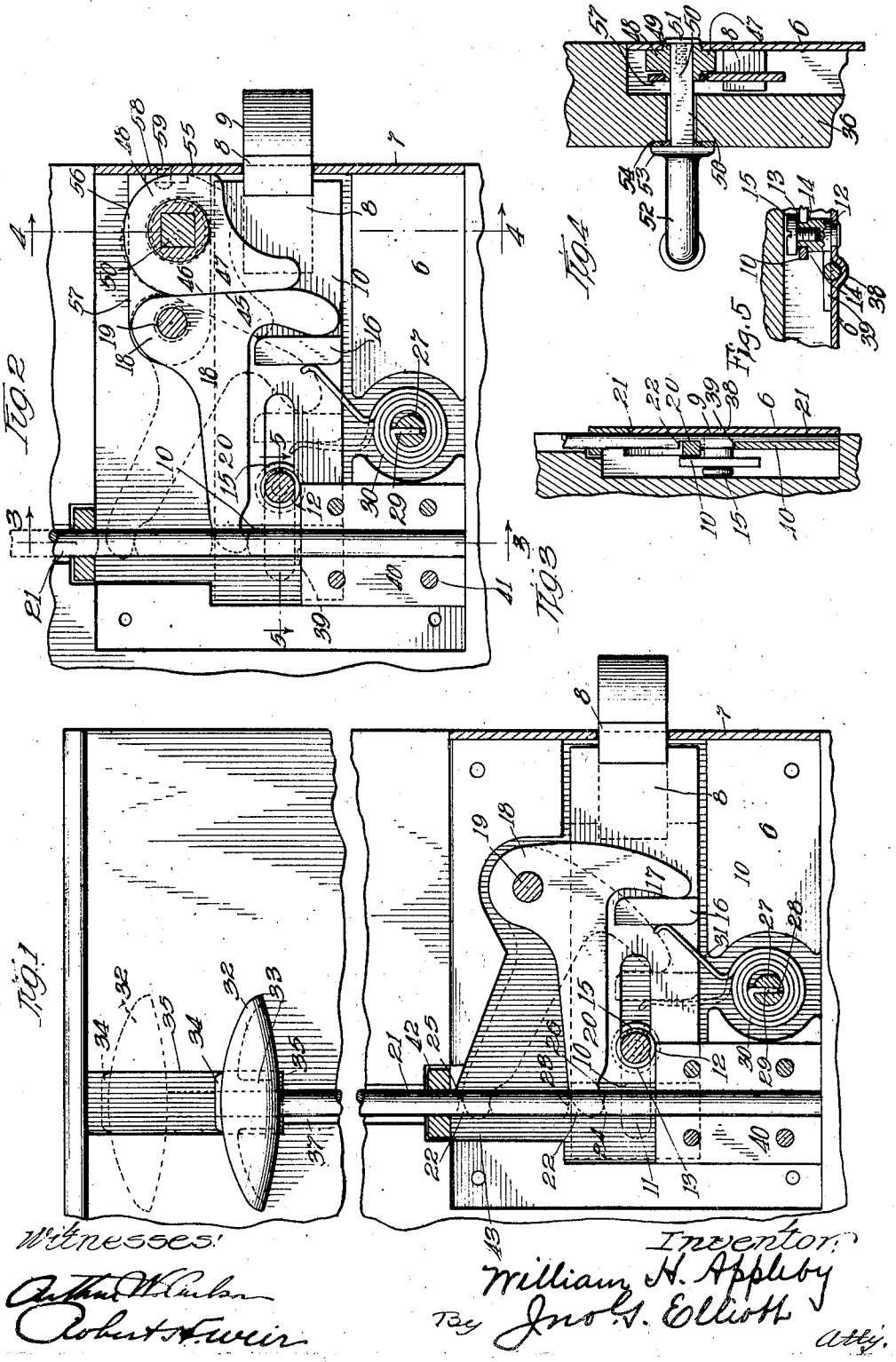
W. H. APPLEBY.

LATCH.

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1,332,876. Patented Mar. 9, 1920.



Witnesses:

Arthur H. Parker

Robert F. Weir

Inventor:

William H. Appleby

By Jno. S. Elliott

Atty.

UNITED STATES PATENT OFFICE.

WILLIAM H. APPLEBY, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE ENGLISH & MERSICK CO., OF NEW HAVEN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

LATCH.

1,332,876. Specification of Letters Patent. Patented Mar. 9, 1920.

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To all whom it may concern:

Be it known that I, WILLIAM H. APPLEBY, a subject of the King of Great Britain, and resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Latches, of which the following is a full, clear, and exact specification.

This invention relates to improvements in latches for the doors of automobiles and other vehicles in which the latch bolt has heretofore been actuated by means of a rotatable rod or shaft, connected with and projecting at a right angle to the path of movement of the latch bolt.

The prime object of my invention broadly stated is to actuate the latch bolt by means of a reciprocating rod or shaft connected therewith, and whereby the lifting of the rod produces a retracting movement of said bolt.

More specifically stated the object of my invention is a latch for the doors of automobiles and other vehicles wherein the latch bolt is normally projected to a locking position by means of a spring, and retracted on lifting a reciprocating rod or shaft connected therewith.

Another object of my invention is to provide such a connection between the latch bolt and the reciprocating rod as will effectually prevent a movement of any part of the latch mechanism producing a rattling sound from the contacting of the metallic surfaces thereof.

A further object of my invention is a latch, the bolt of which is actuated by means of a reciprocating rod, the construction and arrangement of the parts of which when applied to a door render the latch dust proof, and reduces the necessary cutting away of the door to a minimum.

Another object of my invention is to combine with a latch the bolt of which is actuated by a reciprocating rod with a rollback, operated from the side of the door, and adapted for retracting the latch bolt independently of the reciprocating rod therefor, which rollback is so constructed and arranged that it is held from rattling against the latch case, and against the means through which it actuates the bolt.

A further object of my invention is to provide a lock wherein the latch bolt is actuated by means of a reciprocating rod projecting therefrom parallel with the face of a door to approximately the top thereof, of minimum cheapness in cost and parts both when constructed with and without a rollback.

With these ends in view, my invention finds embodiment in certain features of novelty in the construction, combination and arrangement of parts by which the said objects and certain other objects are attained, all as hereinafter fully described with reference to the accompanying drawings, and more particularly pointed out in the claims.

In said drawings:

Figure 1 illustrates in elevation a latch in which my invention finds embodiment, in its operation upon the door of an automobile or carriage, with dotted lines indicating the movement of the several parts of the latch mechanism.

Fig. 2 is a similar view showing the adaptation thereto of a rollback whereby the latch bolt may be actuated independently by means of a reciprocating rod projecting upwardly toward the top of the door and independently of said rod by means of a rollback operated through the medium of a spindle, projecting transversely through the door.

Fig. 3 is a detail section taken on the line 3—3 of Fig. 2.

Fig. 4 is a detail section taken on the line 4—4 of Fig. 2, and—

Fig. 5 is a detail section taken on the line 5—5 of Fig. 2.

Similar characters of reference indicate the same parts in the several figures of the drawings.

The base 6 of the latch case, and the slotted face plate 7 are, and may be of any suitable construction and material adapted for the purposes of my invention, and for respectively supporting a reciprocating latch bolt 8, provided with the usual bevel 9 at its forward end.

Formed with or otherwise secured to the latch bolt is a plate 10, substantially rectangular in form, provided longitudinally with an elongated slot 11 and supported by a stud 12, projecting from the base plate 6 having a reduced end 13 forming a shoulder 14 providing a bearing surface for the plate and screw-threaded to receive a set screw 15 maintaining the plate against its bearing, and from lateral movement thereon, and thereby the movement of the bolt in a direct

line through the slot in the face plate of the latch case.

Projecting from the latch bolt plate 10 is a lug 16, the surface of which is opposed by the curved surface of an arm 17 of a bell crank 18, pivotally mounted on a stud 19, projecting from the base plate of the latch case, the other arm 20 of which bell crank extends at substantially a right angle to the arm 17, and projects in the path of movement of a reciprocating rod 21, by means of a slot 22 formed therein, the end walls of which are provided with convexed surfaces 23 and 24 forming bearings for a convex surface 25 and a concave surface 26, forming respectively the top and bottom edges of the end of the arm 20, whereby the resistance of a spring projecting the bolt and normally maintaining the rod 21 at the limit of its downward and inward movement is reduced when the rod is at the limit of its upward stroke when the latch bolt is fully retracted.

In other words with the bolt projecting from the face plate with the rod at the limit of its downward movement the arm 17 is extended at a right angle to the rod with a portion of but one end of its concave surface in contact with the convex end wall of the slot struck as they are on arcs of circles differing in diameter, and that when the bolt is retracted against the resistance of a spring, the rod is at the limit of its upward stroke with the arm projecting at an oblique angle to the rod and contacting with about half the surface of the convex end wall of the slot, and thereby producing a correspondingly increased friction between the arm and the rod, which together with the oblique position of the arm tends to sustain the rod in its elevated position against the resistance of the spring sufficiently to require less force on the part of the operator to hold the rod in its elevated position than is necessary to lift it to that position.

As a convenient means for projecting the bolt, a stud 27 fixed to the base plate 6 is provided with a slot 28, in which is projected the bent end 29 of a spring 30, coiled about the stud, and provided with an arm 31 bent therefrom opposed to the surface of the lug 16 of the latch plate opposite that of the arm 17, and thereby automatically operating to normally project the latch bolt from the case.

Any other ordinary form of spring, however, adapted for the purpose, may be used.

For convenience in lifting the rod to retract the latch bolt within the latch case against the resistance of the spring 30 there is mounted upon and secured to the upper end of the rod a finger grasp 32, preferably concavo, convex, and semi-cup shape in form, with the straight edge thereof arranged adjacent the door to which the lock is attached, and provided with an inwardly projecting hub 33, either screw-threaded or square in cross section, as may be, securing it to or fitting it upon the rod 21, and if square in cross section held against accidental detachment by means of a set screw 34, for clamping it to the rod, the head of which set screw projects across a groove 35 in an automobile or other vehicle door 36, to which the lock is applied and thereby serves to conceal the end opening of the slot and also that of the groove 37 therein for the rod.

As a simple, cheap and convenient means of constructing bearings for directing and limiting the inward movement of the rod 21 (see Fig. 5) the base plate 6 is bent outwardly at 38 to form a bearing substantially semi-circular in cross section, and forming a bearing for the adjacent rounded surface of the bolt, the opposite side of which is cut away to form a shoulder 39, and has its bearing against a plate 40 secured to the base plate by means of rivets 41, the upper edge of which plate 40 is adapted to be engaged by the shoulder 39 and thereby furnish a stop limiting the downward movement of the rod and at the same time prevent the turning of the latter in its bearings, the upper bearing of the reciprocating rod 21 is in a collar 42 projecting from a plate 43, riveted or otherwise secured to the outer face of the base plate, and grooved to fit over and against the end of the bearing 38.

It will now be observed that the bolt 8 bears at one side against the face of the latch case, and that at the opposite side against an inwardly projecting tongue 44 bent from the face plate, and to this extent is prevented from wearing away the walls surrounding the opening in the face plate.

In Figs. 2 and 4 is illustrated the adaptation to the lock herein before described, for the purposes of a rollback lock, that is to say a lock, wherein the bolt may be actuated through the medium of a spindle projecting laterally through a door, as well as independently of the reciprocating rod before described, and to which end there is no change in the latch mechanism previously described, except to provide the crank arm 18 with a flat surface 45, adapted to be opposed by a correspondingly flat surface 46 on a cam 47 mounted upon a hub 48 provided with a reduced portion 49 projecting through and bearing in the base plate and through which projects a spindle 50, upset as indicated at 51, against the inner end of the hub, and to the outer end of which spindle is secured a handle 52 provided with a surrounding flange 53 bearing against a washer 54, recessed in the outer face of the door 36.

The cam or rollback 47 is provided adjacent the face plate 7 with a flat surface 55 normally in contact with the opposing parallel inner surface of the slotted face plate 7, that is to say until the cam 47 is operated to

actuate the bolt and also when the bolt is being operated by the reciprocating rod 21.

The parallel flat surfaces 46 and 55 of the rollback merge into a semi-circular connecting surface 56, the effect of which is to maintain contact of the cam with the face plate from the instant that the parallel faces of the cam begin to move respectively away from the face plate and the bell crank, on turning the spindle for withdrawing the bolt from its keeper (not shown) and throughout the movement of the bell crank and the rollback, to and from their positions indicated in dotted lines in Fig. 2, and when at the same time the rod 21 is lifted by the arm 20 of the bell crank as shown by the dotted lines of the drawings.

With the cam-rollback constructed as above described, contact is constantly maintained between it and the bell crank, and with the face plate of its inclosing case thereby effectually preventing any looseness of contact of the cam either with the face plate or the bell crank lever, and such a shaking of either as would produce an objectionable rattling sound from any jars possible to impart to the latch by the vehicle to which it is applied.

It will now be observed that the inner end of the hub has its bearings in a plate 57, provided with an upturned lug 58, secured to the face plate by means of a rivet 59, and through which projects the pin 19 on which the bell crank lever 18 is pivoted, and which to this extent provides a dust proof cap plate, for the lever and the rollback, and bearing for the hub 48 of the rollback.

With a latch constructed as above described, and applied to an open door with the finger grasp of the rod normally below the top of the door, as shown in Fig. 1, the occupant of an automobile or other vehicle, having such a door, may from the inside conveniently open it by placing his thumb against the top edge of the door and placing his fingers under the curved plate 32, lift the rod until the bolt is retracted from its keeper, and when upon the outside of the closed door, he may likewise conveniently and readily open the door on turning the handle 52.

In conclusion it is observed that my invention provides for unlocking a door from the inside by a lifting force applied to a reciprocating rod, the construction of which for that purpose is such that but little cutting of the door is required for installing it, together with the latch in its operative position, and in the absence of any construction objectionably marring the appearance of the edge of the door, and with the rod and latch so located as to maintain their bearings dust proof, and which is non-rattling and adapted to likewise be provided with a rollback and be conveniently operated from both the inside and outside of the door with the application of a minimum force consistent with the use of a spring of sufficient force to normally project the latch bolt from its case.

In other words my invention provides for a strong and durable latch of the fewest possible parts, the bolt of which is normally projected from the case by the force of a spring of minimum strength, and retracted within the case by the application of a correspondingly reduced lifting force, and may be through the medium of a turning force.

It will also be observed that the several parts of the latch are so constructed that it can be very quickly assembled without the exercise of more than ordinary mechanical skill, and is therefore reduced to the cheapest possible cost of a latch adapted for its uses and purposes.

Having described my invention, what I claim and desire to secure by Letters Patent is:—

1. A latch for vehicle doors comprising in combination a movable latch bolt, a plate secured thereto provided longitudinally with an elongated slot, a fixed stud forming a bearing for said plate and projecting through said slot, adapted to direct and maintain the bolt in a fixed path of movement, a lug projecting from said plate, a reciprocating rod arranged and operating at an angle with reference to the path of movement of the bolt, a bell crank lever one arm of which has its bearing against said plate stud, and the other arm between the end walls of the rod slot, whereby the rod and the latch bolt are positively connected, the one with the other.

2. A latch comprising in combination a movable bolt, means for supporting and directing the path of movement of said bolt, a lug projecting from the bolt structure, a spring engaging said lug and normally projecting the bolt from the latch, a reciprocating rod located at an angle to the path of movement of the bolt provided with a transverse slot, the surface of the opposing end walls of which are convexed, a bell crank lever, one arm of which has a bearing against said lug, with its other arm projecting in said slot, the surfaces of which opposing the end walls of the slot are respectively convex and concave, whereby the bearing surface of the arm against the rod is increased and its angle with reference to its fulcrum, and the axis of the rod is decreased during the upward movement of the arm retracting the bolt, substantially as and for the purpose described.

3. A latch for vehicle doors comprising in combination a movable bolt, a reciprocating rod the path of movement of which is at an angle to that of the bolt, means connect-

ing said bolt and rod, and means permanently in contact with said connecting means adapted for operating the bolt independently of the rod.

4. A latch for vehicle doors comprising in combination a movable latch bolt, a reciprocating rod located at a right angle with reference to the length of the bolt for actuating said bolt, means connecting said rod and bolt, an oscillating means having permanent contact with said connecting means adapted for moving the bolt independently of the rod.

5. A latch for vehicle doors comprising in combination a latch bolt, a reciprocating rod the path of movement of which is at an angle to that of the bolt for actuating said bolt, means connecting said bolt and rod, a horizontal spindle arranged at a right angle to the path of movement of the rod, and the cam on said spindle permanently contacting with said connecting means for operating the bolt independently of the rod.

6. A latch for vehicle doors comprising in combination a face plate, a bolt movable horizontally through said face plate, a rod reciprocating in a path at an angle to and for actuating the bolt, means connecting said bolt and rod, and an oscillating cam having permanent contact with the face plate and the connecting means, said cam being provided with parallel surfaces adapted for simultaneously contacting with the surface of the face plate and said connecting means, when in its normal position of rest, and adapted to prevent a noisy, rattling contact.

In witness whereof, I have hereunto set my hand and affixed my seal, this 28th day of April, A. D. 1915.

WILLIAM H. APPLEBY. [L. S.]

Witnesses:

M. B. ELSNER,

JNO. G. ELLIOTT.