Jan. 19, 1954 J. T. CARMICHAEL 2,666,244

DRILLING HOOK BILL SAFETY LATCH

Filed Dec. 10, 1952 3 Sheets-Sheet 1

Fig 2.

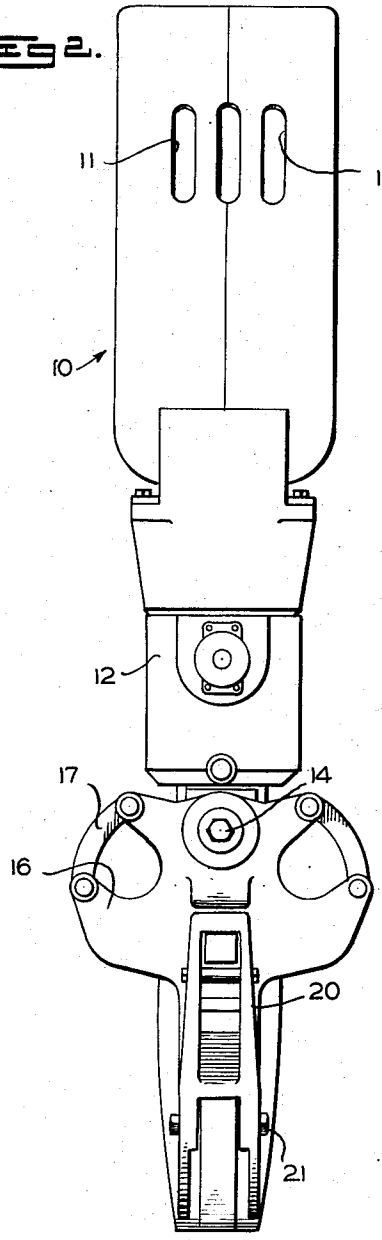
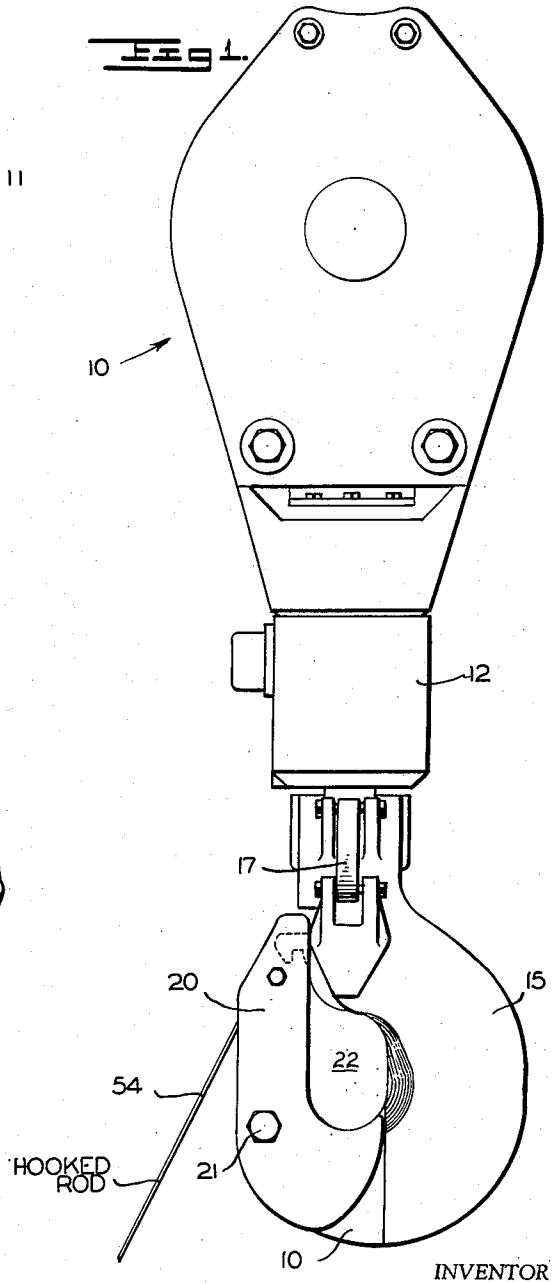


Fig 1.



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Filed Dec. 10, 1952 3 Sheets-Sheet 2

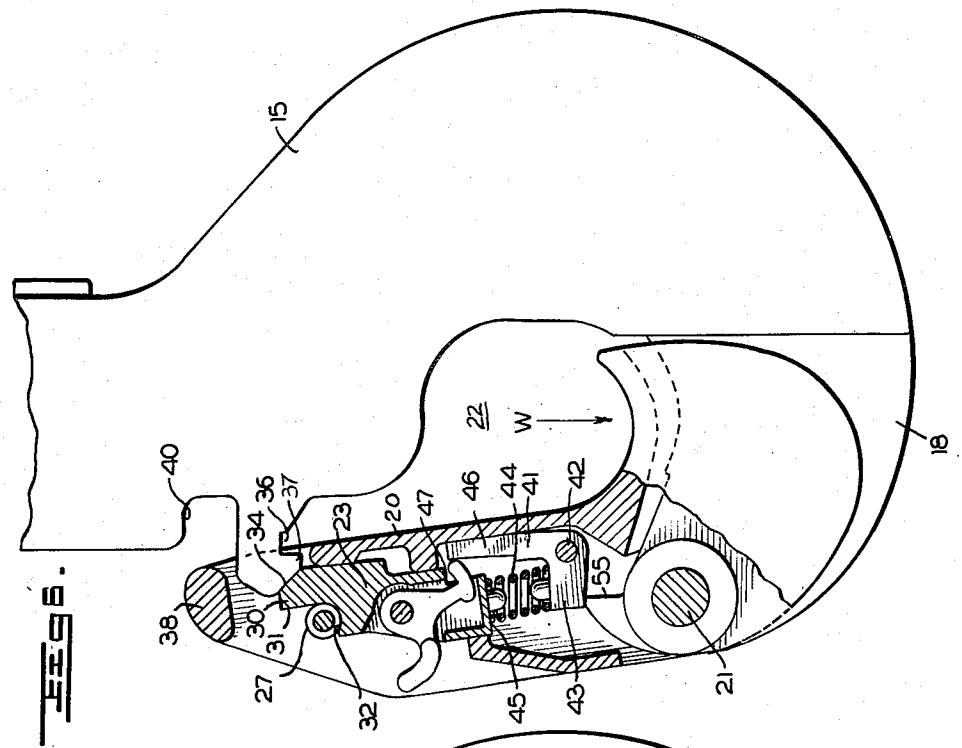


Fig. 6.

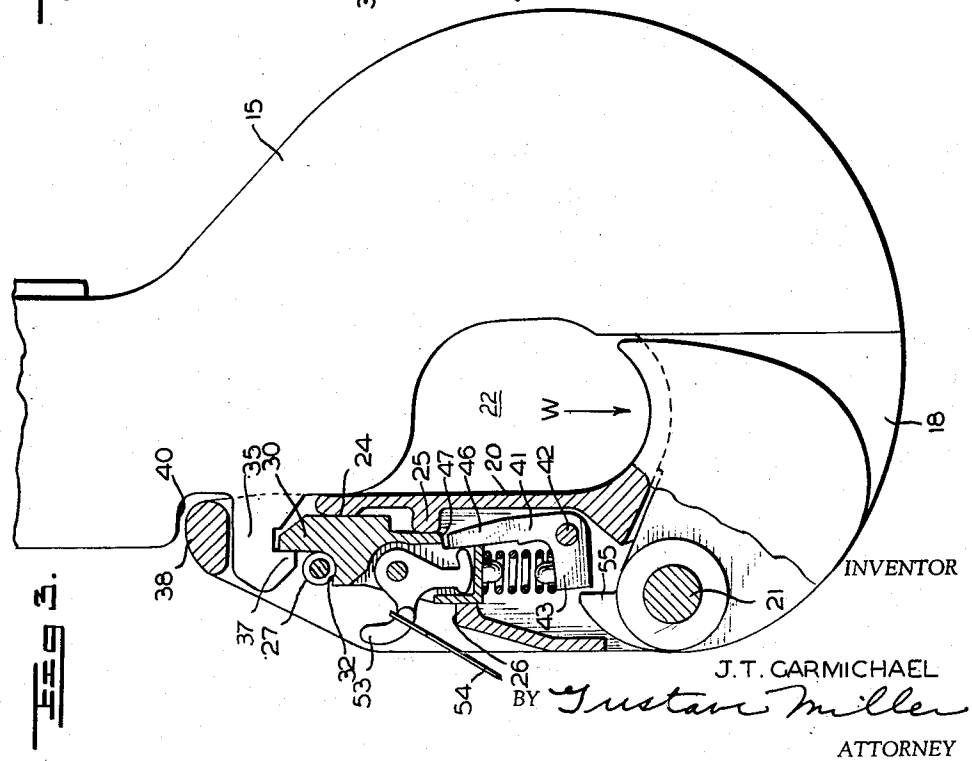


Fig. 3.

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DRILLING HOOK BILL SAFETY LATCH

Filed Dec. 10, 1952 3 Sheets-Sheet 3

Fig. 4.

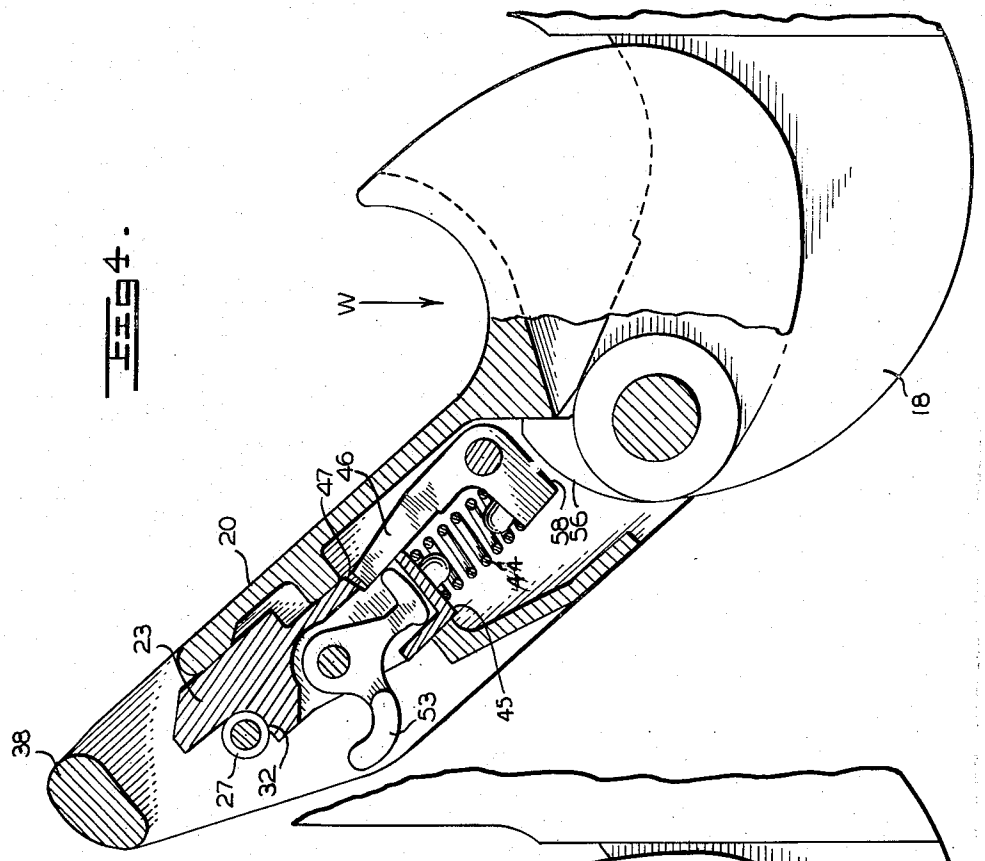
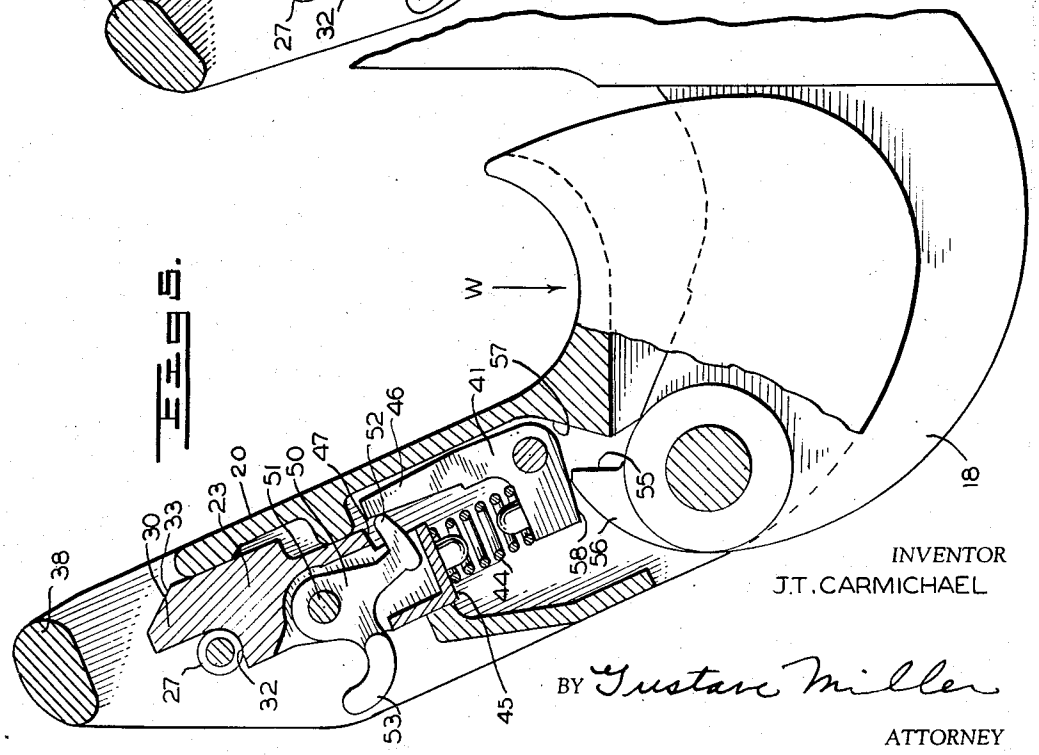


Fig. 5.



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Patented Jan. 19, 1954 2,666,244

UNITED STATES PATENT OFFICE

2,666,244

DRILLING HOOK BILL SAFETY LATCH

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Application December 10, 1952, Serial No. 325,152

10 Claims. (Cl. 24—241)

1

This invention relates to a drilling hook bill safety latch and has for an object to provide an improved safety latch locking mechanism that will prevent the latch arm of the drill hook bill from being jarred open accidently, irrespective of the direction in which the jarring force may be exerted, yet wherein the latch arm can be readily opened by application of manual force to receive or release a bail therein, and when the bail is received therein, the weight of the bail and the supported parts may operate to automatically close the latch arm, and wherein the closing action of the latch arm will automatically retract the latch bolt to permit the latch arm to move to closed position and then permit the latch bolt to extend to the latching position, and then be locked in such latching position by the improved mechanism of this invention.

Still a further object of this invention is to provide an improved latch bolt and latch bolt locking mechanism for the latching arm on the bill of a drill hook, which is incapable of being accidently opened, yet may be readily opened by application of manual force, and which will permit the latch arm to be automatically closed by the weight of the bail when in proper position in the notch within the body of the drill hook.

Still a further object of this invention is to provide a drill hook latch arm locking mechanism wherein a vertically slidable latch bolt therefore is held in locked extended position by means of one bell crank pivotally mounted for rotation in one circumferential direction about its pivot and operated in the releasing direction by a second bell crank mounted thereabove which is pivotally mounted for rotation in an opposite circumferential direction, whereby the effect of any jarring motion tending to rotate the releasing bell crank is counteracted by the tendency of the locking bell crank to rotate in the opposite direction.

Still a further object of this invention is to provide a safety latch bolt slidably mounted in the latch arm pivoted on the bill of a drill hook, wherein the latch bolt is urged toward extended locking position by means of a spring biased at one end against its bottom and biased at its other end against one arm of a bell crank bolt lock tending to rotate the bell crank bolt lock to bring its other arm into abutting relation with a shoulder provided on the latch bolt, and a trigger lever bell crank pivoted on the latch bolt having one arm in abutting relation with the shoulder-abutting crank arm of the latch bolt crank arm and having its other arm providing a

2

trigger arm adapted for manual actuation against the shoulder-abutting arm to move it to non-shoulder abutting or releasing position, and to further provide a cammed lip on the drill hook bill in such relation to the spring biased crank arm of the latch bolt lock bell crank that the lip is normally in the opening path of said spring biased arm unless the bolt lock bell crank has been pivoted to unlocking position to permit the latch arm to be opened, and then when the latch arm is being automatically closed by the weight of the bail thereon, and then the bottom of the spring biased crank belt arm cams on the lip cam of the bill to permit the slidable latch bolt to retract as the latch arm is being closed until it is in closed position, and then to release to extended bolting position and be locked in such extended bolting position by the latch bolt lock bell crank lever.

Although the term "drilling hook" is used throughout, it will be understood that the term "drilling hook" refers to the type of hook that is ordinarily employed in rotary drilling for supporting the drill pipe, and is also used for raising and lowering casings in the operation of connecting new sections of casing to the casing in the well, and then lowering the casing so as to enclose that portion of the well that has been drilled, and the term "drilling hook" is therefore intended to generically cover any possible and customary use of such a hook.

With the foregoing and other objects in view, this invention comprises the combination, construction and arrangement of parts hereinafter set forth, claimed and disclosed in the accompanying drawings, wherein:

Fig. 1 is a side elevational view of a drilling hook and supporting sheave, the latch arm of the drilling hook having this invention installed therein.

Fig. 2 is a front elevational view looking at the left side of Fig. 1.

Fig. 3 is an enlarged fragmentary view of the drill hook body, bill, and latch arm thereon with the safety locking mechanism of this invention shown partly in section therein, with the latch arm in closed and locked position.

Fig. 4 is a similar partly sectional view of the latch arm and latching mechanism on a slightly larger scale in fully opened position.

Fig. 5 is a similar view to Fig. 4 with the latch arm being moved toward notch closing position with the locking bell crank held in unlocked position by the bill lip cam.

Fig. 6 is a similar view in a still further posi-

tion with the latching end of the latch bolt in camming position about to cam the bolt to retracted position so that it may pass by the locking protrusion of the hook body.

There is shown at 10 a drilling, rotary or casing hook sheave block having the usual sheaves therein accessible through the cable openings 11, with its usual depending structure 12 and an internal shank, not shown, secured by means of the swivel pin 14 to the drilling hook body 15. This drilling hook body 15 may be provided with the customary elevator link supporting arms 16 and link latches 17 as usual.

The drilling hook body 15 is provided with an integrally formed bill 18 having a latch arm 20 pivotedly mounted thereon by the pivot pin 21 for closing the hook notch 22. The details thus broadly described are substantially conventional. It is the essence of this invention to provide a latching mechanism for locking the latch arm 20 in notch closing position safe against accidental opening by a jarring force in any direction, yet capable of being manually operated to open bail-receiving or bail-releasing position, and capable of automatically closing under the weight of the bail to the locked position.

The mechanism of this invention includes a safety latch bolt 23 which is slidably mounted in the latch arm 20 between latch arm protrusions 24 and 25 on one side, and a latch arm protrusion 26, and a roller 27 on a pin 28 on the other side. The latching end 30 of the latch bolt is provided with a surface 31 which bears against the roller 27 and a recessed step 32 which abuts against the roller 27 to limit the sliding movement of the latch bolt 23 in the extending or latching direction. A bevelled cam surface 33 is provided on the drilling hook body side of the latch bolt end 30, and is arranged to cam against a correspondingly bevelled cam surface 34 on the outer side of a locking protrusion 35 integrally formed on the drilling hook body 15 at the top end of the notch 22, protrusion 35 being also provided with a keeper notch 36 having a keeper tongue 37, the keeper notch 36 receiving the latch end 30 when in latched position with the end of the bearing surface 31 in contact for bearing against the keeper toe 37.

So long as the latch bolt 23 has its end 30 extended into the keeper notch 36, the latch arm 20 will remain in latched position. The latch arm 20 is provided with an extending eye 38, which as shown in Figs. 3 and 6, extends into a recess 40 integrally formed in the body 15 above the protrusion 35.

In order to lock the latch bolt 23 in the extended or latching position, a bell crank latch bolt locking lever 41 is provided pivoted on a pin 42 at the bell crank angle within the latch arm 20 below the latch bolt 23 and having one bell crank arm 43 extending substantially horizontally to below the latch bolt 23. A yieldable spring 44 has one end biased against the bottom end 45 of latch bolt 23 urging the latch bolt 23 toward the extended or latched position, and has its other end biased against the top of the horizontally extending bell crank arm 43, thus, tending to rotate the bell crank bolt lock arm 41 in counter-clockwise direction, as viewed in Figs. 3 to 6 inclusive. The vertically extending bell crank arm 46 on bell crank 41 extends alongside the latch bolt 23 above its bottom end 45, and is urged by the spring 44 to a locking position abutting against the bottom of a shoulder 47 formed on the latch bolt 23 and spaced above its bottom end 45, as shown in Fig. 3.

As will be apparent, the biasing force of spring 44 serves both to extend the latch bolt 23 and rotate the bell crank 44 so that the end of the bell crank arm 46 is held in this abutting and locking relation against the shoulder 47 of the latch bolt 23. Before the latch bolt 23 can be retracted to permit the latch arm to open the notch 22, the bell crank arm 46 of bell crank 41 must be moved to a non-abutting position in relation to the latch bolt shoulder 47, this position of bell crank 41 being shown in Fig. 5. This action is provided by means of a second bell crank trigger lever 50, which is pivoted, not to the latch arm 20, but within the latch bolt 23 and has a bell crank toe end 52 arranged to abut against and push the bolt lock bell crank arm 46 out from under the latch bolt shoulder 47 when the bell crank 50 is rotated in a counter-clockwise direction, as is viewed in Figs. 3 to 6 inclusive.

A trigger arm 53 is provided by the other bell crank arm of the bell crank 50 and is arranged to be moved in a downward direction as by a hooked rod 54 temporarily extended thereover and pulled downwardly, as in Figs. 1 and 3, by manual force. Application of manual force in a downward direction on the trigger arm 53 of trigger bell crank 50 thus first unlocks the latch bolt 23 and then further application of manual force in the same downward direction retracts the latch bolt 23 downwardly against its biasing spring 44.

The bill 18 is provided at its end with a lip 55 having a camming surface 56 on the back thereof. The lip 55 cooperates with an abutment 57 in the latch arm 20 to limit the opening movement of latch arm 20, as shown in Fig. 4. When the latch arm 20 is in notch closing position, as shown in Fig. 3, the spring biasing bell crank arm 43 is in a position to abut against the lip 55 and prevent the opening of the latch arm 20, as shown in Fig. 3, in addition to the locking effect provided by its other bell crank arm 46. However, movement of the bell crank lock 41 from the position shown in Fig. 3 under manual force on rod 54 moves the bell crank 41 to the position shown in Fig. 6 relative to the latch arm, and raises the spring biasing bell crank arm 43 clear of the end of lip 55, thus permitting it to ride thereover to allow the latch arm 43 to move to its extreme advance position with abutment 57 in contact against lip 55, as shown in Fig. 4.

When in the position in Fig. 4, the bail carrying the drilling or rotary mechanism may be removed from notch 22, or may be received back in notch 22. The arrow W shows the position that the bail is placed, and as will be seen, the load of the bail W is eccentric to the latch arm pivot pin, thus, tending to cause the latch arm 20 to rotate from the position of Fig. 4 to the position of Fig. 5 and Fig. 6 back to the closed position of Figs. 1 and 3. However, as soon as manual force on rod 54 is relieved, the lock bolt 23 will extend to the extended position shown in Figs. 3 to 6, so long as the extreme end 30 of latch bolt 23 is clear of the notch surface 37 of the keeper notch 36 of protrusion 35, whether it is in the locked position shown in Fig. 3, or in any extended position shown in Figs. 4, 5 and 6.

In the fully open position shown in Fig. 4, the

biasing spring 44 has again moved the bell crank lock counter-clockwise and brought its locking end 46 in shoulder abutting position against shoulder 47 of latch bolt 23, thus locking the bolt 23 in extended position. However, as the weight W of the bail is placed on the end of latch arm 20 within notch 22, its eccentric position relative to the pivot pin 21 tends to rotate the latch arm 20 toward closing position. As this latch arm 20 rotates from the position of Fig. 4 through the positions shown in Figs. 5 and 6 to the position shown in Fig. 3, the bottom surface 58 of the spring biasing bell crank arm 43 cams against the cam surface 56 on back of lip 55, as the latch arm 20 moves from the position shown in Fig. 4 to the position shown in Fig. 5, thus, rotating bell crank 41 clockwise to non-locking position and continuing to hold it in non-locking position until the cam surface 33 on the latching end 30 of latch bolt 23 cams against the cam surface 34 of protrusion 35, thus, moving the latch bolt 23 temporarily to retracted position until the latch arm is in fully closed position, whereupon the spring 44 biased against the bottom 45 of latch bolt 23 urges and moves it into extended locking position with the bearing surface 31 thereof behind the protrusion surface 37, thus, permitting the latch arm 23 to automatically retract and then automatically advance to latching position to be held locked in such latching position by the bell crank lock 41 as the load W of the bail automatically pivots the latch arm 20 from fully open position of Fig. 4 through the intermediate positions of Figs. 5 and 6 to the fully closed and locked position of Fig. 3.

As a result of this construction, any jarring force in any direction cannot accidently retract the latch bolt 23 or accidently unlock the latch arm 20. Any force tending to rotate trigger bell crank 50 in counter-clockwise direction and necessarily also tending to retract the latch bolt 23 will increase the biasing force on the spring 44, and thus, on the spring biasing arm 43, to thus rotate the bell crank lock 41 in counter-clockwise direction about its pivot, which is below the pivot of the bell crank 50, and thus, hold the locking crank arm 46 more securely in abutting position against the latch bolt shoulder 47, thus, preventing any accidental unlatching movement of latch bolt 23.

However, as explained above, application of manual force on the trigger arm 53 first unlocks the latch bolt 23, and then retracts latch bolt 23 to the unlatched position, and then pivots the latch arm 20 to the open position of Fig. 4. Then, placing the bail of the drilling or rotary mechanism within notch 22 as above described pivots the latch arm 20 to notch closing position, the cooperating cam surfaces 56 and 55 serving to unlock the latch bolt 23 for retraction under the cooperating cam surfaces 33 and 34 until it has reached the closed position, whereupon the biasing spring 44 both extends the latch bolt 23 to latching position, and then locks the bell crank lock arm 46 under shoulder 47 to hold the latch bolt 23 locked in latched position, safe against accidental opening.

While the device has been shown and the structure described in detail, it is obvious that this invention is not to be considered as being limited to the exact form disclosed, and that changes in detail and construction may be made therein within the scope of what is claimed, without departing from the spirit of this invention.

Having thus set forth and disclosed the nature of this invention, what is claimed is:

1. In a safety drilling hook having a body with a forwardly extending bill forming a bail-receiving notch and a latch arm pivoted to said bill and adapted to close the entrance to said notch, a safety latch bolt slidably mounted on said latch arm for movement in a substantially vertical plane to engage in a keeper notch in the hook body, and having its upper latching end adapted to engage a cam surface on the outside of the member forming a wall of said keeper notch in camming relation thereto to retract said bolt upon closing movement of said latch arm, a spring yieldably biased at its upper end against the lower end of said latch bolt, a latch bolt lock comprising a bell crank lever pivotally mounted on said latch arm at its angle with one crank arm providing a biasing support for the lower end of said spring, thereby biasing its other crank arm against one side of said latch bolt, a shoulder on said latch bolt spaced from its said lower end, said latter crank arm having its end moved to and held in abutting relation with the portion of the latch bolt under said shoulder by said biasing spring when said latch bolt is extended, a bell crank trigger lever pivoted on said latch bolt, a bell crank toe end on said bell crank trigger lever arranged to push said latter crank arm below said shoulder against its biasing force away from abutting relation with said latch bolt below said shoulder, and a trigger arm at the other end of said bell crank trigger lever operative under manual force to pivot said bell crank trigger lever to thus disengage said latter bolt lock crank arm from below said shoulder, then slidably retract said latch bolt from engagement with said keeper notch in said hook body, and then pivot said latch arm to open the entrance to said bail-receiving notch.

2. In the device defined in claim 1, a roller journaled in said latch arm, a surface on said latch bolt bearing against said roller to guide said roller in extending and retracting movement, and a shoulder on said latch bolt at the end of said surface adjacent its upper latching end limiting the extending movement of said latch bolt.

3. In a safety drilling hook having a body with a forwardly extending bill forming a bail-receiving notch and a latch arm pivoted to said bill and adapted to close the entrance to said notch, a safety latch bolt slidably mounted on said latch arm for movement in a substantially vertical plane to engage in a keeper notch in the hook body, and having its upper latching end adapted to engage a cam surface on the outside of the member forming a wall of said keeper notch in camming relation thereto to retract said bolt upon closing movement of said latch arm, a spring yieldably biased at its upper end against the lower end of said latch bolt, a latch bolt lock comprising a bell crank lever pivotally mounted on said latch arm at its angle with one crank arm providing a biasing support for the lower end of said spring, thereby biasing its other crank arm against one side of said latch bolt, a shoulder on said latch bolt spaced from its said lower end, said latter crank arm having its end moved to and held in abutting relation with the portion of the latch bolt under said shoulder by said biasing spring when said latch bolt is extended, a bell crank trigger lever pivoted on said latch bolt, a bell crank toe end on said bell crank trigger lever arranged to push said latter crank arm below said shoulder against its biasing force away from

abutting relation with said latch bolt below said shoulder, a trigger arm at the other end of said bell crank trigger lever operative under manual force to pivot said bell crank trigger lever to thus disengage said latter bolt lock crank arm from below said shoulder, then slidably retract said latch bolt from engagement with said keeper notch in said hook body, and then pivot said latch arm to open the entrance to said bail-receiving notch, and a lip having its inner side extending from said bill into the opening path of said spring-biasing bolt lock crank arm only when said other bolt lock crank arm is in bolt-abutting position, said spring-biasing crank arm moving clear of said lip when said bolt-abutting crank arm is pivoted to non-abutting position.

4. In a safety drilling hook having a body with a forwardly extending bill forming a bail-receiving notch and a latch arm pivoted to said bill and adapted to close the entrance to said notch, a safety latch bolt slidably mounted on said latch arm for movement in a substantially vertical plane to engage in a keeper notch in the hook body, and having its upper latching end adapted to engage a cam surface on the outside of the member forming a wall of said keeper notch in camming relation thereto to retract said bolt upon closing movement of said latch arm, a spring yieldably biased at its upper end against the lower end of said latch bolt, a latch bolt lock comprising a bell crank lever pivotally mounted on said latch arm at its angle with one crank arm providing a biasing support for the lower end of said spring, thereby biasing its other crank arm against one side of said latch bolt, a shoulder on said latch bolt spaced from its said lower end, said latter crank arm having its end moved to and held in abutting relation with the portion of the latch bolt under said shoulder by said biasing spring when said latch bolt is extended, a bell crank trigger lever pivoted on said latch bolt, a bell crank toe end on said bell crank trigger lever arranged to push said latter crank arm below said shoulder against its biasing force away from abutting relation with said latch bolt below said shoulder, a trigger arm at the other end of said bell crank trigger lever operative under manual force to pivot said bell crank trigger lever to thus disengage said latter bolt lock crank arm from below said shoulder, then slidably retract said latch bolt from engagement with said keeper notch in said hook body, and then pivot said latch arm to open the entrance to said bail-receiving notch, a lip having its inner side extending from said bill into the opening path of said spring-biasing bolt lock crank arm only when said other bolt lock crank arm is in bolt-abutting position, said spring-biasing crank arm moving clear of said lip when said bolt-abutting crank arm is pivoted to non-abutting position, and a cam surface provided on the outer side of said lip adapted to cam against the bottom end of said spring-biasing crank arm when said latch arm is moved in notch closing direction to pivot said shoulder-blocking crank arm to non-blocking position and permit said keeper-notch cam surface to move said latch bolt in retracting direction.

5. In a safety drilling hook having a body with a forwardly extending bill forming a bail-receiving notch and a latch arm pivoted to said bill and adapted to close the entrance to said notch, a safety latch bolt slidably mounted on said latch arm for movement in a substantially vertical plane to engage in a keeper notch in the hook body, and having its upper latching end adapted to engage a cam surface on the outside of the member forming a wall of said keeper notch in camming relation thereto to retract said bolt upon closing movement of said latch arm, a spring yieldably biased at its upper end against the lower end of said latch bolt, a latch bolt lock comprising a bell crank lever pivotally mounted on said latch arm at its angle for initial rotation in one circumferential direction with one crank arm providing a biasing support for the lower end of said spring, thereby biasing its other crank arm against one side of said latch bolt, a shoulder on said latch bolt spaced from its said lower end, said latter crank arm having its end moved to and held in abutting relation with the portion of the latch bolt under said shoulder by said biasing spring when said latch bolt is extended, said latter crank arm being thereby adapted to act as a stop for said shoulder to prevent downward movement of said latch bolt against the force of said biasing spring, a bell crank trigger lever comprising a second lever pivoted for initial rotation in the direction opposite from that of said first bell crank lever at its angle on said latch bolt below said shoulder, a bell crank toe end on said bell crank trigger lever arranged to push said latter crank arm below said shoulder against its biasing force away from abutting relation with said latch bolt below said shoulder, and a trigger arm at the other end of said bell crank trigger lever operative under manual force to pivot said bell crank trigger lever to thus disengage said latter bolt lock crank arm from below said shoulder, then slidably retract said latch bolt from engagement with said keeper notch in said hook body, and then pivot said latch arm to open the entrance to said bail-receiving notch.

6. In a safety drilling hook having a body with a forwardly extending bill forming a bail-receiving notch and a latch arm pivoted to said bill and adapted to close the entrance to said notch, a safety latch bolt slidably mounted on said latch arm for movement in a substantially vertical plane to engage in a keeper notch in the hook body, and having its upper latching end adapted to engage a cam surface on the outside of the member forming a wall of said keeper notch in camming relation thereto to retract said bolt upon closing movement of said latch arm, a spring yieldably biased at its upper end against the lower end of said latch bolt, a latch bolt lock comprising a bell crank lever pivotally mounted on said latch arm at its angle for initial rotation in one circumferential direction with one crank arm providing a biasing support for the lower end of said spring, thereby biasing its other crank arm against one side of said latch bolt, a shoulder on said latch bolt spaced from its said lower end, said latter crank arm having its end moved to and held in abutting relation with the portion of the latch bolt under said shoulder by said biasing spring when said latch bolt is extended, said latter crank arm being thereby adapted to act as a stop for said shoulder to prevent downward movement of said latch bolt against the force of said biasing spring a bell crank trigger lever comprising a second lever pivoted for initial rotation in the direction opposite from that of said first bell crank lever at its angle on said latch bolt below said shoulder, a bell crank toe end on said bell crank trigger lever arranged to push said latter crank arm below said shoulder against its biasing force away from abutting relation with said latch bolt below said shoulder, a trigger arm

at the other end of said bell crank trigger lever operative under manual force to pivot said bell crank trigger lever to thus disengage said latter bolt lock crank arm from below said shoulder, then slidably retract said latch bolt from engagement with said keeper notch in said hook body, and then pivot said latch arm to open the entrance to said bail-receiving notch, and a lip having its inner side extending from said bill into the opening path of said spring-biasing bolt lock crank arm only when said other bolt lock crank arm is in bolt-abutting position, said spring-biasing crank arm moving clear of said lip when said bolt-abutting crank arm is pivoted to non-abutting position.

7. In a safety drilling hook having a body with a forwardly extending bill forming a bail-receiving notch and a latch arm pivoted to said bill and adapted to close the entrance to said notch, a safety latch bolt slidably mounted on said latch arm for movement in a substantially vertical plane to engage in a keeper notch in the hook body, and having its upper latching end adapted to engage a cam surface on the outside of the member forming a wall of said keeper notch in camming relation thereto to retract said bolt upon closing movement of said latch arm, a spring yieldably biased at its upper end against the lower end of said latch bolt, a latch bolt lock comprising a bell crank lever pivotally mounted on said latch arm at its angle for initial rotation in one circumferential direction with one crank arm providing a biasing support for the lower end of said spring, thereby biasing its other crank arm against one side of said latch bolt, a shoulder on said latch bolt spaced from its said lower end, said latter crank arm having its end moved to and held in abutting relation with the portion of the latch bolt under said shoulder by said biasing spring when said latch bolt is extended, said latter crank arm being thereby adapted to act as a stop for said shoulder to prevent downward movement of said latch bolt against the force of said biasing spring, a bell crank trigger lever comprising a second lever pivoted for initial rotation in the direction opposite from that of said first bell crank lever at its angle on said latch bolt below said shoulder, a bell crank toe end on said bell crank trigger lever arranged to push said latter crank arm below said shoulder against its biasing force away from abutting relation with said latch bolt below said shoulder, a trigger arm at the other end of said bell crank trigger lever operative under manual force to pivot said bell crank trigger lever to thus disengage said latter bolt lock crank arm from below said shoulder, then slidably retract said latch bolt from engagement with said keeper notch in said hook body, and then pivot said latch arm to open the entrance to said bail-receiving notch, a lip having its inner side extending from said bill into the opening path of said spring-biasing bolt lock crank arm only when said other bolt lock crank arm is in bolt-abutting position, said spring-biasing crank arm moving clear of said lip when said bolt-abutting crank arm is pivoted to non-abutting position, and a cam surface provided on the outer side of said lip adapted to cam against

the bottom end of said spring-biasing crank arm when said latch arm is moved in notch closing direction to pivot said shoulder-blocking crank arm to non-blocking position and permit said keeper-notch cam surface to move said latch bolt in retracting direction, the inside of said wall member of said keeper notch permitting said latch bolt to be extended by said biasing spring into latching position in said keeper notch.

8. In a safety drilling hook having a body with a forwardly extending bill forming a bail-receiving notch and a latch arm pivoted to said bill and adapted to close the entrance to said notch, a safety latch bolt slidably mounted on said latch arm for movement in a substantially vertical plane to engage in a keeper notch in the hook body when the hook is in normal use, and having its upper latching end adapted to engage a cam surface on the outside of the member forming a wall of said keeper notch in camming relation thereto to retract said bolt upon closing movement of said latch arm, spring means biased at its upper end against the lower end of said latch bolt, normally urging said latch bolt toward the extended latching position, a latch bolt lock comprising a bell crank lever pivotally mounted on said latch arm at its angle, said same spring means being biased at its bottom end against one arm of said latch bolt lock and urging the other arm of said latch bolt lock toward locking position with said latch bolt, and latch bolt lock pivoting bell crank means, pivoted at its angle, having one arm manually operative in a substantially downward direction for first pivoting its other bell crank arm against said other bell crank arm of said latch bolt lock against its biasing spring end in a direction toward unlocking position and then retracting said latch bolt and latch arm to the unlatched position.

9. A safety drill hook as defined in claim 8 in which the pivoted latch arm is provided with an inwardly extending finger adapted to extend into said notch and be engaged by a bail received in said notch to automatically close said latch arm, and a cammed lip on said bill extending into the path of said latch bolt pivoting means camming against the bottom of said other latch bolt lock arm for operating said latch bolt lock pivoting means toward unlocking position to permit said latch bolt to be retracted by a cam surface in its path on said hook body and then extend as said latch arm is automatically closed.

10. A safety drill hook as defined in claim 8 in which both said bell crank latch bolt lock and said bell crank latch bolt lock pivoting means are pivotally mounted one above the other for initial movement in opposite circumferential directions each with a vertically extending arm in side-by-side abutting contact, the horizontal bell crank arm of the latch bolt lock bell crank having said spring means biased thereon, the horizontal bell crank arm of the latch bolt lock pivoting means bell crank being the arm manually operative in a substantially downward direction.

JAMES T. CARMICHAEL.

No references cited.