

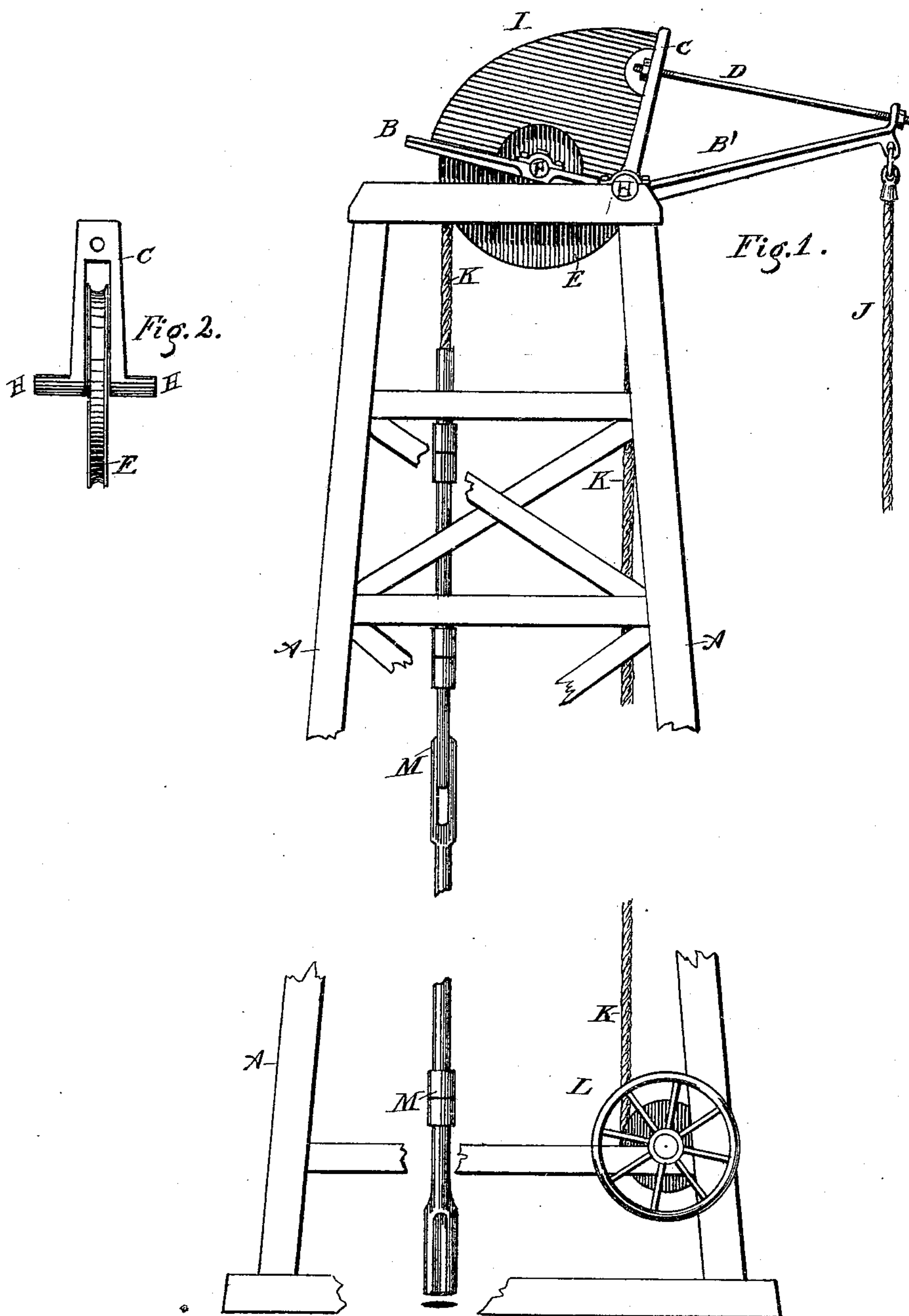
(No Model.)

2 Sheets—Sheet 1.

F. M. GRAY.  
MECHANICAL BOB.

No. 371,575.

Patented Oct. 18, 1887.



Witnesses:  
Chas. König.  
O. L. Hoffmann.

Inventor:  
Frank M. Gray  
By: Edwin C. C. C. C.  
Attorneys

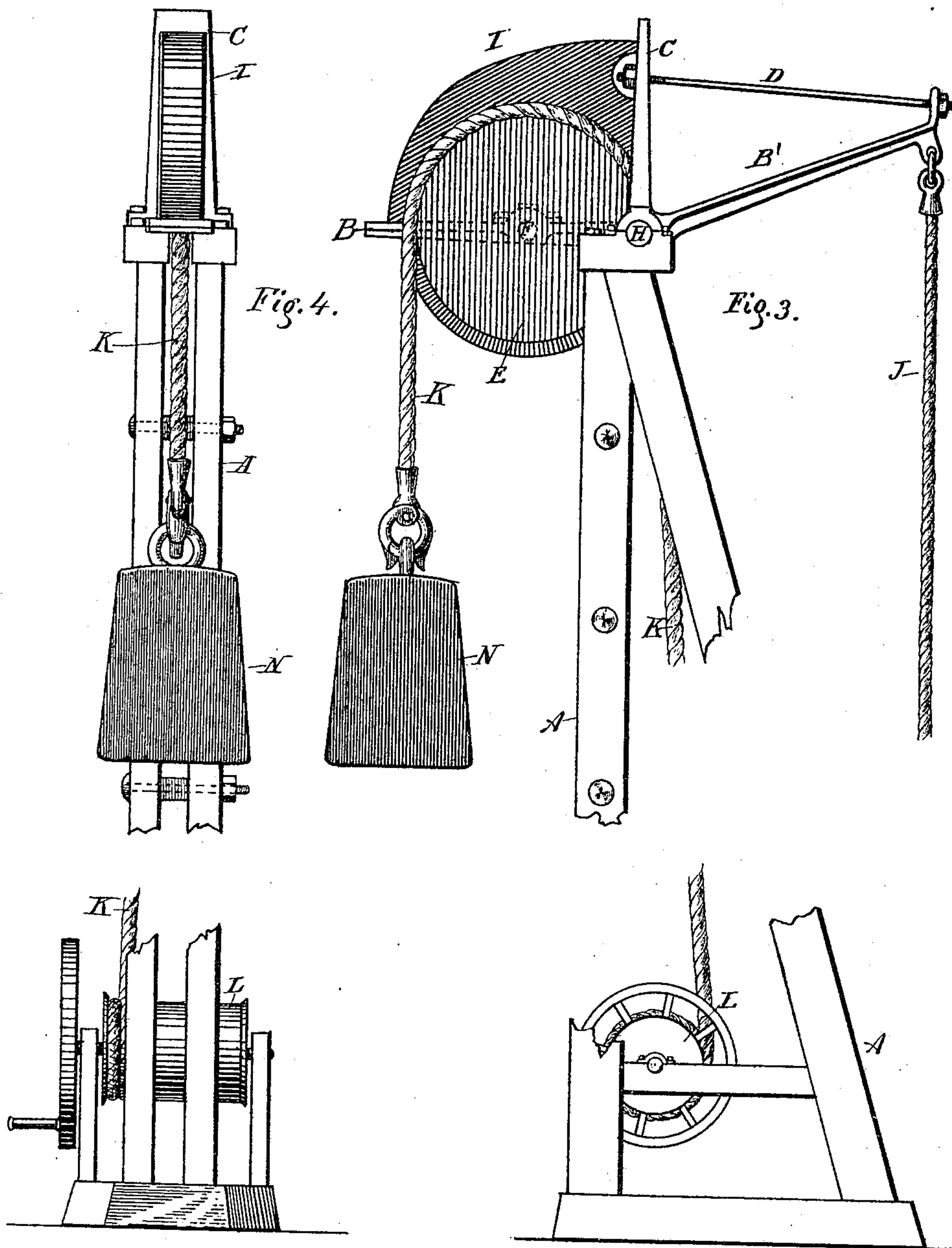
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Attorneys



# UNITED STATES PATENT OFFICE.

FRANK M. GRAY, OF MILWAUKEE, WISCONSIN.

## MECHANICAL BOB.

SPECIFICATION forming part of Letters Patent No. 371,575, dated October 18, 1887.

Application filed September 30, 1886. Serial No. 215,024. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK M. GRAY, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Mechanical Bobs; and I do hereby declare the following to be a full, clear, and exact description of said invention, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

My invention consists, particularly, in the construction and location of the parts of the device hereinafter described, the object of such construction and arrangement being especially to secure the maximum amount of strength of machinery and convenience for use and a minimum amount of friction and wear in the moving parts.

In the drawings, Figure 1 is an elevation of a tower having my mechanical bob or walking-beam supported thereon. Fig. 2 is a detail. Fig. 3 is an elevation of a derrick or mast having my bob supported thereon, parts being removed to show interior parts and their arrangement. Fig. 4 is an elevation of the same device shown in Fig. 3, but at right angles thereto.

The same letters refer to like parts in all the views.

A is a supporting-frame or tower, and is shown in the modified form of a mast or derrick in Fig. 3.

B and B' are the two outwardly-extending arms of the walking-beam or bob. These arms are rigid and integral one with the other, and are preferably set at an angle to each other, the included angle being within their upper sides. Projecting upwardly from the arms B and B' at the point of their junction is the arm or yoke C. This yoke is rigid to or integral with the arms B B'. A supporting or stay rod, D, is attached at its ends to the outer ends, respectively, of the arms B' and C. The arm B is slotted or bifurcated, and supported between the two parts of this arm is a pulley, E. This pulley is supported on an axle having bearings F on the arm B at a distance from its inner end or point of junction with the arm B'.

The bearings F are located on the arm B at such a point that the axis of the cable running

over the pulley E in the groove G intersects transversely the axis of the bob-supporting trunnions H H. The trunnions H H project from the sides of the bob at the point of junction of the arms B and B', and have their bearings in the top of the tower or mast A, or other suitable support. This tower or mast is not less than from thirty to eighty feet high, so that a string of well-boring tools, which is usually from twenty-five to seventy-five feet long, can be suspended from the end of the walking-beam and raised entire from the well, without uncoupling or releasing the tools, by winding up the supporting-cable even while the walking-beam is in motion; and this construction and feature of this device is particularly practical, as it permits of the use of the reciprocating motion of the walking-beam being applied to the tools at the same time that the tools are being raised or lowered by winding or unwinding the cable, whereby any possible sticking fast of the tools in the well is overcome without any transfer or shifting of the cable to other mechanism for the purpose, as is necessary in the devices heretofore in use, in which the walking-beam was not sufficiently elevated to permit the entire string of tools to be raised from the well without uncoupling them. These trunnions are the fulcrum on which the bob oscillates up and down.

The arms B and yoke C are connected together and strengthened by the hood or shell I, rigid thereto and protecting the pulley E. This hood or shell is rigid to the arm B and yoke C, being preferably broken away or provided with openings for conveniently attaching the rod D and the bearings F. A rope or cable, J, for a pitman is attached to the outer end of the arm B', which cable is also attached to the power-supplying mechanism whereby the bob is oscillated. A cable, K, running over pulley E at its inner end, is made fast to and runs upon a drum, L, which drum rotates in bearings in the frame A, by which means the outer end of the cable may be raised or lowered, as desired, and on its outer end this cable K carries the drill-tools M, for drilling wells, or the weight N, for use as a pile-driver, the device being adapted for both purposes.

The well-tools M or weight N may be readily adjusted up or down at a proper distance,



either near to or away from the outer end of the arm B, by winding or unwinding the inner end of the cable K on the drum L, and as the cable K runs upon the pulley E the raising or lowering the tools or weight relatively to the arm B is easily accomplished without perceptible wear on the cable. It will also be seen that as the cable K is supported on the pulley E so that its axis intersects the axis of the trunnions, there is no motion of the cable upon the pulley when the bob is oscillating up and down, but the cable lies stationary on the pulley while the outer end of arm B and the tools or weight are being raised and lowered by the oscillation of the bob.

By constructing the walking-beam with a pulley, as described, I am able to locate the walking-beam or bob at the top of the tower or mast and operate it successfully, which could not be done with old forms of bobs or walking-beams.

What I claim as new, and desire to secure by Letters Patent, is—

1. A mechanical bob consisting of outwardly-extending arms supported centrally on trunnions, on which it is adapted to oscillate, in combination with a pulley supported on one of the arms of the bob, which pulley is so located with reference to the trunnions that the axis of the cable supported thereon intersects transversely the axis of the trunnions and the cable running on said pulley, substantially as described.

2. The combination of arms B B', yoke C,

stay-rod D, and rigid hood I, all supported on trunnions H H, with pulley E, supported on arm B at a distance from the fulcrum-point of the bob equal to the radius of the pulley and the one-half of the diameter of the cable running thereon, the cable K, running on pulley E, and the operating-rope J, substantially as described.

3. In mechanical bobs, a walking-beam provided with a single pulley in one of its arms, upon which the tool or weight sustaining cable is supported, which pulley is so located with reference to the pivotal axis of the walking-beam that the axis of the cable running on the pulley will intersect the pivotal axis of the walking-beam, substantially as described.

4. In well-drilling mechanism, a high tower or mast and a walking-beam supported thereon at such height from the ground, not less than twenty-five feet, that an entire string of well-drilling tools may be supported above the surface of the ground from the outer end of the arm of the beam, in combination with a cable running on a pulley so located and supported in said arm—that the cable at one side of the pulley passes transversely through the axis of the walking beam, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK M. GRAY.

Witnesses:

C. T. BENEDICT,  
O. L. HOFFMANN.