

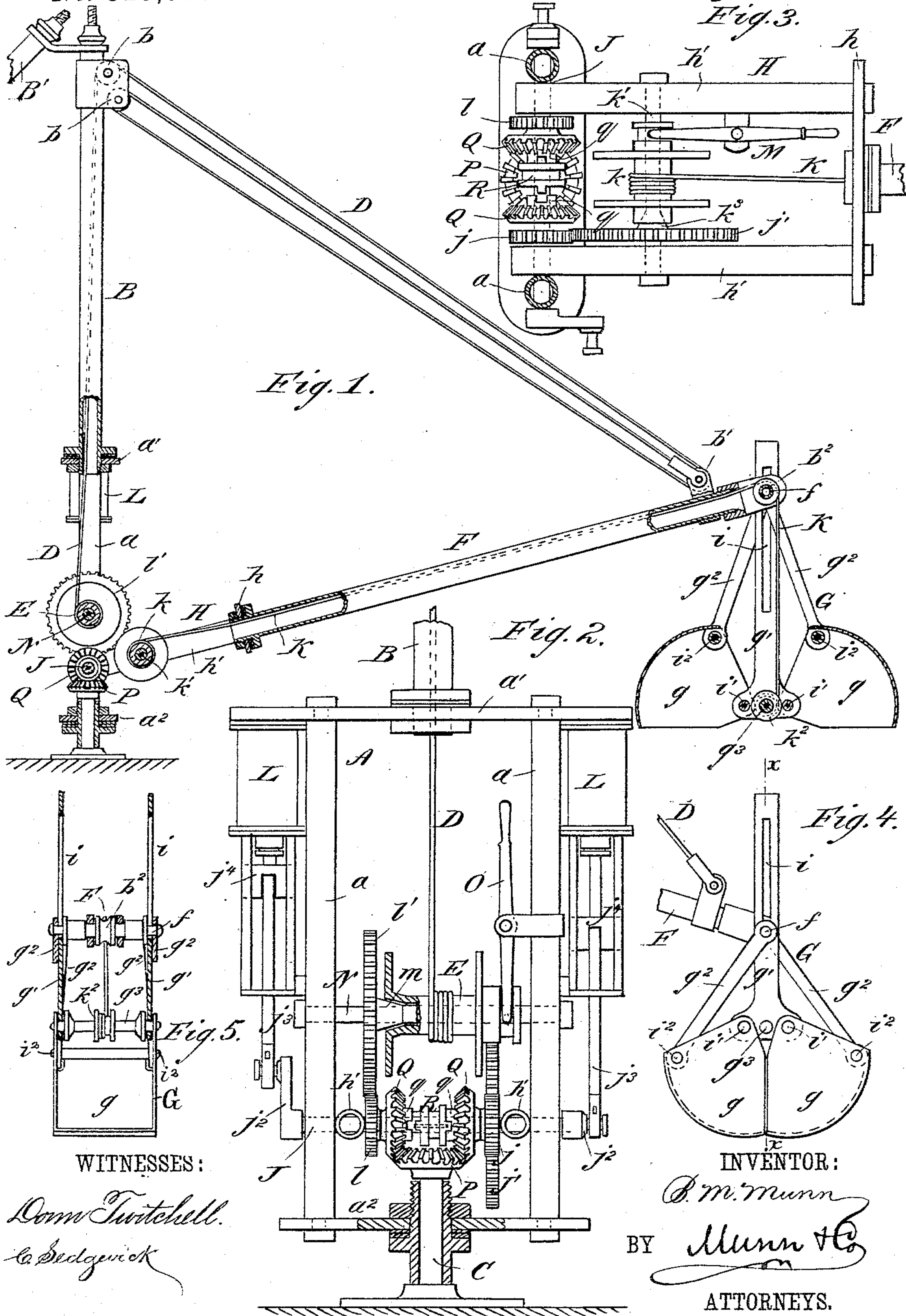
(No Model.)

B. M. MUNN.

COAL HOISTING MACHINE OR DREDGE.

No. 323,589.

Patented Aug. 4, 1885.



UNITED STATES PATENT OFFICE.

BERNARD M. MUNN, OF ELIZABETH, NEW JERSEY.

COAL-HOISTING MACHINE OR DREDGE.

SPECIFICATION forming part of Letters Patent No. 323,589, dated August 4, 1885.

Application filed February 18, 1885. (No model.)

To all whom it may concern:

Be it known that I, BERNARD M. MUNN, of Elizabeth, in the county of Union and State of New Jersey, have invented a new and Improved Coal-Hoisting Machine or Dredge, of which the following is a full, clear, and exact description.

This invention relates to a machine designed more especially for elevating coal; and the invention consists in certain novel constructions, combinations, and arrangements of parts which will be hereinafter described, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of my invention, showing the bucket elevated and open. Fig. 2 is a sectional rear elevation of a part of the machine, showing the engines and mechanism for revolving the hoisting-drums and swinging the boom. Fig. 3 is a plan view of a part of the mechanism, showing the hoisting and turning gearing for the boom. Fig. 4 is a side elevation of the outer end of the boom and the bucket, the latter being shown in closed position; and Fig. 5 is a sectional elevation taken on the line *xx* of Fig. 4.

In constructing my new coal-hoisting or dredging machine I prefer to employ a frame, A, for supporting the main upright or mast B. The frame A is composed in this instance of the two side pieces *a a* and the upper and lower plates, *a' a'*, and the frame is supported in this instance by the fixed stud C. The mast B is hollow and is braced by suitable rods B', and is provided at its upper end with two pulleys, *b b*, over which the cable D, leading from hoisting-drum E to the outer pulley, *b'*, of the boom F, passes. To the outer end of the boom F is attached, upon transverse rod or shaft *f*, the bucket G, and the inner end of the boom is by preference held in the cross-piece *h* of a frame, H, composed of the said cross-piece *h* and the side pieces *h' h'*, which latter are pivoted upon the main power-shaft J. The boom F is by preference made hollow, so that the bucket-cable K may pass through it, as shown in Fig. 1, to prevent the cable from sagging. The said bucket-cable K passes over the drum *k*, placed on shaft *k'*,

journaled in the side pieces *h'* of the frame H, and from the drum *k* the said cable passes along or through the boom F over pulley *b'* at the outer end of the boom, thence down to the drum *k'*, fixed upon the shaft *g'*, held in and between the side pieces or plates, *g' g'*, of the bucket G; and this cable K is for opening and closing the hinged scoops *g g* that compose or constitute the bucket proper.

The bucket G, as a whole, is composed of the said scoops *g g*, side plates, *g' g'*, transverse shafts *f* and *g'*, and the opening and closing arms *g''*, four in number. The side plates, *g'*, are longitudinally slotted, as shown at *i*, and are placed upon the ends of the transverse shaft *f*, the ends of the shaft passing through the slots *i*, as shown clearly in Fig. 5, and to the lower ends of the said side plates, *g'*, the scoops *g* are oppositely hinged upon the studs *i'*. (Shown in Figs. 1 and 4.) The opening and closing arms *g''* are also attached at their upper ends to the said transverse shaft *f*, and at their lower ends they are hinged or pivoted by the studs *i'' i''* to the outer and upper edges of the scoops *g*, so that when the side plates, *g'*, are lowered (by letting away upon the cable K) from the position shown in Fig. 4 to that shown in Fig. 1 the arms *g''*, being relatively stationary at their upper ends, will operate to hold the upper edges of the scoops *g*, while the plates *g'* act to spread and open them away from each other at their lower edges. By drawing in upon the cable K the side plates, *g'*, will be lifted and the opposite action will take place—that is, the arms *g''* will hold the upper and outer edges of the scoops relatively stationary, (save a slight outward movement in a curve,) while the plate *g'* will operate to draw the scoops together to close them, as shown in Fig. 4.

The letting out and drawing in of the cable K for thus opening and closing the scoops *g* is effected in this instance by the above-mentioned drum *k* on shaft *k'*, which latter is revolved continuously from the main shaft J by small gear-wheel *j* on shaft J and larger gear-wheel *j'* on shaft *k'*. The shaft J is revolved in this instance by the steam-engines L L, attached to the sides of frame A, and connected to the opposite cranks, *j'' j''*, of the said shaft J by connecting-rods and cross-heads *j''' j'''*. The drum *k* is loose upon shaft *k'*, and in this in-

stance is adapted to have a slight longitudinal movement on the shaft for clutching it with and releasing it from the cone k^3 formed upon the shaft k' . The end of the drum next to the cone k^3 is slightly recessed to fit the cone k^3 , and I provide the frame H with the lever M for moving the drum longitudinally upon the shaft, so that by simply operating the lever M this drum may be made to revolve with the shaft k' for winding up the cable K for closing the scoops g , or released from the shaft to revolve thereon to let out the cable K for opening the said scoops g . The drum E, over which the cable D passes, is placed loosely upon the shaft N, journaled in the side pieces a of the frame A, and the shaft N is adapted to be revolved from the main power-shaft J by the small gear-wheel l fixed on the power-shaft and the larger gear-wheel l' fixed on shaft N. The shaft N has the cone m formed upon it, and the drum E is adapted to be moved longitudinally on the shaft N by the lever O for clutching the drum with the cone m , for causing the drum to revolve with the shaft or releasing the drum from the cone so that the drum may turn freely upon the shaft. When the drum N is moved upon the cone m , the drum will revolve with the shaft and wind up the cable D and lift the outer end of the boom F, and when the drum is moved off from the cone the weight of the boom and bucket G upon the cable will lower the boom and bucket to the body of coal or other material to be lifted.

Upon the upper end of the fixed stud C, I secure the beveled cog-wheel P, and upon the power-shaft J, I place loosely the beveled cog-wheels Q Q, that mesh with opposite sides of the gear-wheel P. The wheels Q each have a clutch, q , formed upon their inner surfaces, and upon the shaft J, between the clutches $q q$ of the wheels Q, is placed the sliding clutch R, that is attached to the shaft by a key or spline. (Shown in dotted lines in Fig. 2.) The clutch R may be moved upon the shaft J to engage with either of the clutches q , so that by means of the sliding clutch R either of the cog-wheels Q may be made to revolve with the shaft J, so that the power of the engines L may be used or applied for turning the whole machine bodily upon the stud C for swinging the boom F and bucket G from the place of loading to and from the place of dumping.

By adapting the parts g of the bucket G to be opened and closed as described, in order

to fill them (the parts being open) it is only necessary to lower the boom F until the edges of the open scoops of the bucket rest upon the body of coal or other material to be lifted, and then to shift the drum k so as to clutch it with shaft k' , and thus cause the cable K to be wound upon the drum, which will elevate the side pieces g' and close the scoops, as above described, and cause them to be filled with the coal or other material. This done, the drum E will be shifted to clutch it to shaft N, which will wind in cable D and elevate the boom F and loaded bucket G. When elevated to the proper height, the clutch R will be shifted to engage the clutch q of one of the wheels Q, which will cause it to revolve with the main power-shaft J, and, meshing with fixed gear-wheel P, will cause the whole machine to turn on stud C, which will swing the boom F and bucket G to one side for dumping, which latter is effected by simply shifting the drum k on shaft k' to let out the cable K. The dumping being accomplished, the clutch R will be shifted on shaft J to engage the clutch q of the other wheel Q, which will cause it to turn with the shaft J, and cause the whole machine to turn back on stud C, swinging the boom F and bucket G back for another load. In this manner all handling of the coal or other material with shovels is avoided, saving much time and labor.

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

1. The side plates, g' , slotted, placed on shaft f , and having the scoops g pivoted to them, in combination with arms g^2 , and the cable K for raising and lowering the plates g' for opening and closing the scoops g , substantially as and for the purposes set forth.

2. In a hoisting-machine, the drum k , cable K, boom F, and means for revolving the drum k , in combination with the vertically-movable plates g' , arms g^2 , and scoops g , all arranged to operate substantially as and for the purposes set forth.

3. In a hoisting-machine, the hinged frame H, drum k , and boom F, in combination with cable K, and side plates, g' , to which the cable is attached for operating the scoops of the bucket, substantially as described.

BERNARD M. MUNN.

Witnesses:

THEODOR HILBERT,
JOHN OTTO.