E. W. BURGESS.

SHOCK HOIST.

APPLICATION FILED NOV. 25, 1916.

1,345,069.

Patented June 29, 1920.

4 SHEETS—SHEET 1.

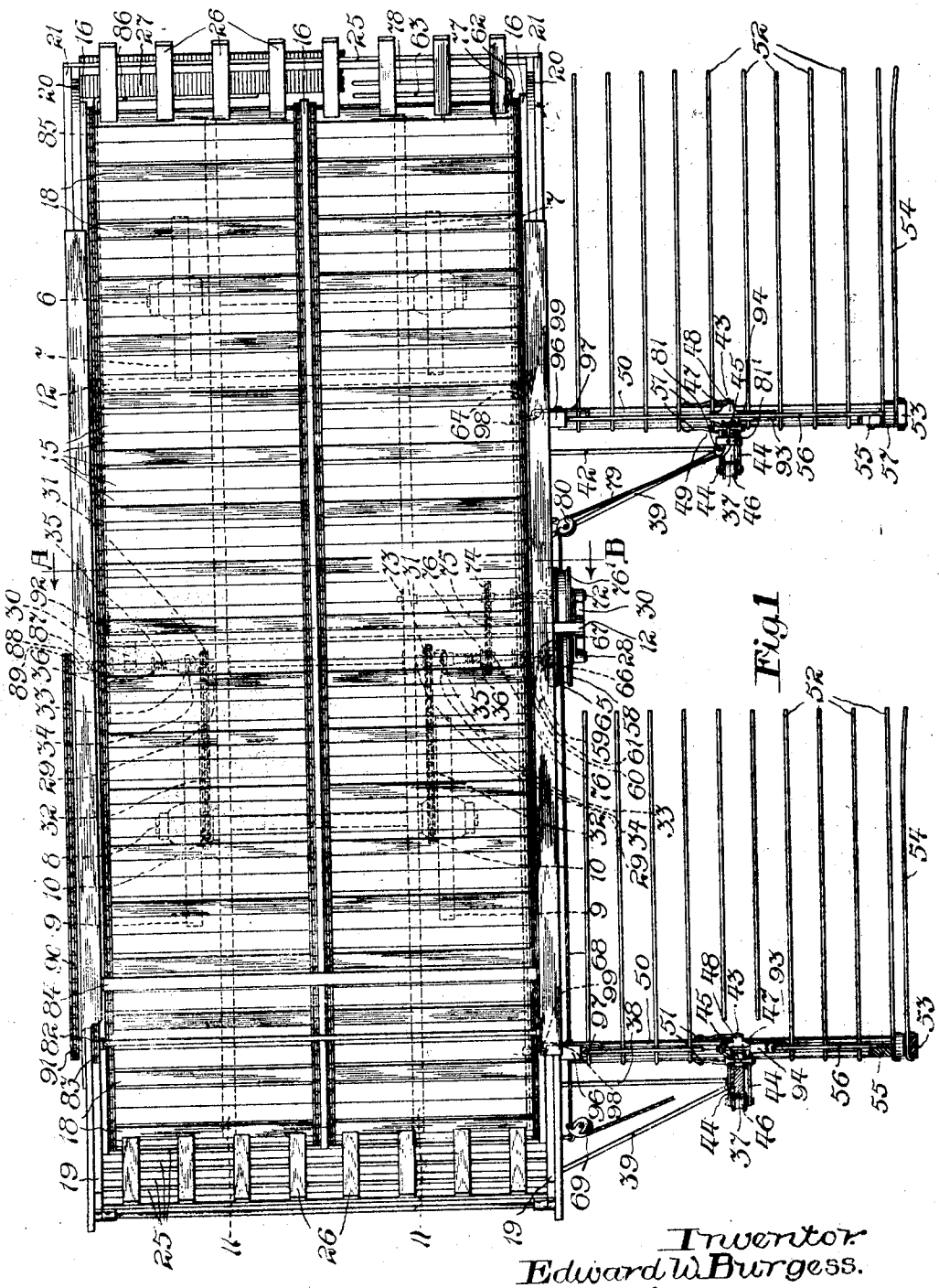


Fig. 1

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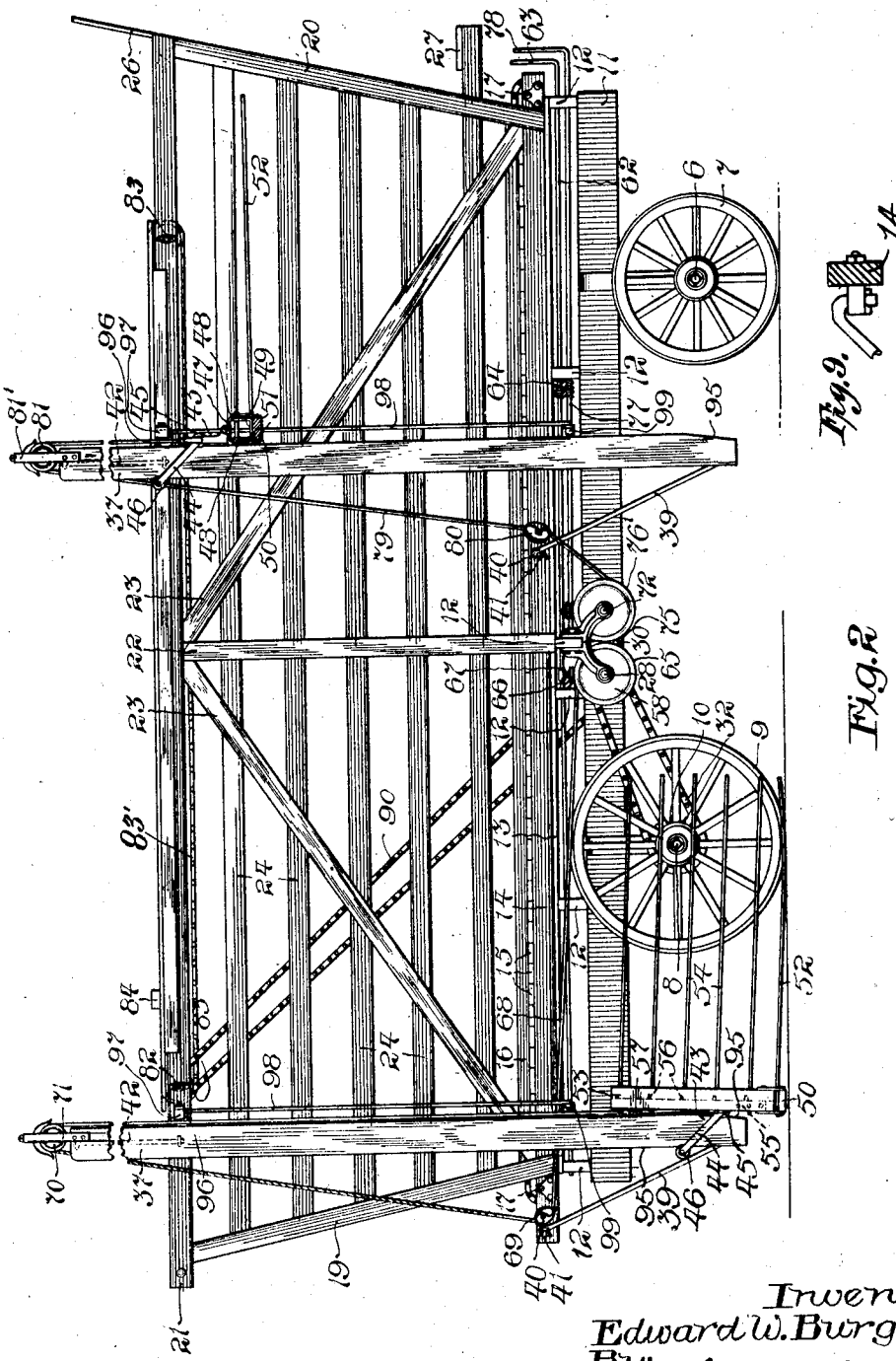


Fig. 2

Fig. 3

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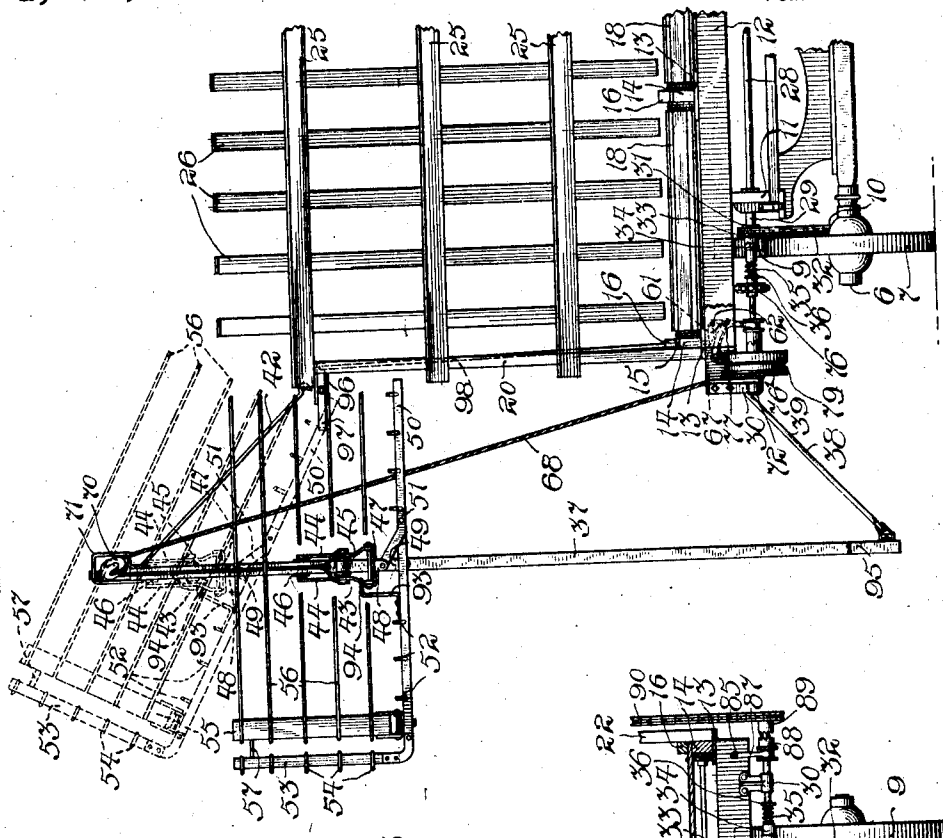


Fig. 3

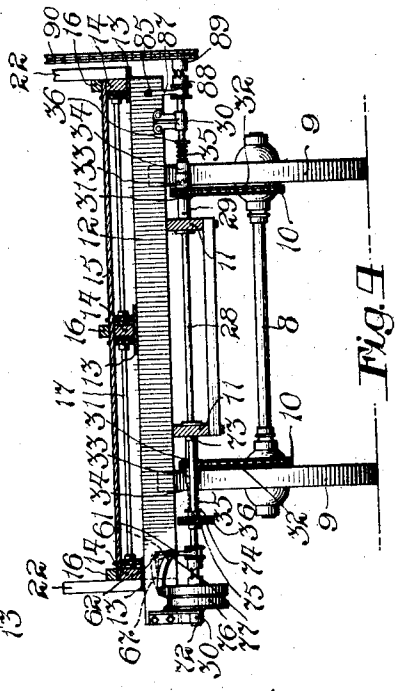


Fig. 4

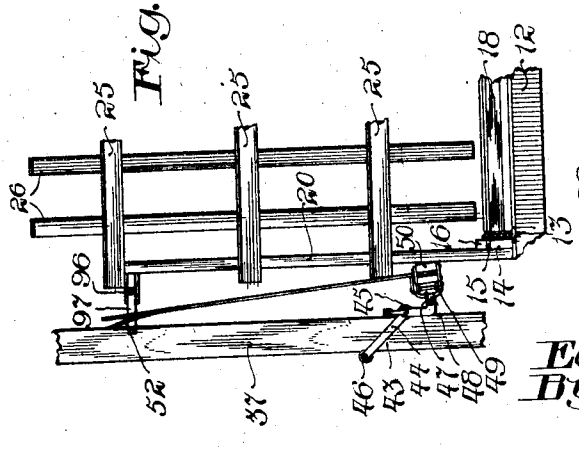


Fig. 5

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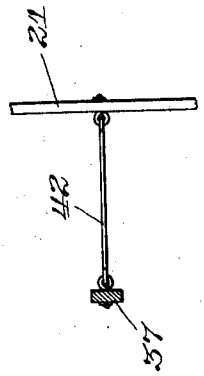


Fig. 7.

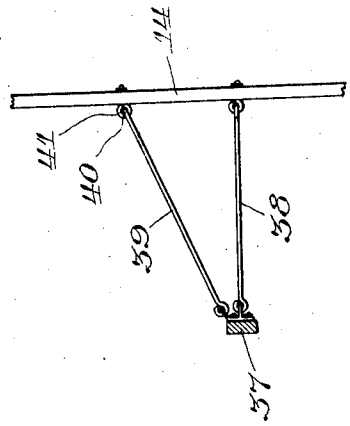


Fig. 8.

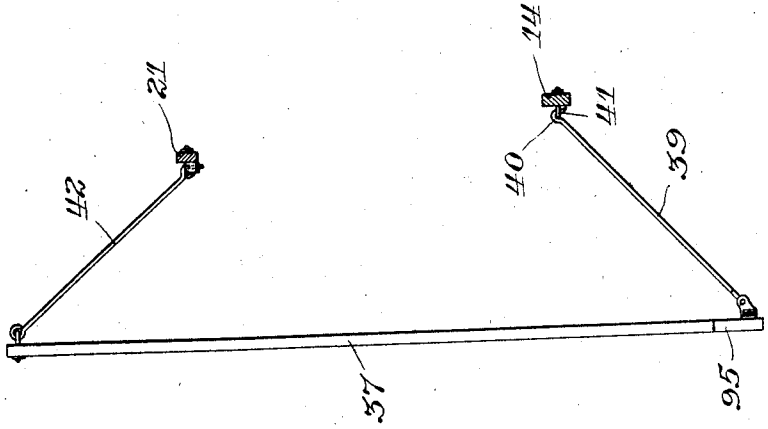


Fig. 6.

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UNITED STATES PATENT OFFICE.

EDWARD W. BURGESS, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO INTERNATIONAL HARVESTER COMPANY, A CORPORATION OF NEW JERSEY.

SHOCK-HOIST.

1,345,069. Specification of Letters Patent. Patented June 29, 1920.

Application filed November 25, 1916. Serial No. 133,408.

To all whom it may concern:

Be it known that I, EDWARD W. BURGESS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Shock-Hoists, of which the following is a full, clear, and exact specification.

My invention relates to shock hoists adapted to be propelled along the side of a wagon and load receiving rack and operative to engage shocks of bound grain, cocks of loose hay or grain, or hay or grain from a windrow or swath and hoist and dump it into the rack while the wagon is drawn continuously over the field.

The object of the invention is to provide a duplex hoisting mechanism including a plurality of load receiving and hoisting forks carried by the rack and operatively connected with the running gear of the wagon, and controllable in a manner whereby they may be operated alternately upon a windrow or upon shocks spaced at short distances, and to provide means whereby the fork supporting masts may be detachably connected with the rack and permitted a swinging movement outward to an operative or inward to a folded position along the side of the rack when the rack has received a load.

These objects are attained by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a top plan view of a wagon and load receiving rack having two shock hoists detachably connected therewith and embodying my invention;

Fig. 2 is a side elevation of Fig. 1;

Fig. 3 is an end elevation of part of Fig. 2;

Fig. 4 is a vertical cross section of part of Fig. 1 along line A—B;

Fig. 5 is a detached detail part of the mechanism designed to show the manner of folding the hoisting forks and their supporting masts against the side of the rack;

Fig. 6 is a detail sectional side view with the inclined bar and part of its bracket omitted for the purpose of clearness.

The same reference characters designate like parts throughout the several views.

The wagon includes a front axle 6 having carrying wheels 7 mounted upon its opposite ends, a rear axle 8 having carrying wheels 9 journaled thereon and to which are secured sprocket wheels 10.

The load receiving rack includes longitudinally disposed bed frame members 11, and carried thereby are a series of transversely disposed frame members 12 spaced apart in the direction of the rack and having longitudinally disposed carrier supporting members 13 secured thereto and to which are secured longitudinally disposed floor supporting members 14 carrying transversely disposed floor boards 15, having carrier guides 16 secured thereto. Transversely disposed shafts 17 are journaled in opposite ends of the side frame members 14 and have endless load discharging carriers 18 operatively connected therewith.

The side walls of the rack include upwardly and rearwardly inclined frame members 19 having their lower ends secured to the rear ends of the side frame members 14, forwardly and upwardly inclined frame members 20 having their lower ends secured to the front ends of the side frame members 14, longitudinally disposed rails 21 upon opposite sides of the rack having their opposite ends secured to the upper ends of the frame members 19 and 20, vertically disposed frame members 22 at the middle of the rack and at opposite sides thereof, diagonally disposed members 23 extending from the lower ends of the frame members 19 and 20 to the upper ends of the frame members 22, and spaced wall members 24 secured to the frame members 19, 20 and 22.

The end walls include transverse members 25 having vertically disposed spaced wall members 26 secured thereto, and 27 represents an operator's seat carried by the front end of the rack.

28 represents a transversely disposed shaft having its body portion journaled in bearing boxes 29 secured to the bed frame members 11 of the rack and its opposite ends in bearing brackets 30 secured to opposite ends of an adjacent transverse rack frame member 12. Journaled upon the shaft are sprocket wheels 31 that are operatively connected by means of chains 32 with the sprocket wheels 10 secured to the wagon wheels 9. The hubs of the sprocket wheels 31 are provided with angular clutch teeth 33 that normally engage with corresponding teeth upon the adjacent ends of sleeve

members 34 splined upon the shaft and yieldingly pressed toward the sprocket wheel by means of compression springs 35 encircling the shaft and reacting between washers and pins 36 in a manner to cause the shaft to rotate with the wheels 10 when the wagon is advancing and permitting a rearward rotation of the wheels independent of the shaft, the associated parts having the function of backing ratchets.

The shock hoists include vertically disposed masts 37 having their lower ends pivotally connected for horizontal movement with the side of the rack by means of upwardly inclined bars 38, and rearwardly and upwardly inclined links 39 having their lower ends pivotally connected with the lower ends of the masts and their upper ends provided with hooks 40 adapted to detachably engage with eye members 41 carried by the side frame member 14 of the rack. The upper ends of the masts are connected with the upper side rail of the rack by means of downwardly inclined links 42.

43 represents a fork carrying carriage adapted to travel upon the mast and including side frame members 44 upon opposite sides of the mast and having rollers 45 and 46 journaled between them that are adapted to travel upon the front and rear edges of the mast, respectively, as the carriage is raised or lowered.

The frame members 44 extend downward from the axis of the roller 45 and are turned forward at their lower ends, and pivotally connected therewith upon a tranverse axis is a bracket member 47 having depending ear members 48 upon its front and rear sides whereby it is pivotally connected on a longitudinal axis with a yoke member 49 secured to a fork head 50 intermediate its ends, the connection being reinforced by means of strap members 51 secured to opposite sides of the fork head. Secured to the fork head are forwardly extending horizontally disposed tines 52. 53 represents a vertically disposed bar having its lower end hingedly connected with the outer end of the fork head in a manner permitting it to be folded inward and downward upon the head, and 54 represents spaced guard fingers carried by the bar and extending forward at the outside of the fork. 55 represents a supplemental vertically disposed bar carrying spaced guard fingers 56 extending toward the rack, and having its lower end hingedly connected with the fork head in a manner permitting it to be folded forward and downward upon the fork tines, and 57 represents a locking hook adapted to retain the bars and fingers in an operative position.

The fork hoisting mechanism includes a winding drum 58 journaled upon one end of the shaft 28 and provided with clutch elements 59 upon its hub adapted to engage with corresponding clutch elements carried by a slidable sleeve 60 splined upon the shaft 28 and controlled by means of a clutch shipping fork 61 secured to the rear end of a longitudinally disposed rock shaft 62 journaled in the transverse rack frame member 12 and provided at its front end with an inwardly extending arm 63 convenient to the foot of an operator in the seat 27. A torsional spring 64 encircles the shaft and reacts between the adjacent rack frame member 12 and the shaft in a manner to normally hold the clutch members disengaged.

The winding drum 58 is provided with a friction rim 65 adapted to be engaged by a brake shoe 66 carried by the free end of an arm 67 preferably integral with the clutch shipping fork 61 and operable to prevent rotation of the winding drum when the clutch elements are disengaged. The winding drum 58 is connected with the carriage 43 by means of a cable 68, having one end secured to the drum, and leading rearward therefrom is passed over a sheave 69 flexibly connected with the rear end of rack frame member 14, and then upward and over a sheave 70 freely suspended within a yoke 71 carried by the upper end of the mast, and then downward and having its opposite end connected with the carriage 43.

The hoisting mechanism for the forward fork includes a supplemental transversely disposed shaft 72 having its inner end journaled in a bearing box 73 secured to one of the bed frame members 11 of the rack and its opposite end in a bearing member carried by one of the brackets 30. Secured to the supplemental shaft is a sprocket wheel 74 whereby it is operatively connected by means of a chain 75 with a sprocket wheel 76 secured to the shaft 28. Journaled upon the shaft 72 is a winding drum 76^1 corresponding in form with the drum 58 and having like clutch elements adapted to connect it rotatably with the shaft 72, and 77 represents a clutch controlling rock shaft journaled upon the rack bed parallel with the rock shaft 62 and provided with a clutch shipping fork and spring controlled brake arm like those carried by the shaft 62, and an arm 78 at its front end whereby it may be manipulated by the operator. 79 represents a hoisting cable having one end connected with the drum 76 and then leads over a sheave 80 flexibly connected with the rack bed, and then upward and over a sheave 81 freely suspended in a yoke 81^1 secured to the upper end of the fork carrying mast and then downward and connected with a fork carriage 43.

82 represents a transversely disposed shaft journaled in bearings carried by the rear ends of the side rails 21 of the rack, and secured to opposite ends thereof are sprocket wheels 83 that engage with endless carrier

chains 83[1] running along the side rails and carrying a load distributing bar 84 movable along the upper side of the rack from end to end thereof and having its movement controlled by the operator by means including a longitudinally disposed rock shaft 85 journaled in the rack frame members 12 and having an inwardly extending arm 86 at its front end whereby it may be manipulated by the foot of an operator from the seat 27. See Figs. 1 and 2. Secured to the opposite end of the shaft is a clutch shipping fork 87 engaging with a clutch sleeve 88 splined upon the shaft 28 and adapted to be moved into engagement with a sprocket wheel 89 journaled upon the shaft and operatively connected by means of a sprocket chain 90 with a sprocket wheel 91 secured to the extended end of the shaft 82. The rock shaft 85 is normally turned in a direction to disengage the clutch mechanism by means of a torsional spring 92 encircling the shaft and reactive between the adjacent rack frame member 12 and the shaft.

In operation the shock receiving and hoisting forks are normally held suspended at any desired position upon the masts by means of the brake mechanism connected with the hoisting drums and actuated by the springs 64, and as the wagon advances and the fork approaches a shock the operator will press down upon one of the arms 63, 78 sufficient to release the brake mechanism but not enough to cause engagement of the clutch mechanism connecting the power shafts 28 or 72 with their respective winding drums. The fork will descend by gravity to the ground and pass under the shock, its pivotal connection with the carriage 43 permitting it to follow the surface of the ground both laterally and longitudinally. When a shock has been received by the fork the operator presses downward upon the respective arm 63 or 78, causing an engagement of the respective clutch mechanism and the load is hoisted along the mast. 93 represents a bracket member secured to the fork head 50 and provided with a laterally turned arm 94 at its upper end adapted to engage with the lower forwardly turned ends of the carriage members 44 in a manner permitting the fork to tilt downward during the initial part of its hoisting movement, and during the same movement the fork is tilted rearward as the carriage travels up the rearwardly inclined edge 95 at the lower end of the mast, whereby the load is tilted against the guard fingers 54 and 56 as the fork is being hoisted to a load discharging position. When the fork approaches a load discharging position the inner end of the head 50 engages with a block 96 secured to the upper part of the side of the rack and the carriage 43 continuing to ascend, the fork is turned about its longitudinal axis to a load dumping position, as shown in dotted lines in Fig. 3 of the drawings. When the fork approaches the limit of its load dumping movement the head 50 engages with the outer end of a laterally extending lever 97 pivotally connected intermediate its ends with the block 96 and having its opposite end pivotally connected with the upper end of a rod 98, the lower end of the rod being pivotally connected with the free end of an arm 99 secured to the respective rock shaft 62 or 77. When the clutch is disengaged the brake is automatically applied to the drum and the fork is retained in an elevated position until the operator manipulates the rock shaft to release the brake and permit the fork to descend. When the rack has received a load the forks may be folded upward against the masts 37 and then the hooks 40 are disengaged from the eyes 41 and the masts and forks turned against the side of the rack. If desired, suitable additional eyes may be provided on the rack to coöperate with the links 39 and hooks 40 and hold the masts in folded position. In Fig. 5 the fork is shown as folded upwardly about the pivot on the bracket member 47, and the mast is shown as folded inwardly against the rack. For the sake of clearness the vertical bars 53 and 55 and the tines 54 and 56 are not shown in this view. It will be understood, however, that when the fork is to be folded the bar 55 with its tines 56 is folded forwardly and downwardly on the normally horizontal bar 50, and the vertical bar 53 and its tines 54 are folded downwardly and inwardly on this bar 50. After these bars have been so folded the fork is folded upwardly about its horizontal pivot, the hook 40 is disengaged from the eye 41 and the mast is swung on the links 38 and 42 to a folded position against the side of rack.

When the shocks of bound grain or cocks of hay or loose grain are too close together to permit an efficient operation of a single hoist, the two hoists may be operated alternately and operating in that manner may deliver hay or grain from a window.

Having shown and described one form that my invention may assume in practice, I do not wish that it be confined to the precise details of the structure as illustrated, it being understood that changes may be made in the form, proportion and organization of its various elements without departing from the spirit of the invention as indicated by the scope of the appended claims.

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

1. In combination, a wagon and a load receiving rack carried thereon, a vertically disposed mast foldably supported upon said

rack, a shock carrying fork adapted to travel along said mast, and means for hoisting said fork vertically on said mast.

2. In combination, a wagon and a load receiving rack carried thereon, a vertically disposed mast connected with the side of said rack in a manner permitting it to be turned bodily toward or from said rack, a shock carrying fork adapted to travel along said mast, and means for hoisting said fork.

3. Shock hoisting mechanism including a frame, a plurality of shock engaging and hoisting forks carried thereby and disposed one behind the other with respect to the line of draft, each of said forks being provided with forwardly directed tines, means for independently hoisting said forks from a common source of power from shock receiving to shock discharging position whereby said forks may be operated independently, and means automatically operable when said forks have reached discharging position for retaining said forks in discharging position until they are released.

4. Shock hoisting mechanism including a frame, a plurality of shock engaging and hoisting forks carried thereby, each of said forks having forwardly extending tines thereon, said forks being arranged one behind the other, hoisting means for each of said forks and including a hoisting drum, operative connections between said source of power and said drums including clutch mechanism, individual clutch controlling means for each of said drums, individual braking mechanism for each of said drums, and means carried by said frame and located in the path of said forks for operating said clutch controlling means and said braking mechanisms.

5. In combination, a receptacle, a substantially vertically disposed mast, link connections between said mast and said receptacle, and a shock carrying fork carried by said mast.

6. In combination, a receptacle, a substantially vertically disposed mast disposed at one side thereof, foldable connections between said mast and said receptacle, a shock receiving fork carried by said mast, and means for operating said fork.

7. In combination, a receptacle, a substantially vertically disposed mast disposed at one side thereof, foldable connections between said mast and said receptacle, a fork carried by said mast having substantially horizontally disposed tines, vertically disposed tines pivotally mounted at the rear of said fork and foldable thereon, and means for operating said fork.

8. In combination, a receptacle, a substantially vertically disposed mast carried thereby at one side thereof, foldable connections between said mast and said receptacle, a bracket slidably mounted on said mast, a shock receiving fork pivoted to said bracket, and means for hoisting said fork on said mast.

9. In combination, a receptacle, a substantially vertically disposed mast located at one side thereof, foldable connections between said mast and said receptacle, a bracket carried by said mast, a shock receiving fork pivoted to said bracket and having substantially horizontally disposed tines, a substantially vertically disposed end wall pivoted to said fork at the rear side thereof, a substantially vertically disposed side wall pivoted to said fork at the side opposite said receptacle, and means for hoisting said fork.

In testimony whereof I affix my signature.

EDWARD W. BURGESS.