No. 829,550. PATENTED AUG. 28, 1906.

R. J. SPARKS.

HAY STACKER.

APPLICATION FILED NOV. 13, 1905.

3 SHEETS—SHEET 1.

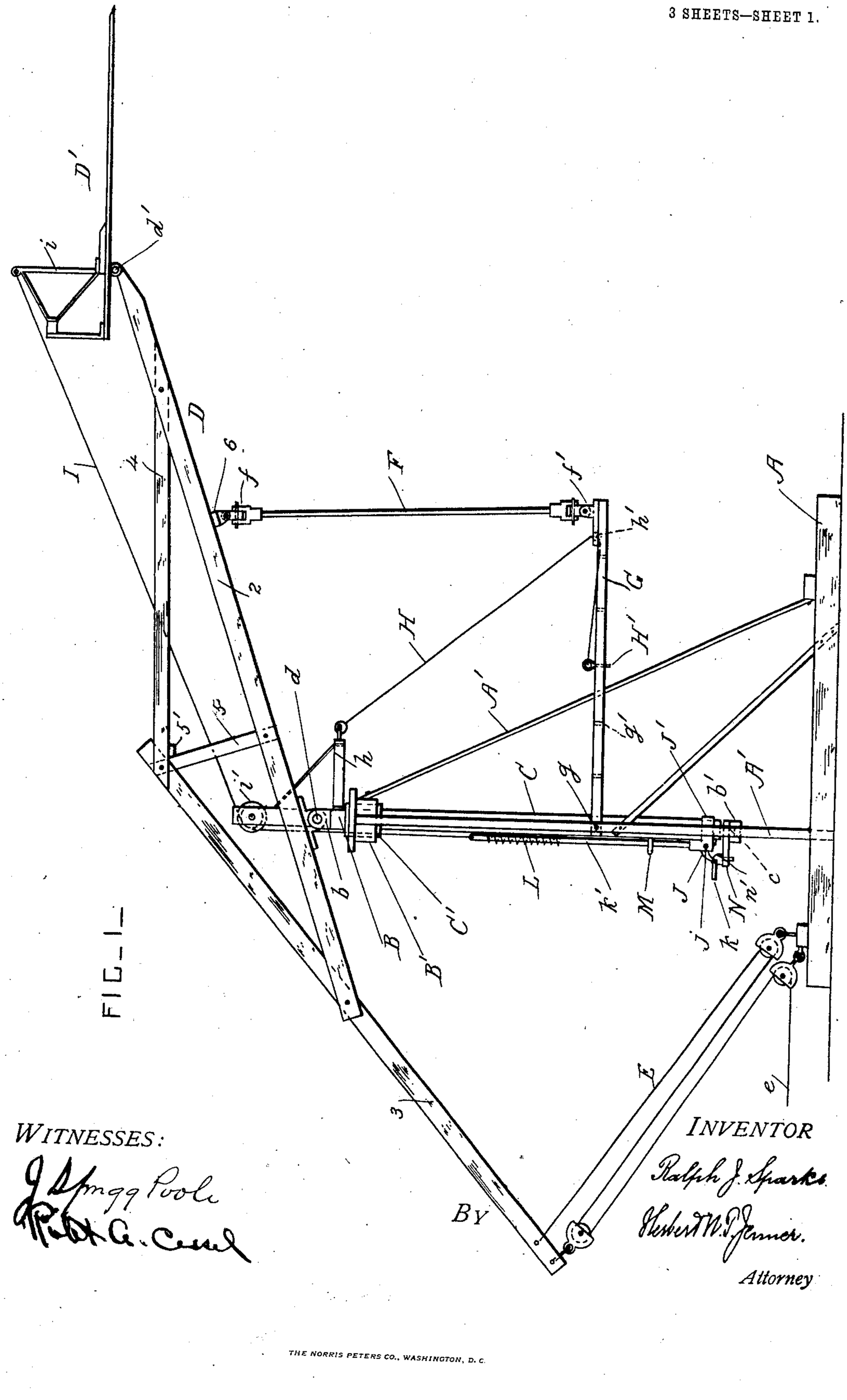

FIG. 1.

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3 SHEETS—SHEET 2.

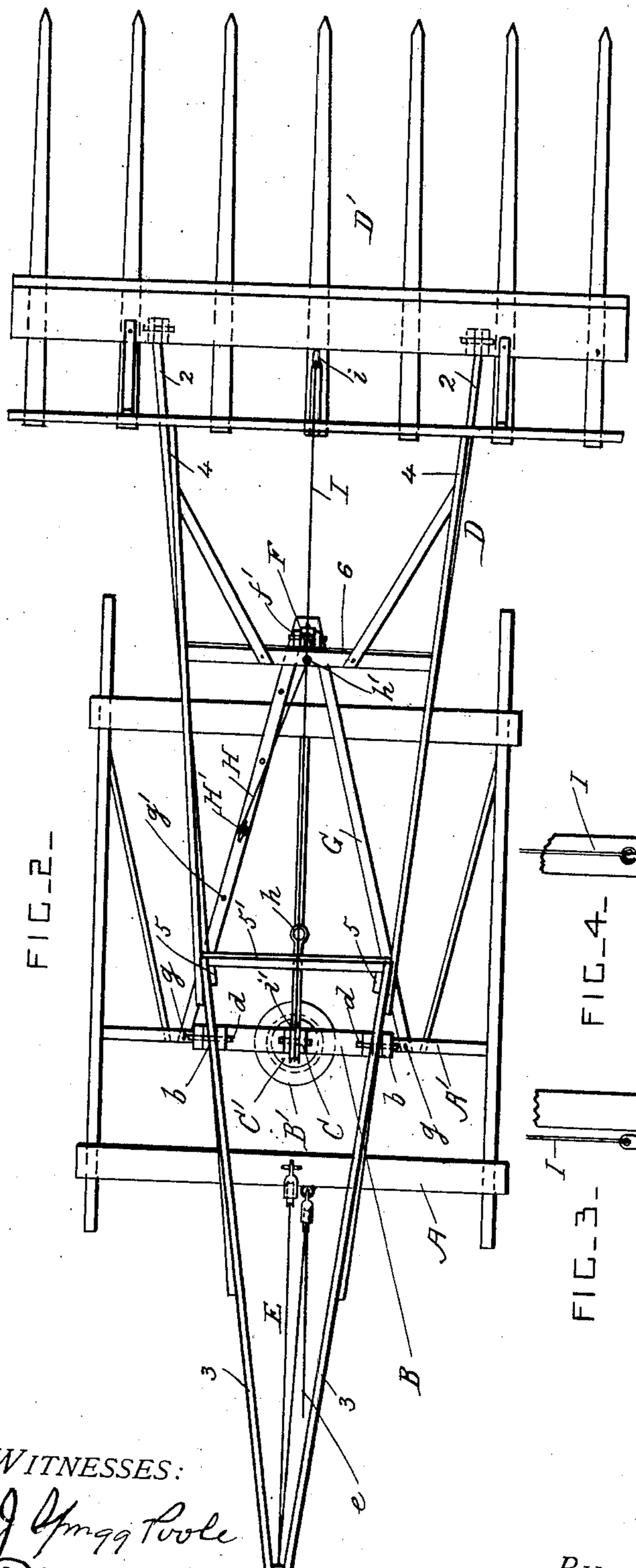

FIG. 2.

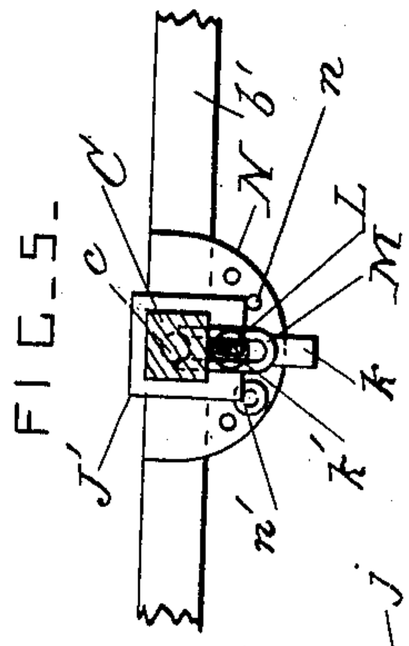

FIG. 5.

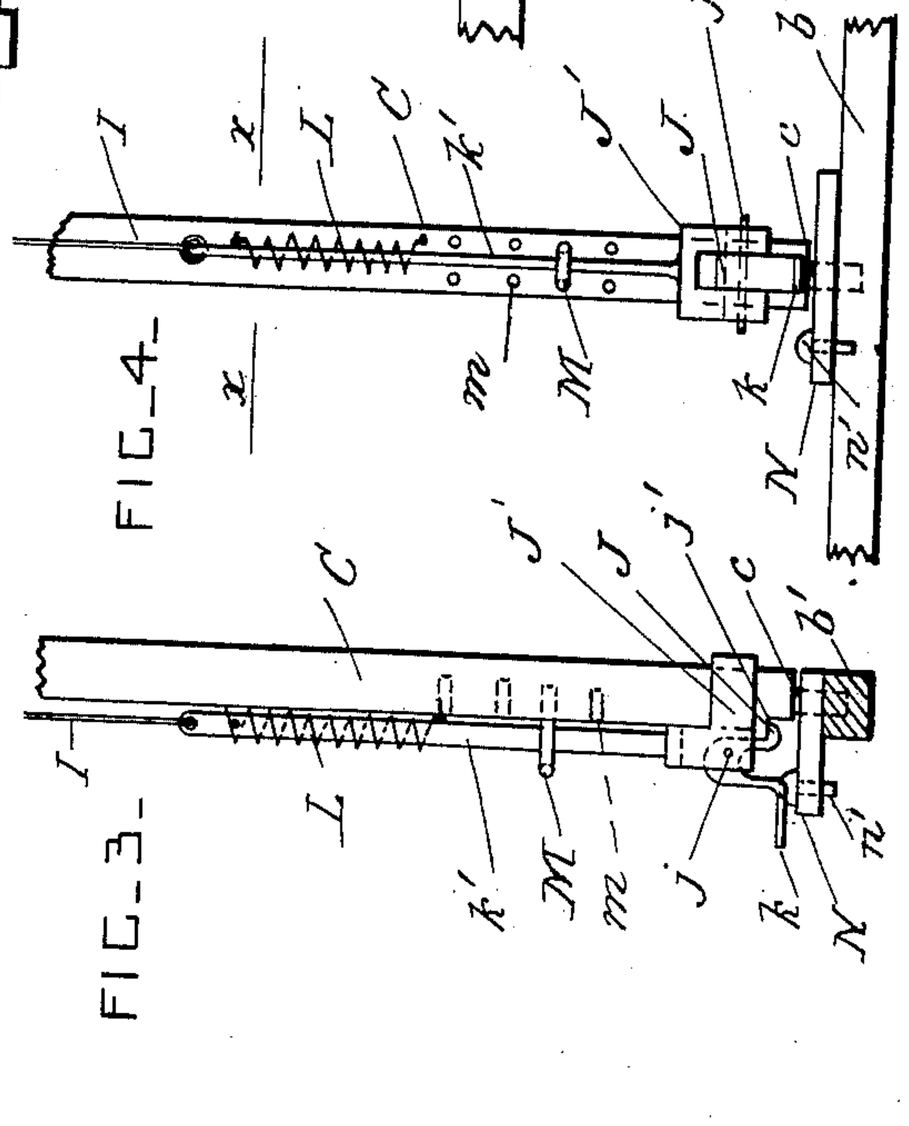

FIG. 4.

FIG. 3.

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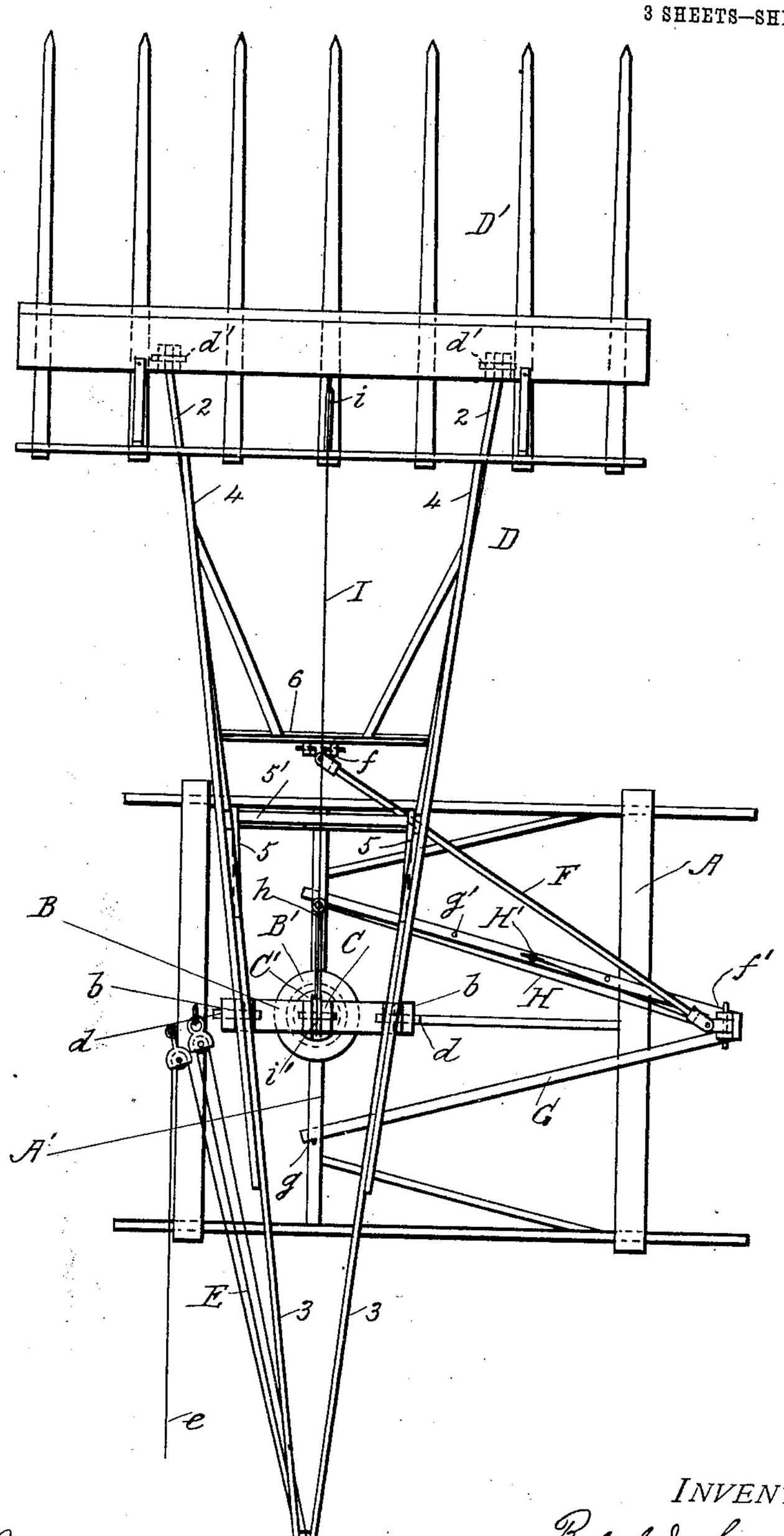
3 SHEETS—SHEET 3.

FIG. 6.



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HAY-STACKER.

No. 829,550. Specification of Letters Patent. Patented Aug. 28, 1906.

Application filed November 13, 1905. Serial No. 287,075.

To all whom it may concern:

Be it known that I, RALPH J. SPARKS, a citizen of the United States, residing at Browning, in the county of Linn and State of Missouri, have invented certain new and useful Improvements in Hay-Stackers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to hay-stackers which operate intermittently and which deliver to one side; and it consists principally of the novel means by which the height of the delivery may be varied and by which the various actions of the mechanism are rendered automatic, as hereinafter fully described and claimed.

In the drawings, Figure 1 is a side view of the stacker, showing the fork raised. Fig. 2 is a plan view of the same. Fig. 3 is a side view of the spring-catch mechanism drawn to a larger scale. Fig. 4 is an end view of the same. Fig. 5 is a plan view taken in section on the line *x x* in Fig. 4. Fig. 6 is a plan view of the stacker similar to Fig. 2, but shows the fork turned around and lowered.

A is a base which supports a frame A′, composed of uprights coupled together by suitable braces.

B is a cross-bar at the upper part of the frame, provided with double eyes *b* at its ends.

B′ is a socket close under the cross-bar B, and *b′* is a cross-bar secured in the lower part of the frame below the said socket B′.

C is a vertical mast which is preferably rectangular in cross-section. This mast has a pivot or bearing *c* at its lower end which is journaled in a hole or sacket in the cross-bar *b′*.

C′ is a disk secured on the upper part of the mast and journaled in the socket B′.

D is the lifting-beam of the fork, the middle part of which is pivoted by pins *d* to the double eyes *b*, so that it is movable in a vertical plane.

D′ is the fork, which is provided with tines and constructed in any approved manner. This fork is pivoted by pins *d′* to the longer end portion of the beam D.

The lifting-beam is preferably constructed of two long diverging bars 2, pivoted to the double eyes *b* and having the fork pivoted to their front or longer ends, two shorter bars 3, arranged at an angle to the bars 2 and secured to their rear ends, and suitable braces. The rear ends of the bars 3 are secured together and their front ends project above the bars 2. Braces 4 are arranged between the front ends of the bars 2 and 3. Struts 5 are arranged between the junctions of the bars 3 and 4 and the middle parts of the bars 2. A cross-bar 5′ is secured between the junctions of the bars 3 and 4, and 6 is a cross-bar between the bars 2, arranged about midway between their pivots and the fork.

E is a lifting-tackle arranged between the rear end of the lifting-beam and the base in any approved manner. The free end *e* of the lifting-cord is connected to a horse or other approved means for operating the stacker.

F is a radius-rod, the upper end of which is pivotally connected with the cross-bar 6 by a universal joint *f* of any approved construction. The lower end of the rod F is provided with a similar universal joint *f′*, which connects it to a support G. The support G is connected to the frame A′, and it preferably consists of two bars arranged at an acute angle with each other and pivoted at one end to the frame A′ by pins *g*. The pivoted support G and the radius-rod F and its universal joints are arranged between the lifting-beam and the frame and they constitute one form of guide mechanism which constrains the lifting-beam to slue around when it is raised by the operating device or lifting-tackle E, as hereinafter more fully described. In order to adjust the position of the free end of the support G, a cord H or other similar flexible connection is provided. One end of this cord is secured to a bracket *h* at the upper part of the mast, and its other end is provided with a pin H′. The middle part of the cord is passed through a guide hole or eye *h′* at the free end of the support G, and the pin H′ is inserted in any one of a series of holes *g′* in one bar of the said support. The normal position of the lower pivoted end of the radius-rod F is adjusted by means of the cord H; but any other approved means for supporting and adjusting the position of the lower end of the radius-rod may be used in carrying out this invention.

I is a flexible connection, such as a cord, which is secured at one end to an upwardly-projecting arm *i* on the fork. This cord passes over a guide-sheave *i'* at the top of the mast C, and its lower end is normally connected to the lower part of the mast by a catch J. The catch J is pivoted on a pin *j* in a guide J', which is slidable vertically on the lower part of the mast. The catch engages with a notch or shoulder *j'* on the mast and is held in engagement therewith by the weight of an arm *k*, which projects rearwardly from it. The guide J' has a rod *k'*, which projects upwardly from it and which is secured to the lower end of the cord I. L is a spring connected to the mast and to the rod *k'* and which normally moves the said rod downward and holds the tines of the fork in a substantially horizontal position.

M is a stop on the mast for the guide J' to strike against. This stop is adjustable, and it is preferably formed like a staple, the mast being provided with a series of holes *m* for it to engage with. The rod *k'* slides in the loop of the staple-shaped stop.

N is a trip-plate secured to the cross-bar *b'* at the foot of the mast. This trip-plate is provided with a series of holes *n*, and *n'* is a trip-pin which may be placed in engagement with any of the said holes. The head of the trip-pin is arranged in the path of the arm *k* of the catch for the purpose of disengaging the catch from the mast.

The action of the hay-stacker is as follows: When the parts are in the position shown in Fig. 6, the catch is locked to the mast and the tines of the fork are held in a horizontal position. The hay is placed on the fork and the rope or cord *e* is pulled upon. The lifting-beam is turned on its pivots, the fork being raised. The mast is partially revolved and the fork is slued around and raised until it reaches the position shown in Figs. 1 and 2, being guided by the radius-rod F and its support G. When the fork is lowered, as shown in Fig. 6, the joint *f* is below the level of the joint *f'*. When the rope *e* is pulled upon, the fork rises substantially vertically, because the rod F is a strut, and prevents the fork and the beam from sluing around until after the joint *f* has been raised above the level of the joint *f'*. The fork rises substantially vertically upon an arc until the joint *f* is about as much above the level of the joint *f'* as it was originally below it. At this point the angularity of the tackle takes effect and pulls around the beam and mast to the right, the upper end of the rod F being free to swing around diagonally upon an arc. The beam at first slues around very slowly in proportion to its upward movement, but it slues around quickly as it approaches the full height of its travel. The angularity of the tackle E, tending to slue around the beam, becomes less as the beam slues around, and it ceases to be effective shortly before the beam is on the center line of the frame, as shown in Fig. 2. The hay is then discharged and the fork descends in the reverse direction to its original position, because it did not arrive at or pass the exact center line of the frame. The fork in practice works on one side only of the frame unless pulled around so as to arrange it to work upon the other side of the frame. Just before the fork is fully raised and slued around the arm of the locking-catch J strikes the trip-pin, so that the catch is disengaged from the mast. The weight of the hay on the tines turns the fork downward on its pivots *d'* until the guide of the catch strikes the stop on the mast and the hay slides off the tines onto the stack. The spring L then raises the tines to their horizontal position. As soon as the rope *e* is slackened the fork begins to slue around and descend, and the locking-catch reëngages automatically with the mast. The fork can be slued to one side or the other, as preferred, and the height of the delivery is adjusted by changing the position of the radius-rod support.

It will be seen that this stacker is automatic in its operations and that one man to drive the horse is all the labor required to operate it.

What I claim is—

1. In a hay-stacker, the combination, with a supporting-frame, of a lifting-beam pivotally supported by the said frame so that it may be raised and slued around, a fork at one end of the said lifting-beam, a radius-rod having its upper end pivoted to the said lifting-beam, means for pivotally supporting the lower end of the said radius-rod from the said frame, and a lifting device connected to the other end of the said lifting-beam.

2. In a hay-stacker, the combination, with a supporting-frame, of a vertical mast pivoted in the said frame and provided with a cross-bar at its upper part, a lifting-beam pivoted to the said cross-bar and provided with a fork at one end, a radius-rod having its upper end pivoted to the said lifting-beam, means for pivotally supporting the lower end of the said radius-rod from the said frame, and a lifting device connected to the other end of the said lifting-beam.

3. In a hay-stacker, the combination, with a supporting-frame, of a lifting-beam pivotally supported by the said frame so that it may be raised and slued around, a fork at one end of the said lifting-beam, a radius-rod having its upper end pivoted to the said li t-ing-beam, a support pivoted to the said frame and pivotally connected with the lower end of the said radius-rod, and a lifting device connected to the other end of the said lifting-beam.

4. In a hay-stacker, the combination, with a supporting-frame, of a lifting-beam pivotally supported by the said frame so that it may be raised and slued around, a fork at one end of the said lifting-beam, a radius-rod having its upper end pivoted to the said lifting-beam, a vertically-adjustable support carried by the said frame and having the lower end of the said radius-rod pivoted to it, and a lifting device connected to the other end of the said lifting-beam.

5. In a hay-stacker, the combination, with a supporting-frame, of a vertical mast pivoted in the said frame, a lifting-beam pivoted to the said mast, a fork at one end of the said lifting-beam, a radius-rod having its upper end pivoted to the said lifting-beam, a support pivoted to the said frame and having the lower end of the said radius-rod pivoted to it, an adjusting device arranged between the said support and the upper part of the said mast, and a lifting device connected to the other end of the said lifting-beam.

6. In a hay-stacker, the combination, with a supporting-frame, of a vertical mast pivoted in the frame, a lifting-beam pivoted to the said mast, a fork at one end of the said lifting-beam, supporting-bars pivoted at one end to the said frame and provided with a longitudinal series of holes and a guide-eye at their free end, a radius-rod pivoted to the free end of the said bars and to the said lifting-beam, a flexible adjusting device having one end secured to the said mast and engaging with the said guide-eye and provided with a pin at its other end for engaging with the said holes, and a lifting device connected to the other end of the said lifting-beam.

7. In a hay-stacker, the combination, with a supporting-frame, of a lifting-beam pivotally supported by the said frame so that it may be raised and slued around, a fork at one end of the lifting-beam, a support carried by the said frame, a radius-rod, universal joints connecting the ends of the said radius-rod with the said support and lifting-beam respectively, and a lifting device connected to the other end of the said lifting-beam.

8. In a hay-stacker, the combination, with a supporting cross-bar, of a lifting-beam comprising two diverging bars which are pivoted to the said cross-bar, a fork connected to the front ends of the said bars, two bars arranged at an angle to the said diverging bars and having their rear ends secured together and their middle parts secured to the rear ends of the said diverging bars, and braces holding all the said bars rigidly connected.

9. In a hay-stacker, the combination, with a supporting-frame, of a lifting-beam pivotally supported by the said frame, a fork pivoted to one end of the said lifting-beam, a connection which normally prevents the said fork from moving downwardly on its pivot, and automatic trip mechanism which releases the said connection when the lifting-beam and fork are slued around.

10. In a hay-stacker, the combination, with a supporting-frame, of a vertical mast pivoted in the said frame, a lifting-beam pivoted to the said mast, a fork pivoted to one end of the said lifting-beam, a catch carried by and normally locked to the said mast, a connection between the said catch and fork, and a trip for releasing the said catch automatically when the said lifting-beam and fork are slued around.

11. In a hay-stacker, the combination, with a supporting-frame, of a vertical mast pivoted in the said frame and provided with a guide at its upper end, a lifting-beam pivoted to the said mast, a fork pivoted to one end of the said lifting-beam and provided with a projecting arm, a catch carried by and normally locked to the said mast, a flexible connection arranged between the said arm and catch and passing over the said guide, a spring which moves the said fork upwardly on its pivot, and a trip carried by the said frame and releasing the said catch automatically when the said lifting-beam and fork are slued around.

12. In a hay-stacker, the combination, with a supporting-frame, of a vertical mast pivoted in the said frame, a lifting-beam pivoted to the said mast, a fork pivoted to one end of the said lifting-beam, a guide slidable on the said mast, a connection between the said guide and fork, a spring which moves the said fork upwardly on its pivot, a stop for the said guide carried by the said mast, a catch pivoted to the said guide and normally locking it to the said mast, and a trip carried by the said frame and releasing the said catch automatically.

13. In a hay-stacker, the combination, with a supporting-frame, of a lifting-beam pivotally supported by the said frame so that it may be raised and slued around, a fork pivoted to one end of the said lifting-beam, a connection which normally prevents the said fork from moving downwardly on its pivot, a support carried by the said frame, a radius-rod pivoted to the said support and to the said lifting-beam, a lifting device connected to the other end of the said lifting-beam, and catch mechanism controlling the movement of the said connection and operated automatically to release the said connection and fork when the said fork has been raised and slued around by the said lifting device.

14. In a hay-stacker, the combination, with a supporting-frame, of a lifting-beam pivotally supported by the said frame, a fork pivoted to one end of the said lifting-beam, a single operating device connected to the other end of the said lifting-beam, guide mechanism between the said lifting-beam and frame

which constrains the said lifting-beam to slue around when it is raised by the said operating device, means for normally preventing the said fork from moving downwardly on its pivot, and trip mechanism which releases the said fork automatically when it has been raised and slued around.

In testimony whereof I have affixed my signature in the presence of two witnesses.

RALPH J. SPARKS.

Witnesses:
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M. R. JENKINS.