Nov. 5, 1929. N. EKBERG 1,734,719

GRABHOOK

Filed Sept. 16, 1927

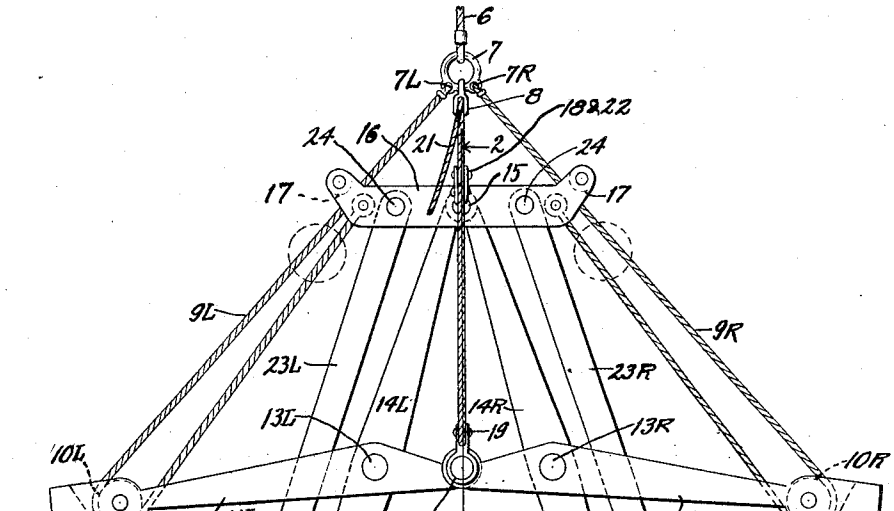


FIG. 1.

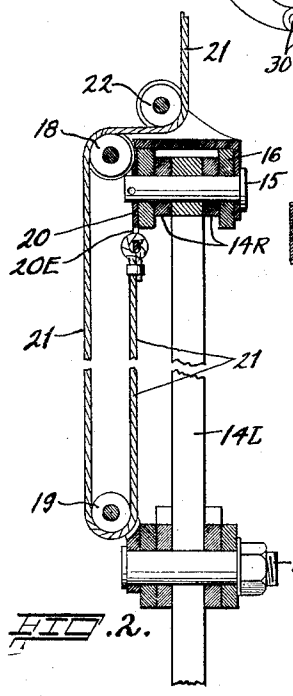


FIG. 2.

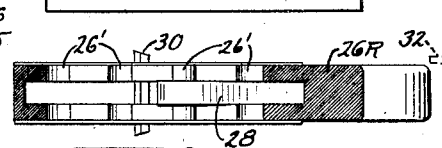


FIG. 3.

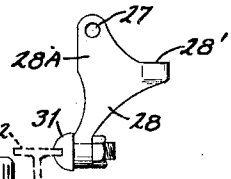


FIG. 4.

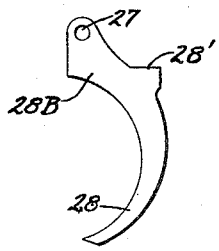


FIG. 5.

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UNITED STATES PATENT OFFICE

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GRABHOOK

Application filed September 16, 1927. Serial No. 219,904.

My invention relates to grab hooks of the class used for lifting and handling heavy articles such as stones in quarries, heavy blocks and crates of various descriptions, where cranes or like hoisting means are used.

The main object is to provide a simple, highly efficient, inexpensive and easily manipulated grab hook of the class mentioned. Further objects will appear in the following specification, reference being had to the accompanying drawing, in which—

Fig. 1 is a front view of my device suspended by a cable and in position to grasp a block.

Fig. 2 is an enlarged vertical central sectional view as at line 2—2 in Fig. 1.

Fig. 3 is an enlarged horizontally sectional view as on line 3—3 in Fig. 1.

Figs. 4 and 5 are side elevations of modified forms of clamping members to be used with my device.

Referring to the drawing by reference numerals 6 designates a lifting cable of any hoisting apparatus and connected to a suitable hitch such as the ring 7 at the lower central part of which is hung a single sheave block 8. 7R and 7L are eyes in ring 7 one at each side of the sheave 8 for retaining the upper ends of cables 9R and 9L respectively. Said latter cables extend downwardly and outwardly to and under sheaves 10R and 10L respectively said sheaves being mounted rotatably in the outer end parts of two arms 11R and 11L pivotally connected at 12 and vertically below the sheave block 8, both of said arms being shown in horizontally extended position in Fig. 1. Equidistant from and near the pivotal connection 12 in each arm, I provide another pivot pin 13R and 13L, passed transversely through each arm and through bars 14R and 14L, said bars being in inverted V-shape and pivotally connected on a pin 15 fixed transversely in the center of a horizontal yoke 16 which comprises two counterpart bars between which said bars 14R and L are pivoted as described. 17 are rollers arranged transversely between the two extreme ends of the two members of the yoke. 18 is a sheave mounted in vertical plane at the front center of bar 16, and 19 is a similar sheave in a block extending upward from the pivot 12 of arms 11R and 11L, all three said sheaves being in vertical alinement with each other. 20 is a block suspending plate on the front part of pivot 15 and has an eye 20E in which is fixed one end of a cable 21. It will be understood that either arm 11R or 11L comprises two horizontally spaced and parallel members one at each side of bars 14R or 14L and the outer ends of said arm members are suitably united beyond the sheaves 10R and 10L.

The cables 9R—9L extend from fixed positions outwardly of pivots 24 in the yoke 16 downwardly to and under the sheaves 10R and 10L, respectively, thence up to and secured in the eyes 7R—7L respectively, of ring 7, the latter bight of each said cable passing by and engaging each a roller 17 in the end parts of the yoke 16. The cable 21 extends downwardly from its eyelet 20E, under sheave 19 thence upwardly to and over sheave 18 (see Fig. 2) thence inwardly and under a vertical sheave 22, fixed over joint 15 thence upwardly and over the sheave 8 and outwardly therefrom for manipulation by an operator as will presently be described.

23R and 23L are right and left outer, angularly arranged bars each parallel to and outwardly of the bars 14R and 14L respectively. These bars are pivotally fixed at 24 in the yoke 16 and their lower ends terminate on a common level with the lower ends of bars 14R and 14L, all of said lower termini being each bored transversely for pairs of pins 25R and 25L. 26R and 26L are counterpart shoe members each comprising two horizontally spaced plates arranged on opposite sides of the lower ends of each pair of bars 23R and 14R or 23L and 14L and pivotally engaged by the pins 25R or 25L as the case may be. Said shoes are thus suspended in outwardly projecting horizontal positions at all times. The side members or plates of each shoe are provided with elongated horizontal registering slots 26S with a number of transversely registering notches 26′. 27 is a pin arranged transversely in each said pair of slots and may be moved to any pair of said notches 26′ each of said pins serving as suspending means for an upwardly directed, 28A of a clamp member as 28 in Fig. 1, and said tongue adapt-

ed to be guided between the plates and bored for said pin. It is obvious that the pins can be thus pressed endwise out of each clamp member when it is desired to change or replace such members, as hereinafter described. The slots 26 are wide enough to permit the pivot pins and the clamp members to be moved to any of the notches 26′ and thus regulate the distance between the clamp members according to the size of block 29 to be raised (see Fig. 1) and moved. The clamp members are each normally suspended from their pins in a vertical plane and directed outwardly from it where a wide transverse shoulder 28′ is provided to limit outward swinging movement of the lower end, said lower end of each clamp being directed inwardly and downwardly and its terminus made in various forms for engaging an article as 29. In Fig. 1, 20 are pivoted padded members arranged to bear against opposite sides of the block 29 when the grabhook is closed. In Fig. 4 the lower end of member 28 includes a large screw head 31 the slit of which opens inwardly and horizontally to engage the flange of an I-beam 32 or other structural flanged bar 32 (shown dotted). In Fig. 5 the lower part of the member is simply in the form of an inwardly directed hook.

In the use of my device the crane or other device used and from which the grabhook is suspended is first placed so that the device is directly over an article to be lifted, as 29 in Fig. 1, the lever arms 11R and L being about in horizontal alinement. Then the clamp members are located the required distances apart, close to opposite sides of the block. Then lifting movement on cable 6 is applied and the direct pull on cables 9R—L pulls the outer ends of levers 11R—11L upwardly and swings them toward each other simultaneously shortening the distance between the pivots 13R and 13L and closing bars 14R—23R and 14L—23L toward each other with a powerful clamping leverage which closes the clamp members 28 against the opposite sides of 29 in a powerful grip. In this upward movement of the lever bars 11R—11L it is obvious that their common pivot 12 is moved down approximately to the position shown dotted in Fig. 1, and furthermore the cable 21 will yield freely to conform to the extended distance between sheaves 19 and 8, the free end of said cable hanging from the sheave 8 and accessible for releasing the grabhook from an article 29 which has been moved to a desired place. It will be readily understood that when an article as 29 has been lowered and set in place, the cable 6 is allowed to be slackened. Then the grip on the block is released when the operator grasps the free end of cable 21 and pulls down on it, causing fulcrum pin 12 to be pulled upwardly from its lower petition (dotted in Fig. 1) by shortening the distance between the sheaves 19 and 8. This upward forcing of the fulcrum 12 causes the arms 11R and 11L to spread and simultaneously spread the arm fulcrum points 13R and L which in turn spreads the bars 14R—14L and 23R—23L and their shoes 26R—L, thus causing the clamp member 28 to be released from the article 29.

The bars 23R—14R and 23L—14L arranged in opposite pairs as described may also be aptly termed pinch bars.

I claim:

1. In a grabhook of the class described adapted to be portably suspended by a ring, a horizontal yoke normally in spaced relation below said ring, a pair of main pinch bars pivotally secured in said yoke and extending downwardly in inverted V-form, a pair of secondary pinch bars aranged parallel to and outwardly of each of said main bars and having their upper ends pivotally secured in said yoke, the lower ends of each adjacent pair of said bars apertured in horizontal alignment and a grabhook member fixed to each pair of apertured ends and suspended therefrom in horizontal alignment, a removable article-engaging hook in each of said grabhook members and adjustable horizontally therein, and means moving said opposite pairs of pinch bars toward each other with said lower ends to cause said article engaging means to engage opposite sides of a block or similar article.

2. The structure specified in claim 1 in which said grabhook members comprise each two parallel plates with corresponding lower horizontal edges, said plates provided with horizontally registering elongated slots with notches in their lower part each of said hooks comprising an arm slidable longitudinally between said plates, a transverse removable pin in the upper part of said arm and adapted to rest selectively in any of said notches, each of said arms extending downwardly and outwardly from said pin and a transverse shoulder at said outer part adapted to bear against said lower edges of the grabhook member to limit outward movement of the lower part of the arm.

3. The structure specified in claim 1 in which said means for closing the pinch bars comprises a pair of lever arms pivoted together between the lower parts of said main pinch bars each pivoted to one of said main pinch bars and each having a long integral arm outwardly of said latter pivot and means for oscillating the outer ends of said levers to move their common pivot in a vertical line and their pinch bar pivots simultaneously towards or away from each other to close or open said pairs of pinch bars as required.

4. The structure specified in claim 1 in which said means for closing the pinch bars comprises a pair of lever arms pivoted together between the lower parts of said main

pinch bars and pivoted each to one of said main pinch bars and each having a long integral arm outwardly of said latter pivot and means for oscillating the outer ends of said levers to move their common pivot in a vertical line and their pinch bar pivots simultaneously toward or away from each other to close or open said pairs of pinch bars as required, said latter means comprising for each of said levers, a sheave at the outer end, a cable fixed in said suspension ring and passed outwardly and downwardly to and around said sheave, thence upwardly in parallel relation to the outer bight and fixed in said yoke, and auxiliary hand operated means for oscillating said lever arms.

5. The structure specified in claim 1 in which said means for closing the pinch bars comprises a pair of lever arms pivoted together between the lower parts of said main pinch bars and pivoted each to one of said main pinch bars and each having a long integral arm outwardly of said latter pivot and means for oscillating the outer ends of said levers to move their common pivot in a vertical line and their pinch bar pivots simultaneously toward or away from each other to close or open said pairs of pinch bars as required, said latter means comprising for each said lever, a sheave at the outer end, a cable fixed in said suspension ring and passed outwardly and downwardly to and around said sheave, thence upwardly in parallel relation to the outer bight and fixed in said yoke, and auxiliary hand operated means for oscillating said lever arms, said auxiliary cable means comprising an upper sheave block suspended centrally from said ring, another sheave block fixed to the common pivot of said lever arms, cable fastening means at the center of the yoke, a cable fixed to said latter means extending downwardly therefrom under the sheave of the block at said common pivot thence upwardly to and over the upper sheave and hanging freely from said latter sheave in accessible position.

In testimony whereof I affix my signature.

NELS EKBERG.