C. E. McCAY.

COMBINED ELEVATOR AND CONVEYER.

APPLICATION FILED OCT. 20, 1911. RENEWED JULY 10, 1914.

1,121,742. Patented Dec. 22, 1914.

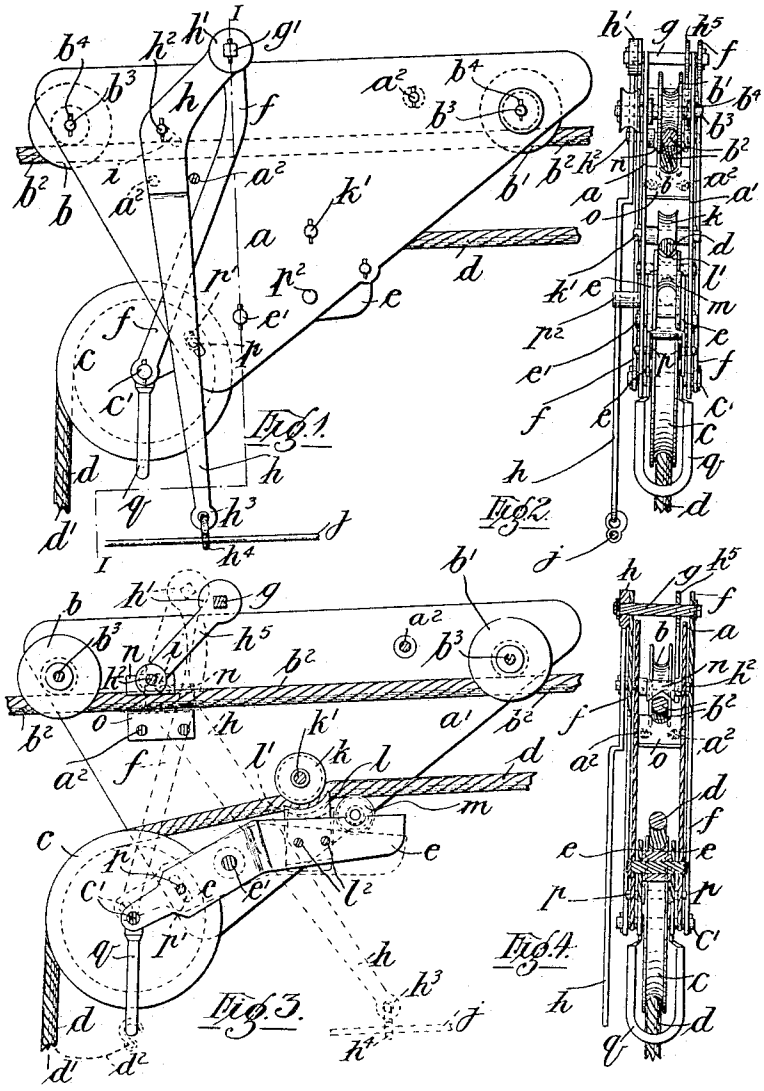


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Witnesses:-
K. J. Noonan.
Joseph F. Sullivan

Inventor:-
Campbell Ernest McCay
by
Edmondson Marks
Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CAMPBELL ERNEST McCAY, OF ESSENDON, VICTORIA, AUSTRALIA.

COMBINED ELEVATOR AND CONVEYER.

1,121,742. Specification of Letters Patent. Patented Dec. 22, 1914.

Application filed October 20, 1911, Serial No. 655,726. Renewed July 10, 1914. Serial No. 850,258.

To all whom it may concern:

Be it known that I, CAMPBELL ERNEST McCAY, a subject of the King of Great Britain, and resident of 7 Kaliman street, Essendon, in the State of Victoria, Australia, have invented certain new and useful Improvements in Combined Elevators and Conveyers, of which the following is the specification.

This invention has been devised to provide means applicable for either raising goods or other weighty materials from a lower to a higher level or conveying them to and from such a position as may be required or alternatively for lowering goods or other weighty material from a higher to a lower level and is applicable generally for lifting weighty goods from any one spot perpendicularly through the air and conveying them laterally along a cable or rope of wire or other suitable material suspended in the air and then lowering them in any desired spot along the cable or rope, using for both motions one rope or cable operated from a winding drum.

Specific uses would be hauling materials up a shaft or well or from an excavation, or from the hold or deck of a ship, or from a railway truck or other vehicle to a given height, and then conveying them up an inclined cable or rope by haulage from the drum or down the cable or rope by paying out the winding rope from which the materials were suspended, allowing gravity to produce the desired travel, then when so conveyed to the desired point to lower them to their destination.

In order that the invention may be more easily understood, reference may be made to the accompanying drawings, in which—

Figure 1 is a side elevation showing a general view of one form of apparatus embodying my invention. Fig. 2 is a front elevation thereof. Fig. 3 is a sectional elevation of Fig. 1, while Fig. 4 is a vertical section taken at the dotted line 1—1 on Fig. 1 when viewed from the back.

In these drawings it will be seen that I employ a supporting frame which preferably consists of twin plates a, a', suitably held together in parallel arrangement by rivets, screws or the like a^2 at all points where rigid fixing is necessary. These twin plates are arranged to carry two free running weight supporting pulleys b, b', grooved or shaped to turn freely upon the cable, rope or similar track, or suspension means b^2. These pulleys run in horizontal alinement, their spindles b^3 being supported by the plates a, a' and provided with pins b^4 to prevent them from working out of position. The cable or rope b^2 forms a fixed track upon which the frame a, a', and the weight hereinafter to be referred to are supported. At the lower end of the said plates a, a', is a pulley c, grooved or shaped to guide a rope or cable d and mounted upon a spindle c' held in a bifurcated arm e, the latter being pivoted upon a spindle e' held between said twin plates a, a'. The spindle c' also serves as a journal for two arms f, which extend upward on the exterior of the twin plates a, a' and above the same to a shaft g, to one end g' of which is connected the upper end h' of a lever arm h, which carries a shaft h^2, free to move in a radial slot i cut in the twin plates a, a'.

It will be seen in Figs. 1, 2 and 4 that the lever arm h is bent outwardly to escape the spindle c' and is eyeleted at h^3 to receive a link h^4 which in turn is fastened to an endless controlling cord j. This cord j can be led to pass over any approved arrangement of free running pulleys if required, or may be operated direct by the person in charge of the raising or lowering operations.

h^5 is a link carried by the shafts g and h^2 to assist in bearing the strain of h when moved.

k (see Figs. 2 and 3) is a free running pulley mounted upon a fixed spindle k' in the twin plates a, a' and is grooved to fit the rope d.

l (see Figs. 2 and 3) is a gripper plate or block having a V shaped groove l' formed therein, the curvature of which approximately corresponds with the curvature of the pulley k. This gripper plate l is rigidly fixed to the bifurcated arm e by rivets or pins l^2, the whole being so arranged that when the spindle c' is moved into the position shown in full lines in Fig. 3 the gripper block l will compress the cable or rope d between itself and the grooved pulley k and form a brake to prevent the travel of the said cable or rope d, and reversely, when the spindle c' carrying with it the bifurcated arm e is raised into the dotted position shown in Fig. 3 the said gripper block l will be moved into the position shown in dotted lines to release the cable or rope d so that it may run freely.

m is a small free running grooved guide or roller the spindle of which passes through the plates a, a', its object being to facilitate the alinement of the cable or rope d in its forward or backward movement and to prevent the acute tension of the cable or rope d tending to depress the gripper block l.

The shaft h^2 of the arm h carries upon it a gripping block n arranged above the cable or rope b^2, while beneath the cable at that portion is a fixed gripping block o held in position by the rivets, pins or screws a^2 in the twin plates a, a' (see Figs. 3 and 4). It will be seen that when the lever arm h has been radially moved into the dotted position in Fig. 3 the gripper block n will be pressed downwardly so as to form a brake on the cable or rope b^2, while when the lever arm is moved into the position shown in full lines in Fig. 1, the block n will be moved away from the cable b^2 and allow the apparatus to run freely thereon. It will also be seen that the lever arm h, the arms f and the bifurcated lever e are so arranged that when the lever arm h is moved into the position shown in full lines in Fig. 1, to release the block n from the cable b^2, the lever e is moved, by means of the arms f, into the position shown in full lines in Fig. 3, to cause the block l to grip the cable d, and that when the lever arm h is moved into the position shown in dotted lines in Fig. 3, to cause the block n to grip the cable b^2, the lever e is moved by means of the arms f, into the position shown in dotted lines in Fig. 3 to release the block l from the cable d. There is thus provided a synchronous releasing of a brake upon one cable and a tightening of a brake on the other cable in accordance with the movement or position of the lever arm h.

p, p, are limitation pins or studs fixed on the arms of the bifurcated lever e to form stops or limitations to the travel of the said lever, the pins working in radial slots p' cut in the plates a, a' of such length that the arm may not travel beyond the necessary distance to bring into action or alternatively to release the gripper block l hereinbefore set forth.

p^2 is a limitation stud carried by the plate a to prevent the lever arm h from undue travel.

q is a hanging loop conveniently placed, to which a dragging rope may be attached for pulling the whole apparatus along the cable or rope b^2 without interfering with the cord j; or alternatively it may receive the hook from the end of the rope at d' as shown dotted at d^2 so that a pulley block may be utilized on the rope at d^2 for lifting extra heavy weights.

The operation of the apparatus is briefly as follows:—The rope j is pulled to move the lever arm h so as to cause the block n to grip the cable b^2 to hold the apparatus stationary, the lever e being moved by arms f to cause the block l to release the cable d. The weight to be lifted is secured to the cable d, which is then wound up to raise the weight to the desired height. The rope j is then operated to move the lever arm h to release the block n from the cable b^2 and to move the lever e to cause the block l to grip the cable d. The cable d is then further wound up to draw the whole apparatus together with the weight carried thereby along the cable b^2. When the desired position is reached, the rope j is pulled to move the arm h to again cause the block n to grip the cable b^2 and to move the lever e to release the block l from the cable d, which may then be paid out to lower the weight carried thereby to the position required. When the cable b^2 is inclined as shown in the drawings, the movement of the apparatus along the cable in one direction may be effected by paying out the cable d, the block n being released and the block l engaging said cable. The action of gravity on the weight suspended from the cable d causes the apparatus to be drawn along the cable b^2 and when the desired position has been reached, the lever arm h is moved to cause the block n to grip the cable b^2 and to cause the block l to be released from the cable d, the latter then being further paid out to lower the weight to the desired position.

It will be seen that when the lever arm h is in the position shown in full lines, the weight to be transported acts on the bifurcated lever e to force the block l into gripping contact with the cable d and that when the lever arm h is in the position shown in dotted lines, the weight acts through the arms f to force the block n into gripping contact with the cable b^2, the gripping or braking action of these two blocks being thus proportional to the weight being transported.

I would have it understood that I do not arbitrarily confine myself to a rigid adherence to the employment of the twin plates a, a' as it is obvious that I may in lieu thereof employ a framework of stanch metallic construction of independent or homogeneous members and I would also reserve to myself the right to modify to any extent the arrangement of the parts relatively to one another and the application of the apparatus to correspond with altering local requirements where the apparatus is to be employed.

What I claim and desire to secure by Letters Patent is:—

1. A raising, lowering or conveying apparatus, comprising a suspension cable, a weight-supporting cable, means for exerting a braking action upon the suspension

cable, means for exerting a braking action upon the weight-supporting cable, and means operated by the weight to be transported for causing either one of said braking means to engage the corresponding cable, while the other braking means is released from its corresponding cable.

2. A raising, lowering or conveying apparatus, comprising a suspension cable, a weight-supporting cable, a lever, a brake block carried by said lever, adapted to engage one of said cables, a pulley carried by said lever for guiding the weight-supporting cable, the weight to be transported acting upon the said lever to cause the brake block to engage the corresponding cable.

3. A raising, lowering or conveying apparatus, comprising a suspension cable, a weight-supporting cable, a lever, a brake block carried by said lever for engaging the suspension cable, a second lever, a brake block on said second lever for engaging said weight-supporting cable, an arm connecting said levers and a pulley mounted at the point of connection of said arm and second lever for guiding said weight-supporting cable, the weight to be transported acting to hold either one of said blocks in engagement with the corresponding cable, while the other of said blocks is withdrawn from engagement with its corresponding cable.

4. A raising, lowering or conveying apparatus, comprising a suspension cable, a weight-supporting cable, a lever, a brake block carried by said lever for engaging the suspension cable, a second lever, a brake block carried by said second lever for engaging the weight-supporting cable, and an arm connecting said levers, the levers in one position causing the one brake block to grip the suspension cable and the other to release the weight-supporting cable, and in the other position causing the one brake block to grip the weight-supporting cable, and the other to release the suspension cable.

5. A raising, lowering or conveying apparatus, comprising a suspension cable, a weight-supporting cable, a pivoted lever, a support therefor having a slot in which the pivot of the lever works, a brake block carried by the pivot of said lever for engaging the suspension cable, and means for operating said lever to move the pivot thereof to one end of the slot in the support for engaging said brake block with the suspension cable, and to the other end of the slot for disengaging the block from the cable.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CAMPBELL ERNEST McCAY.

Witnesses:
ALICE HARKER,
REGINALD ALFRED TURNER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."