(No Model.) 2 Sheets—Sheet 1.

J. N. T. CAWHERN.

HOIST.

No. 464,929. Patented Dec. 8, 1891.

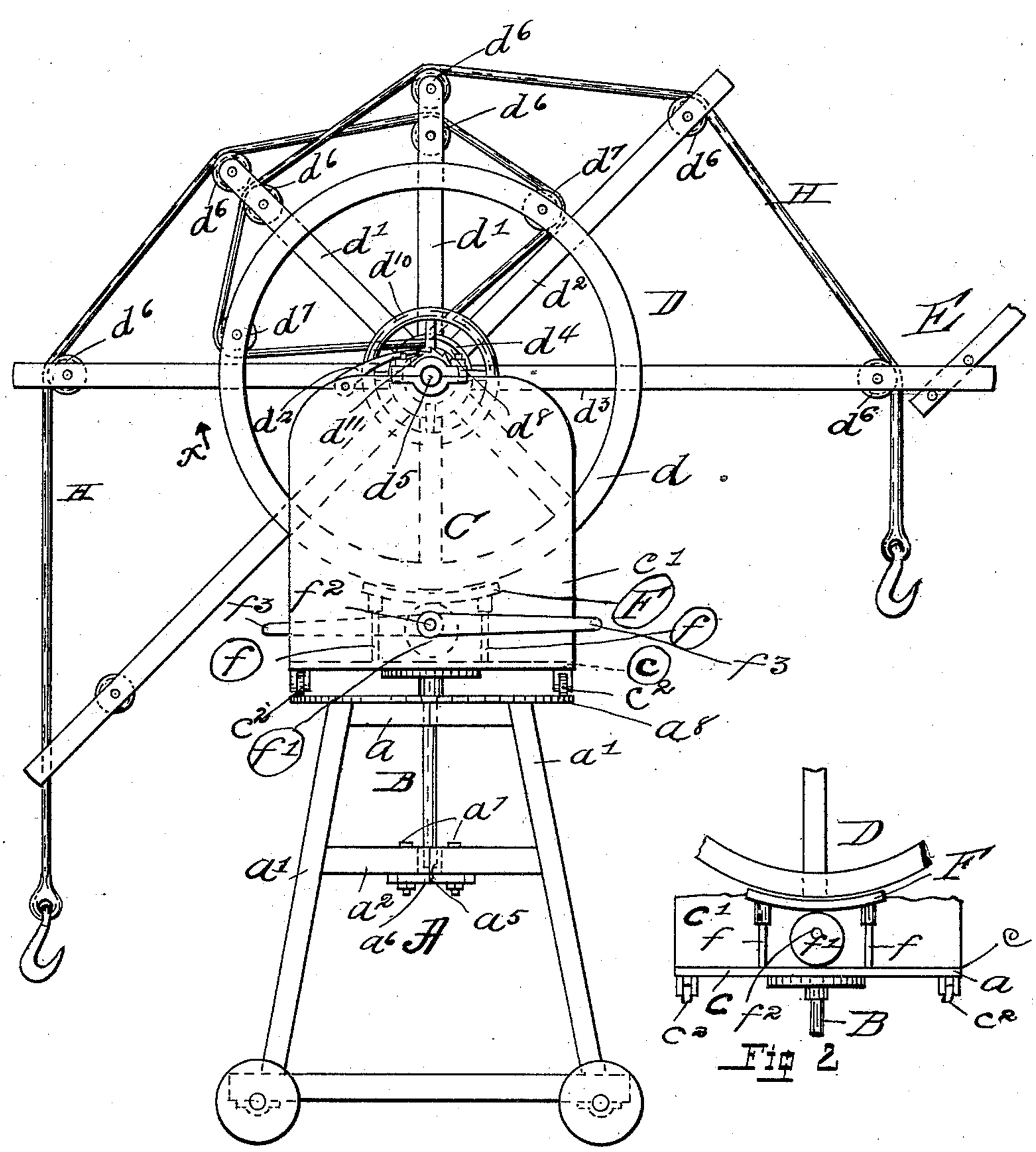

Fig. 1.

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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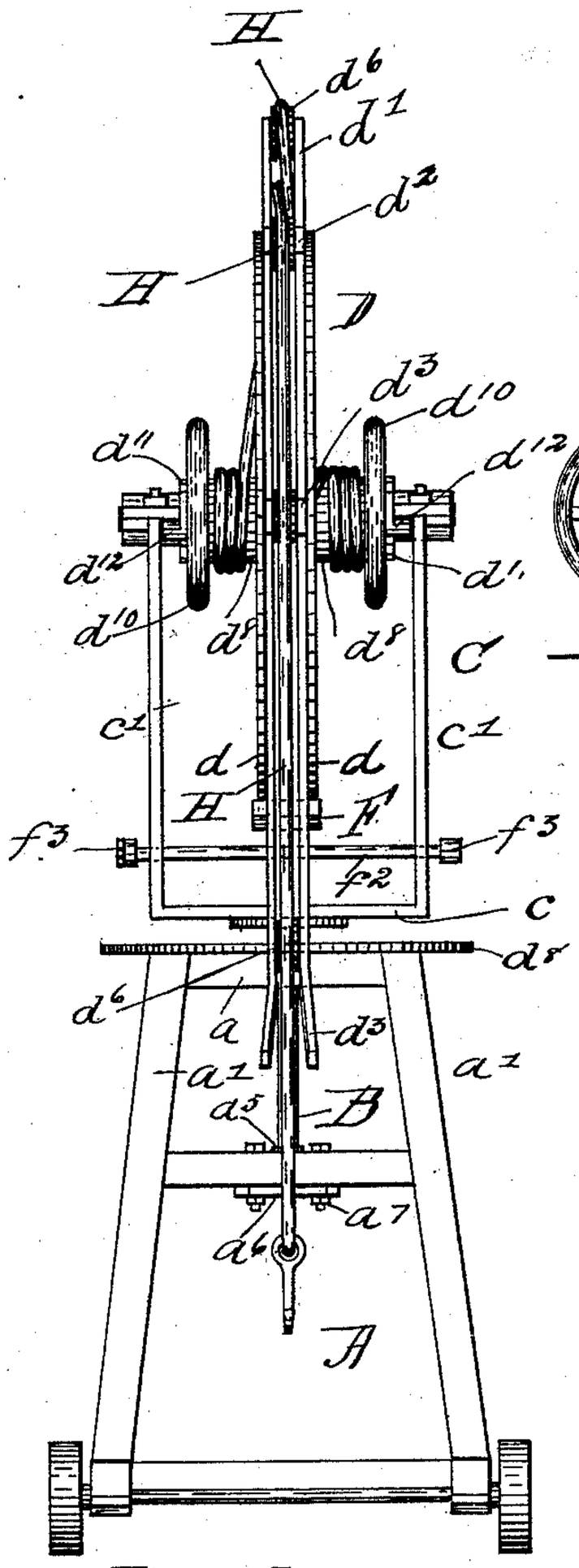

Fig. 3.

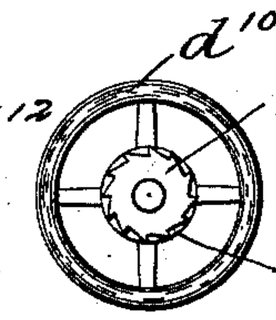

Fig. 6.

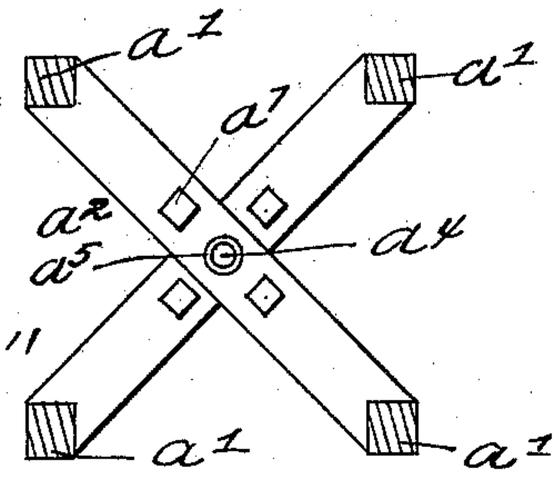

Fig. 7.

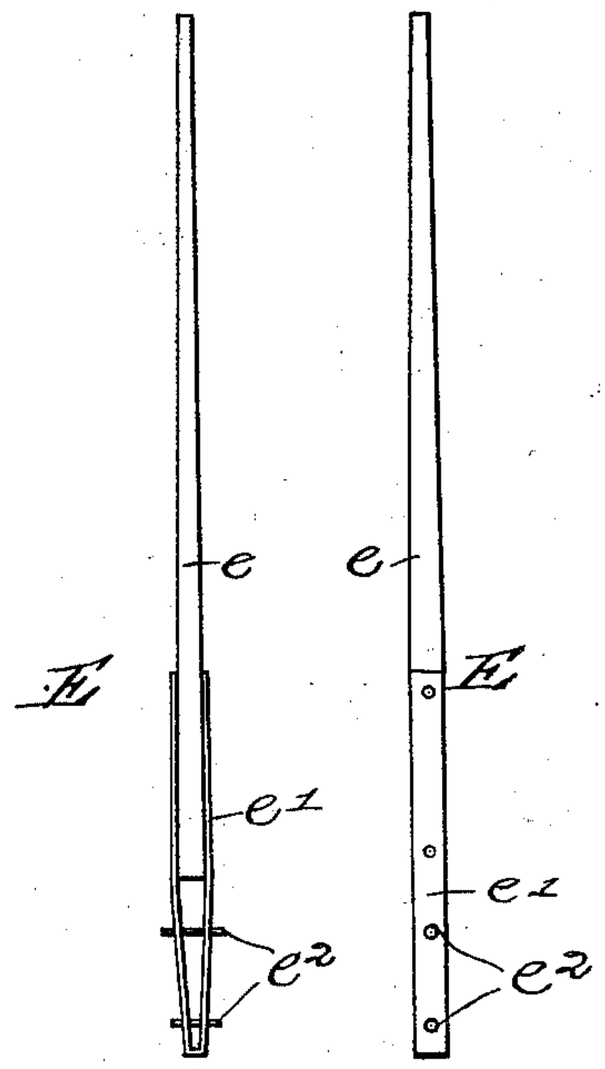

Fig. 4. Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN N. T. CAWHERN, OF ATLANTA, GEORGIA.

HOIST.

SPECIFICATION forming part of Letters Patent No. 464,929, dated December 8, 1891.

Application filed December 24, 1890. Serial No. 375,730. (No model.)

To all whom it may concern:

Be it known that I, JOHN N. T. CAWHERN, a citizen of the United States, and a resident of Atlanta, in the county of Fulton and State of Georgia, have invented certain new and useful Improvements in Hoists; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to devices for hoisting, having more particular reference to such class of said devices as are used in lifting quickly, by means of grapples, such articles as bales and boxes of goods, such as are usually shipped or handled in warehouses, the object being to facilitate the unloading and loading of such goods from or onto cars, drays, and other carriers, the details of construction whereby these ends are accomplished being hereinafter fully specified.

In the accompanying drawings, Figure 1 is a side elevation of the device, showing by dotted lines the position of the brake. Fig. 2 is a view of a portion of the pivoted frame and the wheel, said figure showing in side elevation the brake-shoe and operating-cam. Fig. 3 is an end view of the device, more clearly showing the construction of the wheel and drums for taking up slack rope. Figs. 4 and 5 are respectively views of the lever from top and side thereof. Fig. 6 is a detail view of a winding-drum in end elevation, showing the hand-wheel and ratchet-wheel. Fig. 7 is an inverted plan view of the stepping structure supporting the pivot.

In the figures, like reference-marks indicating corresponding parts in the several views, A is the base-frame, which is composed of a rectangular frame-work a, having a substructure of four uprights a', preferably convergent as they pass upwardly, the upper ends being held relatively stationary by a frame a, X-shaped and formed of two pieces crossed at their middle, at which point of intersection is bored a vertical hole, for a purpose hereinafter fully understood. If desired, this hole may be lined with Babbitt metal or a cast-iron bearing-box. Situated at a suitable place intermediately of the posts a' is a second X-shaped frame a^2, (best shown in Fig. 7,) also formed of cross-timbers and having in its center, as there shown, a hole a^4, in which is set the step a^5, which consists of a cup-shaped bearing, which is provided with and held stationary by a plate a^6 and suspended from the frame a^2 by bolts a^7 passing through said plate and frame, as best shown in Figs. 1, 2, and 3. The pivot B, stepped in the bearing a^5 and revolving freely therein, passes upwardly through its upper bearing, hereinbefore described, and carries, by means of suitable connecting construction, a frame-work C, composed of a horizontal transverse piece c, having uprights c' at each end, upon which is journaled the frame D, which will be hereinafter fully described. This said frame-work C is free to revolve by reason of the journaling of the pivot B, and in order to provide a superabundance of strength rollers c^2 are placed thereunder and form bearings for the said frame C upon the top side of the track a^8, which is circular in form and secured on the top of the uprights a'. These rollers c^2 are placed under the frame D; but, if desired, others may also be placed under the bearings thereof in order to stiffen the frame transversely and relieve the part a of part of the strain placed thereon in hoisting.

The frame D is suitably journaled on the frame C, as hereinbefore mentioned, and is composed of two rings d, of metal, curved edgewise to the proper radius. These rings d are carried upon radial bars d', d^2, and d^3, which bars are secured to a hub d^4, said hub being screwed to and revolving with the shaft d^5. The bars d' extend radially slightly beyond the rings d, and the bars d^3 extend a much greater distance, while the bars d^2 extend in a radial direction a distance intermediately thereof, or, in other words, are longer than the bars d' and shorter than the bars d^3. These bars d', d^2, and d^3 are in sets of two, one ring d carrying one of each set and the other ring carrying the other one of the set parallel thereto and at a short distance therefrom in a sidewise direction, which provides space for the rollers d^6 and for the rope H. The ends of the bars d^2 and d^3 diverge as soon as they pass the wheels d^6 therein, which is for the purpose of guiding the rope onto the said wheels

and also, in the case of the arms d^3, to provide for the insertion, as best shown in Fig. 1, of the lever E, (shown in top and side elevation in Figs. 4 and 5,) which said lever, as therein shown, is constructed of a wood handle e, which has secured thereto the iron e', which consists of a flat piece of bar metal bent upon itself and tapering smaller at the end. Through this metallic end are pins e^2, which engage with the bars d^3, as shown in Fig. 1, whereby the said bars may be pulled down and the frame D turned in the operation of hoisting. When the lever is in its raised position, it will generally be out of reach of a person standing on the ground, and at such times a rope attached to the end of said lever will be utilized in depressing the same.

Between the rings d of the frame D are placed in a suitable position grooved wheels d^7, the function of which will be presently understood. Revolving loosely on the shaft d^5 are two drums d^8, which have thereon hand-wheels d^{10} and ratchet-wheels d^{11}. A pawl d^{12} is provided, engaging with each of the said rachet-wheels, said pawls being pivoted to the upright c', as best shown in Fig. 1, and each operating to prevent the winding off of the rope from said drums, the end of each of said ropes H being secured to and wound upon its corresponding drum, whence it passes over its wheel d^7, and thence over the wheels d^6, successively, in the bars d', d^2, and d^3. It is obvious upon reference to Fig. 1 that as the weight on either of the ropes is raised the end of said rope will be wound a short distance upon said drum, which winding will add to the distance the article is raised relative to the distance the lever E is depressed in direct proportion to the circumference of the drum d^8. The winding upon the drum of the rope is due to the revolution of the frame D and the stationariness of said drum.

In order to hold the frame D stationary and the article raised in an elevated position, a brake-shoe F is provided, which bears on the peripheral surface of said frame D, and is held from revolving therewith by being seated upon guides f, which project upwardly from the bottom of the part c of the frame C and revolves in a horizontal plane with frame C and the said frame D. The brake-shoe F is brought into forcible frictional contact with the frame D by means of an eccentric f', which is carried on a shaft f^2, journaled in the sides c' of the frame C, having on each end, preferably balancing each other, oppositely-projecting levers f^3, the depression of either of which will revolve the eccentric and press the brake-shoe against the wheel in the manner as plainly seen on reference to Fig. 2.

The operation of this device is as follows: For purposes of description it will be supposed that the lever d^3 in the left hand of Fig. 1 stands depressed somewhat more than is shown in that figure—that is, into such a position that it would contact with that edge of the plate c, at which time the wheels d^6 on the bars d' and d^2 on the left-hand side of the machine, as shown in Fig. 1, will be approximately vertically arranged. The hook or grapples would then be attached to the bale or box to be hoisted, and by revolving the proper one of the drums d^8 the slack rope will be taken up and the rope drawn taut. By pulling the rope attached to the end of the lever E the frame D will be revolved in the direction of the arrow in Fig. 1, which will elevate the package slowly and at a comparatively small application of power to the lever E at first. As soon as the frame D shall have been started revolving the arm d^2 will come into play, first swinging the load farther from the machine and increasing the radial distance on the rope-carrying point, and by the time its greatest radial distance has been nearly reached the lever E is down within reaching distance, at which time the power may be more effectively and conveniently applied and the speed of the lifting increased. The depression of the lever E continuing, the wheel d^6 in the arm d^3 will be brought vertically under the wheel of the arm d^2 and said arm d^3 will come into use and swing the load farther out from the machine, and by further increasing the radial distance of the rope-bearing point further increase the speed of the upward lift, the increase in resistance being compensated for by the fact that the lever E is now low down and in such a position that the entire weight of the men can be easily thrown upon it. The brake may be applied at any position of the load desired, and after the application of the same the person operating the lever will simply have to furnish counterbalance-weight to prevent the machine from tipping over in case such counter-balance is not otherwise fully provided for. If necessary, the device may then be rolled to the desired point, and by turning the frame C and parts carried therein to the desired point the load will be deposited. It is obvious that in loading a wagon from a platform or other place one hook and then the other may be used alternately and considerable time saved thereby.

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

1. In a hoist, a supporting-frame, a multiplicity of arms secured to a shaft, each arm extending farther from the center than its predecessor, said shaft adapted to be revolved in bearings on said supporting-frame and so cause said arms to successively act upon a rope suitably secured and passing over the shortest of said arms, and means for revolving said shaft, for the purpose specified.

2. In a hoist, the frame formed of arms secured to and extending radially from a shaft, each arm projecting farther from the center than its predecessor, bearings for said frame-shaft, a windlass loosely carried on the shaft, a rope passing over the distal ends of said

arms and having its end secured to the drum, upon which said shaft may be wound, and means of revolving said frame, substantially as and for the purpose specified.

3. In a hoist, the shaft d^5, suitably journaled and carrying the frame having arms projecting radially therefrom, each arm being longer than its predecessor in the series, a drum on said shaft, and a rope secured thereto and adapted to contact and be carried outwardly by each succeeding longer arm, substantially as shown and described, and for the purpose set forth.

4. In a hoist, the frame D, having radial arms d', d^2, and d^3, secured to and extending from the shaft d^5, suitably journaled on a supporting-frame, the drum d^8, loosely mounted on said shaft, and means for locking said drum, and a rope secured to and adapted to be wound upon said drum and passing freely over the distal points of said arms of the frame D, for the purpose specified.

5. In a hoist, the frame D, having radial arms secured to and extending from a shaft d^5, suitably journaled on a supporting-frame, a drum d^8, loosely mounted on said shaft, a ratchet-wheel d^{11} on said drum, a pawl d^{12}, pivoted on a stationary supporting-frame, and a rope secured to and adapted to be wound upon said drum and passing freely over the distal points of said arms of the frame D, for the purpose specified.

6. In a hoist, the combination of the supporting-frame, the frame D, consisting of the rings d, radial arms d' d^2 d^3, each being longer than its predecessor, and shaft d^5, mounted on said supporting-frame, hoisting-rope H, in contact with the distal ends of one or more of said arms, and the lever E, adapted to be engaged with and disengaged from the desired one of said arms, for the purpose specified.

7. In a hoist, the combination, with a rotatable frame having rings d d, of a brake-shoe adapted to engage the peripheries of said ring, and an eccentric having two levers connected therewith for the purpose of operating said brake-shoe, the said levers projecting in opposite directions for the purpose of balancing said eccentric and preserving same in any set position, substantially as and for the purpose specified.

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

JOHN N. T. CAWHERN.

Witnesses:
A. P. WOOD,
ALBERT A. WOOD.