

Jan. 16, 1940.

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2,187,361

SAFETY BLOCK

Filed Nov. 4, 1938

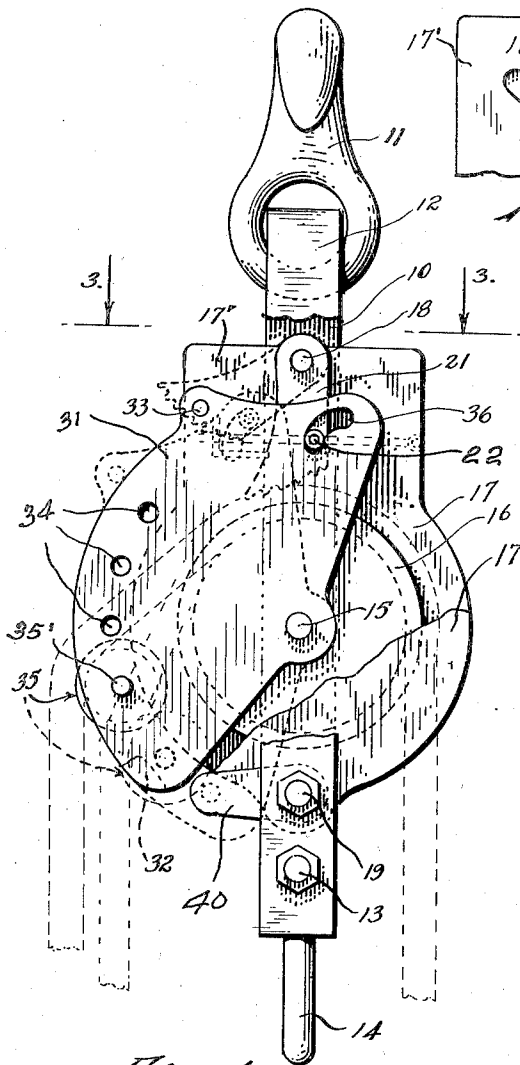


Fig. 1.

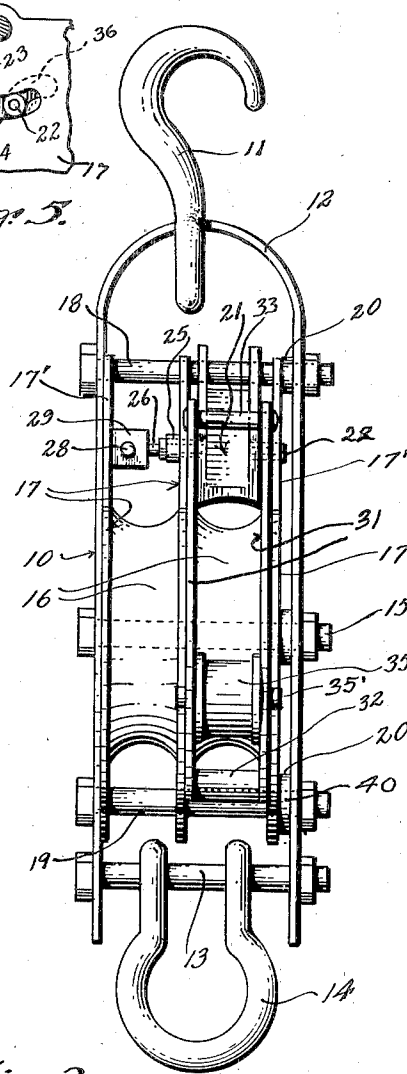


Fig. 2.

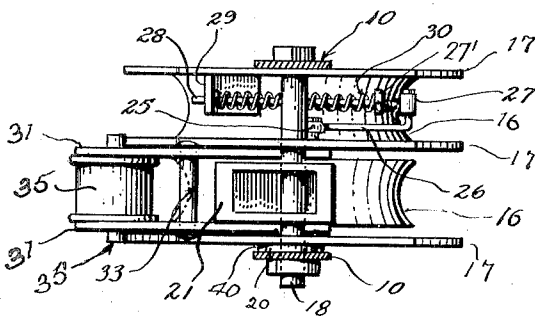


Fig. 3.

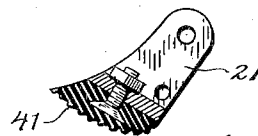


Fig. 4.

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2,187,361

SAFETY BLOCK

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Application November 4, 1938, Serial No. 238,880

3 Claims. (Cl. 188—65.1)

The invention relates to blocks for hoist lines in which means is provided to hold a hoist line against accidental release, and controllable by the outer end of the line, or hauling end, by drawing in of which the load is hoisted, and by paying out of which the load is lowered.

It is a primary object of my invention to present a novel line brake device adapted to be incorporated upon sheave blocks, operative in such manner that it may be controlled by the hauling line to either hold a rope or other line against movement by the load when its outer or hauling end is released, and to allow either further hoisting, or paying out of the rope for lowering of the load at will.

An important aim of the invention is to present a simple construction in such a device embodying novel features contributing to efficiency and durability of such appliance.

Additional objects, advantages, and features of the invention reside in the construction, arrangement and combination of parts involved in the embodiment of the invention, as will be understood from the following description and accompanying drawing, wherein

Figure 1 is a side view of one embodiment of the invention in a sheave block suitable for hand-line and other hoists with one of the cheek plates broken away.

Figure 2 is a front view of the block at the side of the hoist line;

Figure 3 is a bottom view of the article with the line-anchor-eye and its support broken away.

Figure 4 is a fragmentary section of a particular structure of dog;

Figure 5 is a fragmentary elevation from the right of Figure 2, with parts broken away showing the operating pin of the dog and its slot in the cheek plate.

There is illustrated a strap frame 10, substantially in the form of an inverted U, a suspension hook 11 being swivelled in the bight 12, and the lower extremities of the arms having a bar 13 thereacross on which is suspended pivotally a line-anchor-eye 14.

A sheave shaft 15 is fixed between the arms of the frame 10 intermediately of the height of the frame, on which sheaves 16 of the common grooved form are revoluble, cheek plates 17 being interposed respectively between the two sheaves and between the sheaves and the respective side members of the frame. The cheek plates are also connected to the frame 10 by upper and lower assembly bolts 18 and 19, the first engaged through upper extensions 17' of the cheek plates and in the sides of the frame 10, and the one 19 engaged through the lower portions of the cheek plates and the arms of the frame 10, just above the shaft 13. Between the right hand cheek plate 17 and the adjacent side member of the

frame 10, there are washers 20, by which this cheek plate is spaced from the frame.

On the bolt 18 a cable-locking dog 21 is loosely pivoted to swing into close proximity to the right hand sheave 16, the dog being formed with a transversely ridged or otherwise roughened cam face, the normally forward part of which is of greater radius than its rear part, and suitably curved so that large and small cables will be properly gripped when drawn thereunder and over the sheave from left to right as viewed in Figure 1. In such movement of a cable, the dog will grip the upper side of the cable and be drawn with the cable toward the sheave until it so wedges against the cable as to stop its further movement. In order to make certain the movement of the dog into engagement with a cable, it is spring-loaded so as to be pressed toward locking position. Also, means is provided operable by the same rope which engages the dog to control the function of the dog.

The spring loading of the dog consists of an operating pin 22 or shaft fixed transversely through the dog a distance from its pivot 18, and projected through suitable slots 23 in the adjacent cheek plates concentric with the bolt 18. The operating pin is tenoned at its ends and provided with roller sleeves 24 working thereon in the slots 23. The left end of the pin is extended and journaled in an eye bearing 25 formed on the end of a connecting rod 26 which is extended rearwardly therefrom, its ear bent at right angles and engaged revolubly in an eye bearing 27 of a rod 28 extending horizontally forward and engaged slidably through a guide ear 29 formed on the forward part of the upper extension 17' of the extreme left hand cheek plate 17. The rod 28 is of sufficient length to remain always engaged through the ear 29. A protractile helical spring 30 is engaged around the rod 28, confined between the ear 29 and bearing 27' on the rod 28 in advance of the bearing 27, by which means the pin 22 is forced toward the rear, carrying the dog, which is thus held yieldingly in engaging relation to the sheave or interposed cable.

For operating and controlling the dog 21, two sector-shaped lever plates 31 of identical form and size are pivoted on the shaft 15 between the right hand sheave 16 and respective cheek plates 17, these lever plates being free for pivotal movement. They have a radius greater than that of the forward portions of the cheek plates, the latter being formed with body portions concentric with the sheaves and lying outwardly of the sheaves in a normal degree. At the lower parts the lever plates are connected by an interconnected stiffening lug 32, and at their upper parts by a cross pin 33, by which the two are secured rigidly in relation to each other. They have a

series of apertures 34 arranged concentrically beyond the cheek plates, in which a pin 35' is engageable, the apertures of one plate being aligned with those of the other plate, so that the pin is supported transversely in the two lower plates. This pin is removable and insertable in any opposed pair of apertures 34. On it there is revoluble a roller 35, sufficiently grooved to afford a suitable track for a cable drawn over the adjacent sheave 16.

The lever plates at their outer parts extend over a radius of 170 degrees more or less, with respect to the pin 15, and their parts of major radius are located principally at the front of the device, but extending between the upper extensions 17' of the cheek plates 17. At their upper and rearmost parts they are formed with slots 36 receiving the roller sleeves 24 therethrough. These slots extend in a suitable direction to permit the dog 21 to be lifted by forward movement of the upper parts of the plates, due to the wiping action of the rear sides of the slots 36 on the rollers of the pin 22.

In use, the block is engaged with a line in the familiar way, it being possible to anchor one end of a cable to the eye 14, while the cable is threaded back and forth in and between another standard double sheave block and my block, in the familiar way. The load would be attached to the other block, while my block is suspended by the hook 11 as required. The cable being threaded through my block from right to left as viewed in Figure 1, the terminal end of the cable would hang from the rear sheave, being carried over the roller 35, as dotted in the figure. This is termed the "haul line." As long as this is without substantial pull thereon, the roller 35 will be in the upper position illustrated in Figure 1, allowing the dog 21 to be held by a spring 30 in locking engagement with the line which is thus prevented from feeding through the block, and the load sustained by the tackle will be held to whatever position it has been raised. When the outer end of the cable is pulled upon with sufficient force the opposition of the spring 30 tending to hold the dog engaged will be overcome, and by a downward pressure of the cable on the roller 35, moving the lever plates counterclockwise, the slots 36 bear the pin 22 forwardly and swing the dog 21 forwardly and upwardly so as to clear the cable. There must now be applied to the cable sufficient draft to sustain the load, or to hoist it or to allow it to lower properly. The cable may be allowed to be retracted by the load, while sufficient force is applied and maintained to keep the roller 35 depressed, but a quick release will permit the pressure on the roller 35 to be sufficiently relieved to permit the spring 30 to return the dog to engaged position, stopping further descent of the load. Also, in case of a handline, for which my invention is especially desirable, if the line is swung to one side or the other, the cable will ride on the side of the groove of the roller, to frictionally engage the plate 17, which will draw the plates rearwardly at their upper parts, and cause positive movement of the dog to locking position again without shock or abrupt stoppage of movement.

This appliance is particularly useful in hoisting painters' stages and chairs and the like, as well as other loads, its application to the various

uses being readily appreciated by those versed in the art from the foregoing.

In case it is desired to utilize the device as a simple block without my locking device, I have provided a link 40, pivoted on the lower bolt 19, as a part of the lower washer 20, this link having an aperture in its outer end to receive the pin 35' at times, and being of a length to receive this pin when engaged through the lowermost pair of apertures 34 and with the lever plates 10 at their lowermost position.

The dog may be faced with suitable friction material 41, if desired, as indicated in Figure 4, which, may consist of hard, semi-hard, or resilient rubber or other appropriate material, according to the uses contemplated.

It should be understood that while I have disclosed a double sheave pulley, the invention is applicable to others with more or fewer sheaves. Also only one of the sheaves of my article need be used if preferred so that it corresponds to a single sheave pulley.

While I have described particularly the details of one specific embodiment of my invention, it will be understood that this is by way of example only, and I do not regard the invention as limited thereto. On the contrary, modification in the construction and arrangement of the elements may be made in varying degree without departing from the spirit of the invention, within the scope of the appended claims.

I claim:

1. A sheave block comprising a frame, a sheave revoluble therein, a spring loaded dog mounted movably above a sheave having a path such that it may move into wedging engagement with a line on the sheave, a lever connected with the dog to raise the dog from operative position at times, said frame including parallel cheek plates beside the sheave, said dog being pivoted outwardly of the sheave between the plates, said lever consisting of a member pivoted beside the sheave, a roller on the lever lying across the plane of the sheave to receive thereover a line passing also over the sheave, said dog having a transverse pin therethrough spaced from its pivot and said member of the lever being slotted to receive the end of the pin so that movement of the lever will move the pin and dog for operation of the latter.

2. The structure of claim 1 in which said lever includes a part outwardly of and extending a substantial distance in the plane of oscillation of the lever, and having a plurality of mounting means spaced in a series substantially in the direction of said oscillation, and said roller having a shaft alternatively engageable with said mounting means of the lever for the purposes described.

3. The structure of claim 1 in which said lever includes a part extended beside the dog and movable in the direction of operative movement of the dog, said dog having a lateral projection operatively connected with the said part of the lever and extended beyond, a rod swingably mounted thereon, and a spring seated on the frame and under compression against the outer end of the rod in a direction coincident with the direction of engaging movement of the dog.

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