

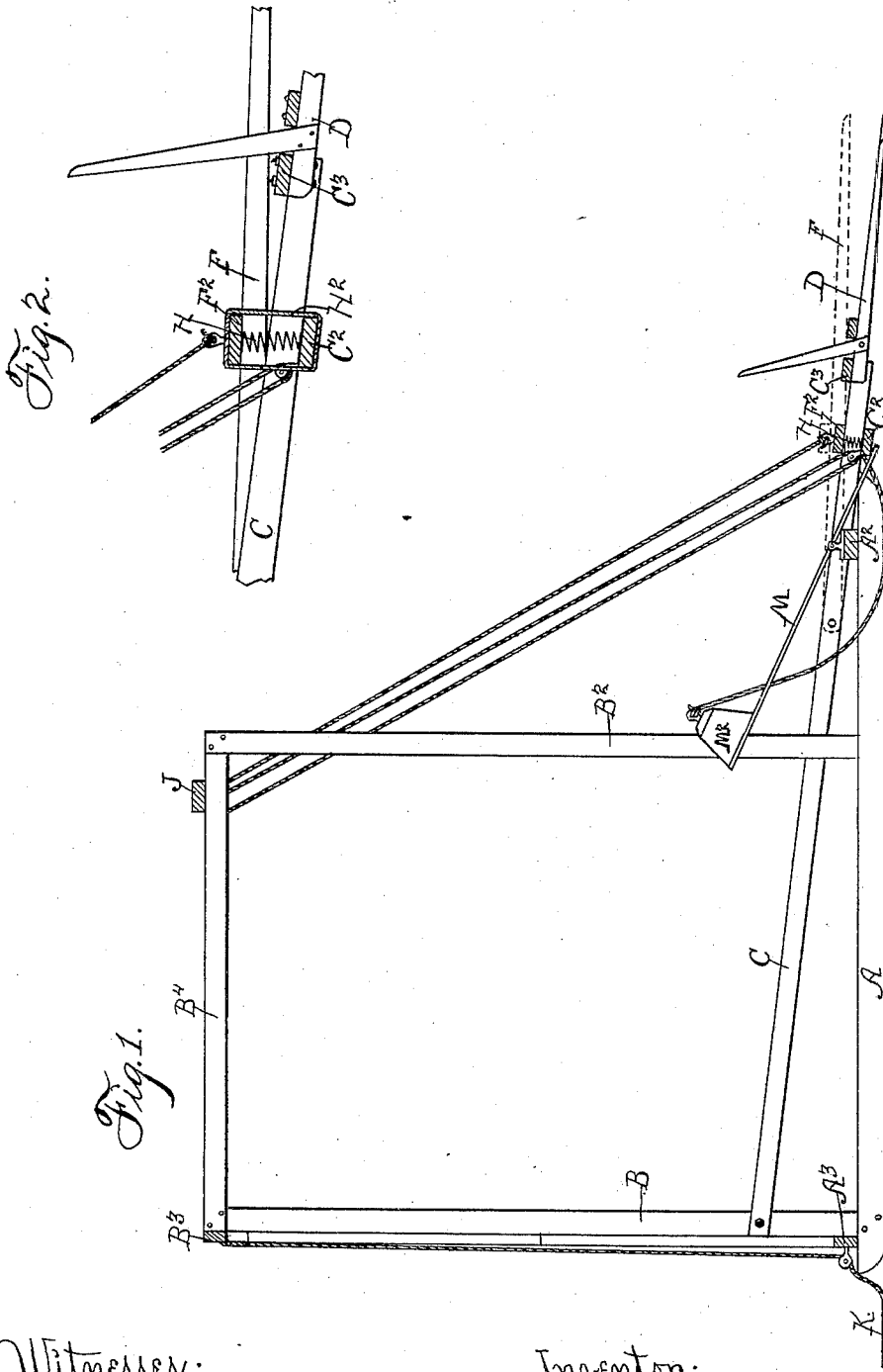
(No Model.)

2 Sheets—Sheet 1.

D. M. STEPHENS.  
HAY STACKER.

No. 474,422.

Patented May 10, 1892.



Witnesses:  
W. P. Smith.  
J. R. Orwig.

Inventor:  
Daniel M. Stephens,  
By Thomas G. Orwig, atty.

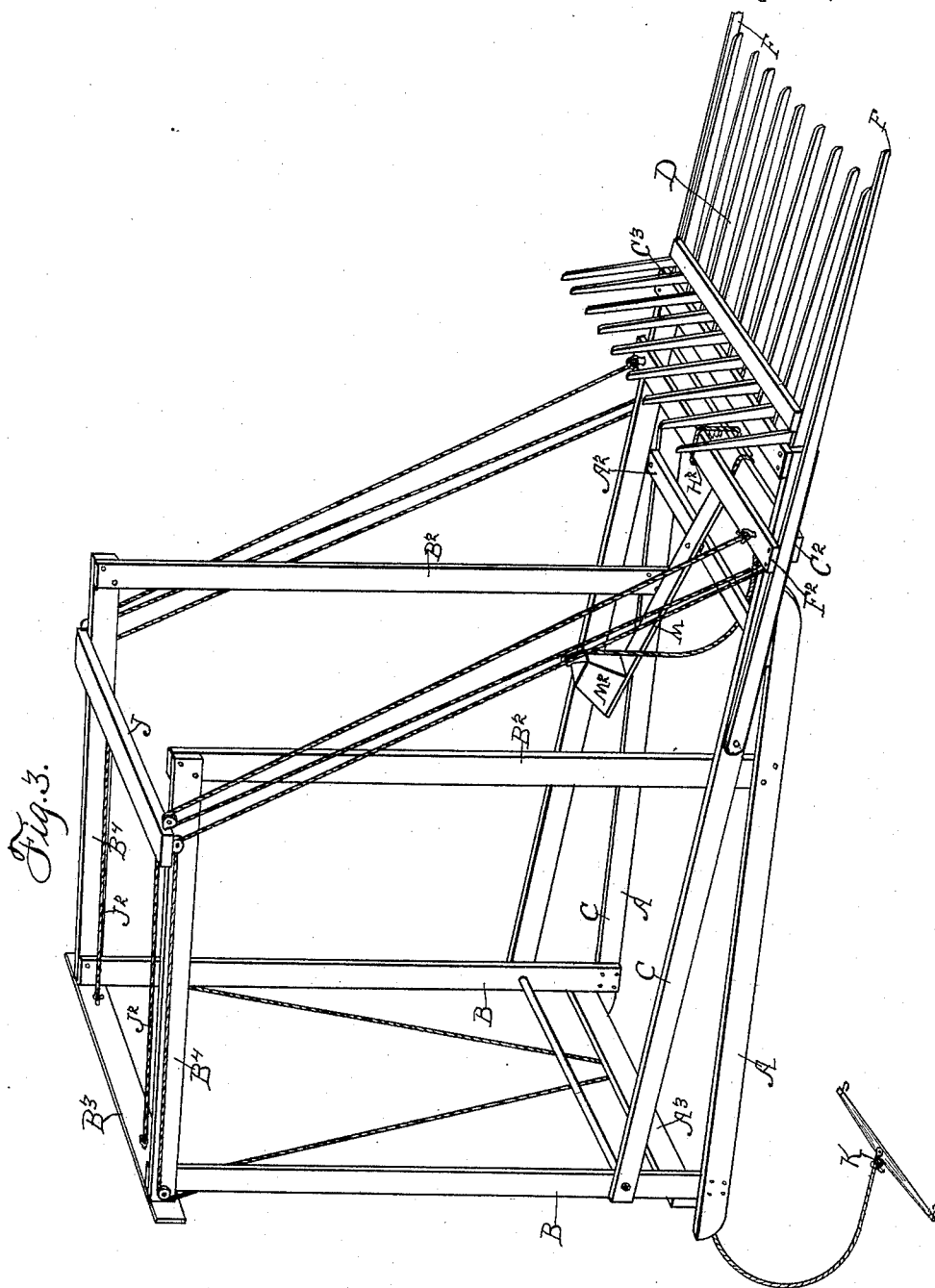
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# UNITED STATES PATENT OFFICE.

DANIEL M. STEPHENS, OF THRALL, IOWA.

## HAY-STACKER.

SPECIFICATION forming part of Letters Patent No. 474,422, dated May 10, 1892.

Application filed September 19, 1891. Serial No. 406,191. (No model.)

*To all whom it may concern:*

Be it known that I, DANIEL M. STEPHENS, a citizen of the United States of America, residing at Thrall, in the county of Wright, State of Iowa, have invented certain new and useful Improvements in Hay-Stackers, of which the following is a specification.

My invention relates to that class of hay-stackers in which the hay is placed on a fork raised to the end of an elevating-arm and raised to the top of a stack by means of a system of ropes and pulleys.

My object is to provide a simple, strong, and durable hay-stacker in which the draft is distributed in such a manner that an easy start and an accelerated finish is given to the movement of the elevating-arm, and also to provide means by which the hay is prevented from falling off the fork while in motion.

My invention consists, primarily, in the construction and combination of the various ropes and pulleys of the hoisting device with a weight adapted to aid in starting the device when loaded and to return it to its normal position when unloaded, and also in providing the fork with movable side bars adapted to retain the hay in the fork when in motion and to place it on the stack in a compact form, and in certain other features of construction hereinafter set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a vertical longitudinal sectional view of the complete device. Fig. 2 is an enlarged detail view of a portion of Fig. 1 to illustrate the manner in which the movable side teeth of the fork operate, and Fig. 3 is a perspective view of the entire machine.

The base A A, having the forward cross-bar A<sup>2</sup> and the rear cross-bar A<sup>3</sup>, the rear upright supporting-bars B, the forward upright supporting-bars B<sup>2</sup>, and the rear horizontal top brace B<sup>3</sup> and the top side bars B<sup>4</sup>, constitute the frame of the machine.

C C are wooden arms adapted to support the hay-fork, pivoted to the bars B a few feet above the base, preferably by means of a single piece of gas-pipe extending through the said arms and upright bars. The forward ends of the said arms are connected by means of a cross-bar C<sup>2</sup> on the under side of the arms and a cross-bar C<sup>3</sup> on the top thereof. A

hay-fork D, of common form, having wooden teeth extending upward and inclining rearwardly therefrom, is fixed to the cross-bar C<sup>3</sup>.

F F represent two teeth hinged to the arms C in the rear of the fork D and are connected with each other by means of a cross-bar F<sup>2</sup>. A coil-spring H is attached to the cross-bar F<sup>2</sup> and the cross-bar C<sup>2</sup> and tends to draw them together, as required, to hold the outer ends of the two outside teeth in close engagement with the ground, and a rope H<sup>2</sup> is attached to the said cross-bars, as required, to limit the upward movement of the outer teeth.

Resting on the horizontal top pieces of the frame is a bar J, provided with a pulley at both its forward and under sides at each end and is connected to the brace B<sup>3</sup> by means of ropes J<sup>2</sup>.

The hoisting mechanism of the device is arranged as follows: Means are provided at the end of the rope K for attaching a draft-animal. The rope then passes through a direction-pulley fixed to the rear cross-bar A<sup>3</sup>. It is then divided and passes over direction-pulleys on the rear of the top side bars B<sup>4</sup>, over the pulley fixed to the bottom of the bar J, under the pulleys fixed to the cross-bar C<sup>2</sup>, over the pulleys fixed to the forward ends of the bar J, and having their outer ends fixed to the cross-brace F<sup>2</sup>.

M represents a lever fulcrumed to the cross-bar A<sup>2</sup> and having a weight M<sup>2</sup> fixed to its rear end, and its free end extends forward enough to be engaged by the cross-bar C<sup>2</sup> upon the descent of the fork-arms, which raises the weight. A rope attached to the weight and to the cross-bar C<sup>2</sup> causes the weight to be raised when the fork-arm is in an approximately vertical position and to overcome its inertia and cause it to descend when the load is discharged.

The practical operation of my invention is as follows: Assuming the device to be in a normal position, with the fork resting on the ground, it will be obvious that the two outside teeth of the fork will be held in close engagement with the ground by means of the coil-spring H, and upon starting to raise the fork-arms it will be obvious that the outside teeth of the fork will be raised first until restricted by the rope H<sup>2</sup>, as required, to prevent the hay from falling off the sides, and that the

weight  $M^2$ , almost balancing the weight of the empty fork and fork-arm, will aid in starting the upward movement of the fork-arm, and it will also be obvious that the bar J will come in contact with the fork-arm when nearly raised, thereby throwing the draft directly on the fork-arm and greatly accelerate the speed, as required, to throw the hay to the center of the stack, and upon the load being discharged it will be seen that the weight  $H^2$ , being attached to the fork-arm, will return it to its normal position.

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

1. In a hay-stacker having a fork-elevating arm, a fork having its central teeth fixed to the said arm and provided with two teeth of greater length than the said central teeth and having their rear ends pivoted to the elevating-arm outside of the fixed fork in such a manner that the said outside teeth may be raised above the fixed fork while the said arm is being elevated, for the purposes stated.

2. The combination, in a hay-stacker, of the elevating-arms pivotally connected to the sides of the frame, having their forward ends connected by means of a cross-bar on the under side and a cross-bar on the top thereof, a hay-fork of common form fixed to the said top cross-bar, two fork-teeth of greater length than the said fork pivotally connected at their rear ends with the outer sides of the elevating-arms and connected with each other by means of a cross-bar, a coil-spring attached to the said cross-bar connecting the movable teeth and the cross-bar on the under side of the elevating-arms, which tends to draw them together, and means for limiting the distance to which they may be separated, substantially as set forth, for the purposes stated.

3. In a hay-stacker, means for producing a direct draft and an accelerated ending to the movement of the elevator-arm, comprising a bar resting on the top of the frame and connected to the rear end of the frame by means of ropes, two pulleys attached to each end

thereof, and a rope on each side of the frame, terminating in a single rope, to which a draft-animal may be attached, each of the said ropes being extended through a pulley on the rear top portion of the frame, one of the pulleys on the said bar, a pulley attached to the elevating-arm, and the remaining pulley on the said bar and having its end fixed to the elevating-arms, to operate in the manner set forth, for the purposes stated.

4. In combination with a hay-stacker having pivoted elevating-arms, means for aiding in starting the said arms in both the upward and downward movements, comprising a lever fulcrumed to a cross-bar on the base of the device, a weight fixed to its rear end and having its forward end adapted to engage a portion of the elevating-arm upon its descent, as required, to raise the said weight, and a cord or rope fixed to the said weight and to a portion of the elevating-arm in such a manner that the weight will be lifted by the arm before it finishes its upward movement, as required, to start the arm on its downward movement, substantially as shown and described.

5. An improved hay-stacker consisting of a supporting-frame having two elevating-arms hinged to its rear portion, a fork fixed to the forward end of the arms, two fork-teeth pivoted to the said arms connected by means of a cross-bar and adapted to be raised above the fork, means for normally holding the said pivoted teeth approximately parallel with the fork and means for limiting the upward movement of the pivoted teeth relative to the fork, a bar resting on the top of the frame and connected with the rear end thereof by means of ropes, a weight attached to a lever and to the fork-arm, as shown and described, and ropes to operate the fork-arm, passing through pulleys attached to the frame, the said bar and the fork-arm to operate in the manner set forth, for the purposes stated.

DANIEL M. STEPHENS.

Witnesses:

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