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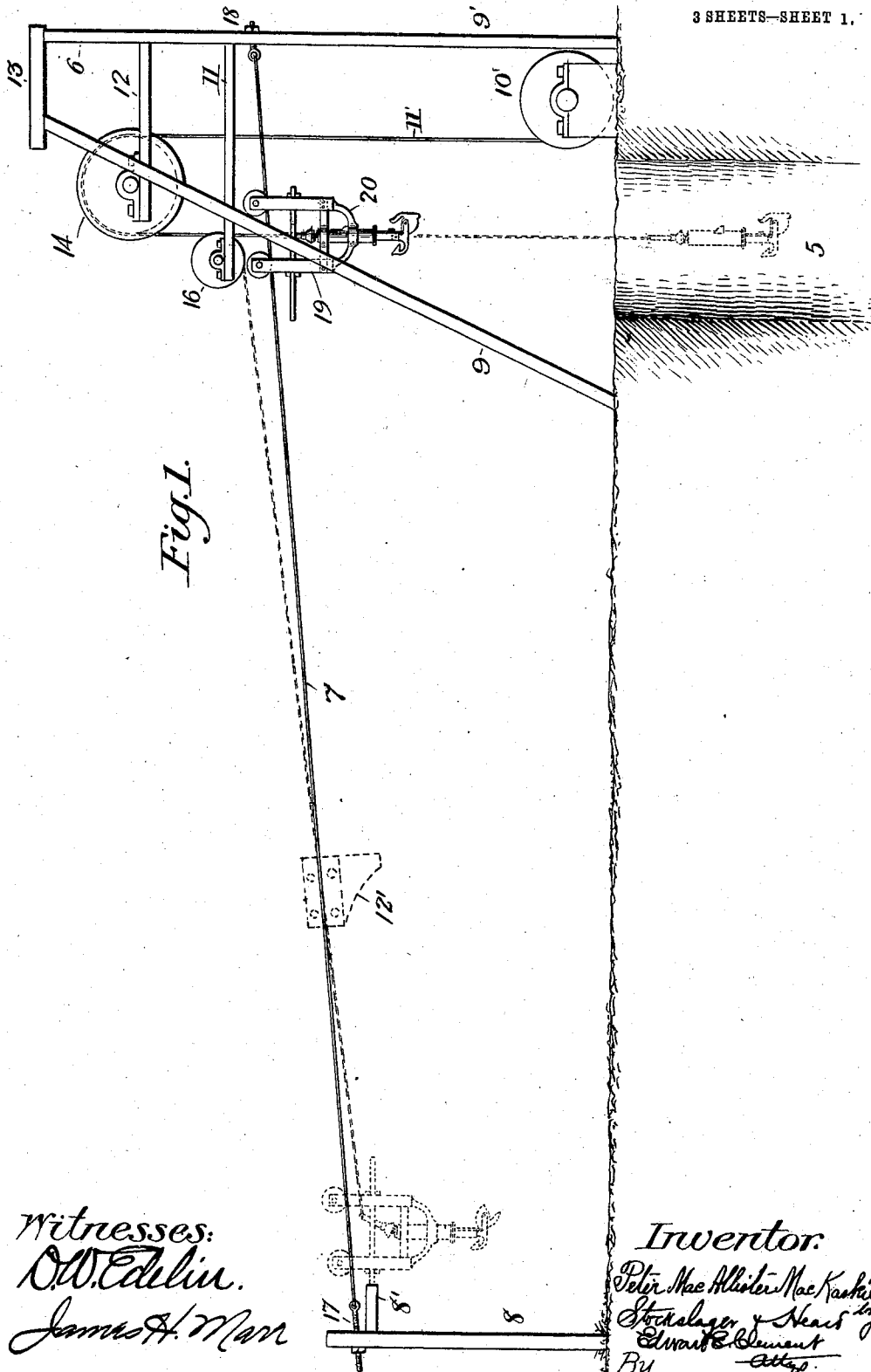
PATENTED JULY 2, 1907.

P. MACA. MACKASKIE.

COMBINATION HOIST, AERIAL TRAMWAY, AND AUTOMATIC DUMPING DEVICE.

APPLICATION FILED OCT. 5, 1904. RENEWED APR. 25, 1907.

3 SHEETS—SHEET 1.



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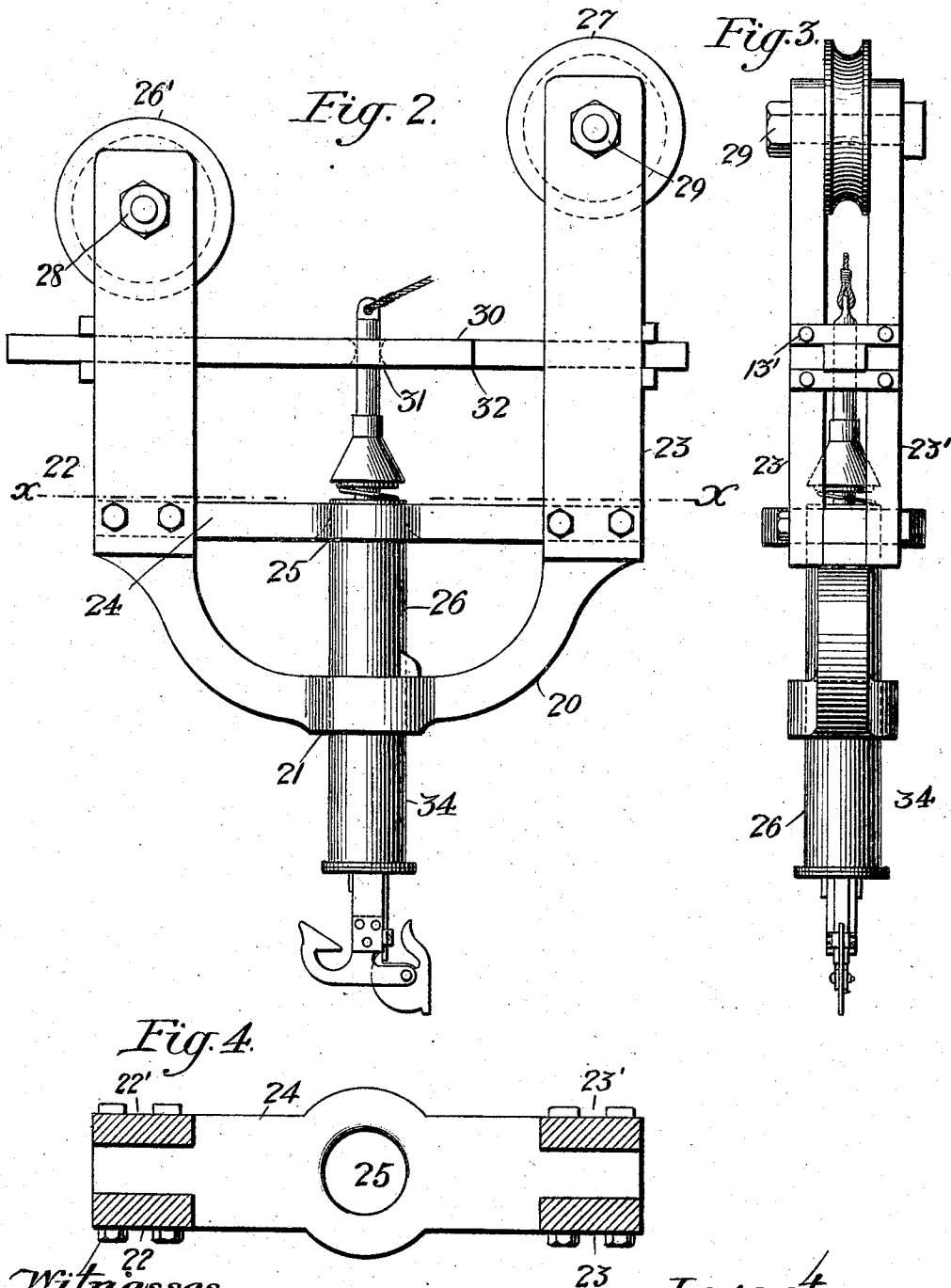
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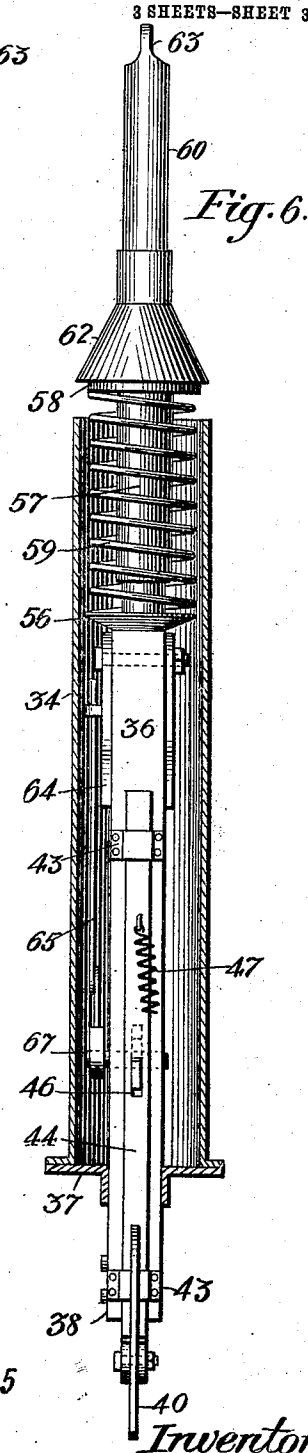
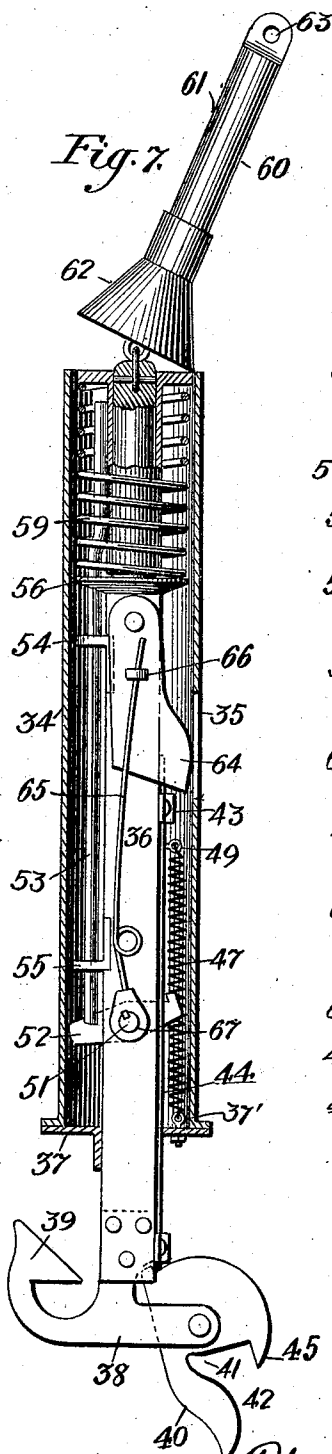
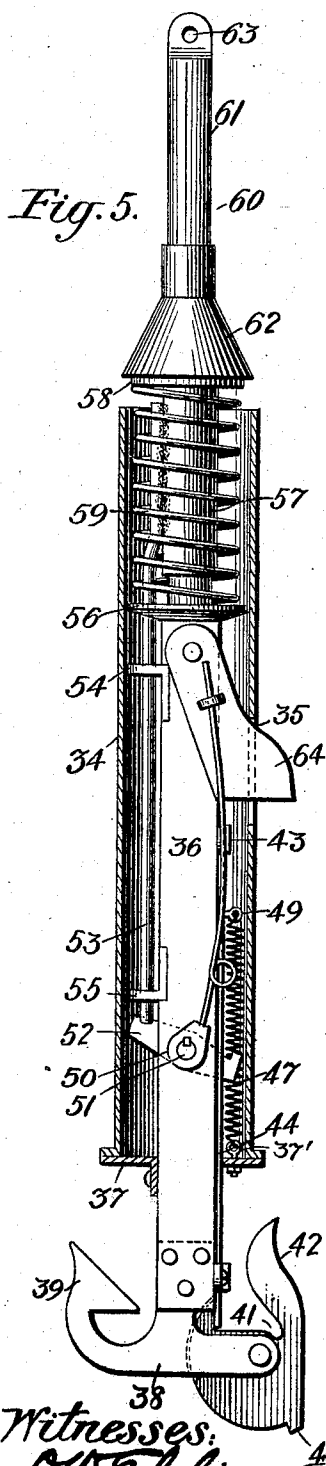
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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COMBINATION HOIST, AERIAL TRAMWAY, AND AUTOMATIC DUMPING DEVICE.

No. 858,815.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed October 5, 1904. Renewed April 25, 1907. Serial No. 370,235.

To all whom it may concern:

Be it known that I, PETER MACALLISTER MACKASKIE, a citizen of the United States, residing at Butler, in the county of Nye and State of Nevada, have invented certain new and useful Improvements in a Combination Hoist, Aerial Tramway, and Automatic Dumping Device; and I do 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 letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to a hoisting, conveying and discharging means, that involves the employment in conjunction with a hoisting apparatus, of an aerial tramway that supports for travel a light running vehicle that is adapted to automatically engage the load supporting devices of the hoisting means, whereby the same may be conveyed to a predetermined point to cause the automatic discharge of the carried load.

The object of said invention is to provide a simple, inexpensive and successful means for carrying out the above referred to method of handling material, in a most practical and desirable manner and this case is a companion to another application filed of even date herewith, Serial No. 227,310.

My invention generally stated consists of an inclined track-wire supported longitudinally of a shaft or pit at a required elevation therefrom and that supports for travel, under the influence of gravity, a car or vehicle that is adapted to detachably embrace a bucket holding and releasing device, said car being also equipped with a forwardly projecting actuating part that is arranged in operative engagement with the releasing parts of said bucket holding and releasing device; and a hoisting means for elevating the said bucket holding and releasing device into operative engagement with the said car and the forwardly projecting actuating part carried thereby; and a linearly adjustable buffer means arranged at a predetermined distance in the travel of said car, in the pathway of said projecting actuating part, whereby the forcible impingement of the latter thereon will cause the releasement and discharge of the bucket by reason of the actuation of the bucket holding and releasing device.

In the accompanying drawings Figure 1 represents a side elevation of a hoisting, conveying and discharging apparatus constructed and arranged in accordance with my invention. Fig. 2 represents a side elevation of the wheeled carrier-frame and the bucket holding and releasing device detachably supported in position on said carrier-frame. Fig. 3 represents an end view of Fig. 2, while Fig. 4 is a top plan view of a section of the carrier-frame taken on line *x-x* of Fig. 2. Fig. 5 represents a

sectional view, in side elevation of the bucket holding and releasing device, with the bucket releasing hook in a closed position. Fig. 6, represents a sectional front elevation showing the bucket releasing hook in a closed position. Fig. 7 is a sectional side elevation, showing one of the bucket discharging hooks in a released position.

Like numerals indicate like parts in the several figures.

Arranged immediately above the shaft 5, sunk in the ground is a head-frame 6, to which is attached one end of an inclined track-wire 7, that spans said shaft and that extends to and connects at its opposite end with the post or standard 8, located at a suitable interval from said shaft. The said post 8 is provided near its upper end with a laterally projecting stop-block 8', that extends in the direction of the inclined track-wire in vertical alinement therewith.

The head-frame comprises in its construction uprights 9 and 9', the former being arranged at a suitable angle, as shown; and cross-connecting beams 11, 12 and 13, the lowermost one of which (11) is provided on its projecting end with a guide-pulley 16, that is journaled as shown.

Mounted on the projecting end of the cross-beam 12, in journaled bearings is the grooved hoisting pulley 14, the working periphery of which is ranged in substantial vertical alinement with that of the guide-pulley 16.

Located on the ground between the shaft and the upright 9' is a winding drum 10' that is in operative connection with a prime-mover (not shown). The periphery of said drum is arranged in substantial vertical alinement with the working face of the hoisting pulley. Wound about said drum is a hoisting or hauling rope 11' that extends upwards to and over the hoisting pulley 14, and from thence downward into operative contact with the guide-pulley 16 and from thence into connection with the bucket holding and releasing device 26.

The inclined track-wire 7, is stretched taut by the attached tension bars 17 and 18 secured, respectively, to the post 8 and the leg 9', of the head-frame; and the angle of inclination thereof is preferably such that the carrier or car 19, mounted to travel thereon will tend to travel under the influence of gravity in the direction of the standard or post 8. The track-wire 7, thus supported is equipped with a longitudinally adjustable clamp-stop or strike block 12' so disposed in the pathway of the carrier 19, as to be struck by a forwardly projecting trip part carried thereby, that serves not only to arrest the further movement of said carrier but causes the discharge of the carried load in a manner to be hereinafter pointed out. The said clamp or strike stop 12' may be located at any point along the said track-wire where it is desirable to dump. The

operator can, however, dump the bucket at any point on the line of travel without employing the strike-block or the stop block 8', as the momentum of the carrier with its load running down the inclined track-wire if suddenly arrested by the stoppage of the winding drum will cause the overcoming of the resistance of the primary spring 59, that controls the movable bucket hook.

The carrier 19, comprises a guide-yoke 20 that is provided with a central aperture 21, and that is connected at its respective ends to the lower ends of the upright pairs 22, 22' and 23 and 23', arranged in spaced parallelism with respect to each other, the latter pair of which extend slightly above the pair 22, 22'. The uprights are further braced by a cross-piece 24, that acts as a tie and a strut to oppose the forces of extension and compression, which the carrier-frame is subjected to; and which is also provided with a central aperture 25, that is in vertical alinement and registers with the aperture 21, of the guide-yoke. These guide apertures are provided for the reception of the body portion of the bucket holding and releasing device 26 to be hereinafter described. 26' and 27 designate grooved supporting and traveling wheels that are respectively journaled on the shank portions of the screw-bolts 28 and 29, that are employed to connect and brace at their upper ends the adjacent upright pair members, at the elevation shown, to admit of the load being suspended directly from the inclined track-wire. Supported for longitudinal movement on said carrier-frame, in guide pieces 13' supported respectively by the uprights 22, 22' and 23, 23', is the slide bar or tripping device 30, that is also provided with a central aperture 31, that is alined with apertures 21 and 25, and at a height to receive the projecting end of the tripping lever 60. The slide bar is also provided with limiting stops 32 that in the rearward thrust of said bar strike against the front edges, respectively, of the upright pair 23, 23'. The slide-bar thus mounted is adapted to receive at its forward projecting nose, an end thrust by reason of its contact with the hereinbefore referred to striking block 12', that is disposed in the pathway of the traveling carrier.

The novel construction, arrangement and operation of the bucket holding and releasing device 26, will now be described.

The said bucket holding and releasing device comprises an outer casing 34, having an opening 35. Said casing is adapted to receive the major portion of the axially disposed stem 36, the lower end of which projects downwardly through the centrally apertured plate 37, that incloses the bottom of said casing.

Secured to the lower end of the stem 36, is a T-shaped casting 38, one lateral end of which terminates in an integral vertically disposed curved short-arm 39, while on the opposite projecting end is pivoted a bucket releasing hook 40. This hook 40 is preferably cam-shaped, in general contour, and is provided with a cut-away portion or recess 41, that extends, as shown, to form a short-arm 42, which is normally held in a vertically disposed retracted position, as shown in Figs. 5 and 6, but which when liberated, swings into the position shown in Fig. 7, to release the handle of the bucket carried thereby. Mounted on said stem 36, for vertical reciprocation, in the respective guide-lugs 43,

is a lock bolt 44, the outer end of which when in its lowermost position is adapted to engage the part 45 of the releasing hook 40, while intermediate of its ends it is provided with a slot 46. The lock-bolt 44, is normally held retracted in its lowermost position by a coiled spring 47, one end of which is connected to the screw-eye-bolt 37' that is fastened to the bottom plate 37 of the casing, while its opposite end is secured by a like screw-eye 49 to the lock-bolt 44.

The stem 36 is provided with a transverse-slot 50, that is disposed at a point adjacent to the slot 46, of the lock-bolt, and within which is arranged a pivot pin 51, upon which is mounted a vertically reciprocable rocking lever 52, one end of which projects through the slot 46 into operative connection with the lock-bolt 44, while its opposite end projects laterally beyond the opposite side of the stem 36, into operative connection with the lower end of a vertically reciprocable rod 53, that extends through the guide lugs 54 and 55, and the stem-flange 56, to and in connection with the flanged sleeve 57.

The sleeve 57 is of a diameter to fit telescopically about the reduced cylindrical-shaped upper end of the stem 36, and is provided at its upper end with a flanged portion 58, that is of a diameter to telescopically fit within the upper open end of the casing 34. Encircling said sleeve 57, is a primary spring 59 one end of which rests upon the upper face of the stem-flange 56, while its upper end obtains a bearing or shoulders on the under face of the sleeve-flange 58. The spring 59 thus arranged serves the important purpose of normally holding the lifting rod 53 in a raised position to in turn hold the rocking-lever 52, and lock-bolt 44, in a depressed position.

Hinged or pivoted to the upper end of the stem 36, is a tripping lever 60, that is preferably of cylindrical shape throughout its shank portion 61, but which terminates at its lower end in a conical shaped pedestal 62, the base of which is substantially the diameter of the flange 58, of the sleeve 57, and which normally rests thereon. The upper end of said lever 60 is provided with an eye or rope-socket 63, for the reception of the end of the hoisting rope 11'.

From the foregoing description it is evident that a tilting of the lever 60, so that the base edge thereof serves as a fulcrum there will be exerted a thrust that will cause a depression of the sleeve 57, and attached rod 53 against the opposing spring 59, whereby the attached rocking-lever 52 and lock-bolt 44, will in turn be lifted in opposition to the small spring 47, to cause the disengagement of said bolt from the bucket releasing hook 40. The bucket holding and releasing device 26 is also provided with means for automatically engaging the yoke frame 20 of the carrier 19, which consists essentially of a catch lever 64, pivoted to the stem 36, as shown, and which is supported by a spring rod 65, one end of which engages with the lug 66, that projects from the said lever, while its opposite lower end is secured to the arm 67, that is mounted on the end of the stub-shaft 51. The spring-rod thus disposed normally holds the lever 64, in its outwardly projecting position, as shown in Fig. 5, but which lever is susceptible of being yieldingly retracted in its passage through the guide-aperture 21, but which will spring out to support the body of the bucket holding and releasing de-

vice on the said yoke frame 20, after its passage through said aperture and which when acted upon by the actuation of the rod 53, will be held in a retracted position until manually reset.

- 5 The operation of my improved hoisting, conveying and discharging apparatus is substantially as follows: Assuming that the hook and catches of the bucket holding and releasing device are arranged as shown in Figs. 1, 5 and 6, the bucket holding and releasing device 10 with its attached bucket is lowered into the shaft by means of the hoisting rope 11' as it is unwound from the drum. Upon the loading of said bucket the drum is driven in a reverse direction until the bucket holding and releasing device is elevated to its extreme upward 15 position into engagement with the carrier 19 and the tripping bar 30, where it is supported by the catch levers 64 in its engagement with the yoke 20, as shown, whereupon the hoisting drum is stopped and reversed to permit of the paying-out of the hoisting or hauling 20 rope 11', thereby allowing the carrier to start down the inclined track-wire under the influence of the carried load in the direction of the post 8. Upon the colliding of the tripping bar 30 with the strike bar 8', the carrier is arrested and said bar is thrown longitudinally in a 25 rearward direction to its limit, thereby tilting the lever 60 carried by the bucket holding and releasing device and simultaneously releasing the bucket handle to discharge the bucket; and retracting the lever 64 thereby freeing the bucket holding and releasing device from 30 its positive engagement with said carrier. The drum is then reversed to haul the carrier back to its initial position, which when reached, the drum is stopped and again reversed in a direction to cause the lowering of said rope 11' and its attached devices into the shaft.
- 35 Having described my invention and its operation, what I desire to claim as new and useful is:

1. In a hoisting, conveying and discharging apparatus, the combination with a head-frame, and the hoisting devices carried by said frame, of a post, a track-wire 40 stretched at an angle between and supported at its respective ends by said head-frame and post, a carrier or car supported on said track-wire, a bucket holding and releasing device connected with the rope of the hoisting means having means for engaging the same to said carrier, and means mounted on said carrier for simultane- 45 ously disengaging the bucket holding and releasing device

from the carrier and actuating the releasing hook, and means located along the way for contact with said releasing device, substantially as described.

2. In a bucket holding and releasing device the combination of a casing, an axially arranged stem supporting 50 at its lower end a pivoted hook, a vertically reciprocable lock-bolt mounted on said stem, a spring arranged to normally hold said lock-bolt in engagement with said pivoted hood, and means for releasing said lock-bolt from its 55 engagement with said pivoted hook, substantially as described.

3. In a bucket holding and releasing device, the combination of a tubular casing having one end closed and the other end open, and a slot opening intermediate of its 60 ends, an axially arranged stem that terminates at its upper end in a reduced cylindrical shaped portion, a hook pivoted to its lower end, a flanged sleeve telescopically mounted on the reduced portion of said stem, a coiled-spring encircling said sleeve and bearing at one end 65 against the stem and shouldering at its opposite end against the flange on said sleeve, a tilting operating lever pivotally mounted on the upper end of said sleeve, a locking-bolt mounted on said stem and adapted to engage the pivoted hook and means for connecting said sleeve 70 and locking bolt, substantially as described.

4. In a bucket holding and releasing device, the combination with the stem and a spring held locking member 75 connected thereto, and an operating lever pivotally hinged to the upper end of said stem, and arranged to exert leverage on said spring held locking member, substantially as described.

5. A connecting device for buckets, composed of a draft rod or stem provided, at its upper end with a pivoted 80 lever means for attachment to the hoisting rope, a sleeve adapted to slide on said stem, that is operatively engaged by said lever means, a spring shouldering at one end against the flange of said sleeve and at its opposite end bearing against a projecting part of said stem, an actuating rod slidingly mounted on said stem and connected at 85 its upper end with said sleeve, a rocking lever pivotally mounted on said stem and connected at one end with said actuating rod, a spring held locking bolt slidingly mounted on said stem, and connected with said rocking lever, a pivoted hook mounted on said stem, that is arranged to be 90 engaged by said locking bolt; and means for detachably connecting the bucket holding and releasing device to the carrier, substantially as described.

In testimony whereof, I affix my signature, in presence of two witnesses.

PETER MACALLISTER MACKASKIE.

Witnesses:

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W. B. PITTMAN.