end of the actuator means constraining the shaft to axial motion with the actuator means; cooperating abutments on the actuator means and the post inside the bore thereof for limiting forward sliding motion of the actuator means; spring means in said bore; means on the operating shaft providing a rearwardly facing surface thereon; and a thrust receiving member in the bore behind the actuator means and in engagement with said rearwardly facing surface on the operating shaft for receiving the thrust of the spring means and for transferring said thrust to the actuator means through its connection with the shaft so that the actuator means is yieldingly held in its forward position in the bore defined by the engagement of said abutments on the actuator means and the post and the shaft is held against rattling at its connection with the actuator means.

21. Door latch operating mechanism of the character described, comprising: a door handle having a bored mounting post thereon; an operating shaft projecting from the rear of said post and having its forward end inside the bore thereof; actuator means for imparting rotative and rearward endwise motion to said shaft including a lock sleeve constrained to axial sliding motion in said bore, a lock cylinder in said sleeve constrained to slide axially therewith but rotatable relative to the sleeve upon insertion of a proper key into the cylinder, said cylinder projecting from the front of the post to provide a push button, and a connection between the shaft and the inner end of the cylinder constraining the shaft to rotary and axial motion with the cylinder; cooperating abutments on the actuator means and the post inside the bore thereof for limiting forward sliding motion of the actuator means; spring means in said bore; means connected with the operating shaft for receiving the thrust of the spring means and for transferring said thrust to the actuator means through the connection between the shaft and cylinder so that the actuator means is yieldingly held in its forward position in the bore and the shaft is held against rattling at its connection with the cylinder; and cooperating detent members carried by the cylinder and the post and biased into engagement with one another by said spring means, said detent members having detent means thereon brought into cooperating relationship by rotation of the cylinder to a key inserting and removing position to define said position of the cylinder.

22. The latch operating mechanism of claim 21 wherein said thrust receiving means provides one of the detent members and comprises a washer mounted on the inner end of the lock cylinder to rotate therewith, and the other detent member comprises an annular member slidable in the bore behind said washer and against which said

spring means seats to press the annular member against the rear of the washer; and means for constraining said annular member to axial sliding motion in the bore.

23. The latch operating mechanism of claim 22 further characterized by the fact that said thrust receiving detent member is interconnected between the cylinder and the shaft to preclude axial separation of the cylinder and shaft.

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