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HOISTING AND CONVEYING APPARATUS.

(Application filed Apr. 25, 1898.)

(No Model.)

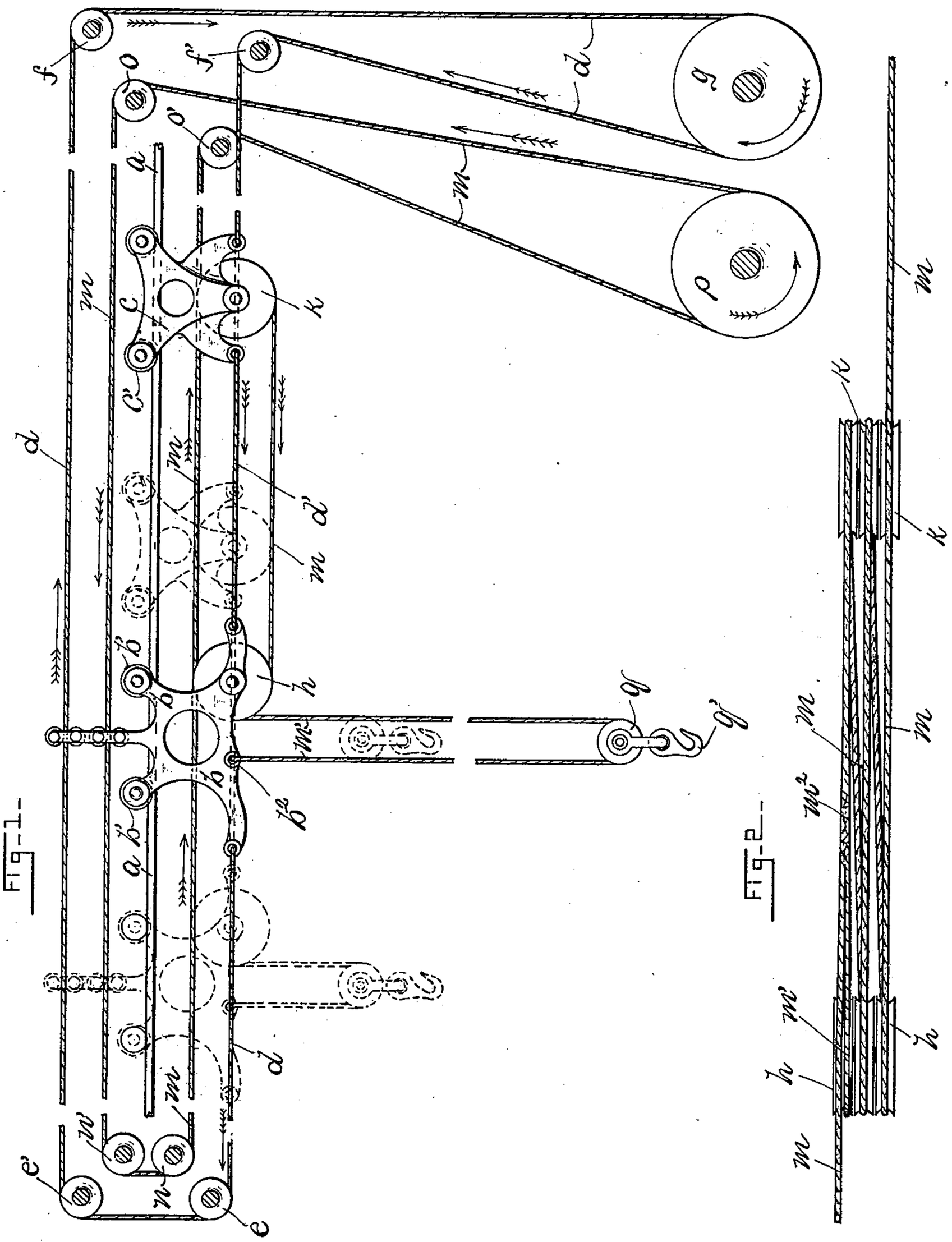

FIG-1-

FIG-2-

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HOISTING AND CONVEYING APPARATUS.

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Application filed April 25, 1898 Serial No. 678,756. (No model.)

To all whom it may concern:

Be it known that I, HERBERT R. PALMER, 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 Conveyers, of which the following is a full, clear, and exact description.

This invention is a hoisting and conveying apparatus of the class commonly used in quarrying, mining, the handling of coal in transportation, in the building of dams and like works of construction engineering, and, in fact, for many purposes in which it is desirable to provide in a single apparatus mechanism whereby the raising, lowering, and transportation of heavy loads may be readily effected. The aim of this invention is to improve this class of apparatus by simplifying the mechanism thereof, thus enabling the same to be more easily manipulated than heretofore.

The main elements of the apparatus to which my invention relates consist of a cable or track stretched between given points, upon which track a carriage is mounted and adapted to travel reciprocally to effect the transportation of the load, the latter being suspended from said carriage. In connection with the track and carriage suitable mechanism is provided to effect the necessary reciprocating travel or "racking" of the carriage and also the raising and lowering of its load.

My newly-invented apparatus embodies mechanism for producing the results above mentioned, a portion of such mechanism being adapted to be operated independently to effect the raising or lowering of the load, and the several parts are adapted to be operated as a whole to effect the racking of the carriage with its load, as I shall explain in detail.

To assist in explaining my invention, I have provided the accompanying sheet of drawings, in which—

Figure 1 shows in elevation my newly-invented apparatus, and Fig. 2 shows detached and somewhat enlarged a portion of the mechanism thereof.

Referring to the drawings, the letter *a* denotes the main cable or track, which, it is assumed, is stretched over the points where the work is to be performed and serves to support the reciprocally-traveling carriage, which latter is denoted as a whole by the letter *b*, and also an auxiliary "take-up" carriage *c*. Carriages *b* and *c* are suspended from track *a*, each being provided with grooved tandem wheels *b' c'*, respectively mounted therein and adapted to travel on said track. From carriage *b* the load to be conveyed is suspended, and carriage *c* is provided chiefly to take up and deliver a portion of the hoisting-cable, as hereinafter explained.

Carriages *b* and *c* are moved upon the track *a* by means of a cable *d*, whose opposite ends are secured, respectively, to the carriages *b* and *c*, and the latter are in turn connected by means of a short cable *d'*. Cable *d* is supported near each end of track *a* on idle (score) pulleys, over which it may freely render. Said pulleys, near one end of track *a*, (the left-hand end, as shown in the drawings,) are denoted by reference-letters *e e'* and those at the opposite end by letters *f f'*, at which last-named end is located also the driving mechanism of the cable *d*, said mechanism consisting of a large drum *g*, either of the grooved or winch type. Tracing out, now, the course of cable *d* it will be seen that starting from carriage *b* said cable engages first the pulleys *e e'*. Thence crossing to the opposite end of cable *a* said cable engages successively the pulley *f*, the drum *g*, the pulley *f'*, and thence passes to carriage *c*, which latter, as above stated, is connected to carriage *b* by the short cable *d'*, thus providing a practically endless cable. Cable *d* encircles drum *g* a sufficient number of turns to insure the driving of said cable when the drum is set in revolution, and it will be readily understood from the foregoing description and from the drawings that when drum *g* is set in revolution the cables *d* and *d'* will cause the carriages *b* and *c* to travel on track *a*, the direction of such travel of the carriages being of course determined by the direction of revolution of said drum.

Journaled in the lower portions of carriages *b* and *c* are one or more sheaves, reference-letter *h* denoting those of carriage *b* and letter *k* those of carriage *c*. The said sheaves *h* and *k*, when more than one is provided, are arranged side by side, as shown in Fig. 2, and

are adapted to receive the hoisting-cable in a manner to be explained. Said hoisting-cable is denoted by the reference-letter *m*, and for the purpose of supporting the same near one end of track *a* pulleys *n n'* are provided adjacent to the pulleys *e e'*, and at the opposite end of said track pulleys *o o'* are provided adjacent to the pulleys *f f'*, already described. A driving-drum *p* is also provided for the cable *m*, which drum is similar and adjacent to the said driving-drum *g*. Cable *m* is endless and by following out the course of the same it will be seen that commencing at the pulley *n* said cable passes thence upward to pulley *n'*, then crosses to the opposite end of track *a* and engages in turn the pulley *o*, drum *p*, (which it preferably encircles a number of turns,) pulley *o'*, one of the pulleys *h*, thence back to sheaves *k*, and passes forward and backward between and around said sheaves *h* and *k* to engage the several sheaves of each carriage *b* and *c*, and finally again reaches pulley *n*, the point of starting. It will thus be seen that cable *m* is endless, and it will be understood that the rotation of its driving-drum *p* will cause the cable to travel freely over and around the several pulleys and sheaves which it engages.

In addition to the driving-cable *m* an auxiliary cable *m'* is provided, one end of which is secured to carriage *b* at b^2 and whose opposite end is secured to cable *m* by splicing or otherwise, as at m^2. (See Fig. 2.) From its points of support the cable *m'* hangs in a loop, in the lower portion of which a pulley-block *q* is located, having a hook *q'* depending therefrom, to which the load may be attached. Cable *m'* is of such length that when it is at full length and so that its pulley-block *q* is in its lowest position the spliced end m^2 is drawn over and somewhat beyond the pulley *h*, as will be readily understood by reference to the drawings. The grooves of the sheaves *h* and *k* are intentionally made wide enough to receive both of the cables *m* and *m'*.

Drums *g* and *p* may each be provided with independent power or may be driven by means common to both, and said drums may be located side by side on a common shaft or on independent shafts, as shown in the drawings; but whatever may be the means employed for driving said drums or the manner in which they are located relatively to each other said driving mechanism must be such that they may be operated independently of each other or in unison.

Assuming that apparatus of my newly-invented construction is provided and the various parts are in the positions shown in full lines in Fig. 1 of the drawings, to operate the same to raise the load drum *p* is set in revolution, thus serving to drive endless cable *m* over its various supporting-pulleys in the directions indicated by the arrows adjacent to said cable *m*. Cable *m*, having secured to it at the point m^2 the cable *m'*, draws the latter with it and carries the same around the pulleys *h* and *k* until the looped portion of said cable is shortened sufficiently to bring pulley-block *q* to the desired height, which, it is assumed, is as shown in dotted lines, Fig. 1. Should it now be desired to cause carriages *b* and *c* to travel horizontally from the positions shown in dotted lines to that shown in full lines, drum *g* is set in revolution to drive cable *d*, as indicated by the arrows adjacent to cable *d*; but at the same time drum *p* must be reversed and revolved in unison with drum *g* and at the same speed, thus causing cable *m* to render in the direction opposite to that of its arrows. Such action causes cable *m* to travel in the same direction and at the same speed as the carriages *b* and *c*, and as a result the pulley-block *q* remains at the same elevation shown in dotted lines in the drawings. To effect the lowering of the load or the driving of the carriages in the opposite direction to that just described, it will be obvious that a mere reversal of the operations just described would be necessary.

In connection with my newly-invented apparatus it should be particularly noted that by increasing the distance apart of carriages *b* and *c* or increasing the number of sheaves *h* and *k* carried thereby it is possible to use an auxiliary hoisting-cable *m'* of almost any desired length, such length being limited only by the distance apart which carriages *b* and *c* could be successfully operated and the number of sheaves *h* and *k* which could be practically used. It is of course desirable to so construct the described apparatus that when the block *q* is in its highest position the cable *m'* will be taken up between and around sheaves *h* and *k* and will not run in upon the drum *p*.

My described hoisting and conveying apparatus as a whole has the desirable qualities of simplicity, cheapness of construction, and ease of manipulation.

Having thus described my invention, I claim—

1. In hoisting and conveying apparatus, in combination, a track or way, a carriage mounted to travel on said way, a practically endless racking-cable *d* supported and connected with said carriage, substantially as set forth, a hoist-controlling cable *m*, and an auxiliary hoisting-cable having one end secured to the said carriage and its other end secured to the said cable *m*.

2. In hoisting and conveying apparatus, in combination, a track or way, carriages *b c* mounted to travel on said way with fixed relation to each other, a hoist-controlling cable supported substantially as described, an auxiliary hoist-cable having one end secured to the said carriage *b* and the other end attached to the said hoist-controlling cable, and take-up rolls *h k* mounted respectively in the said carriages *b* and *c*, in the line of hoist-controlling cable, all substantially as specified.

3. In hoisting and conveying apparatus, in combination, a track or way, a load-supporting carriage mounted to travel on said way, a racking-cable supported and secured to said carriage as set forth, a hoist-controlling cable, an auxiliary hoist-cable having one end secured to the carriage and its other end attached to the hoist-controlling cable, and means for independently operating the said racking and hoist-controlling cables.

Signed at Cleveland, Ohio, this 7th day of April, 1898.

HERBERT R. PALMER.

Witnesses:
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