

July 10, 1951

L. M. REGAN ET AL
PIVOTED SNAP HOOK

2,559,999

Filed May 17, 1947

2 Sheets-Sheet 1

FIG. 1.

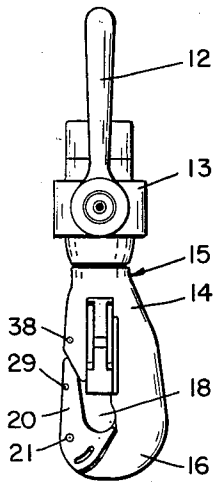


FIG. 2.

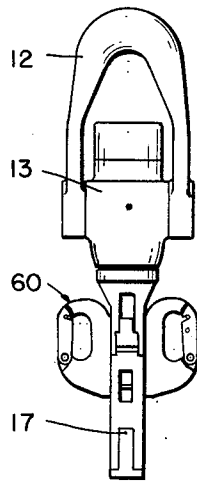


FIG. 4.

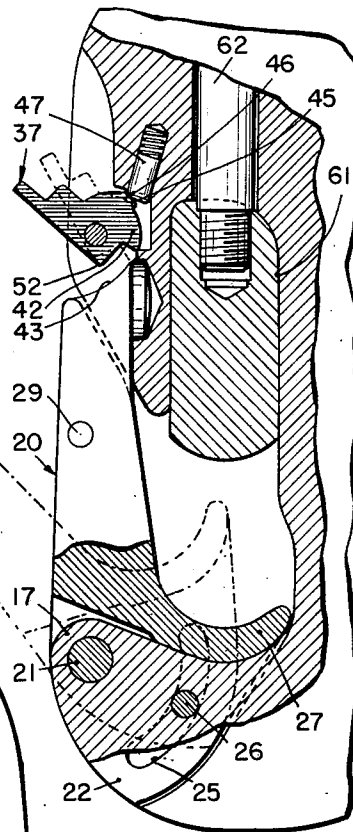
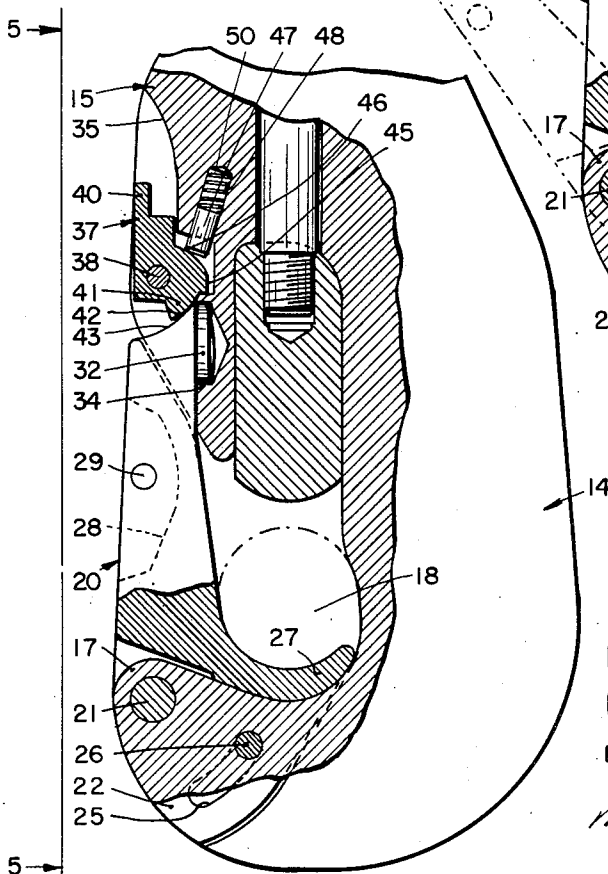


FIG. 3.



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FIG. 7.

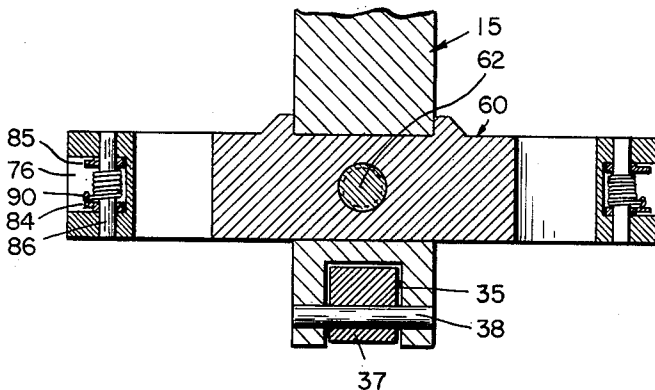


FIG. 5.

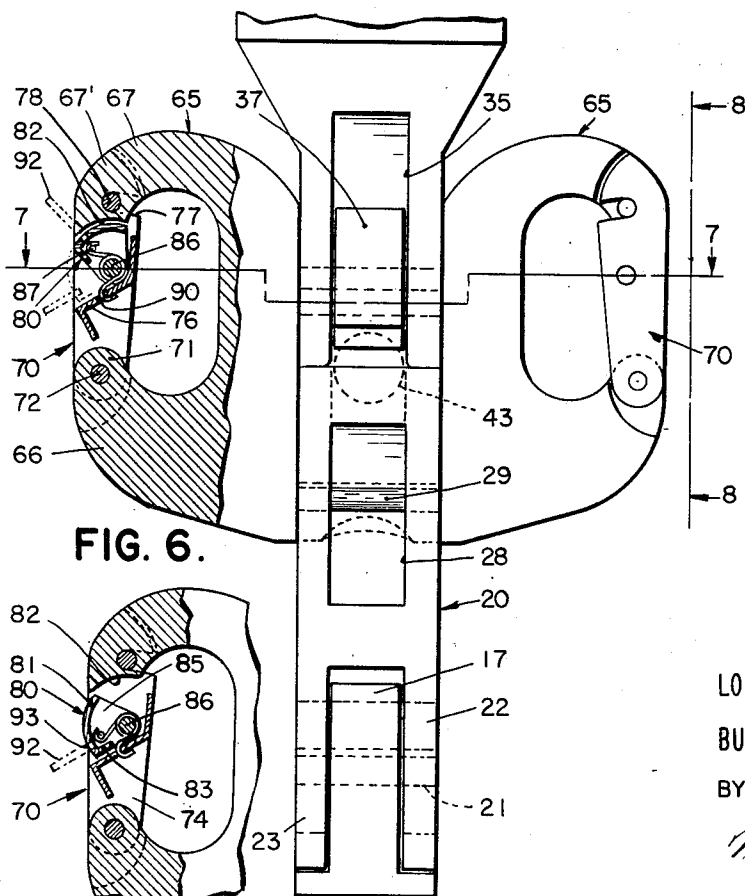
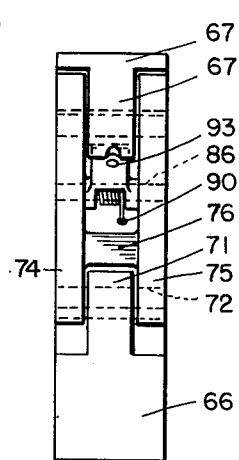


FIG. 6.

FIG. 8.



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PIVOTED SNAP HOOK

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Application May 17, 1947, Serial No. 748,788

4 Claims. (Cl. 24—241)

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This invention relates generally to safety latch means for hooks.

It is an object of this invention to provide a novel self-locking safety latch means for a hook, the latch means including a part adapted to extend from the bill of the hook to the body thereof and to be releasably locked in such position to effectively close the hook.

It is a particular object of this invention to provide a latch means of the type indicated embodying a pivoted arm for closing the hook designed on a cam principle and so constructed and arranged that any force tending to open the latch will tend to rotate the latch mechanism through interengaging surfaces to more firmly hold the latch arm.

In many uses of hooks, as for example in the drilling of oil wells with heavy swivel hooks, it is hazardous to have a latch keeper or trigger which must be left projecting when the latch arm is open.

It is, therefore, also an object of the invention to provide a safety latch embodying a trigger or keeper and a latch arm pivotally mounted in the bill of the hook for closing the hook, in which the trigger or keeper for the arm is caused to return from a position of release in which it partially projects from the body of the hook to a closed and non-projecting position by movement of the latch arm in opening. It is also an object to provide a trigger or keeper which, when closed and the latch arm is open or extending outwardly of the body of the hook, will permit return of the arm to closed position and will automatically lock or latch when the arm is returned.

These and other objects will be apparent from the drawings and the following description thereof. Referring to the drawings, which are for illustrative purposes only:

Fig. 1 is an elevational view of a form of hook embodying the invention;

Fig. 2 is an elevational view of the hook of Fig. 1 taken at right angles thereto;

Fig. 3 is an enlarged fragmentary sectional elevation of the latch means of the main hook;

Fig. 4 is a view similar to Fig. 3, showing the parts in a different position;

Fig. 5 is an enlarged fragmentary elevation, partly in section, on line 5—5 of Fig. 3;

Fig. 6 is a sectional elevation of the latch means for one of the auxiliary hooks shown in Fig. 5, with the latch means shown in unlocked position;

Fig. 7 is a sectional plan view on line 7—7 of Fig. 5; and

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Fig. 8 is an elevational view on line 8—8 of Fig. 5.

More particularly describing the invention, Figs. 1 and 2 show in elevation a swivel hook which is of the general type utilized in the drilling of oil wells, the details of which are disclosed in the copending application of Burt S. Minor, Serial No. 745,475 filed May 2, 1947.

The hook includes a bail 12 attached to a swivel body 13 in which is rotatably suspended a hook member 14 which includes what will be termed a hook body 15, and a hooked portion 16 which terminates in a bill 17. As indicated in Figs. 2 and 5, the bill 17 is of reduced width relative to the remainder of the hooked portion.

Referring particularly to Figs. 3—5 inclusive, this invention provides a latch means for closing the hook to insure the retention of the bail or the like of the load suspended in the bight 18 of the hook. The latch means includes a latch arm 20 which is pivotally mounted on a pin 21 extending through the bill of the hook, the lower end of the arm being bifurcated to provide a pair of legs 22 and 23 which extend on opposite sides of the bill 17.

The legs 22 and 23 of the arm are provided with arcuate slots 25 which are concentric with the pivot pin 21 and cooperate with a stop pin 26 mounted in the hook to limit outward movement of the latch arm.

Immediately above the legs 22 and 23 the latch arm is provided with a tongue 27 which, when the latch arm is in closed position, provides a seat for the member held in the bight of the hook. The intermediate portion of the latch arm is provided with a recess 28 and a pin 29 for convenience in operating the latch arm.

At its outer or upper end the latch arm is provided with a cylindrical projection 32 which extends inwardly from the inner side of the arm and is received in a recess 34 in the body 15 of the hook. This construction serves to tie the bill of the hook and the body of the hook together through the medium of the latch arm when the same is closed and thereby prevent deformation of the hooked portion of the hook under load.

The body of the hook is provided with a slot-like recess 35 which extends longitudinally of the hook, the upper portion of the latch arm being received within this recess when the latch arm is closed. The body of the hook is provided with a keeper or trigger 37 for releasably securing the latch arm in the closed position. This keeper is mounted for rotation on a pin 38 and is positioned within the recess 35. The

keeper has a handle portion 40 and a latch arm engaging portion 41 which extends into the path of the outer end of the latch arm. The outer surface of the portion 41 is formed to provide an arcuate surface 42 substantially concentric with the pivotal axis of the keeper for engagement with a concavely curved mating surface 43 formed on the end of the latch arm. It will be apparent from Fig. 3 that since the end of the latch arm is behind the keeper and its path of movement, as determined by the pivot pin 21, is necessarily curved up toward the keeper, when the latch arm is in closed position any force tending to swing the arm outwardly only serves to more firmly engage the keeper and arm and thereby effectively prevent opening of or outward swinging movement of the arm.

Rearwardly of the projection 41 the keeper is provided with a flat spot or surface 45, which is engaged by a tapered surface 46 on the head of a pin 47 when the keeper is in open or release position (Fig. 4). The pin is slidably mounted in a bore 48 in the body of the hook, a spring 50 being provided for yieldably urging the pin toward the keeper. Thus, when the keeper is rotated to the release position, the pin serves to retain the keeper in such position until the keeper is moved either manually or by the latch arm in a manner to be described.

The keeper is also provided with a projecting point 52 which, when the keeper is rotated to the position of Fig. 4 to release and permit opening of the latch arm, lies in the path of the arm and is struck thereby as the arm is opened or swung out. With this construction it will be apparent that the arm, in opening, will automatically return the keeper to its closed or holding position, namely, that of Fig. 3. When in such position, the latch arm may be closed and the keeper will be pivoted to permit its passage and will then return to latched position under the influence of the spring to firmly lock the arm in place. It may also be pointed out that the keeper may be rotated sufficiently to permit withdrawal of the latch arm without bringing the projection into the path of the latch arm.

In operation, assuming the parts to be in the position in which they are shown in Fig. 3, the latch mechanism may be opened or released by moving the latch keeper 37 to the position it is shown in full lines in Fig. 4, thereby permitting withdrawal of the latch arm 20. When the keeper is in the position of Fig. 4, it is releasably held there by the pin 47 bearing upon flat spot 45 on the keeper. It is apparent that when in this position, assuming that a load is being carried by the hook and, of course, resting on the tongue 28 of the latch arm, the latch arm will remain in the closed position for any desired length of time so long as the load is not shifted laterally to bear against the inner side of the arm and cause opening or outward movement thereof. When desired, the arm may be swung out either manually or by shifting the load against it, and when swung out the upper end of the arm strikes the projection 52 on the keeper, thereby rotating the keeper to its original position. The latch arm may then be closed at any time merely by returning it to its position in Fig. 3.

In returning, the latch arm rotates the keeper since it strikes the forward portion of the portion 41 thereof, and rotates it just sufficiently to permit passage of the arm. This amount of rotation is insufficient to cause the keeper to be

held by the pin 47 in the open or released position, the keeper being rotated to approximately the position in which it is shown in broken lines in Fig. 4.

It will also be apparent that when a load is picked up by the hook with the arm out, raising the hook will cause the load to ride down onto the tongue 27 of the latch arm, thereby closing the arm.

Referring now to Figs. 2 and 5-8 inclusive, it will be seen that the hook includes a yoke generally indicated by 60 which is suspended in a slot 61 in the body of the hook on a stem 62 which is supported by the swivel body 13. As disclosed in the copending application of Burt S. Minor hereinabove referred to, the hook is slidably mounted in the body of the main hook and resiliently supported. The hook provides a pair of auxiliary hooks generally indicated by 65, each of which comprises a bill 66 and a top portion 67 which is curved downwardly toward the bill. The hooks 65 are each adapted to be closed by a latch arm structure generally indicated by reference numeral 70. This latch structure is the same for each hook and only one will be described.

The bill 66 is provided with a vertically extending portion 71 of reduced width on which the latch structure 70 is pivotally mounted by means of a pin 72. The latch structure comprises a latch arm formed of a pair of side plates 74 and 75 which straddle the bill portion 71 and receive the pin 72. The plates are connected by a substantially Z-shaped plate 76 which is welded or otherwise secured to the plates. The upper ends of the plates are provided with arcuate slots 77 which receive a pin 78 mounted in the upper portion 67 of the hook, the upper portion of the hook 67 being reduced in width in the region 67' to provide for the reception of the plates 74 and 75 flush with the sides of the upper portion of the hook.

The means for retaining the latch structure 70 in closed position includes a pivotally mounted keeper 80 formed to provide an arcuate peripheral wall 81 substantially concentric with the pivotal axis of the keeper, as will later be apparent, adapted to abut a mating surface 82 at the lower end of the upper reduced portion 67' of the upper portion of the hook. The keeper 80 includes a wall portion 83 forming a continuation of the wall 81 and a pair of side walls 84 and 85 which are apertured to receive a pin 86 mounted in the plates 74 and 75, the member 80 being rotatable on the pin 86. A coil spring is provided intermediate the walls 84 and 85 and one end of the spring is secured around a pin 87 in the wall 85. The other end of the spring is received within a hole 90 in the plate 76. The spring is so disposed around the pin 86 that it tends to force the keeper 80 inwardly to the position in which it is shown in Fig. 5.

With the construction shown, it will be apparent that when the latch structure 70 is in the closed position in which it is shown in Fig. 5, any force tending to move the latch structure 70 outwardly of the hook will only cause more firm engagement of the keeper 80 with the upper portion of the hook. In order to release the latch mechanism, it is only necessary to insert a pin 92 into an aperture 93 in the wall 81 of the element 80 and pivot the same to the position in which it is shown in Fig. 6, thereby permitting withdrawal or opening of the latch structure as a whole. It will be obvious that

the latch structure is self-locking upon return movement of it, since the element 80 can rotate sufficiently, upon striking the hook body portion 67', to permit passage thereof to its closed position.

Although the invention has been shown and described with reference to a specific embodiment thereof, it is contemplated that various changes and modifications thereof can be made without departing from the scope of the invention as set forth in the following claims.

We claim:

1. In a hook having a body and a hooked portion terminating in a bill, safety latch means for closing the hook comprising, a latch arm pivotally mounted on the bill of the hook and adapted to extend to the body of the hook, a latch keeper pivotally mounted in the body of the hook, said keeper having a portion providing an arcuate face substantially concentric about the pivotal axis of the keeper normally in the path of and partially outwardly of a mating face formed on the outer end of said arm, said keeper being movable to a position to permit passage of said arm, and a projection on said keeper positioned outwardly of said arcuate face and normally out of the path of said arm, said projection being in the path of said arm when said keeper is pivoted a predetermined distance in a direction to permit passage of said arm whereby outward movement of said arm is effective to return said keeper to normal position through the medium of said projection.

2. In a hook having a body and a hooked portion terminating in a bill, safety latch means for closing the hook comprising, a latch arm pivotally mounted on the bill of the hook and adapted to extend to the body of the hook, a latch keeper pivotally mounted in the body of the hook, said keeper having a portion providing an arcuate face substantially concentric about the pivotal axis of the keeper normally in the path of and partially outwardly of a mating face formed on the outer end of said arm, said keeper being movable to a position to permit passage of said arm, a projection on said keeper positioned outwardly of said arcuate face and normally out of the path of said arm, said projection being in the path of said arm when said keeper is pivoted a predetermined distance in a direction to permit passage of said arm whereby outward movement of said arm is effective to return said keeper to normal position through the medium of said projection, and spring actuated means engageable with said keeper for releasably retaining the same out of the path of said arm when rotated said predetermined distance and for urging said keeper to its normal position when it is in any position short of said predetermined position.

3. In a hook having a body and a hooked portion terminating in a bill, safety latch means for closing said hook comprising a latch arm pivotally mounted on the bill of the hook and adapted to extend to the body of the hook, a latch keeper pivotally mounted in the body of the hook on an axis parallel to the axis of said arm in the plane of said arm, said keeper having an arcuate face of limited extent substantially concentric with its axis and normally in the path of and partially outward of the outer

end of said arm, said arm having a mating face formed thereon for engagement with said arcuate face, said keeper being rotatable to a position to permit passage of said arm, a projection on said keeper positioned outwardly of said arcuate face and normally out of the path of said arm, said keeper being rotatable to a position to permit passage of said arm while maintaining said projection out of the path of said arm, said keeper being further rotatable to a position to bring said projection into the path of said arm, spring urged means for releasably holding said keeper in said last mentioned position, said spring urged means being effective to urge said keeper to its normal position when said keeper is in any position intermediate its normal position and the position is occupies when releasably held by said spring urged means.

4. In a hook having a body and a hooked portion terminating in a bill, safety latch means for closing the hook comprising, a latch arm pivotally mounted on the bill of the hook and adapted to extend to the body of the hook, a latch keeper pivotally mounted in the body of the hook, said keeper having a portion providing an arcuate face substantially concentric about the pivotal axis of the keeper normally in the path of and partially outwardly of a mating face formed on the outer end of said arm, said keeper having an outwardly projecting shoulder at the inner end of said arcuate face and a flat spot therebeyond, said keeper having a convexly arcuate surface beyond the flat spot, said keeper having a notch forwardly of said first-mentioned arcuate surface, a spring-pressed pin in said body adapted to bear against said convexly arcuate surface when the keeper is in normal, latch arm retaining position, for yieldably holding the keeper in said normal position, said keeper being pivotally movable to a release position permitting passage of said arm, the forward wall of said notch being in the path of said arm when the keeper is in said release position whereby outward movement of the latch arm returns said keeper to normal position, said spring-pressed pin bearing upon said flat spot when the keeper is in release position for releasably holding the same in said position.

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