United States Patent [19]

Wright

[11] **3,780,879**

[45] **Dec. 25, 1973**

[54] **MANUAL LATCH RETRIEVER APPARATUS FOR CAR UNCOUPLER**

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[73] Assignee: **Westinghouse Air Brake Company,** Wilmerding, Pa.

[22] Filed: **Jan. 25, 1972**

[21] Appl. No.: **220,577**

[52] **U.S. Cl.** ..... **213/159,** 213/75 R, 213/211

[51] **Int. Cl.** **B61g 3/26**

[58] **Field of Search** ..... 213/75, 100 R, 100 W, 213/159, 160, 161, 166, 211, 213

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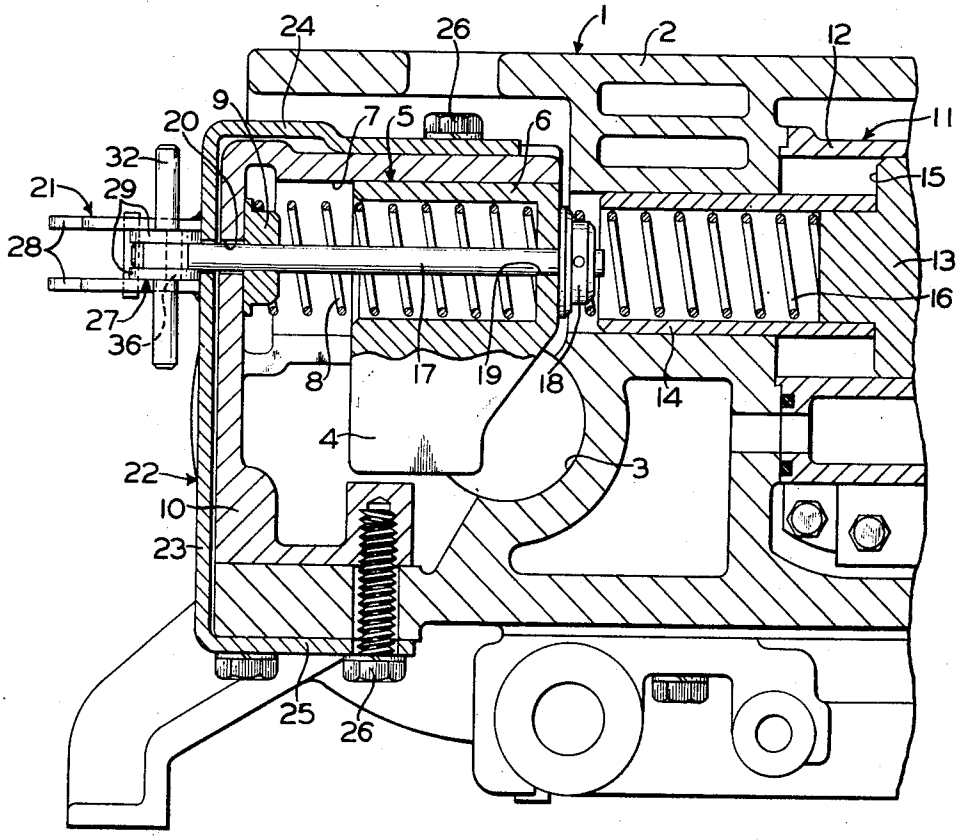
Attorney—Ralph W. McIntire, Jr. et al.

[57] **ABSTRACT**

A manual latch retriever for use with automatic railway car couplers of the type wherein a latch member, upon coupling operation, is biased into engagement with a coupling pin for locking the coupler mating heads in a coupled relation, and wherein power operated means are employed for disengaging the latch member for permitting uncoupling of the cars, said latch retriever comprising manually operable lever means connected to said latch member and extending externally of the casing so as to be accessible for manual manipulation in withdrawing and disengaging the latch member from the coupling pin in the event of failure of the power operated means.

10 Claims, 3 Drawing Figures



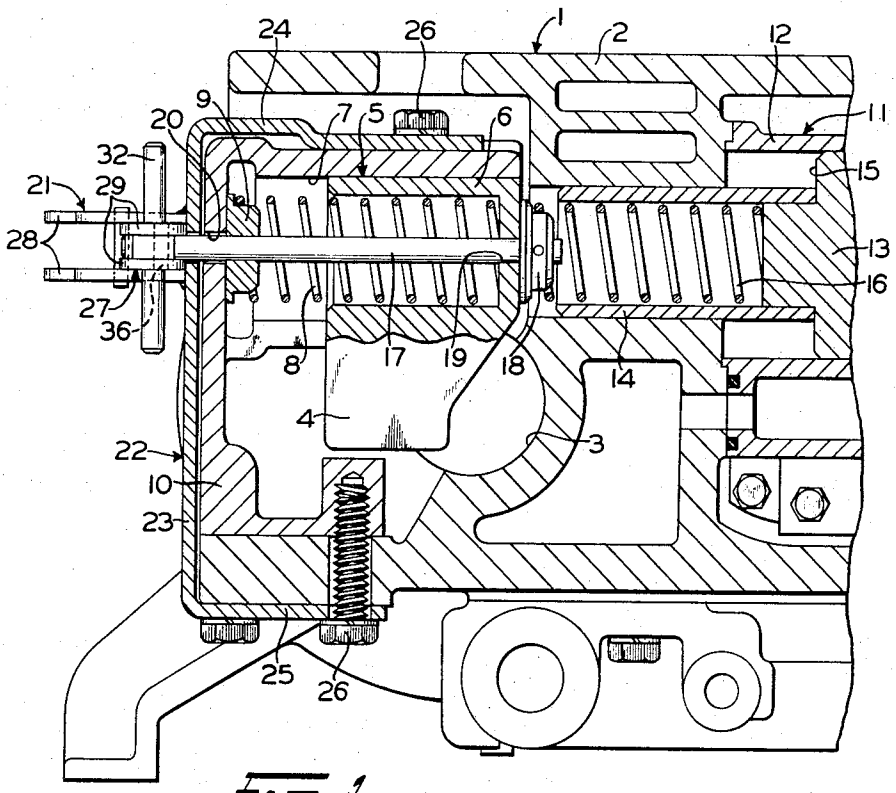


Fig. 1

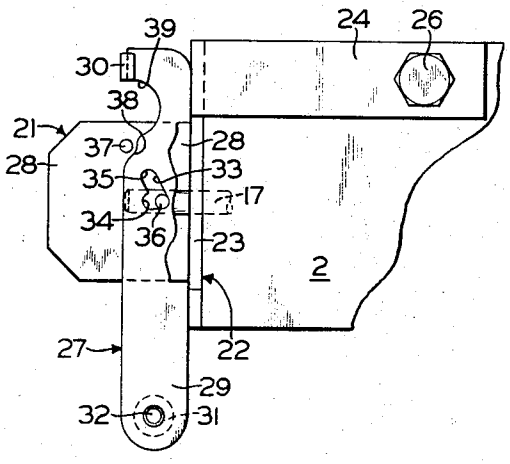


Fig. 2

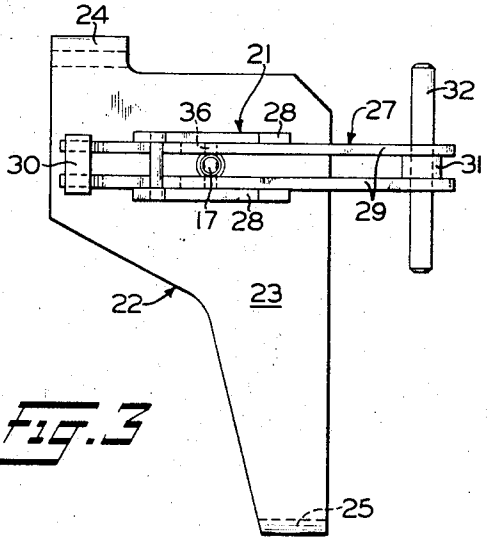


Fig. 3

MANUAL LATCH RETRIEVER APPARATUS FOR CAR UNCOUPLER

BACKGROUND OF THE INVENTION

In the type of automatic car coupler above referred to, each of the mating heads includes a coupling pin having a notch formed therein and into which respective latch members are biased during coupling action for securing the mating heads in a coupled relation. Each of the mating heads also carries a power operated device, such as a fluid pressure operable piston device, which, when actuated in anticipation of uncoupling of the cars, delivers a hammer blow to the latch member for causing said latch member to be dislodged from the notch in the pin. The piston device is effective for holding the latch member in a disengaged position for a certain period of time against the biasing effect acting thereon so that the cars may be moved apart.

It is conceivable that, on occasion, the power operated devices may fail to operate or that the hammer blow delivered thereby is not heavy enough for effecting dislodgement of the latch member from the pin notch.

SUMMARY OF THE INVENTION

The object of the present invention, therefore, is to provide manually operable means connected to the latch members and readily accessible from the exterior of the coupler casing for extracting the latch member from the coupling pin notch in the event of failure of the power operated means.

Briefly, the invention comprises a rod member having one end fixed to the latch member of an automatic car coupler inside the coupler casing and extending axially therefrom so the exterior other end of said rod member is situated outside of the casing and is pivotally connected between the ends of a manually operable lever, one end of said lever resting against the side of the casing to act as a fulcrum while the other end is provided with a handle. In the event of failure of the power means to effect dislodgement of the latch member from the coupler pin notch, the operator simply pulls the handle end of the lever to cause rotation thereof about the fulcrumed end and, therefore effect axial movement of the rod member toward the exterior of the coupler casing with consequent retraction of the latch member connected thereto out of the coupler pin notch. Since the fulcrumed end of the lever is not fixed to the side of the casing but is permitted to slide thereagainst as the lever is rotated, such rotative movement of the lever is thereby translated to linear or axial movement of the rod member. A lost motion connection between the exterior end of the rod member and the manually operable lever allows for limited axial displacement of the rod member during power operated dislodgement of the latch member without causing any displacement of the manually operable lever from its normal inoperative position in which said lever rests against the side of the casing.

In the single sheet drawing, FIG. 1 is an elevational view, in section, of a mating head of an automatic car coupler as seen from a view looking toward the rear thereof with the invention mounted thereon; FIG. 2 is a fragmentary horizontal view of the invention, in outline, as seen from a view looking toward the top of FIG. 1; and FIG. 3 is a side elevational view, in outline, of the invention and the mounting bracket therefor as seen from a view looking toward the left side of FIG. 1.

DESCRIPTION AND OPERATION

Referring to FIG. 1, the reference numeral 1 generally designates a fragmentary portion of a mating head which, with a counterpart mating head (not shown) comprises an automatic railway car coupler, said mating head comprising a casing 2 by which the mating head is suspended by suitable means (not shown) at the end of a draft gear of a railway vehicle, neither of which is shown. Each of the mating heads also comprises a coupling pin (not shown) projecting horizontally therefrom parallel to the longitudinal axis of the car and offset to one side of the vertical center line of the mating head. As the mating heads move into coupled relation, the respective coupling pins are engaged by the opposite respective mating heads. Thus, the coupling pin (not shown) carried by the counterpart mating head (not shown) is engaged by the mating head 1 shown in FIG. 1 by entering an aligned bore 3 opening from the facing side of said mating head 1. The leading end or nose of the coupling pin is tapered so that, upon entering the opening or bore 3, the tapered surface of the coupling pin nose makes contact with a spur 4 formed on a latch member 5 of the mating head 1 and forces axial displacement of said latch member leftwardly, as viewed in FIG. 1.

The latch member 5 includes a cylindrical cup-like portion 6 which, during axial movement of said latch member, is slidably reciprocable within a coaxial bore 7 formed in casing 2. When the mating heads have made abutting contact upon completion of coupling operation, the coupling pin (not shown) of the counterpart mating head (not shown) will have entered completely into the opening 3 to a locking position in which a notch formed in said coupling pin is oppositely aligned with the spur 4. With the coupling pin in its locking position, a spring 8 compressed between the bottom of the cup-like portion 6 and a coaxially disposed spring seat 9 fixed on the inner side of an outer side wall 10 of casing 2, urges latch member 5 rightwardly, as viewed in the drawing, to cause spur 4 to be firmly engaged in the notch of the coupling pin. A similar action occurs when the coupling pin (not shown) carried by the mating head 1 enters the counterpart mating head (not shown), so that the two mating heads comprising the coupler are now locked in a coupled relation.

In anticipation of uncoupling operation, the coupling pins (not shown) and, therefore, the mating heads are unlatched by respective power operated piston devices. A power operated piston device 11 is mounted in the casing 2 in axial alignment with the latch member 5 and comprises a cylinder portion 12 in which a fluid pressure responsive piston 13 is reciprocably operable. A hollow cylindrical striking member 14 is secured to and extends coaxially from a non-pressure side 15 of piston 13 so as to be disposed in axial alignment between said piston and the outer side of the bottom of cup-like portion 6 of the latch member 5. Thus, when piston 13 is subjected to a sudden burst of fluid pressure on a pressure side (not shown) opposite the non-pressure side 15, said piston is moved leftwardly out of a normal position, as viewed in the drawing, with such rapidity and force as to cause the striking member 14 to come into contact with the bottom of cup-like portion 6 of the

latch member 5 and thereby deliver thereto a hammer-like blow for effecting movement thereof in a leftward direction to an unlatching position in which spur 4 is dislodged from the notch (not shown) in the coupling pin (not shown). The piston device 11 is provided with a choked release valve (not shown) for maintaining the effect of fluid pressure acting on the pressure side of piston 13 and therefore maintaining the latch member 5 in its unlatching position relative to the coupling pin for a certain period of time considered sufficient for completing the uncoupling movement of the cars. When the fluid pressure acting in the pressure side of piston 13 has been dissipated through the choked release valve (not shown), a spring 16 compressed between the bottom of cup-like portion 6 and the non-pressure side 15 of piston 13, serves to restore said piston to its normal position in which striking member 14 is out of contact with said cup-like portion, and spring 8 acts to restore latch member 5 to a normal position coinciding with its latching position when engaged with the locking pin.

In the event that the piston device 11 fails to operate or if the hammer blow delivered thereby to the latch member 5 fails to cause dislodgement of spur 4 from the notch of the coupling pin (not shown), manually operable means, in accordance with the invention, are provided to effect said dislodgement of said spur from the coupling pin.

According to the invention, a rod 17 has an inner end secured concentrically to a retaining member or collar 18 resting against the outer side of the bottom of cup-like portion 6 of the latch member 5 said retaining member having a flange portion against which the adjacent end of spring 16 rests for exerting a biasing effect therethrough on said latch member, as above noted. Rod 17 extends coaxially from retaining member 18 through a concentric opening 19 in the bottom of cup-like portion 6, coaxially through said cup-like portion, through spring seat 9, and through an opening 20 formed in side wall 10 of casing 2 in concentric relation with spring seat 9, so that the other or outer end of said rod is located outside of said casing.

The retaining member 18, to which the adjacent end of rod 17 is secured, is not secured to the outer side of the bottom of cup-like portion 6 of latch member 5, but merely rests thereagainst. The latch member 5, therefore, when moving in a left-hand direction, as viewed in FIG. 1, is free to move relative to the rod 17 if said rod is restrained from such movement therewith. This characteristic is used to advantage in eliminating bouncing action of rod 17, as will be more fully explained hereinafter.

Rod 17 is operably connected to a manually operable lever assembly 21, which may be mounted directly on the side wall 10 of casing 2, but for purposes of convenience may also be mounted in the manner shown in the drawing, that is, on a mounting bracket 22 secured to casing 2. The mounting bracket 22 comprises a side plate 23 which, with the bracket mounted on casing 2, is disposed adjacent and parallel to side wall 10. An upper arm 24 and a lower arm 25, as viewed in FIG. 1 of the drawing, extend perpendicularly from the side plate 23 adjacent the top and bottom, respectively, of casing 2 for securing the bracket 22 to said casing by bolts 26. By mounting the lever assembly 21 on the bracket 22, as above described, the entire lever assembly may be removed from the mating head 1 simply by removing said bracket with the lever assembly attached thereto, substantially as shown in FIG. 3.

The lever assembly 21 comprises a lever 27 guidably disposed between a pair of parallel guide plates 28 secured to and extending perpendicularly from side plate 23 of bracket 22. Lever 27 comprises a pair of parallel bars 29 uniformly spaced apart by a limit bar 30 extending transversely across and secured to said parallel bars at one end of the lever and by a spacer bushing 31 disposed between said parallel bars at the other end of the lever with a handle member 32 passing transversely through said parallel bars and said spacer bushing at said other end.

The lever assembly 21 also comprises a cam and pin arrangement by which lever 27 is normally maintained in a normal immobile position in which rod 17 is restrained against axial movement until said lever, in a manner hereinafter explained, is rotated out of said normal position. As best seen in FIG. 2, each of the bars 29 has formed between the ends thereof and at corresponding locations thereon, an angled slot 33 comprising a shorter leg 34 extending from the vertex parallel to the axis of rod 17 and a longer leg 35 angling from the vertex in a direction away from the bracket 22. Slots 33 are positionally formed on bars 29 such that, when rod 17 is in a normal position corresponding to the normal position of latch member 5, above described, the respective ends of a connecting pin 36 fixed transversely in the outer end of said rod are lodged in the vertices of the angled slots 33, respectively. Pin 36, therefore, due to the biasing action of spring 8 acting thereon through latch member 5 and rod 17, urges lever 27 toward its normal position, above noted and in which it is resting against side plate 23 of bracket 22, as best seen in FIG. 2.

A stop pin 37 having the ends thereof anchored in the respective guide plates 28 and extending transversely therebetween, is so positioned as to be engaged by a notch 38 formed in each of the bars 29 adjacent the upper end of lever 27, as viewed in FIG. 2. When the power piston device 11 operates in the manner above described to cause leftward movement of latch member 5, and therefore of rod 17 and pin 36, said pin comes to rest against the extreme leftward end of leg 34 to thereby force lever 27 into a wedged position with notch 38 of lever 27 against stop pin 37. Thus, with notch 38 resting against stop pin 37 and with pin 36 lodged in leg 34 of slot 33, lever 27 is restrained by stop pin 37 against any substantial displacement thereof out of its normal position, above defined, and said lever is prevented from being cammed downwardly (which would defeat the stop action of pin 37 with notch 38) by lodgement of pin 36 in leg 34. Bouncing action of rod 17 and lever 27 is thus prevented during power unlatching of the latching member 5 by the power cylinder device 11.

In the event of failure of the power cylinder device 11, the latch member 5 may be manually retrieved by pulling on handle 32 of lever 27 in a downwardly direction and away from casing 2, as viewed in FIG. 2, sufficiently to cause notch 38 to move out of alignment with pin 37. This downward and outward movement of lever 27 is made possible by the longer leg 35 of slot 33 in which pin 36 is accommodated. Once cleared of stop pin 37, lever 27 is free to be rotated clockwise, as viewed in FIG. 2, to a latch release position, said stop pin actually serving, during such rotation, as a pivot

and support for the lever, the adjacent end of which is fulcrumed against side plate 23 of bracket 22 so that rod 17 may move in a line coinciding with its own axis and, therefore, without any binding action in opening 20. The bars 29 of lever 27 have formed thereon, adjoining notch 38, respective arcuate or circular recesses 39, as shown in FIG. 2. Thus, when notch 38 is moved out of alignment with stop pin 37 and rotation of lever member is continued, said arcuate recesses ride on said stop pin which assumes the full torque load of the lever.

As lever 27 is rotated to its latch release position to force rod 17 to be moved axially in a left-handed direction, as viewed in FIG. 1, latch member 5 is carried with said rod and, therefore, to its unlatching position, above described. It should be apparent that, as lever 27 is rotated, the fulcrumed or upper end thereof, as viewed in FIG. 2, slides along against side plate 23 toward rod 17 until stop bar 30 comes to rest against said rod, thereby limiting rotation of said lever to a 90° arc and preventing rotation thereof past the dead center point. In the fully rotated position of lever 27 and, therefore, a fully retrieved or unlatched position of latch member 5 said lever is disposed in a perpendicular position relative to casing 2 with the bars 29 straddling rod 17 and will remain in said fully rotated position, in which spring 8 is further compressed, until released therefrom, thus maintaining said latch member in said unlatched position relative to the coupling pin (not shown) so that the cars may be separated. After the cars have been separated, lever 27 may be restored to its normal position by striking the lever sufficiently to knock it off dead center, whereupon compressed spring 8 acts to restore rod 17 and latch member 5 to a normal position thereof but not engaged in the coupler pin.

As was above noted, during manual unlatching operation of latch member 5 by rotating lever 27, pin 36 on rod 17 had moved to the extreme closed end of longer leg 35 of slot 33, which leg, as also above noted, is formed at an angle directed away from casing 2. Thus, as lever 27 is pulled by spring 8 back toward its normal position (against side plate 23), pin 36 imposes a camming action on said lever to insure positioning thereof so that pin 36 is horizontally aligned with the shorter leg 34 of slot 33 and notch 38 is aligned with stop pin 37 to thereby prevent displacement of said lever during power unlatching operation.

Having now described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. A manually operable latch retriever assembly for use with a latch mechanism disposed within a casing for a car coupler mating head including a latch member biased in one direction for engaging and retaining a second member in a locked position, and power operated means for effecting movement of the latch member in an opposite direction relative to said one direction for effecting disengagement thereof from the second member, said manually operable latch retriever assembly comprising the combination of:

a. an axially movable rod member;

b. connecting means for coupling one end of said rod member to the latch member for effecting movement of both members in unison in a direction corresponding to said opposite direction, when a correspondingly axially directed force is applied to said rod member, and operative for permitting movement of the latch member only in said opposite direction, when a correspondingly axially directed force is applied to the latch member;

c. biasing means for urging the latch member and said rod member in said one direction; and

d. manually operable means disposed externally of the casing and operatively connected to the other end of said rod member, said manually operable means including cam means acting cooperatively with said biasing means for maintaining the manually operable means in a normal position in which the rod member is restrained against axial movement, and said manually operable means being operable toward a latch release position for applying motivating force to said rod member in a direction corresponding to said opposite direction.

2. A manually operable latch retriever assembly, as set forth in claim 1, wherein said connecting means comprises a collar fixed to said one end of said rod member for making abutting contact with the latch member and effecting said movement of both members in unison when motivating force acting in said opposite direction is applied to the rod member, the latch member being unattached relative to said collar and, therefore, free to move independently of the rod member when motivating force acting in said opposite direction is applied to the latch member.

3. A manually operable latch retriever assembly, as set forth in claim 1, wherein said manually operable means comprises a lever member pivotally connected intermediate the ends thereof to said other end of the rod member with one end fulcrumed against the casing, said lever member being biased by said biasing means acting through the rod member to a normal position corresponding to the normal position of said manually operable means, and being rotatable about the fulcrumed end thereby in one direction and out of said normal position for applying motivating force to said other end of the rod member for effecting said axial movement thereof in unison with the latch member toward the latch release position corresponding to said latch release position of the manually operable means.

4. A manually operable latch retriever assembly, as set forth in claim 3, wherein said fulcrumed end of said lever member is free to slide along the casing surface during rotation of the lever member.

5. A manually operable latch retriever assembly, as set forth in claim 3, whereby said manually operable means further comprises:

a. a bracket removably securable to the mating head casing for mounting said manually operable means thereon;

b. a pair of parallel guide plates fixed perpendicularly on said bracket and between which said lever member is rotatably guided when rotated out of said normal position; and

c. a stop pin with opposite ends secured in said guide plates, respectively, in transverse relation thereto,

d. said lever member having notch means formed on the side thereof opposite the mating head casing, said notch means being normally aligned and engaged by said stop pin when said lever member is in its said normal position for restraining the rod member and the lever member against movement upon application of motivating force to the latch member by the power operated means acting in said opposite direction.

6. A manually operable latch retriever assembly, as set forth in claim 5, further characterized by a connecting pin transversely disposed in said other end of said rod member for providing the pivotal connection between said rod member and said lever member, and wherein said cam means comprises longitudinal slot means formed in said lever member acting cooperatively with the opposite ends of said connecting pin accommodated therein for effecting limited axial displacement of said lever member and consequent disengagement of said notch means with said stop pin at the onset of manual rotation of the lever member.

7. A manually operable retriever assembly, as set forth in claim 6, wherein said lever member is provided with arcuate recess means formed adjacent said notch means for accommodating said stop pin subsequent to disengagement thereof by said notch means and during rotation of said lever member in said one direction for bearing the torque load thereof.

8. A manually operable latch retriever assembly, as set forth in claim 7, further characterized by limiting means carried by said lever member adjacent the fulcrumed end thereof for limiting said rotation of said lever member in said one direction to a position coinciding with the dead center position thereof in which said rod member and the latch member are in their respective latch release positions.

9. A manually operable latch retriever assembly, as set forth in claim 8, wherein said lever member comprises a pair of longitudinal parallel bars uniformly spaced apart at said fulcrumed end by said limiting means comprising a stop bar extending transversely across said longitudinal bars and at the opposite end by a spacer bushing secured between the adjacent ends of the longitudinal bars, each of said longitudinal bars having a correspondingly located notch forming said notch means, each having a correspondingly located arcuate recess forming said recess means, and each having a correspondingly located slot comprising said slot means, and an operator's handle fixed concentrically in said spacer bushing in transverse relation to said parallel bars.

10. A manually operable latch retriever assembly, as set forth in claim 9, wherein said stop bar makes contact with said rod member in the dead center position of the lever member and the latch release position of the rod member for preventing rotation of the lever member beyond said dead center position.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,780,879 Dated December 25, 1973

Inventor(s) Raymond C. Wright

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 6, line 37, "thereby" should be --thereof--

line 41, "the" should be --a--

line 48, "whereby" should be --wherein--

Column 7, line 13, after "operable" insert --latch--

Signed and sealed this 23rd day of July 1974.

(SEAL)
Attest:

McCOY M. GIBSON, JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents