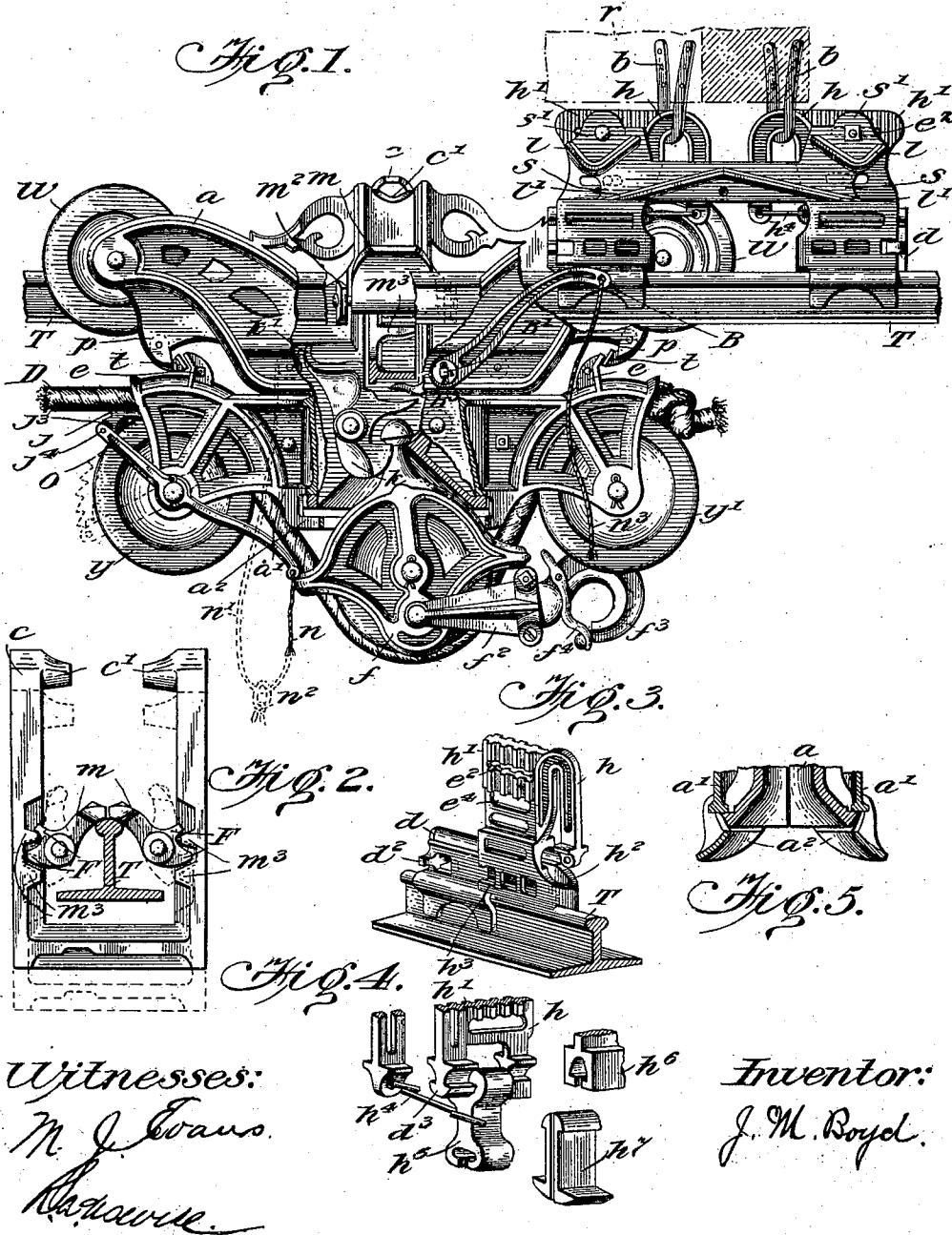


J. M. BOYD.
ELEVATOR AND CARRIER APPARATUS.
APPLICATION FILED DEC. 27, 1904.

980,862.

Patented Jan. 3, 1911.

2 SHEETS-SHEET 1.



Witnesses:
M. J. Evans.
R. H. Evans.

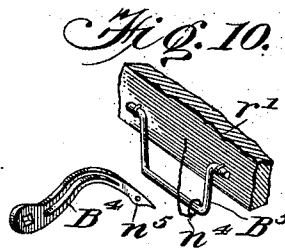
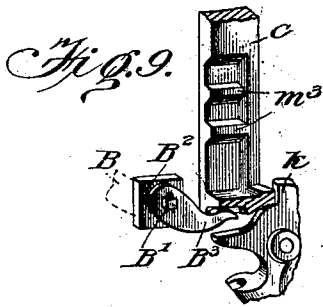
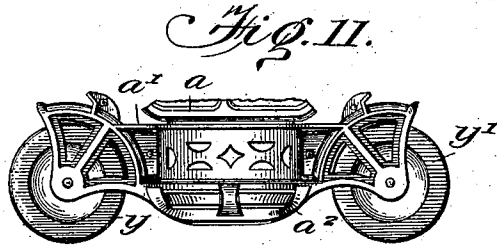
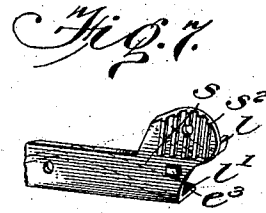
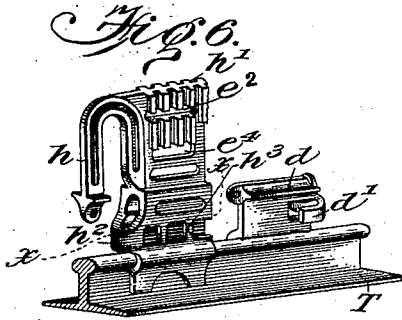
Inventor:
J. M. Boyd.

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2 SHEETS—SHEET 2.



Witnesses:
M. J. Swan
R. A. Howard



Inventor:
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UNITED STATES PATENT OFFICE.

JOHN M. BOYD, OF FOND DU LAC, WISCONSIN.

ELEVATOR AND CARRIER APPARATUS.

980,862.

Specification of Letters Patent.

Patented Jan. 3, 1911.

Application filed December 27, 1904. Serial No. 238,518.

To all whom it may concern:

Be it known that I, JOHN M. BOYD, a citizen of the United States, residing at Fond du Lac, in the county of Fond du Lac and State of Wisconsin, have invented certain new and useful Improvements in Elevator and Carrier Apparatus, of which the following is a specification, 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.

This invention relates to improvements in elevator and carrier apparatus adapted for handling hay and other material, and for use in warehouses, shops, barns, etc., and has for its object to provide means whereby loads may not only be raised at a fixed point on the track and carried back over the mow or other desired place in the ordinary manner, but also whereby the carrier may be tripped to pick up loads at any point underneath the track, without the necessity of attaching stops, trip-blocks, or knockers along the track, or interfering with its working with the stop, trip-block, or knocker attached at a fixed point in the ordinary manner, also for holding and carrying the load at any desired height, and to adapt the carrier for use with different styles of tracks, and to facilitate different parts of the operation, so that loads may be easily and quickly raised and carried in either direction, at any desired height, and raised or lowered either by hand or power at any place along underneath the track, thus greatly increasing its range of usefulness and adaptability to different kinds of work. I attain these objects by providing means for tripping the lock in the carrier at any desired point along the track without the use of a stop or knocker, a clutch or catch in the carrier adapted to catch over the track and hold the carrier when tripped, a rope-clutch adapted to clutch the elevating rope and hold the load at any desired height, means for supporting the stop, trip-block, or knocker in such a manner as not to interfere with the extra clutch mechanism in the carrier, and to adapt the same for use with different styles of tracks, and in other details of construction for facilitating the operation of the ma-

chine or apparatus, as shown in the accompanying drawings, and set forth in the specification and claims.

In the accompanying drawings, Figure 1 is a side elevation of the carrier and track, with the stationary stop attached to the special stop-and-track hangers, part of one side of the carrier frame and collar being broken away to show the arrangement of the interior parts. Fig. 2 is a front elevation of the sliding catch or lock in the carrier, on an enlarged scale, showing the arrangement of the interior clutch or locking jaws at each side of the track. Figs. 3 and 6 are detail views of my special track-and-stop hanger, showing how it is attached to a solid or tee rail track. Fig. 7 is a detail view showing the back or inner side of one end of the stop or trip-block, provided with ribs or corrugations adapted to engage with the upper ribbed or corrugated extensions of the special hangers shown in Figs. 3 and 6, as in Fig. 1. Fig. 4 is a detail view of the coupling links for different styles of tracks. Fig. 5 is a cross-section of the lower part of the carrier, showing the collar or swivel band provided with guards depending below each side of the entrance to said carrier, and Figs. 8, 9, 10, 11 and 12, are detail views of different parts, as hereinafter pointed out.

In the drawings, in which similar letters of reference indicate corresponding parts, *a*, represents the carrier frame, provided with wheels *w*, adapted to run upon a rail or track *T*, in the usual manner; *r*, is the rafter or other overhead support, shown in dotted or broken lines, to which the rafter brackets *b*, are attached to support the hanger hooks or track hangers *h* in the usual manner; *h*¹ is a rear upward extension of the hanger hook, provided with ribs or corrugations, preferably on each side, to engage with similar ribs or corrugations *S*², formed on the inside of the upward extension *S*¹ of the stop or trip *S*, (see Figs. 1, 3, 6, and 7,) which is preferably formed in two side plates, and bolted across from one hanger to the other, on each side, as in Fig. 1; slots *e*² (see also Figs. 3 and 6,) being provided for these bolts in the upper part of the rear extensions of said hangers; lugs *e*³, as in Fig. 7, being also preferably provided on the back or inner sides of these stops or trip-blocks to engage in the slots *e*⁴, provided

underneath said ribs or corrugations on said hangers, (as in Figs. 3 and 6,) to help hold said stops more securely and take part of the strain off said bolts.

5 l, l^1 , (Figs. 1 and 7,) are upper and lower inclines or guiding lugs formed on the outer side of the stop or trip-block to provide guide-ways for the catch c , said catch being provided with inwardly projecting lugs c^1
10 at its upper end to engage therewith, these parts being similar in this respect to those shown in my application of Dec. 23d 1901, Serial No. 87,029, this carrier also being similar, being provided with a collar a^1 ,
15 swiveled around the main carrier frame and carrying end pulleys y, y^1 , and a fork- or trip-pulley f , preferably provided with side arms or links f^2 , carrying a hook f^3 , provided with a closing link f^4 , (as also shown
20 in divisional application of June 4th 1904, Serial No. 211,220, for patent on pulley block,) and said collar being also preferably provided with the bearings or slides e, e ,
25 above the pulleys, adapted to engage and slide upon the end supports or cross-ties t, t , attached to downward extensions p, p , of the carrier frame a , as shown in above applica-
30 tion Number 87,029, (these constructions shown in former applications not being specifically claimed in this,) this carrier being also preferably provided with a similar
35 grapple hook h , and being otherwise similar in general construction. Additional extensions or bearings m^2 , however, are provided inside the carrier frame at each side of the
40 sliding catch c , to support a bolt or pivot on which are pivoted small jaws or catches m , at each side of the track rail and preferably between the vertical sides of said catch, (see
45 Figs. 1 and 2,) said jaws being provided with rear extensions or cogs F , adapted to engage with lugs or cogs m^3 , formed on the inner sides of said sliding catch c , forming
50 a rack, by which means said jaws are opened and closed, preferably above the track, as said catch c is moved up and down, as shown in Fig. 2, the jaws being open when the
55 catch c is down, as indicated by dotted or broken lines in this figure, in which position of said catch the grapple hook h is locked,
60 as shown in Figs. 1 and 9, engaging and holding the trip or registering head of the fork pulley in the usual manner, as in Fig. 1, and leaving the carrier free to travel
65 along the track. When said catch c is raised, said grapple hook h is released, and said jaws m, m , are closed, preferably above the track, as shown in full lines in Fig. 2, ready to catch and hold against the next track hanger, splice clamp, or other obstruction they run against as the carrier is moved either way along the track, said grapple hook h , (Figs. 1 and 9,) tipping forward underneath said catch c , as said catch is raised, as will be understood, thus releasing

the fork- or trip-pulley f , and locking said catch in its raised position and holding said jaws closed, thus retaining said carrier, (without the use of any special stop,) until the trip-pulley is again raised, or the grapple hook h is otherwise tripped, (which may be done by the small cord n^1 , attached to the rear upward extension h^1 , if desired,) when the strain against the upper beveled or slanting ends of said jaws m, m , (see Fig. 1,) pulling against the hanger or other obstruction, will force them open, and, by means of the cogs at their lower rear ends engaging with the cogs or rack formed in the sides of said catch c , (Fig. 2,) will force
70 said catch down, its support having been thus removed, (if it does not fall by gravity,) into locking engagement again with said grapple hook h , as in Fig. 1, said jaws m, m , being thus thrown back to each side of the track, as in said Fig. 1, and as indicated by dotted or broken lines in Fig. 2, leaving the carrier again free to travel along the track, and the operation may be repeated.

A trigger B^2 is provided inside the carrier frame, and connected by means of a pivot or journal B^1 , running through a suitable bearing formed in the side of the carrier frame, (or a removable or loose bearing or block, as B^2 , Fig. 9, adapted to fit into one side of the carrier frame and preferably be held by said pivot or journal passing therethrough and connecting with the trigger B^2 , or other means, attached on the inside of said carrier frame,) with a lever B , attached to the outer
90 end of said pivot or journal B^1 , said pivot or journal being preferably provided with square ends, or said trigger and lever being otherwise rigidly attached thereto at opposite ends, so that a pull on a cord, as n^3 , attached to the outer end of said lever B , will operate said trigger, the free end of said trigger B^2 , projecting underneath the catch
95 c , as in Figs. 1 and 9, so that as the outer end of said lever is pulled down and the free end of said trigger raised, said catch will be also raised thereby, thus freeing the grapple hook h , and operating the jaws m, m , as in Fig. 2, as heretofore described, and as will be readily understood, thus allowing the carrier
100 to be tripped and held at practically any point along the track, without the use of any special or stationary stops attached at different points along said track, as with some other makes of carriers, the regular track hangers, splice clamps, etc., which may be of any ordinary construction, being utilized as stops with this device.

It is also obvious that to operate a carrier provided with these inside jaws or catches
105 m, m , from a stationary stop or trip-block fixed on or above the track over the drive-way in the usual manner when taking in hay, room would have to be provided for said jaws to close over the track rail as the
130

carrier was tripped. This I accomplish by providing special hanging hooks h , h , Figs. 1, 3, and 6, adapted to be supported by rafter brackets, etc., in the usual manner, and to be
 5 attached to the track preferably by means of keys or wedges d , adapted to slide along the track rail and engage inside channels or openings formed in the bodies of said hangers h , (similar to those shown in my former
 10 application No. 87,029 referred to above, also divisional application No. 158,010,) and being locked in position by loops or closing links h^4 , as in Fig. 1, said keys or wedges being also preferably provided with a hooked
 15 extension d^1 at one side, as in Fig. 6, adapted to hook into a recess h^3 on one side of the body of the hanger hook as said wedge is driven in, and with a lug or extension d^2 on
 20 the opposite side if desired, to be bent around into the recess h^3 on the opposite side of said hanger, (see Fig. 3,) the parts being malleable, thus forming a cross-tie across the body of the hangers above the track rail, the
 25 opposite side or end of said hangers being formed with a cross-piece h^2 above the rail, thus holding them against spreading, and the large hooks or loops, by which they are supported by the rafter brackets or other
 30 overhead supports, being preferably formed at one end of the bodies of said hangers, horizontally, thus allowing them to be set wider apart on the track rail, as in Fig. 1, and permitting said jaws m , m , to close between them above the rail, said cross-pieces
 35 h^2 , h^2 , being preferably slightly rounded to form suitable stops for said jaws to engage against, or interchangeable links or couplings, as h^5 , h^7 , Fig. 4, may be used to connect with the rails of different shapes or
 40 styles if desired, as hereinafter described. These special hanger hooks are also formed with an upper rear extension h^1 , provided with vertical ribs or corrugations on each side, to engage with similar ribs or corruga-
 45 tions S^2 (Fig. 7,) formed on the back or inner sides of the upward extensions S^1 of the side plates of the stop S permitting said hooks to be adjusted wider apart or closer together, according to the thickness of the
 50 rafters or other supports to which the rafter brackets b , b , are attached at each side, etc., and the side plates of said stop S , (which is preferably formed in two sides or plates, as above, and as described in my former appli-
 55 cation first referred to above,) will be held firmly in position when adjusted thereto and bolted thereon, as heretofore described, (these rear extensions h^1 , and ribs or corrugations being used in place of the adjusting
 60 wedges d , d , shown in my former application just referred to above, and holding more securely,) said lower inclines l^1 on the sides of said stop lifting said catch S , by means of the inwardly projecting lugs S^1 , as they en-
 65 gage therewith, and holding it by means of

the upper inclines l , as described in the above application, when the jaws m , m , are removed, but holding by said jaws engaging with the lower parts or cross-pieces h^2 of
 70 said hangers when said jaws are in use, (as said jaws engage with said cross-pieces h^2 , before said catch c engages the upper lug l of said stop, as usually constructed,) thus adapting this stop or tripping mechanism
 75 for use either with or without said jaws m , m , which are preferably removable, these new devices being an improvement over those shown in my former application referred to above, and some of the former con-
 80 structions being modified and improved to work properly therewith.

In order to carry the loads at different heights as desired, and to avoid the necessity of raising the loads clear up to the carrier
 85 when there is plenty of room to carry them at a distance below, I also provide a rope-clutch J , pivoted preferably at the end of a lever o , or frame, hung preferably upon the axle of the end pulley in the carrier,
 90 over which the draft or elevating rope D , runs, as in Fig. 1, (though it may be otherwise attached to the frame around said pulley if desired,) said clutch and lever
 95 dropping down into the position shown by dotted or broken lines when said rope is running freely over said pulley, and being thrown up to engage said draft rope D , as shown in full lines, when it is desired to
 100 hold the load at any intermediate point without elevating the trip pulley up to the carrier, said rope-clutch J , being run up in the groove of the sheave or pulley under-
 105 neath said draft rope D , and clutching and binding said rope against the frame or cover (or other means for holding,) above said pulley, as shown in said Fig. 1, said clutch
 110 being operated either by the rope or cord n , attached to the opposite end of said lever o , or by the manipulation of said draft rope D , or otherwise, as desired.

When loads are being raised by hand, as in a warehouse, etc., by pulling the draft or elevating rope down over the end pulley, it
 115 may be made to catch into the clutch when said clutch is in its lower or free position, as shown in dotted or broken lines in Fig. 1; and being held down as it is allowed to run
 120 back, said rope will carry said clutch up with it until it is caught and binds in the frame above said pulley, as shown in full lines in said Fig. 1, when it may be carried to the desired place; and by pulling said
 125 draft rope again outwardly, said clutch may be pulled outwardly until it releases itself by gravity or otherwise from said rope, and falls back into the position shown by dotted or broken lines, (or it may be released by the use of a cord, or a spring coiled around its pivot, or otherwise attached, or other
 130 suitable means,) leaving said rope free to

descend with its load, or to pick up another load, etc. This clutch J, and supporting arms or levers, are held from dropping down too far by suitable stops or lugs (not shown,) formed on the lever, or side arm or frame, on one side to engage with the pulley frame or collar, as will be understood, or by the end of the short lever or arm, on the opposite side from the long or operating lever *o*, shown in Fig. 1, (as at *o*¹, Fig. 12,) being bent around at the opposite side of the axle or pivot, as at *o*², Fig. 12, to engage with the frame at one side of said pulley, (or other means,) to form a stop, as will be readily understood.

Short lugs J³ are also preferably provided at each side of said clutch J, as in Fig. 8, to engage with the edges of said levers or arms *o*, *o*¹, at each side near its pivot J⁴, (see also Fig. 1,) and prevent the point or opposite end of said clutch from dropping in or falling out too far from said pulley. A lengthwise sectional detail view of this clutch is shown at J¹ in said Fig. 8, showing this lug or stop J³, at one side; also views from the upper side of said clutch at J², J², same figure, showing said stop-lugs J³, J³, at each side, and the pivot or bolt J⁴, by which said clutch is connected to said side arms or levers *o*, *o*¹, as in Fig. 1, as will be readily understood. If the draft rope, however, is being run through pulleys overhead where it cannot be easily reached, as when taking in hay from a barn floor, etc., the small rope or cord *n*, Fig. 1, may be attached to the end of the lever *o*, as shown, and used to throw the said clutch J up to engage and hold said draft rope as shown, a short rope or cord being used in this place if desired, and the opposite end *n*¹ being attached to the rear upward extension *k*¹ of the grapple hook *k* in the carrier, a ring being also preferably provided to slide loosely on this rope or cord, to which a longer trip-rope or cord *n*² may be attached, by which it may be operated to trip said grapple hook *k*, independent of the fork- or trip-pulley *f*, thus freeing the catch *c* or jaws *m*, *m*, from the stop, or hangers, etc., as heretofore described, and practically simultaneously operating said lever *o*, to throw said clutch J into engagement with said draft rope D, as above, to support the load as said carrier starts off, as will be understood.

If desired, a small rope or cord may also be attached to the bolt or pivot J⁴ of said clutch J, (or other convenient place,) by which said clutch may be released from said draft rope, as above, and if desired to carry the loads in a reverse direction, the collar *a*¹ carrying the end pulleys *y*, *y*¹ may be swung around in the opposite direction by means of the draft rope, by simply pulling same sidewise, as will be understood.

The above clutching device being more clearly shown in larger views and covered by suitable claims in a divisional case, filed October 28, 1910, Serial No. 589,633, is not claimed broadly herein, but only in combination in the carrier or with parts of the apparatus.

In some instances, especially when using a new or kinky rope, or working rapidly, the registering head or trip of the fork- or trip-pulley of a carrier is liable to shoot off at one side of the entrance as the load is elevated, instead of entering properly to trip the carrier. To prevent this I provide an extension or guard *a*², (see Figs. 1 and 5,) formed on or attached to the collar *a*¹, and depending below said entrance at each side, (as shown in side elevation with said collar and pulleys, and lower part of carrier, in Fig. 11, and in cross-section through the entrance of said carrier, in Fig. 5,) to catch and guide said registering head or trip properly into said entrance, as will be understood; and being attached in this way this guard will not interfere with the proper operation of the rope or pulleys, being open at the ends and depending only at the sides to catch and guide said head or trip as above, and swiveling around with said collar so it will always be in proper position.

In some cases it may be desirable to trip the carrier automatically at given points when running in one direction, for a number of times, or on occasion, but to allow it to run by without tripping when going in the opposite direction, for which purpose I provide the devices shown in Fig. 10, a longer lever B⁴, with an inclined upper edge, being attached in place of the lever B, Fig. 1, and a looped or swinging stop B⁵ being hung as shown at one side of a rafter or other overhead support *n*¹ at the desired place, in such a manner that as the carrier comes along the lower part of said loop or stop will engage with the upper inclined face or edge of said lever B⁴ above its outer end or pivot, and depress said lever as it crowds said loop or stop against said rafter or support, whichever end of said lever may come first, thus tripping the carrier the same as with the lever B, described above, but swinging up and back from said rafter or support, and allowing it to pass without tripping when going in the opposite direction, as will be understood. A cord *n*⁴ may also be attached to said stop or loop B⁵, as in Fig. 10, and run up through an overhead support and down into convenient reach, whereby said loop or stop may be held up out of the way of said lever B⁴ when it is desired to allow the carrier to pass freely both ways without tripping, and an eye, as *n*⁵, or other means, may be provided at or near the outer end of said lever, whereby a cord may be attached to trip it by hand on occasion, the same as

with the lever B, Fig. 1, if desired. To adapt these special track-and-stop hangers for use with track rails of different shapes in cross-section, so that the carrier may be used with them on such rails, the lower parts of said hangers may be formed as shown in Fig. 4, the lower ends being cut off and said lower parts provided with a head or bead d^3 , below the supports provided for the stop S, and adapted to engage with one end of a coupling piece or link h^5 , to which the closing link h^4 may also be connected as shown, the lower end of said coupling link h^5 being formed to engage properly with the style of rail or rails it is intended to be used with, or the lower part of said hangers may be formed as shown at h^6 in same figure, leaving a channel or opening lengthwise there-through, which would be similar to that shown in Fig. 6 being cut off at about the line x, x , and the upper end of said coupling link formed with a head or bead, as at h^7 , Fig. 4, adapted to engage in said channel or opening, the same as the upper edge or head of the wedge d , Figs. 3 and 6, said coupling link being made either solid, or in two parts or halves, as shown, and the lower ends being formed as at h^5 , to engage the bead or head of a solid rail, or as shown at h^7 , to support a track formed of two channel or angle rails, or of any suitable shape to fit the rails they are to be used with, as will be understood, so that by simply changing these coupling links said hangers and stops may be used with the carrier on different styles of rails, which will be especially convenient where said rails or tracks are already up, as in the peak of a barn, and it is desired to use one of these carriers on the same, or where it is more convenient to obtain one style of rail than another, etc., as will be understood.

It is evident that the jaws m, m , may be arranged to engage with obstructions or attachments below the rail instead of above, if desired, by dropping the body of the carrier enough to give them room, and that the tripping lever, rope-clutch, stopping devices, etc., may be used independently if desired, thus adapting the carrier for use in several different ways and for a variety of purposes, also that some of the parts will admit of several other modifications, and that some of them may be adapted for use with machines otherwise different in construction, or in different combinations, etc., therefore having shown what I deem as the most preferable forms of construction, combination, etc., I wish it distinctly understood that I hereby explicitly reserve to myself all such modifications, combinations, and arrangements as properly come within the scope of my invention.

What I claim as my invention and desire to secure by Letters Patent, is—

1. In an elevator and carrier apparatus, in combination with a suitable catch or lock in the carrier, and a stop, trip, or knocker adapted to be supported above the track rail in position to engage and co-act with said catch or lock, means for supporting said stop, trip, or knocker at each end, and vertical ribs or extensions on one part adapted to fit into suitable places formed on the other part to receive same, whereby said means and said stop, trip, or knocker may be held against endwise strain when secured together, substantially as and for the purposes set forth.

2. In an elevator and carrier apparatus, in combination with the stop, trip, or knocker adapted to be supported above the track or way to engage and co-act with the catch or lock in the carrier, a supporting means for said stop, trip, or knocker, formed with means whereby it may be connected to an overhead support, and provided with ribs or corrugations adapted to engage with suitable engaging faces or portions formed on said stop, trip, or knocker, substantially as and for the purposes set forth.

3. In an elevator and carrier apparatus, in combination with the track or way, and a carrier provided with mechanism adapted to be operated by a stop, trip, or knocker supported above the track rail, a stop, trip, or knocker adapted to engage and operate said mechanism, means for supporting the same above said rail or way, and extensions on said means lengthwise of said rail, to which said stop, trip, or knocker may be adjustably secured, substantially as and for the purposes set forth.

4. In an elevator and carrier apparatus, in combination with the stop, trip, or knocker adapted to be supported above the track or way to engage and co-act with the locking mechanism of the carrier, a supporting means for said stop, trip, or knocker, formed with an eye or hook whereby it may be connected to an overhead support, and provided with a slot or slots to admit of adjustment lengthwise of said stop, trip, or knocker, substantially as and for the purposes set forth.

5. In an elevator and carrier apparatus, in combination with mechanism carried by the carrier and projecting up above the track rail, a suitable stop, trip, or knocker formed of two sides or plates provided with means adapted to engage and co-act with said mechanism, and means for supporting said stop, trip, or knocker in proper position, provided with extensions whereby the said means may be adjusted lengthwise of said stop, trip, or knocker, between said sides or plates, and means whereby they may be secured together, substantially as and for the purposes set forth.

6. In an elevator and carrier apparatus, in

combination with the catch or lock in the carrier provided with portions extending above the track, stop or trip supporting means provided with an eye, hook, or other means whereby it may be connected to an overhead support, means at the lower end whereby it may be connected to the track rail, and intermediate means for supporting said stop or trip at the proper height to engage said upper extensions of said catch or lock, and a stop or trip formed in two sides or parts adapted to be secured at the sides of said stop or trip supporting means, with ribs or corrugations formed on one part adapted to engage in grooves or recesses in the other, to prevent endwise movement when secured together, substantially as and for the purposes set forth.

7. In an elevator and carrier apparatus, in combination with the carrier frame and a suitable track or way, means for hanging or supporting said track or way, means whereby said carrier may be retained at different places along the track by engagement with said hanging or supporting means, while loads are being elevated, and means for automatically releasing said retaining means as said loads are elevated to the proper height, substantially as and for the purposes set forth.

8. In an elevator and carrier apparatus, in combination with the carrier frame, and a suitable track or way, means for supporting said track, mechanism in the carrier frame adapted to engage with said supporting means at different points as desired along said track to retain said carrier, and means for automatically releasing said mechanism as the elevating or trip-pulley trips said carrier, substantially as and for the purposes set forth.

9. In an elevator and carrier apparatus, in combination with a suitable track or way, and suitable suspending means for said track, mechanism in said carrier adapted to be thrown into engagement with said suspending means at any desired point along said track, means for locking said mechanism in engagement therewith, and means for automatically tripping or releasing the same as the load is elevated, substantially as and for the purposes set forth.

10. In an elevator and carrier apparatus, in combination with a track or way, and suitable suspending or other engaging means attached thereto, mechanism in the carrier adapted to close cross-wise of said track between said suspending or other engaging means at any point desired, means for locking said mechanism when closed, and means whereby said mechanism may be caused to open by the draft or pull against said suspending or other engaging means when unlocked, substantially as and for the purposes set forth.

11. In an elevator and carrier apparatus, in combination with a suspended track or way, and a stationary stop or trip, mechanism in the carrier adapted to engage with and to be operated by said stationary stop or trip, and also to engage with and operate other mechanism adapted to engage with any of the suspending means along said track, as desired, substantially as and for the purposes set forth.

12. In an elevator and carrier apparatus, in combination with a track or way provided with suitable hangers or suspending means, or other engaging means attached thereto, load supporting means in the carrier, and mechanism adapted to be set into engagement with said hangers or other engaging means, and means for tripping or setting said mechanism at any point desired, by the operation of said load supporting means, substantially as and for the purposes set forth.

13. In an elevator and carrier apparatus, in combination with a carrier frame provided with interior locking mechanism for supporting the load, and catching mechanism adapted to catch cross-wise of the track rail, means attached at one side of said frame, and connected with interior means to engage said locking mechanism whereby said mechanism may be operated to set said catching mechanism, substantially as and for the purposes set forth.

14. In an elevator and carrier apparatus, a carrier provided with a sliding catch or lock, a lever attached at one side of the carrier frame and connected with means whereby said sliding catch or lock may be raised, substantially as and for the purposes set forth.

15. In an elevator and carrier apparatus, in combination with a catch or lock sliding vertically in the carrier frame, mechanism inside said carrier frame adapted to engage underneath and raise said catch, and means at one side of said carrier frame whereby said mechanism may be operated, substantially as set forth.

16. In an elevator and carrier apparatus, in combination with the carrier frame, and a catch or lock sliding vertically therein, a lever or trigger inside said frame adapted to engage with and raise said catch, and means passing through one side of said frame whereby said trigger may be operated, substantially as set forth.

17. In an elevator and carrier apparatus, in combination with the catch in the carrier, a lever or trigger pivoted inside said carrier frame and projecting underneath said catch, and a lever pivoted at one side of said frame and connected with said trigger, substantially as and for the purposes set forth.

18. In an elevator and carrier apparatus, in combination with the track or way, hang-

ers adapted to support said track or way, means in the carrier adapted to engage and hold against said hangers, mechanism in said carrier adapted to operate said engaging and holding means, and means attached to said hangers at desired points for operating said mechanism automatically, substantially as and for the purposes set forth.

19. In an elevator and carrier apparatus, in combination with a main catch or lock in the carrier adapted to engage with a stationary stop, trip, or knocker, a secondary catch or lock adapted to engage with the track hangers or other attachments to the track rail, and means whereby the same may be operated, substantially as and for the purposes set forth.

20. In an elevator and carrier apparatus, in combination with the main catch or lock in the carrier adapted to be operated by a stationary stop or trip, a secondary catch or lock adapted to be operated by engagement with said main catch, and to engage with separate retaining means attached to the track rail, substantially as and for the purposes set forth.

21. In an elevator and carrier apparatus, in combination with a main catch or lock in the carrier adapted to engage with a stationary stop, trip, or knocker, and to be operated up and down in the carrier frame, a secondary catch or lock adapted to be operated cross-wise of said carrier frame, and means for operating the same, substantially as set forth.

22. In an elevator and carrier apparatus, in combination with a main catch or lock sliding vertically in the carrier frame, a secondary catch or lock adapted to be operated by engagement with said main catch, and to open and close cross-wise of said carrier frame, substantially as and for the purposes set forth.

23. In an elevator and carrier apparatus, in combination with a main catch or locking device in the carrier adapted to engage with a stationary stop or trip, and provided with operating lugs or cogs, a secondary catch or lock adapted to be engaged by said lugs or cogs, and to be operated by the movement of said main catch, substantially as set forth.

24. The combination of a sliding catch in the carrier provided with lugs or cogs on its inner sides, and a pivoted catch adapted to be engaged by said lugs or cogs, and to be operated by the movement of said sliding catch, substantially as set forth.

25. In combination with a main catch in the carrier, formed with two outward sides or arms and an open center, a secondary catch or lock pivoted between said sides or arms of said main catch, and means whereby said secondary catch may be operated, substantially as set forth.

26. In combination with a main catch or

lock formed with sides or arms adapted to slide in vertical guideways or bearings in the carrier frame, and with an open center, a secondary catch or lock pivoted between said vertical sides or arms of said main catch, through its open center, and adapted to be operated cross-wise of said carrier frame as said main catch is operated up and down, substantially as set forth.

27. In combination with a main catch or lock in a carrier, formed with vertical sides or arms and an open center, cross-catches or jaws pivoted cross-wise through said open center of said main catch, and provided with lugs or cogs adapted to engage in racks formed in the vertical sides of said main catch, whereby said cross-catches or jaws may be operated back and forth as said main catch is moved up and down, substantially as set forth.

28. In combination with a main catch or lock in the carrier, provided with lateral extensions or lugs adapted to engage with lateral lugs or inclines formed on a stationary stop or trip, whereby said catch may be raised as it comes in contact therewith, a secondary catch or lock in the carrier frame adapted to catch over the track rail underneath said stationary stop or trip, substantially as set forth.

29. In combination with a suitable upwardly extending catch or lock in the carrier frame, and a stop, trip, or knocker adapted to operate said catch or lock as it engages therewith, hanging or suspending hooks adapted to support said stop, trip, or knocker from an overhead support, and provided with extensions at one side in line with the track rail, to which said stop, trip, or knocker may be attached, and a lower catch or lock in the carrier adapted to catch over said track rail between said hangers, substantially as set forth.

30. In an elevator and carrier apparatus, in combination with the carrier frame and a suitable upwardly extending catch or lock, hanging or suspending hooks adapted to engage with rafter brackets or other supporting means, and provided with ribbed or corrugated extensions to which the stop or trip may be attached to hold it in proper position to operate said upwardly extending catch or lock, and lower catches or jaws in said carrier frame adapted to engage with said hangers underneath said stop or trip, substantially as set forth.

31. In an elevator and carrier apparatus, in combination with a suitable catch or lock in the carrier frame adapted to work up and down, and hanging or suspending hooks provided with ribbed or corrugated extensions, a stop or trip provided with ribs or corrugations adapted to engage with the said extensions, whereby said stop or trip and said hangers may be adjusted and held in place

endwise, and catches or jaws in said carrier adapted to engage cross-wise over the track rail underneath said stop or trip, substantially as set forth.

5 32. In an elevator and carrier apparatus, in combination with the stop or trip, and hangers adapted to support said stop or trip from an overhead support, removable means adapted to engage with said stop hangers at
10 one end, and with the track rail at the other, to hold said stop or trip at proper distance from said rail, substantially as set forth.

33. In combination with the trip or stop, and the catch on the carrier, hangers adapted to support said trip or stop from an overhead support, and suitable connecting means or links adapted to engage with said stop hangers at one end, and with the track rail at the other, to support said rail in proper
15 position to bring said catch into proper engagement with said stop or trip, substantially as set forth.

34. In an elevator and carrier apparatus, in combination with the trip or stop, and the track rail, hangers adapted to support said stop from an overhead support, links or connecting means adapted to be attached at one end to said track rail, and connected to said hangers at the other by means of a
20 rib or bead on one part engaging into an opening or channel on the other part, to hold said track rail and stop in proper relation to each other to operate the mechanism in the carrier, substantially as set forth.

35. In an elevator and carrier apparatus, in combination with the draft or elevating rope, the end pulley of the carrier, over which said rope is run, and the frame around said pulley, a lever or frame pivoted at the side or sides of said pulley frame and carrying a clutch, as J, adapted to engage with and clamp said rope against said frame above said pulley to hold the load, a grapple hook, as k, in the carrier frame, adapted to
30 support or lock the catch into engagement with the stop on the track, and a cord, as n, n¹, connecting said grapple hook with the operating lever, as o, of said clutch, whereby said clutch and said grapple hook may
40 be operated practically simultaneously, substantially as and for the purposes set forth.

36. In an elevator and carrier apparatus, in combination with the carrier frame, and a lever pivoted at one side of said frame, a
45 suitable stop or trip suspended above and at one side of the track or way for said carrier in such a manner that it will engage and depress said lever as said carrier passes, and trip said carrier, substantially as set
50 forth.

37. In combination with the carrier frame, and a lever attached at one side of the same, a stop or tripping device swung at one side of an overhead support in such a manner
55 that it will engage and trip said lever as

said carrier passes in one direction, and swing up and allow it to pass freely in the opposite direction, substantially as set forth.

38. In combination with the carrier frame, and a lever attached at one side of the same, a stop or tripping device connected to an overhead support, and means whereby the same may be lowered to engage and operate said lever as said carrier passes, or raised out of the way of said lever, substantially
60 as set forth.

39. In an elevator and carrier apparatus, in combination with the main frame of the carrier, a collar or swivel band swiveled around said main frame and carrying the rope and pulleys, and an extension or guard depending therefrom on each side of the main entrance, whereby the upper part of the fork- or trip-pulley may be guided properly into said entrance, substantially as set
65 forth.

40. In combination with a collar or band swiveled around the carrier frame, and a head or trip adapted to project into an entrance at the lower side of said frame and engage mechanism therein, a lower extension or guard depending from each side of said collar or band, and adapted to guide said head or trip properly into said entrance, substantially as set forth.
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41. In an elevator and carrier apparatus, in combination with the carrier frame provided with suitable mechanism therein, and a collar or band swiveled around the same, a suitable pulley block provided with a registering head or other tripping means adapted to engage said mechanism, and a shield or guard suspended from said collar or band at each side of the entrance to said carrier frame, to prevent said tripping means from shooting off sidewise, substantially as set forth.
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42. In an elevator and carrier apparatus, the combination of the hangers h, h, stop S, catch or lock c, jaws m, m, and rail T, substantially as set forth.
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43. In an elevator and carrier apparatus, the combination of the catch or lock c, jaws m, m, rail T, a trigger adapted to lift said catch, and means at one side of said carrier whereby said trigger may be operated.
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44. The combination of the grapple hook h, catch c, trigger B³, and a lever at one side of the carrier frame whereby said trigger may be operated to release said grapple hook h, by raising said catch c, substantially as set forth.
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45. The combination of the catch in the carrier adapted to lock the load supporting mechanism, a trigger B³, pivoted at one side of said catch and out of the line of operation of the elevating devices, and adapted to engage with said catch when desired to release said load supporting mechanism, a journal B¹, passed through bearings in one
95

side of the carrier frame, and means attached to the outer end of said journal whereby said trigger may be operated independent of the draft rope, substantially as set forth.

46. The combination of the catch in the carrier, a trigger B^3 , adapted to lift said catch, a journal B^1 , to the inner end of which said trigger is attached, a removable bearing B^2 , for said journal, and means attached to the outer end of said journal whereby said trigger may be operated to lift said catch.

47. The combination of the catch c , the grapple hook with rear upward extension k^1 , the clutch J , the lever o , cord n , n^1 , connecting said lever o , and said rear extension k^1 of said grapple hook, and the ring and cord n^2 , whereby said cord n , n^1 , may be operated to simultaneously operate said clutch J , and said grapple hook, substantially as and for the purposes set forth.

48. In combination with the carrier provided with internal tripping mechanism adapted to be operated by means attached to one side of said carrier, a depending stop or trip B^5 attached to an overhead support above and at one side of the track or way for said carrier, and adapted to engage with said operating means at one side of said carrier, and a cord n^4 , whereby said stop or trip may be raised to allow said carrier to pass freely when desired, substantially as set forth.

49. The combination of the trigger B^3 ,

journal B^1 , a lever attached to the outer end of said journal, a trip B^5 , and a cord n^4 , whereby said trip may be operated, substantially as set forth.

50. The combination of the carrier frame a , a collar or band a^1 , swiveled around said carrier frame, an elevating rope D , a trip pulley f , provided with suitable tripping means to enter the carrier, and guards a^2 , attached to said collar and depending at each side of the entrance to said carrier frame, substantially as and for the purposes set forth.

51. The combination of the carrier frame a , a collar or band a^1 carrying the elevating pulleys, and guides or guards a^2 depending at each side of the entrance to said carrier frame and flaring outwardly, substantially as set forth.

52. The combination of the grapple hook k , trigger B^3 , journal B^1 , lever B^4 , swinging stop or trip B^5 , stationary stop S , and sliding catch c , adapted to be raised by said stop S , or by said trigger when actuated by said swinging stop or trip B^5 , or other means, to release said grapple hook k , substantially as set forth.

In testimony whereof I hereby affix my signature in presence of two subscribing witnesses, this 17th day of December 1904.

JOHN M. BOYD.

Witnesses:

W. A. GOREY,
A. B. DAY.