

(No Model.)

C. H. WEEKS.
PULLEY BLOCK.

No. 438,454.

Patented Oct. 14, 1890.

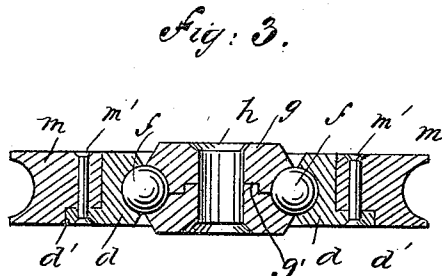
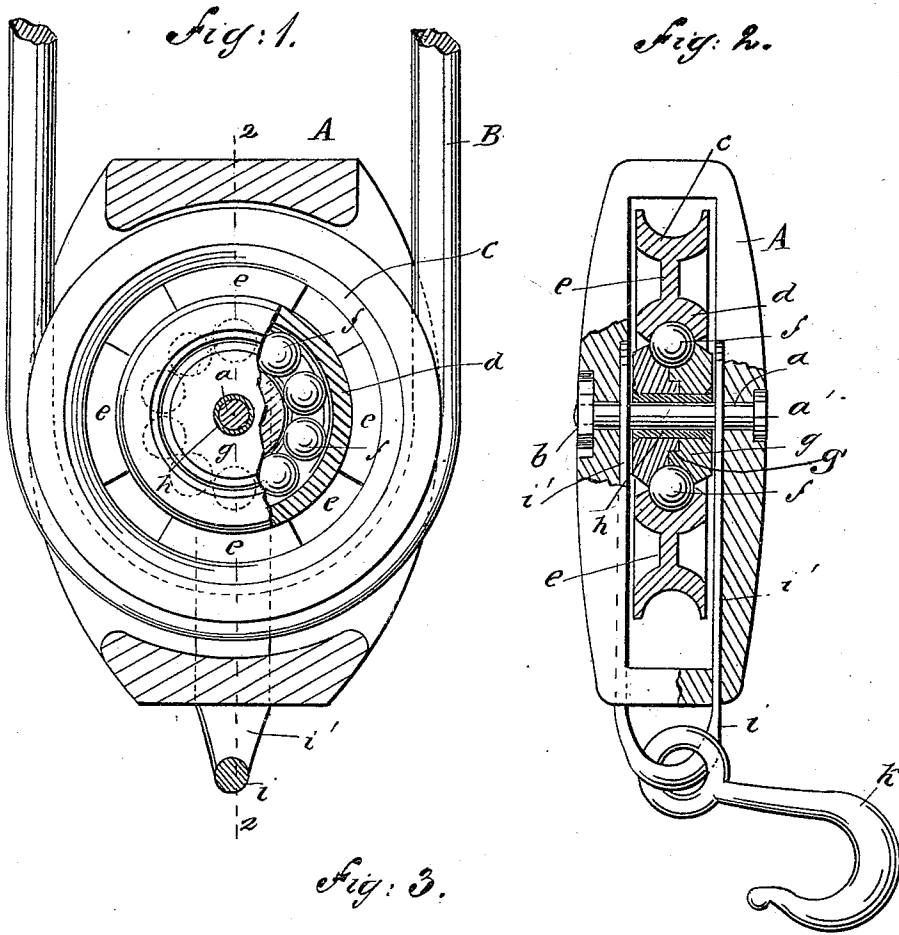


Fig. 4.



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PULLEY-BLOCK.

SPECIFICATION forming part of Letters Patent No. 438,454, dated October 14, 1890.

Application filed March 27, 1890. Serial No. 345,484. (No model.)

To all whom it may concern:

Be it known that I, CALVIN H. WEEKS, of Haverhill, in the county of Essex and State of Massachusetts, have invented a new and useful Pulley-Block, of which the following is a full, clear, and exact description.

This invention relates to a class of pulley-blocks in which anti-friction balls are employed, and has for its object to provide a composite sheave wherein a series of spherical balls are loosely retained in a manner to greatly reduce friction, while simplicity of construction and durability of the parts are also secured.

To these ends my invention consists in the novel construction of parts and their combination, as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side view of a pulley-block, showing a sheave in elevation and partly broken away, embodying the preferred form of my invention. Fig. 2 is an edge view of a pulley-block having the preferred form of anti-friction sheave combined therewith, the block-body being partly broken away and the sheave shown in longitudinal section, taken on line 2 2 in Fig. 1. Fig. 3 is a cross-section through the axis of a modified form of the composite sheave, and Fig. 4 represents a center sleeve employed in both forms of the sheave to hold the parts in place when they are assembled.

The block-body A may be made of metal or hard wood. The usual elliptical form is preferably given to it, and a longitudinal slot for the introduction of other parts is made through the transverse center of the same, of such proportionate length and width that side and end walls are produced of proper strength.

Through the side walls of the block-body A a central transverse round perforation is made for the introduction of a sheave-supporting bolt a, which has its head a' and screw-nut b seated in counterbored enlargements of the perforation, so that these parts will not project as obstructions. The composite sheave

c, which is preferably made integral with a concentric inner and oppositely-grooved rim d, the sides of which rims lie in parallel planes. The connections between these rims may be effected by a series of spaced arms e, or a continuous radial web may be substituted for the arms where great strength is desired. The outer diameter of the rim c is proportioned to suit the size and capacity of the pulley-block of which it forms a part and is grooved of a depth to receive and retain the rope B, with which the block is engaged, and a proper diameter is given to the inner rim d, whereby its true rounded groove will be adapted to receive and prevent a lateral displacement of the spherical balls f, which latter are of equal and such size, proportioned to the grooves that receive them, that when the balls are placed in position a slight space may intervene and thus permit free revoluble movement in the retaining-grooves.

To sustain the balls f in revoluble engagement with the grooved rim d, a sectional hub g, divided transversely to its axis, is provided, composed of two disks of equal diameter and substantially the same thickness, which are preferably joined where they engage each other by a lateral annular tongue-and-socket connection produced thereon. As shown at g' in Figs. 1 and 2, these disks are centrally bored to receive a sleeve h and peripherally grooved to engage the surface of the balls f oppositely to their circumferential contact with the continuous groove in the rim d. It is preferred that the depth of the opposed grooves in the sectional hub and the rim d be so proportioned to the diameter of the balls f that the latter will be almost completely encompassed thereby, which will prevent the introduction of dirt or other matter that would impede the free travel of the balls in their orbit.

A bail-strap I is furnished for the connection of a hook k with the pulley-block, said strap being bent to afford parallel spaced limbs i', which enter slots made in the end wall of the block-body A at such points as will align grooves in the inner faces of the body, and so that these limbs will be flush with the faces of the side walls of the slot in the block.

The limbs i , between which the sheave-bolt a may slide and fit, are of a suitable length, proportioned to that of the block A , to extend therein, so that perforations made oppositely in their end portions will align with the perforations in the block-body as well as the aperture through the sleeve h , so that the bolt a will retain all parts in proper position when these are assembled and the bolt inserted, as shown in Fig. 2.

It is essential that the thickness of the sectional hub g be made such as to afford a close fit of the limbs i against its side walls when the parts are in position, so that compression of the sides of the block-body A by the bolt a and its nuts b will, without injurious strain, clamp the sides of the transversely-divided hub between the ends of the limbs i , but permit a free rotary movement of the rim portion c upon the series of balls f , the rim being of less thickness to give a clearance-space between the sides of the adjacent walls of the slot in the block-body A . When a light pulley-block is to be produced, the portion A may be dispensed with, and by shortening the bolt a the nut b may be caused to bear directly upon one limb i of the bail-strap i , and said limbs upon the hub-sections g , whereby these connected parts will be stably secured together and the rim-piece c be allowed to rotate freely on the balls f .

The sleeve h will operate efficiently if made straight throughout its length of a diameter to be forced with moderate pressure into place until its ends are flush with the sides of the hub g . It is preferred, however, as a measure of additional security, to countersink the bore made for the introduction of the sleeve through the hub upon each side of the said hub suitably to receive a correspondingly-flaring flange on one end of the sleeve, (see Fig. 4,) the other end being similarly flanged by any suitable means when the parts are assembled.

In Fig. 3 there is a modified form of the device shown, wherein a wooden rim m is substituted for the metal rim c , and to facilitate such a construction, which may be utilized in light blocks, the inner rim d is furnished on one peripheral edge with an annular flange d' , and the annular rim-piece m is rabbeted on the inner edge of one side to fit the annular flange d' . The hard wooden rim m is secured to the metal rim d by transverse rivets or screw-bolts m' , which are inserted through the flange d' and rim m . The rim m has a suitably-shaped groove formed in its periphery. The hub g in Fig. 3 is identical in form with the same piece in Fig. 2. This form of construction of the hub is an important feature of the invention, as by making the hub in two pieces that join laterally the rim d may be made integral, the insertion of the balls f being effected by placing them on one side of the hub, which is held concentric to and near the rim d , and then adjusting the

other section of the hub so as to locate all the balls in position, as shown in Figs. 2 and 3.

The hub-sections can be constructed to abut flat against each other without seriously impairing the efficiency of the device. Hence I do not desire to limit the construction to the precise forms shown.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A sheave comprising an annular rim having an internal groove, a transversely-divided peripherally-grooved hub, anti-friction balls interposed between the hub and rim, and a sleeve passing through the hub-sections, securing them together, and having its ends flush with the ends or outer sides of the hub, substantially as set forth.

2. A sheave comprising an annular rim, a transversely-divided hub having the ends of its bore countersunk, balls interposed between the hub and the rim, and a sleeve passing through the hub and having its ends upset in the said countersunk portions flush with the ends or outer faces of the said sections, substantially as set forth.

3. The combination, with the pulley-block or hanger, of the composite sheave therein, consisting in an annular rim, a transversely-divided hub having the ends of its bore countersunk and projecting at its side faces or ends beyond the sides of the rim close to the inner walls of the block or hanger, a sleeve passed through the hub with its ends upset in said countersunk portions, and a bolt passing through the sleeve and sides or arms of the block or hanger, substantially as set forth.

4. The combination, with a block-body that is adapted to receive a sheave and is laterally perforated to receive a sheave-bolt, of a composite sheave comprising an annular rim-piece that is grooved on its outer and inner edges, a series of round balls which engage the inner groove of the rim-piece, a divided peripherally-grooved hub that engages the balls, a sleeve that holds the hub-pieces together, a hook-bearing bail-strap, and a sheave-bolt, substantially as set forth.

5. The combination, with a block-body that is integral and is slotted for the lateral introduction of a sheave and the longitudinal insertion of a bail-clamp, of a transversely-divided hub, a sleeve connecting the hub-sections, a bail-strap which bears upon the hub-sections laterally, and a clamping-bolt, substantially as set forth.

6. The combination, with a block A , slotted to receive a sheave, and a divided sheave-hub g the sections of which interlock laterally at g' , and are grooved peripherally, of a solid rim-piece c , having an inner concentric rim d , a series of balls f , located between the rim d and sections of the hub g , and a clamping-bolt i , substantially as set forth.

7. The combination, with a solid rim c , grooved concentrically on its outer and inner

edges, a transversely-divided hub *g*, which is
peripherally grooved and is provided with
lateral interlocking shoulders *g'* on the hub-
sections, and a series of spherical balls *f*, lo-
5 cated between the rim and hub, of a sleeve *h*,
that is adapted to bear on the hub-sections
with its ends, a bail-strap *i*, the limbs *i'* of

which have a lateral bearing on the hub-sec-
tions, and a screw-bolt and nut that clamp the
parts together, substantially as set forth.

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Witnesses:

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