ABSTRACT

The manual fly section of a multi-section telescopic crane boom is extended and retracted through the cooperative use of an extensible and retractable plunger on one of the boom extension cylinders and a manual locking pin insertable through registering openings of the fly section and outer mid-section of the telescopic boom. The latching plunger cooperates with a notched latch bar attached to the interior of the manual fly section and the plunger is actuated manually from the exterior of the boom by a rotary screw mechanism.
BOOM LATCH MECHANISM

BACKGROUND OF THE INVENTION

Prior U.S. Pat. No. 3,386,594 issued June 4, 1968 to John L. Grove discloses and claims a method and apparatus for extending a telescopic crane boom, and more particularly a method of extending the manual fly section of such a boom.

The invention herein is in accordance with the method of said prior patent but the apparatus or mechanism has been greatly improved and rendered more practical and reliable and much more suitable for manufacturing.

In accordance with the present invention, the manual fly section of a telescoping crane boom is extended and retracted by following a simple sequence of procedures which involves extensions and retractions of boom mid-sections by the customary power means, coordinated with manual extensions and retractions of a spring-urged latch plunger and a cooperating manual main locking pin. The simplified operating procedure and mechanism allows extension and retraction of the manual fly section with facility and safety. The latch plunger is manually operated from the exterior of the boom through registering clearance openings in the boom sections and the locking pin is manually positioned and disengaged relative to registering openings from the exterior of the boom. The invention also utilizes strategically placed wear pads, restraining devices and adjusting means to render the operational sequence smooth and reliable. Cam-like notched latch bars on the interior of the fly section automatically receive the manually extended spring-urged plunger on the cantilevered end of the extension cylinder for the boom inner mid-section. Binding of the plunger in the notched latch bar during retraction of the plunger is not detrimental to the proper operation of the plunger screw feed means and on subsequent minute movement of the boom outer mid-section during normal usage, the binding is relieved and the spring means of the plunger completes the retraction process automatically.

Other features and advantages of the invention will become apparent during the course of the following detailed description.

BRIEF DESCRIPTION OF DRAWING FIGURES

FIG. 1 is a fragmentary vertical section taken through a telescopic crane boom equipped with the mechanism of the invention and showing particularly the cooperative action of a latch plunger and notched latch bar.

FIG. 2 is a transverse vertical section taken on line 2—2 of FIG. 1.

FIG. 3 is a similar section taken on line 3—3 of FIG. 1.

FIG. 4 is a fragmentary vertical section taken on line 4—4 of FIG. 1.

FIG. 5 is a vertical section taken on line 5—5 of FIG. 1.

FIG. 6 is an enlarged central vertical section through a latching plunger, plunger housing and operating means.

FIG. 7 is a fragmentary plan view of the plunger taken on line 7—7 of FIG. 6.

FIG. 8 is a fragmentary horizontal section taken on line 8—8 of FIG. 6.

FIGS. 9, 10, 11, 12, 13, 14 and 15 are partially schematic operational sequence views showing particularly the sequence of operations during the extension of the manual fly section of the boom.

FIG. 16 is a fragmentary vertical section similar to FIG. 1, showing a modification of the invention.

FIG. 17 is a transverse vertical section similar to FIG. 2 and taken at right angles to FIG. 16.

FIG. 18 is a vertical section similar to FIG. 3 taken on line 18—18 of FIG. 16.

FIG. 19 is an enlarged fragmentary vertical section similar to FIG. 6, showing latch plunger drive gearing employed in the modified form of the invention.

DETAILED DESCRIPTION

Referring to the drawings in detail, wherein like numerals designate like parts, the numerals 20, 21 and 22 designate, respectively, the inner mid-section, outer mid-section and manual fly section of a preferably four section telescoping boom of the type illustrated in the aforementioned prior patent and also shown in FIGS. 9 through 15. The complete boom includes a base section 23. While the boom is illustrated as being trapezoidal in cross section, it should be understood that the invention is equally applicable to booms of other cross sectional shapes.

The illustrated telescopic boom has a first extension cylinder or ram 24 connected at 25 to the rear of inner mid-section 20 and being cantilevered forwardly from this point. The rod of cylinder 24 is attached at 26 to base section 23. A second cylinder or ram 27 beneath and parallel to the cylinder 24 has its rod end similarly attached as at 28 to the rear of outer mid-section 21 and has its rod attached at 29 to inner mid-section 20 of the telescopic boom. The fragmentary parts of the two cylinders 24 and 27 appearing in FIG. 1 are their forward cantilevered ends, the rearward portions of the two cylinders being broken away in FIG. 1.

A foot assembly 30 for the lower cylinder 27 consists of a tubing section 31 having a rear end plate 32 bolted as at 33 to a mating plate or flange 34 on the leading end of lower cylinder 27. A pair of spaced coupling sleeves 35, FIG. 3, secured to the lower portion of cylinder 27 by webs 36, receive coupling bolts 37 which extend through openings in the plate 32 and through spacer sleeves 38 on the forward side of plate 32. This arrangement is for stability and distribution of stresses which may be quite high through the foot assembly 30.

At its forward end, the tubing section 31 carries a rigid welded triangular brace frame 39, provided on its lower corners with widely spaced retainers 40 for wear pads 41 which are in sliding contact with the bottom wall of manual fly section 22 near the side walls of the latter. In FIG. 1, it may be noted that the foot assembly 30 is sufficiently long forwardly of cylinder 27 to enable wear pads 41 to remain in contact with manual fly section 22 in all adjusted positions of the latter.

Stabilizing and aligning means for the cantilevered end of the upper cylinder 24 relative to the lower cylinder 27 is also provided. This means includes abutting plates 42 and 43 on the forward end of cylinder 24 and on a rigid welded support structure ahead of the cylinder 24 which includes longitudinal bars 44 and 45, the latter being welded to the plate 43. At their forward ends, the bars 44 and 45 carry another flange or plate 46 rigid therewith and parallel to the plate 43. Intervening block elements 47 are also included in the welded unit for strength, and beneath the blocks 47 a some-
what inclined plate or web 48 is welded to the blocks 47 and to the previously-described bars 44 and 45. Finally, the welded structure ahead of cylinder 24 and above cylinder 27 includes a brace web 49 considerably forwardly of plate 43 and a depending apertured bracket portion 50 immediately forwardly of the plate 43 and spaced from and parallel to the web 49, see FIG. 1.

The two abutting plates 42 and 43 are firmly coupled together near their tops by tension bolts 51 which extend through the blocks 47 and also through a pair of stabilizing sleeves 52 on the top portion of cylinder 44. The lower corners of plates 42 and 43 are coupled by additional bolts 53. The welded structure including plates 43 and 46 and bars 44 and 45 and associated elements is therefore cantilevered ahead of the upper cylinder 24 and is disposed above the foot assembly 30.

To further support the leading end of cantilevered cylinder 24, a support and wear pad 54 is arranged in sliding contact with the top of cylinder 27 and is securely bolted as at 55 to the bottom of cylinder 24 through a welded bracket means 56. For lateral support and alignability, a pair of side wear pads 57 are placed on opposite sides of lower cylinder 27 in sliding contact therewith. These side wear pads are retained on a pair of support arms 58 whose upper extensions 59 carry interfitting apertured knuckles 60, midway between the arms 58. These apertured knuckles receive a pivot element or bolt 61 which is supported on and extends between the web 49 and bracket 50, FIG. 1. Above the pivot element 61, arm extensions 59 straddle bar 45 and are equipped with opposed adjusting set screws 62 by means of which the wear pads 57 may be individually adjusted in relation to the lower cylinder 27.

A latch assembly 63 forming a key element of the invention is bodily mounted on the leading end of the welded structure which includes the plate 46. This assembly includes a latch housing 64 which receives upper and lower pairs of mounting bolts 65 and 66. The upper bolts 65 engage through plate 46 and blocks 47 and the lower bolts 66 engage through the plate 46, FIG. 1. Adjusting shims 67 for the latch assembly 63 are provided as required to locate it accurately in relation to the mounting plate 46.

The housing 64 has a bore 68 receiving an extensible and retractable latch plunger 69 therein. The plunger is sealed in the bore 68 by a suitable fluid seal 70, the internal chamber of the housing 64 being oil-filled. The interior end of the latch plunger 69 carries a stepped flange 71 adapted to engage an annular shoulder 72 formed in the housing. A compression spring 73 surrounds latch plunger 69 in an enlarged bore chamber 74 of the housing and one end of this spring engages stepped flange 71 while its other end engages a shoulder 75 within the housing. Spring 73 urges the latch plunger 69 inwardly or retracted relative to the housing 64. The plunger 69 is restrained from rotation on its longitudinal axis by a pair of parallel plates 76 mounted on the top of housing 64, and cooperating with a pair of flats 77, FIG. 7, formed on opposite sides of the plunger. The latch plunger 69 is extended and retracted manually by an internal nut 78 driven axially by a screw shaft 79 whose outward movement is limited by a head 80 on the screw shaft. The latch plunger 69 is shown fully extended from the housing 64 in FIG. 6. A second compression spring 81 inside of the plunger 69 is seated on the nut 78 and urges the latch plunger outwardly toward its extended position. The two springs 73 and 81 work in opposition in relation to the plunger 69. The nut 78 is prevented from turning with the screw shaft 79 by an abutment plate 82 in the bore of plunger 69 and arranged close to a flat face 83 formed on the nut 78.

A cover plate 84 for the lower side of housing 64 is bolted thereto at 85 with a suitable gasket 86 interposed between the cover plate and housing. The screw shaft 79 has a shank 87 swiveled and sealed within an opening of the cover plate 84, and the screw shaft is turned by a drive shaft 88 coupled through a first universal joint 89 with the screw shaft 79. A bracket arm 90 welded to the cover plate 84 extends downwardly and to one side of tube section 31 and terminates near the bottom of brace frame 39, FIG. 2. This arm supports a sleeve 91 for a rotary shaft 92 coupled through a second universal joint 93 with the shaft 88. The shaft 92 has a hex head 94 to permit turning by a manual crank wrench 95, FIGS. 9 and 14, whose use will be fully explained. Wrench access openings 96 are formed in the bottom walls of boom sections 20, 21 and 22, as shown.

In cooperative relation with the latch plunger 69, a latch bar or plate 97 is fixedly secured to the top wall of manual fly section 22, FIGS. 1 and 2. This latch bar has sloping cam faces 98 on opposite sides of a centrally located receiver notch 99 for latch plunger 69.

OPERATION

The operation of the described mechanism can best be understood in connection with partly schematic FIGS. 9 through 15. The complete operational sequence is carried out with the telescopic boom in a horizontal position.

To extend the manual fly section 22 from the fully retracted position of FIG. 9, the inner mid-section 20 is slightly extended by the cylinder 24 to the position shown in FIG. 10, so that the latch wrench 95 will clear the base section 23 when entering the openings 96. The latch wrench 95 is now coupled to the turning head 94 and the screw shaft 79 is turned counter-clockwise to shift latch plunger 69 to the extended position. This manual operation is carried out from the bottom of the boom assembly as shown in FIG. 10.

In FIG. 11, outer mid-section 21 is extended by use of the lower extension cylinder 27. As the outer mid-section nears full extension, the spring-loaded latch plunger 69 engages and rides over one of the sloping cam faces 98 and snaps into the notch 99 of the latch bar 97. As the plunger 69 is pushed into the housing 64, the inner spring 81 is compressed. As the outer mid-section 21 continues to extend, the plunger 69 passes over the notch 99 and is forced into the notch by spring 81. At this point, the lower cylinder 27 has bottomed out. The use of the shims 67 assures accuracy in the relationship of the plunger 69 to the latch bar notch 99. The arrangement is such that the notch receives the plunger 69 at the same time that the extension cylinder 27 bottoms out and the fly section 22 is fully retracted in the outer mid-section 21.

In connection with the operation thus far described in FIGS. 9, 10 and 11, the manual fly section 22 is positively locked to outer mid-section 21 by a manual locking pin unit 100. If the fly section 22 happens to be extended a fraction of an inch in FIG. 11, which is possible due to the clearance provided for the locking pin
5 by the opening 101 in the fly section, the latch plunger 69 will engage the latch bar notch 99 as the latch tends to pass by the notch. The fly section 22 will be moved back into the outer mid-section 21 until it engages its stops simultaneously with the bottoming out of lower cylinder 27. This small reverse movement of fly section 22 will relieve any binding on the locking pin 100 to facilitate its manual removal, as now required in the operational sequence. The manual removal of the locking pin 100 is shown in FIG. 12, all other parts remaining in their relative positions illustrated in FIG. 11.

In FIG. 13, following removal of the locking pin 100, the outer mid-section 21 is retracted by cylinder 27 until it bottoms out against its stops. The manual fly section 22 now securely latched to the upper cylinder 24 remains extended as the outer mid-section is retracted. In this position, FIG. 13, a second opening 102 in the bottom wall of fly section 22 and near the rear thereof becomes aligned with the locking pin hole 103 of outer mid-section 21. This alignment or registration need only be approximate due to the generous clearance for the locking pin 100 allowed in the receiver openings 101 and 102 of the fly section. As shown by the arrow in FIG. 13, the manual locking pin 100 is now installed and secured in the aligned openings 102 and 103, positively locking the fly section 22 and outer mid-section 21 together. The locking pin 100 will never bind during its installation.

Referring now to FIG. 14, the latch wrench 95 is again utilized to turn screw shaft 79 clockwise in order to retract latch plunger 69 from the latch bar notch 99, thus unlatching the manual fly section 22 from the upper cylinder 24 on which the latch assembly 63 is bodily mounted. The boom now has its manual fly section 22 fully extended and ready for normal usage. Should the latch plunger 69 be bound in the notch 99, FIG. 14, at the time for retraction, as can occur if the operation of the screw shaft will not immediately effect plunger retraction. However, the screw shaft 79 will be free to turn the required amount. During this operation, the nut 78 moves downwardly relieving all tension in the inner spring 81. The outer spring 73, being compressed, exerts a force on the plunger 69 tending to dislodge it from the notch 99. As the outer mid-section 21 is extended for normal boom usage, the binding of the plunger 69 is relieved and the outer spring 73 will immediately retract the plunger from the notch 99.

The retraction operational sequence for the boom manual fly section 22 is generally the reverse of the above and it is thought to be unnecessary to utilize additional schematic views similar to FIGS. 9 through 15 to show the retraction despite the fact that these figures of the drawings are only strictly illustrative of the operation for extending the manual fly section 22.

Beginning with FIG. 15, the latch plunger 69 is manually extended by use of the crank wrench 95 through clearance openings 96 as previously described. The outer mid-section 21 is retracted as shown in FIG. 14 by operation of cylinder 27. As the outer mid-section nears full retraction, the plunger 69 is pushed back into housing 64 by cam face 98, compressing inner spring 81. The plunger 69 then snaps into the notch 99. The outer mid-section 21 has not yet bottomed out, and fly section 22 will be moved forwardly a fraction of an inch relieving binding on locking pin 100.

The locking pin 100 is the load carrying member locking the fly section 22 to outer mid-section 21 in the extended position. Binding of the locking pin will be caused by the fly section of the boom sliding back against the pin 100 when a load is being lifted by the boom and with the boom elevated.

Next, as shown in FIG. 13, the locking pin 100 is removed. As shown in FIG. 12, the outer mid-section is extended by lower cylinder 27. The forward opening 101 in fly section 22 comes into registry with locking pin opening 103 in the outer mid-section 21. The locking pin 100 is inserted and secured. Latch plunger 69 is retracted by manually turning screw shaft 79 clockwise by means of crank wrench 95. If the latch plunger 69 binds in notch 99, the latch nut 78 will travel down the screw shaft relieving all of the spring tension which holds the plunger extended. The outer spring 73 now tends to extract the plunger 69 from the notch, which it does instantaneously when the binding of the plunger is relieved as the outer mid-section is retracted.

If the operator does not retract the plunger 69 and has the locking pin 100 installed, the system can be double blocked by retracting the outer mid-section of the boom. Double blocking can also be experienced in FIG. 6. The mechanism is designed to withstand inadvertent double blocking with full force on the cylinder 27 in either direction.

It is to be understood that the invention contemplates that the positions of the latch assembly 63 and latch bar 97 within the boom may be reversed, so that the latch bar 97 is connected to the end of the support member or hydraulic cylinder 24 extending into the boom sections and the latch assembly 63 is mounted on the inner end of the manual fly section 22. Thus, in the broadest aspect of the invention, one latching element is secured to the support member or cylinder 24 within the boom sections and which support member or cylinder is connected to the innermost section 20 of a three-section boom; and a cooperating latching element is mounted on the interior end portion of manual fly section 22, independent of the means connected between the boom mid-section 21 and the adjacent innermost section 20 of a three-section boom sub-assembly for extending the mid-section 21 relative to the innermost section 20. Also, the means for extending the boom mid-section may comprise other types of power means, such as a hydraulic motor chain or belt drive, or other equivalent means in lieu of the cylinder-piston arrangement shown in the drawings.

Referring to FIGS. 16—19, a modification of the invention is shown wherein the boom fly section 100' is equipped with a notched latch bar 101' constructed in a manner described in the prior embodiment of the invention. Latch assembly 102' corresponding to the assembly 63 is bolted at 103' to a short extension support structure 104 on the forward cantilevered end of an upper cylinder 105, which is identical to the previously described cylinder 24. Locator shims 106, as required, are placed between the latch assembly 102' and the cylinder-carried support structure 104.

A lower cylinder 107 identical to the lower cylinder 27 has a rigid leg structure 108 bolted to its forward end, and widely-spaced wear pads 109 are carried by the two legs of structure 108 and bear slidably on the bottom wall of boom fly section 100', as shown in FIGS. 16 and 17.

In lieu of the adjustable side wear pad arrangement, shown in FIGS. 3 and 4, the present modification employs a fixed or non-adjustable side wear pad arrangement shown particularly in FIG. 18. As shown therein the latch assembly support structure 104 includes a
bottom plate 110 having a pair of side depending plates 111 welded thereto in straddling relationship to the lower cylinder 107. Side wear pads 112, carried by the plates 111, slidably engage the opposite sides of cylinder 107. This cylinder 107 is equipped at its top with a fixed inverted channel element 113 providing a flat top bearing surface for an upper wear pad 114 secured to the bottom of the plate 110. The engaging flat faces of channel 113 and wear pad 114 prevent relative rotation of the wear pad structure and cylinder 105 during boom operation. The arrangement is somewhat simpler and involves fewer parts than the corresponding arrangement shown in FIGS. 3 and 4. It may also be pointed out here that in contrast to the prior embodiment where the latch assembly 63 and associated parts were inclined to the vertical, as shown in FIGS. 2, 3 and 5, these parts are now arranged vertically in the present modification, rendering the structure somewhat economical to manufacture and assemble without loss of desirable function.

Continuing to described the modification the latch assembly 102 is identical in construction to the assembly 63 from its top down to its cover plate 115. It employs the same housing 64 and latch plunger arrangement described in connection with FIG. 6, as well as the identical dual plunger arrangement shown in that figure. In the modified unit a screw shaft 116, similar to the screw shaft 79, is employed for the identical purpose of extending and retracting the latch plunger 69. The screw shaft 116 is journaled for rotation in a bearing 117 of cover plate 115. A drive gear 118 for the screw shaft 116 is pinned to the lower end thereof below the cover plate 115 and meshes with an idler gear 119 journaled on a short shaft 120 welded to the cover plate 115. This idler gear 119 meshes with an input drive gear 121 pinned to a manual drive shaft 122 journaled in a bearing means 123 on a lateral extension 124 of cover plate 115. The manual drive shaft 122 is pinned at its top to a suspension or thrust bearing 125 which rotates with the shaft 122 and bears on a fixed sleeve 126 carried by cover plate extension 124.

The lower end of manual drive shaft 122 has a wrench-engageable head 127, such as a hex head adapted to be coupled with, and turned by, the previously described manual wrench 95, or an equivalent manual means.

In the modified form of the invention access to the head 127 of manual drive shaft 122 is gained through the aligned openings 96 in the manner shown and described in the prior embodiment and these clearance openings are, of course, located in the bottom walls of the respective boom sections in proper alignment with the vertical axis of the manual screw drive shaft 122. The necessity for the angled shaft 88 and the two universal joints 89 and 93, FIG. 2, is dispensed with in the improved construction. A somewhat longer manual wrench will be utilized due to the placement of the head 127 at a higher elevation than the head 94 in the prior embodiment.

In all other respects the construction and mode of operation of the latch assembly, and of the entire invention, remains identical to the prior embodiment.

The terms and expressions which have been employed herein are used as terms of description and not of limitation, and there is no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof but it is recognized that various modifications are possible within the scope of the invention claimed.

1. A latch mechanism for a telescopic boom having at least three boom sections including a boom inner section, a boom mid-section and a manual fly section each having a hollow interior and at least one power cylinder for extending and retracting the boom mid-section, a support member mounted on the boom inner section projecting forwardly into the hollow interior of said mid-section and into the hollow interior of said manual fly section telescoped in the mid-section, a manual latch assembly bodily mounted on said support member to project into the hollow interior of said manual fly section and including a manually extensible and retractable latch plunger, manually operated extension and retraction means for said plunger adapted to be selectively operated from the exterior of the telescopic boom, a latch bar fixed to said manual fly section and movable therewith relative to said latch assembly, said latch plunger being springloaded for interlocking engagement with the latch bar when the latter is moved into contact with said plunger, whereby the plunger is selectively manually operated from the exterior of the telescopic boom to be in an operative or non-operative position with respect to said latch bar, and manual means for positively coupling said manual fly section and mid-section together for movement as a unit by said power cylinder and for allowing the power cylinder to move the mid-section relative to the manual fly section when the latter is latched and said manual means is removed.

2. A latch mechanism as defined by claim 1, wherein said support for said manual latch assembly comprises a second power cylinder for the telescopic boom having a connection with a base section thereof and an inner mid-section of the boom.

3. A latch mechanism as defined by claim 1, and said manually operated extension and retraction means for said plunger including a screw shaft, a nut drivingly connected to the screw shaft, and a compression spring interposed between the nut and latch plunger.

4. A latch mechanism as defined by claim 1, and a housing for said latch plunger attached to the support and having a plunger bore, and a second compression spring in said housing engaging the housing and said latch plunger and urging the latch plunger oppositely to the direction in which it is urged by the first-named spring.

5. A latch mechanism as defined by claim 4, and manual drive shaft means coupled to said screw shaft and having a rotary input element adapted for turning by a manual tool from the exterior of the boom, the boom sections having alignable access openings to receive said tool.

6. A latch mechanism as defined by claim 4, and means on said latch assembly engaging said latch plunger and nut to resist rotation thereof while allowing the same to move axially in two directions.

7. A latch mechanism as defined by claim 1, wherein said latch bar has a plunger receiving notch and an inclined plunger engaging cam portion on each side of said notch, and spring means connected with said latch plunger urging it to engage in said notch and yielding to allow plunger retraction on contact with either of said cam portions.

8. A latch mechanism as defined by claim 2, and a stabilizing foot assembly on the forward end of the first-
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named power cylinder including wear pad means in
sliding contact with the bottom wall of said manual fly
section.

9. A latch mechanism as defined by claim 8, and an
extension structure on the leading end of said second
power cylinder and coupled to and carrying said man-
ual latch assembly.

10. A latch mechanism as defined by claim 9, and the
second power cylinder and said extension structure dis-
posed above the first-named power cylinder and said
foot assembly, and side bearing pads dependingly se-
cured to said extension structure and slidably contact-
ing opposite sides of said first-named power cylinder.

11. A latch mechanism as defined by claim 10, and
means to independently adjust the side bearing pads
laterally.

12. A latch mechanism as defined by claim 11, and
said last-named means including a pair of pivoted arms
carrying the side bearing pads, and independently oper-
able screw-threaded adjusting means for each pivoted
arm.

13. A latch mechanism as defined by claim 1,
wherein said support member is cantilevered forwardly
from its point of connection with the boom inner sec-
tion.

14. A latch mechanism for a telescopic boom having
at least three boom sections having an interior space
including a manual fly section, a midsection and an in-
nermost section, and power means for extending and
retracting said mid-section, comprising a support mem-
ber mounted on the boom innermost section projecting
forwardly into the interior space of said midsection and
into the interior space of said manual fly section tele-
scoped in the midsection, a pair of cooperating latch
components mounted one each on the support member
and on the manual fly section for relative movement,
said cooperating latch components adapted to engage
and interlock in one relative position of the manual fly
section to the innermost section when moved together
in response to operation of said power means, and man-
ual means for positively coupling said manual fly sec-
tion and the mid-section together for movement as a
unit by said power means and for allowing the power
means to move the mid-section relative to the manual

fly section when the latter is latched and said manual
means is removed, and one of said cooperation manual
latch components being manually and mechanically ad-
justable by a mechanical implement directly hand oper-
able from the boom exterior between an operative or a
non-operative position with respect to the other of said
cooperating manual latch components thereby respect-
vively allowing or preventing the engagement and inter-
locking of said cooperating latch components in said
one relative position.

15. A latch mechanism as defined by claim 14,
wherein one latch component includes an extensible
and retractable latch plunger, and the other latch com-
ponent is a member having means to receive the latch
plunger interlockingly when said components are
moved together into engagement.

16. A latch mechanism as defined by claim 14, and
manually operable gearing connected with said extensi-
ble and retractable latch plunger to operate the same.

17. A latch mechanism as defined by claim 16, and
said gearing comprising a screw shaft having a connec-
tion with the latch plunger, spur gearing coupled with
the screw shaft to drive it, and a manual drive shaft
connected with the spur gearing and having a coupling
head adapted to be engaged by a manual crank wrench
for turning.

18. A latch mechanism as defined by claim 17, and
said connection of said screw shaft with said latch
plunger comprising a yielding connection.

19. A latch mechanism as defined by claim 5, and a
gear train interposed between said rotary input element
and said screw shaft and allowing the rotary input ele-
ment to be spaced laterally of the screw shaft on said
manual latch assembly.

20. A latch mechanism as defined by claim 15, and a
stabilizing device intervened between said support
member and said power means and including a pair of
side wear pads arranged on opposite sides of the power
means, and an upper wear pad arranged at the top of
the power means and engaging the same.

21. A latch mechanism as defined by claim 20, and
means forming a flat bearing face for said top wear pad
on the upper side of said power means.

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