

(No Model.)

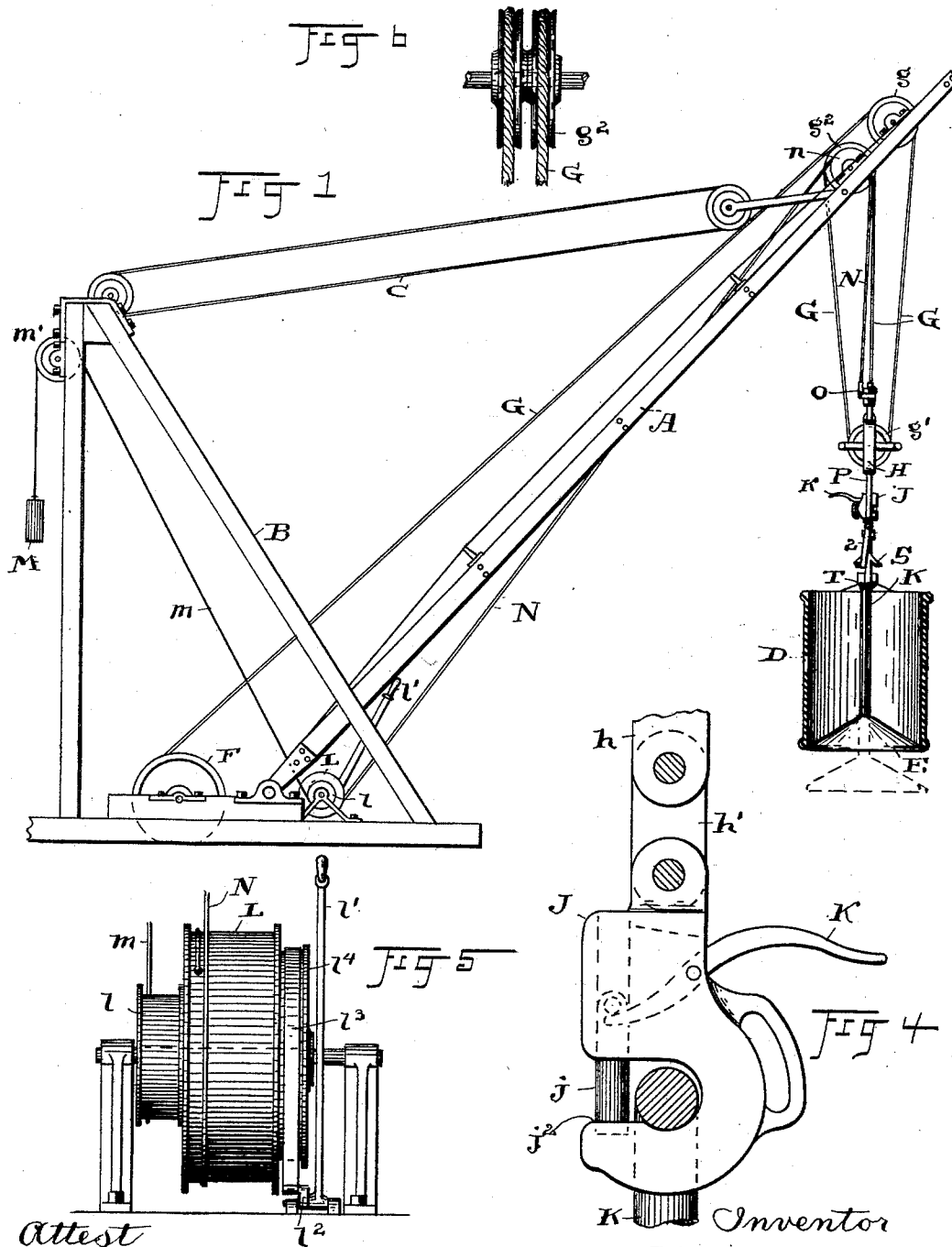
2 Sheets—Sheet 1.

W. E. LUDLOW.

BUCKET HOISTING AND TRIPPING APPARATUS.

No. 519,723.

Patented May 15, 1894.



Attest
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(No Model.)

2 Sheets—Sheet 2.

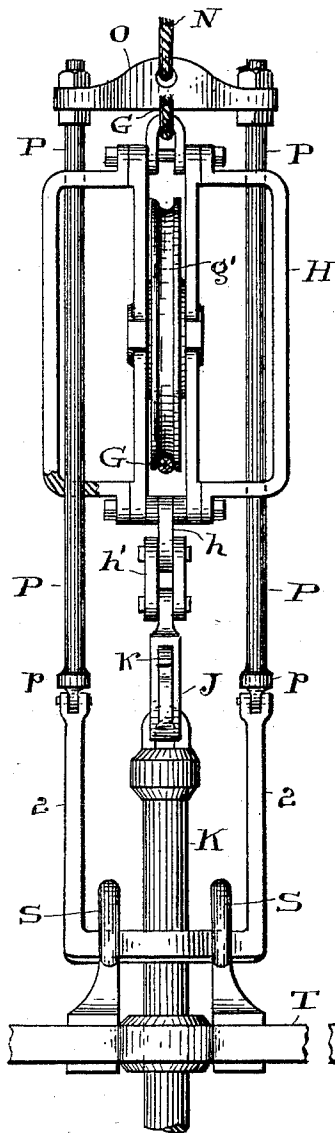
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Fig 2



Attest.

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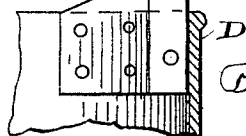
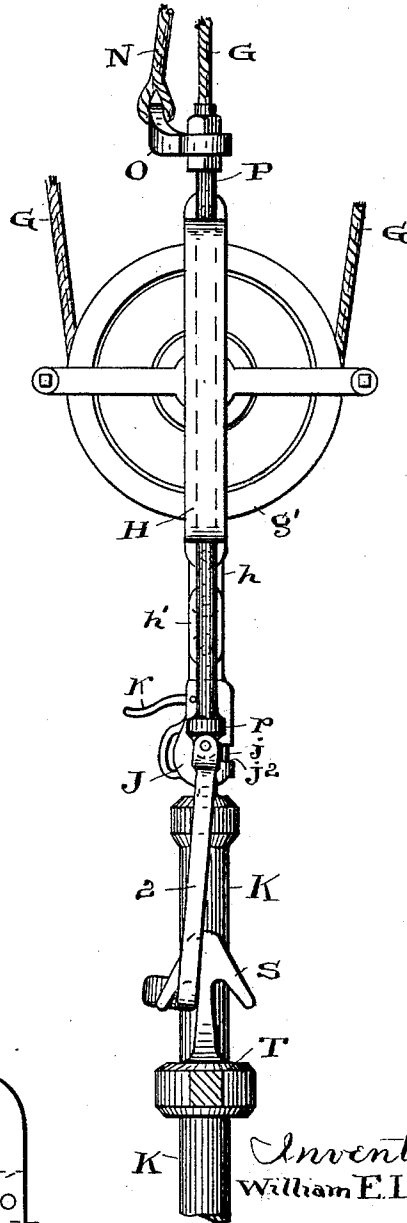


Fig 3



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UNITED STATES PATENT OFFICE.

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BUCKET HOISTING AND TRIPPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 519,723, dated May 15, 1894.

Application filed May 6, 1893. Serial No. 473,218. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. LUDLOW, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Bucket Hoisting and Tripping Apparatus; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to and the invention consists in the construction, combination and arrangements of parts, substantially as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of hoisting and conveying apparatus in which my invention is comprised, and showing the bucket in vertical central sectional elevation. Fig. 2, Sheet 2, is a side elevation, enlarged, of the mechanism more particularly associated with the two parts of the bucket and as said mechanism appears when the bottom of the bucket is in position as seen in Fig. 1. Fig. 3 is an elevation of said mechanism at right angles to the view in Fig. 2, the parts thereof in the positions, relatively, shown in Figs. 1 and 2, and hereinafter more particularly described. Fig. 4, Sheet 1, is an enlarged view of a section of the mechanism more particularly designed to support the bucket bottom and showing the means of conveying the load, and disclosing the means for engaging and disengaging said parts. Fig. 5 is an enlarged view of the drums shown in end elevation in Fig. 1, and through which and the cables thereon the body of the bucket is controlled, as hereinafter described. Fig. 6 is a plan view of the sheaves at the top of the boom carrying the respective cables or ropes which support the two parts of the bucket.

The mechanism thus shown may, in a general way, be stated as having two functions and purposes, namely, to carry the bucket with its load to the unloading position, and when that position is reached to suspend the body of the bucket from further movement while the bottom of the bucket is permitted to move on downward until the limit of its movement be reached, as seen in dotted lines

Fig. 1, and the load is discharged. The parts are then restored to their carrying position and the operation is repeated. Incident to this construction and arrangement of parts is the mechanism for readily interchanging buckets, so that an empty bucket can be left, and a full one taken up and carried forward to be discharged.

The invention being therefore comprised in special and distinct features of the structure shown, I lay no claim to novelty in the other elements in themselves, such, for example, as the pivoted boom A, the frame-work B and cables C by which the boom is supported at a higher or lower elevation or swung about from point to point as is customary in such constructions.

D represents the body of the bucket, and E the bottom thereof. This bucket is of the variety having a movable bottom, so that the bucket is discharged without the labor and inconvenience of dumping, as was necessary in the older style of buckets. Now, in order that the load may be easily and speedily discharged when the bucket reaches its destination, I provide two distinct lines of suspensory and operating mechanism, one for each part thereof. Thus the bottom E, upon which practically all the weight of the load rests, is controlled and carried from the drum F in the power house, under the control of the engineer, and the cable G, passing over sheave g at the extremity of the boom, the sheave g', supported on the suspended mechanism lower down, and the sheave g² likewise on the boom but below sheave g, as seen in Figs. 1 and 6. This cable has one end secured to the drum F and the other end to the sliding frame H, seen clearly in Figs. 2 and 3. The sheave g' is journaled centrally in this frame, and the bottom E of the bucket is suspended therefrom by several parts forming a flexible connection and consisting of the links h and h', the hook J, and the central carrying rod K, to the lower end of which the bottom of the bucket is rigidly fixed. This rod has an eye at its upper end to engage over the hook J, and the said hook has a locking bolt j, to confine the said rod and a handle k controlling said bolt. The bucket body D likewise is controlled by the engineer in the engine or power house, in which is located a drum

L, having another drum l about half the diameter of drum L at its side on the same shaft. On this smaller drum is a rope m passing over a sheave m' and having a counter-weight M on its outer end. A cable or rope N, fixed to and wound about the drum L, passes over sheave n near the upper end of the boom and thence down and is attached to the cross head O, Figs. 2 and 3. The bucket body is suspended from this cross head through the two rods P, fixed rigidly in the ends of said cross head O and having heads p at their lower ends upon which is pivotally swung the hanger 2. This hanger is substantially U shape, except that it has angular corners so as to give a horizontal cross portion for engagement by the two anchor shaped hooks S on the bail T of the bucket body D. This construction of hanger and hooks renders connecting and disconnecting of the bucket easy and convenient, because either side of the bucket can be presented for engagement with the hanger with equal advantage. It will be noticed, now, that provision is made for engagement and disengagement of the parts D and E of the bucket with the supporting mechanism of each at different places and with somewhat different means, but yet with practically equal facility so that, as an empty bucket is left, a full one can be caught up and carried forward to be unloaded without material loss of time in making the exchange. It will be noticed also that the frame H, from which the bucket bottom is suspended, is supported and slides on the two parallel rods P, and the drop of said bottom in respect to the body D is fixed and limited, in this instance, by the heads p on the lower ends of said rods. Hence, when in the operations of the apparatus the body D is stopped at any given place to discharge, the other line of mechanism carrying bottom E continues to lower until the frame H is stopped at heads P, and then the movement of this line also is stopped and the bucket is open to discharge its load. The engineer has control of both actions and mechanisms through the drums carrying the cables G and N, and a lever l' having a crank arm l^2 controls a friction brake strap l^3 over a narrow drum l^4 at the side of large drum L. In this operation the counter-weight M is designed to be sufficient to take up the slack of rope N, especially after a load has been discharged and the parts of the bucket are brought back together again, and when the bucket is loaded and descending to the place of discharge the downward pull on the body caused by the load causes the drum L to turn with this movement, and the weight M to rise correspondingly.

The application of the brake mechanism l , l^2 and l^3 arrests the movements of these parts, as above described, and when the bucket is emptied all the parts are carried up again by rope G and swung away for another load. The drum l is shown here as only about half

the diameter of drum L, so that the counter-weight M will have, relatively, only a short distance to travel.

The hook J in the suspensory mechanism for the bucket, and more particularly for the bottom of the bucket, has the locking bolt or keeper j supported in its head so as to slide up and down therein, and normally is down as in Fig. 4. The lever K is pivoted in the head of the hook and engages the upper end of the bolt. Obviously, other locking mechanism might be substituted and be within the spirit of the invention, but the special form of hook shown is deemed important largely on account of the great strength of the hook made as shown. It will be seen that the head of the hook is very strong as is also the shank lower down, while with the use of the bolt or keeper j , a straight or almost straight hook portion j^2 can be used, thus greatly facilitating the release of the link or carrying rod K.

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

1. The bucket body and the bucket bottom and distinct lines of suspensory mechanism for each of said parts wholly above the bucket and having jointed connections, the mechanism supporting one of said parts of the bucket constructed to slide on the mechanism supporting the other part, separate cables for said mechanisms and bucket parts respectively, and separate drums and shafts for said cables, substantially as set forth.

2. The bucket body and mechanism situated above and apart therefrom and a jointed connection between said mechanism and said body, said mechanism having guides and stops on the guides, in combination with the bucket bottom, a frame sliding on said guides from which said bottom is suspended, and separate cables for said body and bottom respectively, substantially as set forth.

3. A bucket body, and a supporting cable therefor and mechanism connecting the cable with said body, in combination with the bucket bottom, a frame from which the bottom is suspended and having a sheave journaled therein and a cable about said sheave serving to carry said bottom, substantially as set forth.

4. The bucket bottom and the cable and mechanism carrying the bottom, said mechanism having one end of the cable fixed thereto and a sheave in said mechanism over which the said cable passes, in combination with the bucket body and mechanism supporting said body constructed to guide and limit the movements of the mechanism carrying the bottom, substantially as set forth.

5. The two separate mechanisms for supporting the bucket, consisting of a pair of guides rigidly connected at their top and having the bucket body suspended from their ends and a supporting cable connected with the said guides, in combination with the bot-

tom of the bucket and suspensory frame there-
for having a sliding connection with the said
guide and a separate cable connected with
its top and a sheave journaled in said frame
5 supporting said cable, substantially as set
forth.

6. The bucket bottom and the suspensory
mechanism therefor having a frame with a
sheave therein and link connections between
10 said bottom and said frame, in combination
with the bucket body, mechanism from which

said body is suspended having sliding con-
nection with the said frame, and means to dis-
connect the bucket body and the bottom from
their supports, substantially as set forth. 15

Witness my hand to the foregoing specifi-
cation.

WILLIAM E. LUDLOW.

Witnesses:

H. T. FISHER,
GEORGIA SCHAEFFER.