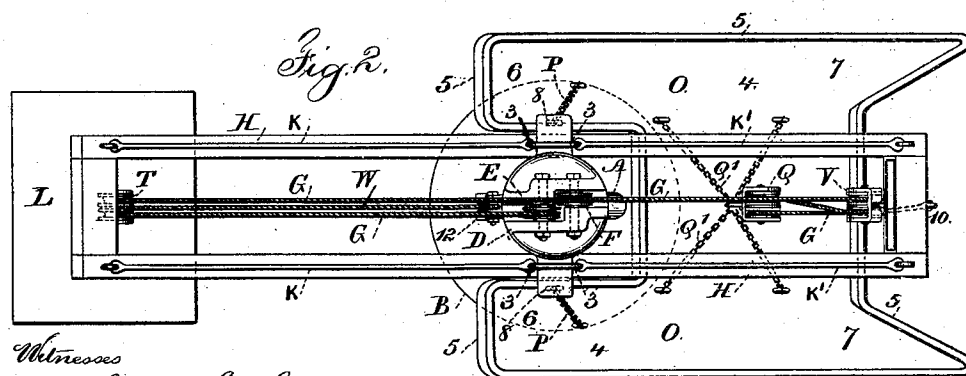
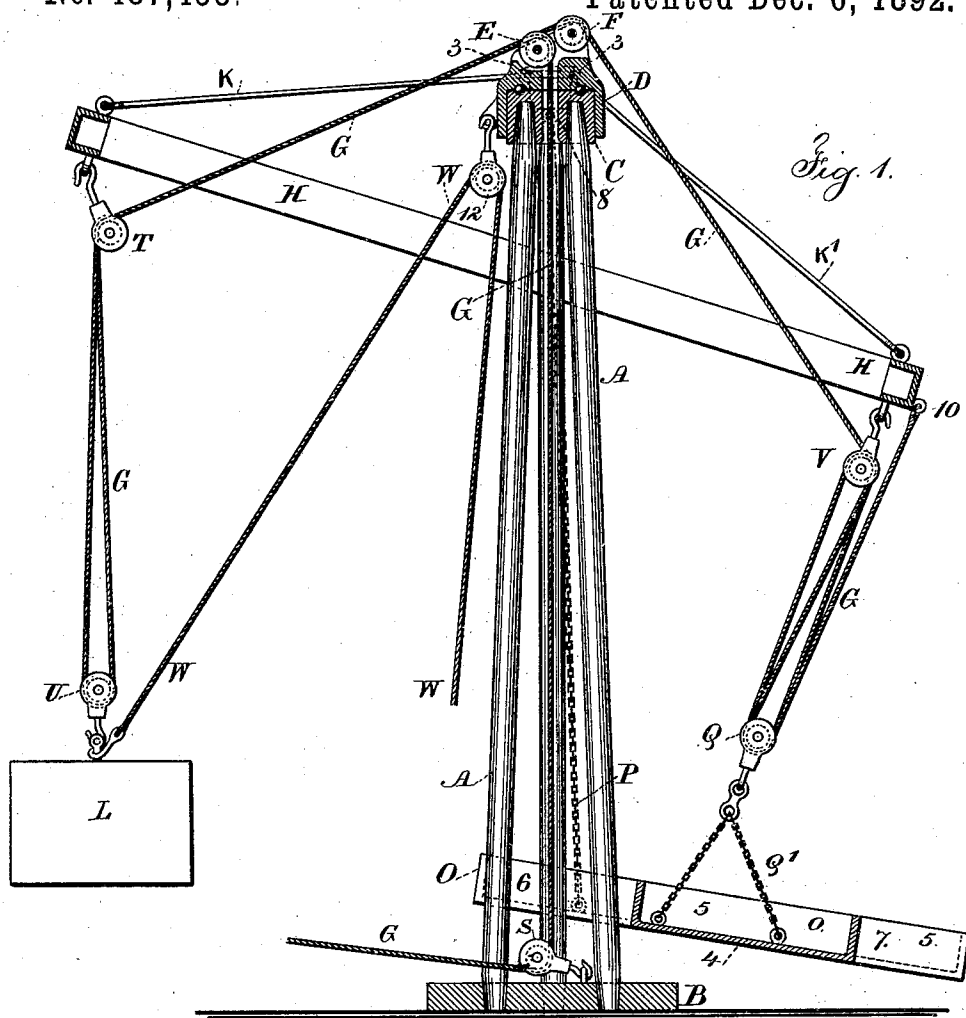


(No Model.)

J. E. SERRELL.
DERRICK.

No. 487,453.

Patented Dec. 6, 1892.



Witnesses

Chas. H. Smith
J. Strait

James E. Serrell Inventor
per Lemuel W. Serrell
Atty.

UNITED STATES PATENT OFFICE.

JAMES E. SERRELL, OF NEW YORK, N. Y.; MARY J. THOMSON ADMINISTRATRIX OF SAID SERRELL, DECEASED.

DERRICK.

SPECIFICATION forming part of Letters Patent No. 487,453, dated December 6, 1892.

Application filed March 4, 1892. Serial No. 423,713. (No model.)

To all whom it may concern:

Be it known that I, JAMES E. SERRELL, a citizen of the United States, residing at the city and State of New York, have invented an Improvement in Derricks, of which the following is a specification.

In Letters Patent No. 142,740, granted to me September 9, 1873, a derrick is represented in which the weight that is acted upon is suspended from a counterpoised boom, so that the counterpoise swings away from the central support as the weight that is being raised increases. Hence there is only a vertical pressure upon the mast or frame supporting the counterpoise-boom. In this construction difficulty arose in the winding of the hoisting rope or chain around the mast when the suspended weight and boom were revolved.

The present invention is made for allowing the weight that is suspended and the counterweight and the boom to be revolved with freedom around the mast or supporting-frame without the hoisting rope or chain fouling with such mast or support, and I also provide a peculiar counterpoise-platform that is capable of being loaded to a greater or less extent, according to the weight to be raised.

In the drawings, Figure 1 is an elevation with the cap in section, and Fig. 2 is a plan view.

The mast is composed of three, four, or more spars or frames, as represented at A, and these are to be of suitable size, according to the strength required in the derrick, and they are connected at their lower ends with a base or support B, and at the upper ends is a cylindrical cap C, having a central opening, and this cylindrical cap C is permanently connected to the frame A in any suitable manner, and such cylindrical cap forms a base to the turn-table D, such turn-table having a cylindrical flanges surrounding the cap C, and the parts may be provided with rollers or balls to lessen friction, if desired.

Upon the turn-table D are the two sheaves E and F, supported in suitable jaws, and the inner edge of the sheave E is in line with the vertical center of the turn-table D, or nearly so, in order that the flexible hoist—such as a rope or chain G, which passes up centrally through the cap C and turn-table D—may

pass freely over this sheave E and extend to the block or tackle by which the weight is hoisted, and although the rope or chain may be twisted by the rotation of the boom of the derrick the twist at one movement will usually be taken out by the swinging of the boom in the opposite direction at another time; but the rope or chain will not rub against or twist around any portion of the mast or frame when the boom is being rotated.

The boom H is of any desired size and character. Usually it is composed of two side pieces or spars joined together at their ends, and these spars are sufficiently distant from each other for the mast or frame to be between them without coming into contact, as illustrated in Fig. 2, and the boom is suspended by connections—such as the rods or chains K K'—extending from the respective ends of the boom to the turn-table D, where the ends of the rods or chains K K' are permanently connected by eyes or loops, so that the entire boom is free to swing upon the eyes or loops at 3, and in consequence of the rods K K' being at downward inclinations from such eyes or loops 3 the end of the boom which may swing downwardly moves toward the mast and the end of the boom that swings upwardly moves farther away from the mast, the same as in the aforesaid patent, and by these movements the weight L that is to be lifted and the counterpoise O come to an equilibrium, and there is only a downward pressure upon the mast or frame by the weights that are carried.

The counterpoise O is composed of a platform 4 with a rim 5, so as to be adapted to receive stone or other easily-procured substances, so that the platform may be loaded in proportion to the weight that is to be raised, and by making this platform with the side extensions 6, that pass at opposite sides of the frame or mast, I am enabled to load the platform heavily and to bring the weight of the counterpoise into operation advantageously, as hereinafter described, and by projecting the platform at the outer ends thereof may be loaded so as to act with leverage upon the hoisting appliances next described.

The chains P serve to suspend the counterpoise, as in my aforesaid patent. They are

connected at their upper ends by loops or eyes 8 to the turn-table D, and at their lower ends to the side extensions 6 of the platform, and the hoisting-block Q is connected by three
 5 or four branch chains Q' to the platform 4, so that the platform will be raised gradually by the block and tackle Q. The hoisting rope or chain G passes, preferably, through a sheave S and vertically, or nearly so, over the sheave
 10 E, through the blocks T and U, and returns through the block T and over the sheave F, thence through the blocks V and Q, and the end of the rope G is attached at 10 to the boom H. It will be observed that the block
 15 U is single, and the blocks T, V, and Q are double, so that there will be the necessary purchase in raising the counterpoise O; but the blocks may be made with a greater number of sheaves, so as to increase the purchase,
 20 if desired, and I provide a guy rope or chain W over a sheave 12, by which the weight after it has been raised can be drawn inwardly toward the mast or allowed to swing out, as desired, and this sheave or block 12 is connected
 25 with the turn-table, so as to move with the boom as the same may be revolved. It will now be observed that when the block U is connected to the weight L to be raised and the chain G is drawn upon by any suitable power such
 30 weight is not raised until the rope or chain G has been drawn upon sufficiently to act upon the counterpoise O and lift the same off the deck or platform supporting the derrick, and in lifting the counterpoise a large portion
 35 of the weight is at first unacted upon, because it hangs by the chains P, and as the counterpoise is lifted it swings outwardly from the mast, more or less, according to whether the weight is entirely taken by the blocks V Q
 40 and the boom or partially by the suspending-chains P, and the hoisting operation is continued until the counterpoise is sufficient to raise the weight and the counterpoise has a greater leverage, as the other end of the boom
 45 may be pulled down toward the weight and the counterpoise end of the boom thrown farther away from the mast, and after the counterpoise is sufficient to raise the weight the weight and the counterpoise hang at the res-
 50 pective ends of the boom and the weight can be drawn up more or less by the action of the chain or rope G without disturbing the equilibrium of the parts, and when the weight has been raised to the desired height the boom
 55 may be swung around more or less, or the weight may be drawn into the platform or deck upon which the derrick is placed; and it will be observed that under all circumstances the boom, with the counterpoise, swings ac-
 60 cording to the weight to be raised or the leverage of the weight upon the boom, and as the weight is lowered the counterpoise will also be lowered, and by the action of the chains P it will be swung in until it is sus-
 65 pended at one end by such chains and the other end is lowered gradually and rests upon the deck or platform of the derrick. In con-

sequence of the divergence of the chains below the block the two parts of such chain that pass toward the suspending-chains P may be-
 70 come slack as the counterpoise-platform is lowered into the inclined position of rest, and such chains when drawn upon lift the platform and hold it level, or nearly so, when brought into action as a counterpoise.
 75

Whenever the derrick is to be used upon a weight that is beyond a vertical line below the moving end of the boom, such weight may be drawn toward the boom before being lifted by a bridle-pulley at the base of the mast, as
 80 shown in my aforesaid patent. By these improvements the action of the counterpoise is rendered more reliable and the entire derrick can be more easily manipulated than in my former patent.
 85

I claim as my invention—

1. The combination, with a stationary supporting mast or frame, of a turn-table at the upper end of such mast or frame, such turn-
 90 table having a central or nearly central opening, a boom composed of two pieces passing the mast freely at opposite sides and united at their ends, and devices for suspending the same from the turn-table, a counterpoise suspended at one end of the boom, a sheave
 95 upon the turn-table, and a flexible hoist passing through the turn-table over the sheave to the hoist-block, substantially as set forth.

2. The combination, in a derrick, of a stationary supporting mast or frame, a turn-
 100 table upon the upper end thereof with a central opening, a boom composed of two pieces passing the mast freely at opposite sides and united at their ends and devices for suspending the same from the turn-table, a
 105 counterpoise connected with one end of the boom, a sheave upon the turn-table, a flexible hoist, a block at the lower part of the mast or frame through which the hoist passes and extends up through the turn-table and
 110 over the sheave thereon, a hoist-block at one end of the boom, and another to be connected with the weight and through which the flexible hoist passes, substantially as set forth.
 115

3. The combination, in a derrick, of a stationary mast or frame, a turn-table upon the upper end thereof, two sheaves supported by the turn-table, a boom composed of two
 120 pieces passing the mast freely at opposite sides and united at their ends and devices by which it is suspended from the turn-table, a counterpoise, and the blocks at the respective ends of the boom, and the flexible hoist pass-
 125 ing through the turn-table over one of the sheaves to the blocks of the weight to be raised and returning over the other sheave to the blocks of the counterpoise, whereby the power is first exerted to raise the coun-
 130 terpoise until it has sufficient leverage for lifting the weight, substantially as set forth.

4. In a derrick, the combination, with the stationary mast or frame, the turn-table at the top thereof, and the boom composed of

two pieces passing the mast freely at opposite sides and united at their ends, and devices for suspending the boom from the turn-table, of a counterpoise-platform having side extensions at the sides of the mast and suspending devices to the turn-table and a block and tackle for acting upon the counterpoise-platform, substantially as set forth.

5
10 5. The combination, in a derrick, of a stationary mast or frame, a turn-table at the upper end thereof, a boom composed of two pieces passing the mast freely at opposite

sides and united at their ends and devices for suspending the same from the turn-table, a counterpoise, and hoisting mechanism, the flexible hoist passing through the middle of the turn-table at the top of the mast, so that the turn-table and boom can be revolved, substantially as set forth. 15

Signed by me this 2d day of March, 1892.

JAMES E. SERRELL.

Witnesses:

GEO. T. PINCKNEY,
WILLIAM G. MOTT.