

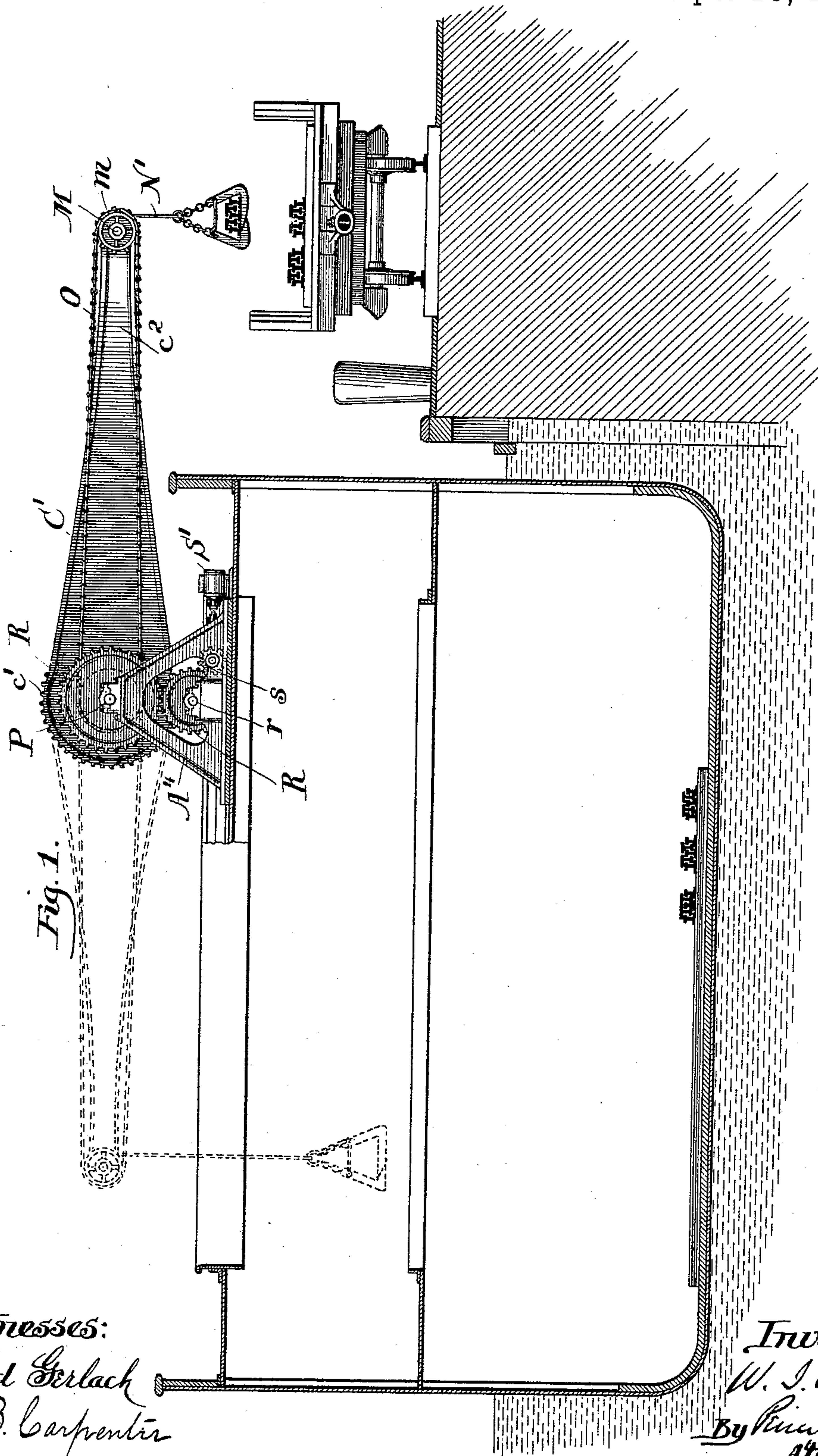
(No Model.)

2 Sheets—Sheet 1.

W. I. BABCOCK.
HOISTING APPARATUS.

No. 459,434.

Patented Sept. 15, 1891.



Witnesses:
Fred Gerlach
J. B. Carpenter

Inventor:
W. I. Babcock
By Rina Fisher
Attorneys.

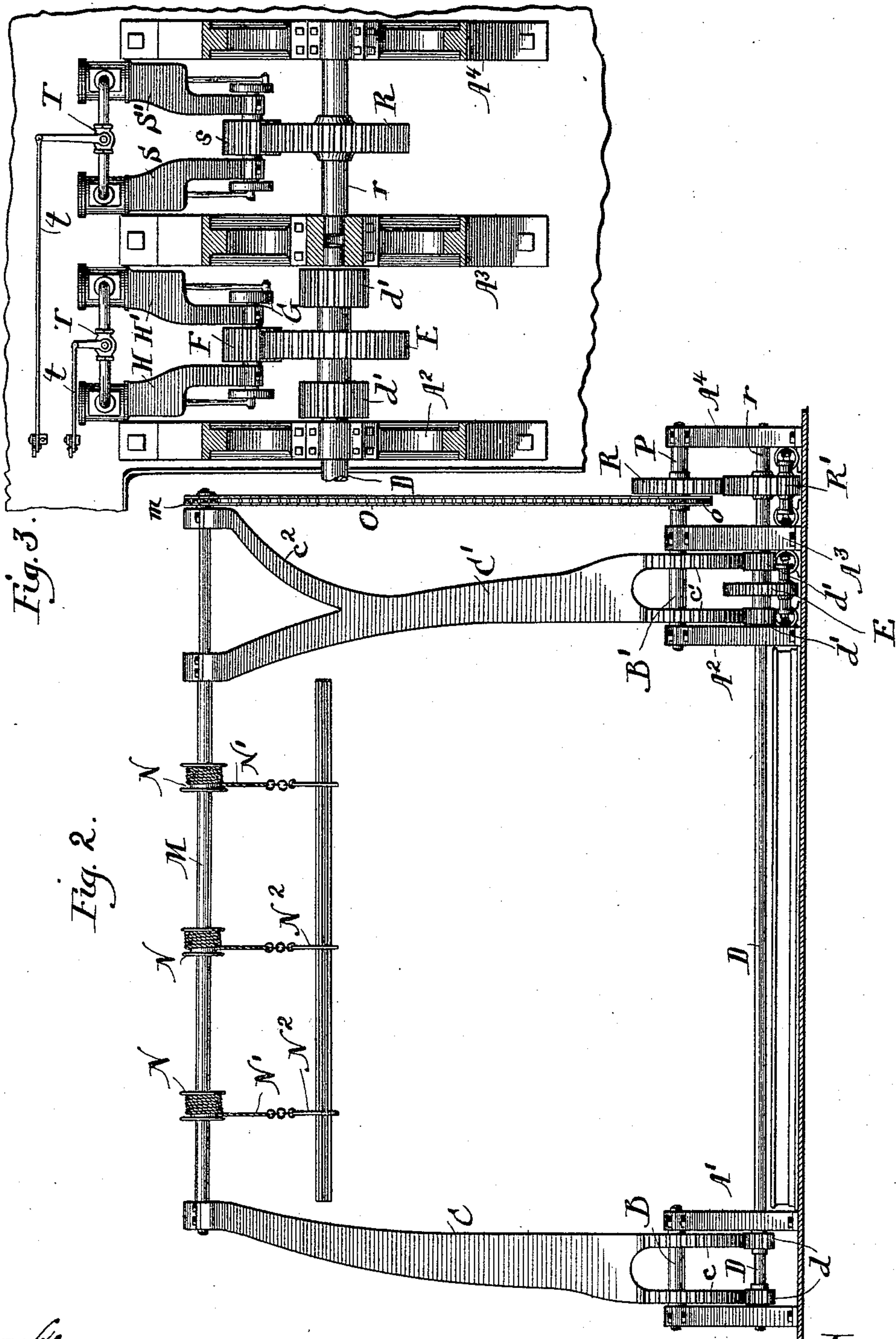
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UNITED STATES PATENT OFFICE.

WASHINGTON IRVING BABCOCK, OF CHICAGO, ILLINOIS.

HOISTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 459,434, dated September 15, 1891.

Application filed June 6, 1891. Serial No. 395,401. (No model.)

To all whom it may concern:

Be it known that I, WASHINGTON IRVING BABCOCK, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hoisting Apparatus, of which the following is hereby declared to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My present invention, while applicable in whole or in part to a variety of purposes, is more especially designed for loading and unloading railway-rails into vessels or onto railway-cars.

The invention consists in the various novel features of construction hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the claims at the end of this specification.

Figure 1 is a view in side elevation of my improved apparatus, this apparatus being shown mounted upon the deck of a vessel that is illustrated in section, and being shown as transferring rails to the hold of a vessel from a platform railway-car upon an adjacent dock. Fig. 2 is a view in elevation of my improved apparatus. Fig. 3 is an enlarged detail view, being a horizontal section, showing the operating mechanism at one end of the apparatus.

In the top of the standards A and A' is journaled a short shaft B, and in the top of the standards A² and A³ is journaled a corresponding short shaft B B', and upon the short shafts B B' are carried, respectively, the lifting arms or beams C and C', the lower portion of the beam C being sustained between the standards A and A', while the lower portion of the beam C' is sustained between the standards A² and A³. The lower ends of the beams C and C' are provided with segmental racks c and c', two of these racks being preferably employed for each of the arms or beams. With the segmental racks of the beam C engage the pinions d, keyed upon the shaft D, that is journaled in the standards A, A', A², and A³, and upon the opposite end of this shaft D are keyed the pinions d', that engage with the segmental racks c' of the arm or beam C'. Upon the shaft D and between the pinions d' is keyed the gear-wheel E, that engages with a pinion F upon the crank-shaft G, that receives motion from

the engines H H' or other suitable source of power. Hence it will be seen that by transmitting motion to the gear-wheel E and shaft D such motion will be communicated by the pinions d d' to the arms or beams C C', causing the same to swing in unison in the operation of lifting the load, as will presently more fully appear. I prefer to employ two engines H H', in order to avoid dead-centers and to permit the more ready reversing of the apparatus. It is obvious, however, that the same results may be reached by suitable clutch-and-gear mechanism for connecting the shaft D with the source of power. At the outer ends of the arms or beams C C' is journaled the winding-shaft M, upon which are keyed the winding-drums N in suitable numbers. The winding-shaft M is by preference extended to some distance beyond the arm or beam C' to bring it more directly over the mechanism by which motion is imparted to this shaft, and the outer end of this shaft M is preferably journaled in a bracket-arm c² projecting from the arm or beam C'. Upon the outer end of the winding-shaft M is fixed a sprocket-wheel m, that is connected by a sprocket-chain O with a sprocket-wheel o, keyed to the shaft P. Upon the shaft P, which is journaled in the standards A³ and A⁴ and in line with, although not connected to the shaft B', is keyed the gear-wheel R, that engages with a gear-wheel R' upon the short shaft r, that engages with a pinion s upon the crank-shaft of the engines S S'. The shaft r is sustained by the standards A³ and A⁴ in line with the shaft D, although not connected thereto. I prefer to employ two engines S S' (see Fig. 3) for effecting the movement of the winding-shaft M and drums N, as by so doing the necessity of complicated clutch-and-gear mechanism is avoided, although I do not regard the employment of such engines as any part of my present invention, since the movement of the apparatus may be effected from any suitable source of power and by convenient means. Each of the winding-drums N carries a chain or cable N', and is furnished at its end with a suitable grapple N².

From the foregoing description the operation of my improved apparatus in the hoisting of railway-rails will be seen to be as follows, it being assumed that the apparatus is mounted upon the deck of a vessel, as shown in Fig. 1

of the drawings, and the rails to be handled are upon a railway-car on the dock: The grapples N^2 of the several winding chains or cables N' having been placed about the bunch of rails to be lifted, the operator will start the engines $S S'$, so as to impart rotation to the gear-wheels $R R'$ and the shaft P , and from this shaft, through the medium of the sprocket-chain o and sprocket-wheels, to the winding-shaft M and drums N . In this way the cables or chains N' will be wound upon the drums until the bunch of rails is raised by the grapples to the position illustrated in Fig. 1 of the drawings. The operator, having stopped the engines $S S'$, will next start the engines $H H'$, causing these engines, through the gear-mechanism above described, to impart rotation to the shaft D and by means of the pinions $d d'$ to the segment-racks $c c'$ of the arms or beams to swing upward, backward, and downward until they assume the position seen by dotted lines in Fig. 1. The engines $H H'$ will then be stopped and the engines $S S'$ again started to permit the unwinding of the drums $N N'$, so as to lower the bunch of rails into the hold of the vessel. When the rails have thus been lowered, the engines $S S'$ will be stopped and the grapples $N N' N^2$ will be released and the engines $H H'$ will be started to return the arms or beams $C C'$ to position to lift the next succeeding bunch of rails. It is manifest that while the apparatus may be conveniently operated, still, if desired, the engines $H H'$ and $S S'$ may be operated conjointly, so that during the time that the arms or beams $C C'$ are being swung upward to lift the bunch of rails from off the car the engines $S S'$ may be operated to cause the unwinding of the cables, it simply being necessary that the bunch of rails shall be suspended a sufficient distance to permit the rails to clear the deck of the vessel and pass freely into the hatchway. The engines $H H'$ may be of any suitable type that can be readily started, stopped, and reversed, and are controlled by suitable valves T , manipulated by rods t , extending into convenient reach of the operator. My purpose in employing three winding-drums N , as I prefer to do when the apparatus is employed for loading and unloading railway-rails, is to permit the bunches of rails to be set in tiers or layers extending at right angles to each other, and it is obvious that by releasing the end grapples and sustaining the rails by the central grapple they can be readily swung around to a position at right angles to the winding-shaft M .

While I have described what I regard as the preferred embodiment of my invention, I do not wish the invention to be understood as restricted to the precise details of construction above set out. Thus it is obvious that instead of two arms or beams $C C'$ being employed a greater number of arms might be used, the length of the shaft M and the number of winding-drums N being correspondingly increased. So, also, without de-

parting from the spirit of my invention a single arm C' might be used, the upper part of this arm being provided with a short winding-shaft furnished with a single winding-drum—that is to say, the winding-shaft M would in such case project beyond the arm or beam C' only a sufficient distance to carry the single winding-drum. In the preferred form of the invention, however, and particularly when it is designed to be employed for the loading and unloading of railway-rails, a number of winding-drums will be employed mounted upon a shaft sustained by the beams or arms $C C'$. This employment of a series of winding-drums upon a single shaft is particularly advantageous in that it insures the uniform motion of the drums and the accurate raising and lowering of the rails.

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

1. A hoisting apparatus comprising an arm or beam provided at its lower end with a segment rack-bar and at its outer end with a winding shaft and drum, suitable gear mechanism for imparting a swinging movement to said arm or beam, and suitable gear mechanism for imparting revolution to said winding-shaft at the outer end of said arm or beam, substantially as described.

2. A hoisting apparatus comprising suitable arms or beams pivoted at their lower ends and having a winding-shaft at their outer ends, a suitable drum upon said winding-shaft, mechanism for imparting a swinging movement to said beams or arms, and mechanism for driving said winding-shaft at the outer ends of said beams or arms, substantially as described.

3. A hoisting apparatus comprising suitable arms or beams $C C'$, having segment-racks at their lower ends and having a winding-shaft at their outer ends, a suitable drum and cable upon said winding-shaft, mechanism for imparting a swinging movement to said beams or arms $C C'$, and mechanism for imparting a revolution to said winding-shaft at the outer end of said beams or arms, substantially as described.

4. A hoisting apparatus comprising suitable arms or beams $C C'$, having segment rack-bars at their lower ends, a shaft D , provided with pinions $d d'$ to engage with said segment rack-bars, suitable mechanism for imparting rotation to said shaft D , a winding-shaft M , extending between and journaled in the outer ends of said arms or beams $C C'$, gear mechanism for imparting revolution to said shaft M , and means for driving said gear mechanism independently of said mechanism, whereby the swinging of said arms $C C'$ is effected, substantially as described.

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