H. G. VOIGHT.

LOCK.

APPLICATION FILED FEB. 21, 1916.

1,241,787.

Patented Oct. 2, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

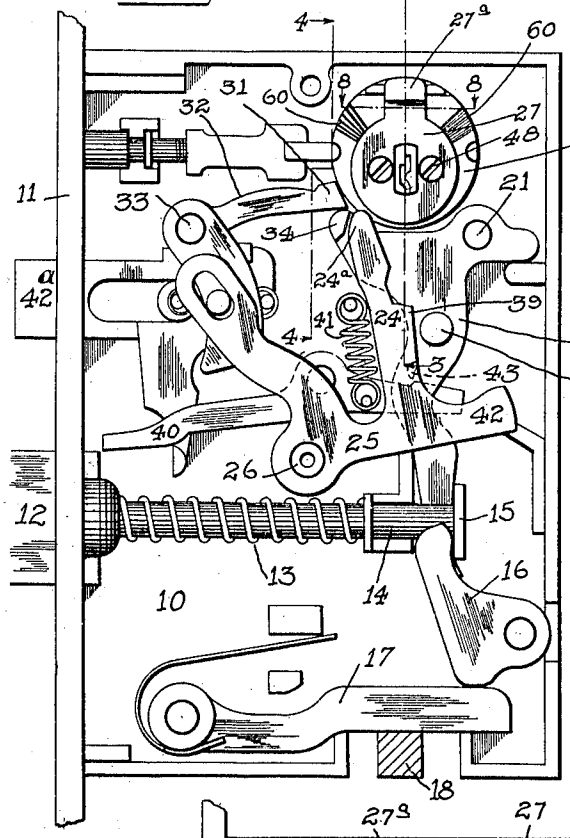


Fig. 3.

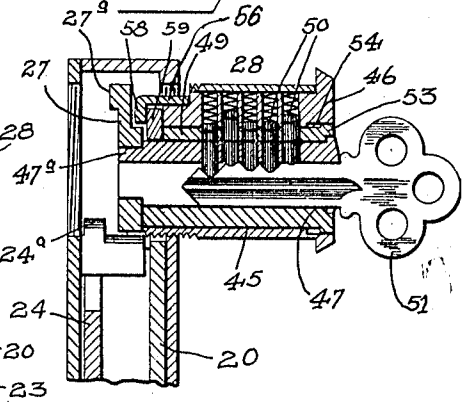
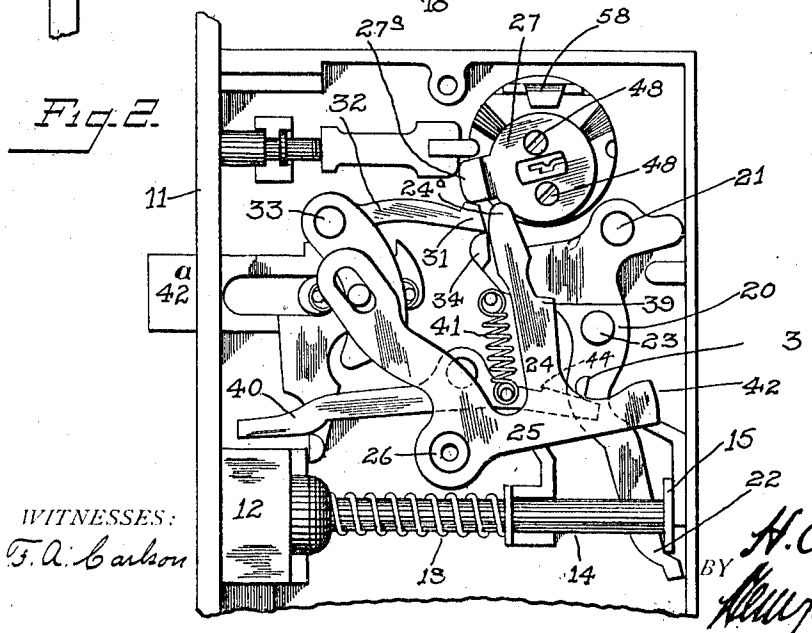


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 5.

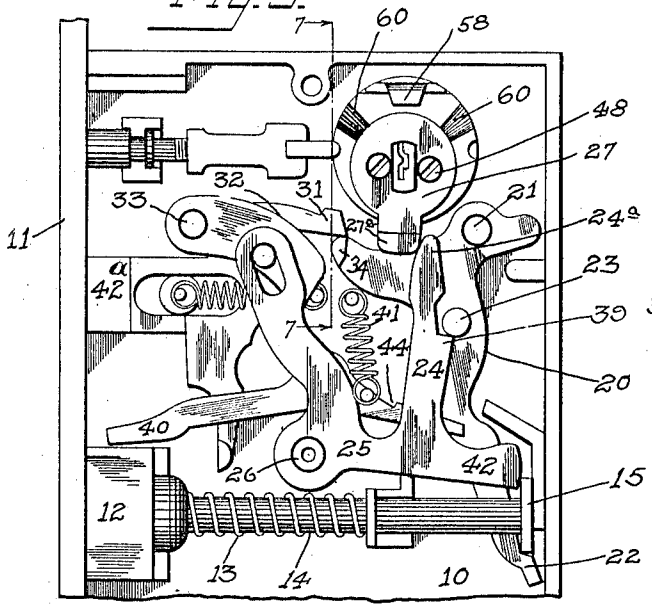


Fig. 4.

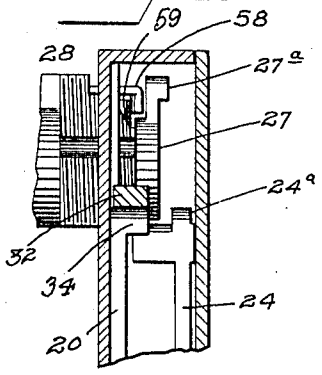


Fig. 6.

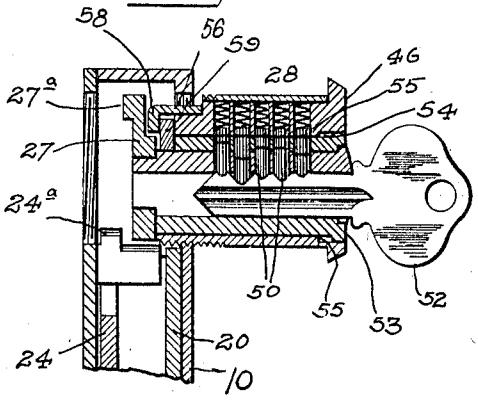


Fig. 7.

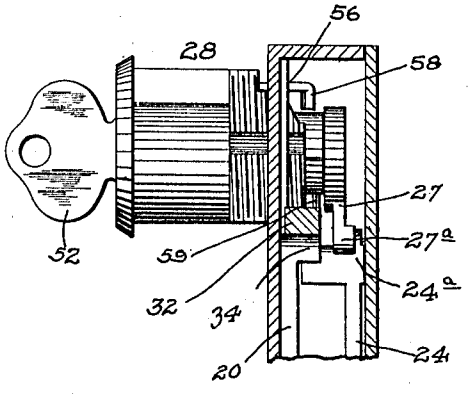
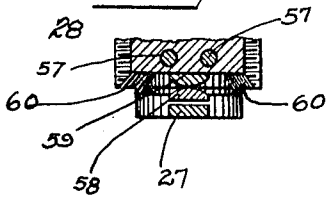


Fig. 8.



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LOCK.

1,241,787. Specification of Letters Patent. Patented Oct. 2, 1917.

Application filed February 21, 1916. Serial No. 79,717.

To all whom it may concern:

Be it known that I, HENRY G. VOIGHT, a citizen of the United States, residing at New Britain, county of Hartford, and State of Connecticut, have invented certain new and useful Improvements in Locks, of which the following is a full, clear, and exact description.

This invention relates to locks, and more particularly to latch bolt locks for schoolhouses and similar buildings, having means whereby the latch bolt may be dogged in retracted position by a key. The invention relates more especially to locks of this character having a master keyed cylinder operable by a plurality of keys, one of said keys being adapted to dog the bolt in retracted position, and another of said keys being inoperative to dog the bolt but operative to retract the bolt. In the case of a schoolhouse, for example, it is sometimes advisable to provide a teacher's key which will retract the bolt, but which is inoperative to dog the bolt back in the case, whereas the janitor's key, on the other hand, will not only retract the bolt but will dog it in the retracted position, so that the door may then be opened by merely pushing or pulling on the same.

The primary object of the present invention is to provide a lock of this general character embodying a cylinder having a single rollback operable by one key, *e. g.*, the teacher's key, only for the purpose of retracting the bolt, but operative by another key, *e. g.*, the janitor's key, for the purpose of dogging the bolt. In other words, the same rollback is adapted to be actuated by different keys, and when so actuated it has different functions, one such function being the dogging of the bolt (generally in the fully retracted position), and another function being the retracting of the bolt.

Another object of the invention is to improve the general construction and operation of locks of the class to which the invention relates.

To these and other ends, the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings,

Figure 1 is an elevation of a mortise lock embodying my improvements, with the cap plate removed;

Fig. 2 shows the upper portion of the lock with the latch bolt retracted by the change key, also referred to as the teacher's key;

Fig. 3 is a section on line 3—3 of Fig. 1, showing the teacher's key inserted into the cylinder lock;

Fig. 4 is a fragmentary section on line 4—4 of Fig. 1;

Fig. 5 is a view of the upper portion of the mortise lock, showing the latch bolt dogged in retracted position by a master key, referred to as the janitor's key;

Fig. 6 is a vertical section through the upper part of the lock, showing the janitor's key inserted into the cylinder;

Fig. 7 is a section on line 7—7 of Fig. 5; and

Fig. 8 is a detail section on line 8—8 of Fig. 1.

In the particular form shown, the case 10 of the lock, having the usual face plate 11, contains a latch bolt 12 normally projected by a spring 13. The stem 14 of the latch bolt carries a head 15 engaged by a lever 16 adapted to be operated by a lifter 17, which is in turn actuated by an inside thumb piece or push bar 18, or equivalent mechanism. The particular means for retracting the latch bolt manually from the inside of the door is immaterial. In the particular lock selected for illustration, the retraction of the bolt from the outside of the door is confined to the key, but this is likewise an immaterial feature.

The means for retracting the latch bolt 12 by means of a key comprises a latch bolt retracting lever 20, pivoted in the case at 21, and having one extremity 22 thereof engaged with the cross-head 15 of the bolt. The lever 20 is provided with a projection 23 engaged by an arm 24 of a main detent lever 25, pivoted in the case at 26. The upper extremity of the arm 24 extends into operative relation to the dog, cam arm or rollback 27 of a cylinder lock 28 inserted in a suitable opening in the case at the outside of the door. This cylinder lock is adapted to be actuated by a plurality of keys, as hereinafter described. Under certain circumstances, the rollback 27 when rotated in a counter-clockwise direction, with respect to Fig. 1, will engage the upper extremity of the arm 24, thereby moving said arm to the right, and said arm 24 by engaging the pro-

jection 23 carries with it the retracting lever 20 which is moved on its pivot so as to retract the latch bolt. The rollback 27 is also adapted, under certain circumstances, to engage the free end 31 of a retracting lever 32, pivoted in the case at 33, which free end 31 loosely rests on and is supported by a lateral projection 34 on the retracting lever 20 adjacent the upper extremity of the arm 24. Under certain circumstances, the rollback 27 will depress the lever 32, which by engaging the projection 34 on lever 20 will shift the last named lever to retract the latch bolt independently of the lever 25, as hereinafter described.

The arm 24 of the lever 25 is of special shape so that it may properly actuate the lever 20 and assist in holding the latch bolt in its retracted position. To this end, the edge portion of the arm 24, coacting with the projection 23 is formed with a shoulder 39, the edges of which are directed at an angle to each other to create a pointed projection, as shown. As the latch bolt is being retracted by the lever 25, the lower edge of said shoulder or projection bears against the projection 23 as the arm 24 moves toward the right with respect to Fig. 1. As the movement of the arm 24 continues, the shoulder 39 and projection 33 move relatively to each other in such a manner that as soon as the latch bolt has been fully retracted, the projection 23 passes the apex of the shoulder 39 and snaps into position against the upper edge of said shoulder, whereby the lever 25 and the latch bolt 12 are locked in retracted position. In order to increase the security with which the latch bolt is held in this position, the detent lever 25 is provided with a rearwardly directed extension 42, which as the projection 23, passes from one side to the other of the shoulder 39 snaps into position in front of the cross-head 15. In this manner, the latch bolt is held securely in retracted position, and it will remain in such position until the dog or rollback 27 is rotated into engagement with the upper extremity of the arm 24 to release the detent lever and latch bolt, whereupon the parts will be restored to the normal position.

In the particular form shown, the latch bolt is dogged in projected position automatically on the closing of the door by means of a dogging lever 40 acted on by a spring 41 in such a manner that the head of such lever tends to lie in the path of the latch bolt so as to block the incursion of the same. The lever 40 is held out of blocking position with respect to the latch bolt by a projecting controller bolt 42ª, which is forced in by contact with the strike so as to cause the bolt to be dogged by the lever automatically on the closing of the door. In opening the door, a projection 43 on lever 20 engages a shoulder 44 on the tail of the lever 40 in such a manner as to swing the lever out of the path of the bolt head in the usual manner. In order to move the dogging lever out of the path of the bolt when the latter is to be retracted by the manual retracting means at the inside of the door, the lever 16 acts on the lower extremity of the lever 20 in a manner well understood in the art, so that said lever is swung on its pivot when the bolt is to be retracted by the manual retracting means, as well as when it is retracted by the key operated means whereby the projection 43, on the lever 20, will throw off the dogging lever 40 and permit the latch bolt to be freely retracted. These features in themselves are old in the art, but it will be apparent that by the construction described the latch bolt may be retracted by the manual retracting means independently of the detent mechanism, and that thereafter the detent lever 25 may be moved by the rollback 27 to a position to dog the bolt in the retracted position. In other words, while the bolt is held back by the depression of the thumb piece, it may be dogged in position by a key which actuates the detent lever independently, as hereinafter described.

Referring now to the detailed construction of the cylinder lock 28, it will be observed that this cylinder lock has the usual case 45, face plate or escutcheon 46, and key plug or barrel 47. The dog or rollback 27 is secured on the rear end of the key plug 47. Preferably, it embraces an extension 47ª on the rear end of the key plug, and is secured to said plug by screws 48. Surrounding the key plug is a sleeve 49 rotatable concentrically with respect to said key plug. Sectional pin tumblers 50 of the usual type connect the key plug, sleeve and casing, the arrangement being such that one key is adapted to rotate the key plug individually, while another key rotates both the key plug and sleeve. As previously intimated, the levers 32, 20 are actuated by the rollback 27 when one key is used, for the purpose of retracting the bolt, and when another key is used the detent lever 25 is actuated for the purpose of dogging the bolt in the retracted position. When the change key or teacher's key 51 is used to actuate the cylinder lock, the rollback 27 will be so rotated that its operating projection 27ª on the end of its radial arm will turn in the plane of the primary lever 32, and out of the plane of the secondary member or lever arm 24, so that the lever 20 will be actuated to retract the latch bolt. When the janitor's key 52 is used to actuate the cylinder lock, as shown in Figs. 6 and 7, the operating projection 27ª of the rollback will be rotated in the plane of the secondary member 24 so as to actuate the detent lever and dog the bolt in retracted

position. To accomplish these results, one of the rotary tumbler controlled members of the cylinder lock is displaceable rearwardly when the tumblers have been racked in a predetermined manner by the janitor's key, whereas said member is not displaceable rearwardly when the teacher's key is used. In the particular example illustrated, the sleeve 49 is movable endwise of the casing 45 when the janitor's key is used, and to permit this the shoulder 53 at the forward end of the sleeve operates in a somewhat wider rabbet 54 in the face plate of the cylinder so that when the sleeve is released and turned by a key, as shown in Figs. 6 and 7, the sleeve may move rearwardly until the shoulder 53 takes up against a shoulder 55 on the casing of the cylinder. In other words, the shouldered portion of the casing at the face of the cylinder which limits the endwise movement of the sleeve is farther back than in ordinary cylinders, so that the sleeve may have an appreciable rearward movement.

In this operation, the sleeve is locked by the pin tumblers 50 to the key plug 47, so that the latter is likewise carried rearwardly together with the rollback 27 and therefore instead of rotating in the normal plane of rotation, the rollback is carried rearwardly and rotated in the plane of a projection 24^a, on the upper extremity of the arm 24. Before the sleeve is turned on its axis, it should be held against rearward movement by suitable means for relieving the pin tumblers of strain. To this end, I may attach to the rear of the cylinder lock a plate 56, which is secured to the upper portion of the cylinder by screws 57 (Fig. 8), and has a depending tongue or lip 58 abutting against the rear face of a cam member 59 screwed or otherwise secured to the rear extremity of the sleeve 49. When the janitor's key is inserted into the cylinder, the engagement between the lip 58 and cam 59 will take up rearward thrust on the sleeve, and thereby relieve the tumblers of strain and wear; but when the sleeve is turned by the janitor's key, the cam 59 will disengage the lip 58 and thereby permit the sleeve to be thrust rearwardly under the usual pressure on the key, so that the rollback 27 will be rearwardly displaced, as above explained. By preference, the cam 59 is screwed against the rear face of the sleeve and that part of the cam which engages the lip 58 is in the form of a radial projection, which is rounded off at its rear face, as shown in Fig. 8, while the coöperating lip 58 is rounded off at the front face. In Fig. 3, I have shown the position of the parts when the teacher's key is inserted into the cylinder. This key racks the pin tumblers in such a manner as to release the key plug for independent rotation while the sleeve remains locked to the casing. By using this key, the latch bolt may be retracted, as previously described. When the janitor's key is inserted into the cylinder, as shown in Fig. 6, the pin tumblers are racked so as to permit the key plug and sleeve to rotate together. When the key is inserted, rearward movement of the rollback 27 is at first prevented by the engagement of lip 58 with cam 59, but when the key is turned in either direction, the projection of the cam passes clear of the lip, and is then immediately moved rearwardly by the usual pressure of the hand of the person actuating the lock, so as to carry the rollback into the plane of the projection 24^a of arm 24. If, however, the pressure on the key is not sufficient to move the rollback to its rearmost position, this will be effected by the cam action of the cam 59 on the casing of the cylinder lock, which is cut away to present cam surfaces 60 adapted to be contacted by the cam 59, as the latter is rotated in one or the other direction, and to thrust the rollback in a rearward direction. The cam rotates in contact with the rear face of the cylinder casing, after said cam has been thrust rearwardly by one of the cam surfaces 60, or by the pressure of the hand on the key, and therefore it will be understood that the cam or key thrusts back the rollback when said key has been turned to a very slight extent, and that thereafter the rollback is prevented from moving out of the plane of the arm 24 of the detent lever until the key is rotated through nearly three hundred and sixty degrees, or is turned back to the initial position. As the parts approach their initial position, the cam 59 is thrust against the lip 58, which is also in the nature of a cam, and said lip forces the cam forwardly again so that when the tumblers are lined up for the removal of the key, the sleeve, key plug and rollback will occupy the normal positions relatively to the cylinder.

Supposing that the improved lock is used on the door of a schoolhouse, the teacher's key can at all times retract the latch bolt by means of the levers 32, 20, for the purpose of opening the door. The janitor's key is also operative at all times to open the door, because when said key is used, it will act on the detent lever 25 to operate the latch retracting lever 20. In this operation, the operating projection 27^a of the rollback is in line with and engages the operating projection 24^a of the detent lever. The janitor's key will also dog the bolt in fully retracted position, as shown in Fig. 5. When the bolt is fully retracted by the janitor's key, the extension 42 on lever 25 will move down in front of the cross-head 15, as previously described. It will be understood that in the form shown, the janitor's key will retract the latch bolt and cause it to be dogged in retracted position when it reaches the limit

of its initial movement, but the janitor's key will also dog the latch bolt when it has been retracted by the manual retracting means or by some other means. When the janitor's key has moved the parts to the position shown in Fig. 5, the rollback is turned back to the initial position, and the key is removed leaving the latch bolt dogged in the retracted position. When it is desired to release the latch from its dogged position, the janitor's key is re-inserted and turned in the opposite direction so as to engage the opposite face of the projection 24ª and thereby release the detent lever and permit the latch to be projected by its spring.

Various changes in the details of the construction may be made without departing from the scope of the invention as defined in the claims.

I do not claim broadly herein the combination with mortise lock mechanism having two members lying in different planes of a cylinder lock having a rollback to engage and operate either of said members, as claimed in my application Serial No. 74,460.

I do not claim herein certain features of my cylinder lock *per se* as claimed in my application Serial No. 74461.

What I claim is:—

1. In a lock, a latch bolt, retracting mechanism therefor, dogging mechanism therefor, and a cylinder lock having a rollback with a single operating projection for operating said retracting mechanism or said dogging mechanism; substantially as described.

2. In a lock, a latch bolt, retracting mechanism therefor, dogging mechanism therefor, a cylinder lock, a rollback for said cylinder lock having an operating projection, a key for said cylinder lock adapted to operate said retracting mechanism through said operating projection, and another key for said cylinder lock adapted to operate said dogging mechanism through said operating projection; substantially as described.

3. In a lock, a latch bolt, retracting mechanism therefor, mechanism for dogging said bolt in retracted position, a cylinder lock, a rollback for said cylinder lock, having a radial arm, a key for operating said retracting mechanism through said rollback arm, and another key for operating said dogging mechanism through said rollback arm; substantially as described.

4. In a lock, a latch bolt, retracting mechanism therefor, detent mechanism for dogging the bolt in retracted position, a cylinder lock a rollback for said cylinder lock having a radial arm, a key for said cylinder lock adapted to retract the latch bolt and dog it in retracted position through said rollback arm, and another key for said cylinder lock operative to retract the latch bolt through said rollback arm but inoperative to dog said bolt in retracted position; substantially as described.

5. In a lock, a latch bolt, retracting mechanism therefor, dogging mechanism therefor, a cylinder lock, a rollback for said cylinder lock having an operating projection, a key for said cylinder lock adapted to dog said latch bolt through said rollback by engaging said projection with said dogging mechanism, and another key for said cylinder lock adapted to retract the latch bolt through said rollback by engaging said projection with said retracting mechanism; substantially as described.

6. In a lock, a latch bolt, retracting mechanism therefor, detent mechanism for dogging the bolt in retracted position, a cylinder lock, a rollback carried by said cylinder lock, a key adapted to dog said latch bolt in retracted position by engaging said rollback with said detent mechanism and another key adapted to retract the latch bolt by engaging rollback with said retracting mechanism but inoperative to dog said latch bolt in retracted position; substantially as described.

7. In a lock, a latch bolt, retracting mechanism therefor, dogging mechanism therefor, a cylinder lock, a rollback for said cylinder lock, a key for said cylinder lock adapted to engage said rollback with the dogging mechanism, and another key for said cylinder lock adapted to retract the bolt through said rollback but inoperative to dog the bolt; substantially as described.

8. In a lock, a latch bolt, retracting mechanism therefor, detent mechanism for dogging the bolt in retracted position, a cylinder lock, a rollback for said cylinder lock having an operating projection, a key for said cylinder lock adapted to retract the latch bolt through said operating projection and dog it in retracted position on continued rotation of said rollback, and another key for said cylinder lock operative to retract the latch bolt through said operating projection but inoperative to dog it in retracted position; substantially as described.

9. In a lock, the combination of a latch bolt, a cylinder lock, a rollback for said cylinder lock having a radial arm, means actuated by engagement with said rollback arm to dog the bolt in retracted position, and means actuated by engagement with said rollback arm to retract the bolt; substantially as described.

10. In a lock, the combination of a latch bolt, a cylinder lock, a rollback for said cylinder lock having a radial arm, means actuated by said rollback arm to dog the bolt, means actuated by said rollback arm to retract the bolt, and two keys for said cylinder lock adapted to actuate the respective dogging and retracting means; substantially as described.

11. In a lock, the combination of a latch bolt, a cylinder lock, a rollback for said cylinder lock having a single operating projection, means actuated by said rollback projection to dog the bolt, means actuated by said rollback projection to retract the bolt, and two keys for said cylinder lock adapted to actuate the respective dogging and retracting means, one of said keys inoperative to dog the bolt; substantially as described.

12. In a lock, the combination of a latch bolt, a cylinder lock, a rollback carried by said cylinder lock having a single operating projection, means operable by said rollback projection to dog the latch bolt in retracted position, and other means operable by said rollback projection to retract the bolt without dogging it in retracted position; substantially as described.

13. In a lock, a latch bolt, a cylinder lock, a rollback for said cylinder lock having a single operating projection, a plurality of keys for operating said rollback, and mechanism operable by one of said keys through said rollback projection to retract the bolt, or to dog it in retracted position, and operable by another of said keys through said rollback projection to retract the bolt without holding it retracted; substantially as described.

14. In a lock, a latch bolt, a retracting member therefor, a detent member therefor, a cylinder lock, and a rollback on said cylinder lock having an arm adapted to engage either said retracting member or said detent member to operate the same; substantially as described.

15. In a lock, a latch bolt, a retracting mechanism including a lever therefor, a dogging lever for said bolt, a cylinder lock, and a rollback for said cylinder lock having an arm adapted to engage either of said levers to actuate the same; substantially as described.

16. In a lock, a latch bolt, a retracting lever therefor, a dogging lever adapted to operate said retracting lever, a cylinder lock having a rollback with a single operating projection, a key for operating said levers together through said rollback projection, and another key for operating one of said levers independently through said rollback projection; substantially as described.

17. The combination with a latch bolt mechanism having two members lying in different planes, of a cylinder lock having a rollback with an operating projection adapted to engage and operate either of said members; substantially as described.

18. The combination with a latch bolt mechanism having two levers, of a cylinder lock having a rollback with a single operating projection adapted to engage and operate either of said levers; substantially as described.

19. The combination with a latch bolt mechanism having a retracting lever and a dogging lever lying in different planes, of a cylinder lock having a rollback with a single operating projection adapted to engage and operate either of said levers; substantially as described.

20. The combination with a latch bolt mechanism having a retracting lever and a dogging lever, said levers pivoted eccentrically of each other, a cylinder lock, and a rollback for said cylinder lock having a single operating projection adapted to engage and operate either of said levers; substantially as described.

In witness whereof, I have hereunto set my hand on the 17th day of February, 1916.

HENRY G. VOIGHT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."