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HOISTING BLOCK

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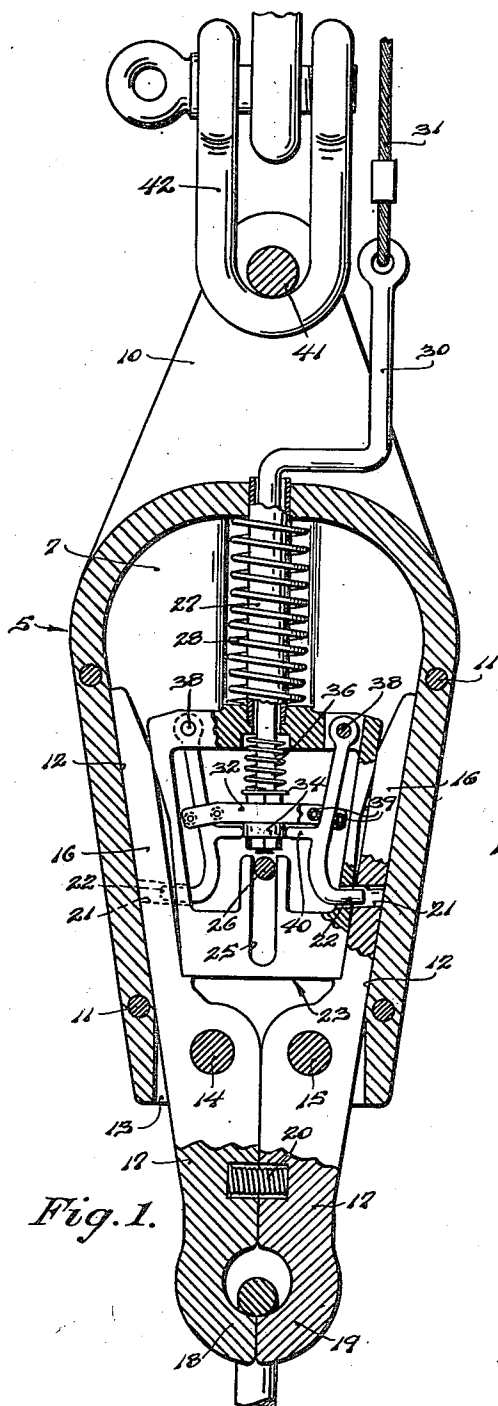


Fig. 1.

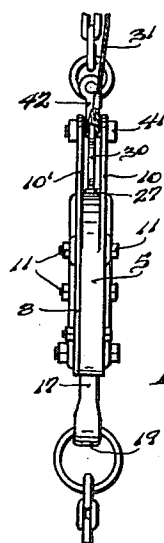


Fig. 3.

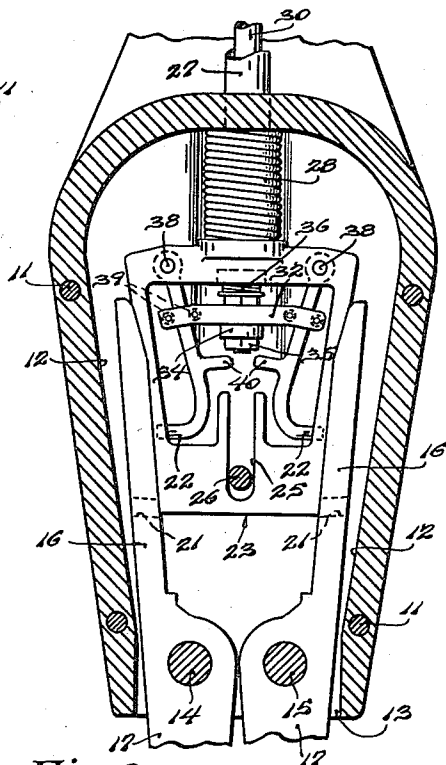


Fig. 2.

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HOISTING BLOCK

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9 Claims. (Cl. 294—116)

This invention relates to hoisting blocks and especially is directed to improvements in structure of the character illustrated and described in my prior U. S. Patents issued March 7, 1933 and May 9, 1933, Nos. 1,900,194 and 1,907,436

Particular objects and advantages of my present invention, primarily directed to perfecting the lock mechanism and safety devices of a hoisting block, will become apparent in the course of the following detailed description and in the claims annexed thereto, the invention consisting in the novel construction, adaptation, and combination of parts hereinafter described and claimed.

In the drawing:—

Figure 1 is a longitudinal vertical section of my now preferred embodiment of the invention, parts being shown in side elevation.

Fig. 2 is a somewhat fragmentary similar sectional view representing the several parts of the block in the positions assumed in releasing the work-engaging jaws; and

Fig. 3 is an elevational view to a reduced scale to indicate the approximate transverse dimensions of the block.

Referring to the drawing, I represent by the numeral 5 a body casting formed with a cavity 7 therein and which with a closure plate 8 constitutes the block housing, said body casting and the closure plate providing a pair of spaced apart cheek extensions 10, 10' receiving a cross bolt 41 for engaging a clevis 42 to which a hoist line such as a cable or chain is attached. Bolts 11 secure the housing parts rigidly.

As shown, said cavity 7 is formed to a relative horse-shoe configuration with the side walls 12 of the same converging downwardly to an open throat 13, in close proximity of the opening of which throat are a pair of fulcrum pins 14, 15, located at opposite sides of the transverse vertical center of the cavity. Supported by said pins at a point approximately medially of the lengths are lever members the upper or power arms 16 of which extend into the cavity of the block and the lower or work arms 17 of which depend below the block in the provision of companion jaw elements 18, 19. Said power arms, in the normal closed disposition of the jaws, seat against the side walls of the block cavity, extending, as shown, divergently upwardly from the fulcrum pins 14, 15. A spring 20 received in associated sockets of the work arms of the levers tends to spread the jaws for opening the same.

At or about the mid-height of the power arms of said levers the same are recessed in the pro-

vision of sockets 21 which preferably incline slightly upwardly and operate to receive locking fingers 22 carried by a wedge member 23. Said wedge member, arranged for vertical tracking engagement in the cavity of the block between the power arms of the levers, is cast with a vertical slot 25 acting to receive a stationary pin 26, said pin and slot co-acting with an aperture in the head wall of the cavity 7 through which a tubular pipe 27 extends for guiding the wedge movement. Said pipe, threaded in the upper end of the wedge and receiving a major spring 28 about the same for influencing the wedge downwardly between the power arms 16, further operates as a sleeve for the reception of a control rod 30, said rod having an offset portion at its upper end and engaging a release line 31, the lower end projecting below the sleeve into an open center core of the wedge and extending through a medially disposed aperture of a cross-arm 32 located therein. In rigidly securing the cross-arm and rod, the lower end of the rod is threaded and receives a nut between which and an annular collar 34 the cross-arm is engaged, a lock nut 35 being threaded over the rod below the collar for clamping the assembly. Said collar serves as an abutment, in the manner hereinafter described, to prevent accidental dislodgment of the locking fingers 22 from the power arm sockets 21. 36 indicates a minor spring surrounding the rod and seating between the upper wall of the wedge and the cross-arm 32 for normally depressing the cross-arm.

More particularly as respects the locking fingers, the same extend vertically upwardly from their horizontally disposed pedal extremities 22 and at the upper ends are formed with eyes which are received over wedge-carried fulcrum pins 38, said upwardly extending arms passing between pairs of rollers 39 journaled in bifurcate extensions of the cross-arm 32. More especially, said upward extensions of the locking fingers diverge outwardly from one another and, in response to upward movement of the cross-arm, are forced inwardly about the axis of the fulcrum pins 38 to retract the extremities 22 from sockets 21. Each of said locking members are further provided at their approximate mid-heights below the cross-arm with opposing horizontal fingers 40 which abut opposite sides of the collar 34 in the normal socketed disposition of the fingers 22.

The invention and the operation of the same is believed clear from the foregoing. As the release line 31 retracts the collar 34 from between the fingers 40, the outer roller of the

cross-arm 32 engages the locking arm to draw the fingers 22 inwardly. The minor spring is initially compressed until the fingers are completely released from the sockets 21, following
 5 which the major spring 27 is compressed and the wedge drawn upwardly, allowing the spring 20 to open the jaws 18, 19. Release of line 31 operates to spread the power arms 16 as the wedge is forced downwardly between the same
 10 under the influence of major spring 27, the locking fingers being subsequently forced into the sockets 21 as the minor spring asserts its power. The relatively steep pitch of the locking arms allows a limited movement of the cross-arm upwardly to extract the collar from between the
 15 fingers 40 prior to disengagement of the fingers 22 from their sockets.

It is not my intention to expressly limit myself to the disclosure and purpose that the invention
 20 shall be confined only by the scope of the hereto annexed claims.

What I claim, is:—

1. In a hoisting block, a pair of lever members fulcrumed at their mid-lengths to provide
 25 companion work-engaging jaws below and power arms above the respective points of fulcrum suspension, a chambered wedge supported for movement in the space between said power arms for spreading the same to close the jaws in response to one direction of travel and for releasing the power arms to open the jaws in response to travel in the opposite direction, slot-and-pin guide means for said wedge, a pair of aligned
 30 sockets in the wedge-tracking faces of said power arms, openings from the chamber of said wedge located to communicate with said sockets in the jaw-closed position of the wedge, a pair of locking arms pivoted at their upper ends to the wedge and arranged for lateral swinging movement in said wedge chamber, said locking arms converging with respect to one another toward the free ends of the same with said free ends being turned outwardly to provide fingers extending through said wedge openings for engagement in the sockets of the power arms, a release
 45 rod extending through the head wall of the wedge into the wedge chamber, a cross-arm carried by said rod and provided with bifurcate extremities arranged to straddle the locking arms, rollers journaled between said bifurcate extremities to engage the inner and outer surfaces of the locking arms, said rollers operating to retract and spread the fingers from and into engagement with the power arm sockets responsive to the movement of the release rod, a major spring for influencing said wedge into jaw-closing position, and a minor spring for influencing the cross-arm to spread the fingers into engagement with the power arm sockets, said release rod being operative to compress the minor and the major springs successively.

2. The structure as defined in claim 1, and positive locking means carried by said release rod for engagement with the locking arms to prevent accidental retraction of the fingers from the power arm sockets.

3. In a hoisting block, a pair of lever members fulcrumed at their approximate mid-lengths to provide power arms above and work-engaging jaws below the point of fulcrum suspension, a wedge arranged for movement between the power arms and normally operating to spread the same for maintaining the jaws in closed position, said power arms providing sockets in the wedge-tracking faces of the same and the wedge providing

opening openings normally aligned with the power arm sockets, fingers pivotally carried by the wedge to extend through said wedge openings into socketed engagement in the power arms, a major and a minor spring respectively operating to oppose retraction of the wedge and the fingers, and means for compressing said minor and major springs successively to release the wedge from its jaw-closing position, said means including a vertically movable member arranged for riding engagement over the fingers.

4. In a hoisting block, a pair of lever members fulcrumed at their approximate mid-lengths to provide power arms above and work-engaging jaws below the point of fulcrum suspension, a member operative to said power arms for closing the jaws, fingers of a relative L-shape coupled together and pivotally carried by said member to normally engage the free ends of the same in the power arms for locking the member against movement, a major spring operating to oppose retraction of the member from its jaw-closing position and a minor spring operating to oppose retraction of the fingers from their normal dispositions in the power arms, and means for compressing said minor and major springs successively to release the member from its jaw-closing position.

5. In a hoisting block, a pair of lever members fulcrumed at their approximate mid-lengths to provide power arms above and work-engaging jaws below the point of fulcrum suspension, a member operative to said power arms for closing the jaws, means pivotally carried by said member adapted to engage the power arms in the jaw-closed position of the member for locking the member with respect to the power arms, a spring operating to oppose movement of the member from said locked position, positive means acting to lock the locking means against accidental dislodgment from the power arms, and means operating in conjunction with retractive movement of the member for rendering said last-named means inoperative.

6. The combination with a movable member, and means for guiding said member, means comprising a pair of pivotally supported fingers operative to lock said member against movement, a spring for influencing said fingers into locking positions, positive means for locking said fingers against retraction from the locking positions of the same, and means for rendering said finger-locking means and the spring successively inoperative to allow movement of the member.

7. In combination with spaced elements provided with pin-receiving openings in the inner walls of the same, oppositely movable pins located between said elements arranged for engagement in said openings, means coupling said pins for conjoint movement, a spring operative to said coupling means for influencing the pins into engagement in said openings, and means carried by said coupling means to normally lie between the pins to operate as an abutment in preventing accidental retraction of the pins from the openings.

8. In lock structure, the combination of a pair of spaced arms having aligned pin-receiving openings in the inner walls of the same, a pair of pins arranged for movement oppositely of one another into and from engagement in said openings, a spring tending to influence said pins into engagement in said openings, means also influenced by said spring into the space between the pins to act as an abutment for the pins to prevent accidental dislodgment of the pins from the openings, and

means for retracting said means to withdraw the pins.

9. In lock structure, in combination with means providing spaced walls and an element supported
5 in the space between said walls for movement longitudinally relative to the walls, a pair of spaced-apart pins carried by said element and movable oppositely of one another in a plane at cross angles to the plane of movement of the element into
10 positions, when disposed at the outer limits of their movement, whereat said walls are engaged by the pins for resisting said relative movement

of the element, a spring acting to influence said pins directly from one another into their wall-engaging positions, means movable into the space between the pins to act as an abutment in maintaining the pins in their wall-engaging positions,
5 and means for moving said last-named means from its abutment-forming position whereby to allow movement of the pins directly toward one another for releasing the element for relative
10 movement of the latter longitudinally as respects the walls.

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