

C. ZETTERLUND.
ELEVATING AND LOWERING APPARATUS.
APPLICATION FILED NOV. 13, 1912.

1,060,394.

Patented Apr. 29, 1913.

2 SHEETS—SHEET 1.

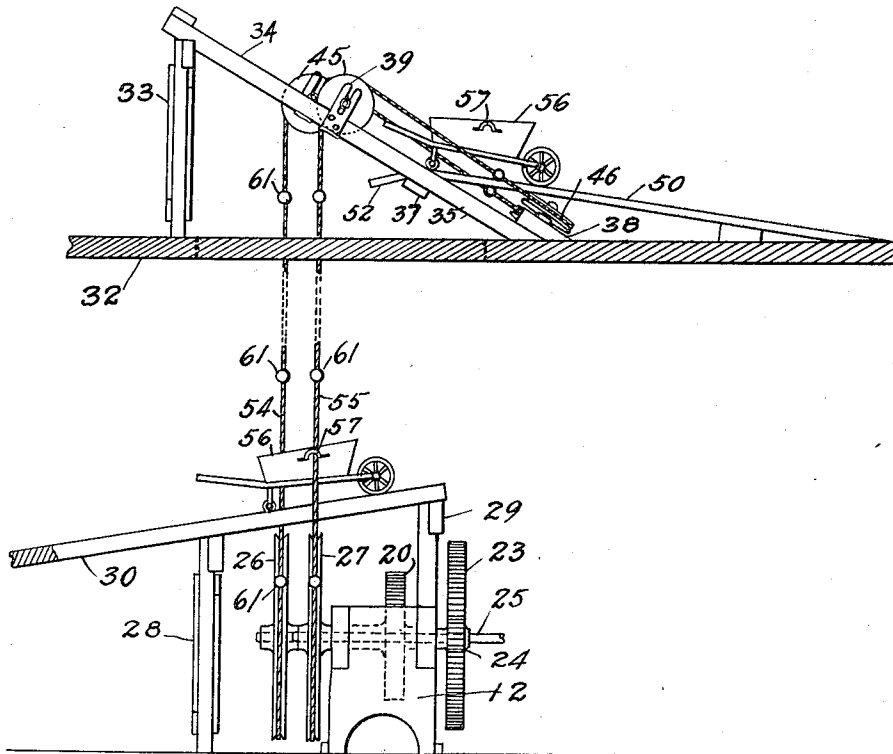


Fig. 1.

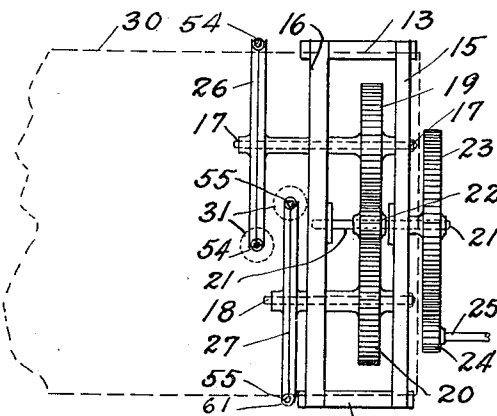


Fig. 2. 14

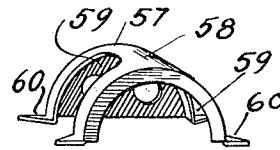


Fig. 7.

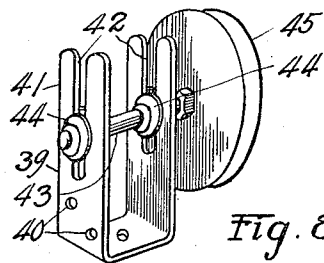


Fig. 8.

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2 SHEETS—SHEET 2.

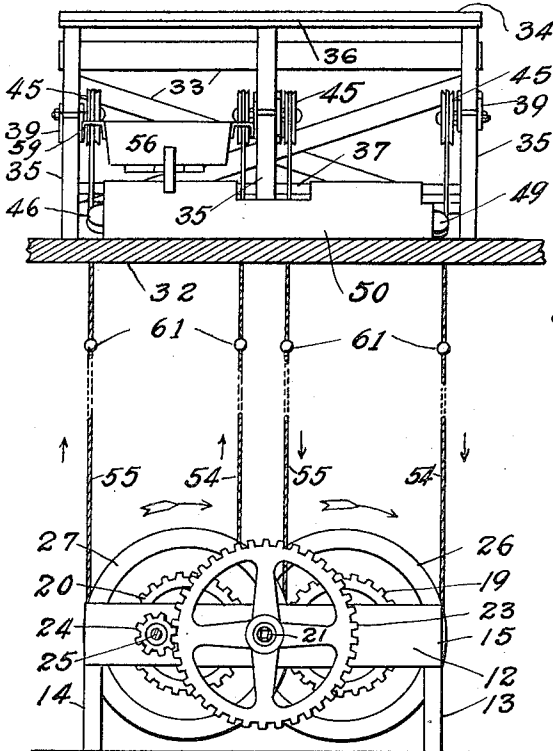


Fig. 3.

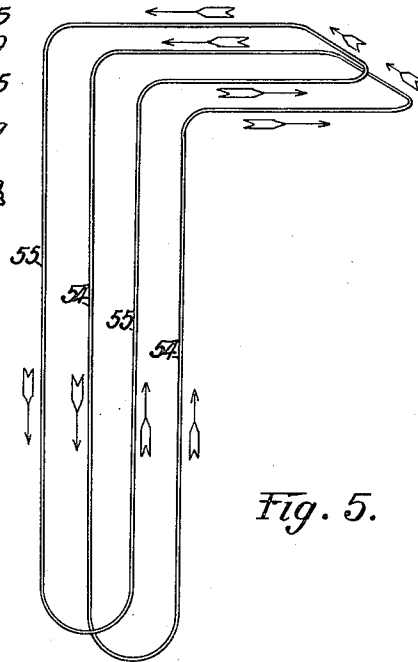


Fig. 5.

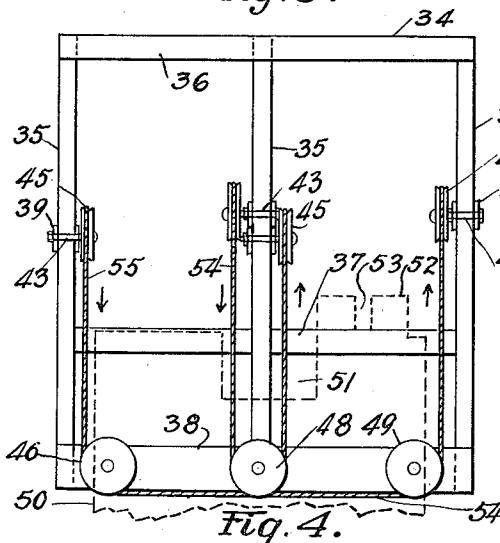


Fig. 4.

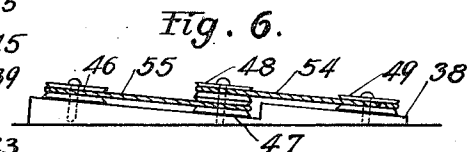


Fig. 6.

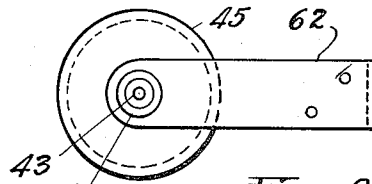


Fig. 9.

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UNITED STATES PATENT OFFICE.

CARL ZETTERLUND, OF CHICAGO, ILLINOIS.

ELEVATING AND LOWERING APPARATUS.

1,060,394.

Specification of Letters Patent.

Patented Apr. 29, 1913.

Application filed November 13, 1912. Serial No. 731,098.

To all whom it may concern:

Be it known that I, CARL ZETTERLUND, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Elevating and Lowering Apparatus, of which the following is a specification.

This invention relates to improvements in elevating and lowering apparatus, and it consists in certain peculiarities of the construction, novel arrangement and operation of the various parts, as will be hereinafter more fully set forth and specifically claimed.

The principal object of the invention is to provide a simple, inexpensive and efficient apparatus to be used for elevating material or articles of various kinds from a lower to a higher place in a conveying receptacle, and for lowering said receptacle after it has been emptied, to the end that it may be refilled and again lifted to the desired point, and again discharged of its load.

While the apparatus may be used in mines, ore docks and coal yards for elevating ore, coal or the like, yet it is especially intended for use in the construction of buildings for conveying material, such as brick, mortar, laths and the like from the ground to the upper floors, in wheel barrows or wheeled receptacles, by means of which it can be trundled to and from the apparatus to the point on the floor where required.

Another object of the invention is to provide an apparatus of the above named character, which can be operated continuously, and so that no time will be lost in placing the conveying receptacle in engagement with the elevating cables or removing them therefrom; and, furthermore, so that there will be no interference between the ascending and descending receptacles.

Other objects and advantages of the invention will be disclosed in the subjoined description and explanation.

In the accompanying drawings which serve to illustrate the invention—Figure 1 is a side view partly in elevation and partly in section of an apparatus embodying the invention, showing a part of the

lower or loading platform and a portion of an upper floor or elevated support with the pulley supporting frame and unloading platform mounted thereon, and also illustrating a wheel barrow in about the act of being elevated, and another one in the position it will occupy after being elevated, and just after it is disengaged from the elevating cables; Fig. 2 is a plan view of the driving mechanism of the apparatus illustrating by dotted lines, a portion of the loading or lower inclined platform mounted on the frame of said mechanism; Fig. 3 is a front view of the apparatus, showing the cables thereof shortened for the convenience of illustration; Fig. 4 is a plan view of the pulley supporting frame for the elevated support; Fig. 5 is a diagrammatic view of the endless cables, the movement of the strands of the same being indicated by arrows; Fig. 6 is an edge or end view of the lower portion of the pulley supporting frame; Fig. 7 is a detached perspective view of one of the catches employed on the sides of the wheel barrow for engaging the cables; Fig. 8 is an enlarged detached perspective view of one of the hangers for the elevated pulleys, showing one of said pulleys journaled thereon, and Fig. 9 is a side view of a modified construction of said hangers.

Corresponding numerals of reference refer to like parts throughout the different views of the drawings.

The reference numeral 12 designates the supporting frame of the driving mechanism of the apparatus, which frame includes end uprights 13 and 14, which are united at their upper portions by means of side pieces 15 and 16, which are spaced apart as shown in Fig. 1 of the drawings. Horizontally journaled in parallelism with one another on the frame 12, and transversely with respect to the members 15 and 16 are shafts 17 and 18, on which are mounted gears 19 and 20, respectively. Journaled horizontally and transversely on the pieces 15 and 16, of the main frame, and about midway between the shafts 17 and 18, is another shaft 21, on which is mounted a pinion 22, which meshes with the gears 19 and 20, so as to cause them to rotate in the same direction. Mounted on the shaft

21, outwardly of the frame 12, is a gear 23, which is driven by means of a pinion 24, mounted on a power shaft 25, which may be operated by a gasolene engine (not shown),
 5 or any other suitable motive power.

As shown in Figs. 1 and 2, the shafts 17 and 18 are extended through the frame 12, and rearwardly thereof. The shaft 17, has mounted on its rear portion a grooved pulley 26, and the shaft 18, has mounted thereon a grooved pulley 27, so as to lie in parallelism with the pulley 26, and so that said pulleys will overlap each other sidewise, that is, assuming that the portion of the frame 12, on
 15 which the gear 23 is located is the front portion of said frame and apparatus, the pulley 27, will be located forwardly of the pulley 26, yet the two will be in parallel planes with one another.

Mounted on suitable upright supports 28 and 29, the latter of which may be extended upwardly from the frame 12, is an inclined loading platform 30, which is provided with openings 31, in its upper portion for the passage of the elevating cables, and has its lower end resting on the ground or lower floor. The upper floor or elevated support 32, is provided with an opening therein directly above the upper portion of the platform 30,
 20 of suitable size to permit of the passage of wheel barrows, and has mounted near one end of said opening an upright or horse 33, which supports the upper end of a pulley carrying frame 34, the other end of which rests on the floor 32, near the opposite end of the opening therein. The frame 34, includes three parallel rails 35, which are connected together at their upper ends by means of a cross piece 36, and near their lower ends by means of a transverse bar 37, and at their
 30 lower ends by means of another transverse bar 38, on the latter of which are journaled a series of grooved pulleys.

Mounted on each of the outside rails 35, of the frame 34, is a hanger 39, for the elevated pulley shafts, each of which hangers 39, is formed substantially U-shaped in cross section, as shown in Fig. 8, so as to straddle the rails 35, to which they may be secured by means of bolts extended through
 40 openings 40, in the upright arms 41, of said hangers. Each of the arms 41, is provided with a longitudinal slot 42, to receive the pulley shaft 43, which is loosely mounted in bearings 44, adjustably engaging the arms 41, of its hanger. Each of the shafts 43, is loosely mounted in the hangers 44, so as to rotate therein, and has on its inner end a grooved pulley 45, which pulleys are journaled at right angles to the planes of the pulleys 26 and 27, but directly above the same. Located on the intervening rail 35, of the frame 34, are two of the hangers 39, which are located one above the other, as is

clearly shown in Fig. 4 of the drawings. A shaft 43, is journaled in each of the hangers 39, on the middle rail, and said shafts have on their opposed ends pulleys 45, which are also journaled at right angles to the planes of the pulleys 26 and 27, of the driving
 65 mechanism.

As shown in Figs. 1, 3 and 6, the bar 38, which unites the lower ends of the rails 35, of the pulley supporting frame lies in an inclined position, and has journaled on its upper surface a series of grooved pulleys 46, 47, 48 and 49, the pulleys 47 and 48 being preferably journaled one above the other.

An inclined unloading platform 50, rests at its lower end on the floor 32, and at its upper end on the bar 37, of the pulley frame, and is of sufficient width only to lie between the outer rails 35, of said frame. The upper portion of the platform 50, is provided with a recess 51, to receive the middle rail of the frame 34, and at one side of said recess the platform 50, is provided with a forwardly and downwardly projected extension 52, which is provided with a slot 53, in its free end. Extended around the pulley 26, and over one of the pulleys 45, on one of the side rails of the frame 34, and over one of the pulleys 45, on the opposite side of the middle rail of said frame, is an endless cable 54, which also is extended around the pulleys 48 and 49, on the bar 38, of the frame for the elevated pulleys. Extended around the pulley 27, and over one of the pulleys 45, on the opposite side rail of the frame 34, from that on which the pulley 45, over which the cable 54 passes, and over one of the pulleys 45 on the opposite side of the middle rail of said frame, is an endless cable 55, which is also extended around the pulleys 46 and 47 on the bar 38, of the supporting frame for the elevated pulleys. Thus it will be seen that the descending strands of the cables 54 and 55, will be located between one of the side rails 35, and the middle rail 35, of the frame 34, and that the ascending strands of said cables will be located between the other side rail and middle rail of said frame, and also that the descending strand of one cable will be forwardly of the descending strand of the other cable, while the ascending strand of one cable will be located forwardly of the ascending strand of the other cable, which arrangement is clearly shown in Figs. 2 and 4 of the drawings.

In the present instance I have shown the conveying receptacle in the form of a wheel barrow, which is provided with a box-like body 56, which body has on each of its sides a grip or catch which is designated as a whole by the numeral 57, and each of said grips or catches is formed of a semicircular

piece 58, provided with slots 59, in its front and rear portions. At the open ends of each of the slots 59, the grip piece 58 is provided with divergent prongs 60, to serve the purpose of guiding the cables in the said slots. The grip or catch 57, on one side of the body 56, of the wheel barrow is located near the rear end of said body, while the catch on the other side is located forwardly of its middle so that the wheel barrow will be balanced when said grips or catches are engaged by the balls 61, with which each of the cables is provided at proper points thereon.

Instead of using the slotted hangers shown in Fig. 8, and above described, a hanger 62, substantially U-shaped to straddle the rails 34, and shown in Fig. 9, of the drawings, may be employed for each of the elevated pulleys 45, one of which may be journaled on each of said hangers.

From the foregoing and by reference to the drawings, it will be clearly understood and readily seen that by trundling a wheel barrow or other wheeled receptacle upwardly on the loading platform 30, between the ascending strands of the cables 54 and 55, that the said cables will enter the forward slots of the catches 57, and pass through the same until a pair of the balls or spherical projections 61, which are rigidly secured on said cables contact with the concave surfaces of the catches 57, when the box 56, will be raised thereby and caused to pass between the elevated pulleys 45, on the adjacent surfaces of one of the outer rails 35, and the middle rail of the supporting frame 34, and to be carried over said pulleys and downwardly toward the unloading platform 50, until the wheel or wheels of the receptacle 56, or wheel barrow, strike said platform, at about which time the catches 57, will be released from said cables by reason of the fact that the platform 50 is located at a different inclination or angle from that of the inclined portions of said cables. After the wheel barrow has thus been delivered to the platform 50, it is obvious that it may be trundled to the desired point and emptied of its load, when it can be wheeled back to said platform and on the same until the front wheel of the wheel barrow shall enter the slot 53, when the axle of said wheel will rest on the platform 50, at each side of said slot, thus elevating the rear portion of the wheel barrow and at the same time the rear portions of the catches thereon, so that the balls 61, on the cables will pass into the cavities of said catches and engage the same, to the end that the wheel barrow will be carried over the elevated pulleys 45, on the adjacent sides of the outer rail 35, and middle rail 35, of the frame 34, opposite those above mentioned, and downwardly to the lower

platform 30, down which the wheel barrow may be trundled for another load. Inasmuch as the descending strands of the cables 54 and 55 are located in different inclined planes, it may be necessary to tilt the wheel barrow or receptacle 56, so that one of the catches 57 thereon may be elevated to the proper point to engage one of said cables.

It will be understood that the balls or spherical enlargements 61, are somewhat greater in diameter than the thickness of the pulleys 45, so that in passing over the same while in engagement with the catches 57, they will support said catches on the pulleys in such a manner that the catches will ride thereover without hindrance.

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

1. In an apparatus of the character described, the combination with a pair of grooved pulleys journaled in parallel planes with one another, means to drive said pulleys in the same direction, a pair of grooved pulleys journaled in parallel planes with one another above each of the first named pulleys and in planes at right angles thereto, a plurality of grooved and inclined pulleys journaled near and below the said pairs of pulleys, an endless cable having enlargements thereon and extended around each of the lower pulleys and each cable extended over one of the pairs of the uppermost pulleys and around one of the inclined pulleys, a wheeled receptacle, and a laterally extended catch or grip for the enlargements on the cables secured to each side of said receptacle, said catches or grips being downwardly concave and slotted fore and aft and arranged on said receptacle one in front and one rearwardly of its transverse axis.

2. In an apparatus of the character described, the combination with a main frame, of a pair of grooved pulleys journaled thereon in parallel planes, means on said frame to drive said pulleys in the same direction, an inclined loading platform mounted on the frame and having openings in its upper portion, an elevated floor having an opening located directly above said pulleys, an inclined frame mounted on the floor and extended over the opening therein, two pairs of grooved pulleys journaled on the upper part of said inclined frame in planes at right angles to the planes of said lower pulleys, a series of grooved and inclined pulleys journaled at the lower portion of said inclined frame, an inclined unloading platform supported at its upper end on the inclined frame and at its lower end on said floor, an endless cable having enlargements thereon and extended around each of the lower pulleys and each cable extended over a pair of the uppermost pulleys and around one of the inclined

pulleys, a wheeled receptacle having on each of its sides a laterally extended balancing catch or grip for the enlargements on the cables, said grips being downwardly concaved and slotted fore and aft.

In witness whereof, I have hereunto subscribed my name this 9th day of November

1912, in the presence of two subscribing witnesses.

CARL ZETTERLUND.

Witnesses:

CHAS. C. TILLMAN,
A. S. PHILLIPS.

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