(No Model.) 3 Sheets—Sheet 1.

N. L. DARLING.

HARVESTER.

No. 458,335. Patented Aug. 25, 1891.

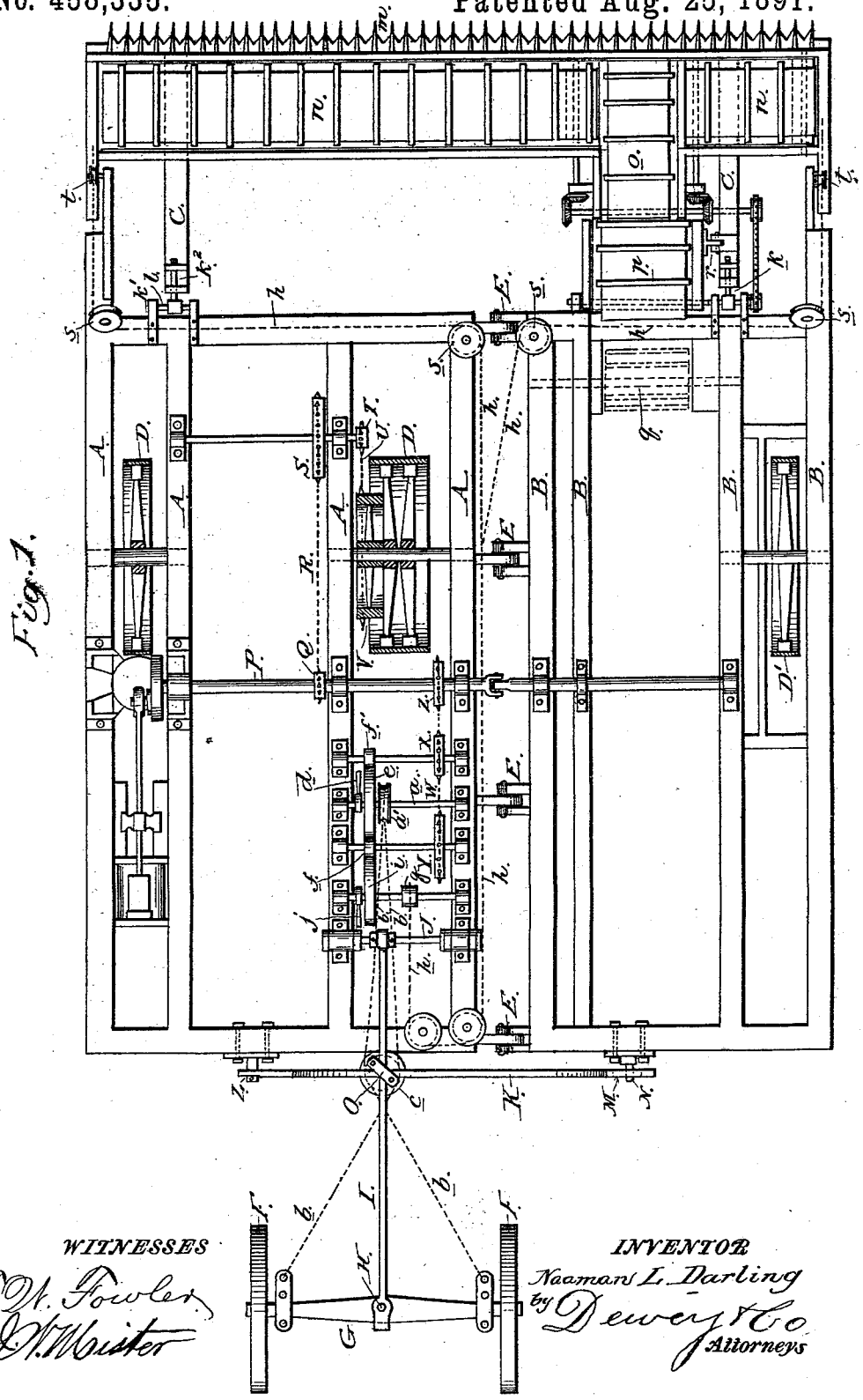

Fig. 1.

WITNESSES

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(No Model.) 3 Sheets—Sheet 2.

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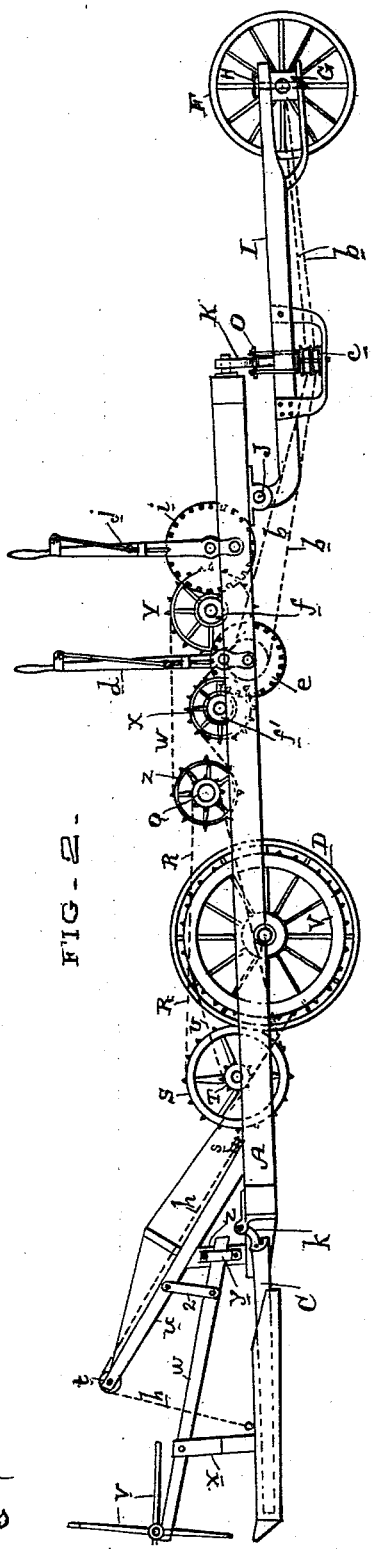

FIG - 2.

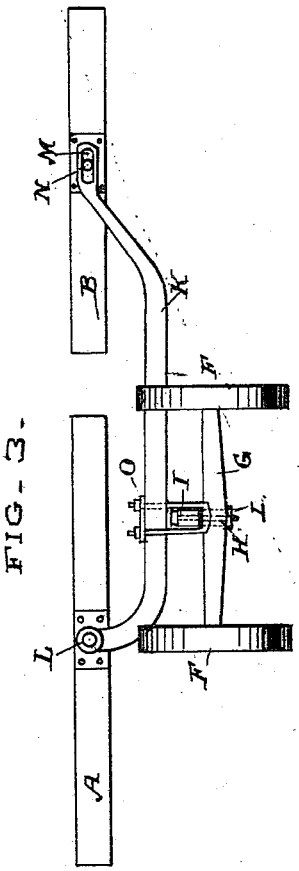

FIG - 3.

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(No Model.) 3 Sheets—Sheet 3.

N. L. DARLING.

HARVESTER.

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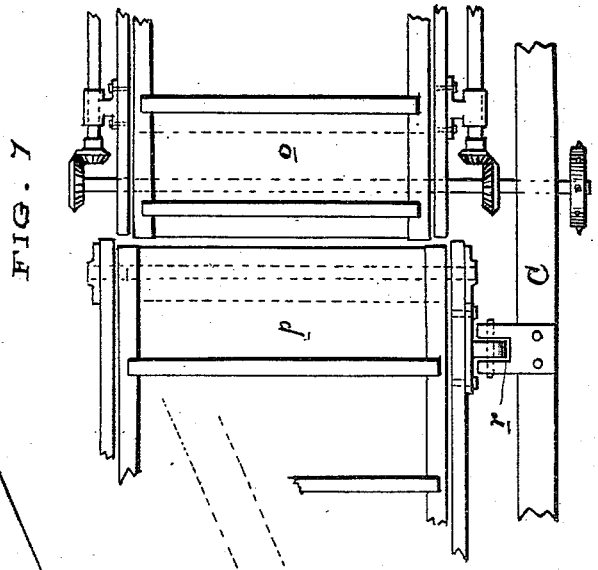

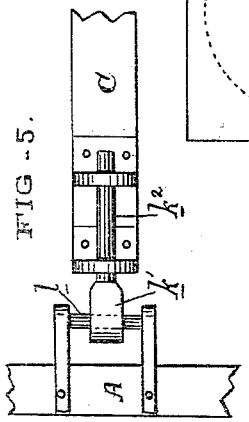

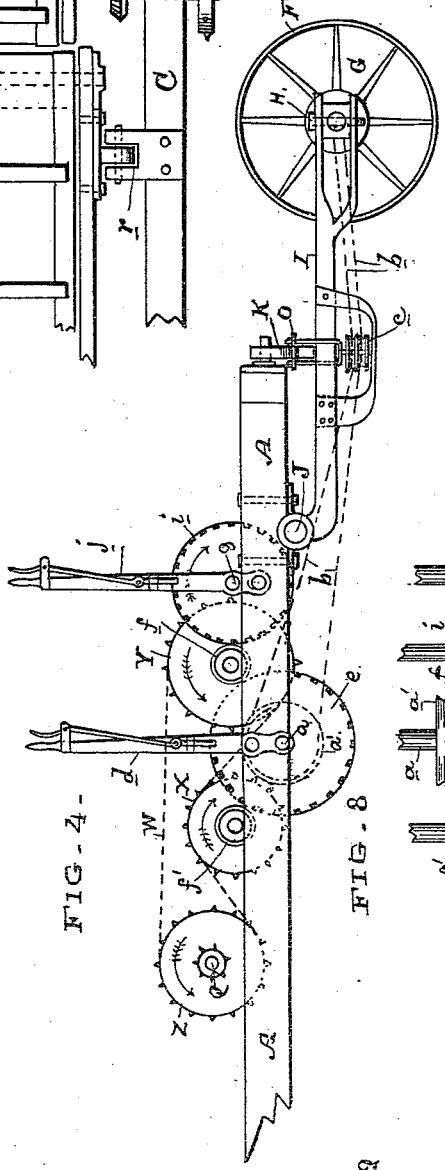

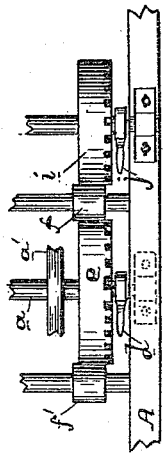

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UNITED STATES PATENT OFFICE.

NAAMAN L. DARLING, OF BENICIA, ASSIGNOR OF ONE-THIRD TO J. R. DIXON, OF LOS ANGELES, CALIFORNIA.

HARVESTER.

SPECIFICATION forming part of Letters Patent No. 458,335, dated August 25, 1891.

Application filed October 16, 1890. Serial No. 368,372. (No model.)

To all whom it may concern:

Be it known that I, NAAMAN L. DARLING, a citizen of the United States, residing at Benicia, Solano county, State of California, have invented an Improvement in Combined Traveling Harvesters; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to certain improvements in that class of machines known as "traveling harvesters," in which the grain is cut, thrashed, cleaned, and sacked ready for market at a single operation and while the machine is traveling about the field.

My invention consists in certain details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a plan view of the frame-work and such features of the upper part of the mechanism as are necessary for the explanation of my invention. Fig. 2 is a side elevation. Fig. 3 is a rear end view showing the weight-equalizer. Fig. 4 is an enlarged view showing the chain driving-gear and the mechanism for steering and raising and lowering the sickle. Fig. 5, Sheet 3, is an enlarged view of the sliding hinge *k'*. Fig. 7 is an enlarged plan view of the drapers O and P, showing the hinge *r*. Fig. 8 is a detail.

In the construction of my apparatus I have shown three independent frames A, B, and C, peculiarly hinged together, the frame A having a pair of bearing-wheels D and serving to carry the engine from which power is derived to propel the machine and operate the various parts of the machinery. The frame B carries the thrashing, separating, and cleaning mechanism, and is connected with the frame A by hinges E, so that the two frames may have independent movements about the lines of these hinges. The frame B is situated upon the right-hand side of the engine-frame A, and upon its right side is a bearing-wheel D', which supports the outer side of the thrashing-machine frame, the inner side being supported from the engine-frame by means of the hinges E, before described.

The rear portion of the two frames A and B is supported by the steering-wheels F, mounted upon an axle G, which is swiveled, so as to turn about a vertical axis H. These wheels are turned by means of chains or ropes connected with opposite ends of the axle and leading forward to a drum, around which the ropes pass from opposite sides, and this drum is operated by a mechanism from the engine, so as to turn the steering-wheels in either one direction or the other, as will be hereinafter more fully described. The upright axis H is supported upon a bar I, which extends forward from this point and has its forward end fitted to slide loosely upon a horizontal shaft J, which is fixed upon the frame A, as shown.

K is a bar having one end pivoted to the frame-work A, as shown at L. The bar is bent or curved downwardly from this pivotal point, extends along horizontally beneath the rear ends of the frames A and B, is again bent upwardly, and has the opposite end slotted, as shown at M, this slot being fitted to slide upon a pin N, fixed to the bar B.

To the central depressed portion of this bar the bar I is secured by clips O, and by means of these clips it will be manifest that the bar I may be moved to either side, the front end sliding correspondingly upon the shaft J, until the bar I is at the desired point so as to equalize the weight of the two frames A and B upon the steering-wheels F, when the clamp O may be tightened upon the bar and thereafter remain permanently at that point. By this construction I am enabled to move the steering-wheels so as to regulate and equalize the weight of the two frames upon these wheels, and it will be manifest that when they are turned to one side or the other they will act to steer the machine to any desired point.

The engine and boiler are mounted upon the frame A. I have in the present case shown the engine as having two cylinders standing at right angles with each other, one horizontal and the other vertical, the axis of the cylinders intersecting with the driving-shaft, to which the connecting-rods of both are coupled, so that these engines acting at right angles upon the single-crank pin will always exert full power upon the driving-shaft and there will be no dead-center.

I prefer to communicate power for driving the traction-wheels from the driving-shaft P

by means of a sprocket-wheel Q, fixed upon said shaft, and a chain R, passing from this sprocket-wheel to a larger sprocket-wheel S, upon the shaft of which is fixed another small sprocket-wheel T, and a chain U from this sprocket-wheel passes around the large sprocket-wheel V, which is secured upon the side of the main bearing and driving wheel D. Upon the shaft P is fixed another sprocket-wheel Z, around which passes a chain W, and this chain drives the wheels X and Y.

a is a shaft, upon which is secured the drum *a'*, and around this drum the chains *b* pass. These chains lead backward from this drum around a direction-pulley *c* and thence to the ends of the axle G of the steering-wheels, as previously described. The shaft *a* has one end mounted in a journal-box, which is carried upon the end of a lever *d*, and this lever is operated so as to swing the shaft from one side to the other. Upon this shaft is fixed a frictional pulley *e*, and this pulley may be thrown into contact with corresponding frictional drums *f f'*, which are fixed upon the shafts of the wheels X and Y, and thus turned so as to turn the steering-drum in opposite directions when its controlling-wheel is thrown into contact with either one or the other of these frictional drums.

g is a drum upon which the rope or chain *h*, which raises and lowers the header-frame, is coiled, and this drum has a similar friction-wheel *i*, which is adapted to be thrown into contact with one of the frictional drums *f* by the action of a lever *j* similar to *d*.

Power to drive the thrashing and cleaning machinery is derived from a counter-shaft which receives power from the main engine-shaft. This counter-shaft extends across from the frame A to the frame B and has an intermediate universal joint in line with the hinges E, so that it is free to bend at this point and accommodate itself to the varying movements of the two frames A and B as the machine passes over irregularities on the surface of the land.

The frame C extends entirely across the front of the frames A and B and it is hinged to the frame B by a hinge *k*. It is hinged to the frame A by a hinge *k'*. This hinge consists of a head bored so as to slide upon the horizontal rod or shaft *l*, the head being allowed to slide between the ends of this rod to accommodate the movements of the two frames A and B about their intermediate hinges E. As it will be manifest that sometimes these frames will be bent at such an angle with each other that a line drawn between their outer sides would form the longest side of an obtuse-angled triangle, and as this would be shorter than a straight line drawn between the same points when the frames were level or in line with each other, it will be manifest that these hinges *k* and *k'* must be so constructed as to compensate for this change of distance, and by allowing the head *k'* to slide upon the shaft *l*, which connects it with the header-frame C, this compensation is effected.

The head *k'* has a shaft k^2, journaled horizontally upon the frame A, as shown, and this shaft turns slightly in its journal-boxes to accommodate itself to the varying movements above described, this being necessary on account of the fitting of the head or hinge *k'* to the shaft *l*, which is at right angles with the shaft k^2. This construction allows perfect freedom of motion at this point without any binding or cramping, and the other hinge *k* may thus be made of the ordinary form without any compensating device.

The sickle-bar and sickle *m* extend entirely across the front of the machine. Transversely-moving drapers *n* deliver the cut straw and grain upon a draper *o*, which travels backwardly from the front of the machine, thus carrying all the grain which is received from the drapers *n*, delivering from the sides, and also the grain which falls directly upon it from the sickle *m*. This draper *o* delivers upon a self-feeder *p*, hinged to the frame B, and this in turn delivers the grain to the thrashing-cylinder *q*.

As the header-frame C has a movement to elevate and depress it about the hinges *k*, and there is also another movement given it by reason of the hinges between the frames A and B, it will be manifest that some adjustment must be made between the draper *o* and the self-feeder *p*. This is effected by means of the hinge *r*, by which the one side of the frame C is hinged to the corresponding side of the frame of the self-feeder *p*. The opposite sides of these two frames are not connected, and it will be seen from this construction that when the frames A and B are tilted with relation to each other so that the outer sides are above the ends adjacent to the joint connection between them the movement of the hinge *k'*, before described, will take place. At the same time the tendency of the side of the draper-frame *o*, which is connected by the hinge *r*, will be to move about the hinge *k'* as a center while the frames A and B are turning about the hinges E. This action is allowed to take place without binding or cramping by hinging the frame at *r*, while the opposite side is left free, and this side of the draper *o* and the side of the self-feeder *p* are thus allowed to move about their different centers without cramping. The wire rope or cord *h*, which raises and lowers the header, is, as before described, wound upon a drum *g*, and this rope forks or separates into two before it reaches the front end of the machine, and the two parts there pass around guide-pulleys *s* and are directed, respectively, to the outer sides of the header-frame C, at which point they pass again around guide-pulleys, and thence over pulleys *t* upon the upper ends of the supporting-timbers *u*, in which these pulleys are journaled, thence the ropes lead down to the header-frame, to which they are attached, as

shown, and when they are drawn up or relaxed the header-frame will be correspondingly raised or depressed. The reel *v* is journaled in the ends of the supporting-arms *w*, which arms are pivoted in the posts *x* and extend backward through the slotted guides *y* upon the posts *z*. The rear ends of the levers *w* are connected with the stationary standards *u* by the links 2. Now the action of these links and the levers *w*, fulcrumed in the posts *x*, will be as follows: By reason of the two different fulcrum-points, about which the parts move, it will be seen that when the header-frame C is depressed about the hinges *k* the front end will also be depressed, carrying with it the reel and the rear of the supporting-arms *w*, but by reason of the links 2, connecting the rear ends of these arms with the stationary standards *u*, which are fixed to the main frame, the reel will be depressed as the front of the header is depressed and will travel nearer to the sickle, thus enabling it to sweep the short grain more thoroughly upon the draper and prevent its being scattered and lost. When the header is raised so that its front end is higher, the reverse of this action takes place, and the reel is correspondingly raised from the front of the machine. This connection being automatic with the raising and depressing of the header-frame, it will be manifest that no attention need be paid to it, but that it will always operate as above described.

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

1. In a traveling harvester, the frames A and B, hinged together and standing side by side, having the engine mounted upon one frame, the thrashing and cleaning mechanism upon the other, a header-frame hinged to the front of the two, a pair of bearing-wheels beneath the engine-frame, a single wheel supporting the side of the thrashing mechanism which is opposite to the hinges, and a steering wheel or wheels adapted to support the rear of the two connected frames jointly and movable about a vertical axis, so as to steer said mechanism, substantially as herein described.

2. A traveling harvester and thrasher consisting of the two frames standing side by side, hinged together, a header-frame hinged to the front of the two, having the bearing-wheels disposed as shown, an engine mounted upon one of said frames and a thrashing and cleaning mechanism upon the other, steering-wheels mounted upon a shaft which is movable about a vertical axis, an equalizing-bar extending transversely across and connecting the engine-frame and the thrashing-machine frame at the rear, and clips whereby the steering-wheel support may be secured to the equalizing-bar at any desired point in its length, substantially as herein described.

3. A traveling harvester consisting of the two parallel frames mounted upon bearing and steering wheels, as shown, and hinged together at their adjacent sides in the line of the travel of the machine, a header-frame having one hinge connecting it with one of these movable frames and a second hinge connecting it with the other, so that it may be raised and depressed about these hinges, one of said hinges being so constructed as to have a compensating motion with reference to the two main frames when they move about their connecting-hinges, substantially as herein described.

4. The traveling harvester, the engine-frame and a thrashing-machine frame having the bearing and steering wheels, as shown, the adjacent sides of said frames being hinged together in the line of travel of the machine, and a header-frame having one end hinged to one of said frames and the other hinged to the other of the frames by means of a compensating hinge $k' k^2 l$, the parts being connected together and operating substantially as herein described.

5. The engine-frame and thrashing-machine frame hinged together at their adjacent sides in the line of the travel of the machine, having the bearing and steering wheels disposed as shown, a header-frame extending across the front of both these frames, hinged thereto with compensating hinges, as described, a transversely-moving draper *n*, a rearwardly-moving draper *o*, receiving grain therefrom and from the sickle and delivering it to the self-feeder *p*, which is hinged to the thrasher-machine frame, and the hinge *r*, by which the header-frame is connected at one side only with the frame of the self-feeder *p*, substantially as herein described.

6. The engine-frame and a thrashing-machine frame hinged together at their adjacent sides in the line of travel of the machine, having the bearing-wheels and steering-wheels disposed beneath the frames, as shown, a rope or chain having its ends connected with the opposite ends of the steering-wheel axle and its intermediate portion passing around a winding-drum, frictional wheels driven in opposite directions by power derived from the engine, and a frictional wheel mounted upon the drum-shaft and movable so as to be thrown into contact with either one or the other of the oppositely-moving friction-wheels, whereby the drum is rotated in opposite directions and the steering-wheels turned to one side or the other, substantially as herein described.

7. In a traveling harvester, the engine-frame and the thrashing and cleaning machine frame having their adjacent sides hinged together on the line of travel of the machine, bearing and steering wheels disposed beneath these frames as shown, a header-frame hinged to the front of the engine and thrashing-machine frame, respectively, ropes connected with the outer sides of said header-frame passing over direction-pulleys, by which they are brought together in a line between the engine

and thrashing-machine frames and united with a single rope, a drum around which said rope is wound, a frictional wheel mounted upon the shaft of said winding-drum, and a mechanism whereby the shaft is moved so as to throw the frictional wheel into contact with a second friction-wheel driven by power derived from the engine, so that the rope may be coiled or uncoiled upon its drum and the header-frame raised or depressed about its hinges, substantially as herein described.

8. In a traveling harvester, the engine-frame and thrashing-machine frame hinged together at their adjacent sides in the line of travel of the machine, having the bearing and steering wheels disposed beneath them as shown, the header-frame hinged to the front of the engine and thrashing-machine frame, respectively, and a means for raising and lowering said frame about its hinges, in combination with the reel-supporting arms fulcrumed upon posts upon the header-frame and having their rear ends connected by links or hangers with standards upon the main frames, whereby the movement about the different centers as the header-frame is raised or depressed will correspondingly raise or depress the reel, substantially as herein described.

In witness whereof I have hereunto set my hand.

NAAMAN L. DARLING.

Witnesses:
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W. P. JOHNSON.