No. 858,814. 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.

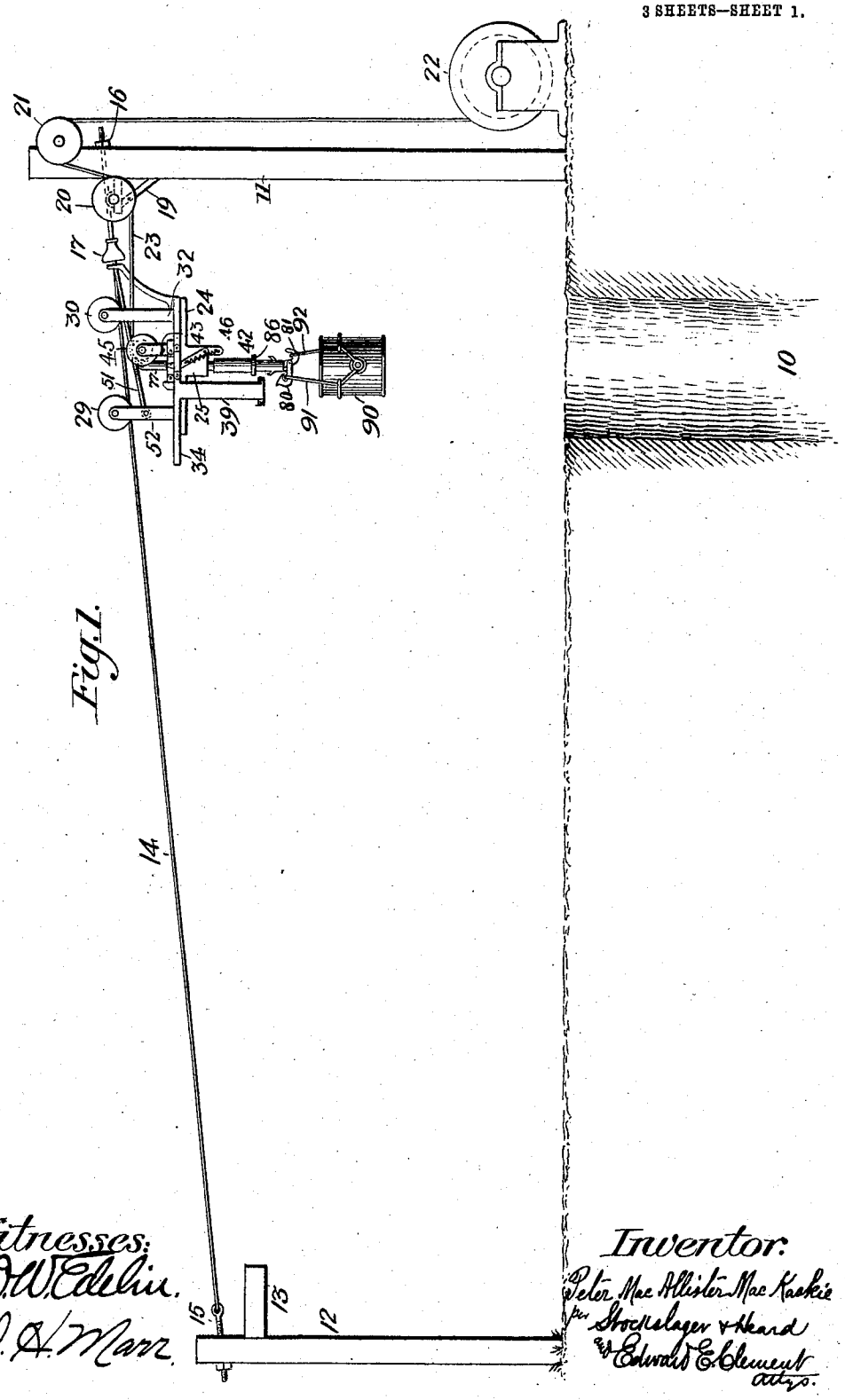

Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2.

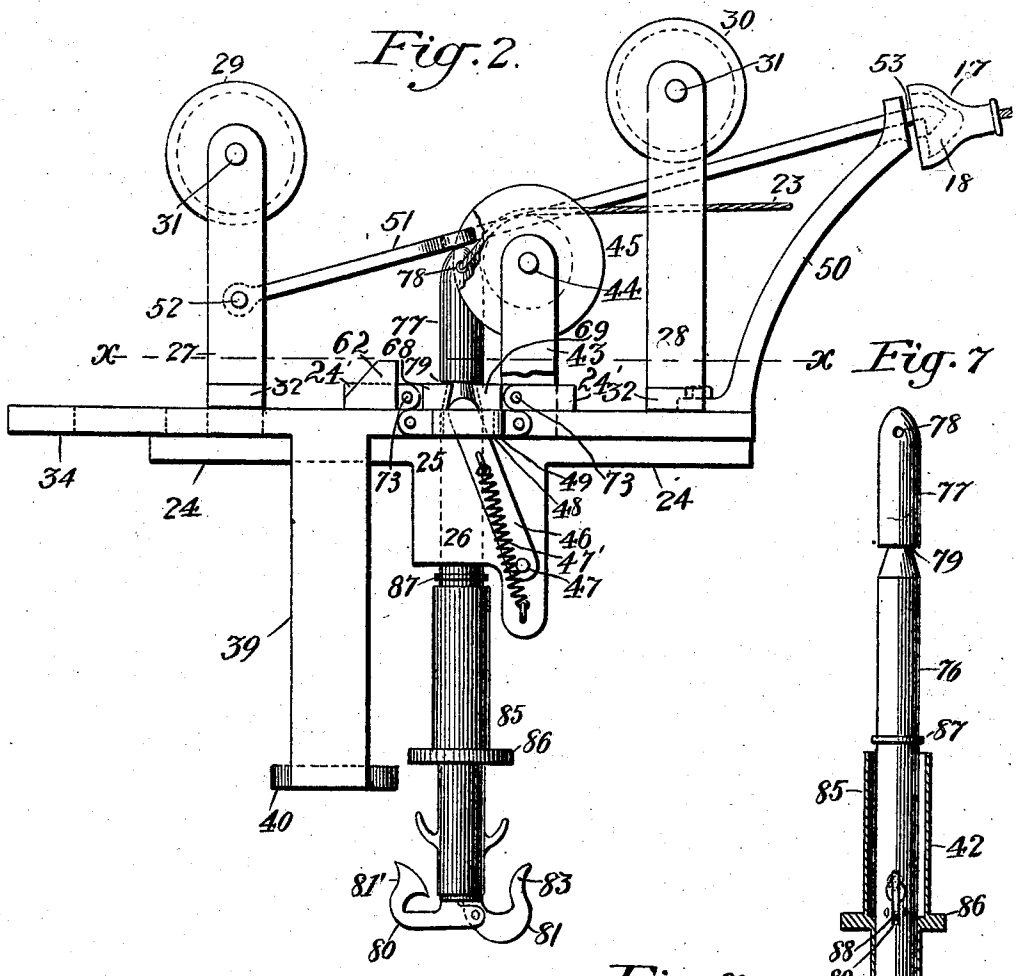
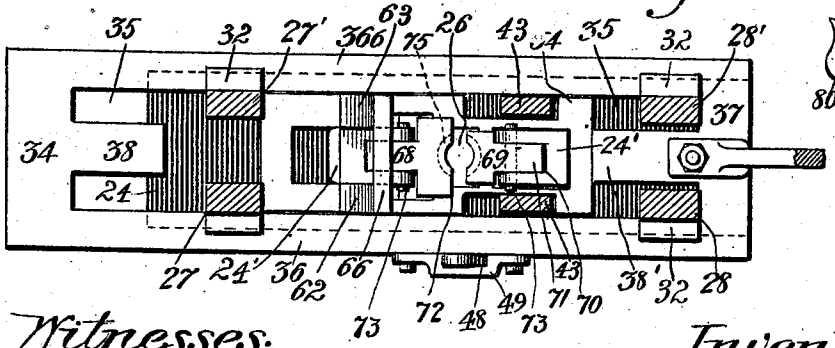


Fig. 7.

Fig. 3.



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3 SHEETS—SHEET 3.

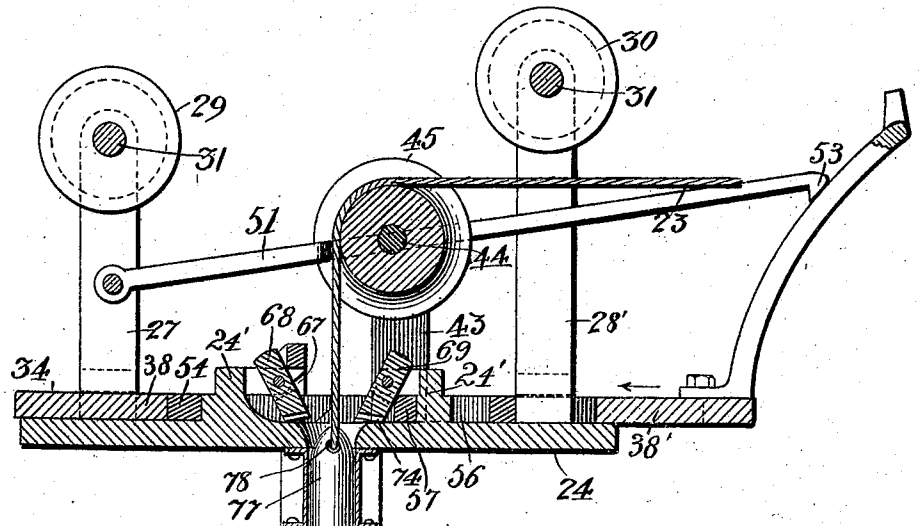

Fig. 4.

Fig. 8.

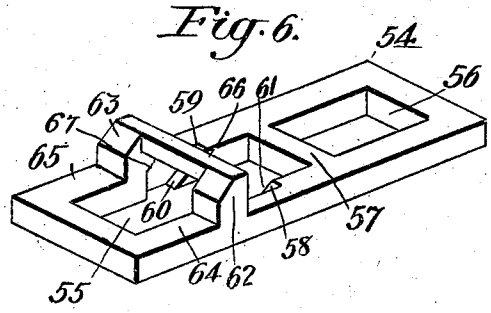

Fig. 6.

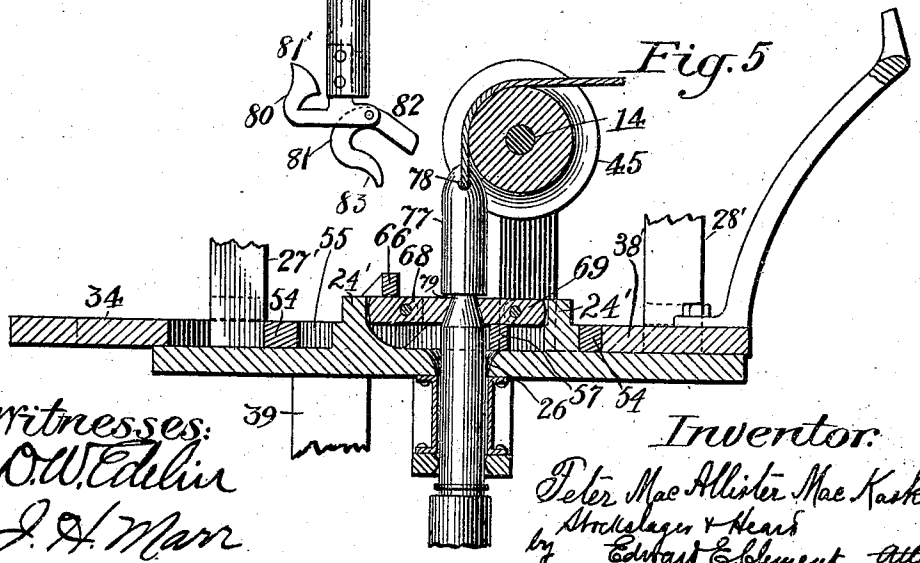

Fig. 5.

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UNITED STATES PATENT OFFICE.

PETER MacALLISTER MacKASKIE, OF BUTLER, NEVADA, ASSIGNOR OF ONE-HALF TO KEY PITTMAN, OF TONOPAH, NEVADA.

COMBINATION HOIST, AERIAL TRAMWAY, AND AUTOMATIC DUMPING DEVICE.

No. 858,814. Specification of Letters Patent. Patented July 2, 1907.

Application filed October 5, 1904. Renewed April 25, 1907. Serial No. 370,234.

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 apparatus of a type shown and described in an application for Letters Patent of the United States filed by me the 5th day of October, 1904, Serial No. 227,312, that employs a hoisting means in conjunction with a fixed carrying rope or track-wire having a carrier thereon that is adapted to travel under the influence of gravity, from one terminal to the other and to be drawn back again by the hauling rope of the said hoisting means.

The primary object of the said invention is to provide a simple and inexpensive hoisting, conveying and discharging means, that will expedite the raising and transference of material from one point to another, and that can be employed advantageously in numerous industries; and which is especially applicable for mining and quarrying purposes in localities where other methods are unavailable.

To these ends the present invention, broadly and collectively speaking, consists of a track supported longitudinally of a shaft at a suitable height, and a co-operating traveling carrier-receptacle comprising in its construction a wheel supporting member sustaining, respectively, a relatively sliding gripping or locking member; and a sliding transferring and discharging member; a hoisting means for elevating a bucket hanger or holding and releasing device, and attached bucket, into operative relation and engagement with said gripping or locking member; and a buffer means arranged at a predetermined distance in the travel of said carrier-receptacle and in the pathway of said transferring and discharging member, whereby the forcible impact of the latter against said buffer causes the release of the bucket hanger device from the embrace of the said gripping member and its transference to the transferring and discharging member together with the consequent gravity release and discharge of said bucket.

The invention further consists in the peculiar construction and operation of the bucket hanger or holding and releasing device.

The invention consists further in the legitimate combinations of the features referred to with each other and with other features not yet alluded to, and also in certain specific features of construction, all of which will be fully described hereinafter.

In the accompanying drawings Figure 1, is a side elevation of the improved hoisting, conveying and discharging apparatus. Fig. 2 shows a side elevation of the carrier-receptacle removed from the track-wire, and illustrating the engagement therewith of the bucket hanger or holding and releasing device. Fig. 3 represents a top plan view of the receptacle taken on line x—x, of Fig. 2 with the bucket hanger removed. Fig. 4 represents in section a side elevation of the carrier-receptacle together with the bucket hanger raised into operative relation therewith. Fig. 5 represents a partial enlarged view of a portion of Fig. 4. Fig. 6 shows in perspective an enlarged detail of a part of said carrier-receptacle. Fig. 7 illustrates in elevation, partly in section, the bucket hanger, or holding and releasing device. Fig. 8 is a detail of the yoke 40 with a pendent arm 39 in section.

To enable those skilled in the art to which my invention relates to make and use the same, I will now proceed to more fully describe it, by reference to the drawings, in which like numerals indicate corresponding parts in the several figures.

10 designates a mining shaft, near the mouth of which is erected a supporting post or standard 11. Arranged in alinement with said shaft 10, and post 11, at a suitable distance therefrom, is a supporting post or standard 12, which is provided near its upper end with a right-angular projecting buffer-piece 13, that is arranged in vertical alinement and that extends in parallelism beneath the track-wire. The said track-wire is supported at one end by a tension bar or other tightening gear 15, that is in turn secured to said post, and at its opposite end to a like tension bar 16, secured to the post 11, and which by manipulation may be turned to apply the required tension to the said track-wire. The track-wire thus erected is positioned in a manner to allow of a slight inclination of the said track in the direction of the post 12. Secured to the track-wire 14, at the terminal adjacent to the post 11, there is placed a bumper cup 17, which consists of a cylindrical cup-shaped body portion having a recess 18, that is adapted to receive the latch end of a catch bar 51. This construction is one that will permit the catch to always engage even when the carrier-receptacle has a swinging movement.

Mounted and journaled on the bracket 19, that projects laterally from the post 11, is a guide-pulley 20, the periphery of which is arranged to be brought into parallelism or alinement with the track-wire 14. Mounted above said guide-pulley on the opposite side of the post 11, is a hoisting pulley 21, which is likewise mounted and journaled on a bracket (not shown).

Located near the base of the standard or post 11, is a winding drum 22, that is in operative connection with a prime-mover (not shown). Wound about said drum 22 is a hauling or hoisting rope 23, that extends upwards to and over the hoisting pulley 21, and from thence downward into operative relation to a guide pulley mounted and supported by the carrier-receptacle.

The preferred construction of the carrier-receptacle is as follows: 24 designates a platform or base plate having a central pendant boss 25, that is bored out to form a vertically extending opening 26. This base plate is provided near its respective ends with upright-pairs 27, 27′ and 28, 28′, that are shown as being arranged in spaced parallelism for sustaining, respectively, the wheels 29, and 30, which are provided with grooved peripheries, to adapt them to travel on the track-wire 14. The wheels 29 and 30 are, respectively, journaled on spindles or axles 31, that are, respectively, supported at both ends by the contiguous upright pairs, to admit of the load being suspended directly from the track-wire. The base plate 24 is also provided with a spaced pair of vertically extending locks 24′.

32 designate laterally projecting guide pieces that are secured to the uprights 27, 27′ and 28, 28′ near their base ends, and which serve to prevent the vertical displacement of the longitudinally movable transferring and discharging slide member 34, that is mounted on the platform 24. The slide 34 is preferably rectangular in shape and is formed with a central longitudinal slot or opening 35, that extends nearly its whole length, and which provides a frame-work having parallel arranged side bars 36, and end bars 37, the latter having central extensions that project inwardly in the same plane, to form stop-pieces 38 and 38′. The slide 34 is also provided with integrally formed pendent arms 39, that are disposed on either side in parallelism at a point slightly in advance of the boss 25, and which support at their lower ends a platform or yoke 40 that is provided with a crotch opening 44, that is intended for the reception of the body portion of the bucket hanger or holding and releasing device 42, to be hereinafter referred to.

Mounted on the platform 24 is an upstanding standard 43, at the upper end of which projects laterally a spindle 14′, upon which is mounted a guide-pulley 45, which is so disposed that when the slide 34 is in its normal projected position the working periphery of said guide-pulley is brought in substantial alinement with the opening 26 in the boss 25. The slide 34 is held in the initial position shown by the spring retracted holding lever 46, that projects upwardly from its pivotal connection, 47 on the boss 25, into the slot 48 formed by the bracket 49, which is supported on the outer face of the side bar 36 of the slide 34. The slide 34, is also provided on its rearward end with an upstanding angularly projecting arm 50, which serves to support in its released position the catch bar 51, that is shown as being pivoted at one end to a stub-shaft 52, that in turn is supported by the upright pair 27, 27′. The catch bar 51 is provided with a hook end 53, that is adapted to engage within the recess 18 of the bumper cup 17, hereinbefore referred to, and which when thus engaged is adapted to hold the carrier receptacle in proper position over the shaft, in readiness for the reception of the bucket hanger 42; which latter in its extreme upward movement strikes the catch bar and releases same from the bumper cup, and allows the carrier-receptacle to start under the influence of its load.

The slide thus constructed and equipped is adapted for horizontal movement from the forward projecting position shown in Figs. 1, 2, 3 and 5 to the rearward position shown in Fig. 4 (where it is stopped by the upright pair 27, 27′) in which latter position the projection or stop piece 38 is brought into contact with the forward end of the lock-bar or actuating lock-slide 54. This lock-slide 54 comprises a rectangular shaped piece that is of a size to fit slidingly within the rectangular slot 35 of the slide 34, and which when in position is adapted to lie flatwise against the supporting platform 24. The lock slide 54 is provided with two substantially rectangular shaped slots 55 and 56, that are of a size to adapt them to slidingly receive the respective blocks 24′ that project vertically from the platform 24, and which are separated from each other by the cross-piece or ledge 57. The slot 55 of the slide 54, is provided on either side at a point intermediate of its ends with oppositely arranged recesses 58 and 59, that terminate in their rearward end walls with upwardly inclined surfaces 60 and 61, respectively. The lock slide 54 is also provided with an oppositely disposed pair of lugs 62 and 63, that project vertically from the respective side bar portions 64 and 65 of the slide and which are integrally connected by a cross-piece 66, that spans at a suitable height above the opening or slot 55, to form a head-piece the function of which will be hereinafter pointed out. The head-piece is likewise provided with complemental inclined surfaces 67, that coincide in their angle of inclination with the surfaces 60 and 61.

The coupling or locking action required to embrace the coupling end of the bucket hanger 42 is accomplished by a complemental pair of locking bars 68 and 69, that are pivoted, respectively, within the recesses formed on the blocks 24′, that extend vertically from the upper face of the base plate or platform 24. These locking-bars or grippers are substantially similar in shape and construction, and though their specific construction may be varied without departing from the idea of means, they are here shown as comprising a tongue portion 71 and head-portion 72, the former being pivotally journaled on the trunnions 73, that are journaled in the blocks 24′, in a manner to bring their heads into juxtaposition to form a substantially closed pair, that normally extend in a horizontal plane, and are supported respectively, on the ledges 57, and the upper faces of the side bars 64 and 65. The head portions of the locking bars are provided on their under faces with concaved receding portions 74, that form when the heads are in their normal position a wedged shaped guiding socket 75, for the reception of the coupling-head of the bucket hanger.

The operation of the mechanism of the carrier-receptacle with regard to the co-acting bucket-hanger and its transference thereon may now be described, without reference to the specific construction of the said bucket hanger device, which will be hereinafter fully described.

Assuming that the respective parts are in the position shown in Figs. 2 and 3, in proper position for coupling with the bucket hanger device 42, which has been elevated into operative position therewith by the arrow-

like head thereof being projected through the opening 26 to a point where it strikes into the socket 75, formed by the locking bars. A further upward thrust of said coupling head raises the heads of the locking bars into open relation or separation to allow the passage of the head therethrough to a point where the reduced shank portion of the coupling head of the hanger allows of the return of the locking bars to their normal horizontal position at rest on the ledges 57, and 64 and 65, whereupon the bucket hanger is held in an interlocked position.

At the same time the coupling action just described takes place the head of the hanger strikes against the catch bar 51, which is in turn released from the bumper cup 17, thereby freeing the carrier-receptacle which starts under the influence of its load down the track-wire. Upon the carrier-receptacle reaching the opposite terminal and the impingement of the slide 34 against the buffer-piece 13, the spring 47′ of the holding lever 47, is overcome and the slide 34 is given an excessive rearward movement, while the ontraveling base-plate or platform 24 by reason of the momentum of the carried load is forcibly thrown forward until by the relative longitudinal movements of both, the projecting stop-piece 38 is brought into contact with the forward end of the lock slide 54, whereupon the base-plate in its continued forward advance carries the blocks 24′ through their limit of travel in the slots 55 and 56 of the slide 54, thereby advancing the lock-bars carried thereby to a position to bring the coupled stem of the bucket hanger in alinement with the opening 44 of the yoke 40, and at the same time advancing the heads of the locking bars to a point they are withdrawn from their ledge resting positions to one where they overhang the slot 55, which under the load of the bucket hanger pulls them down into the position shown in Fig. 4, whereupon the slackening of the hauling rope 23 will allow the bucket hanger to drop with its flange into operative engagement with the crotch opening 44 thereby causing the release of the holding devices, in a manner to be presently pointed out.

Having described the construction and operation of the mechanism of the carrier-receptacle for coupling and uncoupling the bucket holding and releasing device and the transference thereof to a discharge position on said carrier, I will now proceed to describe the special type of bucket hanger or holding and releasing device which is especially adapted for employment with the construction heretofore described, and which comprises a cylindrical shaped stem or draft rod 76, that is provided at its upper or coupling end with an arrow-like or cuneiform shaped end 77, having a rope socket 78, and which in its upward movement expands or opens the jaw-heads of the locking bars 68 and 69 in order to admit of their engagement with the undercut or reduced portion 79, of the stem. The said stem 76 carries at its lower end bucket holding hooks 80 and 81, that project laterally therefrom, the first mentioned one being rigidly secured to said stem and terminating in a vertically disposed curved short arm 81′, while the hook 81 is pivotally connected to said stem and comprises two vertically disposed arms 82 and 83, the former of which normally is held flush within the vertically disposed slot or recess 84, formed in the lower end of the stem. The hook arm 82 is normally held in place by a locking sleeve 85, that fits telescopically on said stem, for vertical reciprocation, and which is provided intermediate of its ends with a laterally extending flange 86. The upward movement of the locking sleeve is prescribed by the limiting stop 87, which is secured to the stem 76, while the said sleeve is held in its upper position by the spring catch 88, that is seated and held in the slot 89 formed in the stem. The shifting of said sleeve when it has been normally set, is accomplished by the utilization of the power of gravity due to the load carried by the bucket hanger when the latter is dropped with its flange portion onto the sleeve crotch opening 44.

90 designates the preferred form of bucket that is suitable for attachment to the bucket holding and releasing device 42, and which is provided with pivoted bails or handles 91 and 92, the former being hung on the permanent hook 80, and the latter on the movable hook 81, which latter when released frees the bail 92, and allows of the overturn and discharge of the contents of the bucket.

The general operation of the hoisting, conveying and discharging apparatus herein described is apparent from the foregoing description.

Having described my invention, what I desire to claim as new and useful is:

1. In an apparatus of the class described, the combination with an elevated track, of a traveling carrier-receptacle comprising in its construction a wheel supporting member that supports, respectively, a relatively sliding gripping or locking member, and a slidable transferring and discharging member; a hoisting means for elevating a bucket hanger or holding and releasing device into operative relation with said locking member; and a buffer means arranged at a predetermined distance in the travel of said carrier-receptacle and in the pathway of said transferring and discharging member, substantially as described.

2. In a carrier-receptacle combining the following instrumentalities, a wheel carrying base-plate provided with a central opening and carrying pivotally mounted bucket hanger engaging means, a superimposed sliding member supporting a bucket hanger yoke and having a centrally extending slot, a slidable keeper or locking member mounted flat wise on said base-plate within the confines of the first mentioned sliding member and normally supporting in horizontal position the engaging means, the whole being arranged in a manner, whereby the reciprocal longitudinal movements of the base-plate and the coacting sliding member cause the longitudinal thrust forward of the slidable locking member to withdraw its support from the locking means to allow of their releasement, substantially as described.

3. In a carrier-receptacle combining the following instrumentalities, a wheel carrying base-plate provided with a central opening and carrying pivotally mounted bucket hanger locking bars, a superimposed slidable member supporting a bucket hanger yoke and having a centrally extending slot, a slidable locking member mounted flatwise on said base plate within the confines of the first mentioned sliding member and normally supporting in horizontal position the locking bars, and a means for holding the carrier-receptacle in a given loading position, that is adapted to be tripped by the bucket hanger.

4. In a carrier-receptacle combining the following features of construction, a wheel carrying base-plate provided with a central opening and carrying pivotally mounted bucket hanger locking bars, a superimposed sliding member supporting a bucket hanger yoke or platform and having a centrally extending slot opening, a slidable locking member mounted flatwise on said base-plate within the confine of the first mentioned sliding member, and normally supporting in horizontal position the said locking bars, a guide-pulley carried by said base plate, a hauling

rope in operative contact with said guide-pulley a bucket hanger device attached to said rope that comprises in its construction, a draft stem having at its upper end a coupling head portion that is adapted for coupling engagement with the said locking bars, and a pivotally mounted bucket hook at its opposite end, a locking sleeve telescopically fitted on said stem, that is provided with a laterally projecting flange portion, said sleeve being normally in operative engagement with the pivoted hook, the whole being arranged in a manner whereby when the bucket hanger is in coupled relation to the locking bars, the reciprocable movements of the base-plate and superimposed sliding member causes the withdrawal of the locking-bars from their interlocked connection with the head of the stem of the bucket hanger, while at the same time the sliding member causes the alinement of the yoke opening with that of the central opening in the base-plate and the deposit of said hanger on said yoke and the consequent retraction of the pivoted hook locking sleeve, and the discharge of the bucket carried thereby, substantially as described.

5. A bucket hanger releasing device that comprises a coupling-head portion at one end, and a pivotally supported hook at the other end, a locking sleeve telescopically fitted on the body portion of said hanger and which is provided with a laterally projecting flange portion, the said sleeve being adapted for withdrawal from a locking engagement with said hook by the weight of the carried load, when the hanger is supported only by the flange portion of the locking sleeve, substantially as described.

6. A bucket hanger and releasing device, consisting of a stem, having an arrow-like or cuniform-shaped coupling head at one end and that is provided with a rope attaching means, and at its opposite end with bucket attaching hooks, one of which is pivotally mounted and is provided with two angularly projecting arms, a slot formed in the end of the stem for the seating of one of the arm extensions of said hook, and a vertical reciprocable locking sleeve for engagement with said arm extension when seated in said slot, and a flange extension projecting from said sleeve for lifting same from its engagement with said hook, substantially as described.

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

PETER MACALLISTER MACKASKIE.

Witnesses:
H. B. LIND,
W. B. PITTMAN.