Nov. 21, 1950 H. R. WATSON 2,530,496

HAY STACKER AND LOADER

Filed Sept. 20, 1946 2 Sheets-Sheet 1

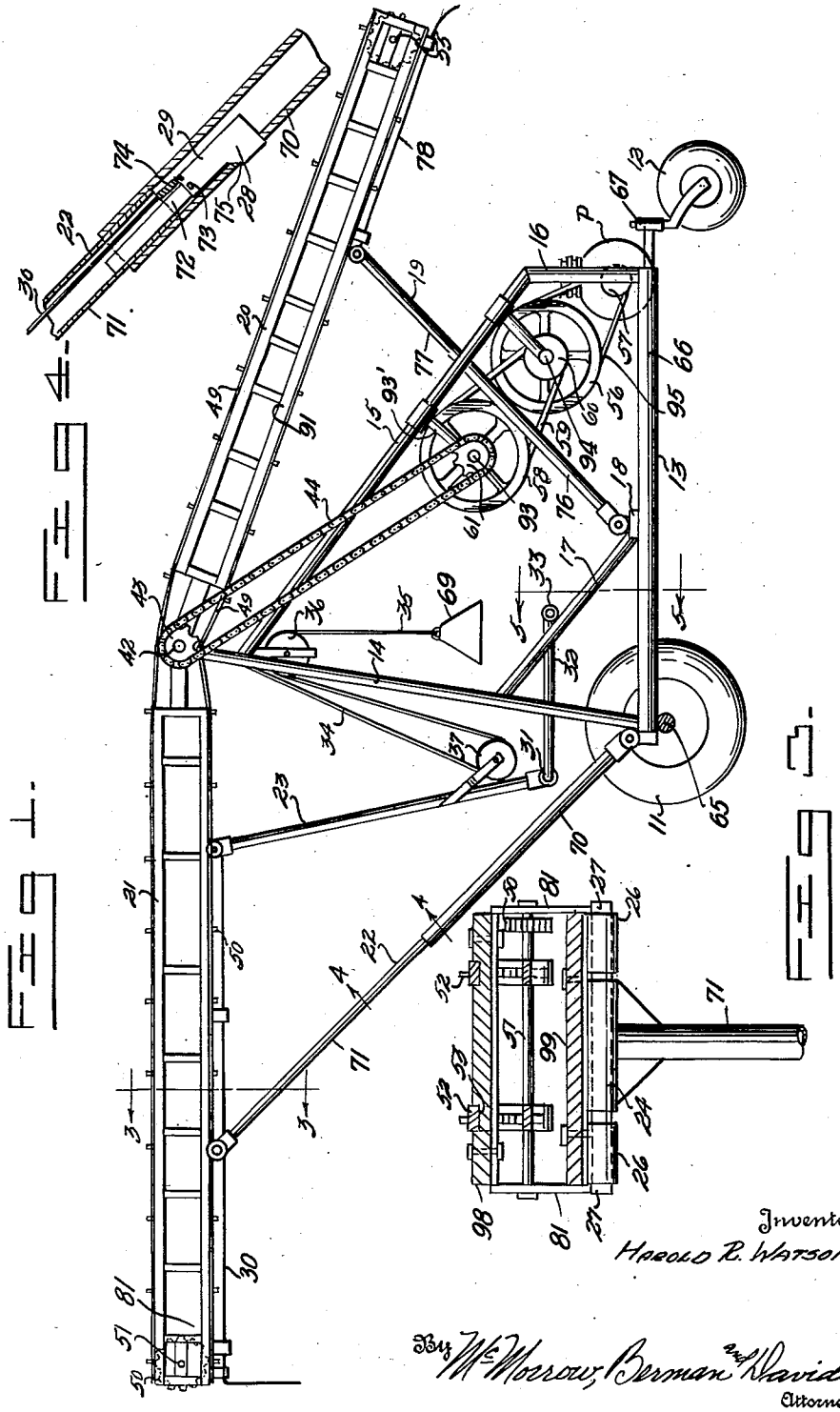


Fig. 1.

Fig. 4.

Fig. 5.

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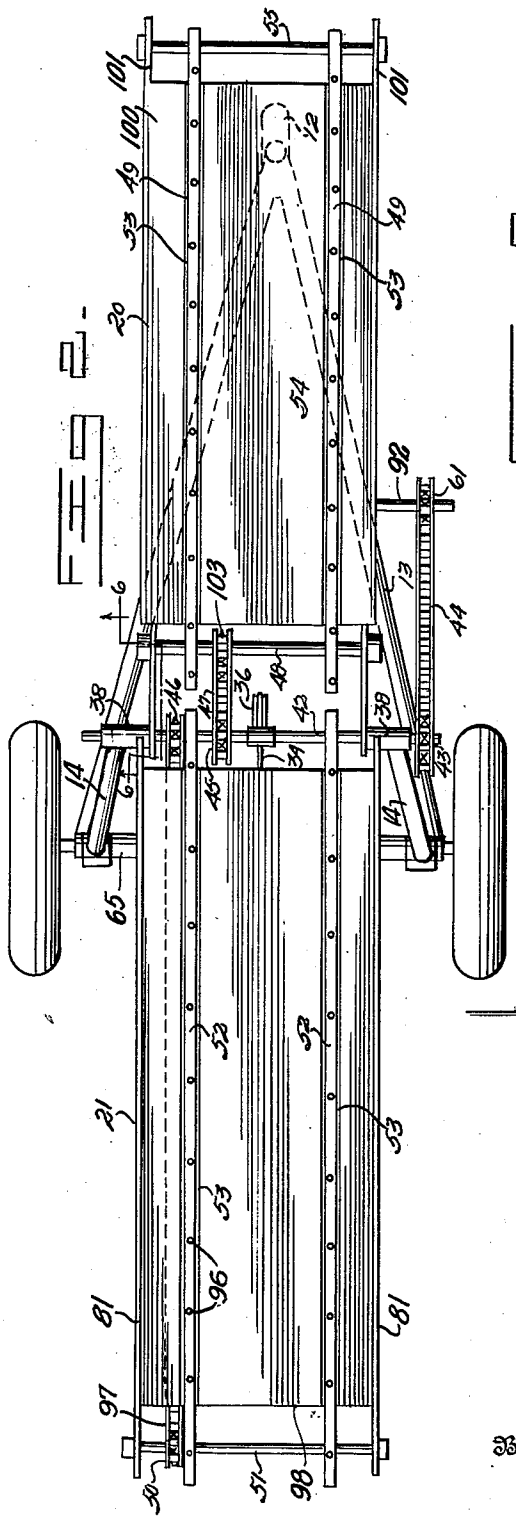


FIG. 2.

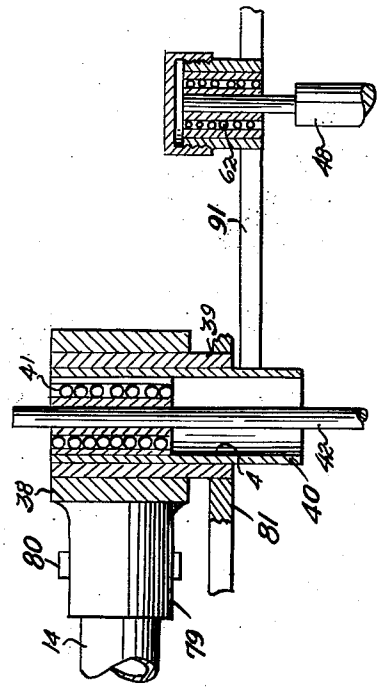


FIG. 6.

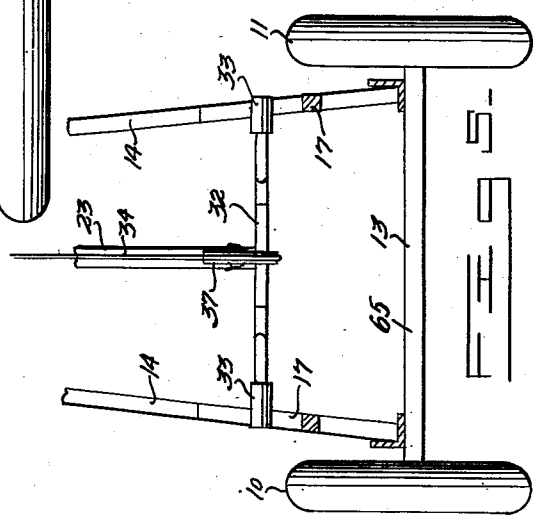


FIG. 5.

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UNITED STATES PATENT OFFICE

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HAY STACKER AND LOADER

Harold R. Watson, Victorville, Calif.

Application September 20, 1946, Serial No. 698,295

3 Claims. (Cl. 198—91)

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The present invention relates to powered stackers and is more particularly concerned with a machine for stacking baled hay and sacks of grain or other commodities.

The primary object of the invention is to provide a device of the character referred to which is adapted to the stacking of baled hay in high stacks or high up in barns and for loading trucks.

Another object of the invention is to provide a device of the character referred to which is also adapted to the handling of sacks of grain and other commodities, either to place them in high piles or store them high up in barns and to load them on trucks.

A further object of the invention is to provide a device of the character referred to of simpler and more durable construction than prior devices.

With the foregoing and other objects and advantages in view the invention consists of the novel construction, arrangement and combination of parts hereinafer described and claimed.

In the accompanying drawings illustrating the invention:

Figure 1 is a side elevation of the machine,

Figure 2 is a top plan view thereof,

Figure 3 is a section on line 3—3 of Figure 1,

Figure 4 is a longitudinal cross-section on an enlarged scale of a fragmentary part of an expansible supporting strut showing a strut-latching mechanism.

Figure 5 is a vertical transverse section on line 5—5 of Figure 1, and

Figure 6 is an enlarged horizontal section on line 6—6 of Figure 2.

Like numerals, as used in the description and drawings, designate the same parts of construction.

The machine is supported on three rubber-tire wheels, one of which is caster type. These wheels 10, 11 and 12 are mounted on a triangular chassis 13. Mounted on said chassis is the main frame of the machine which frame includes a rear axle 65 upon which the rear wheels 10 and 11 are journaled and side members 66 secured at their rear ends to axle 65 adjacent the ends of the latter and converging forwardly to a connection with a caster wheel yoke 67. It consists of two vertical and suitably spaced standards 14 extending upwardly from the rear axle 65, one near each end of the latter to support the two conveyor units 20 and 21. These standards are braced adjacent their upper ends by a cross truss, not illustrated.

Two substantially parallel bracing bars 15 are connected at their rearward, upper ends, one to

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each standard 14 near the upper end of the corresponding standard and extend downwardly and forwardly to a vertically-disposed yoke 16 on the forward part of the frame.

Subsidiary, diagonal braces 17 extend on an incline from the frame side members 66 to the lower portions of the standards 14 and a footplate 18 is secured across the lower ends of these subsidiary braces. This footplate serves as a base for a telescopic strut 19 which is pivotally mounted in the center of the footplate at its lower end and is pivotally connected at its upper end to the underside of the conveyor unit 20.

The two conveyor units 20 and 21 are disposed in longitudinally-aligned, end-to-end relationship and are pivotally connected at their adjacent inner ends to the upper ends of the two frame standards 14. The conveyor unit 20 extends forwardly from the pivotal connection with the upper ends of the standards over the front caster wheel 12, while the unit 21 extends rearwardly from the pivotal connection.

A link 23 is pivotally connected at its upper end to the underside of conveyor unit 21 at a location spaced from the inner end of the latter and is pivotally secured at its lower end to the intermediate portion of a U-shaped lever 32, the ends of which are pivotally connected to respective subsidiary frame braces 17 by respective sleeves 33 secured on the braces intermediate the length of the latter and rotatably receiving the outwardly-turned ends of the U-shaped lever 32. A cable sheave 37 is secured to link 23 near the lower end of the latter and a cable 34 connected at one end to the standards 14 near the upper ends of the latter extends downwardly under sheave 37, upwardly over a sheave 36 supported by the standards, near their upper ends, and downwardly from sheave 36. A weight 69 is secured to the lower end of the cable to constitute, with the cable, the cable sheaves and the link 23 and lever 32 a counterbalance for the conveyor unit 21. The link 23 and lever 32 are disposed at an angle to each other and provide, in effect, a toggle assembly between the frame and the conveyor unit 21. The pull of the cable 34 on the elbow of this toggle assembly, occassioned by the suspended weight 69, tends to lift the outer end of the conveyor unit. The weight is not heavy enough to lift the unit, but lightens it to such an extent that it can be easily raised by an operator working at that end of the conveyor. The conveyor unit is supported with its free end at any desired elevation by a telescopic strut 22. This strut 22 comprises a tube 70 piv-

otally connected at its lower end to the rear axle 65 and having longitudinally-aligned apertures 28, and a rod 71 pivotally connected to the underside of conveyor unit 21 at a location outward of the connection between the conveyor unit and link 23, and slidably received in tube 70. A cylindrical plug 72 is secured in the inner end of tubular rod 71 within tube 70 and is medially slotted longitudinally to receive a latch 29. This latch is a flat, substantially rectangular plate having at one corner a dog engageable in the apertures 28 of tube 70 and near an opposite corner is provided with an aperture receiving a pin 73 pivotally connecting the latch to plug 72. A compression spring 74 disposed between the plug and one corner of the latch resiliently urges the latch to a position in which the latch dog engages in a selected aperture 28. A cord or strand 30 is connected at one end to the latch and extends through the tubular rod 71, out of the upper end of the rod and along the conveyor unit 21 to the free end of the latter where the cord is readily accessible to an operator at the free end of the elevator unit so that the operator can release the latch dog from the aperture in tube 70 in which the dog is engaged in order to lower the free end of the conveyor unit. The dog is preferably provided on its upper end with an inclined surface 75 so that it will pull out of the corresponding aperture without use of the cord when the free end of the conveyor unit is lifted.

The telescopic strut 19 supporting the conveyor unit 20 is pivotally connected at its lower end to footplate 18 and at its upper end to the underside of the conveyor unit 20 at a location spaced from the pivotal connection of the inner end of this conveyor unit with the upper ends of standards 14. The construction of strut 19 is the same as that of strut 22, described above, and strut 19 comprises a lower tube 76 provided with spaced-apart apertures, an upper tubular rod 77 telescopically received in tube 76, a latch assembly, as illustrated in Figure 4, on the inner end of the rod, and a cord 78 secured to the latch and extending out of the rod 77 and along the conveyor unit 20 to the free end of the latter.

A pair of tubular sleeves or bushings 38 is mounted, one on the upper end of each standard 14, by respective tubular sockets 79, each connected at one end to the respective sleeve and receiving the upper end of the corresponding standard to which it is attached by a through pin 80.

The conveyor unit 21 has a pair of substantially parallel frame side members 81 of flat, rectangular cross-section, provided in corresponding ends with respective, enlarged apertures. A pair of bearing sleeves 39 projects, one into each end frame-member aperture, and is rigidly secured to the frame member. These bearing sleeves project laterally outwardly from the corresponding side-frame members and are rotatably received in respective outer sleeves 38.

The conveyor unit 20 has substantially parallel side-frame members 91 provided at corresponding ends with respective enlarged apertures and a pair of inner bearing sleeves 40 extends, one into each of the side-frame members 91 and is rigidly secured thereto. Each inner sleeve 40 is rotatably received in a respective intermediate sleeve 39 and the two pair of bearing sleeves 39 and 40 pivotally inter-connect the inner or adjacent ends of the two conveyor units and pivotally support the ends of the conveyor units on the upper ends of the standards 14 for vertical swinging movement of the two conveyor units about a common axis.

A drive shaft 42 extends concentrically through the inner bearing sleeves 40 and is journaled therein by respective ball bearings 41. This shaft has two spaced-apart conveyor belt pulleys thereon and three chain sprockets 43, 45 and 46. Sprocket 43 is secured on the shaft adjacent one end of the latter and is driven by a chain 44 from a sprocket 61 secured on a jack shaft 92 journaled in bearing brackets 93 secured to the main frame members 15. Jack shaft 93 carries a large belt pulley 58 driven by a belt 59 from a small belt pulley 60 secured on a second jack shaft 94. A large pulley 56 is secured on the second jack shaft and driven by a belt 95 from a small pulley 57 secured on the drive shaft of a suitable power unit, such as a gasoline engine or electric motor D.

The belt pulleys 57, 56, 60 and 58, the belts 95 and 59, the chain sprockets 61 and 43, and the chain 44 provide a speed-reducing power drive of large ratio between the power unit D and shaft 42.

A shaft 51 extends transversely through the outer end of conveyor unit 21 and is journaled in the side-frame members 89 near the outer ends of the latter. A pair of spaced-apart conveyor belt pulleys and a chain sprocket 50 are secured on shaft 51. A pair of parallel conveyor belts 52 extends around corresponding belt pulleys on shafts 42 and 51 and are provided with outwardly-projecting studs 53 for gripping articles, such as bales of hay or bags of grain, to be moved along the conveyor unit. Chain 97 connects sprockets 46 and 50 to drive shaft 51 from shaft 42 and thereby drive the conveyor belts from both ends of the conveyor unit.

An elongated, flat plate 98 is disposed between the side-frame members 81 with its longitudinal edges secured one to each frame side member to provide a supporting platform extending lengthwise of the conveyor unit. A lower plate, or suitable transverse members, 99 is secured between the frame side members below the plate 98 to reinforce the frame structure of the conveyor unit.

The upper end of rod 71 of strut 22 is secured to the underside of the conveyor unit 21 by a pair of aligned sleeves 26 secured to and depending from the under surface of lower plate 99, a sleeve 24 secured on the upper end of rod 71, and the pin 27 extending through sleeves 24 and 26, as particularly illustrated in Figure 3.

The upper end of link 23 is pivotally connected to the under surface of unit 21 and the upper end of strut 19 is pivotally connected to the under surface of unit 20 in a similar manner.

Conveyor unit 20 is similar in construction to unit 21 and includes a supporting platform plate 100.

A shaft 48 extends transversely of unit 20 near the inner end of the latter and is journaled in the side-frame members 91 of unit 20, and a second transverse shaft 55 is journaled in the side-frame members near the outer end of the unit. Corresponding, spaced-apart belt pulleys are secured on shafts 48 and 55 to carry the substantially parallel conveyor belts 49 of unit 20. A chain sprocket 103 is secured on shaft 48 and a chain 47 drivingly connects sprocket 45 on shaft 42 with sprocket 103 to drive shaft 48 and the conveyor belts 49.

As different embodiments may be made of this inventive concept and modifications may be

made in the embodiment hereinbefore shown and described, it will be understood that the matter herein is to be interpreted as illustrative merely and not in a limiting sense.

What I claim is:

1. Conveyor mechanism comprising a wheel-supported frame including a pair of spaced-apart, upwardly-extending standards, a pair of longitudinally-aligned conveyor units disposed in end-to-end relationship, means pivotally connecting the adjacent inner ends of said conveyor units to the upper ends of said standards, adjustable struts pivotally connected at their lower ends to said frame and at their upper ends, one to each conveyor unit to support said units with their free ends at desired elevations, movable conveyor belts in each of said conveyor units, a power unit mounted on said frame, and speed-reducing drive means connecting said power unit with said conveyor belts for driving the latter, each of said conveyor units comprising a pair of substantially parallel side-frame members, a platform plate extending between and having its longitudinal edges secured one to each of said side-frame members, a pair of transverse shafts journaled in said side-frame members, one near each end of said unit carrying the corresponding conveyor belt.

2. Conveyor mechanism comprising a wheel-supported frame including a pair of spaced-apart, upwardly-extending standards, a pair of longitudinally-aligned conveyor units disposed in end-to-end relationship, means pivotally connecting the adjacent inner ends of said conveyor units to the upper ends of said standards, adjustable struts pivotally connected at their lower ends to said frame and at their upper ends, one to each conveyor unit to support said units with their free ends at desired elevations, movable conveyor belts in each of said conveyor units, a power unit mounted on said frame, and speed-reducing drive means connecting said power unit with said conveyor belts for driving the latter, each of said conveyor units comprising a pair of substantially parallel side-frame members, and said means connecting said adjacent ends of said units to said standards comprising a pair of outer sleeves secured one to the upper end of each standard, a pair of intermediate sleeves secured one to each side-frame member of one conveyor unit and rotatably received in respective outer sleeves, and a pair of inner sleeves secured one to each side-frame member of the other conveyor unit and rotatably received in respective intermediate sleeves.

3. Conveyor mechanism comprising a wheel-supported frame including a pair of spaced-apart, upwardly-extending standards, a pair of longitudinally-aligned conveyor units disposed in end-to-end relationship, means pivotally connecting the adjacent inner ends of said conveyor units to the upper ends of said standards, adjustable struts pivotally connected at the lower ends to said frame and at their upper ends, one to each conveyor unit to support said units with their free ends at desired elevations, movable conveyor belts in each of said conveyor units, a power unit mounted on said frame, and speed-reducing drive means connecting said power unit with said conveyor belts for driving the latter, each of said conveyor units comprising a pair of substantially parallel side-frame members, and said means connecting said adjacent ends of said units to said standards comprising a pair of outer sleeves secured one to the upper end of each standard, a pair of intermediate sleeves secured one to each side-frame member of one conveyor unit and rotatably received in respective outer sleeves, and a pair of inner sleeves secured one to each side-frame member of the other conveyor unit and rotatably received in respective intermediate sleeves, and said drive means including a shaft extending through and journaled in said inner sleeves, and chain sprockets on said shaft for drivingly connecting said shaft with said power unit and with the conveyor belt of both conveyor units.

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