

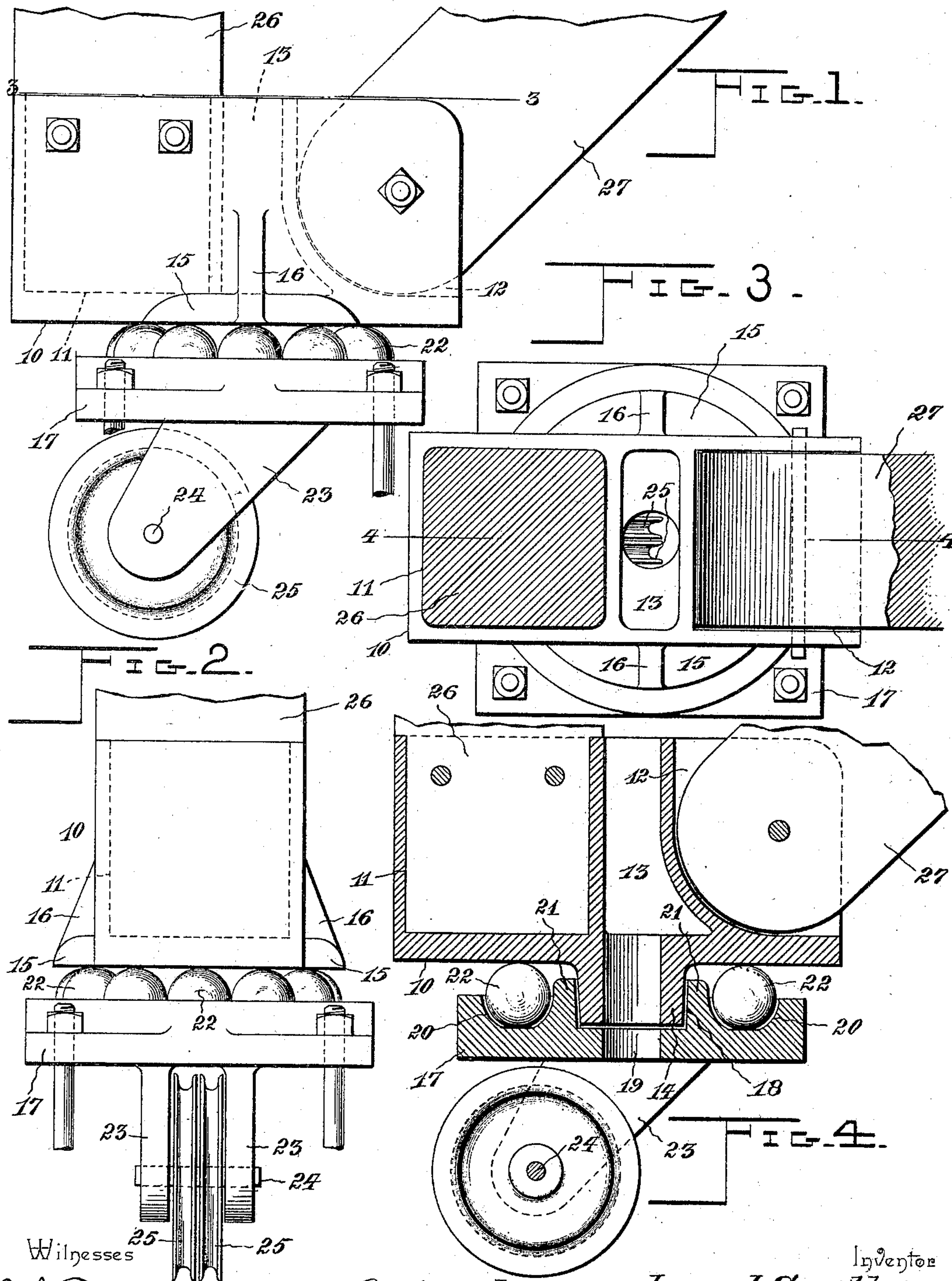
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J. J. SMITH.  
FOOT BLOCK FOR DERRICKS.

(Application filed July 12, 1899.)

(No Model.)



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## FOOT-BLOCK FOR DERRICKS.

SPECIFICATION forming part of Letters Patent No. 634,917, dated October 17, 1899.

Application filed July 12, 1899. Serial No. 723,606. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES J. SMITH, a citizen of the United States, residing at Cobleskill, in the county of Schoharie and State of New York, have invented a new and useful Foot-Block for Derricks, of which the following is a specification.

My invention relates to improvements in foot-blocks for derricks of that class wherein a revoluble standard or post and a pivoted boom are carried by a single block adapted to turn in a horizontal plane on a vertical axis; and the objects in view are, first, to provide an improved construction which accommodates a series of bearing-balls arranged to sustain vertically the weight of the foot-block and the parts carried thereby and said bearing-balls isolated from engagement with the trunnion of said foot-block, thus providing an enlarged base-support for the foot-block, and, secondly, to provide for the support on the base-plate of guide-sheaves that direct the cables to the free end of the pivoted boom, said supports for the sheaves arranged to confine them against lateral displacement.

With these ends in view the invention consists in the novel construction and arrangement of parts, which will be hereinafter fully described and claimed.

In the drawings, Figure 1 is a side elevation of part of a derrick with my improved foot-block and ball-bearing in operative relation to the post or boom. Fig. 2 is an elevation at right angles to Fig. 1, showing the position of the guide-sheaves. Fig. 3 is a horizontal section on a plane through the post and boom, the plane of the section being indicated by the dotted line 3 3 of Fig. 1, and showing the foot-block and base-plate therefor in plan. Fig. 4 is a vertical sectional elevation on the plane indicated by the dotted line 4 4 of Fig. 3.

The same numerals of reference are used to indicate like and corresponding parts in each of the several figures of the drawings.

The foot-block 10 of my invention is cast in a single piece of metal for strength and simplicity of construction. This foot-block is provided with vertical flanges, which are arranged or disposed to form a vertical socket 11, and a curved socket 12, adapted to receive, respectively, the lower ends of the post and

the boom, which are ordinarily employed in hoisting-derricks. The flanges or walls which form the post-socket 11 are disposed at right angles for the reception of an angular post; but one of the walls for the socket 12, adapted to receive the boom, is curved concentric with the axis of the boom-pivot in order that a curved end of the boom may work freely in the socket 12.

The foot-block is provided with a vertical cable-passage 13, which lies between the curved wall of the boom-socket 12 and the inner wall of the post-socket 11, said foot-block being furthermore cast with the laterally-extending flanges 15, disposed in the plane of the bottom of the foot-block, and said flanges being reinforced by ribs 16, which are integral with the flanges and the side walls of the foot-block, as clearly shown by the several figures of the drawings.

It will be understood that this foot-block is cast in a single piece of metal to accommodate the post and the boom and that the bottom of said cast-metal foot-block is formed with flanges adapted to engage with bearing-balls, the foot-block being furthermore provided between its sockets with a vertical passage, which enables the derrick-cables to be threaded through the foot-block. Another element of this foot-block is a hollow journal-stud 14, which is cast as an integral part of the foot-block to extend in a downward direction from the middle thereof. This journal-stud is hollow for its opening to communicate with the vertical passage 13, and thus the derrick-cables may pass through the foot-block and the journal-stud 14 thereof.

The base-plate 17, which supports the foot-block, is cast in a single piece of metal for the formation of a ball-race adapted to receive the bearing-balls and with bracket-plates which support the arbor for the guide-sheaves of the derrick-cables. This base-plate is provided in its upper side with a central annular step-socket 18, in the bottom of which is a vertical opening 19, the diameter of said opening 19 being less than the diameter of the socket 18 and equal to the diameter of the opening in the journal-stud 14. Said base-plate is furthermore provided in its upper surface with an annular groove 20, which is separated from the step-socket 18 by an interven-



ing annular wall 21, and this groove and the annular wall which forms one side thereof constitute a ball-race adapted to receive and confine a plurality of bearing-balls 22, upon  
 5 which the foot-block is adapted to ride. The base-plate 17 is cast in a single piece with a pair of parallel bracket-plates 23, which depend from the lower side of the base-plate and are disposed in vertical positions on op-  
 10 posite sides of the opening 19 through said base-plate. The bracket-plates carry a transverse arbor 24, on which is loosely mounted the pair of grooved guide-sheaves 25, said guide-sheaves being arranged in close rela-  
 15 tion to the bracket-plates, so as to be confined thereby from lateral displacement on the base-plate.

The post of the derrick is indicated by the numeral 26 as having its lower end fitted in  
 20 the socket 11 and secured firmly therein by transverse bolts. The boom 27 has its lower end curved and fitted in the socket 12, said boom being pivotally supported on the foot-block by a transverse bolt in the usual way.  
 25 The foot-block has its journal-stud 14 fitted loosely in the socket 18 of the base-plate, but the bearing-balls 22 are disposed to support the weight of the foot-block and the parts carried thereby, the lower extremity of the  
 30 journal-stud being perfectly free from contact with the bottom of the socket 18. The bearing-balls are of large diameter in order that the lower side of the foot-block will be elevated a suitable distance above the base-  
 35 plate, and these bearing-balls are confined away from the journal-stud by the intervening wall 21, thus preventing the bearing-balls from riding against the journal-stud, disposing the bearing-balls some distance be-  
 40 yond the axis of rotation of the foot-block, and providing an enlarged base for the support of the foot-block. Another advantage obtained by my invention is that the bear-  
 45 ing-balls are disposed in the planes of the post-socket and the boom-socket of the foot-block, thus exposing the bearing-balls to the direct vertical thrust of the post and the boom as distinguished from a radial thrust, which  
 50 would be obtained if the bearing-balls were disposed in such close relation to the journal-stud as to ride directly against the exposed face thereof. The base-plate 17 may be fastened to the foundation-frame of the derrick in any usual or approved manner, and this  
 55 base-plate serves to support the guide-sheaves

25 in proper relation to the vertically-alined openings 19 13 and the opening of the hollow stud 14. A further advantage of the bracket-plates is that they confine the guide-sheaves against lateral displacement on the arbor 24, 60 and these sheaves are thus held in proper position for the derrick-cables to pass below said sheaves and through the base-plate, the foot-block, and the journal-stud.

Changes may be made in the form and pro- 65 portion of some of the parts, while their essential features are retained and the spirit of the invention embodied. Hence I do not desire to be limited to the precise form of all the parts as shown, reserving the right to 70 vary therefrom.

Having thus described the invention, what I claim is—

1. In a derrick, the base-plate provided in its upper surface with a central cavity form- 75 ing a step-socket and with an annular ball-race isolated from the socket-cavity by an intervening annular bridge-wall which protrudes above the plane of the base-plate, a foot-block having a flat horizontal bearing- 80 surface and provided with a depending cylindrical journal-stud fitted loosely in the socket-cavity, and bearing-balls occupying the ball-race and projecting above the bridge-wall of the base-plate, for the flat under sur- 85 face of the foot-block to ride directly thereon, whereby the journal-stud is disposed in a central relation to, and in the horizontal plane of, the bearing-balls, substantially as de-  
 90 scribed.

2. In a derrick, the combination of a base-plate having a step-socket and a ball-race isolated one from the other by an intervening wall, a foot-block provided with the post and boom sockets and with a hollow journal-stud 95 which communicates with a cable-receiving passage, bearing-balls fitted in the raceway to support the foot-block and confined by the intervening wall against engagement with the journal-stud, bracket-plates depending from 100 the base-plate, and guide-sheaves mounted in the bracket-plates, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in 105 the presence of two witnesses.

JAMES J. SMITH.

Witnesses:

WATSON SAMUELS,  
 C. A. WIETING.