Aug. 1, 1939. S. T. ALLEN 2,167,736

LOCK AND LATCH

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Fig. 2

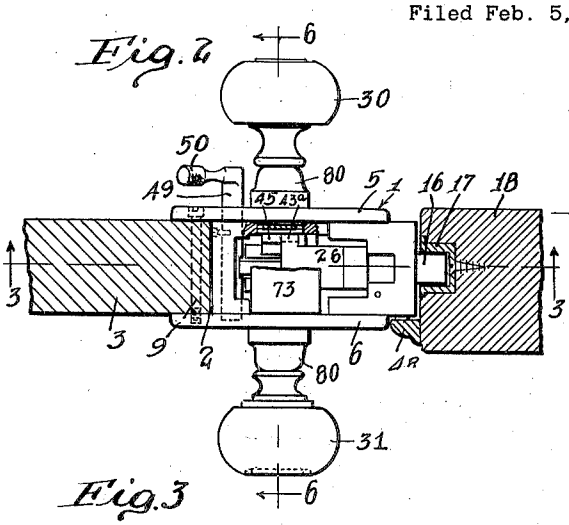


Fig. 3

Fig. 1

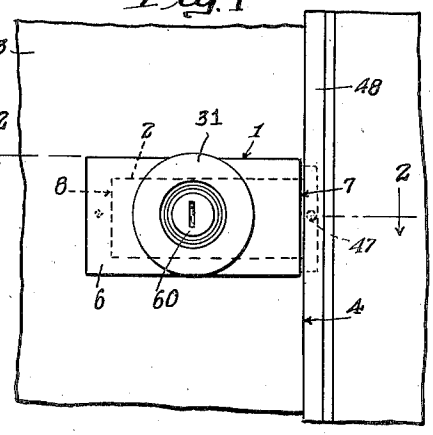
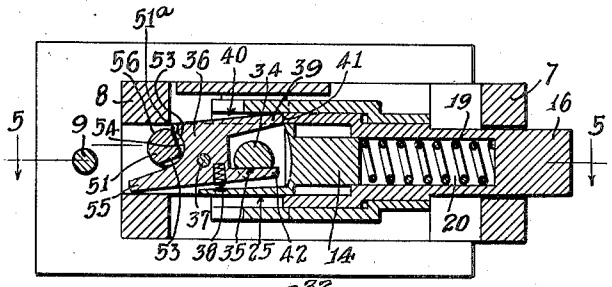


Fig. 4



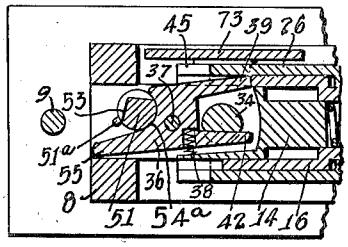
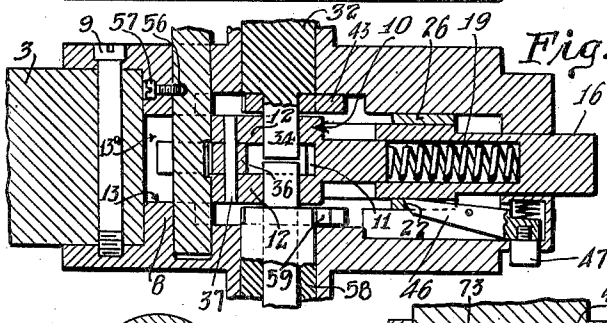


Fig. 5.



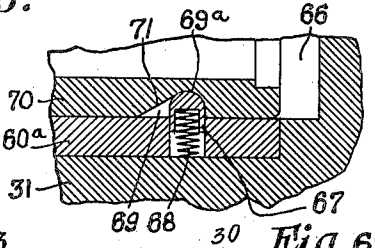


Fig. 6a

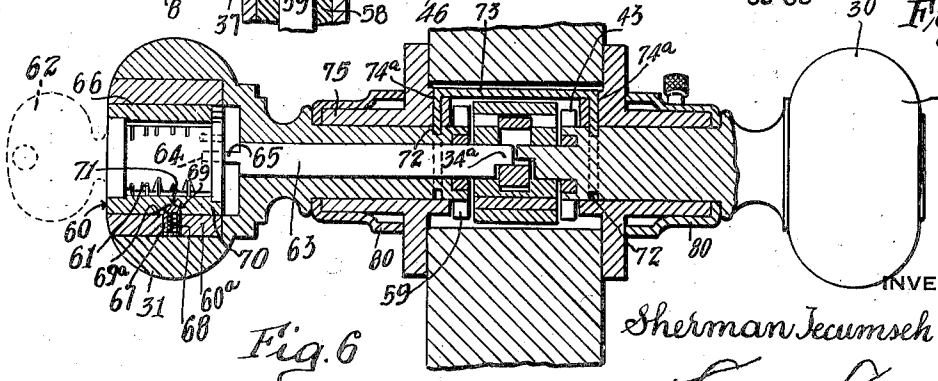


Fig. 6

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Fig. 18

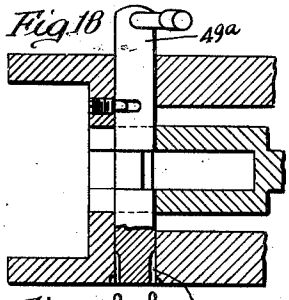


Fig. 18a



Fig. 19

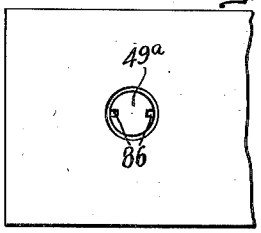


Fig. 7

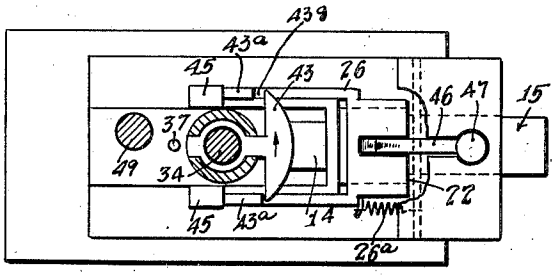


Fig. 8

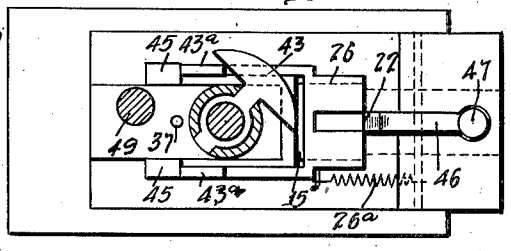


Fig. 16

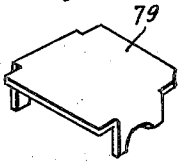


Fig. 9

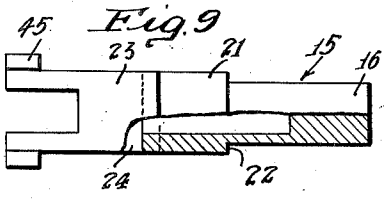


Fig. 10

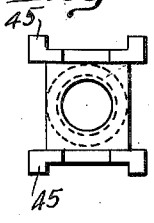


Fig. 11

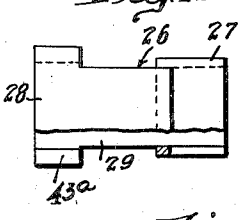


Fig. 12

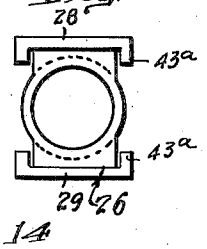


Fig. 13

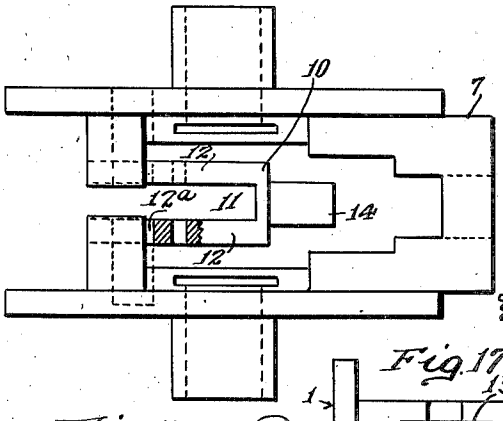


Fig. 14

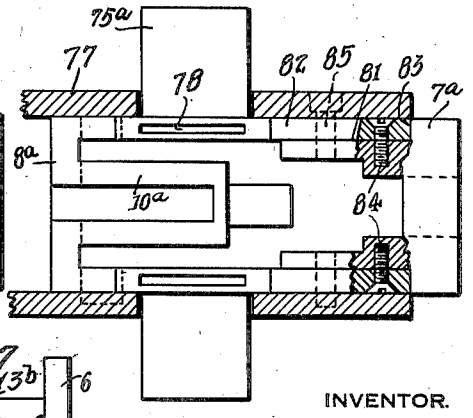


Fig. 15

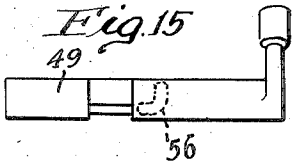
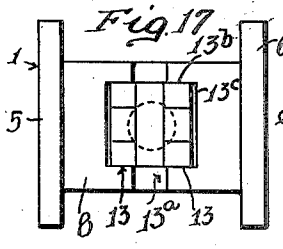


Fig. 17



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LOCK AND LATCH

Sherman Tecumseh Allen, Los Angeles, Calif.

Application February 5, 1937, Serial No. 124,221

15 Claims. (Cl. 70—150)

This invention relates to a latch, and while it is capable of employment in many situations, it is intended primarily for use as a door latch; and while the invention operates as a latch, it also can function as a lock.

A general object of the invention is to produce a latch of simple construction, having few parts which can readily be assembled.

In a common type of latch or lock, the latch bolt projects from the latch casing, from the edge of the door, and the bolt is formed with an inclined face or cam face that enables the keeper on the door jamb to push back the bolt when the door is moved to its closed position. This projecting bolt is objectionable particularly where the latch is on an automobile door, as one's wearing apparel may become caught in it in getting in or out of the car.

One of the objects of this invention is to provide a latch whose bolt will be withdrawn into the lock casing or edge of the door while the door is in its open position, and having improved means for controlling the bolt.

In the preferred embodiment of the invention, the mechanism of the latch includes an automatic stop, which engages the bolt when the bolt is in its extended or locking position; and one of the objects of the invention is to provide very simple means for effecting control of this automatic stop.

A further object of the invention is to provide a latch having a casing of simple construction, which is adapted to facilitate the assembly of the parts of the latch.

When the latch is intended to be used as a lock capable of being unlocked by means of a key at the outer side of the door, the locking mechanism is carried in a chamber in the knob on the outer side of the door; and one of the objects of the invention is to provide improved means for enabling a key-controlled lock to be placed in a chamber of the knob in such a way that it will become automatically locked in this chamber against withdrawal.

A further object of the invention is to provide a latch of improved construction, and having simple means for securing the shanks of the knobs rotatably within the latch casing, and operating to reduce the number of parts usually necessary for accomplishing this.

It is found in practice that there is a slight variation in the thickness of doors, even where the doors are supposed to have the same thickness. One of the objects of this invention is to provide a construction for the latch casing that will enable it to be readily adapted to doors of different thickness. Also to provide a lock that can readily be secured in the door by means of a single screw or bolt.

A further object of the invention is to provide a latch with a simple night lock for use on an outside door; and to provide simple means whereby such a lock when used on an inside door, can be opened from the outerside if that should become necessary. This latter feature adapts the lock admirably for use on a bath-room door.

Further objects of the invention will appear hereinafter.

The invention consists in the novel parts and combination of parts to be described hereinafter, all of which contribute to produce an efficient door lock.

A preferred embodiment of the invention is described in the following specification, while the broad scope of the invention is pointed out in the appended claims.

In the drawings:

Fig. 1 is a fragmentary side elevation showing a portion of a door with a lock applied to the same. This view also shows a portion of the door jamb broken away.

Fig. 2 is a horizontal section taken about on the line 2—2 of Fig. 1, and showing certain portions of the latch broken away.

Fig. 3 is a vertical section taken about on the line 3—3 of Fig. 2 upon an enlarged scale, and illustrating the parts of the latch in the relation which they have when the bolt is extended; that is to say, when the bolt is in its locking position. This view illustrates the automatic stop engaging with the bolt to prevent unauthorized withdrawal of the bolt. This view also shows the control means for the automatic stop in a neutral position, in which it will permit movement of the automatic stop by the knobs of the door.

Fig. 4 is a view similar to Fig. 3, but with the forward portion of the casing and latch mechanism broken away. This view illustrates the control member for the automatic stop in a position which will prevent movement of the automatic stop out of engagement with the bolt from the outer side of the door, without the use of a key.

Fig. 5 is a horizontal section taken about on the line 5—5 of Fig. 3, but showing the controlling means or controlling pin for the automatic latch, partially in section and partially in plan.

Fig. 6 is a vertical section taken about on the line 6—6 of Fig. 2, but upon an enlarged scale, and further illustrating details of the means for mounting the knobs, and the relation of the key-

lock mounted in the outer knob. This view, of course, shows adjacent portions of the door broken away.

Fig. 6a is a section upon an enlarged scale corresponding to Fig. 6, and particularly illustrating the details of the locking means for securing the key-controlled lock in the knob.

Fig. 7 is a side elevation of the latch with certain parts shown in section, and other parts broken away, and particularly illustrating the means actuated by the knobs for withdrawing the latch bolt. This view shows the latch bolt in an extended position.

Fig. 8 is a view similar to Fig. 7, but showing the cam actuated by the knob in its active position, that is to say, in the act of withdrawing the bolt.

Fig. 9 is a plan of the latch bolt broken away and shown partially in section.

Fig. 10 is an end elevation of the latch bolt viewed from its inner end and in an upright position.

Fig. 11 is a plan of a sleeve associated with the bolt, which cooperates with the knob cams for withdrawing the bolt.

Fig. 12 is an end elevation of the sleeve illustrated in Fig. 11, and showing the same in an upright position. This view shows the sleeve of Fig. 11 as viewed from its inner end.

Fig. 13 is a plan of the lock casing with the movable parts of the latch removed, and particularly illustrating the relation of the bolt guide to the casing of the lock, and the means for mounting the same in the latch casing. This figure illustrates the casing constructed in one piece, but so that it can adapt itself to doors of different thicknesses.

Fig. 14 is a view similar to Fig. 13, but illustrating another embodiment of the latch, portions of the escutcheon plates of the latch being broken away and shown in section. This view illustrates an embodiment of the invention in which the forward end of the casing is constructed as a separate piece from the inner casing escutcheon plates.

Fig. 15 is a side elevation of the controlling pin that controls the automatic stop.

Fig. 16 is a perspective of a cotter plate, which I employ for holding the knobs in the casing of the latch.

Fig. 17 is an end elevation of the latch casing illustrated in Fig. 13, but in an upright position.

Fig. 18 is a horizontal fragmentary section through the latch at the controlling pin, and illustrating a modified construction for inside doors such as a bath-room door, that will enable the pin to be controlled from the outer side of the door if necessity demands.

Fig. 18a is a plan of a simple key that may be employed for opening that latch shown in Fig. 18, from the outer side of the door.

Fig. 19 is a fragmentary elevation of the escutcheon plate adjacent the control pin shown in Fig. 18.

Referring particularly to Figs. 1 to 6, the latch has a casing or case 1 that is preferably mounted in a notch 2 cut into the door 3 at its free edge 4.

The casing preferably has two escutcheons or escutcheon plates 5 and 6. The forward wall 7 of the casing 1 and the rear wall 8 have sufficient vertical depth to fill the notch 2 neatly, and the entire latch can be secured in the door by a single through-bolt 9, that passes into the escutcheon plates from the inner side, see Fig. 2.

Within the casing 1, I provide a bolt guide 10 (see Figs. 5 and 13), the body of which is of block form with a central recess 11, so that two forks 12 are presented at the rear, said forks being received in notches 13 formed in divided sections of the inner transverse wall 8 of the case. This cross-wall 8 is divided by a gap 13a cut through it (see Fig. 17), and the two wall sections are cast integral with the escutcheon plates 5 and 6, and seat against the inner end of the notch 2, (see Fig. 5).

The forward end of the bolt guide 10 is formed into a guide stem 14 on which the bolt 15 slides, the nose 16 of the bolt being guided through the forward wall 7 of the casing, so that it can project into a keeper 17 recessed into the door jamb 18.

A spring is provided for projecting the bolt from the casing 1 preferably in the form of a coil spring 19 mounted between the guide and the bolt. In the present instance it is mounted in a spring chamber 20 formed in the forward end of the bolt.

The bolt 15 shown in detail in Figs. 9 and 10, has an integral neck 21 of slightly larger diameter than the nose 16, so that a shoulder 22 is formed for a purpose that will appear hereinafter. The rear end of the bolt is formed with two plate-like forks 23 and 24 that extend rearwardly and slide on the upper and lower flat guide faces 25 of the bolt guide 10.

An actuator or actuating sleeve 26 for withdrawing the bolt, is guided on the outer side of the bolt 15, (see Figs. 1 and 3). This sleeve shown in detail in Figs. 11 and 12, has a cylindrical collar 27 that slides on the neck 21 of the bolt 15, and the rear portion of this actuating sleeve 26 has two integral plate-like forks 28 and 29 that slide on the faces 23 and 24 of the bolt 15.

Knobs 30 and 31 are provided, with shanks (see Fig. 6) that are rotatably mounted in the escutcheons 5 and 6, and the end of the shank 32 is cut away on its under side to form a short tongue 34 with a cam face 35 on its under side to disengage an automatic stop 36 that is capable of locking the bolt in its extended position (see Fig. 3). This stop 36 is preferably mounted on a pivot pin 37 in the aforesaid recess 11 of the bolt guide (see Fig. 13).

When the bolt 15 is in its extended position a spring 38 under the stop forces the stop up so that the forward end of its upper finger 39 lies in a notch 40 at the rear end of the bolt 15 (see Fig. 9) and the end of this finger 39 engages the rear end of the bolt at the edge 41 of this notch. When the shank 32 is rotated the cam face 35 engaging a lower finger 42 on the stop 36, depresses the forward end of the stop and disengages it from the bolt 15. This permits the bolt to be withdrawn. In order to accomplish this, the shank 32 of the inside knob 30 carries a double-toed cam 43. The toes of this cam cooperate with shoulders 43a of the actuating sleeve 26, and slide the sleeve in on the bolt 15. As this takes place, the forward end of the sleeve 26 (see Fig. 7) pushes against shoulders 45 on the bolt and withdraws the bolt. When the bolt is completely withdrawn, a spring-actuated detent pawl 46 engages the shoulder 22 on the bolt (see Fig. 5) and holds the bolt back until the door is closed; when this occurs an exposed button 47 strikes the stop strip 48 of the door jamb and releases the detent pawl, whereupon the spring shoots the bolt into the keeper 17. A spring 26a returns the

slide 26, (Fig. 8), and this rotates the knobs to neutral position.

When the bolt is being withdrawn, of course, the forward end of the stop 36 is held down by the under face of the upper fork 28 of the sleeve 26. A night lock is provided. For this purpose I provide means for controlling the automatic stop from the inner side of the door, and this means preferably consists of a pin 49 (see Fig. 2) having a handle 50 for moving it. In the neutral position of this pin a reduced neck 51 of the pin has the relation indicated in Fig. 3. The reduced neck is formed by cutting away the side of the pin to form clearance notches 52 and 53. This neck is located at an arc-shaped recess 54 forming the rear edge of the stop 36, and below this point the stop has a rearwardly projecting tail 55. By rotating the pin 49 on its own axis the circumferential face 56 can be brought around to a diametrically opposite position to fill the recess 54 and this, of course, will lock the stop against being depressed at its forward end. At this time the latch cannot be opened even by means of a key at the outside of the door. The spring 19 only advances the bolt, and hence can be relatively weak. This avoids noise when the bolt goes into the keeper. The spring 26*a*, as stated, retains the sleeve 26.

If the pin handle 50 is so located that the shank of knob 30 would prevent its rotation, then the pin would be mounted to slide longitudinally so as to bring the full cross-section of the pin into the recess 54*a* (see Fig. 4). In order to permit this to be accomplished, the side of the pin 49 may be provided with a bayonet slot 56 (see Figs. 5 and 15) engaged by a set-screw 57.

The forks 12 of the bolt guide are provided with recesses 12*a* to permit the pin 49 to pass through (see Fig. 13). The pin, of course, holds the rear end of the bolt guide against moving up or down.

The outer knob 31 has a shank 58, the inner end of which is constructed like the shank 32 of the inside knob, and is provided with a double-toed cam 59 that engages two shoulders 43*a* (see Fig. 11) of the sleeve, but it cannot withdraw the bolt 15 unless the automatic stop 36 is disengaged from the bolt. If the night lock pin 49 is not locking the automatic stop 36 against being released, it can be released through the agency of a key-lock 60 the barrel 61 of which can be rotated by the proper key 62. The inner end of the barrel can rotate a stem 63 rotatably mounted coaxially within the shank 33. For this purpose the inner end of the barrel has a rectangular socket 64 for a tongue 65 on the end of the stem 63. The other end of the stem has a short tongue 34*a* like the tongue 34 (see Fig. 6) and operating in the same way when rotated, to depress the forward end of the automatic stop, to release the bolt 15 for withdrawal.

The key lock 60 is inserted in a chamber 66 from the outer end of the knob 31, and I provide means for holding the entire lock against withdrawal. For this purpose I provide yielding means such as a pin 67 (see Fig. 6) mounted in a sleeve 60*a* having a pressed fit in the knob. The pin is urged inwardly by a spring 68. When the key lock 60 is shoved into the sleeve 60*a*, its inward movement is arrested by the end of the barrel 61 seating against the end of tongue 65. When this occurs, the nose of pin 67 snaps into a socket 69 having an abrupt shoulder 69*a*, in the outer face of the case 70 of the key lock. In order to enable the key lock to be removed, the latch must be disassembled sufficiently to enable the stem 63 to be shifted inwardly. When the stem 63 is out of the way the key lock 60 can be pushed further into the bore of the sleeve 60*a*, clearance being provided for this at the inner end of chamber 66, and in doing this the pin 67 is pushed back by a cam face 71 of the socket 69; then by a slight rotation of the entire lock 60 through the medium of its key, the shoulder 69*a* will be moved out of line with the pin, enabling the lock 60 to be withdrawn from the chamber 66.

In order to hold the knobs 30 and 31 against withdrawal, I provide the shank of each knob with a circumferential groove 72, and these grooves are engaged by the downwardly bent ends of a saddle plate 73 (see Fig. 6). If desired, the ends of the saddle plate may seat through slots 74*a* formed in bosses 74 formed on the inner faces of the escutcheon plates 5 and 6.

In the construction shown in Fig. 6, the escutcheons may be provided with integral sleeves 75 for supporting the knobs. In Fig. 14 I illustrate a modification in which the knob sleeves 75*a* project through the escutcheon plates 77, and have slots 78 to cooperate with a cottar, or key-plate 79, (see Fig. 16) that is dropped into the slots 78 from above to engage with grooves (not illustrated) in the knob shanks like the grooves 72.

If desired, the sleeves 75 may be covered by ornamental sleeves 80.

In assembling the parts of the latch having the construction of the casing illustrated in Figs. 5 and 13, the bolt 15 with the sleeve 26 mounted on it should be slipped over the bolt guide 10 before the bolt guide is set in the casing; the spring 19 should be placed in the spring chamber 20, however, in assembling these parts. The bolt should be pressed inwardly so as to compress the spring 19 sufficiently to enable the bolt guide and bolt to be introduced by lateral movement into the interior of the casing, whereupon the nose of the bolt should be guided into its guide opening in the forward wall 7 of the casing. The rear end of the bolt guide is then shoved back so that its forks 25 lie in the notches 13 fitting tightly between the upper and lower faces 13*b* of the notches, (see Fig. 17). As viewed in Fig. 17, it will be seen that the horizontal width of the inner end of the bolt guide 10 is considerably less than the distance between the vertical faces 13*c* of the notches 13 so that clearance gaps are formed at each side. The presence of these clearance gaps enables this latch casing to fit doors of different thickness because when the screw 9 is put in place it will spring the rear ends of the escutcheon plates inwardly and clamp them against the faces of the door.

If the latch casing has the construction of frame illustrated in Fig. 14, the bolt guide 10*a* will be made integral with the inner wall 8*a* of the casing. This wall 8*a* has no middle gap, but extends completely across between the side walls of the latch-casing. With this form of casing the forward wall 7*a* is constructed as a separate piece from the remainder of the casing. The inner portion of this front wall 7*a* is of reduced width so as to present side faces 81 that fit in between the side walls 82 of the casing. The shoulders 83 formed on the front wall 7*a* seat against the ends of the side walls 82 of the casing, and the forward wall 7*a* is secured in place by countersunk screws 84 that pass into the same through the outer faces of the side walls 82 of

the latch casing. The escutcheon plates 11 may be secured to the side walls 82 of the casing by long screws such as the screw or bolt 9 illustrated in Figs. 2 and 3. In Fig. 14 the drilled opening to receive such a screw is indicated by the dotted lines 85. These drilled openings would, of course, be placed at points out of line with the moving parts inside of the latch casing.

Referring again to Fig. 6, it should be said that mounting the spring-pressed pin for the key lock casing 60 in a bushing or sleeve 60a separate from the knob 31 is most advantageous, because it greatly simplifies the operations necessary to seat the key lock in its knob-chamber, and greatly reduces the cost of the construction.

When the latch is used on an inside door such as a bath-room door, it may be constructed so that the locking pin 49 can be rotated from the outer side of the door. For this purpose the end of the locking pin 49a (see Fig. 13) is exposed at the side of the casing, and provided with two small sockets 86 to receive the forks of a key 87 that functions as a small spanner wrench to enable the locking pin to be rotated to release the automatic stop of the latch. A little projection or dog 51a on pin 49 engages the automatic stop 36 (see Fig. 3) to depress it at its forward end.

The mode of operation of the entire latch will now be briefly described. In the normal position of the parts with the door closed, the bolt 15 will be in an extended position projecting through the forward end wall 7 of the latch casing, as illustrated in Fig. 3. This figure shows the night latch pin 49 in a neutral position in which the notches 52 and 53 in this pin are opposite the curved rear edge 54 of the automatic stop 36 which, at this time, has its upper finger 39 in engagement with the edge 41 at the rear end of the bolt. In this way the automatic latch 39 being held up by its spring 38, prevents the bolt from being withdrawn until the automatic stop 36 is depressed. With the parts in the position illustrated in Fig. 3, if the inner knob 30 is rotated the cam face 35 will press the lower finger 42 downwardly and thereby depress the finger 39 of the automatic latch so that it will disengage itself from the edge 41. The further rotation of the knob 30 will cause the active toe of the double-toed cam 43 to engage its corresponding shoulder 43a on the sleeve 46 (see Figs. 2 and 11). This contact with the shoulder 43a occurs however, after the cam face 35 has depressed the automatic latch 36. The cam toe then slides the sleeve 26 toward the left as viewed in Fig. 3, and as soon as the shoulder 43a on the sleeve 26 strikes the shoulder 45 on the bolt, the bolt will be withdrawn from the keeper 3. In other words, the bolt is slipped toward the left, compressing the spring 19. When the bolt has slid a sufficient distance toward the left, the spring-pressed detent pawl 46 will engage the shoulder 22 (see Fig. 5) and hold the bolt in its withdrawn position. The bolt will stay in this position until the door is closed, and when the door arrives at its closed position the releasing button 47 being engaged by the stop cleat 48 of the door jamb, will be pulled inwardly, thereby releasing the bolt and permitting the spring 19 to extend the bolt into the keeper 17.

When it is desired to set the night lock on the latch, this may be accomplished by rotating the night lock pin 49, or by pulling it longitudinally in an outward direction on its own axis. If the handle 50 of this night lock pin 49 has sufficient freedom of movement the reduced neck 51 of this pin 49 can be rotated through substantially 180° so as to bring the peripheral face 56 in contact with the rounded edge or recess 54 at the back of the automatic stop 36. This face 56 engaging the curved recess 54, will prevent the automatic stop 36 from being rotated downwardly, and hence the door in this condition cannot be opened even by rotating its knob on the inside, nor can the door be opened even by means of a key applied in the key-lock 60 in the outside knob 31.

If the night lock pin 49, however, is in the neutral position shown in Fig. 3, the bolt 15 can be withdrawn through the agency of a key 62 applied in the barrel 61 of the key lock 60. The use of a key inserted in this barrel will enable the barrel to be rotated in the key-lock casing 70. The rotation of the barrel 61 through the agency of the tongue 65 (see Fig. 6) will enable the stem 63 to be rotated. This stem, through the agency of its short tongue 34a, will depress the automatic stop 36 by functioning in the same way as the short tongue 34 that is controlled by the inside knob 30. As soon as the automatic stop 36 has been disengaged from the bolt, then the knob 31 can be rotated and it can operate through the agency of its double-toed cam 59 engaging one of the shoulders 43a of the sleeve 26, and will move the sleeve toward the left and withdraw the bolt.

After the sleeve 26 has moved toward the left to withdraw the bolt, it is returned by its return spring 26a to its normal position, thereby bringing the double-toed cam of the operating handle back to its normal position, as illustrated in Fig. 7, and return the knob to normal position.

The key-lock casing 70, through the agency of the shoulder 69a, prevents the key-lock from being pulled out of the key-lock chamber 66. The key-lock can only be removed from this chamber by dismantling the latch sufficiently to enable the stem 63 to be shifted toward the right. This would give clearance at the inner end of the chamber 66 to permit the key-lock casing to be pushed further in. This inward movement will enable the inclined cam face 71 to push the pin 67 back, thereby disengaging it from the shoulder 69. By rotating the key-lock casing thereafter through a sufficient number of degrees beyond the limit of movement of the barrel 61, the notch can be thrown out of line with the pin 67, and this will permit the key-lock to be removed.

When the lock is used on a bath-room door, the key 87 should be hung up in a convenient place outside the door. This key can be used to open the door from the outside because it enables the locking pin 49 to be rotated. In doing this, the dog 51a rocks the automatic stop 36 down, and this will permit the knob to be rotated to withdraw the bolt.

As indicated in Fig. 7, a considerable lost motion gap 43g is provided between the shoulder 43a and the upper toe to cam 43, while the lower shoulder 43a is in contact with the lower toe of the cam. With this relation it is evident that if the knob is rotated so that the cam moves in the direction of the arrow in Fig. 7, the automatic latch 36 will be released before the cam starts the withdrawal of the bolt, but rotating the knob in the other direction will not release the automatic latch before it starts to withdraw the bolt. Hence this direction of rotation for the knob cannot withdraw the bolt. It is preferable to provide a single gap 43g for each cam because the sleeve

26 will then hold the knobs yieldingly in their neutral position, and so that they will not rattle.

It is understood that the embodiment of the invention described herein is only one of the many embodiments this invention may take, and I do not wish to be limited in the practice of the invention, or in the claims, to the particular embodiment set forth.

What I claim is:

1. In a latch, the combination of a casing, a bolt guided within the casing, a spring urging the bolt to project from the casing, an automatically operating stop for engaging the bolt in its extended position to prevent withdrawal of the bolt, a handle, means actuated thereby for moving the automatic stop to permit withdrawal of the bolt, means also actuated by the handle for withdrawing the bolt; and hand-controlled means for locking the automatic stop in its engaging relation with the bolt to prevent the operation of the handle from withdrawing the bolt.

2. In a latch, the combination of a casing, a bolt guided within the casing, a spring urging the bolt to project from the casing, an automatically operating stop for engaging the bolt in its extended position to prevent withdrawal of the bolt, a handle, means actuated thereby for moving the automatic stop to permit withdrawal of the bolt, means also actuated by the handle for withdrawing the bolt; a transverse pin associated with the automatic stop, to be operated at will into different positions, said pin having a form such that in one of said positions it permits free movement of the automatic stop, and in another position locks the stop against movement away from engagement with the bolt.

3. In a latch, the combination of a casing, a bolt guided within the casing, a spring urging the bolt to project from the casing, an automatically operating stop for engaging the bolt in its extended position to prevent withdrawal of the bolt, a handle, means actuated thereby for moving the automatic stop to permit withdrawal of the bolt, means also actuated by the handle for withdrawing the bolt, means for supporting said stop to swing in a plane substantially in line with the direction of movement of the bolt, said handle located adjacent the forward end of the stop, and hand-controlled means cooperating with the rear end of said stop capable of locking the stop in engagement with the bolt.

4. In a latch, the combination of a casing, a bolt guided within the casing, a spring urging the bolt to project from the casing, an automatically operating stop for engaging the bolt in its extended position to prevent withdrawal of the bolt, a handle, means actuated thereby for moving the automatic stop to permit withdrawal of the bolt, means also actuated by the handle for withdrawing the bolt; a guide on which the bolt slides, means for supporting the stop on said guide to swing in a plane substantially in line with the direction of movement of the bolt, said handle having a shank for engaging the forward part of said stop to disengage the same from the bolt.

5. In a latch, the combination of a casing, a bolt guided within the casing, a spring urging the bolt to project from the casing, an automatically operating stop for engaging the bolt in its extended position to prevent withdrawal of the bolt, a handle, means actuated thereby for moving the automatic stop to permit withdrawal of the bolt, means also actuated by the handle for withdrawing the bolt; a guide on which the bolt slides, means for supporting the stop on said guide to swing in a plane substantially in line with the direction of movement of the bolt, said handle having a shank for engaging the forward part of said stop to disengage the same from the bolt, and a transverse hand-controlled pin capable of engaging the rear part of the stop to lock it in engagement with the bolt.

6. In a door latch, the combination of a casing having escutcheon plates on the sides thereof and having a rear cross-wall integral therewith, a bolt guide supported at its rear end on said cross-wall, a bolt guided to slide on the guide, a spring urging the bolt to project from the casing, said casing having an integral forward wall with an opening for the forward end of the bolt, the rear end of said guide having a slot therein, an automatic stop mounted in said slot to swing in a plane substantially in line with the direction in which the bolt is guided to slide, for engaging the bolt to prevent its withdrawal, a handle with means actuated thereby for releasing the stop, and means operating thereafter to withdraw the bolt.

7. In a door latch, the combination of a casing having escutcheon plates on the sides thereof and having a rear cross-wall integral therewith, a bolt guide supported at its rear end on said cross-wall, a bolt guided to slide on the guide, a spring urging the bolt to project from the casing, said casing having an integral forward wall with an opening for the forward end of the bolt, the rear end of said guide having a slot therein, an automatic stop mounted in said slot to swing in a plane substantially in line with the direction in which the bolt is guided to slide, for engaging the bolt to prevent its withdrawal, a handle with means actuated thereby for releasing the stop, means operating thereafter to withdraw the bolt, and a transverse movable pin to be operated from the side of the door having means for engaging the stop to lock the same against disengagement from the bolt.

8. In a door latch, the combination of a casing having escutcheon plates on the sides thereof and having a rear cross-wall integral therewith, a bolt guide supported at its rear end on said cross-wall, a bolt guided to slide on the guide, a spring urging the bolt to project from the casing, said casing having an integral forward wall with an opening for the forward end of the bolt, the rear end of said guide having a slot therein, an automatic stop mounted in said slot to swing in a plane substantially in line with the direction in which the bolt is guided to slide, for engaging the bolt to prevent its withdrawal, a handle with means actuated thereby for releasing the stop, means operating thereafter to withdraw the bolt, and a transverse movable pin to be operated from the side of the door having a notch in its side adjacent the said stop permitting free movement of the stop, and capable of movement to withdraw the notch and present the full diameter of the pin against the stop to lock the same against movement by the said handle.

9. In a door latch, the combination of a casing having a pair of escutcheon plates to seat against the sides of the door, said casing having a rear wall between the escutcheon plates, a bolt guide projecting forwardly from the rear wall of the casing into the interior of the same, a bolt guided on the said bolt guide, said bolt guide and bolt having a spring chamber formed therebetween, a spring received in said spring chamber for urging the bolt to project from the casing, an automatic stop for engaging the bolt to prevent withdrawal

of the same, a knob having a shank extending through one of the escutcheon plates with means actuated thereby for disengaging the stop, and means actuated thereafter for withdrawing the bolt.

10. In a door latch, the combination of a casing having a pair of escutcheon plates to seat against the sides of the door, said casing having a rear wall connecting the escutcheon plates, a bolt guide projecting forwardly from the rear wall of the casing into the interior of the same, a bolt guided on the said bolt guide, said bolt guide and bolt having a spring chamber formed therebetween, a spring received in said spring chamber for urging the bolt to project from the said casing, a knob rotatably mounted in one of the escutcheon plates, a stem within the said knob, said knob having a key-lock chamber therein, a key-lock mounted in the said chamber for rotating said stem, an automatic stop for engaging the bolt to hold it projected from the casing, said stem having means for actuating the automatic stop to disengage the same from the bolt, and means actuated by the knob after the automatic stop has been disengaged, for withdrawing the bolt.

11. In a door latch, the combination of a main casing, a knob rotatably mounted in the main casing and having a lock chamber therein, a lock mounted in the lock chamber including a key-lock casing and rotatable key-controlled means within the key-lock casing, a stem rotatably mounted in the shank of the knob and engaging the key-controlled means for imparting movements from the key-controlled means to the interior of the lock casing, said key-lock casing being insertable into the said chamber from the outer end of the knob, yielding means mounted in the knob for locking the key-lock casing against withdrawal after the same has been inserted in the key-lock chamber, said stem operating to limit the inward movement of the lock casing within its chamber, said chamber extending beyond the inner end of the key-lock so as to permit further inward movement of the key-lock casing when the said stem has been removed, said key-lock casing and said yielding locking means having correlated means cooperating to enable the said further inward movement of the key-lock casing in the key-lock chamber after the stem has been removed, to effect the release of the key-lock casing from the yielding locking means.

12. In a door latch, the combination of a main casing, a knob rotatably mounted in the casing and having a key-lock chamber therein, a key-lock mounted in the key-lock chamber, said key-lock including a cylindrical shell and a key barrel rotatably mounted in said cylindrical shell, a stem rotatably mounted in the shank of the knob and engaging the inner end of the key barrel for imparting movements to the lock mechanism on the interior of the main casing for controlling the same, a spring-pressed pin mounted in the knob, said shell having a pin socket in its outer face adapted to cooperate with the spring-pressed pin to prevent withdrawal of the key-lock shell after the same has been inserted in the key-lock chamber, said stem operating to limit the inward movement of the key barrel and its shell within the key-lock chamber, said chamber extending beyond the inner end of the key-lock in the position of the key-lock when the same is engaged by the spring-pressed pin, enabling the key-lock casing to be pushed further into the said chamber when the said stem has been removed, the said pin socket in the said shell having a cam face for pushing back the spring-pressed pin when the key-lock casing is pushed further into its chamber, and thereby operating to release the key-lock casing from the spring-pressed pin.

13. A latch constructed as described in claim 11, in which the spring-pressed pin is carried in a sleeve pressed into the chamber in the knob.

14. A latch constructed as described in claim 8, in which the transverse movable pin is provided with a dog operating to engage the automatic stop and disengage the same from the bolt, when the transverse pin is rotated.

15. In a door lock, a bolt, means for guiding the bolt, a spring urging the bolt into its extended locking position, a detent for engaging the bolt to hold it in its extended position, a rotatable knob, a key-controlled barrel mounted in the knob and having a key-slot, means actuated by the barrel to release the detent, means actuated by the rotation of the knob from its normal position to withdraw the bolt, and means for returning the knob to its normal position, and thereby returning the barrel and key-slot to their normal positions.

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