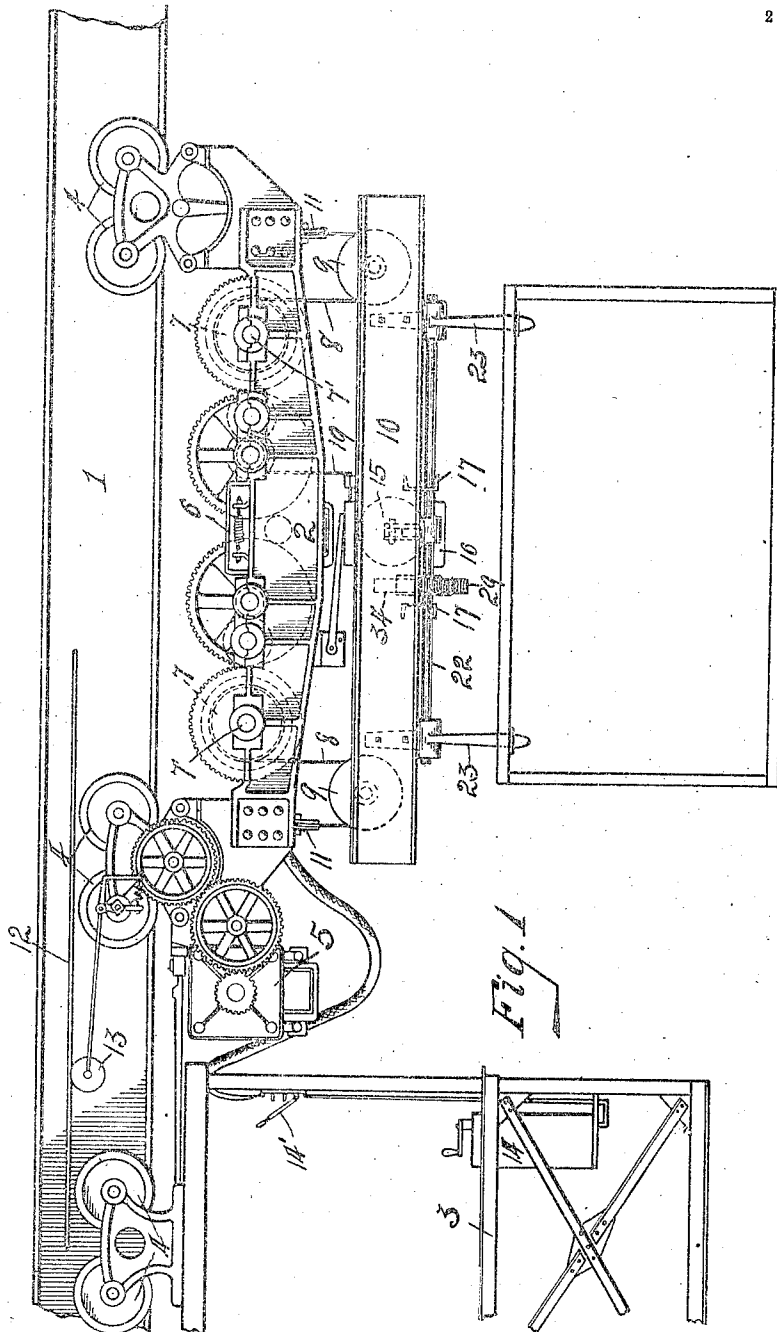


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HOISTING AND CONVEYING APPARATUS.
APPLICATION FILED APR. 22, 1912.

1,050,578.

Patented Jan. 14, 1913.
2 SHEETS—SHEET 1.



WITNESSES.
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Fig. 2

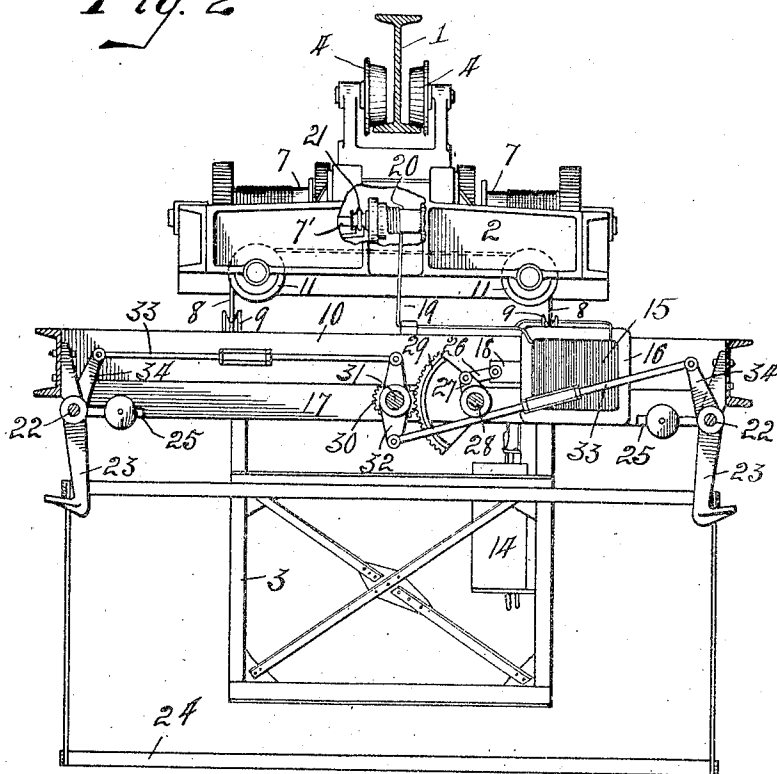
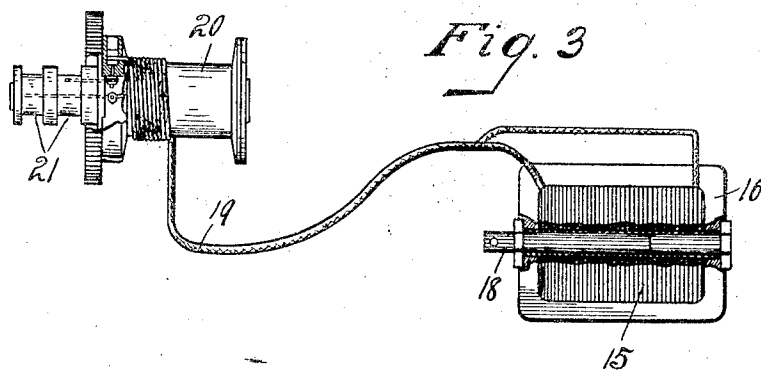


Fig. 3



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UNITED STATES PATENT OFFICE.

CHARLES H. TUCKER, OF TOLEDO, OHIO.

HOISTING AND CONVEYING APPARATUS.

1,050,578.

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Application filed April 22, 1912. Serial No. 692,523.

To all whom it may concern:

Be it known that I, CHARLES H. TUCKER, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a certain new and useful Hoisting and Conveying Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates to hoisting and conveying apparatus of the class adapted to travel on an overhead track or way, and particularly to an apparatus of this character which is especially adapted for picking up, conveying from place to place, and depositing piles of leather, lumber and other materials, but is not restricted to such use as it is intended for use in any connection for which it may be adapted or appropriate. The object of my invention is the provision of an improved apparatus of this character, which is simple and efficient in its construction and operation, and capable of being easily and quickly operated to pick up or release material or articles, as may be desired, thus materially enhancing its practicability and commercial value.

The invention is fully described in the following specification, and while, in its broader aspect, it is capable of embodiment in numerous forms, a preferred embodiment thereof is illustrated in the accompanying drawings, in which,—

Figure 1 is a side elevation of an apparatus embodying the invention with the operator's cage partly broken away. Fig. 2 is an end elevation thereof with the lifting head in section and a portion of the trolley frame broken away, and Fig. 3 is an enlarged detail of the magnet and connected reel, with parts thereof broken away.

Referring to the drawings, 1 designates a rail or track, in the present instance of I-beam construction, from which is suspended the trolley-frame 2 and attached operator's cage 3 by wheels 4, as indicated, or in any other suitable manner. The trolley-frame, as is customary in apparatus of this class, carries a motor 5, which is geared to one of the sets of wheels 4 to drive the apparatus longitudinally of the track and

carries a second motor, a part of which is designated at 6, for controlling the operation of the cable-winding drums 7, 7 mounted in said frame. These drums are shown as being arranged in pairs at opposite sides of the motor 6, and each pair has opposite ends of associated cables 8 winding thereon, which cables extend downwardly from the drums and pass over sheaves 9 carried at the associated end of the hoisting-head or frame 10 and thence loop over equalizing sheaves 11 carried at the associated end portions of the frame 2, as indicated. The operating current for the motors is taken from a trolley wire 12 by a trolley wheel 13 operating thereon, such wheel being in suitable connection with the motors through a control box 14 in the operator's cage, as is well understood in the art.

The hoisting head or frame 10 is shown, in the present instance, as being of rectangular construction and as carrying an electro-magnet 15 and inclosing frame 16, which frame, in the present instance, is mounted on beams 17 connecting opposite sides of the frame 10. A bar-armature 18 works longitudinally within the hollow core of the magnet coil, being energized to have an inward movement relative to the coil by the passing of an electric current therethrough. The positive and negative wires of the solenoid coil 15 pass through a common cable 19, which extends upward from the hoisting head 10 and winds upon a drum 20 in the trolley-frame 2. This drum is carried, in the present instance, by one of the drum shafts 7' of the trolley-frame, and is of suitable size to cause a paying out and taking up of the cable 19 at speeds corresponding to the speeds of lowering and raising of the hoisting frame 10 relative to the trolley frame. The drum ends of the coil wires are connected in any suitable manner to a double commutator 21 on the shaft 7' which commutators are in suitable electrical connection with the switch 14' in the operator's cage.

The hoisting-frame 10 carries a pair of rock-shafts 22, 22 adjacent to opposite ends thereof, and attached to each of these shafts is one or more pendent grapple-hooks 23 having their hooked ends adapted to be outwardly engaged under convenient parts of an article carrying frame 24 or other suitable engaging parts. Weighted arms 25 are shown as projecting inwardly from the

respective shafts 22, 22 to tend to normally retain the hooks 23 in the frame engaging positions shown in Fig. 2. The frame releasing movements of the grapple-hooks 23 are actuated by an electrically energized movement of the armature bar 18 within its coil, such bar being connected through suitable intermediate mechanism with the rock-shafts 22, 22 for such purpose. This mechanism is shown, in the present instance, as comprising a link 26 and rock-arm 27 which connect the bar 18 to a shaft 28 suitably mounted in the frame 10 transversely thereof, whereby a longitudinal movement of the bar 18 imparts rocking movements to such shaft. The shaft 28 is in turn connected by a segmental gear 29, carried thereby, to a gear 30 mounted on a rock-shaft 31, which is suitably mounted in the frame 10 in parallelism with the shaft 28, and the shaft 31 has a cross-arm 32, the opposite ends of which are adjustably connected by rods 33, 33 to arms 34 rising from the rock-shafts 22, 22. The connection of the bar 18 to the rock-shaft 22, 22 in this manner causes simultaneous inward or article releasing movements to be imparted to the grapple-hooks 23, 23 from an inward or electrically energized movement of said bar. Upon an opening of the magnet current the electrical attraction for the bar 18 ceases and the weighted arms 25, 25 then operate to move the grapple-hooks to the normal or frame engaging positions shown.

In the use of my improved apparatus it is run upon the track 1 to suitable position for the hoisting head or frame 10 to be lowered in position to engage an article or pile of material to be conveyed thereby. When the hoisting head 10 is near a frame 24 or article to be engaged, the operator closes the circuit to the electro-magnet 15 to attract and impart an inward movement to the armature-bar 18 and a consequent movement of the grappling-hooks 23 to inward or inoperative positions. When the hoisting frame has been lowered into proper position for its grappling hooks to engage under parts of the frame 24 or other material or article carrying means, the operator opens the magnet circuit, thus releasing the electrical attraction upon the bar 18 and permitting the weighted arms 25 on the rock-shafts 22, 22 to act by gravity to move the associated grappling-hooks 23 into article engaging positions, as will be apparent. The apparatus may then be operated to raise the material or article attached to the hoisting parts and convey it to any suitable position where it is lowered and then released by the operator closing the magnet circuit to retract the grappling-hooks 23 to inoperative positions. Upon a lowering of the hoisting head 10, the drum 20 is rotated to unwind the cable 19 and upon a raising

of the hoisting head the drum 20 is turned in the opposite direction to act as a retriever for said cable, thus preventing any considerable slack from occurring at any time in the cable 19.

It is apparent that I have provided simple and efficient means for controlling the movements of the grappling hooks whereby the same may be quickly operated to release or engage an article as may be desired; and also, that while I have shown my improved grappling hook control means in association with a particular type of hoisting mechanism, it is not restricted to use in connection therewith but may be used in connection with any mechanism of this character for which it may be adapted.

I wish it understood that my invention is not limited to any specific construction or arrangement of the parts except in so far as such limitations are specified in the claims.

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

1. In a hoisting and conveying mechanism, a hoisting head of rectangular form, a pair of rock-shafts carried for rocking movements by said head with one at each of opposite sides thereof, means normally influencing a rocking movement of each of said shafts in one direction, grapple members carried by said shafts for rocking movements therewith, an electro-magnet carried by the head between said shafts, an armature movable by an energizing of said magnet, and means connecting said armature and both of said shafts and operable upon a movement of the armature to communicate simultaneous rocking movements to said shafts.

2. In a hoisting and conveying apparatus, a hoisting frame, rock-shafts carried by said frame at opposite sides thereof, grapple members attached to said rock-shafts for rocking movements therewith, rock-arms projecting from said shafts, an electro-magnet, an armature movable by an energizing of said magnet, a cross-arm pivoted between said shafts, connection between said cross-arm and rock-arms, and means actuated by a movement of said armature for rocking said cross-arm to communicate opposed simultaneous rocking movements to said members.

3. In a hoisting apparatus, a hoisting head, rock-shafts carried at opposite ends of said head, grapple members attached to said shaft for rocking movements therewith, an electro-magnet carried by the head intermediate said shafts, an armature, mechanism connecting the armature and shafts whereby opposed rocking movements are imparted to the latter from a movement in one direction of the former, and means con-

trolling the energizing of said magnet to attract the armature.

4. In a hoisting apparatus, a hoisting head, a pair of rock-shafts carried thereby, 5
grappling members carried by said shafts for rocking movements therewith, rock-arms projecting from said shaft, a shaft disposed intermediate said rock shafts, a 10
cross-arm carried by said intermediate shaft, rods connecting the opposite ends of said cross-arm to different ones of said 15
rock-arms, an electro-magnet, an armature, means connecting the armature to said in-

termediate shaft to communicate rocking movements to the latter from a reciproca- 15
tion of the former when the magnet is energized, and control means for said magnet.

In witness whereof, I have hereunto signed my name to this specification in the 20
presence of two subscribing witnesses.

CHARLES H. TUCKER.

Witnesses:

S. T. Klotz,
C. W. OWEN.