O. CROSBY.

DERRICK.

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1,052,439.

Patented Feb. 4, 1913.

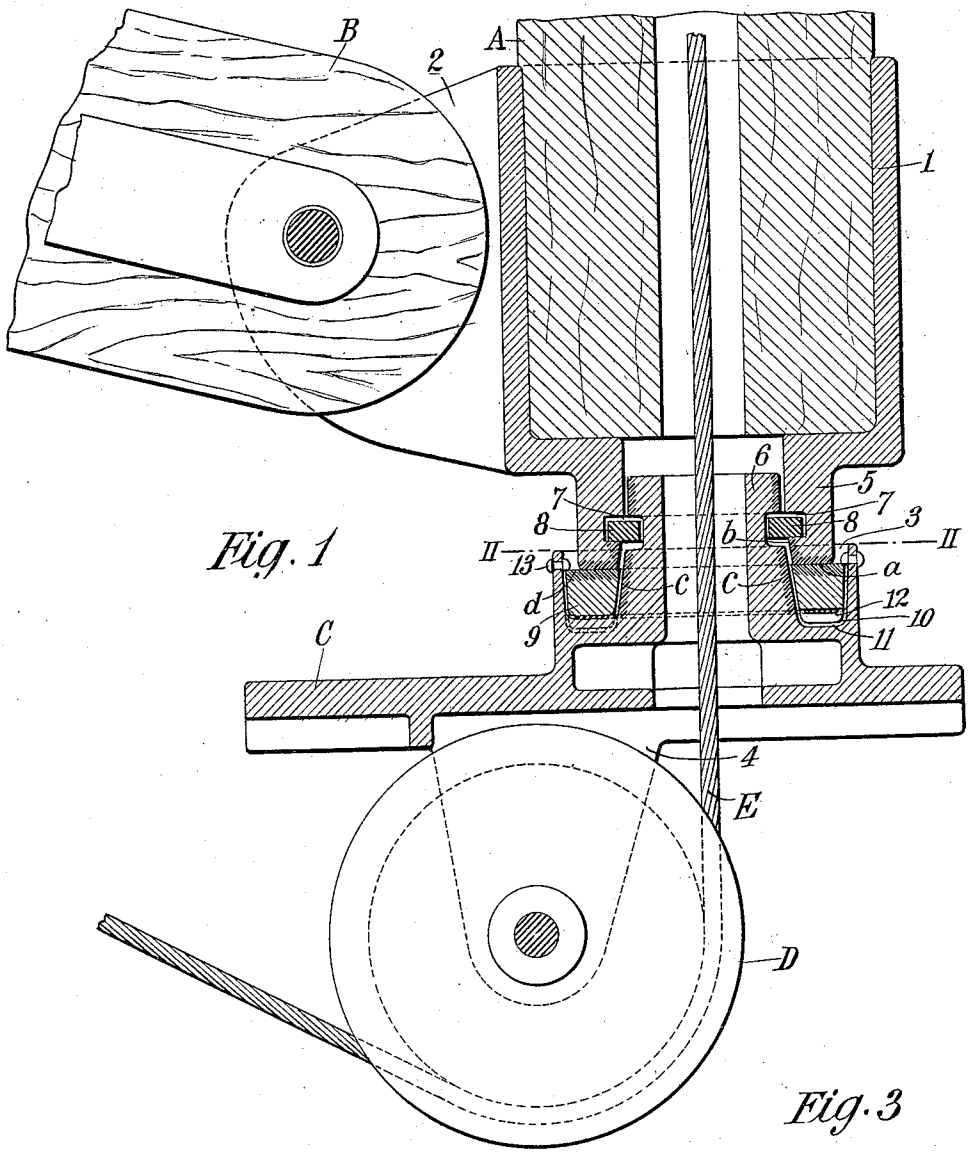


Fig. 1

Fig. 3

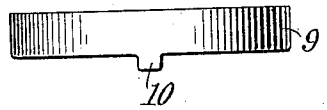
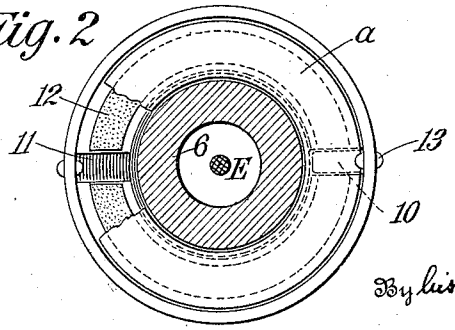


Fig. 2



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UNITED STATES PATENT OFFICE.

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DERRICK.

1,052,439. Specification of Letters Patent. Patented Feb. 4, 1913.

Application filed January 18, 1910. Serial No. 538,581.

To all whom it may concern:

Be it known that I, OLIVER CROSBY, a citizen of the United States, residing at St. Paul, Ramsey county, Minnesota, have invented new and useful Improvements in Derricks, of which the following is a specification.

My invention relates to improvements in derricks particularly the construction of the derrick foot and step thereof, and has for its objects the provision of means to increase the durability of the step of said derrick in order to avoid the necessity of constant disassembling of the derrick for the renewal of worn parts thereof.

My experiments have lead to the discovery that those portions of the derrick which are subjected to the greatest amount of friction, particularly the step of said derrick in operation, cannot be successfully chilled when the bearing surface of said step is integral with the foot-plate, owing to the large amount of material which must necessarily be employed for such a casting and consequent rapid conduction and radiation of heat, which prevents successful chilling of but a portion of its surface.

The construction and operation of the derrick embodying my improved foot and step is described in detail in the following specification and drawing forming a part thereof, in which,

Figure 1 is a fragmentary vertical section of a derrick; Fig. 2 is a part section of the derrick step isolated; and Fig. 3 is an elevation of the friction ring when isolated, showing lugs securing the same against rotation.

Referring to the construction shown in the drawing, the reference numeral 1 designates a socket for the reception of the hollow mast A, the same being provided with opposing integral wings 2, between which the boom B is pivotally mounted. Said socket is swiveled in the step 3 of a base-plate C, the latter being provided with oppositely disposed wings 4 that serve as a hanger for a sheave D, around which is reeved the hoisting rope E, the latter being secured to a hoisting mechanism in any suitable manner, as for example, in accordance with that disclosed in my Patent No. 388,839, of September 4, 1888. The said socket is provided with a reduced neck 5, which is swiveled over a trunnion 6 integral with the base-plate, both said neck and trunnion being provided with opposing recesses 7, adapted to receive keys or locking-pins 8 which can be inserted in the customary manner therein. The lower horizontal face *a* of said neck, which receives the greatest amount of frictional abrasion, and a portion *b* of the adjoining inner vertical face of said neck, which latter receives the principal wear due to side thrusts of said derrick, and also the bearing-surface *c* of said trunnion, are chilled in the manner well known, in order to greatly increase the hardness of the same, and thereby reduce to a minimum such frictional wear and tear thereon during the employment of the derrick for hoisting and other purposes.

A removable friction ring 9, is mounted on the step of the base plate, the same conforming substantially in configuration to the recess or step and being adapted to snugly fit thereon. Downwardly projecting lugs 10 integrally formed on said ring, are adapted to project into recesses 11 of said step and lock the ring against rotation. In order to compensate for any irregularities, in the lower face of said ring, and the bottom of said step, respectively, an annular strip or ring 12 of soft yielding material, such as lead for example, is interposed between them, which fills and embeds irregularities upon them, and thereby gives a uniform bearing surface or support. The upper face *d* of said ring, similar to the faces *a*, *b*, and *c*, is also chilled, in order to enhance its durability and efficiency as a bearing surface. This can be successfully accomplished owing to the fact there is a minimum of material in the friction ring by virtue of its annular configuration and consequently it readily lends itself to the process of chilling, as there is a minimum tendency for any deleterious result by radiation and conduction of heat from the main body of the metal to the chilled surface, during the process of chilling. In order to secure the said friction ring within the recess or step of the base-plate during shipment, I preferably supply rivets 13, although obviously these can be dispensed with if desired.

It is evident that the socket, base-plate and the friction ring, are preferably con-

structed of cast iron as this can be most satisfactorily hardened by chilling.

The term "rotor element" as used in the claims, describes a movable part which is adapted to be mounted on said step, for example preferably a wooden mast having an iron socket secured to the bottom thereof. Also the term friction-element is employed to embrace any material which may be interposed between the rotor element and the step and be subjected to the frictional wear and tear which occurs when the derrick is in operation.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. In a derrick, in combination, a hollow rotor element, an annular step supporting said rotor element and having a trunnion extending upwardly into the same, and a friction element seated in the bottom of said step and serving as a bearing for said rotor element.

2. In a derrick, in combination, an annularly grooved step, the central portion constituting an upwardly extending trunnion, a hollow rotor element fitted to said trunnion, means for locking said rotor element to said trunnion while permitting rotative movement thereon, and an annular friction ring seated in said annular step and serving as a bearing support for the said rotor element, the contacting faces of said rotor element of said friction element being hardened.

3. In a derrick, the combination comprising a hollow rotor element, a base-plate provided with a trunnion and an annular step surrounding said trunnion, an annular friction element positioned in said step and means for locking the same against rotation.

4. In a derrick, the combination comprising a rotor element, a member provided with a step adapted to serve as a bearing for said rotor element, and an independent friction-element interposed between the lower end of said rotor element and said step, and means for locking the same against rotation.

5. In a derrick, the combination comprising a rotor element, a member provided with a step adapted to serve as a bearing for the said rotor element, a friction-element positioned in said step, and means consisting of relatively soft material interposed between the lower face of said friction-element and said step and adapted to produce even surfaces irrespective of any irregularities normally existing in the surface of said step and the lower surface of said friction-element, respectively.

6. In a derrick, the combination comprising a rotor element, a member provided with a step adapted to serve as a bearing for the said rotor element, a friction-element positioned in said step, means for locking same against rotation, and means consisting of relatively soft material interposed between the lower face of said friction-element and said step and adapted to produce even surfaces irrespective of any irregularities normally existing in the surface of said step and the lower surface of said friction-element respectively.

7. In a derrick, the combination comprising a hollow mast, a socket secured to the lower end of said mast and having a downwardly projecting annular neck, a base-plate provided with a trunnion adapted to project into said neck and having an annular step surrounding said trunnion, an annular friction-element positioned in said step, the surfaces of said socket, said trunnion and said friction-element, which are subjected to friction, being abnormally hard in order to reduce frictional abrasion to a minimum, and means for compensating for any irregularities in the lower surface of said friction-element and the surface of said step in contact therewith, whereby said friction element is caused to present an even bearing-surface to said mast.

8. In a derrick, the combination comprising a hollow mast, a socket secured to the lower end of said mast and having a downwardly projecting annular neck, a base-plate provided with a trunnion adapted to project into said neck and having an annular step surrounding said trunnion, an annular friction-element positioned in said step, the surfaces of said socket, said trunnion and said friction-element, which are subjected to friction, being abnormally hard, in order to reduce frictional abrasion to a minimum, means for locking same, and means for compensating for any irregularities in the lower surface of said friction-element and the surface of said step in contacting therewith, whereby said friction element is caused to present an even bearing surface to said mast.

In witness whereof, I have hereunto set my hand at the city of St. Paul this third day of January 1910.

OLIVER CROSBY.

Witnesses:
ELIJAH BAKER,
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