Nov. 18, 1969 F. W. REILLY ETAL 3,479,014

VERSATILE SHEAVE BLOCK

Filed Oct. 28, 1963

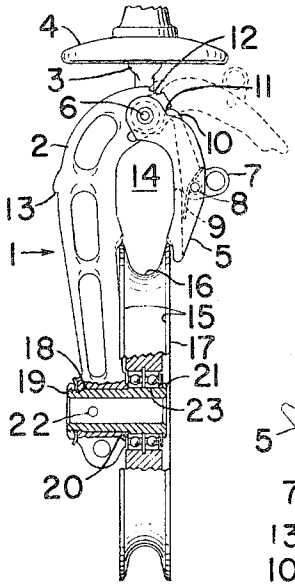


FIG. 1

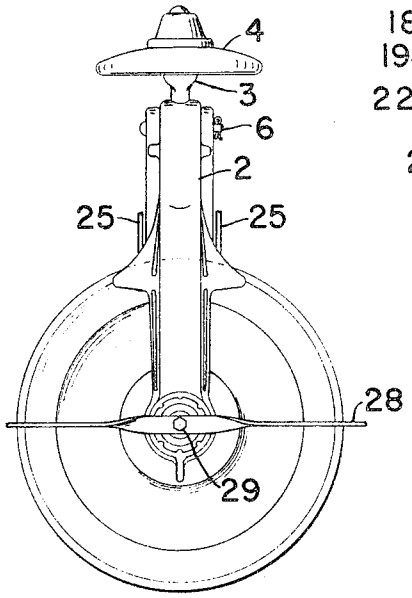


FIG. 2

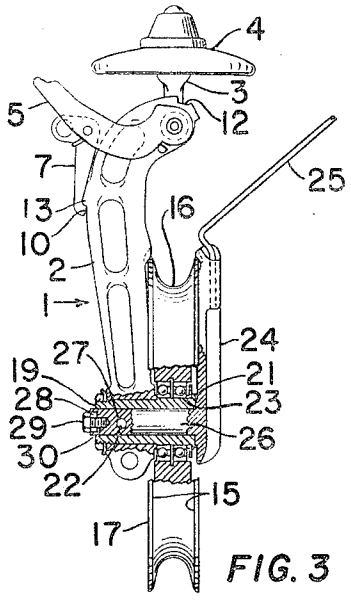


FIG. 3

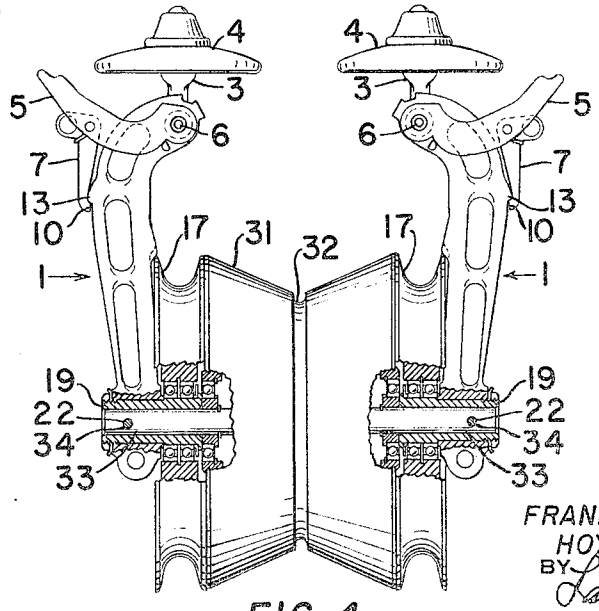


FIG. 4

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United States Patent Office 3,479,014 Patented Nov. 18, 1969

3,479,014

VERSATILE SHEAVE BLOCK

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Filed Oct. 28, 1963, Ser. No. 319,429
Int. Cl. B66d 1/36
U.S. Cl. 254—193 1 Claim

This invention relates to a sheave block and more particularly to such a block which is useful in stringing electric power transmission lines.

In the stringing of electric power transmission lines, there are various requirements necessitating different designs of sheave blocks, depending upon the method of stringing being used. A commonly used method is the stringing of a single transmission line with a single pulling rope. For this type of stringing, an open-side block having a guard which can be latched in open position while the pulling rope is being put into position in the groove of the sheave and then the guard can be latched to form an enclosure with the sheave for the pulling rope and the line is particularly useful. Another type of stringing which is coming more and more into use is stringing by helicopter, especially over difficult terrain, and for this use a partially open block equipped with an outrigger or wing for guiding the line into the block is most useful. Another type of stringing which is being used more widely as time goes on is the pulling of two, three or four conductors simultaneously with a single pulling line, known in the trade as bundling. The purpose of this type of stringing is to achieve better electrical efficiency in that two or more parallel conductors have a much lower reactance than a single larger conductor of the same electrical conductivity. This is true particularly in the transmission of extra high voltages, which is the modern trend in long transmission line design, the multiple parallel conductors resulting in a lower impedance and much better transmission. In stringing such parallel lines, a device known as a running board is used to pull the lines parallel to each other and to guide them into the grooves of the sheave.

Other means of reducing the reactance are being experimented with, such as the so-called hollow or expanded conductor. The hollow or expanded conductor is subject to damage from being twisted and, in some instances, torque arms are used to keep the conductor from rotating. When such torque arms are used, an open-side block is necessary so that the torque arm can pass through the block. Each of these uses has heretofore required a sheave block especially adapted to that use.

One object of the invention is to provide a wire stringing block which is readily adaptable to varied uses.

Another object is to provide a block with an open-side frame and a pivoted guard forming an enclosure for a wire.

A further object of the invention is to provide an open-side block including means for detachably securing thereto different fittings adapting the block for varied types of uses.

Other objects and advantages of the invention will be apparent from the following description, taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a front elevation, partly in section, of a block made in accordance with this invention;

FIG. 2 is a side elevation, partly broken away, showing the guard in closed position, and FIG. 3 is a front elevation, partly in section and partly broken away, of such a block showing the guard in open position and used in connection with an auxiliary frame member to form

a partially open block, with an extended wing or outrigger for helicopter stringing; and

FIG. 4 is a front elevation, partly in section, of a pair of blocks used in connection with a wire stringing drum for stringing multiple wires.

In the drawings, referring now to FIG. 1, there is illustrated an openside wire stringing block generally designated at **1**. This block includes an openside frame **2** preferably made of metal, such as a high strength aluminum alloy, and means **3** attached to the frame for supporting the block from a series of innsulators **4**, only one of which is shown attached to a supporting structure, not shown.

A guard **5** is pivotally attached to the frame **2** on a pivot pin **6**. A locking pawl **7** is pivoted on a pin **8** and a spring **9** urges its detent **10** into locking engagement with selected notches **11** or **12** or with a shoulder **13**. In the full line position of FIG. 1, the guard **5** is held in a closed position, in which it forms an enclosure **14** with the flanges **15** and groove **16** of a sheave **17** and with the inner surface of the frame **2**. The guard is locked in the closed position by the spring **9** forcing the detent **10** of the pawl **7** into the notch **11**. In this closed position, the guard will restrain the pulling rope and the conductor wire from getting out of the block.

When the block is used for stringing hollow or expanded conductors, using torsion or torque arms, the guard is raised to the position shown in broken lines in FIG. 1, in which position it is held by the force of the spring **9** urging the detent **10** into the notch **12**. After the stringing operation has been completed, the guard can be opened to the position shown in broken lines in FIG. 1 or to the fully retracted position illustrated in FIGS. 3 and 4, in which it is held by engagement of the detent **10** with the shoulder **13**.

The frame **2** is apertured near its lower end at **18** to receive a hollow pin **19**, having a shoulder **20** thereon to stop the pin in the correct position and a flange **21** at its outer end. The pin is held in place in the frame by means of a crosspin **22** passed through aligned openings in the frame and in the hollow pin. A bearing surface **23** is formed between the shoulder **20** and the flange **21** to receive the sheave **17** journaled on the pin.

In connection with the stringing of wire by helicopter, the form of block attachment illustrated in FIG. 2 and 3 is used. In this case, the structure is the same as that in FIG. 1, with the addition of an auxiliary frame member or side piece **24**. This side piece supports an outrigger or wing **25** for use in aiding stringing by helicopter, as disclosed fully in the copending application of Delmar C. Sherman, Ser. No. 199,014, filed May 31, 1962, now Patent No. 3,195,862. The auxiliary frame member **24** is attached to the frame **2** by means of a mandril **26** which is adapted to be received in the hollow pin **19**. The mandril has an opening **27** which registers with the openings in the frame **2** and in the pin **19** to receive the crosspin **22** and thereby to lock the mandril and the auxiliary frame member **24** in position.

In stringing of a transmission line by helicopter, it is essential to hold the stringing block in line with the wire being strung with its sheave in a vertical position. For this purpose, an orienting or stabilizing bar **28** is used and it may be suitably attached, as by means of a bolt **29** received in a tapped opening **30** in the end of the mandril **26**. Stays or ties, not shown, are provided to connect with a tower or H-frame, not shown, and with holes provided in the ends, not shown, of the orienting or stabilizing bar **28**. In this use of the block, the guard **5** is not needed and it is swung out of the way and latched in the position illustrated in FIG. 3. In this way, the

guard does not interfere with use of the block, but is left attached, so that it cannot become lost.

In the use of the block illustrated in FIG. 4, a central drum **31** is mounted between two blocks spaced from each other, each having a sheave **17** mounted thereon as illustrated in FIG. 1 and as described in connection therewith. The drum **31** may have a central groove **32** for receiving and guiding the pulling rope. It is quickly assembled with the two blocks by inserting a drum mandril or axle **33** projecting from each end of the drum into the hollow pins **19**, which are also shown in FIGS. 1 and 3. As in the case of the form shown in FIG. 3, the mandril **33** is attached by means of the crosspin **22** being passed through openings in the frame **2**, in the hollow pin **19** and through an opening **34** in the mandril in registry therewith. As in the case of the form illustrated in FIGS. 2 and 3, the guard **5** is latched back out of the way.

The form illustrated in FIG. 4 is of a two conductor bundle block and it will be readily understood that the central drum **31** can be replaced by other similar drums to provide three-conductor, four-conductor, etc., bundle blocks.

By this invention, there is provided a block which is very versatile in its use for stringing electric power transmission lines. It constitutes a single piece of equipment which can be adapted readily for use in various types of stringing jobs, so that the user need not buy and keep on hand a multiplicity of equipment. The block can be used for the stringing of a single transmission line with a single pulling rope. It can be readily so used with or without torque or torsion arms in connection with the stringing of hollow or expanded conductors to keep the conductors from rotating and being damaged by twisting, the block being an openside block to permit passage of the torque or torsion arms through the block in such use. The block can also be used for stringing of a line by helicopter, providing an outrigger or wing for guiding the line into the block, as described fully in the copending application identified above. In addition, the block can be used in connection with a bundle block for the simultaneous stringing of two, three, four, etc., conductors, with bundle blocks being formed by the use of a cooperating, spaced pair of blocks made in accordance with this invention and central drums, for the purpose of achieving better electrical efficiency.

It will be apparent to those skilled in the art that various changes may be made in the invention, without departing from the spirit and scope thereof, and therefore the invention is not limited by that which is shown in the drawings and described in the specification as indicated in the appended claim.

We claim:

1. A wire stringing block comprising a frame having an open side, a guard pivoted at one end to the frame, means associated with the guard to hold it in open position, a pin supported by the frame which pin is hollow throughout its length and has a sheave journaled thereon, a mandril received in said pin, the mandril supporting a wire guiding member at one end and a block stabilizing bar at the other end.

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U.S. Cl. X.R.

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