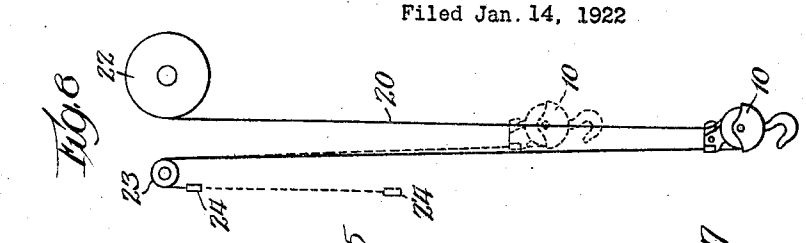
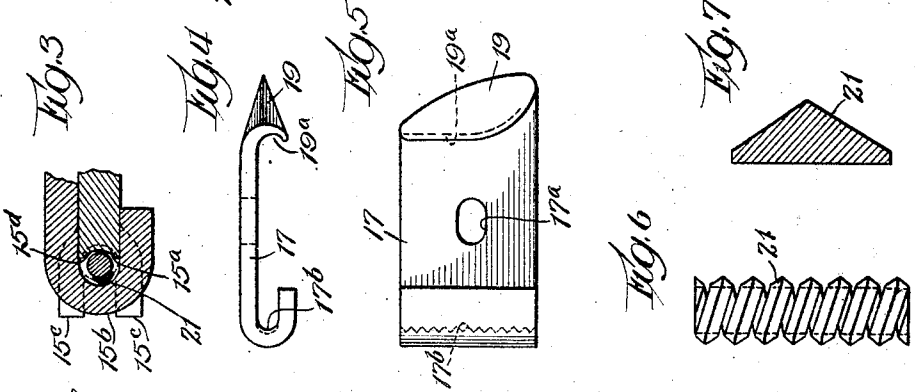
May 10, 1927. 1,628,403

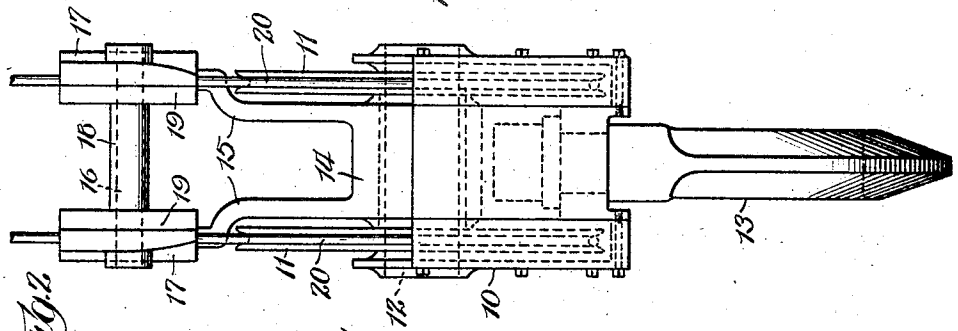
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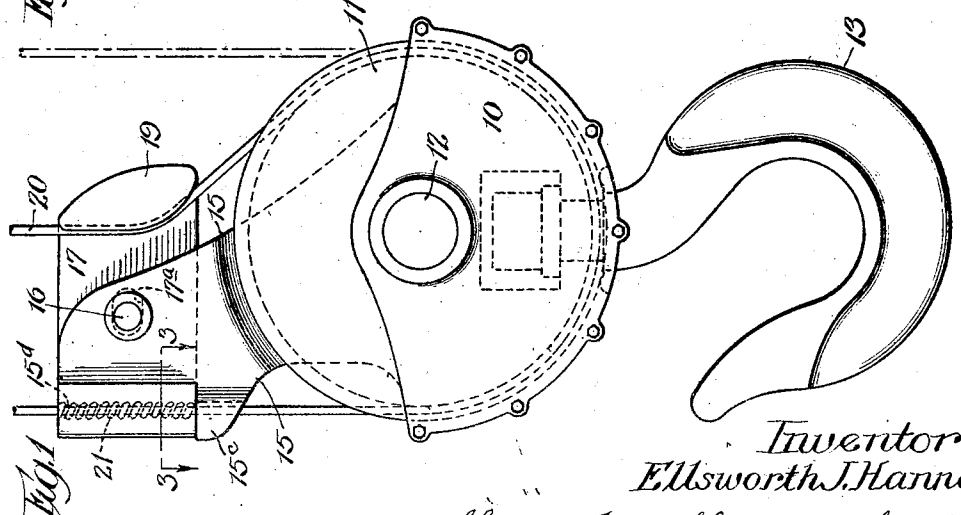
REDUCTION BLOCK

Filed Jan. 14, 1922




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# UNITED STATES PATENT OFFICE.

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## REDUCTION BLOCK.

Application filed January 14, 1922. Serial No. 529,162.

This invention relates to improvements in reduction blocks or pulleys which are used in conjunction with cranes, derricks, or other lifting devices. In practice the load to be lifted by a crane or hoist is often much less than the maximum capacity thereof and time is lost by the slow lift occasioned by the action of the reduction block with which the crane is equipped.

The object of this invention is to provide a reduction block, in the use of which, when a small load is to be lifted, the reduction feature of the block may be wholly eliminated or to lessen the reduction power thereof if it is one of a multiple reduction type, thus enabling the crane or hoist to effect a straight lift of the load or to lift it in less time than would be required if the complete reduction powers of the block were utilized. This object is attained by providing a block with a locking device which is actuatable to grip the cable on the anchor side of the block, whereupon, as will be clear, the block, together with the load carried thereby, will be supported entirely by the cable on the drum or power side thereof.

Other objects relate to features of construction and arrangement which will more fully hereinafter appear, taken in connection with the accompanying drawings, wherein—

Figure 1 is a side elevation of a two sheave reduction block, showing my cable-locking mechanism;

Fig. 2 is a front elevation thereof;

Fig. 3 is a sectional view, taken on the line 3—3 of Fig. 1;

Fig. 4 is a plan view of the locking plate;

Fig. 5 is an elevation of the same;

Fig. 6 is an elevation of the cable-engaging coil;

Fig. 7 is a cross sectional view thereof; and

Fig. 8 shows diagrammatically my improved block suspended by a cable between a winding drum and a point of anchor.

Similar reference characters indicate the same elements throughout the drawings, in which—

10 indicates generally the casing of my improved reduction block which carries a pair of sheaves 11, 11 upon a shaft 12, the construction of such parts being of any preferred form. A load supporting hook 13 is carried by and suitably swiveled in the yoke 14, through which the shaft 12 extends. The yoke, in the embodiment of the double reduction block herein illustrated, is provided with a pair of upwardly extending brackets 15, 15, which in their upper portions lie substantially in the respective planes of the sheaves 11, 11, as shown in Fig. 2. A shaft 16 extends through the upper portions of the brackets 15, 15 and carries thereon a pair of locking plates, 17, 17, each having an elongated hole $17^a$, through which said shaft extends, said plates being retained in position on the shaft, as shown in Fig. 2, by the spacing tube 18. One end of each of the locking plates is suitably reinforced and provided with a portion offset from the plane of the plate body, as shown, this offset portion 19 having a groove $19^a$ of suitable diameter to receive therein the hoisting cable 20 and, preferably, having the general curvature shown in Figs. 1 and 5, for purposes to be hereinafter set forth. The opposite end of each of the plates 17 is U-shaped, and has the free end overlying a portion of the surface of the corresponding bracket when in assembled relation as shown in Figs. 1 and 3. The surface of the edge $15^a$ of bracket 15 is concave and has threads $15^d$ therein corresponding to resilient coil 21, which is secured in the position shown in Fig. 1 by said threads and coacting threads $17^b$ formed in the inner curved portion of the plate 17—see Fig. 4. The bore of the coil 21 is such that the cable 20 will pass freely therethrough, and a suitable slot $15^b$ to receive said cable is provided in the plate guide $15^c$, which is preferably formed integral with the bracket 15.

In operation the cable extends from the winding drum 22 of any hoisting apparatus to and around the sheave of my improved reduction block, and thence to a point of anchorage 23, if the block be one of a single sheave only. If the block be one of greater reduction power as shown in the embodiment of my invention herewith disclosed, the cable, after passing the first sheave of my block, passes around the sheave of an ordinary reduction pulley, usually carried by the crane, thence again to my device, and so on to the final point of anchorage on the crane. It will be understood that the runs of the

cable extending between the sheaves of my reduction block and the said point of anchorage or other pulleys carried by the hoisting apparatus pass through the respective coils 21 carried by said block.

When it is desired to use my device as an ordinary reduction block, the cable enters the block, as shown by dotted lines in Fig. 1. If the block is of a single sheave and the load to be lifted requires less than one-half the minimum power of the lifting crane, a saving of time required for making the lift can be effected by eliminating the reduction power of the block. This is done by inclining the top of the block shown in Fig. 1 to the right, and inserting the power run of cable 20 into the groove $19^a$, as shown in full lines in said figure. The hook 13 is then secured to the load to be lifted, and as the cable becomes taut under the action of the hoisting mechanism, the plate 17 having drawn the ply of cable to the left is moved to the right, as viewed in Fig. 1, and causes the coils 21 to creep in the surrounding threads $15^d$ and $17^b$ thus effecting a reduction in diameter of the coil and a firm gripping of the cable passing therethrough. It will be clear that after this engagement of the cable occurs the entire weight of the load carried by hook 13 will be borne by the single ply of cable on the power side of the block, and that the anchor side of the cable above the coil will hang idle. As shown in Fig. 8 this slack may be taken care of by a weight 24, thus precluding any danger of the idle cable becoming entangled with the block or load.

It will be seen that the plate 17 can move only in a substantially horizontal direction, as viewed in Fig. 1, because of the guiding action of the lug $15^c$ hereinbefore mentioned, and that this movement of the plate causes a uniform gripping of the cable throughout the length of the coil. It will also be apparent that the heavier the load carried by the hook the more tightly will the coil be pressed into gripping contact with the cable and that this will be the effect also due to the tapered friction surfaces of the coil, from any tendency of the same to slip from the surrounding threads in which it is retained.

It will be seen that the invention above described is adapted for use on single as well as multiple sheave blocks, and that when used with blocks of the latter class the same may be converted to blocks of less reduction by locking any desired run of cable as above described, or the entire reduction power of the block may be eliminated by adjusting the proper locking mechanism.

Although I have shown and described a certain form of my invention, it is obvious that changes may be made therein without departing from the scope thereof; and I do not, therefore, wish to be restricted to the form shown and described, except where so limited in the claims.

What I claim is:

1. In combination a reduction block, a cable movable therethrough, and means associated with said block adapted to be contracted into engagement with said cable to lessen the reduction power of said block.

2. In combination a reduction block having a plurality of sheaves, a cable movable through said block and coacting with said sheaves, and means adapted to engage said cable to prevent movement thereof relatively to any desired sheave.

3. In combination a reduction block, a cable running therethrough, means to grip and lock said cable to said block for elimination of reduction thereby, said means having an opening therein through which said cable passes, said means being actuatable by the load carried by said block.

4. In combination a reduction block having a sheave, a cable of substantially smooth exterior coacting therewith, means to lock said cable relative to said block and independently of said sheave for direct movement of one run of said cable with said block in either direction.

5. In combination a movable reduction block, a cable extending therethrough, means to lock one run of said cable to said block against relative movement in either direction, said means comprising a member engaging and actuated by the other run of said cable.

6. In combination, a reduction block having a sheave, a cable of substantially smooth exterior normally coacting therewith, and means carried by said block above said sheave for preventing relative movement in either direction of said cable therethrough.

7. In combination, a reduction block, a cable movable therethrough, a bracket carried by said block, and means comprising a slidable member and a cable-surrounding gripping member carried by said bracket for preventing the movement of said cable through said block.

8. In combination, a reduction block, a cable movable therethrough, coiled cable-gripping means associated with said block, and means adapted to actuate said gripping means.

9. In combination, a reduction block, a cable movable therethrough, coiled cable-gripping means associated with said block, a movable member adapted to actuate said gripping means into circumferential contact with said cable, and a guide adapted to direct the movement of said member.

10. In combination, a reduction block, a cable movable therethrough, a bracket carried by said block, a plate slidably carried by said bracket, and coiled cable-gripping

means actuatable by the movement of said plate.

11. In combination, a reduction block, a cable movable therethrough, cable-gripping means supported adjacent said block and circumferentially surrounding a portion of said cable, and means for actuating said gripping means.

12. In combination a reduction block, a cable running therethrough, a coiled gripping member having a flattened gripping surface actuatable to engage said cable, and means for actuating said gripping member.

13. In combination, a reduction block, a cable associated therewith, a bracket supported by said block, a plate carried by said bracket, compressible gripping means carried by said bracket and said plate, and means for effecting a compression of said gripping means to prevent the movement of said cable relatively thereto.

14. In combination a reduction block, a cable movable therethrough, a bracket carried by said block, said bracket having a threaded portion, a plate movable relatively to said bracket and having a threaded portion complemental to the threaded portion of said bracket, a resilient coil secured by said threaded portions, said cable passing therethrough, and means for contracting said coil into locking contact with said cable.

In testimony whereof, I have subscribed my name.

ELLSWORTH J. HANNA.