A. E. BLOXSOM.

DOOR LATCH.

APPLICATION FILED JUNE 18, 1919.

1,370,681.

Patented Mar. 8, 1921.

2 SHEETS—SHEET 1.

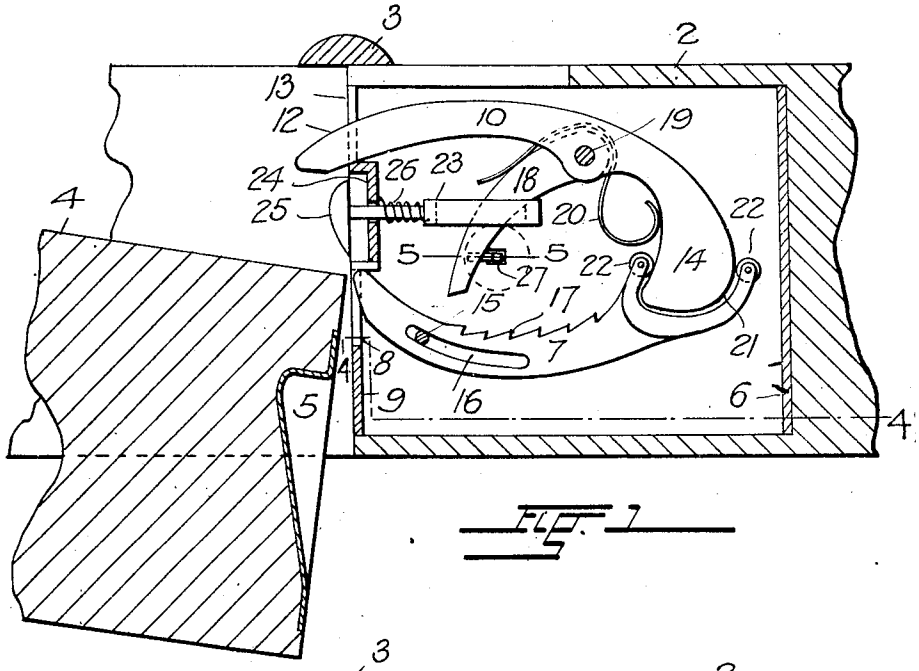


FIG. 1

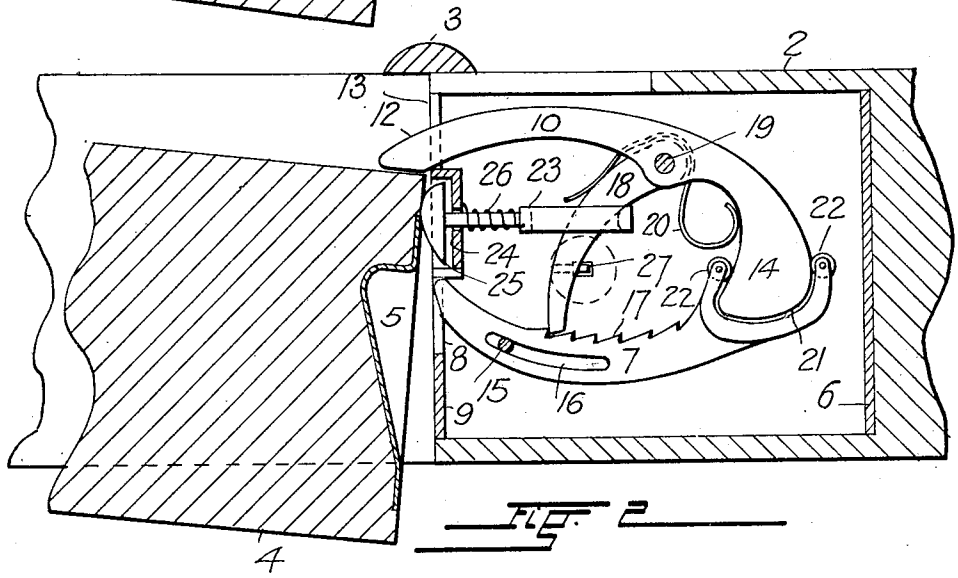


FIG. 2

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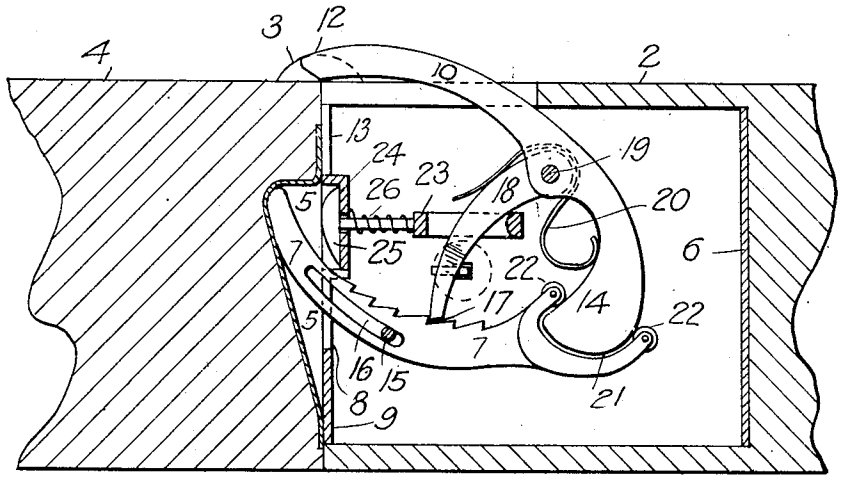


FIG. 3.

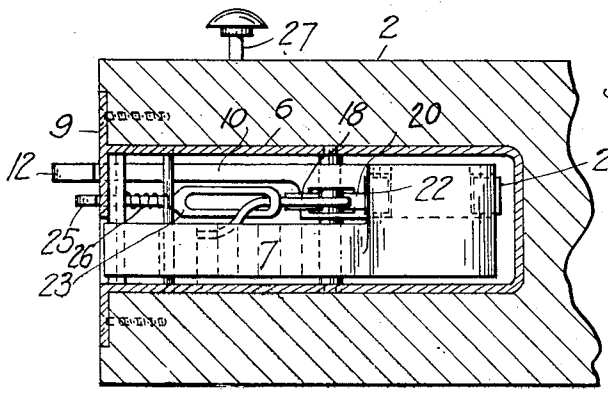


FIG. 4.

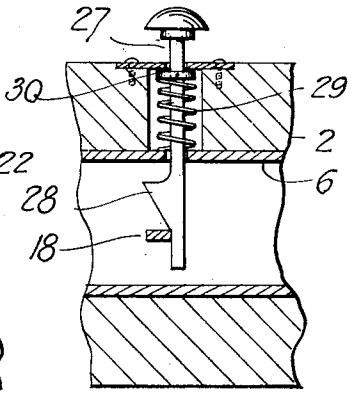


FIG. 5.

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UNITED STATES PATENT OFFICE.

ARTHUR E. BLOXSOM, OF PUEBLO, COLORADO.

DOOR-LATCH.

1,370,681. Specification of Letters Patent. Patented Mar. 8, 1921.

Application filed June 18, 1919. Serial No. 305,022.

To all whom it may concern:

Be it known that I, ARTHUR E. BLOXSOM, a citizen of the United States, residing at Pueblo, in the county of Pueblo and State of Colorado, have invented certain new and useful Improvements in Door-Latches, of which the following is a specification.

This invention relates to door latches and its principal object is to provide a locking mechanism of novel construction which operates to secure a door or the like in a closed position by the automatic projection of a latch bolt and which locks itself so that the bolt can be withdrawn only by the use of a specially constructed key or releasing member.

A further object of my invention is to provide a device of the type referred to, the operating mechanism of which is contained within a pocket of the door frame, and still another object is to provide a locking mechanism for the latch bolt which is normally inoperative and which becomes effective only by contact with the door during its closing movement.

With the above and other objects in view, all of which will fully appear in the course of the following description, my improved door latch which is particularly designed for use on automobiles, consists of the construction and combination of parts shown in their preferred form in the accompanying two sheets of drawings in the several views of which like parts are similarly designated and in which

Figures 1, 2 and 3 represent horizontal sections of a door-frame to which the invention is applied, showing the operating mechanism of the same in its normal position and in two distinctive operating positions in which it is placed by the closing movement of the door;

Fig. 4, a vertical section through the door-frame and the latch on the line 4—4, Fig. 1, and

Fig. 5, a vertical section through the frame and the latch taken on the line 5—5, Fig. 1.

Referring to the drawings, the reference numeral 2 designates the door-frame preferably provided with a stop 3, and 4 the hinged door which in its edge has a tapering metal-lined socket 5 to admit the sliding latch-bolt of the mechanism the operating parts of which are contained in their entirety in a casing 6 fitted within a pocket of the frame.

The latch mechanism consists of a bolt 7 which has a curvilinear sliding movement through an aperture 8 in the edge of the jamb plate 9 of the casing to gradually enter the socket of the door during its closing movement.

A bent bolt-actuating lever 10 has a long arm 12 which in the normal condition of the mechanism projects into the door opening through an aperture 13 in the jamb-plate of the casing, and a short arm 14 which has a movable connection with the bolt 7.

The bolt is guided in its operative movement by a pin 15 extending through a longitudinal slot 16 of its body portion and it has at the inner edge of its said portion a series of ratchet shaped notches 17 for cooperation with a locking pawl 18 which for convenience in construction is pivoted on the pin 19 which constitutes the fulcrum of the lever.

A double-action spring 20 yieldingly holds the lever in its projecting position when the mechanism is in its idle condition, and maintains the pawl in engagement with the notches of the bolt when the latter extends into the socket of the door.

The short arm 14 of the lever projects loosely into a socket 21 in the end of the latch bolt and it has curved cam faces which are engaged by anti-friction rollers 22 at the outer end of the socket of the bolt.

The curvature of the short arm of the operating lever is such that when the lever is moved about its fulcrum by contact with the closing door as will hereinafter be more fully described, its points of contact with the locking bolt will gradually recede from the fulcrum so that as the door nears its closing position the movement of the bolt is accelerated to cause it to fully occupy the socket 5 when the door is closed.

When the door is in the open position, the pawl is held free from the notches of the latch-bolt by a keeper 23 which projects slidingly through an opening in the bottom of a shallow recess 24 in the jamb-plate of the lock casing. The keeper has a rounded head 25 adapted to enter the recess and it has at its opposite end a longitudinal slot through which the pawl loosely extends.

A coiled spring 26 fastened at its ends to the keeper and to the part of the casing through which the keeper extends serves to pull the latter to the position in which its head projects into the door opening and the pawl is held free from the notch in the locking bolt, when the door is open and the locking mechanism is accordingly in an inactive condition.

The key or releasing member by which the bolt is released for its withdrawal from the socket in the door may be of any suitable construction. In the form illustrated in the drawings, it consists of a longitudinally movable headed stem 27 provided with a beveled bit 28 which engages the edge of the pawl opposite to that upon which the spring 20 presses.

The stem projects through an opening in an edge of the door frame at right angles to the jamb thereof, and a spring 29 in an enlargement of said opening, pressing against a collar 30 on the stem, holds the key in its normal inoperative position.

When the door is open and the lock mechanism is consequently in an inactive condition as shown in Fig. 1 of the drawings, the end of the long arm of the operating lever projects, under the influence of the spring 20, into the door opening, and the spring 26 holds the keeper 23 in the position in which its head projects into the door opening, the pawl 7 is in consequence separated from the notches in the latch-bolt, and the latter is withdrawn from the door-opening and extends in its entirety within the casing in which the latch mechanism is assembled.

It will be noticed that with the parts thus relatively positioned, the lever 10 may be moved about its fulcrum without locking the bolt so that if by accident or in play the projecting end of the lever is pushed into its casing, the operative condition of the lock is not affected and the parts will be automatically returned to their normal relative positions, by the spring 20 as soon as the lever is released.

When the door is moved to its closed position, it first of all engages the head of the keeper and presses it into the recess of the door jamb against the pulling action of the spring 26, with the result that the pawl 18 is released and permitted to move into engagement with the notches of the locking bolt by the pressure of the spring 20, as shown in Fig. 2.

Upon further inward movement of the door its forward side engages the projecting end of the lever 10 and moves the latter about its fulcrum, thereby causing the bolt 7 to be projected into the door opening.

The socket 5 in the edge of the door is at this time in register with the aperture of the jamb-plate through which the latch-bolt has its movement so that when the bolt is shot by the initial motion of the lever it immediately enters the socket of the door and thus prevents the latter from backward movement.

The continued closing movement of the door causes the bolt to move farther into its socket until at the time the door has reached its full closed position in engagement with the stop 3 as shown in Fig. 3, the end of the lever is entirely retracted from the door-opening and the bolt is fully projected into the socket.

The parts are secured in this position by the engagement of the spring-pressed pawl with a notch of the bolt and can be released only by operation of the key which separates the pawl from the bolt as hereinbefore described.

The last part of the movement of the bolt into the door-socket is accelerated by the decreased leverage of the lever so that all play between the end of the bolt and the shoulder of the socket is taken up when the door reaches its closed position.

It will be seen that by the use of my invention a door may be securely locked by moving it to its closed position without slamming and without the manipulation of bolt-retracting parts, and that for these reasons the lock is of particular value for use on motor driven vehicles to secure the doors in the body thereof.

Having thus described my improved latch mechanism in the best form at present known to me, I desire it understood that variations in the form and arrangement of its component parts may be resorted to within the spirit of the invention as set forth in the appended claims:

What I claim and desire to secure by Letters-Patent is:

1. The combination with a socketed swinging door and a frame having an opening into which the door closes, of a lever normally projecting into the opening and adapted to be retracted by the door in its closing movement, a notched bolt adapted to be projected into the door opening by movement of the lever, to enter the socket of the door, a pawl adapted to engage a notch in the bolt, to lock the latter in its projected position, and a key adapted to disengage the pawl from the bolt.

2. The combination with a socketed door and a frame having an opening into which the door closes, of a lever normally projecting into the opening to be engaged by the door in its closing movement, a notched bolt adapted to be projected into the door opening by movement of the lever to enter a socket of the door, a pawl adapted to move into engagement with a notch in the bolt to lock the latter in its projected position, a movable keeper controlling the movement of the pawl and projecting normally into

the opening to be moved by contact of the door, and a key adapted to disengage the pawl from the bolt.

3. The combination with a socketed door and a frame having an opening into which the door closes, of a lever normally projecting into the opening to be engaged by the door in its closing movement, a notched bolt adapted to be projected into the door opening by movement of the lever, to enter a socket of the door, a pawl adapted to move into engagement with a notch in the bolt to lock the latter in its projected position, a sliding, spring-actuated keeper controlling the movement of the pawl and projecting normally into the opening to be moved by contact of the door, and a key adapted to disengage the pawl from the bolt.

4. The combination with a socketed swinging door and a frame having an opening into which the door closes, of a spring-pressed lever normally projecting into the opening and adapted to be retracted by the door in its closing movement, a notched bolt adapted to be projected into the door opening by movement of the lever, to enter the socket of the door, a spring-pressed pawl adapted to engage a notch in the bolt to lock the latter in its projected position, and a key adapted to disengage the pawl from the bolt.

5. A door-latch comprising in combination, a casing having an apertured jamb-plate, a lever normally projecting through an aperture of the plate, a notched bolt adapted to be projected through another aperture of the same and having a movable connection with the lever, a pivoted pawl adapted to move into engagement with a notch of the bolt to lock the latter in a projected position, a keeper movable in an aperture of the plate and controlling the movement of the pawl, and a key adapted to disengage the pawl from the bolt.

6. A door-latch comprising in combination, a casing having an apertured jamb-plate, a lever normally projecting through an aperture of the plate, a notched bolt adapted to be projected through another aperture of the same and having a movable connection with the lever, a pivoted pawl adapted to move into engagement with a notch of the bolt to lock the latter in a projected position, a keeper movable in an aperture of the plate and controlling the movement of the pawl, a spring yieldingly resisting the inward movement of the keeper, and a key adapted to disengage the pawl from the bolt.

7. A door-latch comprising in combination, a casing having an apertured jamb-plate, a notched bolt adapted to be projected through an aperture of the plate, a lever having a long arm normally projecting through another aperture of the plate and adapted to operate the lever by the contact of a door swinging across the jamb-plate, and a short arm in impellant contact with the bolt, a pivoted pawl adapted to engage a notch in the bolt to lock the latter in a projected position, and a key adapted to disengage the pawl from the bolt.

8. A door-latch comprising in combination, a casing having an apertured jamb-plate, a notched bolt adapted to be projected through an aperture of the plate, a lever having a long arm normally projecting through another aperture of the plate, and a short arm having a curved cam of varying leverage in impellant contact with the bolt, a pivoted pawl adapted to engage a notch in the bolt to lock the latter in a projected position, and a key adapted to disengage the pawl from the bolt.

9. A door-latch comprising in combination with a door and a frame having an opening into which the door closes, of two members projectable into the opening and operatively associated for the projection of one by retraction of the other, a key-controlled member adapted to lock said one member in its projected position, and a member normally projecting into the opening and controlling the action of the key-controlled member.

10. A door-latch comprising in combination with a swinging door and a frame having an opening into which the door closes, a member normally projecting in the opening and adapted to be retracted by contact of a door moving into the same, a second member connected with the other member to be projected into the opening by the retraction thereof, and key-controlled means automatically locking the projected member against retraction when the door is closed.

In testimony whereof I have affixed my signature.

ARTHUR E. BLOXSON.