J. H. COPE.

HAY STACKER.

APPLICATION FILED APR. 6, 1909.

924,534.

Patented June 8, 1909.

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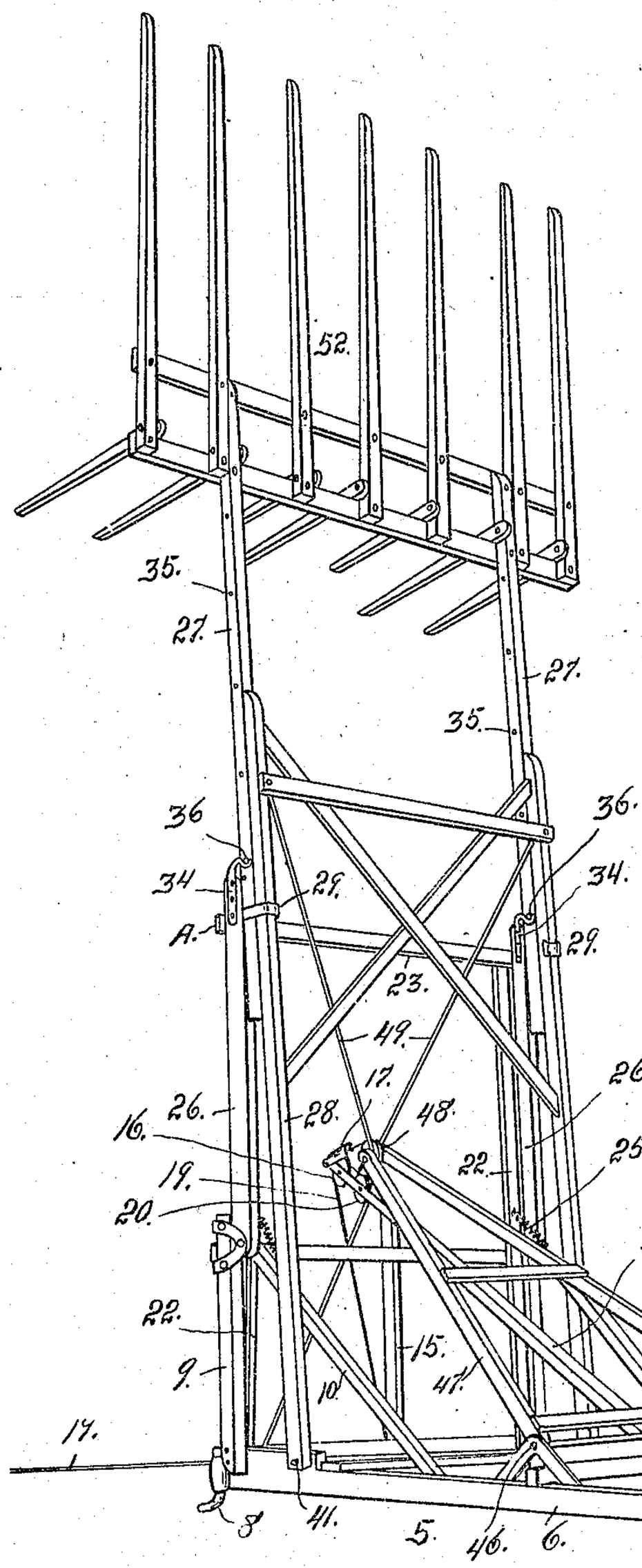

Fig. 1

Witnesses
Otto E. Hoddick
F. E. O'Brien

Inventor
Joseph H. Cope.
By H. G. Underwood
Attorney

J. H. COPE.

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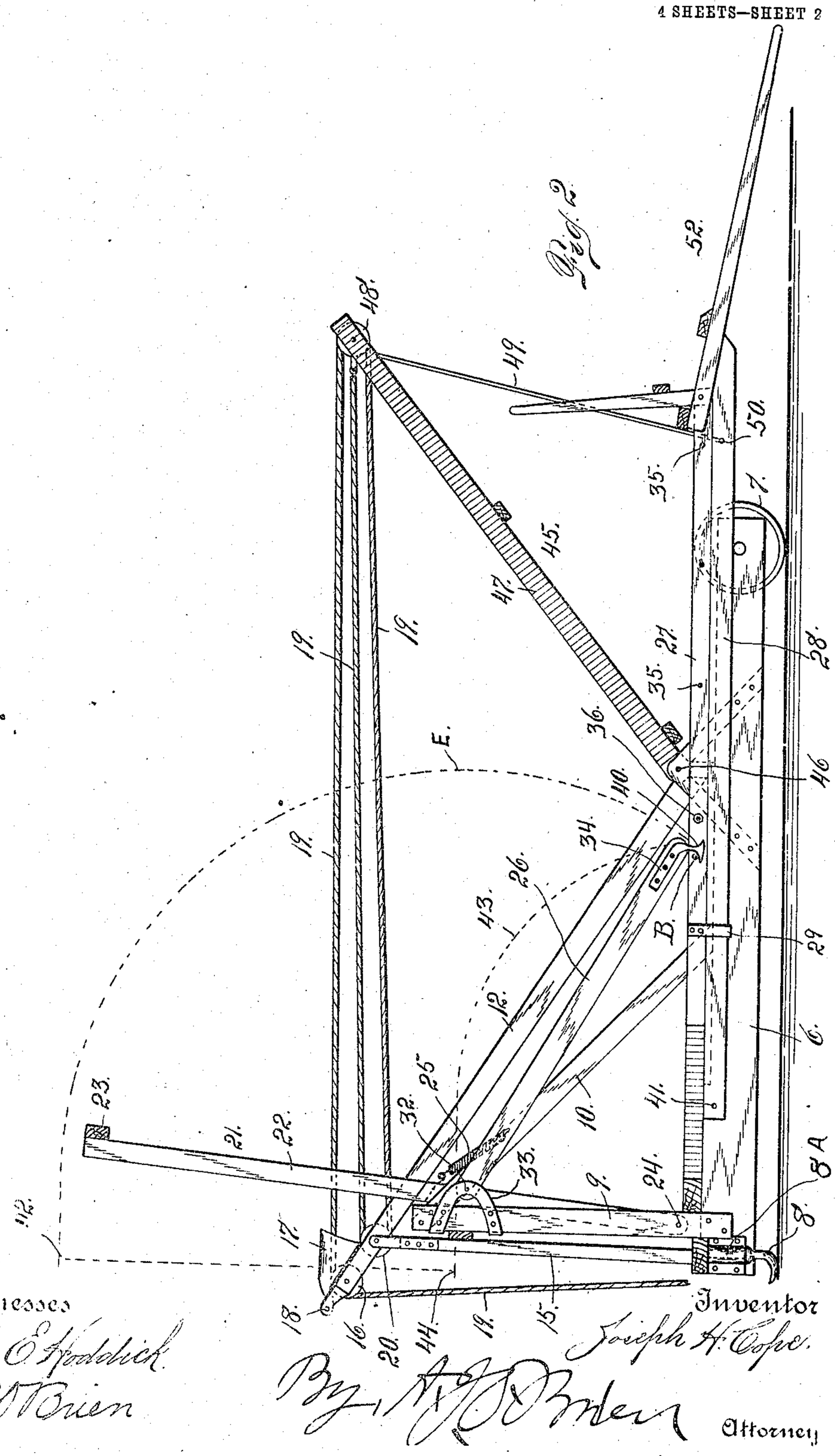
4 SHEETS—SHEET 2



Witnesses

Otto E. Hodelich.

P. E. O'Brien

Inventor

Joseph H. Cope.

By A. E. O'Brien Attorney

J. H. COPE.

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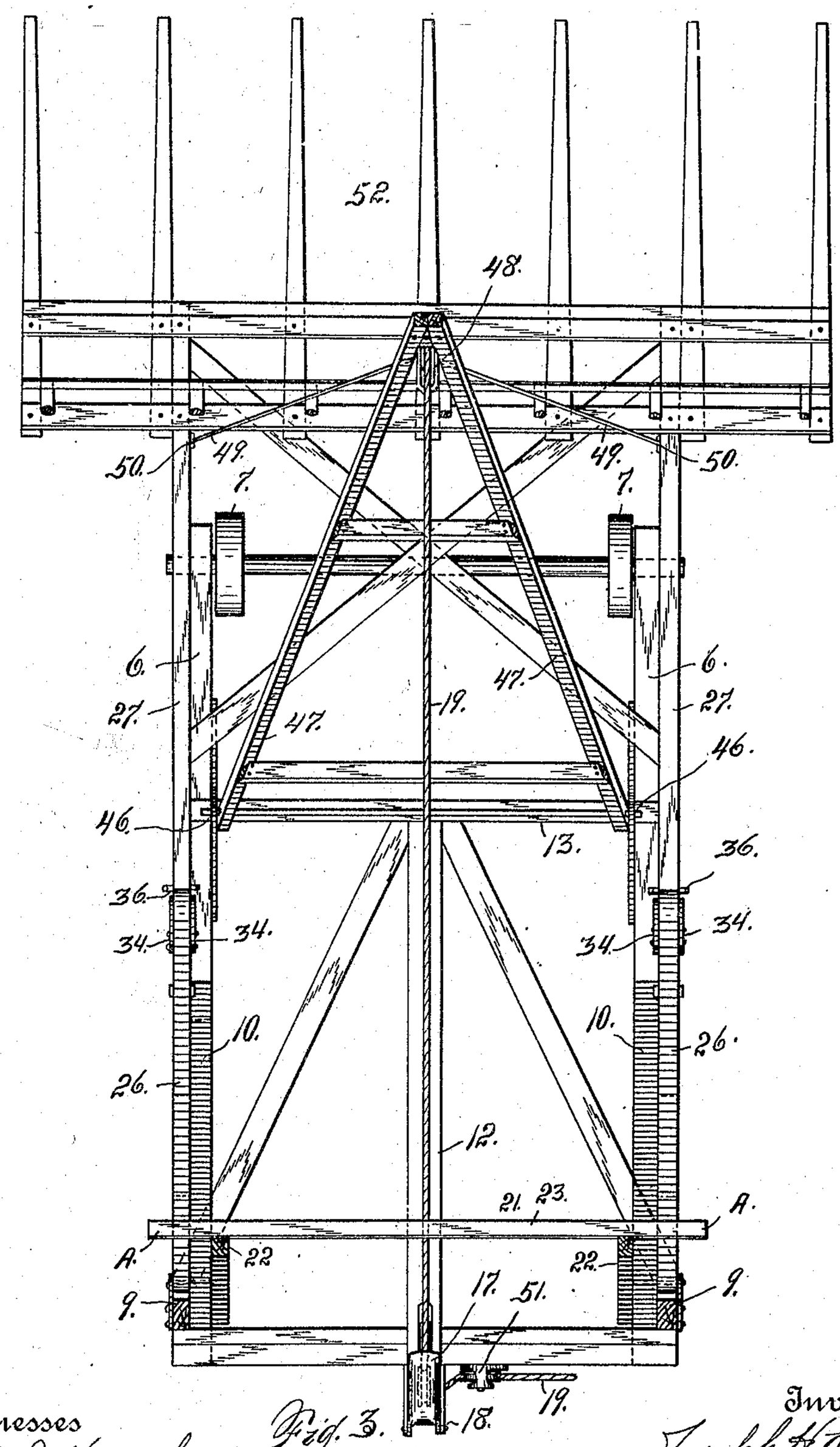

Fig. 3.

Witnesses

Otto E. Hoddick.

H. C. O'Brien

Inventor

Joseph H. Cope

By H. P. & R. D. Boden Attorney

J. H. COPE.

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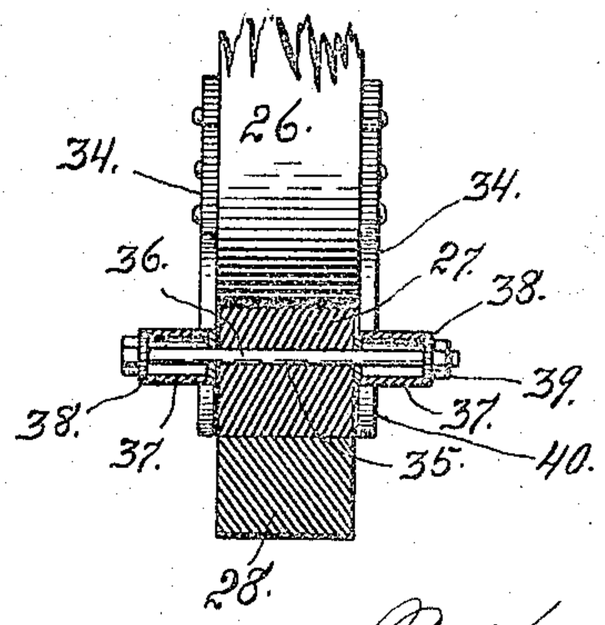

Fig. 6.

Fig. 5.

Fig. 4.

Witnesses

Otto E. Hoddick.

H. C. Brown

Inventor

Joseph H. Cope.

By Wright Brown & Quinby

Attorneys

UNITED STATES PATENT OFFICE.

JOSEPH H. COPE, OF WINDSOR, COLORADO.

HAY-STACKER.

No. 924,534. Specification of Letters Patent. Patented June 8, 1909.

Application filed April 6, 1908. Serial No. 425,391.

To all whom it may concern:

Be it known that I, JOSEPH H. COPE, a citizen of the United States, residing at Windsor, in the county of Weld and State of Colorado, have invented certain new and useful Improvements in Hay-Stackers; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in hay stackers, my object being to provide an improved extension arm construction whereby as the stacker head is lifted, it may be simultaneously extended or elevated or not as may be desired.

In my Patent No. 701;257, dated May 27th, 1902, the general construction is disclosed and covered, whereby the stacker head is provided with bars slidably connected with the lifting frame, the said bars of the head being connected with links, the opposite extremities of the links being pivotally connected to the stationary frame at a point above the pivoted point of the lifting frame. In my improved construction the so called links or extension arms are arranged to slide upon the bars of the stacker head if it is not desired to extend or elevate the head during the lifting operation, which is the case when the stack is low. However, as the stack rises and it becomes necessary to lift the hay or other material higher, pins detachably connected with the bars of the stacker head are inserted in holes formed in the said bars, each of the latter being provided with a series of holes for this purpose. In this event the pins form stops for the extension arms at any desired point, thus controlling the degree of lift or rise given the stacker head during the upward movement of the lifting frame. In my improved construction I also employ an A-shaped lever arm or lever-like device pivotally connected at one extremity with the stationary frame, while its opposite extremity is connected with the lifting frame by means of rods or other suitable devices whose extremities are pivoted to the connected parts. These rods support the A-shaped lever arm at a suitable angle when the stacker head is at its lowest limit of movement. At the outer extremity of the said lever arm is located a pulley around which the lifting cable passes after passing around a pulley at the rear extremity of the stationary frame. As the stacker head is elevated with the lifting frame with which it is slidably connected, the said lever arm swings rearwardly as the cable shortens between the said forward and rearward points of engagement. The movement of the lever arm carries the lifting frame with it, whereby the latter is elevated for the purpose of raising the load carried by the stacker head.

Having briefly outlined my improved construction, I will proceed to describe the same in detail reference being made to the accompanying drawing in which is illustrated an embodiment thereof.

In this drawing, Figure 1 is a perspective view of a hay stacker equipped with my improvements showing the stacker head in the elevated position. Fig. 2 is a side elevation showing the stacker head in the lowermost position. Fig. 3 is a top plan view of the same. Fig. 4 is a side elevation showing the stacker head just before it reaches its upward and rearward limit of movement. Fig. 5 is a fragmentary elevation showing the outer extremity of one of the extension arms, in operative relation with the lifting frame and the slidable arms of the stacker head, the parts being shown on a larger scale. Fig. 6 is a section taken on the line 6—6 Fig. 5.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate the stationary frame which as shown in the drawing is composed of parallel separated bottom bars 6 having wheels 7 at their forward extremities to facilitate the movement of the stacker from place to place. This frame is also provided in the rear with caster shoes 8 which are pivoted in bearings 8^a, whereby the said shoes are adapted to swing to harmonize with the direction of movement of the stacker when the same is being hauled from place to place. The wheels 7 also support the forward part of the stationary frame sufficiently above the ground, to allow the teeth of the sweep rake, after passing between the teeth of the stacker head, to pass below the forward extremity of the stationary frame. In the absence of the wheels 7 or other suitable supporting means, the teeth of the rake are liable to strike the forward extremity of the stationary fraime, resulting in breaking the teeth while loading

the stacker head. The stationary frame is also provided with upwardly-projecting rearwardly located bars 9 together with braces 10, one being located on each side; and a centrally located inclined bar 12 whose forward extremity is rigidly secured to a cross bar 13 of the frame. This bar 12 extends rearwardly and upwardly from the bar 13, its rear extremity being supported by an upright bar 15. At the rear extremity of the bar 12 is mounted a pulley 16 protected by a housing 17 pivoted to the bar 12 at 18, so that as the stacker head rises, this housing may adjust itself to harmonize with the position of the cable 19. The housing 17 protects the pulley 16 from the hay or other material to be stacked, whereby the said material is prevented from catching on the pulley and interfering with its proper operation in connection with the cable. Slightly forward of the pulley 16, the pulley 20 is also mounted on the bar 12.

Upon the rear extremity of the stationary frame is mounted a rectangular frame 21 composed of upwardly projecting bars 22 and a transverse bar 23 attached to their upper extremities. The lower extremities of the bars 22 are pivotally connected with the frame work as shown at 24. This frame 21 is yieldingly connected with the stationary frame by coil springs 25 which normally hold it at its forward position (see Figs. 1 and 4) whereby as the stacker head is raised, the extension arms 26 come in contact with the cross bar 23 and form a stop which while yielding to prevent unnecessary concussion or jar, at the same time checks the rearward movement of the stacker head with sufficient suddenness to give the material upon the head a rearward impetus due to the acquired momentum, whereby the said material is readily discharged from the head and thrown upon the stack. The recoil of the springs connected with the buffer frame, also gives the stacker head and its connections a forward impetus after the discharge of the material from the said head, whereby the latter is thrown forward of a vertical position thus facilitating its downward movement. It will be noted that the transverse bar 23 projects beyond the stationary bottom side bars 6, as shown at A, thus bringing these extensions within the path of the extension arms 26, the bars 27 of the stacker head, and the bars 28 of the lifting frame. These bars 27 of the stacker head are slidably connected with the bars 28 of the lifting frame, by means of U-shaped keepers 29 secured to the bars 27 as shown at 30 and passing around the bars 28 as shown at 31. The parts 31 are arranged to slide freely on the bars 28 for a purpose hereinafter more fully explained.

The extension arms 26, are pivotally connected at 32 with brackets 33 mounted on the upper portions of the upright bars 9. Their outer extremities or those remote from the pivots 32, are each provided with irons 34 one on each side which extend beyond the arm and engage a bar 27 of the stacker head on opposite sides. Each bar 27 is provided with a series of openings 35 adapted to receive a bolt or pin 36 having sleeves 37 applied to its opposite extremities beyond the bar 27. These sleeves are held in place by washers 38 interposed between the head of the bolt at one extremity and a fastening nut 39 at the opposite extremity. These sleeves 37 form stops or bearings for the projecting extremities 40 of the irons 34, whereby when the bolt is inserted in a proper opening, the stacker head may be elevated to any desired height within reasonable limits during the upward movement of the lifting frame. Or if the pin is left out altogether, the extensions of the irons 34, simply slide upon the bars 27 without changing their relative position on the bars 28 of the lifting frame which are pivoted on the stationary frame as shown at 41.

The advantage of the employment of the extension arms 26, while raising the load on the stacker head is illustrated in Fig. 2. By referring to this figure, if it be assumed that the stop bolts 36 are in the position indicated in Figs. 2 and 3, it will be understood that during the upward movement of the lifting frame the extremities 40 of the irons 34 will travel in the dotted arc E, thus causing the bolt 36 of each bar 27, to travel in the same or approximately the same arc. Hence when the lifting frame is at its upward limit of movement, the pin 36 will occupy a position approximately indicated by the point 42, whereas, if the extension arms were not employed, the pin 36 remaining relatively stationary with the arms of the lifting frame, would travel in an arc 43 in which event when the lifting frame is at its upward limit of movement, the pin would occupy a position at a point 44 approximately, thus indicating that by reason of the extension arms, the stacker head has been raised during its upward and rearward travel, a distance equal to the vertical distance between the points 44 and 42. By putting the pin or bolt 36 in one of the openings 35 farther removed from the pivotal point 41 of the lifting frame, the stacker head will be moved upwardly a less distance; while leaving the stop pin or bolt out altogether, the stacker head will remain relatively stationary on the lifting frame during its upward and rearward travel.

Attention is called to the fact that the arc 43 is obtained by using a radius equal to the distance between the pivoted point 41 and the pin 36 referring to Fig. 2; while the arc 41 is obtained by using a radius equal to the distance from the pivoted point 32 to the pin 36 referring to the same figure.

The A-shaped lever-like device heretofore referred to, which is designated 45, is pivotally connected with the stationary frame as shown at 46. This device is composed of side bars 47 whose outer extremities approach each other and between them is pivotally mounted a pulley 48. The outer extremity of this device is connected with the respective bars 28 of the lifting frame, by rods 49, the extremities of these rods being pivoted to the connected parts, to allow the various elements to move in harmony when the stacker is in use. The said rods are connected with the bars 28 of the lifting frame at points 50, while their opposite extremities are connected with the A-shaped device at the apex or outer extremity of the latter.

When the apparatus is in use, the lifting cable 19 has power applied to one extremity to which a horse may be attached. This cable passes under a pulley 51 attached to the rear part of the machine, and thence upwardly around the pulley 16 (see Fig. 2) and thence forwardly around the pulley 48, and thence rearwardly passing around the pulley 20, and thence forwardly where it is attached to the outer extremity of the A-shaped device 45. Now as the power is applied to the free extremity of this cable, assuming that the structure is in the position shown in Fig. 2 whereby the stacker head 52 is at its lowest limit of movement, a pull on the cable will gradually shorten its lengths, between the two pulleys 16 and 20 in the rear, and the pulley 48 in front. During this shortening operation, the A-shaped device will move rearwardly, carrying the lifting frame and the stacker head therewith by virtue of the construction heretofore described. During this operation, assuming that the irons 34 of the extension arms 26, are in engagement with the pins 36 at the beginning of the operation, the arms 27 together with the stacker head, will be moved on the lifting frame approximately the distance between the points 44 and 42 (see Fig. 2) while the lifting frame is traveling upwardly and rearwardly to its limit of movement: while if the pins 36 are in other openings 35 of the bars 27 farther removed from the axis of the lifting frame, the relative movement of the bars 27 upon the corresponding bars of the lifting frame, will be lessened to a corresponding degree, during the same operation.

Nearer the pivotal point 41 of the lifting frame than any of the openings 35, the arms 27 are provided with stops B which lie in the path of the irons 34 during the downward movement of the lifting frame, whereby the arms 27 are caused to return to their normal position by the time the lifting frame and its attachments reach their lowest limit of movement.

Having thus described my invention, what I claim is:

1. In a stacker, the combination with a relatively stationary frame, of a lifting frame hinged or pivoted thereon, a head having bars slidably connected with the lifting frame, and arms or links slidably connected with the rigid head bars at one extremity and pivotally connected with the stationary frame at the opposite extremity at a point above the pivotal point of the lifting frame, and devices connected with the head bars and adapted to occupy positions in the path of the sliding extremities of said links or arms, substantially as described.

2. In a stacker, the combination with a relatively stationary frame, of a lifting frame pivoted thereon, a head having bars slidably connected with the pivoted frame, and links or arms having irons slidably connected with the rigid head bars at one extremity and pivotally connected with the stationary frame at their opposite extremities, at points above the pivoted point of the lifting frame, the said head bars being provided with stops lying in the path of the said irons of the links or arms, substantially as described.

3. In a stacker, the combination with a relatively stationary frame, of a lifting frame pivoted thereon, a head having bars slidably connected with the pivoted frame, the said bars being provided with a number of openings, stops detachably connected with the bars whereby they may be inserted in any of the said openings, and links or arms slidably connected with the rigid head bars at one extremity and pivotally connected with the stationary frame at the opposite extremity, whereby the sliding extremities of the links are adapted to engage the stops of the head bars, substantially as described.

4. In a stacker, the combination with a stationary frame, of a lifting frame pivoted thereon, a head having bars slidably connected with the pivoted frame and provided with a series of openings, pins adapted to be inserted in the openings of the said bars and arranged to protrude beyond the said bars, and links or arms pivotally connected with the stationary frame at one extremity at a point above the pivoted point of the lifting frame, the opposite extremities of the said arms being provided with devices projecting into the path of the stops of the head bars during the travel of the said arms during the lifting operation, the head bars also having other stops located in the opposite direction from the first named stops, whereby the devices of the said arms will engage the other stops during the return or downward movement of the pivoted frame, and cause the sliding head bars to return to their normal position.

5. In a stacker, the combination with a

stationary frame, of a lifting frame pivotally connected therewith, a head having bars slidably connected with the lifting frame, and links slidably connected with the head bars at one extremity and pivotally connected with the stationary frame at their opposite extremities, a lever-like device pivotally connected with the stationary frame at one extremity, a connection between the opposite extremity of the lever-like device and the lifting frame, the lever-like device having its outer extremity in a forward position when the lifting frame is at its lowest limit of movement, and a hoisting cable having one extremity madefast to the outer extremity of the lever-like device, and means located at the rear extremity of the stationary frame for guiding the said cable, whereby a pull on the cable causes the lever-like device to swing rearwardly whereby the lifting frame is caused to rise, substantially as described.

6. In a stacker, the combination with a relatively stationary frame of a lifting frame pivotally connected with the stationary frame, means for raising the lifting frame, and a buffer frame projecting upwardly from the rear extremity of the stationary frame and having its lower extremity pivotally connected with the stationary frame.

7. In a stacker, the combination with a relatively stationary frame, of a lifting frame pivoted thereon, a head having bars slidably connected with the pivoted frame, and links or arms slidably connected with the head bars at one extremity and pivotally connected with the stacker at their opposite extremities.

8. In a stacker, the combination with a relatively stationary frame, of a suitable support, a head having bars slidably connected with said support, and links slidably connected with the head bars at one extremity and pivotally connected with the stationary frame at their opposite extremities.

9. In a stacker, the combination with a relatively stationary frame, of a lifting frame, and a yieldingly held buffer frame including bars projecting upwardly from the rear end of the stationary frame, and a cross bar connecting the upper ends of the first named bars, and adapted to engage the lifting frame as the latter approaches the limit of its upward stroke.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH H. COPE.

Witnesses:
DENA NELSON,
ALODIA HUTCHISON.