

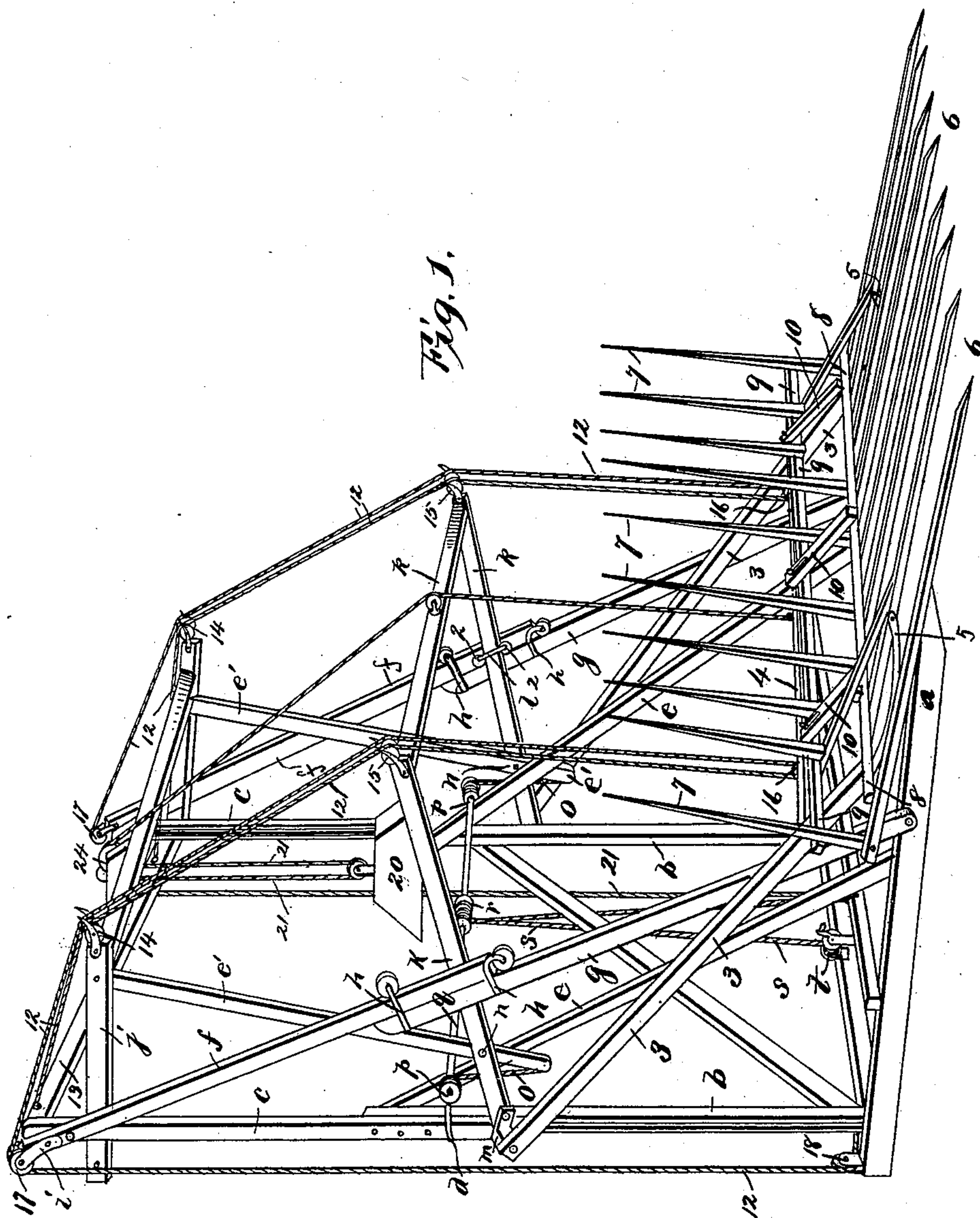
(No Model.)

3 Sheets—Sheet 1.

C. A. BLUME.  
HAY RICKER.

No. 486,751.

Patented Nov. 22, 1892.



WITNESSES:

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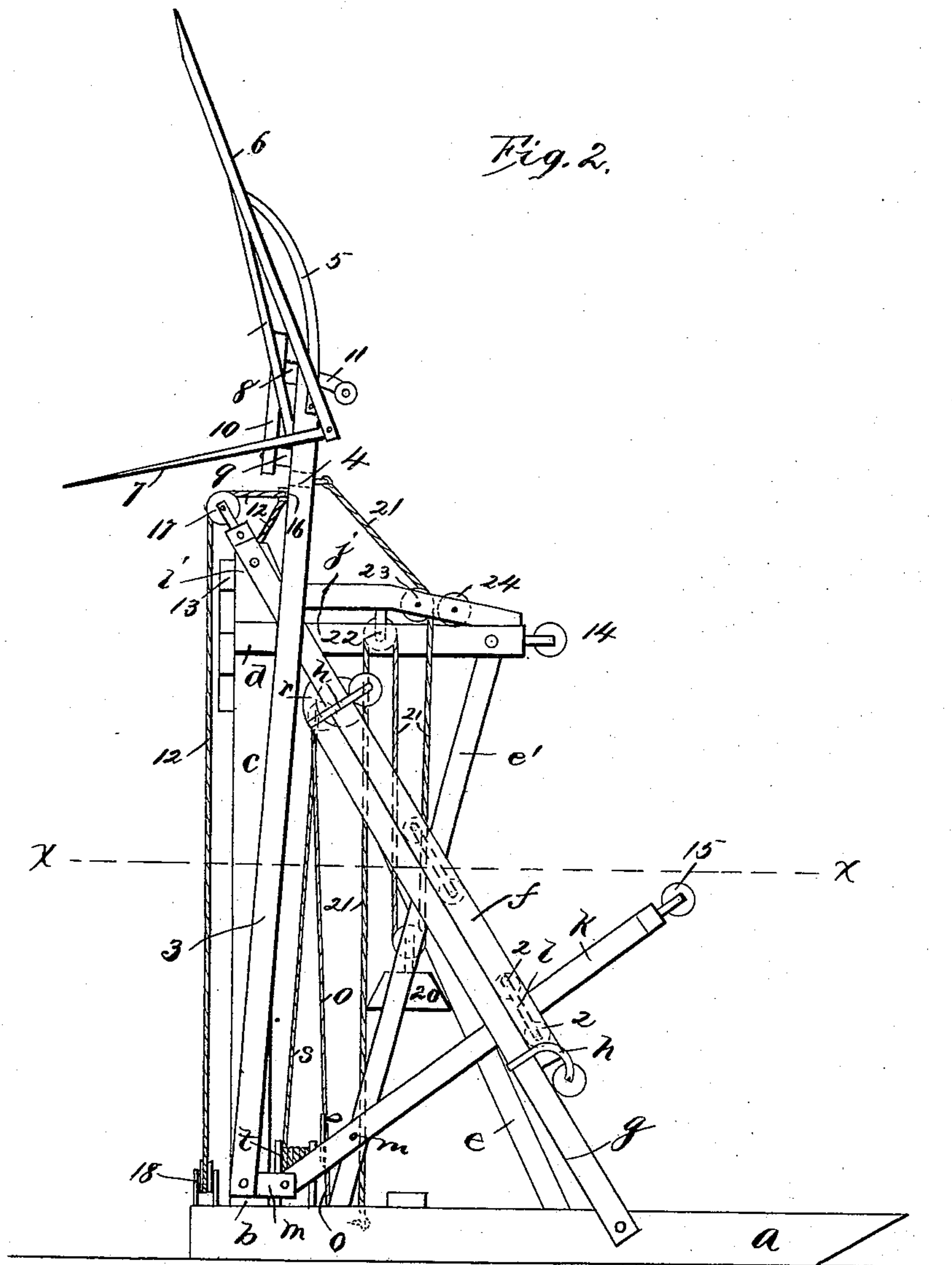
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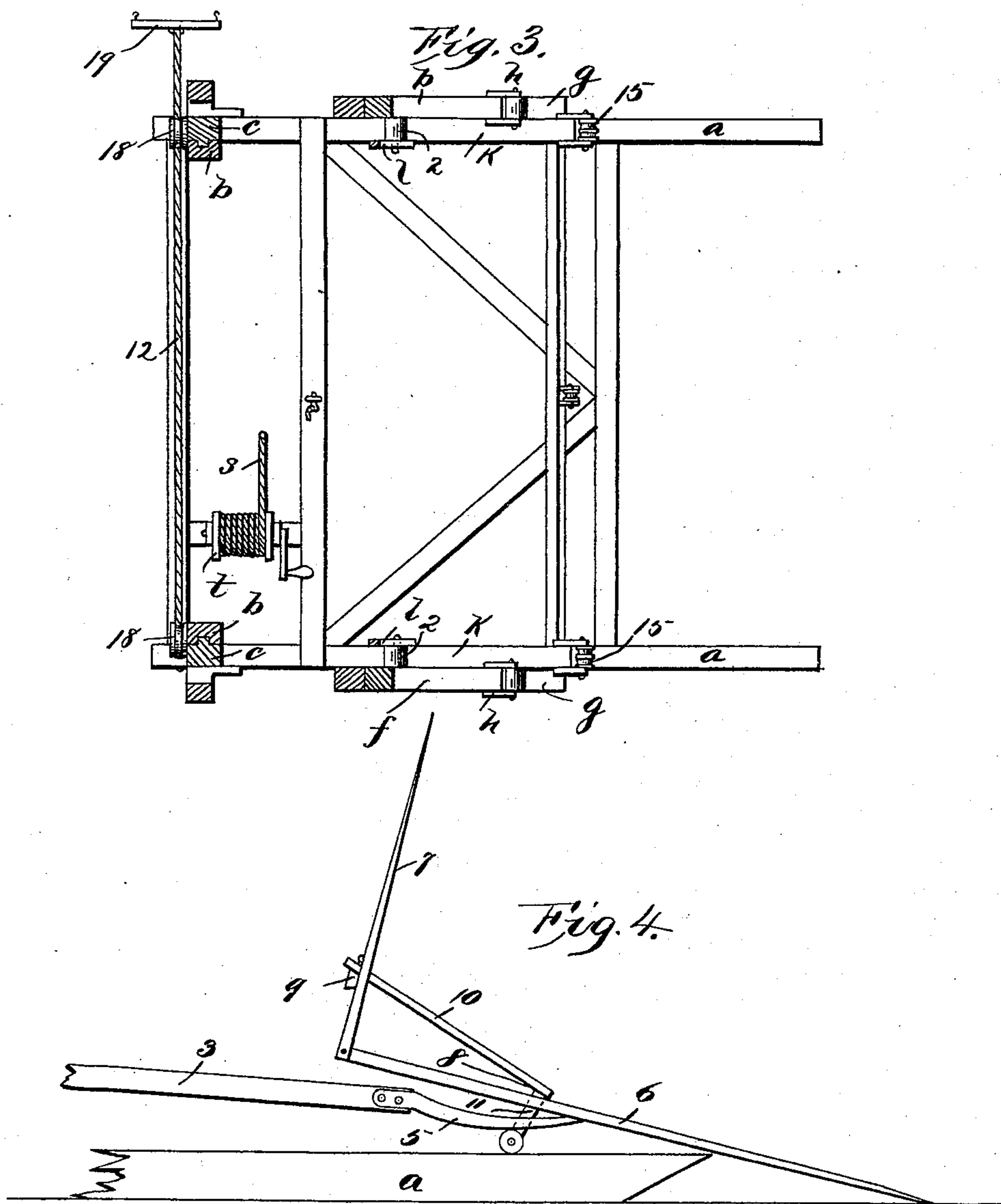
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# UNITED STATES PATENT OFFICE.

CHARLES A. BLUME, OF ATTICA, ASSIGNOR TO FREDERICK E. MINOR, OF COLFAX, INDIANA, AND OSCAR C. MINOR, OF GARDNER, ILLINOIS.

## HAY-RICKER.

SPECIFICATION forming part of Letters Patent No. 486,751, dated November 22, 1892.

Application filed April 29, 1892. Serial No. 431,135. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES A. BLUME, of Attica, in the county of Fountain and State of Indiana, have invented certain new and useful Improvements in Hay-Rickers; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form part of this specification.

This invention relates to certain improvements in hay-rickers.

The object of the invention is to provide an improved hay-ricker, exceedingly simple, cheap, and durable in construction, and which can be easily operated with a minimum amount of power, and which can be adjusted as the stack increases in height, so that the hay will not have a great distance to travel from the fork to the top of the stack and so that a stack of considerable height can be formed; and a further object is to provide certain improvements in the construction of detail parts whereby the operation and construction of the machine is improved.

The invention consists in certain novel features of construction and in combinations of parts more fully described hereinafter, and particularly pointed out in the claims.

Referring to the accompanying drawings, Figure 1 is a perspective of the machine, showing it adjusted to its full height and the elevating-fork in its lowered position to receive the load. Fig. 2 is a side elevation, the hay-fork being shown in its elevated position and the machine adjusted to its lowered position. Fig. 3 is a sectional view on line *x x*, Fig. 2. Fig. 4 is a detail view.

In the drawings, reference-letter *a* indicates two parallel runners, of suitable length and held the required distance apart by strong braces and cross-strips, so that said runners will be rigidly held in position against lateral independent twisting or play. An extensible vertical frame is rigidly secured to and carried by these runners or sills. This frame preferably consists of the two lower

vertical parallel beams *b*, at their lower ends rigidly secured to the runners and secured together and braced, and the upper beams *c* forming adjustable extensions of the beams *b*, and secured to the beams *b* by means of embracing rings or loops *d* and a tongue and groove, so that the beam *c* can slide longitudinally on the beams *b*, whereby the frame is rendered vertically extensible or adjustable. The beams *b* and *c* can be provided with registering apertures, so that the upper section of the frame can be held in the desired vertical adjustment by means of pins. Inclined braces *e* are rigidly secured at their lower ends to the runners and at their upper ends to the upper ends of the vertical rigid beams *b*. An extensible brace is provided for the upper vertical adjustable section of the vertical supporting-frame, composed of the sections *f g*, sliding longitudinally on each other, as shown, and held together by the straps and rollers *h*. The lower end of each lower section *g* is pivoted to the outer portion of its respective runner, and the upper end of the section *f* is pivoted to the upper end of its respective beam *c*.

*j* is a frame composed of two parallel beams rigidly secured together and extending outwardly and approximately horizontally from the upper portion of the beams *c*, to which the inner portions of the side beams of said frame *j* are secured. The outer end of this frame *j* is supported by the downwardly-extending braces *e'*, near their lower ends pivoted to a vertically-movable frame *k*, extending outwardly from the lower ends of said beams *c*, to which it is pivoted by means of a suitable casting *m*. The braces *e'* extend downwardly and inwardly from the outer end of frame *j* and are pivoted at *n* to the side bars of the frame *k* and extend a short distance below the said side bars of the frame *k*, where they are provided with suitable means for attaching the raising or hoisting cables *o*, which extend upwardly therefrom to two spools *p*, rigid on the shaft *q*, and mounted on and near the upper ends of the braces *e*, and this shaft *q* is provided with a central drum *r*, on which the rope *s* is secured, which extends down to the windlass *t*, mounted on



one of the cross-bars connecting the runners *a*. By this means the upper section of the vertical supporting-frame and the frames *j* and *k* and braces *e'* can be all raised or dropped to the desired adjustment for the purpose hereinafter described. The frame *k* extends outwardly at an angle between the braces *g* and *f*, and this frame is held in the proper position by the metal straps 1, secured to the sections *f* of the extensible braces and bracing the side beams of frame *k*, rollers 2 being provided to bear on the upper and lower edges of the side beams of the frame *k*.

3 is a vertical swinging frame carrying and hoisting the hay-fork and composed of the two parallel bars at their rear ends pivoted to the lower ends of the beam *c* of the vertical adjusting section of the supporting-frame, said beams 3 being preferably pivoted to the same casting *m* to which the frame *k* is pivoted, the bars 3 extending outwardly at the outer sides of the vertical supporting-frame and of the braces and other parts of the machine. These beams 3 are rigidly secured together by cross-bar 4, located a distance back from their outer free ends.

5 are outwardly and upwardly curved metal arms rigidly secured to the ends of the beams 3, and to the outer ends of which the hay-fork is pivoted to swing in a vertical plane. The hay-fork consists of the series of parallel main fingers 6, which when the hay-fork is lowered lie in an approximately-horizontal position to the supporting upwardly-extending fingers 7, extending approximately at right angles from the inner ends of the main fingers 6. The main fingers are rigidly secured together by the cross-bar 8, rigidly secured thereto on their upper sides a distance in front of their rear ends, and the upright fingers 7 are also secured together by the cross-bar 9, located above their lower ends, and the inner meeting ends of the fingers 6 and 7 are pivoted together, as shown, so that the angle between the two series of fingers 6 and 7 can be varied by means of the inclined braces 10, rigidly secured to one of the cross-bars 8 or 9, and provided with slots and bolts passing therethrough for clamping their opposite ends adjustably to the other cross-bar. The inclination of the series of fingers 7 can be varied, so that the hay can be held in the V-shaped fork if desired, or so that it will slide off more readily when the fork is in its elevated position. The cross-bar 8 can also, if desired, be provided with short arms 11, carrying rollers, which engage the front ends of the runners when the fork is in its lowered position, thereby holding the fork in the proper position to receive the load by tilting the fork so that the fingers 6 rest on the ground. Great advantages are obtained by pivoting the fork at the point in advance of the apex of the V-shaped fork, so that when the fork is loaded and its swinging frame begins to rise the fork immediately swings up into the proper position to hold the load be-

tween the two series of fingers, throwing cross-bar 9 against the bars 3, thereby holding the fork firmly in position, as when the bars 3 reach the perpendicular position the hay slides off of the series of fingers 7 onto the stack, and when the bars 3 swing down the series of fingers 6 drop down upon the ground in position to receive the load. The fork thus assumes automatically its proper position throughout its operation. The fork and its swinging carrier are controlled by the ropes 12 at their upper ends, secured to the cross-bar 13 of the vertically-adjustable supporting-frame, and from thence extending downward over pulleys 14, carried by the outer end of frame *j*, and pulleys 15, carried by the outer end of frame *k*, to and around pulleys 16, carried by cross-bar 4 of the swinging carrier, to the fork, and from thence upwardly from the outer ends of frames *k* and *j* to pulleys 17, mounted at the top of the vertical adjustable supporting-frame, and thence passing down to the runners and under pulleys 18, secured thereto to the singletree 19, to which the horse is attached. Thus when the horse draws out of the lower end of the cable the swinging carrier and fork are elevated by means of the cables, and as the carrier swings upwardly the cables leave the pulleys 15 at the outer end of the frame *k*, and when the carrier is moved up two-thirds of its distance the cables leave the pulleys 14. The strain is then sustained by the pulleys 17 at the upper end of the vertical supporting-frame, and when the cable is slackened the swinging carrier descends and the cables take their proper position on the pulleys 14 and 15. A suitable counterweighting device is provided for the swinging carrier and the fork, consisting of weight 20, supported by cable 21 at one end, secured to a cross-bar connecting the runners, from thence extending up over pulley 22, carried by frame *j*, and thence extending down under a pulley carried by the weight 20, and from thence upwardly between the two pulleys 23 and 24, and from thence to the cross-bar 4 of the swinging frame, to which it is secured, so that when the swinging carrier and fork are lowered the weight 20 is elevated and the cable 21 passes over pulley 24, and when the carrier and fork are in their elevated position the weight 20 is lowered and the cable 21 passes over the pulley 23. This counterweighting device equalizes the action of the swinging carrier and its fork, so as to reduce the force necessary to raise the loaded fork.

The counterweight assists the swinging carrier or frame in its upward movement until it reaches such a height that the cable 21 passes from pulley 24 to pulley 23. The weight is then raised by its cable, so that the carrier will be quickly and automatically started on its return, when the load is discharged and the controlling-cables slackened. The weight draws the carrier forward and down until



cable 21 passes from pulley 23 to pulley 24, after which point is reached the downward movement of the carrier raises the weight, whereby all movements of the swinging carrier are equalized. As the swinging carrier or frame is in a perpendicular position when the fork discharges its hay, some force is required to start it in its return or downward movement.

When the stack is first begun, the vertical adjustable supporting-frame is located at its lower point of adjustment and the fulcrum of the swinging carrier of the fork is near the ground, as shown in Fig. 2, the other parts occupying corresponding positions. When the stack has been built up so that the fork does not reach high enough, the vertical supporting-frame is raised to the desired point by the windlass *t* and ropes *o* and shaft *g*, thereby raising the frame *j* and *k* and their respective guide-pulleys, and also raising the fulcrum of the swinging carrier of the fork. This operation is continued until the vertical supporting-frame is adjusted to its full height, at which adjustment the fulcrum of the swinging carrier is located at the upper ends of beams *b*, and the fulcrum can reach to a considerable height, which is twenty feet in the machine of standard size.

It should be observed that when the fulcrum of the swinging carrier is lifted the other parts are correspondingly elevated, so that the guide-pulleys for the controlling-cables are always in the proper position, no matter what the adjustment of the machine, and the upper end of the vertical adjusting supporting-frame is always braced, whatever the adjustment.

Great advantages are attained by the curved metal extension-arms 5, on and between which the fork freely swings. This is a feature of importance in a vertically-adjustable stacker, as the fork automatically adjusts itself and the teeth will always lie close and flat on the ground, whatever the vertical adjustment of the machine. As the fork is pivoted to said arms at a distance outwardly from the apex of the fork, the weight is thrown toward or nearer the fulcrum of the swinging frame than if the fork was secured at its apex, whereby a minimum amount of power is required to raise the fork.

The many and great advantages of the apparatus are obvious without further explanation, and it is evident that various changes and variations might be resorted to in the forms, constructions, and arrangements of the parts described without departing from the spirit and scope of my invention. Hence I do not desire to limit myself to the construction herein set forth, but consider myself entitled to all such changes and modifications as fall within the spirit and scope of my invention.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In a hay-ricker, the combination, with a vertical supporting frame, of the swinging car-

rier fulcrumed to said frame and vertically adjustable therewith at its fulcrum-point, the hay-fork carried by said carrier, and operating means, substantially as set forth.

2. A hay-ricker provided with the swinging fork-carrier provided with a vertically-adjustable fulcrum, and cables for swinging the carrier, provided with guide-pulleys carried by movable supports, substantially as set forth and described.

3. A hay-ricker provided with the vertical adjustable supporting-frame, guide-pulleys carried thereby, the swinging carrier fulcrumed to and vertically adjustable with said frame at its fulcrum, the hay-fork carried by said carrier, and cables for swinging said carrier, passing over said pulleys, combined substantially as described and set forth.

4. A hay-ricker having the swinging carrier provided with a vertically-adjustable support and fulcrum, substantially as described.

5. A hay-ricker having the swinging hay-fork carrier, controlling-cables for operating the carrier, and a vertically-adjustable support carrying said carrier and provided with guide-pulleys for said cable, substantially as described.

6. In a hay-ricker, the combination of the extensible vertical frame, a support therefor, the swinging frame fulcrumed to and vertically adjustable with said vertical frame, the hay-carrier carried by said swinging frame, cables for operating said swinging frame, passing over pulleys carried by said vertical frame, and a counterweight device for equalizing the movements of and starting the swinging frame in its downward movement.

7. In combination, the runners, the vertically-extensible supporting-frame extending up therefrom, extensible braces therefor from the runners, outwardly-extending frames pivoted to said extensible frame and carrying guide-pulleys, the vertically-swinging frame fulcrumed to and vertically adjustable with said extensible frame, a hay-carrier carried by said swinging frame, and controlling-cables for the swinging frame, passing over said guide-pulleys, substantially as described.

8. In combination, a support, the rigid vertical frame, the vertical vertically-adjustable frame supported by and confined to the rigid frame, a windlass and cables for adjusting the adjustable frame, guide-pulleys carried by the adjustable frame, the swinging frame at its inner end fulcrumed to the adjustable frame, the pivoted fork carried by the outer end of the swinging frame, and controlling-cables for the swinging frame, passing up over the adjustable frame and the pulleys thereof, substantially as described.

9. In combination, the runners, the vertical rigid frame secured thereto, the vertically-adjustable frame confined to and adjustable on the rigid frame, the inclined extensible braces pivoted to the runners and said adjustable frame, having their sections loosely confined together, so as to slide longitudinally on each



other, means, substantially as described, for adjusting the adjustable frame, the vertically-swinging frame pivoted to the adjustable frame and carrying the hay-carrier, and  
5 operating means, substantially as described, for the swinging frame.

10. In a hay-ricker, a base or support, a rigid vertical frame, a vertically-adjustable frame confined thereto and provided with extensible braces, cable-guiding frames pivoted to and extending outwardly from said adjustable frame, the lower pulley-guiding frame being loosely supported by said extensible braces, the braces supporting the upper guide-  
15 frame, hoisting-cables secured to the lower ends of said last-mentioned braces, the windlass mounted in said rigid frame to receive said cables and raise and lower the adjustable frame, and the swinging fork-frame carried by said adjustable frame and provided with one or more operating-cables, combined as set forth.

11. In a hay-ricker, the vertically-adjustable supporting-frame provided with the vertically-swinging fork-carrying frame fulcrumed thereto and having the outwardly-extending cable-guiding frames for the operating-cables of said swinging frame, said swinging and guide frames being movable with the  
25 adjustable frame.

12. A support, the vertically-adjustable vertical frame, and the outwardly-extending cable-guide frame pivoted to said adjustable frame and provided with supports loosely holding them, in combination with the vertically-swinging frame pivoted to said adjustable frame and carrying the hay-fork and the operating-cables therefor, substantially as described.

40 13. The vertically-swinging frame, in combination with the V-shaped fork pivotally jointed to the free end of said frame beyond the apex of the fork, so that the center of

gravity of the fork when loaded is beneath or inwardly from said pivotal points, substantially as described.

14. The vertically-swinging frame, in combination with the V-shaped fork composed of the two series of fingers joined at their inner ends, said fork being pivoted to the free  
50 end of the frame at a distance beyond the inner ends of the fingers, so that the meeting points of the fingers are located over the frame, as set forth.

15. The swinging frame having the outer  
55 ends of its beams provided with the outwardly-extending upwardly-curved arms, in combination with the fork composed of the two series of fingers joined together at their inner ends, said fork being pivotally joined to  
60 said arms at a distance from the inner ends of the fingers, so that the fork will rest against said frame, substantially as described.

16. The swinging frame having the outwardly-extending arms, in combination with  
65 the fork composed of the series of main fingers secured together, the series of upwardly-extending fingers secured together and to the inner ends of the main fingers, the fork being pivoted to said arms at points a distance  
70 outwardly from the inner ends of their main fingers, and the stop-arms carrying rollers, substantially as described.

17. The swinging frame, in combination with the V-shaped fork pivoted thereto and  
75 composed of the two series of fingers pivoted together at their inner ends and adjustably secured so that their angles can be varied, as set forth.

In testimony that I claim the foregoing as  
80 my own I affix my signature in presence of two witnesses.

CHARLES A. BLUME.

Witnesses:

I. E. SCHOONOVER,  
ALBERT SCHOONOVER.