E. LUDFORD, JR.

SHEAVE BLOCK.

APPLICATION FILED MAY 24, 1912.

1,067,044.

Patented July 8, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

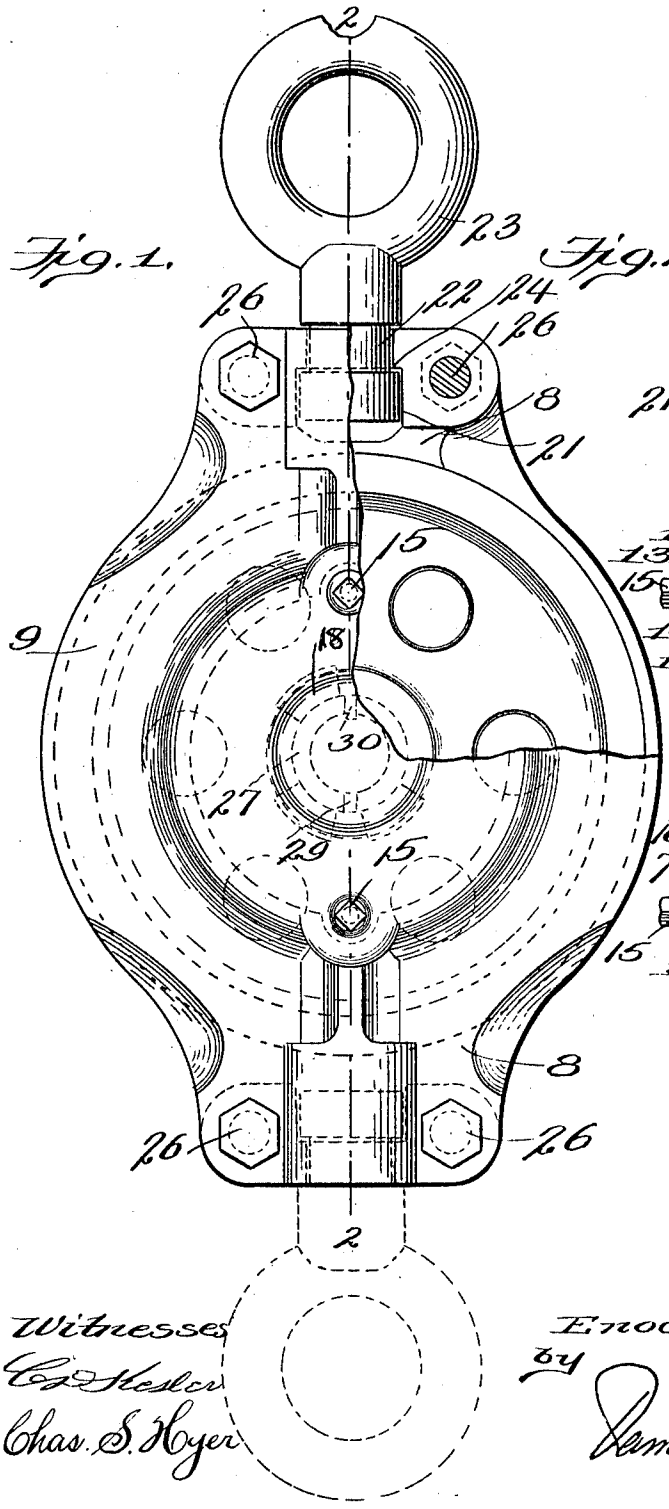
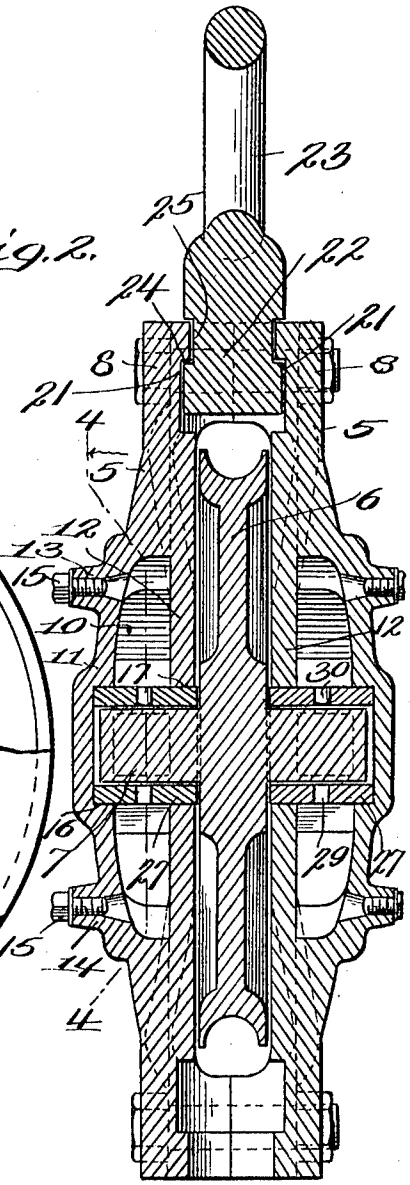


Fig. 2.



Witnesses

Chas. S. Keslar

Chas. S. Hoyer

Inventor

Enoch Ludford Jr.

by

James L. Morris, Jr.

Atty.

E. LUDFORD, JR.

SHEAVE BLOCK.

APPLICATION FILED MAY 24, 1912.

1,067,044.

Patented July 8, 1913.

2 SHEETS—SHEET 2.

Fig. 3.

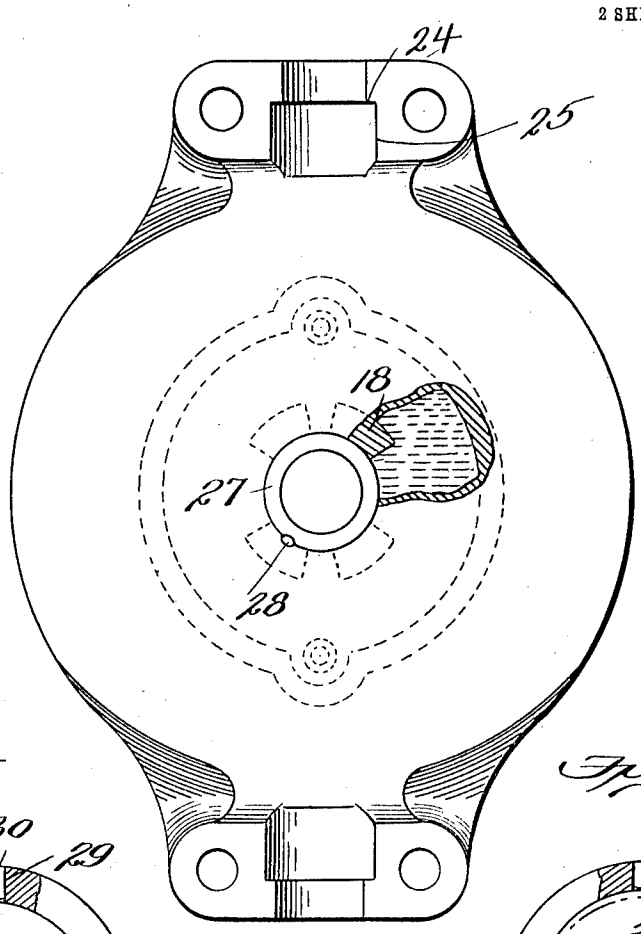


Fig. 5.

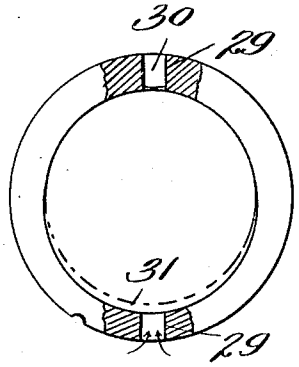


Fig. 6.

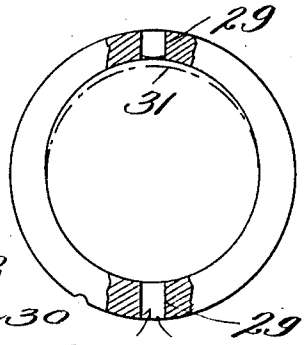
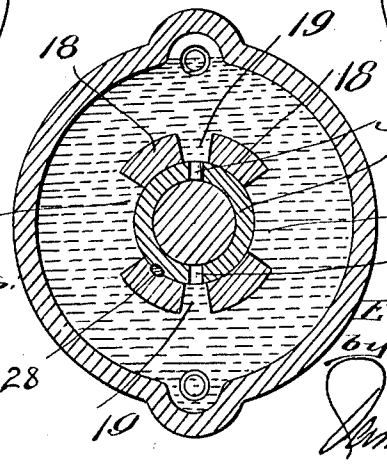


Fig. 4.



Witnesses.

C. F. Keller

Chas. S. Hyer

Inventor

Enoch Ludford Jr

by

James L. Norris, Jr.

Atty

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ENOCH LUDFORD, JR., OF ELIZABETH CITY, NORTH CAROLINA.

SHEAVE-BLOCK.

1,067,044. Specification of Letters Patent. Patented July 8, 1913.

Application filed May 24, 1912. Serial No. 699,532.

To all whom it may concern:

Be it known that I, ENOCH LUDFORD, JR., a citizen of the United States, residing at Elizabeth City, in the county of Pasquotank and State of North Carolina, have invented new and useful Improvements in Sheave-Blocks, of which the following is a specification.

This invention relates to sheave blocks of the type disclosed by my Patent No. 844,159, granted February 12, 1907, and upon which the present invention is an improvement.

The primary object of the invention is to provide a sheave block embodying reversible features or one which is operatively disposable to bring opposite portions of the pulley uppermost to compensate for wear on the side plates and shaft bearings and doubly prolong the wearing life and efficiency of the sheave block without in the least detracting from its strength and efficiency in operation.

A further object of the invention is to provide a reversible sheave block having self-oiling means extending completely around the pulley shaft extremities or the bearings for the latter and operative to economically feed the oil to the opposite shaft extremities and at the same time maintain an effective lubrication of the shaft.

A further object of the invention is to generally improve the structures of sheave blocks and particularly that type embodying self-oiling features and also to provide means for readily changing the application of the swivel to different parts of the pulley and readily reverse the bushings or brasses for the pulley shaft extremities in a convenient and expeditious manner.

The invention consists in the construction and arrangement of the several parts which will be more fully hereinafter described and claimed.

In the accompanying drawings a preferred embodiment of the improved sheave block is illustrated, and therein:—

Figure 1 is a side elevation, partially broken away, of the improved sheave block showing the swivel reversed in dotted lines. Fig. 2 is a transverse vertical section on the line 2—2, Fig. 1. Fig. 3 is an elevation of one of the side plates looking toward the inner portion of the latter and partially broken away to illustrate the surrounding or annular oil chamber therein. Fig. 4 is a transverse vertical section taken in the plane of the line 4—4, Fig. 2. Figs. 5 and 6 are edge elevations of the bushings or brasses for the pulley shaft extremities showing in dotted lines the wear thereof and the reversal to bring a new or unworn portion in engagement with the pulley shaft extremities.

The numeral 5 designates opposite side plates which in all respects are similar in construction and general contour and between which is rotatably mounted a grooved pulley or sheave 6 having a shaft 7 which projects outwardly equally on opposite sides of the center of said pulley. The opposite extremities of each plate 5 are reduced as at 8 and are continuous with an intermediate substantially circular body 9 which is centrally swelled outwardly and formed with an annular oil chamber 10 between the outer and inner walls 11 and 12, the chamber 10 of each side plate having upper and lower oil inlets or nipples 13 and 14 normally closed by screw plugs 15 so that the chamber may be supplied with oil through either of the inlets or nipples that may be situated uppermost. In the center of the inner side of the outer wall 11 a circular recess 16 is formed in alinement with a circular opening 17 through the center of the inner plate or wall 12, the latter presenting a straight flat face adjacent to the side of the pulley 6.

Between the inner and outer walls of the chamber 10 adjacent to the recess 16 and opening 17, reinforce ties or bonds 18 are formed integral with the said walls and preferably arranged in upper and lower pairs, as clearly shown by Fig. 4. The ties or bonds 18 are of segmental contour in cross-section and have spaces 19 between the inner sides of the pairs thereof of considerably less width than the spaces 20 between the outer sides of the outermost member of each pair of the ties or bonds. The ties or bonds 18 resist crushing and breaking strain that may be applied to the outer side of the wall 11 and thus strengthen the center of each side plate, and, furthermore, the said bonds or ties resist downward pressure and fracture that results from the weight strain on the shaft extremities and transmitted to the latter through the pulley 6 in view of the load that may be on the pulley. The bonds or ties by their particular disposition to provide the narrower spaces 19 more effectively feed the oil for lubricating the shaft extremities in a man-

ner which will be presently explained, and the larger spaces 20 facilitate the removal of core from the chamber 10 after the casting operation of the side plate 5 has been completed, the parts of the core being withdrawn through the opening 17.

The inner portions of the walls of the reduced extremities 8 are formed with semicircular sockets 21 which are located at the center, the said sockets combining to form a single socket for the application and retention of the shank 22 of the swivel 23, the semicircular sockets 21 also being formed with offsets or shoulders 24 to product an annular abutment within the complete socket and also contract the upper portion or throat of the latter. The shank 22 of the swivel is formed with an annular groove 25 which receives the shoulder of the socket, as clearly shown by Fig. 2, and when the swivel and its shank are associated with the reduced extremities of the side plates 5 said extremities are separably secured by removable bolts 26.

The openings 17 in the centers of the inner walls 12 of the side plates are larger in diameter than the diameter of the extremities of the shaft 7, and removably and rotatably seated within the openings 17 and the recesses 16 are tubular bushings or brasses 27 which are shown in detail by Figs. 5 and 6, the said bushings or brasses being held against movement by frictional engagement therewith of the shaft extremities through the medium of short keys 28, as shown particularly by Fig. 3, the said keys engaging semicircular grooves formed in the bushings and the walls of the openings 17. The keys 28 may be readily removed to permit worn bushings or brasses 27 to be replaced by new devices of a similar form and kind. Each bushing or brass 27 has diametrically opposed openings or ports 29 extending through the wall thereof, the uppermost of each of these ports being temporarily closed by a wooden or other suitable plug 30 so that the oil from each chamber 10 will be fed upwardly between the inner ends of the pairs 18 of the bonds or ties or through the channels 19 and the lower open ports 29 to the opposite extremities or journals of the shaft of the sheave or pulley. The inner ends of the bushings or brasses 27 project inwardly a slight distance beyond the inner faces of the plates 5 so as to hold the opposite sides of the center web or hub portion of the sheave or pulley out of contact with the said plate faces and by this means the sheave or pulley is centered and runs freely between the inner faces of the plates 5.

The plates 5 as a whole are of strong and durable structure and such material will be used in their manufacture as will be best adapted for the maintenance of strength and durability and to resist fracture due to strains that may be imposed on different portions thereof.

When it is desired to reverse the side plates 5 so as to bring the lower portions thereof together with corresponding portions of the bushings or brasses 27 uppermost, the bolts 26 at both reduced extremities 8 of the plates are removed and the pulley with its shaft released. The bushings or brasses 27 are reversed or simultaneously move with the said plates in view of the fact that the said brasses are keyed to the plates, for instance, from the position shown by Fig. 5 to bring the lower worn surface, as indicated by the dotted line 31, uppermost and the upper unworn surface into lower position, as shown by Fig. 6. The plug 30 of each bushing or brass is then changed so as to occupy the uppermost opening 29 and the swivel 23 is applied to the reduced extremities 8 opposite the said extremities previously occupied by the said swivel, the pulley or sheave 6 and its shaft extremities or journals being inserted in the bushings or brasses 27 as in the original association of said parts. The bolts 26 are then all firmly secured and the sheared or worn portions of the inner faces of the plates 5 produced by the abrasion and wear of the sheave or pulley flanges thereon when the said sheave or pulley was previously operated with the swivel at the other end of the block will be at the lower portion of the sheave, whereas the unworn portions of the inner faces of the side plates will be adjacent to the upper portion of the pulley or sheave or where the greatest strain or pressure is imposed on the sheave or pulley by the rope or cable running thereover.

During the operation of the sheave or pulley the shaft extremities or journals of the latter will be regularly and efficiently lubricated with material advantages in the operation of the device as a whole. It will be understood that the oil will be at a level high enough above the lower opening of each brass or bushing to feed upwardly and engage the extremities or journals of the shaft 7, and as the feed of the oil is at the bottom of the shaft extremities or journals, waste of the oil is prevented in contradistinction to an upper feed wherein the gravitation of the oil or pressure from above would be more effective in forcing the oil outwardly between the lower portions of the brasses and the shaft extremities or journals. It must be considered that the weight of the sheave and the shaft thereof is considerable and the weight pressure of these combined parts on the lower portions of the brasses will always maintain a very close association or contact of the said parts, and this, together with the bottom feed or outlet of the oil, irrespective of the static condition

of the oil within the annular chambers, will result in the dispensation of only so much oil as is necessary to thoroughly lubricate the shaft extremities or journals or in the economical distribution of the oil.

The improved sheave block is adapted for general work, but has been particularly devised for heavy work or where a great strain is brought to bear on the sheave and particularly the upper portion of the latter and overcomes the disadvantages of the common form of sheave block in that it has a freer action and is also more durable or will last for a greater length of time and in fact has about double the life of the ordinary sheave block.

What is claimed is:

1. The combination with a pulley and sheave, of a pair of independently endwise reversible side plates having a similar construction at opposite extremities and each provided with an annular lubricant reservoir at the center and of equal extent and capacity around the center, reversible bushings having opposed openings to communicate with the said reservoirs, the bushings being engaged by the extremities of the pulley shaft, and a device for supporting the block as a whole.

2. A sheave block comprising a pair of side plates, the plates having annular lubricant chambers at the center, means engaging the centers of the plates for feeding the lubricant upwardly in either one of two positions of the sheave block, a pulley having journal devices engaging the said feeding means, and a support for the block as a whole.

3. In a sheave block, the combination with a sheave and its shaft, of a pair of side plates having a similar construction at opposite extremities and separably applied to the sheave and shaft and independently reversible relatively to the latter, the side plates having annular lubricant chambers at the centers thereof of equal extent and capacity around the centers, bushings at the centers of the plates to receive the opposite extremities of the sheave shaft and simultaneously reversible with the plates, the said bushings having feed means which are in part temporarily closed, and a device for supporting the block as a whole.

4. In a sheave block, the combination with a pulley and its shaft, of a pair of side plates having the same construction at opposite extremities and independently reversible and carrying removable bushings to receive the extremities of the shaft, the side plates having annular lubricant chambers extending equally and having the same capacity around the centers thereof and around the bushings, and a device for supporting the block.

5. In a sheave block, the combination with a sheave and its shaft, of a pair of side plates having annular lubricant chambers at the centers thereof, bushings inserted in and removable from the central portions of the side plates from the interior faces of the latter to receive the opposite extremities of the sheave shaft and forming the surrounding intercepting walls between the said shaft extremities and chambers, the bushings having upper and lower openings and the upper openings temporarily closed by removable plugs, and a supporting device for the block.

6. In a sheave block, the combination with a sheave and its shaft, of side plates having the same construction at opposite extremities and independently reversible and between which the shaft is mounted, said side plates having annular lubricant chambers extending equally around the centers thereof on opposite sides of the pulley and also provided with center bearings to receive the shaft extremities, and an attaching device adapted for supporting the block as a whole.

7. In a sheave block, the combination with a sheave and its shaft, of side plates separably applied to the sheave and having center bearings for the shaft extremities, the side plates having annular lubricant chambers extending equally about the centers thereof, and bonding devices between the inner and outer walls of each annular chamber around the adjacent center bearing, the bonding devices being separated by spaces to guide the oil from the chambers upwardly to the center bearings and through the latter to the shaft extremities.

8. In a sheave block, the combination with a sheave and its shaft, of side plates separably associated over opposite sides of the sheave and having annular lubricant chambers at the center thereof and openings in the inner walls and recesses in the inner portions of the outer walls in alinement with the said openings, bushings removably inserted through the said openings into the recesses and having upper and lower feed openings, the upper openings being temporarily closed, the extremities of the shaft extending into the said bushings, and a supporting device for the block as a whole.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ENOCH LUDFORD, JR.

Witnesses:
CHAS. S. HYER,
F. B. KEEFER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."