No. 704,830. Patented July 15, 1902.

W. J. JACKMAN.

CABLE MECHANISM FOR HAULING LOADS UP INCLINED SURFACES.

(Application filed Mar. 11, 1902.)

(No Model.) 2 Sheets—Sheet 1.

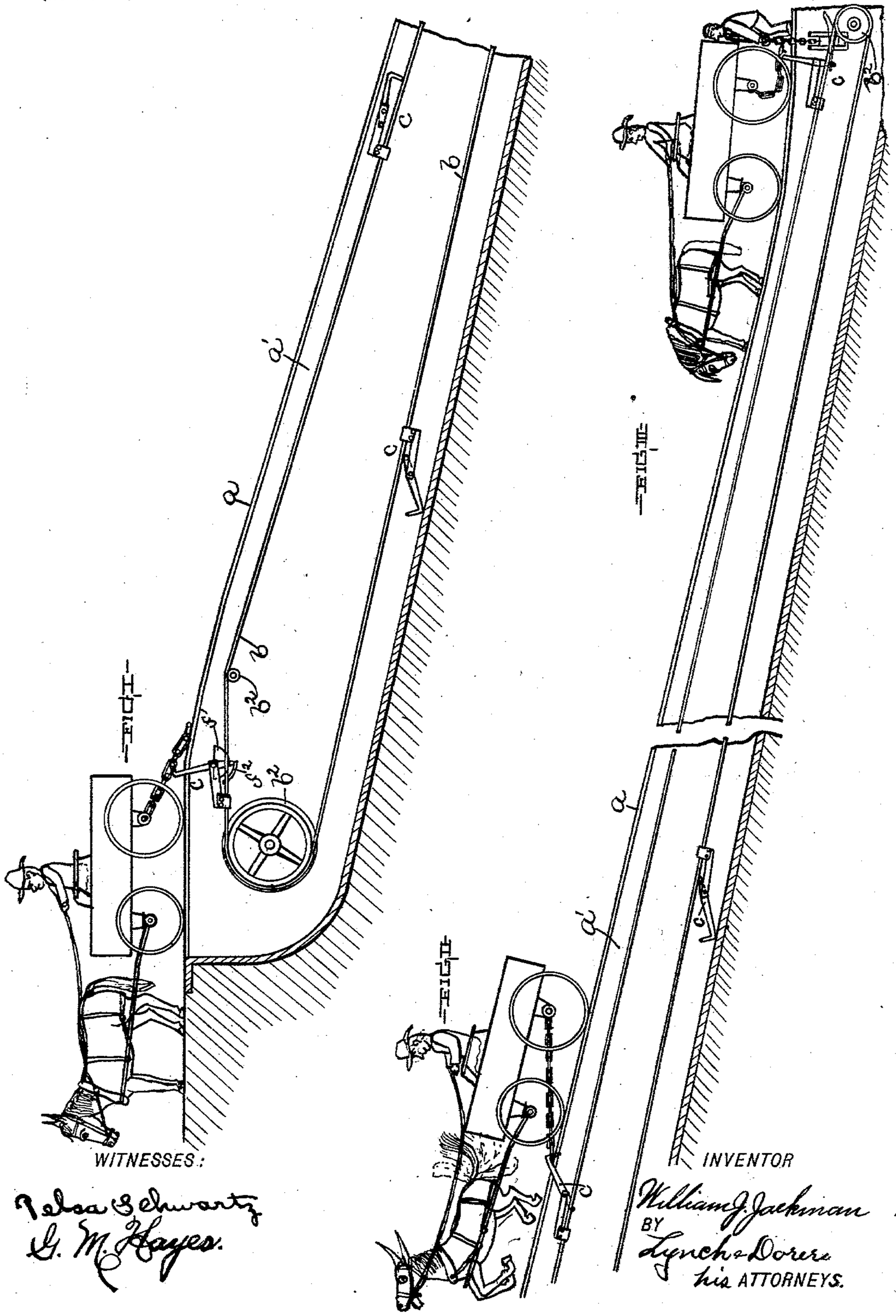

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FIG. IV.

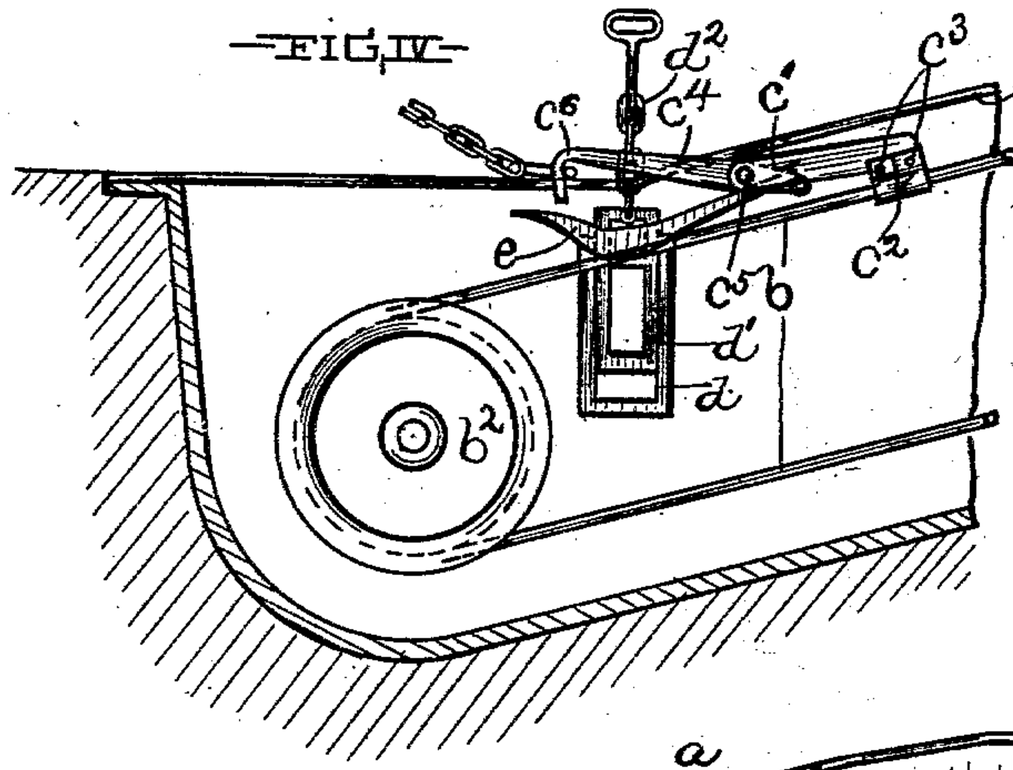


FIG. V.

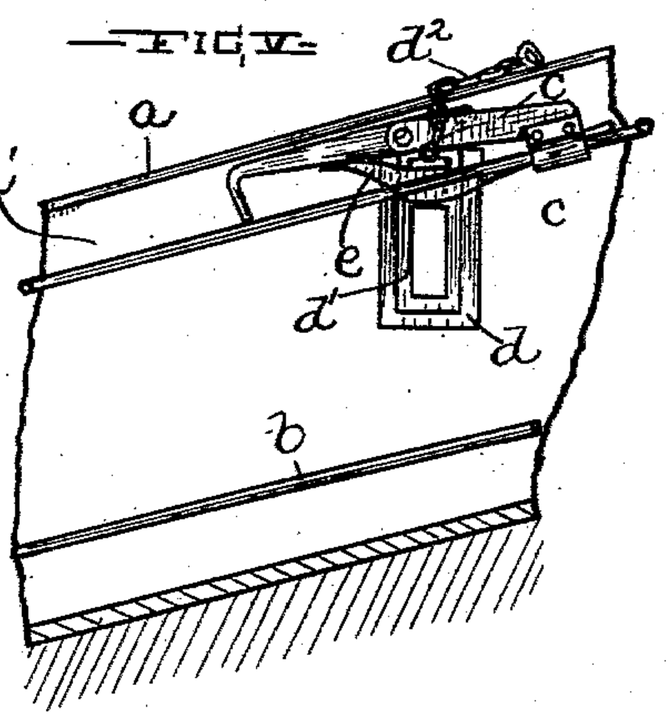


FIG. VI.

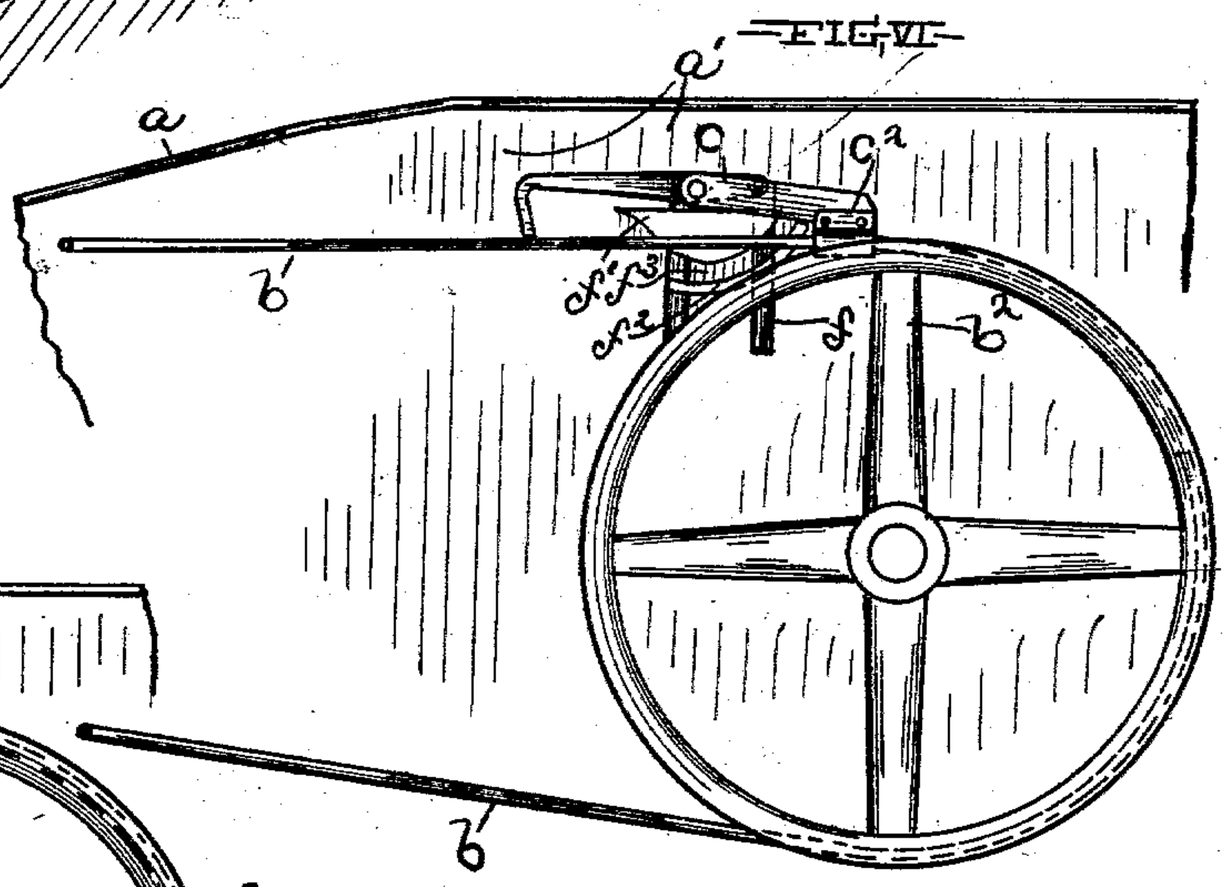


FIG. VII.

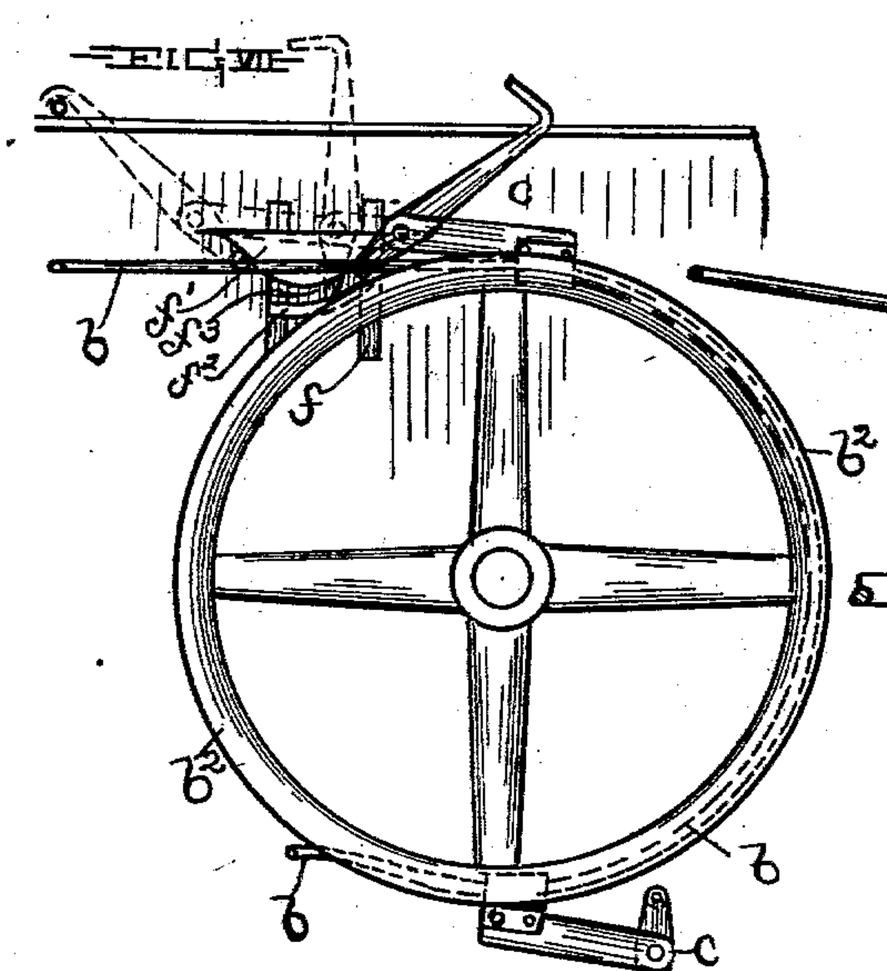
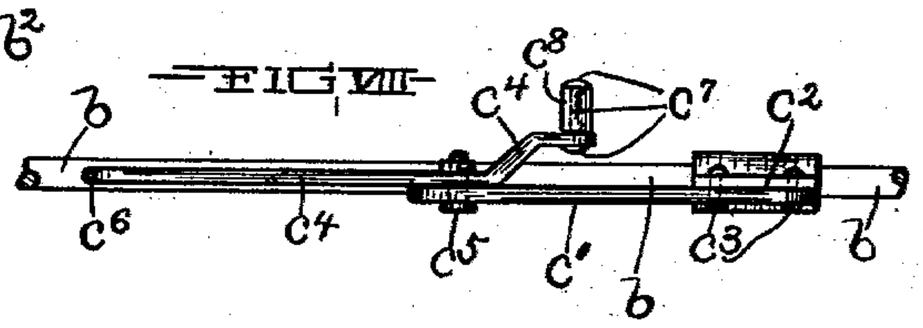


FIG. VIII.



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UNITED STATES PATENT OFFICE.

WILLIAM J. JACKMAN, OF CLEVELAND, OHIO.

CABLE MECHANISM FOR HAULING LOADS UP INCLINED SURFACES.

SPECIFICATION forming part of Letters Patent No. 704,830, dated July 15, 1902.

Application filed March 11, 1902. Serial No. 97,707. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. JACKMAN, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Cable Mechanism for Hauling Loads up Inclined Surfaces; and I 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 pertains to make and use the same.

This invention relates to improvements in cable mechanism for hauling loads up inclined surfaces.

The object of this invention is to provide, in combination with an inclined roadway, auxiliary means for assisting to the top of the said inclined roadway wagons and other vehicles which are provided with motive power of their own sufficient to propel them under normal conditions or on level ground.

With this object in view my invention consists in providing, in combination with an inclined roadway, a cable-conduit having a cable arranged therein provided with means for forming an engagement with a load at the bottom of or at predetermined points along the inclined roadway and means for automatically disengaging the cable from the load at the top of the inclined roadway.

My invention also consists in the features of construction and combination of parts, as illustrated in the drawings and hereinafter set forth in the specification and pointed out in the claims.

In carrying out my invention I construct a cable-conduit which extends from the bottom to the top of the inclined roadway and which is provided with a cable-slot in the top thereof. Within the cable-conduit I arrange an endless cable on carriers of the usual construction and connect the same with an electric motor or other means for propelling the cable continuously in the desired direction. On the cable I secure a number of devices adapted to engage with a load to be hauled up the inclined roadway. These devices are arranged so that in their normal positions they will lie entirely in the conduit. At predetermined points within the conduit I arrange cam devices, both movable and stationary, which when brought into contact with the engaging devices or when the engaging devices come in contact with them will cause the engaging devices to rise through the slot in the top of the conduit, so that a load may be secured thereto or disengaged therefrom.

In the accompanying drawings, Figure I illustrates a portion of an inclined roadway, partly in section, showing a load at the top of the incline being automatically disengaged from the cable. Fig. II is a similar view showing a load passing up the inclined roadway in engagement with the cable. Fig. III is a similar view showing a load at the bottom of the incline in position to be connected to the cable. Fig. IV is a detail view showing an engaging or gripping device on the cable just completing engagement with the chain secured to load. (Load not shown.) Fig. V is a detail view showing the engaging or gripping device on the cable in its normal position passing over a movable cam device in its normal position. Fig. VI is a detail view showing an engaging or gripping device in its normal position passing over a stationary cam device at the top of the incline. Fig. VII is a detail view showing an engaging or gripping device being automatically released from engagement with a load by coming into contact with a stationary cam device. Fig. VIII is a top plan of a gripping device.

Again referring to the drawings, a represents an inclined roadway.

a' represents a cable-conduit of the usual construction.

b represents an endless cable, which is mounted on rollers or carriers b^2 in the usual manner.

c represents the engaging devices which are secured to the cable at predetermined points. Each engaging or gripping device c comprises a support or bracket c', which extends longitudinally of the cable and is rigidly secured thereto by means of clamping-jaws c^2, which engage the sides of the cable. The jaws c^2 are caused to closely engage the cable by means of bolts c^3. On the end of the bracket c' is pivotally supported a lever c^4 by means of a pin c^5, which passes through the lever c^4 at a point below its center, dividing the lever into a long arm and a short arm. On the end of the long arm of the lever c^4 is formed a hook c^6. The short arm of the lever is pref-

erably curved outwardly away from the cable in order that it will lie near to one side of the conduit and so that when it swings down it will not come into contact with the cable. On the end of the short arm of the lever c^4 is secured a pin c^7, on which is mounted a roller c^8.

At predetermined points within the conduit, preferably at the bottom and at points where other roads intersect the inclined roadway, are arranged vertical guideways d. In each of these guideways is arranged a frame d', capable of moving vertically therein. To the top of each frame is secured a chain d^2, by means of which the frame may be raised or lowered in the guideway. On each frame d' is mounted a block e, having a cam-face formed on its bottom side. These blocks e are arranged in the vertical plane of the rollers c^8 on the levers c^4; but when the frame d' is in its lowest or normal position the block e will lie below the roller c^8, and as the cable travels along the rollers c^8 will pass over the blocks e without coming in contact therewith and the lever c^4 will maintain its normal position approximately parallel with the cable and entirely within the conduit. When the frame d' is raised by means of the chain d^2 to its highest position, the end of the block e will rise above the horizontal plane of the roller c^8 in its normal position, and as the movement of the cable brings a roller into contact therewith the roller will be forced down along the cam-face of the block e, thereby depressing the short arm of the lever c^4 and tilting or raising up the long arm of the said lever until the hook c^6 on the end of the lever projects through the slot in the top of the conduit a sufficient distance to allow a load to be secured thereto or disengaged therefrom. As the roller c^8 is carried along the cam-face of the block e the lever c^4 will gradually tend to resume its normal position; but if a load has been secured thereto the connecting-link between the hook and the load will prevent the hook from entering the conduit while in engagement therewith.

f represents a stationary cam device comprising a frame which is secured within the conduit at the top of the inclined roadway. To this frame is rigidly secured a block f', arranged in the vertical plane of the rollers c^8, but below the horizontal plane of the said rollers when in their normal position. This block is provided with a cam-face on its bottom side. Below the block f' is rigidly secured a block f^2, having a cam-face on its top. The respective blocks f' and f^2 are arranged so as to leave a groove f^3 between their adjacent surfaces wide enough to allow the rollers c^8 to pass through. As the cable moves along the rollers c^8 on the ends of the levers which are in their normal positions—that is, on the ends of all levers not in engagement with a load—will pass over and entirely clear the stationary cam device without any change of position, as shown in Fig. VII; but if the hook on the end of any lever c^4 is in engagement with a load the short arm of the lever will be depressed and the roller c^8 thereon will come into contact with the stationary cam device and will be forced down along the cam-face of the block f' and through the groove between the respective blocks f' and f^2, causing the hook to describe a complete semicircle, lifting it out of engagement with the load and causing it to fall backward into the conduit, as shown in Fig. VII. It will be readily understood that the object of this stationary cam device is to automatically disengage the cable from the load when the load has been raised to the top of the incline.

The operation of my improved mechanism is as follows: When a load is in position to be assisted up the incline, the operator pulls upon a chain d, lifting the block e to the proper position to be engaged by a roller c^8, passing thereunder, and as the cable continues to travel the roller passing along the under surface of the block e raises the lever c^4 to the position shown in Fig. III. While the hook is in this position one end of a chain which is secured to the load is attached to the hook. When the roller leaves the cam-face of the block e, the lever c^4 will fall back, but will not assume its normal position, as the chain will prevent the hook from reëntering the slot, as shown in Fig. II. The roller c^8 will therefore be below its normal position, and when the load comes to the top of the incline the roller will come into contact with the stationary cam device and the hook end of the lever will be lifted from its engagement with the chain, as before described, and the cable will be disengaged from the load, as shown in Fig. I.

I do not desire to limit myself to the exact construction herein set forth, as my invention comprises the combination, with a conduit, a cable arranged in said conduit, and means for operating said cable, of gripping devices permanently secured on said cable within the conduit, and means for actuating said gripping devices arranged within said conduit and lying without the path of the said gripping devices when the said gripping devices are in their normal positions, so that the said gripping devices will remain in their normal positions on said cable until the said actuating devices are brought into contact therewith either through the movement of the said actuating devices or through the displacement of the said engaging devices from their normal positions.

Furthermore, it is quite apparent that my invention is equally well adapted for use on a level surface and may be so used without any modification whatsoever.

What I claim is—

1. The combination with a conduit, with a slot formed in its upper surface, a cable operatively mounted in said conduit, and means for operating said cable, of an arm pivotally

secured on said cable, a gripping device arranged on one end of said arm, movable devices arranged within said conduit and lying without the path of said arm, means for causing said devices to come into engagement with said arm, so as to cause said gripping device to rise through the slot in said conduit, and stationary devices arranged in said conduit and lying without the path of said arm, when the said arm is in its normal position within the said conduit, and arranged to engage with said arm when said arm is in its raised position, for the purpose set forth.

2. The combination with a conduit, with a slot formed in its upper surface and extending longitudinally thereof, a cable operatively mounted in said conduit and means for operating said cable, of gripping devices permanently secured to said cable and normally lying entirely within said conduit, cam devices mounted within said conduit at predetermined points and arranged so that when the said gripping devices come in contact therewith the said gripping devices will rise through the slot in the said conduit, for the purpose set forth.

3. The combination with a conduit, with a slot formed in its upper surface and extending longitudinally thereof, a cable operatively mounted in said conduit and means for operating said cable, of gripping devices each of said gripping devices comprising a bracket extending longitudinally of the cable and rigidly secured thereto, a lever pivoted to the free end of said bracket, a hook formed on one end of said lever, and devices arranged at predetermined points within the conduit, and adapted to engage the said lever so as to cause the hook on the end thereof to rise through the slot in the said conduit, for the purpose set forth.

4. The combination with a conduit, with a slot formed in its upper surface and extending longitudinally of the said conduit, a cable operatively mounted in said conduit and means for operating said cable, of engaging or gripping devices permanently secured to said cable, each of said gripping devices comprising a bracket rigidly secured to said cable, a lever pivoted to said bracket, a hook formed on one end of said lever and a roller on the other end and cam devices arranged at predetermined points within said conduit and adapted to engage the said roller so as to depress the roller-carrying end of the lever and elevate the hook-carrying end of the said lever, substantially as described and for the purpose set forth.

5. The combination with a conduit, with a slot formed in its upper surface and extending longitudinally thereof, a cable operatively mounted in said conduit and means for operating said cable, of gripping devices each of said gripping devices comprising a bracket rigidly secured to said cable, a lever pivoted to the free end of the said bracket and a hook formed on one end of said lever, and cam devices located within said conduit and arranged below the path of said gripping devices and means for moving said cam devices into the path of the said gripping devices, substantially as described and for the purpose set forth.

6. The combination with a conduit, with a slot formed in the upper surface and extending longitudinally thereof, a cable operatively mounted in said conduit and means for operating said cable, of gripping devices each of said devices comprising a bracket rigidly secured to said cable, a lever pivoted on said bracket, a hook formed on one end of said lever, and a roller mounted on the other end of said lever, guideways located within said conduit, frames arranged in said guideways, cams secured to said frames and normally lying without the path of said roller on said lever, and means for lifting said frames in said guideways so as to bring said cams within the path of said roller, substantially as described and for the purpose set forth.

7. The combination with a conduit, with a slot formed in its upper surface and extending longitudinally thereof, a cable operatively mounted in said conduit and means for operating said cable, of gripping devices each of said devices comprising a bracket rigidly secured to said cable, a lever pivoted on said bracket, a hook formed on one end of said lever, and a roller mounted on the other end of said lever, vertical guideways located within said conduit, frames arranged in said guideways, cams secured to said frames and normally lying without the path of said roller on said lever, and a chain secured to said frames and adapted to lift said frames in the said guideways, substantially as described and for the purpose set forth.

8. The combination with a conduit, with a slot formed in its upper surface, a cable operatively mounted in said conduit and means for operating said cable, of gripping devices pivotally secured to said cable and normally lying entirely within said conduit, a movable cam arranged within said conduit and normally lying without the path of said gripping device, for causing said gripping device to rise through the slot in the said conduit when said cam is brought into the path of said gripping device, and a stationary device, for automatically disengaging said gripping device from a load, arranged within the conduit and lying without the path of the gripping device when in its normal position within the conduit, and lying within the path of and adapted to engage with said gripping device when said gripping device is in its raised position, for the purpose set forth.

9. The combination with a conduit, with a slot formed in its upper surface and extending longitudinally of said conduit, a cable operatively mounted in said conduit and means for operating said cable, of gripping devices normally lying entirely within said conduit, means for causing said gripping devices to

rise through the slot in the said conduit so as to engage with a load above the said conduit, a stationary cam mounted within said conduit and arranged so as to lie below the horizontal frame of the said gripping device when in its normal position, and to contact with the said gripping device when the said gripping device is in engagement with a load, substantially as described and for the purpose set forth.

10. The combination with a conduit with a slot formed in its upper surface, a cable operatively mounted in said conduit, and means for operating said cable, of a gripping device pivotally secured to said cable and normally lying within said conduit, frames arranged within said conduit without the path of said gripping device, cams arranged on said frames, and means for actuating said frames, so as to cause the said cams to lie within the path of said gripping device, for the purpose set forth.

11. The combination with a conduit, a cable-slot formed in said conduit, a cable operatively mounted in said conduit and means for operating said cable, of a gripping device pivotally secured to said cable and normally lying within said conduit, a movable frame arranged within said conduit, without the path of the said gripping device, a cam arranged on said frame, means for actuating said frame so as to bring said cam within the path of the said gripping device, a stationary frame arranged within said conduit, a cam mounted on said frame and lying without the path of said gripping device, when said gripping device is in its normal position within the conduit, and arranged to engage with the said gripping device, when the said gripping device is in its raised position, for the purpose set forth.

In testimony whereof I sign the foregoing specification, in the presence of two witnesses, this 28th day of February, 1902, at Cleveland, Ohio.

WILLIAM J. JACKMAN.

Witnesses:

GERTRUDE M. HAYES,

TELSA SCHWARTZ.