Jan. 7, 1941. H. L. F. DIMMOCK ET AL 2,228,204

CLEAT AND LIKE APPARATUS

Filed Nov. 25, 1939

Fig. 1.

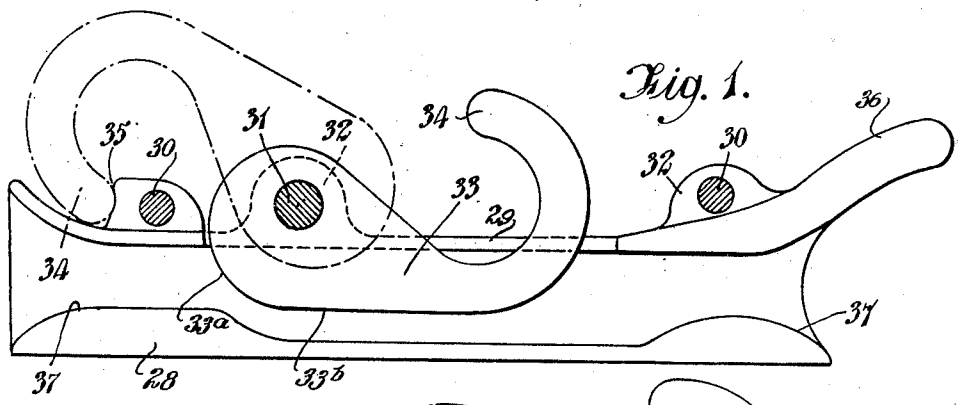


Fig. 2.

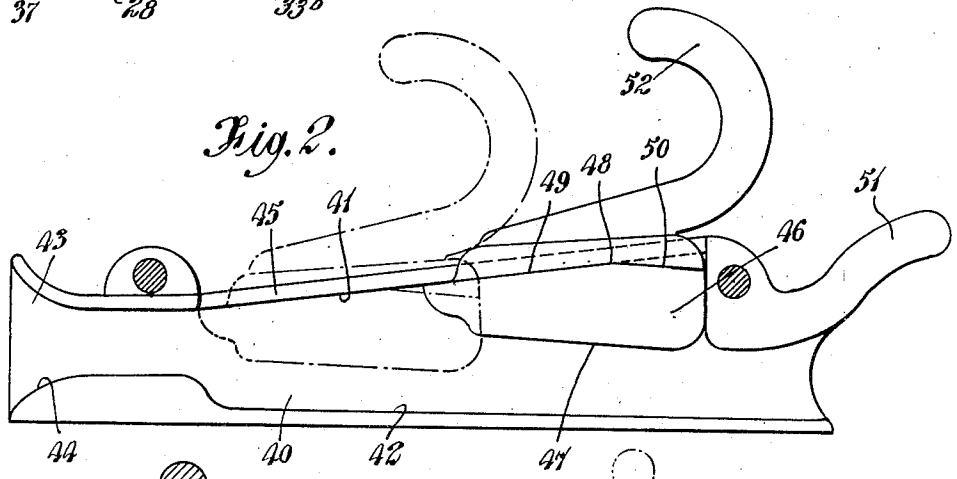


Fig. 3.

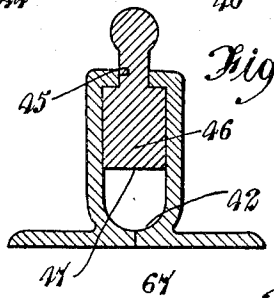


Fig. 5.

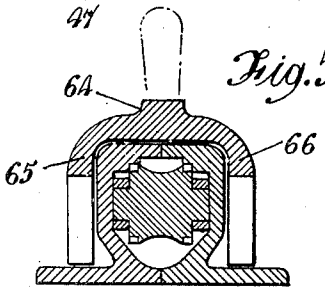
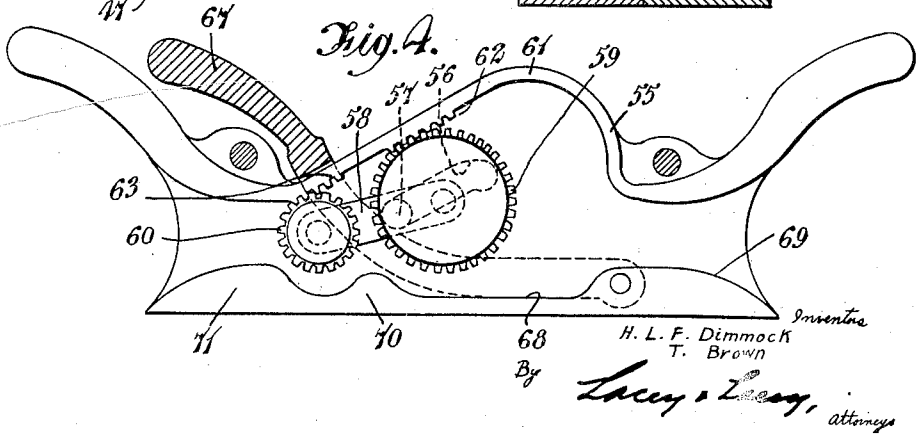


Fig. 4.



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CLEAT AND LIKE APPARATUS

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Application November 25, 1939, Serial No. 306,194
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4 Claims. (Cl. 114—218)

This invention relates to rope cleats of the kind, hereinafter referred to as the "kind defined," comprising two relatively movable parts between which a rope, wire, cable or the like, is normally free to run and which have portions such that when engaged by the rope or the like a pull on the latter in the running direction will automatically cause the members to move relatively to grip and hold the rope.

The object of the present invention is to provide an improved rope cleat of the kind defined which is so constructed that the running rope or wire can readily be brought to rest and held by causing the rope or wire to be bent and without the necessity for any corrugations or roughing on one of the relatively movable members. It is an advantage of the invention that there is little or no risk of damaging the rope or wire by continued use of the cleat.

A rope cleat of the kind defined, according to the invention, is characterised in that one of the two relatively movable parts is in the form of a tubular guide or fairlead for attachment to a fixed support and the other of the two relatively movable parts is carried by the guide or fairlead so as to be movable towards and away from a portion of the guide or fairlead which is humped, the arrangement being such that when the rope or the like is engaged by the movable part, the tendency for the rope to continue moving will cause the movable part to "wedge" against the rope and so bend it around the hump or humps to bring the rope to rest.

The movable part can be mounted to turn about a pivot which is fixed relatively to the guide or fairlead, and may have an eccentric part that in rotating about a pivotal axis can approach or recede from the rope passing through the guide or fairlead. Alternatively, the movable part may be slidable along the guide or fairlead so as to have a wedge action on the rope. Again, the movable part may be a roller so constructed as to be rotatable and movable bodily from an enlarged towards a narrower portion of the fairlead.

As an additional precaution and in order to fasten off the rope, the running end of the rope may be lapped around a pair of horns at opposite ends of the fixed part of the cleat, or around one horn on the fixed part and another on the movable part, depending upon whether it is desirable to retain the rope or the like, simply by the action of the movable part, or to transfer the strain to the horn or horns carried by the guide or fairlead or fixed part.

The invention is illustrated by the accompanying drawing, of which:

Figure 1 is a sectional side view of a rope cleat according to one form of the invention;

Figure 2 is a similar view of an alternative embodiment of the invention;

Figure 3 being a sectional end view on the line 3—3 of Figure 2; and

Figure 4 is a sectional side view of another form of the invention,

Figure 5 being a sectional end view on the line 5—5 of Figure 4.

Referring to Figure 1, the rope cleat comprises a fixed part 28 in the form of a tubular guide which has a flat fixing plate, of conventional design, through which screws can be passed to secure the guide permanently to a fixed support. The fixed part has a longitudinally extending slot 29 near one end and at opposite sides of which the fixed part carries a pair of extending lugs 32 between which the movable part of the cleat comprising a lever 33 is pivotally mounted on a pivot pin 31. The fixed part 28 of the rope cleat is formed in two mating longitudinal sections which are held together by clamped bolts 30 one of which forms the pivot pin for the lever 33.

The lever 33 has an eccentric portion 33*a* blending into a flat portion 33*b* and terminates at its free end 34 in a hook. When the lever is in its inoperative position, indicated by broken lines, it is clear of the rope which is free to run through the guide. The lever is held in its inoperative position by its end 34 springing over the recessed lug 35 on the fixed part of the cleat. At the opposite end of the guide 28 through which end the rope enters, said guide has an integral upstanding and rearwardly extending horn 36.

As the lever 33 is swung in a clockwise direction away from the position shown in broken lines it will engage the rope and movement of the lever will cause it to grip and bind the rope between it and the oppositely disposed part of the guide 28. With a view to increasing the holding ability of the cleat without risk of injury to the rope that part of the guide opposite the lever 33 is humped or undulated as indicated at 37. In this example, two humps are provided which are longitudinally spaced in relation to the lever 33, one being at the inlet end and the other at the outlet end of the guide 28. Thus as the lever moves to grip the rope it will at the same time cause that portion thereof within the cleat to be deflected out from a straight line.

As an extra precaution and for fastening off

the rope, the rope may be lapped around the hook 34 and horn 36.

In the modification shown in Figures 2 and 3, the guide or fairlead 40 has its upper and lower walls 41 and 42 respectively tapering towards the outlet end 43. The lower wall 42 has a hump 44 adjacent the end 43. Sliding in a slot 45 in the upper wall 41, longitudinally of the fairlead, is a wedge member 46 which is guided by the surface of the upper wall 41 so that as it moves longitudinally towards the outlet end of the fairlead, the gripping surface 47 of the wedge member 46 will be guided to approach a rope passing through the fairlead, and will be guided to recede from the rope when moving in the opposite direction. The surface of the wedge member 46 which engages the under-surface of the upper wall of the fairlead is so formed that it can rock slightly about the transverse edge 48 at the junction of the two surfaces 49 and 50. This provision enables the wedge member to accommodate itself to the rope, and ensures the freeing of the rope when the wedge member has been moved to the upper end of the slot. As in the previous case, the inlet end of the fairlead has a projecting horn 51, and the movable member is hooked at 52. As the wedge member 46 moves down and engages the rope it will at the same time due to the hump 44 cause the rope to be deflected out from a straight line.

The wedge member 46 may carry an insert of any suitable friction material. This also applies to the lever 33 of Figure 1.

In the further modification illustrated in Figures 4 and 5 the vertical dimension of the interior space in the guide or fairlead is enlarged near the inlet end and narrows down towards the end from which the rope runs out. Lateral slots 56 are formed in opposite sides of the fairlead, and projecting through each of these slots is a spindle 57 carrying a bracket 58 in which two toothed wheels 59 and 60 are mounted in tandem. The inner surface of the upper wall 61 of the fairlead is formed with racks 62 and 63 meshing with the wheels 59 and 60 respectively. Each wheel is in the form of a roller having a central portion which is hollowed to engage the rope, as clearly shown in Figure 5. The central portion may be roughened or otherwise provided with a gripping surface. A forked lever 64 has its forked arms 65 and 66 straddling the fairlead 55 to engage behind the ends of the spindles 57 which project outwardly through the slots 56. The forked lever 64 is fulcrumed at the lower ends of the forked arms 65 and 66, and has a single operating arm 67 projecting upwardly above the fairlead. It will be seen that as the lever 64 is rocked at its upper end towards the inlet of the fairlead it will cause the wheels 59 and 60 to ride upwardly away from the surface of the bottom wall 68 of the fairlead. When the lever is rocked in the opposite direction the two wheels will ride down towards the lower wall 68. It will be seen that the bottom wall 68 of the fairlead is humped in three places 69, 70 and 71 so that the rope passing through the fairlead will be bent several times by the wheels gripping the rope and forcing the rope against the lower wall 68. The fairlead of this construction has a projecting horn at both ends, as the arm 67 is not suitable for use as part of the cleat, as any pressure on the arm tending to rotate it at its upper end towards the inlet of the fairlead tends also to reduce the pressure between the wheels and the rope.

Although two rollers are shown in Figure 4, it is to be understood that the arrangement would be quite satisfactory for light work with a single roller.

It is to be noted that in the construction according to Figure 2, when the rope or the like is lapped around the horns 51 and 52, the movable member 46 will move rearwardly so that the strain will be taken by the fixed part of the cleat and will not be taken in part by the action of the movable part. In the construction of Figure 4, however, which is intended for heavier work, the rope or the like can be lapped around the horns at the opposite ends of the fixed part so that the strain is taken by the fixed part and by the action of the movable part. If it is desired to relieve all strain from the movable part, the lever 67 is raised.

In all cases when the rope is being hauled in, the movable part of the cleat is out of action, but may still be resting on the rope lightly so that when the rope is released there is sufficient friction on the movable part to cause the latter to travel forward with the rope. As friction material, rubber or fibre will preferably be incorporated in the gripping surfaces in order to reduce any risk of severity on the rope without omitting the requisite friction.

Although the fixed part or guide of the forms of the invention above described are made in two longitudinally split sections it will be understood that the fixed part may be made in one piece.

What we claim is:

1. A cleat including a tubular fairlead having a passage for a rope, said passage being formed with a hump, said fairlead having a horn formed thereon, and a clamping element movably mounted on the fairlead and having a handle defining a horn, said clamping element being disposed above the hump and being movable from a position out of engagement with the rope to a position engaging the rope and deflecting said rope partially about the hump whereby said rope will be locked, said horns being adapted to cooperate with said rope to hold said clamping element in one of said positions.

2. A cleat including a tubular fairlead having a passage for a rope, said passage being formed with a depression, said fairlead having a horn formed thereon, and a clamping element movably mounted on the fairlead and having a handle defining a horn, said clamping element being disposed above the depression and being movable from a position out of engagement with the rope to a position engaging said rope and deflecting the rope into the depression whereby said rope will be locked, said horns being adapted to cooperate with said rope to hold said clamping element in one of said positions.

3. A cleat including a fairlead comprising a pair of mating interconnected sections, said fairlead having a passage for a rope and defining a guide for said rope, said passage being formed with a hump, a horn on the fairlead, and a clamping element movably mounted on the fairlead and having a horn, said clamping element being disposed above the hump and being movable from a position out of engagement with the rope to a position engaging the rope and deflecting said rope partially about the hump whereby said rope will be locked, said horns being adapted to cooperate with said rope to hold said clamping element in one of said positions.

4. A rope cleat including a fairlead having a rope passage formed with a hump, said passage

having inlet and outlet mouths and said fairlead having an enlarged central portion formed with alined inclined slots, a spindle extending transversely of the fairlead and having opposite ends engaging in the slots, a bracket carried by the spindle, a toothed wheel carried by the bracket, a ratchet carried by the fairlead and having teeth engageable with the teeth of the toothed wheel, and a lever pivotally mounted on the fairlead and having slidable engagement with the ends of the spindle, said toothed wheel being shiftable from a position out of engagement with a rope in the fairlead to a position in engagement with the rope for deflecting said rope partially about the hump for locking the rope in the fairlead, said lever being shiftable for shifting the spindle in the inclined slots whereby the toothed wheel will be disengaged from the rope for permitting release of the rope within the fairlead.

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