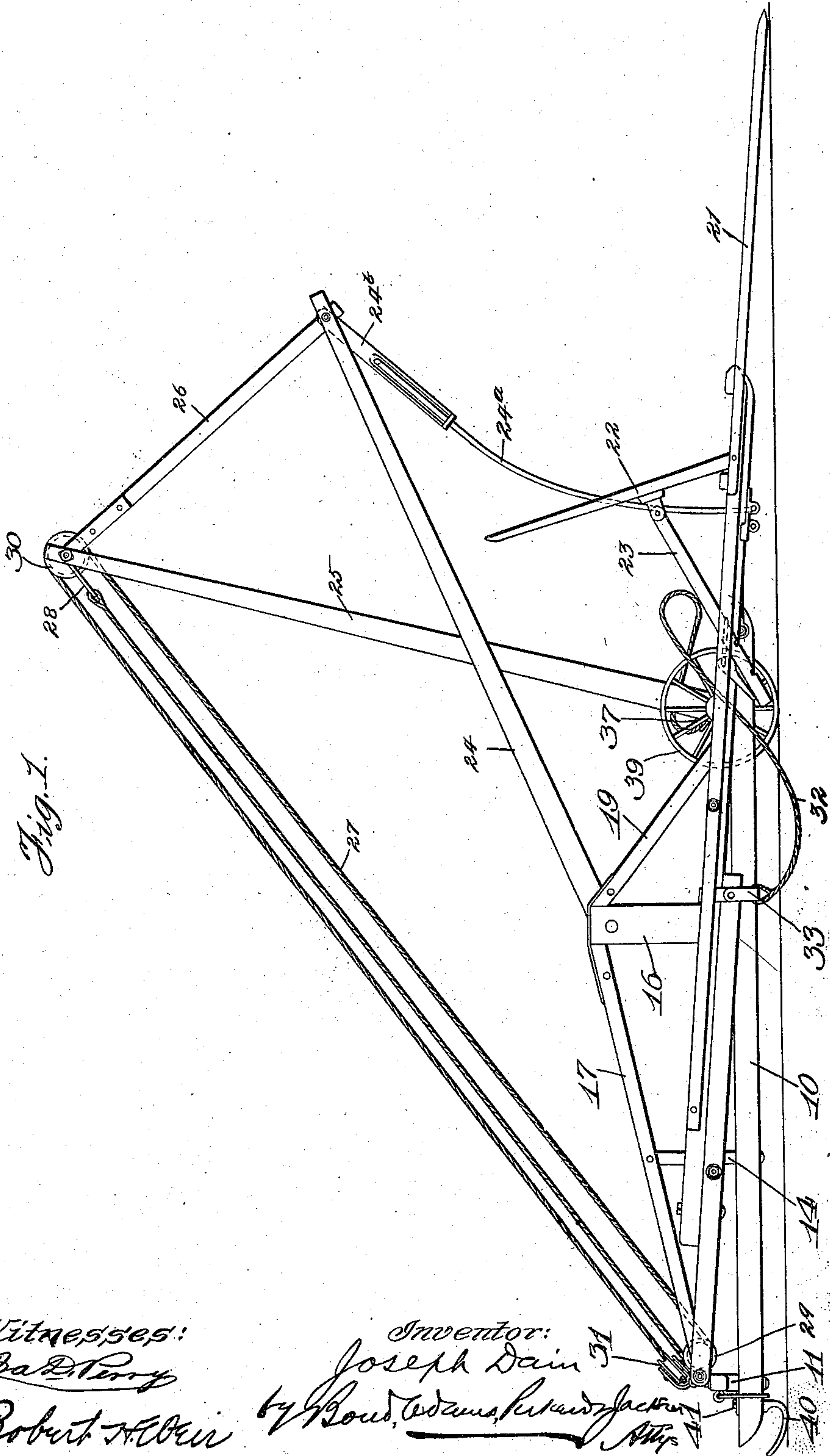


No. 840,477.

PATENTED JAN. 8, 1907.

J. DAIN.
HAY STACKER.
APPLICATION FILED OCT. 30, 1905.

3 SHEETS—SHEET 1.



Witnesses:

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Robert H. Orr

Inventor:

Joseph Dain

by Roud. Adams, Esq. Attorney

No. 840,477.

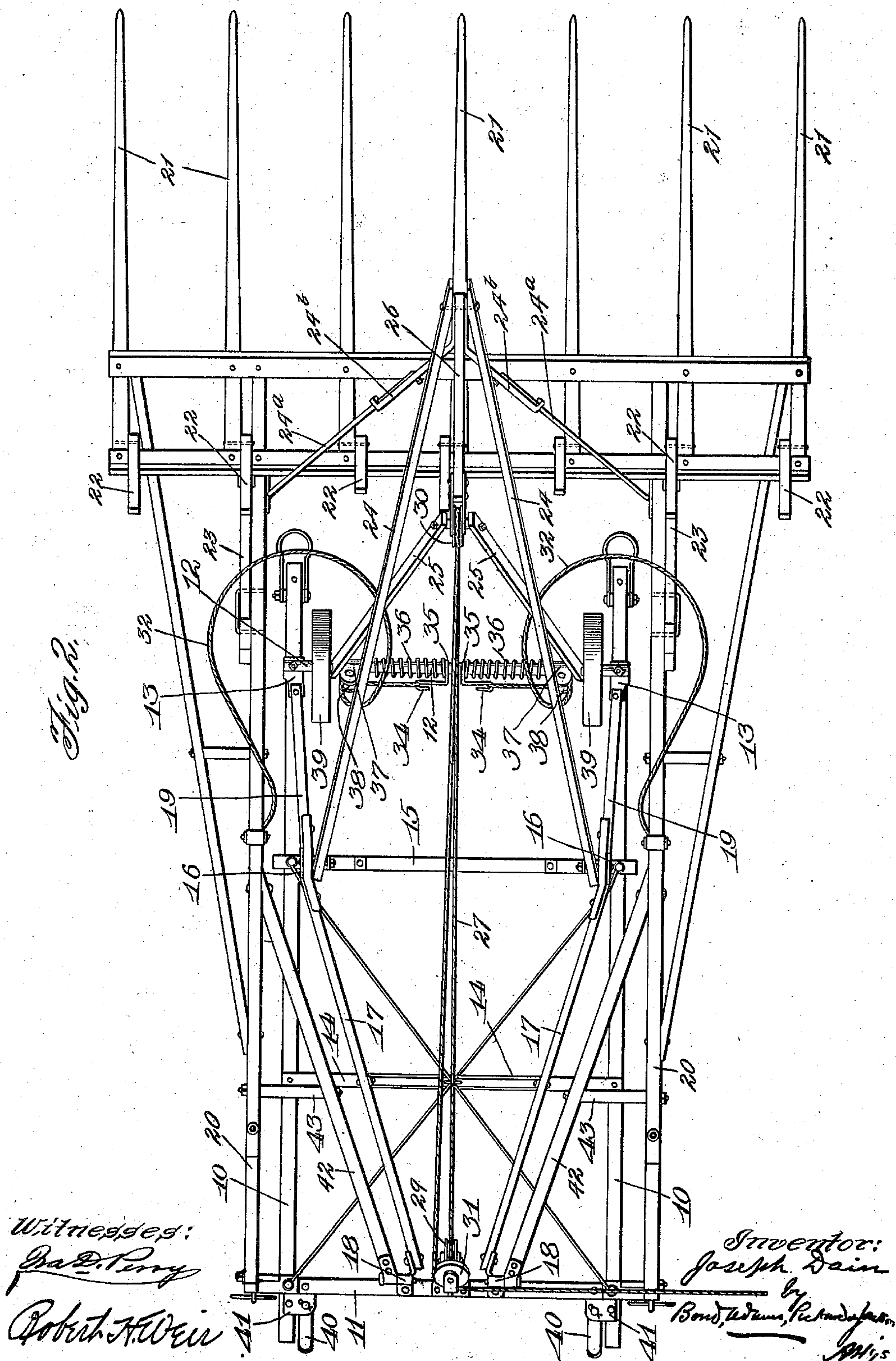
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3 SHEETS—SHEET 2.



Witnesses:

Wm. D. Perry

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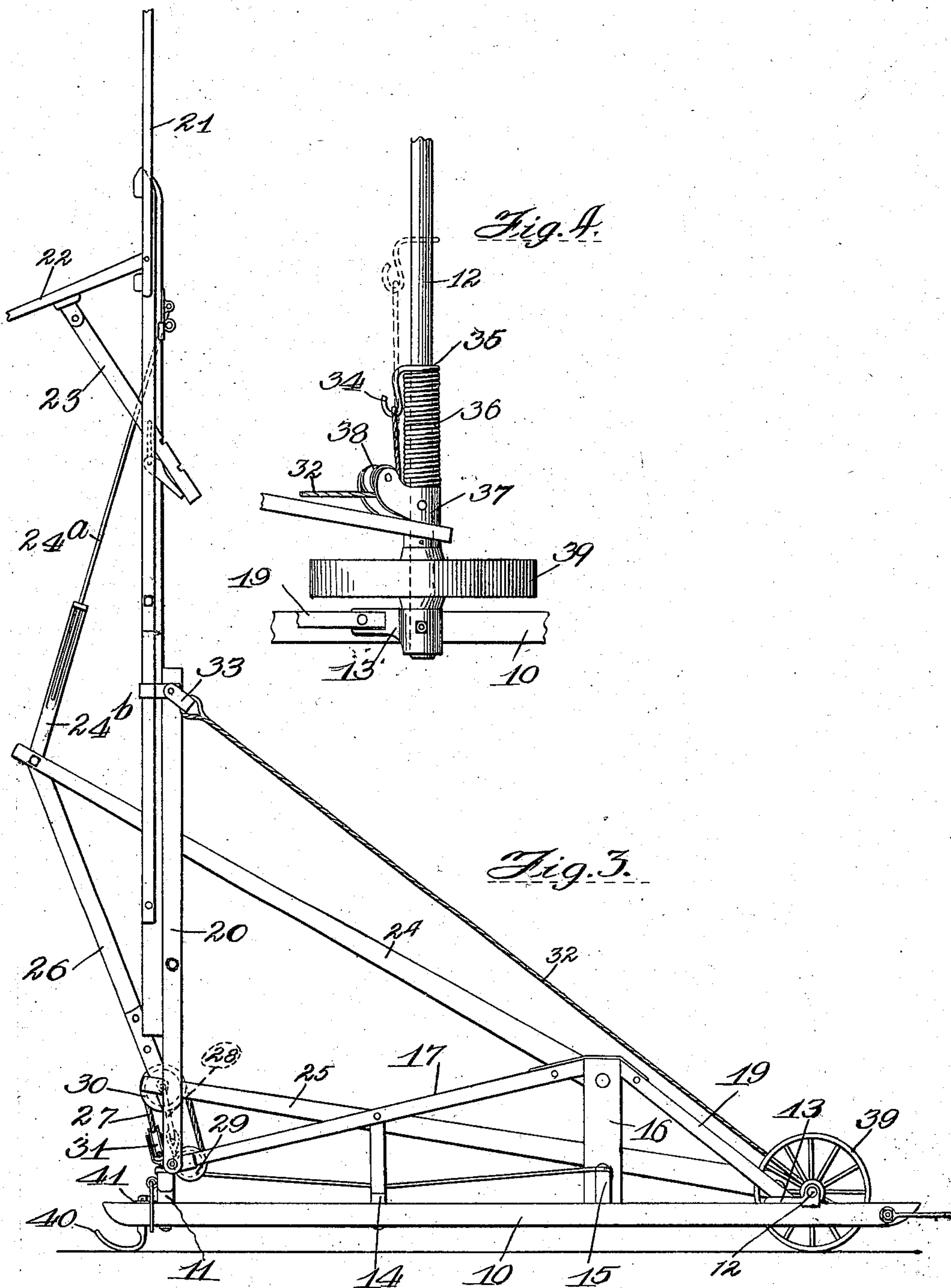
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J. DAIN.
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APPLICATION FILED OCT. 30, 1905.

3 SHEETS—SHEET 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOSEPH DAIN, OF OTTUMWA, IOWA.

HAY-STACKER.

No. 840,477.

Specification of Letters Patent.

Patented Jan. 8, 1907.

Application filed October 30, 1905. Serial No. 285,198.

To all whom it may concern:

Be it known that I, JOSEPH DAIN, a citizen of the United States, residing at Ottumwa, county of Wapello, State of Iowa, have invented certain new and useful Improvements in Hay-Stackers, of which the following is a full and complete specification, reference being had to the accompanying drawings.

This invention relates to hay-stackers of that class wherein the hay to be elevated is placed upon a carrier that is pivotally connected to a supporting-frame, such pivoted carrier being adapted to be elevated with its load by being turned on its pivots through the medium of power applied through elevating-ropes.

One of the objects of my invention is to provide means for automatically causing the pivoted carrier to at once turn on its pivots after it has reached the limit of its upward movement and discharged its load, so that there will be no delay in causing such carrier to resume its lowermost position ready to receive another load.

Another object of my invention is to provide an improved bracing construction for the inner or rear end of said pivoted carrier, whereby it will be made much stronger than such carriers have heretofore been made, such bracing construction being of a character to prevent any interference with the supporting-frame.

It is further the object of my invention to improve the construction of machines of this character in various details.

I accomplish the objects of my invention by the means shown in the drawings and hereinafter specifically described.

That which I believe to be new will be pointed out in the claims.

In the drawings, Figure 1 is a side elevation showing the parts in position to receive a load. Fig. 2 is a plan view. Fig. 3 is a side elevation showing the pivoted carrier in its elevated position. Fig. 4 is an enlarged detail, being a plan view of one of the two sets of spring devices that are employed to avoid shock to the pivoted carrier as it completes its upward movement and that aid in returning such carrier to its load-receiving position.

Referring to the several figures of the drawings, 10 10 indicate the side bars of the supporting-frame, these side bars being connected near their rear ends by a sill 11 and near their forward ends by an axle 12, the

ends of such axle being preferably secured in brackets 13. Intermediate of the end sill 11 and the axle 12 the side bars 10 are in the construction shown further secured together by cross-pieces 14 and 15.

16 indicates short posts placed opposite each other and secured to the side bars 10. Extending rearwardly from each of these posts 16 and toward the central portion of the inner or rear sill 11 are brace-bars 17. The rear ends of these brace-bars 17 are secured in the construction shown to brackets 18.

19 indicates another and shorter brace extending from each post 16 downward and secured at its lower end to one of the side bars 10 just in rear of the axle 12.

20 indicates the side bars of the pivoted carrier-frame, which carry at their outer or forward ends a series of teeth 21, upon which the hay to be elevated is deposited and which is held on such teeth by an adjustable set of teeth 22, such latter teeth being adjusted to the desired angle by means of the adjusting-bars 23, as usual. There are shown two lifting-frames, one consisting of a pair of bars 24, pivoted to the posts 16, and the other consisting of a pair of bars 25, in the construction shown pivoted on the axle 12 close to the wheels on such axle. Each of these lifting-frames, as ordinarily constructed and as here illustrated, has its two bars inclined toward each other at the upper ends, and the upper ends of the two lifting-frames 24 and 25 are joined together by a rigid connection 26, pivotally secured to the bars of each lifting-frame. The lifting-frame composed of bars 24 is connected with the pivoted carrier by suitable devices, such as that shown and indicated by 24^a or by any other suitable devices. The parts 24^a, as shown, are two metal rods attached at their lower ends near opposite sides of the pivoted carrier and at their upper ends are adjustably secured in channel-plates 24^b, which plates are secured in place at their upper ends by the same pivot-bolt that secures the bars 24 and the connection 26 together.

27 indicates a rope fastened at one end, as usual, to a loop 28, that is secured to the pivot that unites the upper ends of the bars 25 and passes down and over a pulley 29, that is secured to the end sill 11, and thence up and over a second pulley 30, carried at the upper ends of the elevating-frame 25, and thence down and around a pulley 31, that is also at-

tached to said sill 11. This construction and arrangement of lifting-frames, rope, and pulleys are old and well understood, and it will be recognized that when power is applied to the end of the rope the lifting-frames 24 and 25 will turn on their supporting-pivots, and the pivoted carrier-frame will be raised into the position shown in Fig. 3, and the load of hay carried thereby on the teeth will be discharged.

It has been common to provide a rope attached to the carrier-frame to limit the extent to which such carrier-frame can be turned on its pivots and to prevent its being turned farther than is necessary or desired, which rope has been fastened at a suitable point on the supporting-frame. I provide such ropes, which in the drawings are indicated by 32, two of such ropes being shown, one for each side of the machine, and each rope 32 being secured to the pivoted carrier by a metal loop or eye 33. Instead of securing the opposite ends of such ropes 32 to the supporting-frame, as has heretofore been the practice, I attach each rope to a hook 34, that is formed on the end of a rod that is bent into the shape of an eye or ring 35 and that encircles the axle 12 near the forward or outer end of the machine. 36 indicates two coiled springs around the said axle 12, and against the inner end of each of which one of the rings or eyes 35 is adapted to bear, the other end of the coiled spring being held against the inner face of the bracket 37, secured to the said axle 12, said bracket also having projecting arms between which is provided a small guide-roller 38, under which one of the ropes 32 runs. By this arrangement of a roller 38 near each end of the axle and by passing one of the ropes 32 under it a straight direct pull will be had on the eye 35, causing a proper compression of the spring 36 when such pull on the rope 32 is had.

39 indicates a pair of small wheels journaled on the axle 12 between the side bars 10 and the brackets 37. At the opposite end of the machine are shown small runners 40, the vertical shanks of which are loosely journaled in brackets 41, so as to permit the runners to turn freely as required.

When the pivoted carrier is in its raised position and carrying a load of hay, there is of course a great strain on the pivoted carrier, and owing to the length of the side bars of such carrier unless the load is evenly distributed there is at times danger of distorting the parts so as to interfere with their free and easy operation, and great strain is brought to bear upon the pivots of this carrier. It is necessary that the side bars of this pivoted carrier lie outside of the elevated brace-bars that run from the post 16 backward, and by reason of that fact and by reason of the fact that it has heretofore seemed necessary to

run such elevated brace-bars back in substantially the same horizontal plane as the side bars of the supporting-frame it has not been possible to give adequate bracing support to the side bars of the pivoted carrier. By my construction, however, I arrange these elevated brace-bars that run from the posts 16 in a diagonal direction toward the central portion of the rear sill, and room is thereby provided for ample bracing of the side bars of the pivoted carrier. Such bracing is indicated in the drawings by two bars 42 42, each of which is secured at its forward end in the construction shown to the inner face of one of the side bars 20 of the carrier-frame, and extending back in a diagonal direction practically parallel to the diagonal direction of the adjacent raised brace 17 has its rear end pivotally connected with the end sill 11, such pivotal connection in the construction shown being to the bracket 18, to which one of the raised brace-bars 17 is attached. Each diagonal brace 42 is further secured to one of the side bars 20 of the carrier-frame by a short cross-piece 43. By this construction and arrangement of parts it is evident that the supporting-frame can be made just as rigid with its rearwardly-extending raised brace-bars 17 extending in a diagonal direction toward the center of the end sill as if they came straight back and were secured near the ends of such end sill, as has formerly been the case, while it is clear that by so arranging these raised brace-bars the carrier-frame can be made much stronger and stiffer by reason of the bracing that can be given it by the bars 42, as shown, than under the old constructions.

By having the ropes 32 of a proper length pressure will be brought to bear upon the inner ends of the coiled springs 36, so as to compress such springs just as the carrier-frame has about completed its swinging movement to discharge its load, and thereby a cushioning effect will be had, tending to relieve the carrier-frame of shock and jar as it comes to a stop; and as the load is discharged the reaction or expansion of the springs will, through the ropes 32, give a sufficient pull on the raised carrier to cause it to turn back on its pivots to again settle into position to receive another load.

The axle 12 serves not only as an axle proper for the wheels 39, but serves also as a suitable device to which the bars 25, composing one of the lifting-frames, are pivoted, and in addition to these functions it affords an efficient brace between the forward ends of the side bars of the supporting-frame and also serves to properly carry the two springs 36.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a supporting-frame having rearwardly-extending diagonal braces, of a carrier-frame pivotally connected

with said supporting-frame and provided with rearwardly-extending diagonal braces that are also pivotally connected with said supporting-frame and are adapted to be moved past the first-mentioned braces and to lie opposite the outer sides of said first-mentioned braces, and means for raising said carrier-frame, substantially as described.

2. The combination with a supporting-frame having two braces raised at their forward ends above the plane of said frame and extending diagonally to the rear toward the longitudinal center of the frame, of a carrier-frame pivotally connected with said supporting-frame and provided with rearwardly-extending diagonal braces that are also pivotally connected with said supporting-frame and are adapted to be moved past the first-mentioned braces and to lie opposite the outer sides of said first-mentioned braces, and means for raising said carrier-frame, substantially as described.

3. The combination with a supporting-frame having rearwardly-extending diagonal braces, of a carrier-frame pivotally connected with said supporting-frame and provided with rearwardly-extending diagonal braces that also have a pivotal connection with said supporting-frame, and means for raising said carrier-frame, substantially as described.

4. The combination with a supporting-frame comprising side bars an end sill and two braces extending diagonally from the said side bars toward the said sill, of brackets on said sill with which the said braces are connected, a carrier-frame pivotally mounted on said supporting-frame, diagonal braces secured to the said carrier-frame and pivotally attached to the said brackets on the said sill, and means for raising said carrier-frame, substantially as described.

5. The combination with a supporting-frame comprising side bars, an end sill, posts on the side bars, and two braces extending diagonally downward and to the rear from said posts and connected to said posts and to the said end sill, of a carrier-frame comprising side bars and two diagonal braces connected at their forward ends to said last-mentioned side bars and at their rear ends pivotally connected to the said end sill, and means for moving said carrier-frame, substantially as described.

6. The combination with a pivoted carrier-frame, and means for raising the same, of a spring arranged transversely of the line of travel of the said carrier-frame, a rope connected with said carrier-frame and said spring, and a guiding device for said rope, substantially as described.

7. The combination with a pivoted carrier-frame, and means for raising the same, of a rope attached to said frame and adapted to limit the movement of the frame, a coiled spring, a bar arranged transversely of the

machine on which such spring is mounted, and means for connecting said rope and spring, substantially as described.

8. The combination with a supporting-frame, a carrier-frame pivotally attached thereto, and means for raising said carrier-frame, of a cross-bar extending between the side bars of the supporting-frame, a coiled spring on said cross-bar, a rope connected with said carrier-frame and said spring, and a guiding device around which the rope passes, substantially as described.

9. The combination with a supporting-frame, a carrier-frame pivotally attached thereto, and means for raising said carrier-frame, of a cross-bar extending between the side bars of the supporting-frame, a coiled spring on said cross-bars, a device slidable on said cross-bar and adapted to bear against one end of said spring, and a rope connected with said carrier-frame and said slidable device, substantially as described.

10. The combination with a supporting-frame, a carrier-frame pivotally attached thereto, and means for raising said carrier-frame, of an axle near the forward end of the supporting-frame, supporting-wheels on said axle, two springs on said axle intermediate of said wheels, two ropes connected with said carrier-frame, each of said ropes being connected with one of said springs, and a guiding device for each rope, substantially as described.

11. The combination with a supporting-frame, an axle near the forward end thereof, and supporting-wheels on said axle, of a carrier-frame pivotally mounted on said axle, means for raising said carrier-frame, two springs on said axle intermediate of said wheels, two ropes connected with said carrier-frame, each of said ropes being connected with one of said springs, and a guiding device for each rope, substantially as described.

12. A hay-stacker having a supporting-frame, a swinging carrier-frame, mechanism for raising the carrier-frame from loading to dumping position, and spring mechanism mounted on and transversely of said supporting-frame and acting to return said carrier-frame toward its receiving position.

13. A hay-stacker having a supporting-frame, a swinging carrier-frame, mechanism for raising the carrier-frame from loading to dumping position, and compression-spring mechanism mounted on and transversely of said supporting-frame and acting to return said carrier-frame toward its receiving position.

14. A hay-stacker having a supporting-frame, a swinging carrier-frame, mechanism for raising the carrier-frame from loading to dumping position, and an elastic cushion acting to check further movement of the carrier-frame when it approaches the limit of its upward movement, said elastic cushion being

arranged transversely of the supporting-frame.

15. A hay-stacker having a supporting-frame, a swinging carrier-frame, mechanism
5 for raising the carrier-frame from loading to dumping position, and an elastic cushion mounted on said supporting-frame and acting to move said carrier-frame toward its receiving position, said elastic cushion being
10 arranged transversely of the supporting-frame.

16. A hay-stacker having a supporting-

frame, a swinging carrier-frame, mechanism for raising the carrier-frame from loading to dumping position, and a cushioning device 15 arranged transversely to the plane of movement of the carrier-frame and acting to check the further movement of said carrier-frame when it approaches the limit of its upward movement.

JOSEPH DAIN.

Witnesses:

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W. G. DUFFIELD.