

Jan. 24, 1967

L. J. FLESKES

3,300,238

GARAGE DOOR LATCH

Filed Feb. 17, 1965

3 Sheets-Sheet 1

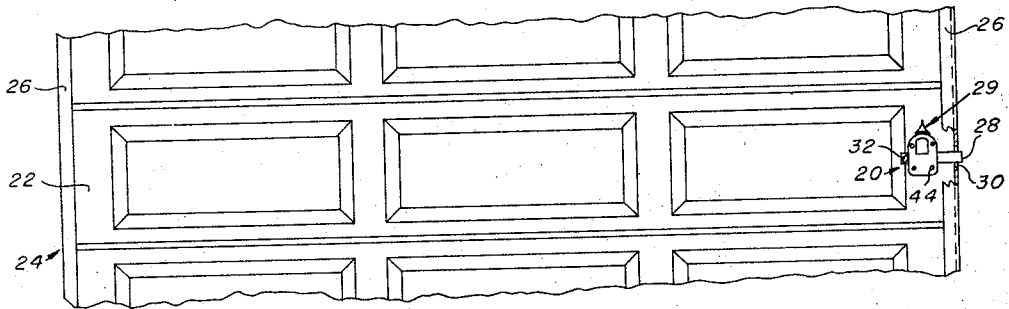


FIG. 1

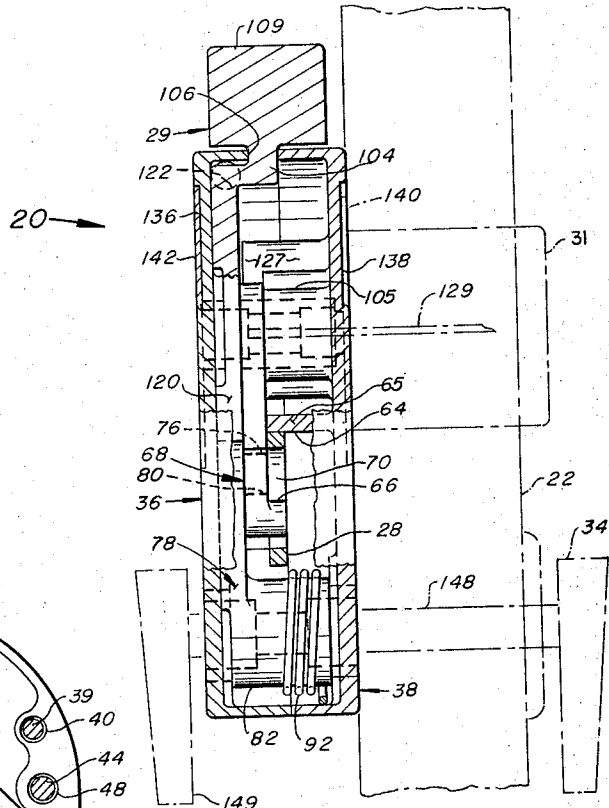


FIG. 3

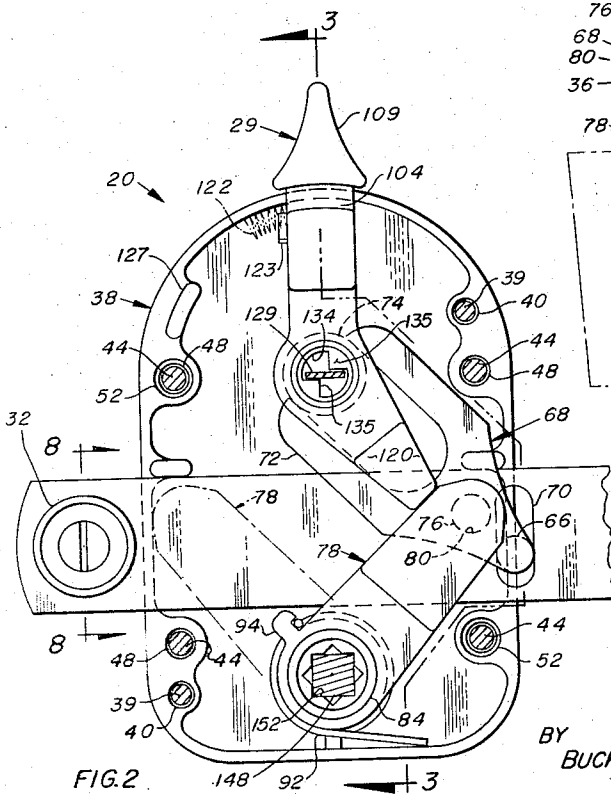
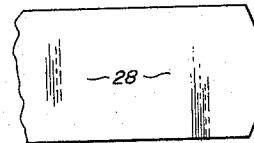


FIG. 2



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3 Sheets-Sheet 2

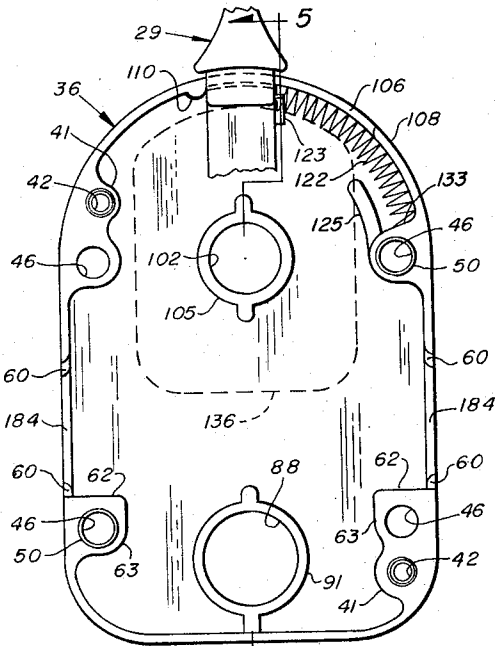


FIG. 4

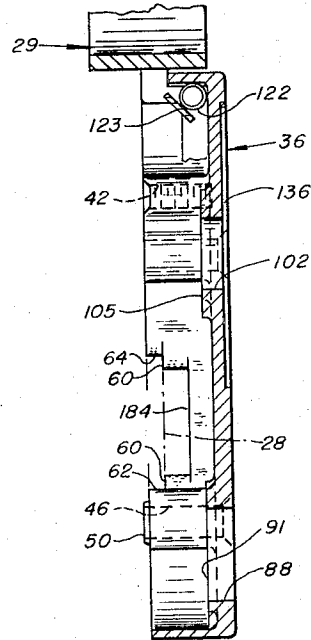


FIG. 5

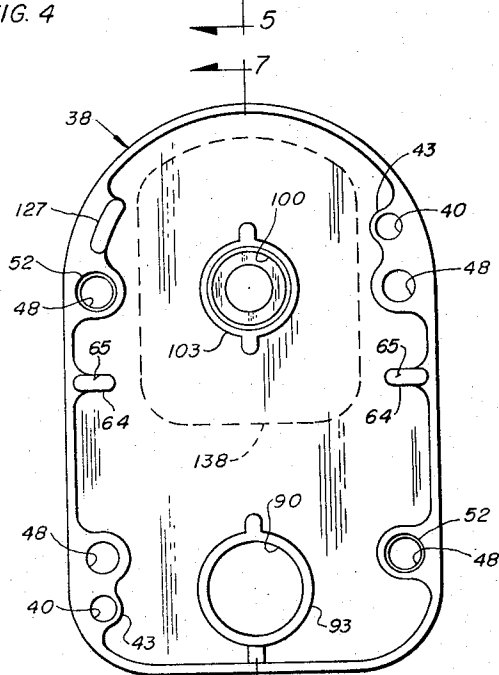


FIG. 6

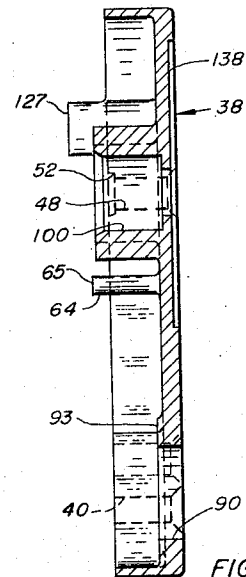


FIG. 7

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L. J. FLESKES
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3,300,238

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3 Sheets-Sheet 3

FIG. 8

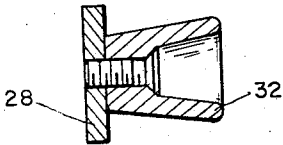


FIG. 9

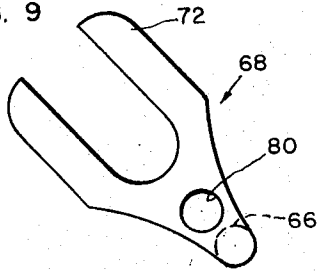


FIG. 10

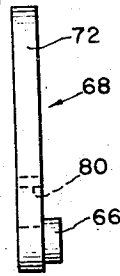


FIG. 11

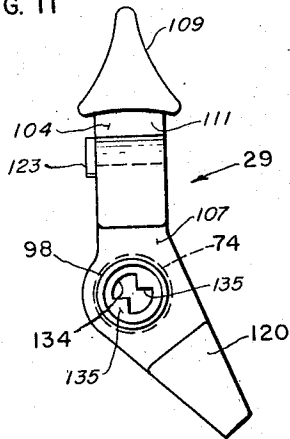


FIG. 12

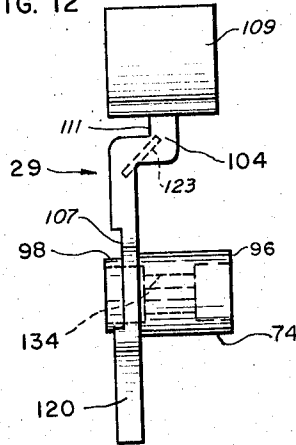


FIG. 15

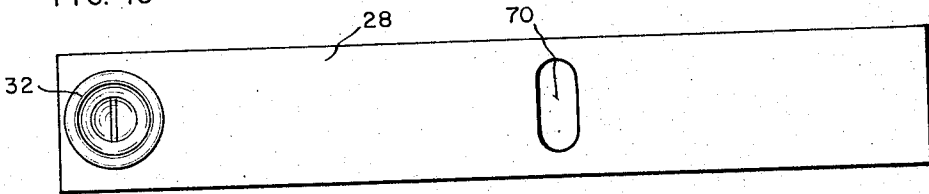


FIG. 13

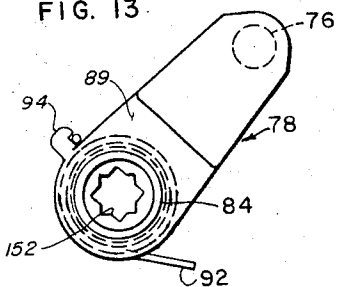
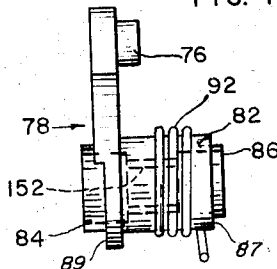


FIG. 14



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1

2

3,300,238

GARAGE DOOR LATCH

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8 Claims. (Cl. 292—173)

This invention relates to a garage door latch, and more particularly to a garage door latch reversible for both righthand and lefthand installations without disassembly of the latch or changing parts thereof.

In a garage door latch for a sectional, overhead, garage door, a latching bar thereof must have sufficient throw to both surely engage a fixed latching part and to be retracted sufficiently to clear tracks guiding the garage door. In the past, the latches have had to have large, bulky operating mechanisms in order to provide a sufficiently long throw of the latching bar. As a result, it has been difficult to mount the latches in the limited space available on the edge portions of the garage door sections. It would be desirable to provide a garage door latch which is very compact while having a long throw from the latching bar thereof and which is also very rugged. It would also be desirable to provide such a latch which is reversible for both righthand and lefthand installations without disassembly of the latch or changing parts thereof.

An object of the invention is to provide a new and improved garage door latch.

Another object of the invention is to provide a garage door latch reversible for both righthand and lefthand installations without disassembly of the latch or changing parts thereof.

A further object of the invention is to provide a compact garage door latch with a latching bar having a long throw.

The invention provides a garage door latch having a latching bar to which a long throw is imparted by a compact actuating mechanism. The actuating mechanism preferably includes a slide arm connected by a pin-and-slot connection to the latching bar and driven by a latch lever and adapted to extend beyond the latch lever at each end of the travel of the latch lever to increase the throw thereof. Preferably a lock arm is mounted on a shaft serving to guide the slide arm and is movable between a locking position holding the latch lever in latching position and a releasing position permitting a spring to move the latch lever, the slide arm and the latching bar to releasing positions. A narrow housing encloses the actuating mechanism and has guideways for the latching bar along with oppositely disposed clearance openings through which the end of the slide arm projects alternately at opposite ends of its travel, thus providing long throw while permitting the housing to be compact. The latch preferably is reversible so that it may be used for either righthand installation or lefthand installation without disassembly of the latch or changing parts thereof.

A complete understanding of the invention may be obtained from the following detailed description of a garage door latch forming a specific embodiment thereof when read in conjunction with the appended drawings, in which:

FIG. 1 is a fragmentary, elevation view of the inner side of a garage door and a garage door latch forming one embodiment of the invention mounted on the door;

FIG. 2 is an enlarged vertical section of the latch of FIG. 1;

FIG. 3 is an enlarged vertical section taken substantially along line 3—3 of FIG. 2;

FIG. 4 is an enlarged elevation of a housing section of the latch of FIG. 1;

FIG. 5 is a vertical section taken substantially along line 5—5 of FIG. 4;

FIG. 6 is an enlarged elevation of a housing section of the latch of FIG. 1;

FIG. 7 is an enlarged vertical section taken substantially along line 7—7 of FIG. 6;

FIG. 8 is an enlarged vertical section taken substantially along line 8—8 of FIG. 2;

FIGS. 9 and 10 are enlarged front and side elevations, respectively, of a slide arm of the latch of FIG. 1;

FIGS. 11 and 12 are enlarged front and side elevations, respectively, of a lock arm of the latch of FIG. 1;

FIGS. 13 and 14 are enlarged front and side elevations, respectively, of a latch lever and a spring of the latch of FIG. 1; and

FIG. 15 is an enlarged front elevation of a latching bar of the latch of FIG. 1.

Referring now in detail to the drawings, a garage door latch 20 (FIG. 1) is mounted on a section 22 of a typical sectional, overhead garage door 24 having rollers (not shown) movable along channel-like guides 26 to open and close the door. The latch includes a latching bar 28, which, when the latch is released by manually pressing a lock arm 29 to the left, as viewed in FIG. 2, or by rotation of the lock arm by a key operated lock 31, is spring urged out of a latching slot 30 in the adjacent guide 26. To move the bar 28 to a latching position, the user, if at the inside of the door, grasps knob 32 and pushes the bar to the right, and if at the outside of the door, turns a handle 34.

The latch is reversible from the righthand installation shown for lefthand installation merely by mounting the knob 32 on the other face of the bar 28 from that shown. The latch includes a split housing or casing including diecast halves or sections 36 and 38 (FIGS. 2, 4, 5, 6 and 7). The sections 36 and 38 are secured together by two screws 39 threaded into tapped bores 42 (FIG. 4) in boss portions 41 of the section 36 and extending through aligned bores 40 (FIG. 6) in boss portions 43 of the section 38. Screws 44 (FIG. 2) extend through bores 46 and 48 in the boss portions of the sections 36 and 38, respectively, into the garage door to secure the latch to the garage door in the desired position. The section 36 has raised, tapered aligning pin portions 50 surrounding bores 46 therethrough. The pin portions 50 fit into complementary, countersunk portions 52 in the section 38.

The latching bar 28 is slidable in aligned notches 60 in the section 36 and is guided by opposed guide portions 62 and 64 formed on bosses 63 and 65. A pin 66 (FIGS. 2 and 3) on forked slide arm 68 forming a part of an actuating mechanism extends into and is slidable along cross slot 70 in the bar 28. Fork 72 of the slide arm brackets is pivoted on and is slidable transversely relative to shaft 74 of the lock arm 29. A pin 76 (FIGS. 2, 13 and 14) of latch lever 78 projects into bore 80 in the slide arm 68 to drivingly interlock therewith. The latch lever 78 has a shaft 82 integral therewith and having reduced portions 84 and 86 fitting rotatably into lower aligned bores 88 (FIG. 4) and 90 (FIG. 6) in bosses 91 and 93 of the sections 36 and 38, respectively, to mount the latch lever 78 rotatably in the housing. Recessed bearing portions 87 and 89 bear against the ends of the bosses 91 and 93, respectively, and provide clearance for the bosses 91 and 93.

A torsion spring 92 engaging hook-like projection 94 of the lever 78 and the adjacent wall of the casing urges the lever 78 counterclockwise, as viewed in FIG. 2, away from the latching position thereof. The shaft 74 has

3

aligned end portions 96 and 98 (FIGS. 11 and 12) fitting respectively into counterbore 100 (FIG. 6) in boss 103 and bore 102 (FIG. 4) in boss 105 of the sections 38 and 36, respectively, to mount the shaft 74 (FIG. 2) rotatably in the housing. The arm 29 has a recessed, bearing portion 107 to provide clearance for the boss 105. The lock arm 29 has an offset portion 104 projecting through slot 106 in arcuate wall portion 108 of the section 36 and also has a knob or handle portion 109 forming, with a portion 109, a clearance slot 111. The wall portion 108 is concentric with the bore 102 and has an enlarged, rib-like, reinforcing stop 110 at the upper lefthand end of the slot 106 as viewed in FIG. 4. The arm 29 has a locking arm portion 120 (FIG. 2) and is urged by compression spring 122 toward a slightly overcenter locking position, as shown in FIG. 2, engaging lever 78 and holding the lever 78, and thereby the latching bar 28, in their latching positions. The spring 122 nests at one end thereof under retaining lug 123 (FIGS. 2 and 11) of the arm 29 and nests at its other end between the wall 108 (FIG. 4) and ribs 125 and 127 (FIGS. 2, 4, and 6). Thus, the spring is well nested at both ends and bears at its ends against boss 133 and the edge of the arm 29. The spring is flexible so that its compression urges it laterally against the arcuate wall 108 as illustrated best in FIG. 4, the wall 108 acting as a guide for the spring to limit buckling thereof. The spring 122 being positioned against the wall 108 is out of the path of movement of the slide arm 68.

A thin shaft 129 (FIG. 2) of the known, key-operated lock 31 (FIG. 3) mounted in the door section 22 extends into either selected end of a keying or splining hole 134 in the shaft 74, projections 135 being engaged when shaft 129 of the lock is turned counterclockwise, as viewed in FIG. 2, to turn the shaft 74. When the shaft 74 is turned counterclockwise by pushing the handle portion 109, the spaces between the projections 135 provide clearance or lost motion relative to the thin shaft 129 so that the arm 29 is moved without turning the shaft of the lock. The sections 36 and 38 have shallow recesses 136 (FIG. 5) and 138 (FIG. 7) in the outer faces thereof to provide clearance for plate 140 (FIG. 3) of the lock 31 and the recess 136 or 138 which is not being used in the position of the latch illustrated, is filled by a thin name plate 142 having a pressure sensitive adhesive on the inner face thereof and fitting into the recess 136 or 138. A square shaft 148 carrying outer handle 34 and inner handle 149 is mounted rotatably on the door section 22 and fits into complementary, keying or splining hole 152 in the shaft 82 from either selected end of the shaft 82.

To lock the latch 20 from the outside of the door 24, the user turns the handle 34 (FIG. 3) to turn the latch lever 78 clockwise, as viewed in FIG. 2, against the action of the spring 92, from the releasing position thereof to the latching position thereof which is shown in FIG. 2. This moves the latching bar from its releasing position to the right to the shown, latching position thereof, and the lock arm 29 is urged by the spring 122 to its overcenter locking position shown in FIG. 2 in locking engagement with the lever 78.

To release the latch 20 from the outside, the user inserts a key into the lock 31 (FIG. 3) and turns the key to turn shaft 74 (FIG. 2) counterclockwise, as viewed in FIG. 2, against the light action of the spring 122. The spring 92 then turns latch lever 78 counterclockwise to the broken-line, releasing position thereof, and the lever 78 moves, through the slide arm 68, the latching bar 28 to the left to its releasing position and holds the bar 28 in its releasing position. As the arm 78 so moves, the forked slide arm slides on the shaft 74 and the pin 66 moves in slot 70 in the bar 28 to prevent binding. By mounting the slide arm slidably on the shaft 74 and connecting the slide arm pivotally to the latch lever 78 intermediate the end of the slide arm, the slide arm projects beyond the latch lever in the latch direction when the

4

latch lever is in its latching position and projects beyond the latch lever in the releasing direction when the latch lever is in its releasing position. Thus, the slide arm multiplies the length of the throw of the latch lever.

To release the latch 20 from the inside of the door 24, the user merely swings the lock arm 29 counterclockwise as viewed in FIG. 2. The spring 92 then swings the latch lever 78 to its releasing position and the latch lever swings the slide arm 68 clockwise about the shaft 74 to pull the latching bar 28 to the left to its releasing position.

To latch the door from the inside, the user merely grasps the knob 32 and pushes the latching bar to the right, as viewed in FIG. 2, and, when the lever 78 reaches its latching position, the lock arm 29 is swung by spring 122 to its locking position. Latching can also be accomplished by turning the inner handle 149 to turn the shaft 148.

The lever 78 swings about 90° between the bosses 63 (FIG. 4) which act as stops, and, at the extreme positions of the lever 78, the end of the slide arm 68 projects through clearance notches 184 (FIGS. 4 and 5) slightly out of the section 36 as the slide arm imparts a long throw to the latching bar 28 of a length nearly as great as the width of the section 36. This construction permits the throw to be of the length necessary for good latching and ample clearance when desired, and also permits the housing to be quite narrow, which is desirable for mounting the latch on the limited available space of the portion of the door on which the latch can be securely mounted. By the provision of the slide arm, the throw of the actuating mechanism is made long while the actuating mechanism is quite compact and the housing is permitted to be correspondingly small.

It is to be understood that the above-described arrangements are simply illustrative of the application of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. In a garage door latch, a latching bar, a housing of a predetermined width having aligned guide openings mounting the bar slidably, and a manually operable member in the housing and drivingly engaging the bar for moving the bar along the guide openings, the housing being provided with clearance openings adjacent the guide openings to permit the member to extend therethrough partly out of the housing to permit a throw of the latching bar that is long compared with said width, the manually operable member being pivotally connected at the end portion thereof, said end portion of the manually operable member being adapted to extend through the clearance openings in the housing when in extreme positions of movement thereof relative to the housing.
2. In a garage door latch, a latching bar having first coupling means, means guiding the latching bar between a latching position and a releasing position, means urging the bar toward its releasing position, a latch lever mounted pivotally on a first fixed axis and having second coupling means spaced from the fixed axis thereof, a throw-multiplying slide arm having third coupling means drivingly engaged with the second coupling means of the latch lever, the slide arm also having fourth coupling means drivingly engaged with the first coupling means of the latching bar and spaced along the slide arm from the third coupling means and the slide arm also being provided with a slotted portion, and a lock arm having a shaft mounted pivotally on a

5

second fixed axis parallel to the first fixed axis and extending through the slotted portion of the slide arm,

the lock arm also having an arm urged into engagement with the latch lever to hold the latch lever in its latching position and movable manually away from the latch lever.

3. In a garage door latch, a latching bar having a transverse slot therein, means guiding the latching bar between a latching position and a releasing position, means urging the latching bar toward its releasing position,

a latch lever mounted pivotally on a first fixed axis and having a pin offset from the fixed axis thereof,

a slide arm having a hole receiving the pin of the latch lever, a pin extending into the slot in the latching bar and a forked portion,

and a lock arm having a shaft mounted pivotally on a second fixed axis parallel to the first fixed axis and extending through the forked portion of the slide arm,

the lock arm also having an arm urged into engagement with the latch lever to hold the latch lever in its latching position and being movable manually away from the latch lever.

4. In a garage door latch, a pair of housing sections having an arcuate upper edge portion, a slot in the arcuate upper edge portion, an upper pair of aligned bores, a lower pair of aligned bores and a pair of aligned guideways in the side edge portions thereof,

a latching bar extending through the guideways and slidable therealong and having a slot extending transversely thereof,

a lock arm having a handle portion extending through the slot in the upper edge portion, a locking arm portion and a shaft portion having reduced ends journaled in the upper pair of aligned bores and also having keying sockets in the ends thereof,

a slide arm having a forked end portion slidable on the shaft portion of the lock arm, a pin at the other end portion extending into the slot in the latching bar and a bore therein extending parallel to the pin,

a latch lever having an arm provided with a pin extending into the bore in the slide arm and also being provided with a shaft portion having reduced end portions fitting rotatably into the lower pair of aligned bores in the housing and having keying sockets in the ends thereof,

spring means urging the latch lever toward a releasing position in which the latching bar is in a releasing position and permitting movement of the latch lever to a latching position in which the latching bar is in a latching position,

and means urging the lock arm toward a locking position in which the locking arm portion engages and holds the latch lever in the latching position thereof.

5. The garage door latch of claim 4 wherein the housing is provided with openings permitting the slide arm to extend therethrough.

6. In a garage door latch, a housing,

a latching bar mounted movably by the housing, a latch member mounted pivotally in the housing for movement of one end of the member between a first position adjacent one edge of the housing and a second

6

position adjacent the opposite edge of the housing,

an arm pivotally secured at a first point therealong to said one end of the member and secured pivotally at a second point therealong spaced from the first point to the latching bar,

and guide means carried by the housing for engaging a portion of the arm at the side of said first point opposite to the side at which said second point is located relative to said first point and operable to swing the arm to a position extending in one direction away from the member as the member is moved to the first position thereof and to swing the arm to a position extending away from the member in the direction opposite to said one direction as the member is moved to the second position thereof, whereby the throw of the member is increased.

7. In a garage door latch adapted to be installed on the inner face of a garage door having a lock shaft extending inwardly from the inner face and a shaft of a handle extending inwardly from the inner face and parallel to the lock shaft,

a housing adapted to be secured to the inner face of the garage door and having a pair of openings spaced to receive the lock shaft and the shaft of the handle, the housing also having a pair of aligned guide openings in opposite sides thereof,

a latching bar mounted slidably in first portions of the guide openings,

latch lever means mounted pivotally in the housing and having a socket receiving the shaft of the handle in splined relationship and including coupling lever means drivingly interconnecting the latch lever and the latching bar,

guide means carried by the housing and engaging the coupling lever means for swinging the coupling lever means between extreme positions extending in generally opposite directions relative to the housing,

and a lock arm mounted pivotally in the housing and having a socket receiving the lock shaft and operable when in one position to lock the latch lever in a latching position and when in a second position to release the latch lever for movement to an unlatching position,

the coupling means including portions adapted to extend through second portions of the guide openings and extend beyond the opposite sides of the housing having the guide openings therein.

8. The garage door latch of claim 7 including knob means mounted on a portion of the latching bar at one side of the housing for pushing the latching bar to its latching position,

and spring means urging the latching bar toward its unlatching position.

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BOBBY R. GAY, Primary Examiner.