C. R. DAVIS.

HAY LOADER.

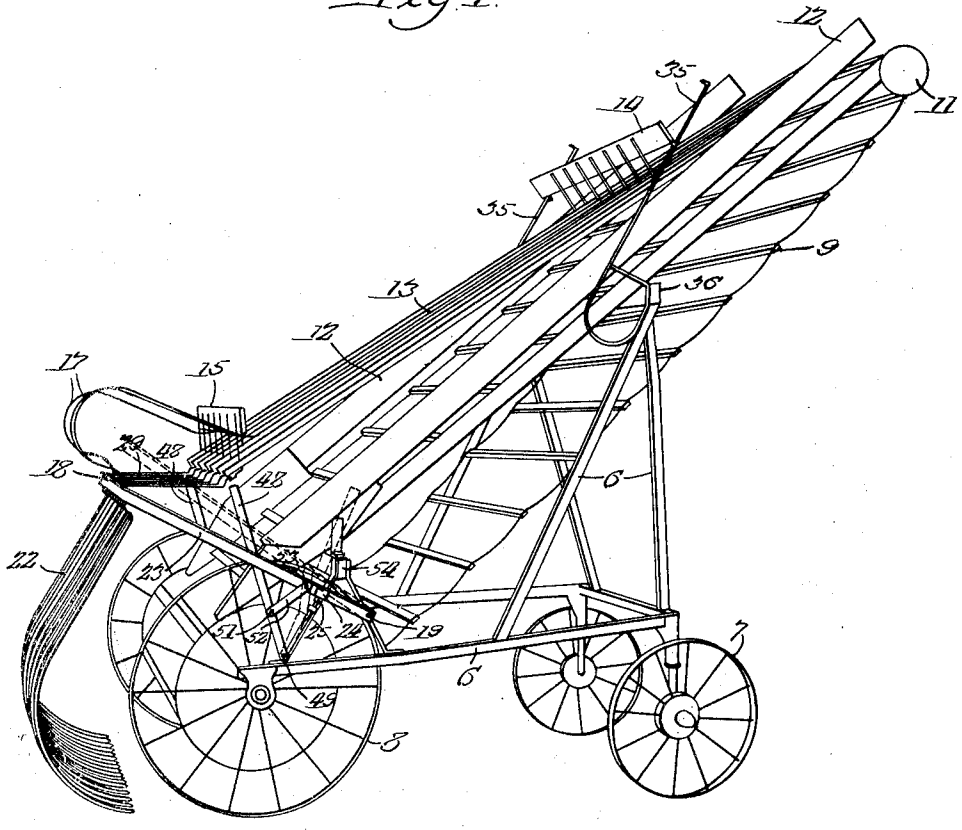
APPLICATION FILED MAR. 14, 1918.

1,338,215.

Patented Apr. 27, 1920.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

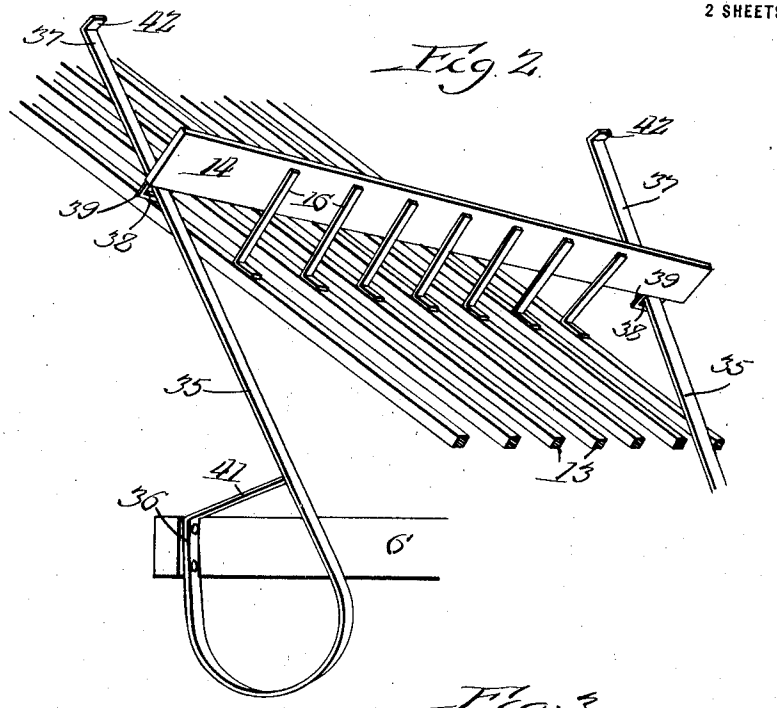


Fig. 3.

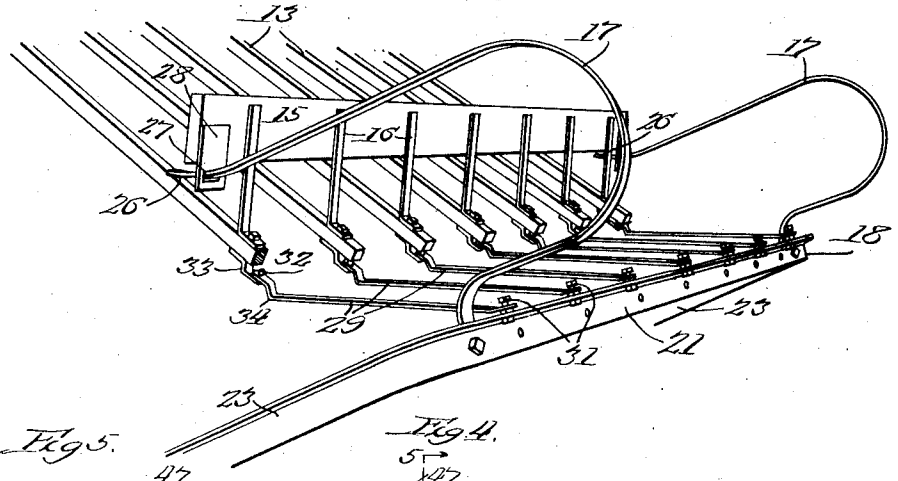


Fig. 5.

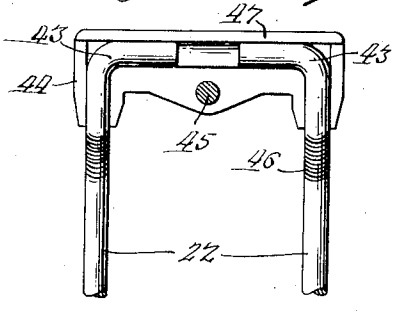
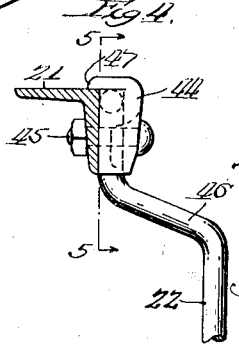


Fig. 4.



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UNITED STATES PATENT OFFICE.

CALVIN R. DAVIS, OF ROCKFORD, ILLINOIS, ASSIGNOR TO EMERSON-BRANTINGHAM COMPANY, OF ROCKFORD, ILLINOIS, A CORPORATION OF ILLINOIS.

HAY-LOADER.

1,338,215. Specification of Letters Patent. Patented Apr. 27, 1920.

Application filed March 14, 1918. Serial No. 222,398.

To all whom it may concern:

Be it known that I, CALVIN R. DAVIS, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Hay-Loaders, of which the following is a specification.

This invention relates in general to hay loaders of the type employing a compressor in conjunction with an endless hay elevating carrier, a compressor being known as a yieldable means overlying the upper reach of the hay carrier or elevator for urging the hay against the latter and also for preventing the hay from being blown away.

In the present instance, I have aimed, primarily, to provide a compressor of generally improved construction, which will operate most satisfactorily under the varying conditions and exigencies of usage. To this end I have provided novel means designed to yieldingly support and suspend a compressor structure in working position and to allow the compressor to freely yield and accommodate a very large quantity of hay. This is attained chiefly by employing spring members arranged in a novel manner for supporting the upper and lower ends of the compressor in such manner that the latter is full-floating and may yield at any corner independent of the others, and is capable as an entirety of a considerably greater yielding movement and consequently of accommodating a much greater load than is possible with previous constructions. As a result, the hay may be raked into large windrows and elevated much quicker than is possible when the hay must be gathered from small windrows necessitated by the comparatively smaller capacity of previous loaders.

In connection with the compressor and the means for yieldingly supporting the same I have provided means at the throat of the hay elevating means forming a continuation of the compressor and arranged to provide an enlarged throat. This means also serves the purpose of holding the compressor against lengthwise displacement with respect to the elevating means and yet allows the desired flexibility of the compressor. And, in addition to this enlarged throat I have provided adjustable means for varying the size of the throat as will be mentioned more particularly hereinafter.

I have also aimed to provide an improved rake head which constitutes the main support for the lower end of the compressor. This rake head, I have constructed so as to be capable of adjustment for varying the size of the throat mentioned above and of being moved into and out of working position by novel means which also will be described more fully hereinafter.

Other objects and attendant advantages of my improvements will be appreciated by those skilled in the art as the invention becomes better understood by reference to the following description when considered in connection with the accompanying drawings, in which—

Figure 1 is a rear quarter elevation of a hay loader embodying my improvements;

Figs. 2 and 3, fragmentary perspective views of the upper and lower compressor structure, respectively;

Fig. 4, a cross-sectional view through the rake head illustrating the attachment of the rake teeth thereon; and

Fig. 5, a sectional view taken substantially on the line 5—5 of Fig. 4.

The hay loader illustrated in the drawings is of the cylinder type. Those parts of the loader not directly pertinent to my present improvements are not illustrated in detail as their particular construction is not essential and their operation is well understood. The parts shown comprise a frame 6 supported by front dirigible wheels 7 and rear traction wheels 8, an endless hay carrier or elevator 9 trained over idlers 11 mounted on the top of the frame, and side boards defining the sides of the inclined carrier way.

In operation, the hay is picked up by teeth on the gathering cylinder (co-axial with the traction wheels and not shown) as the latter revolves, and delivered onto the carrier 9 and elevated thereby between the side boards until the top of the carrier way or elevating platform is reached, whereupon the hay is delivered or dropped onto the rack behind which the loader is drawn. Because of the inclination of the elevator, it is necessary to urge

or slightly press the hay against the slats of the elevator in order to insure that the hay shall be carried along and shall not stop or be banked so as to clog the machine. It is also necessary to press the hay against the elevator to prevent the hay from being blown away. The means for performing these functions is generally known as a compressor. Since the character of the hay differs widely in different localities and is gathered in different quantities, it is desired that the compressor shall under all conditions perform its proper function and accommodate the varying quantities of hay. It is to these ends that my improvements relate in part, that is, to the provision of a compressor which shall meet in the most practical and satisfactory manner the most varied conditions and requirements of usage.

The compressor body itself may be of any suitable or preferred construction, and in the present instance I have shown it as comprising a plurality of compression slats 13 held in spaced parallel relation at their upper and lower ends by upper and lower cross bars 14 and 15 respectively, through the agency of suitable strap irons or brackets 16. The means shown for yieldingly supporting the compressor, I believe to be wholly novel. They consist, generally stated, of flat spring members supporting both the upper and lower ends of the compressor in a particularly advantageous manner. Those spring members supporting the lower end of the compressor and designated in general by character 17, are fixed at one end to a stationary part of the frame, which in this case is in the form of a rake head designated in general by character 18, of a general U-shape pivoted at its ends 19 to the main frame structure and serving throughout its cross portion 21 as the direct means of attachment for the spring members 17 and rake teeth 22, the latter of which will be mentioned hereinafter. The side members 23 of the rake head normally rest at 24 on adjustable set screws or stops 25 carried by the main frame structure, which limit the lowered working position of the rake head. The normal working position of the rake head 21 is shown in Fig. 1, from which it will be observed that the rake head rests upon the bolts 25. The rake head may, when desired, be swung upwardly about the pivots 19 for purposes mentioned hereinafter. Referring now to Fig. 3, it will be seen that the flat spring members 17 are bowed or arched rearwardly and upwardly and thence forwardly with their free ends 26 substantially extended. These free ends 26 project loosely through openings 27 in cleats 28 fixed to the ends of the lower cross bar 15 and thus serve as the direct means for supporting the compressor at its lower end. The compression slats terminate at their lower ends short of the rake head and a continuation of said slats is established by the provision of compression links 29 pivotally connected at their opposite ends respectively to the cross portion 21 of the rake head and to the lower ends of the compression slats in longitudinal alinement therewith. As shown plainly in Fig. 3, the compression links 29 have a loose pivotal connection at their rear ends with the bolts 31 and are hooked loosely over the upstanding pins 32 of brackets 33 which are fixed respectively to the compression slats, the pins 32 terminating in such proximity to the underside of the slats as to preclude withdrawal of the compression links. The compression links are shaped as shown at their forward ends to provide depressed portions 34 which prevent the upwardly passing hay from lodging or becoming clogged in the pivotal connection between the compression links and slats. These links serve as practically the sole means of holding the compressor against lengthwise displacement with respect to the elevator and yet permit the compressor to rise and fall under the influence of varying quantities of hay as it is being elevated. The links also form a continuation of the compressor so as to provide an enlarged throat for the entrance of hay between the carrier and compressor.

As a consequence of the foregoing, a large quantity of hay in loose fluffy condition may be raised by gathering means onto the elevator and entered beneath the compressor without danger of becoming clogged or entangled by the end of the compressor structure in a manner frequently occurring with constructions of other design. When a large quantity of hay enters the throat and is carried upwardly, it raises the compresser bodily so that the compressor, it might be said, literally floats on the hay and by its weight and the spring pressure of the supporting members urges the hay against the elevator so as to positively insure the proper carriage of the hay upwardly. Considering merely the operation of the lower end of the compressor, it will be manifest that when not in use the compressor is carried by the spring members 17 and is held in position against lengthwise displacement by the links 29. Inasmuch as the compressor is independently supported at each side by a spring member capable of a wide range of flexibility, either side of the compressor may be swung upwardly independently of the other, or the entire lower end of the compressor may be raised to accommodate as large a quantity of hay as can be crowded into the throat of the machine. Consequently, it is possible with a construction of this character to elevate a very large quantity of hay, although as will presently be seen, the com-

pressor is constructed so as to normally handle either a small or large quantity and in exceptional cases to be adjustable to enlarge the throat when the hay is exceedingly heavy or is raked into very large windrows and it is desired to elevate a large quantity of hay very quickly.

The means for supporting the upper end of the compressor, best shown in Fig. 2, consists of a flat spring member at each side of the compressor, designated generally by character 35. These spring members serve very much the same purpose as the lower members 17, that is, to yieldingly support the compressor and hold it against sidewise displacement, and in addition, function somewhat as an inclined slideway upon which the compressor is guided, since the upper end is subject to greater and more varied yielding movement or flexibility than is the lower end. These spring members are each rigidly secured at 36 to one of the fixed cross bars of the main frame structure and are bowed or arched downwardly and thence turned upwardly to form a relatively long upwardly and forwardly inclined free end 37 passing loosely through an opening 38 in the part 39 fixed to the cross bar 14. Because of the length of the free ends 37 suitable stops are provided intermediate their ends so that the members will flex to a greater extent throughout that portion which is not arched. For this purpose, in the present instance the fixed ends 41 of the spring members are turned back so as to form rests or stops for the flexible ends of the spring members just above the arched portions. The uppermost ends of the spring members are shaped to provide stops 42 for preventing withdrawal of the cross bar 14 from the spring members. The upper end of the compressor is always normally carried wholly by the spring members 35 together, of course, with the assistance of the lower spring members 17. In other words, the upper end of the compressor does not rest upon or touch the elevator as might be thought from a first glance at the loader in the position in which it is shown in Fig. 1. From this figure it will be noted, however, that the compressor is supported at its upper end nearer to the elevator than at its lower end. By reason of this arrangement the hay is gradually and increasingly urged against the elevator as it reaches the higher points so as to preclude any tendency of the upper hay from slipping and clogging. When a good body of hay is elevated, the upper end of the compessor will yield accordingly and become full-floating in the manner mentioned below, although guided in its movement by the members 35. These members, it will be noted permit the upper end of the compressor to be lifted so as to accommodate even a very large quantity of hay, it being apparent that the compressor will be lifted against the pressure of the spring members so that there will be a constant yielding pressure on the hay which increases as the volume of hay increases. This construction allows the compressor to rise freely under and in accordance with the volume and disposition of the hay on the elevator in such manner as always to bear properly upon the hay for insuring its proper elevation. It may be said, therefore, that in operation, when a substantial body of hay is being elevated the compressor is full-floating so as to be immediately yieldable to accommodate the hay, yet is supported so as to bear with proper compression upon the hay, this being effected by means of spring members having free ends loosely engaging the corners of the compressor and upon which members the compressor is freely movable to accommodate the hay under any and all conditions within the maximum limit of the loader. This maximum limit, it might be mentioned is exceedingly larger for a given size loader than any previous loader of similar size, because an exceptionally large throat is provided and the compressor is mounted in a novel manner and capable of such movement as to handle light, medium or heavy hay equally well.

Referring now to Fig. 1, it will be noted that the rake teeth 22, mentioned above, carried by the head 21 are arranged to pick up any loose hay missed by the rake teeth on the cylinder and that the teeth 22 also insure the proper entry of hay into the throat of the machine. The teeth, however, are constructed in a novel manner so that they may be easily detached when they are not necessary in the operation and so that when in use they will prevent the hay from lodging against or being obstructed by the head 21. As shown in Figs. 4 and 5, the rake teeth are connected in pairs to the rake head. Each rake tooth is bent at one end to form an elbow 43 which is adapted to be clamped or otherwise rigidly secured to one face of the head 21 by means of a bracket 44 and a bolt 45. In the present instance, the teeth are clamped to the forward upright wings of the angle iron head 21 and the shank portions of the teeth are bent forwardly as at 46, so as to lie in a plane substantially forward of the rake head for the purpose of preventing the hay as it passes upward and forward from becoming caught or in any way obstructed by the head. As will be noted from Figs. 4 and 5, the bracket 44 is shaped on one face to provide a groove which receives the elbows of a pair of rake teeth and is shaped to provide a ledge 47 adapted to engage the top of the angle iron head 21 so that by means of the single bolt 45 passing through the head, a pair of rake

teeth may be rigidly clamped to the head and precluded from any accidental displacement. The rake teeth are shown in operative position in Fig. 1, and in Fig. 3 they are detached from the rake head.

Means is now provided for raising the rake teeth to an inoperative position so that when the loader is transported idly the teeth will not strike the ground. This means, shown only in Fig. 1, consists of a lever 48 pivoted at 49 to the frame structure at each side of the loader and pivotally connected intermediate its ends at 51 by means of a link 52 to the rake head at the point 53. As already mentioned, the rake head normally rests on the set screws 25 carried by the main frame and is adapted to be swung upwardly about the pivot 19 for the purpose of widening the throat between the compressor and the elevator, and as is now apparent, for elevating the rake teeth 22. By swinging the levers 48 forwardly, the rake head will be raised to an elevated position by means of the toggle connection between the head and frame provided by the levers 48 and the links 52. When the rake head has been fully elevated by movement of the levers to the position indicated in dotted lines in Fig. 1, which position is limited by abutment of the levers against the frame bar 54, the pivots 51 will have been moved past a dead-center line intersecting the pivots 49 and 53, so that due to the weight of the rake head, the latter will be automatically locked in elevated position. To lower the head, the levers 48 may be swung rearwardly past the dead-center locking position, whereupon the rake head will be free to swing downwardly under its own weight to the working position limited by the set screws 25. Upon elevating the rake teeth the compressor structure is simply shifted forwardly and upwardly by the rake head, it being manifest that the upper compressor structure will simply slide upwardly on the spring members 35. Thus the rake teeth will be raised and lowered without interfering in any respect with the operativeness of the compressor.

It is believed that the foregoing conveys a clear understanding of my improvements, and while I have illustrated but one working embodiment thereof, various changes might be made in the construction without departing from the spirit and scope of the invention as expressed in the appended claims.

I claim:

1. In a hay loader, the combination with hay gathering and elevating means, of a compressor adapted to operate above the elevating means, means for yieldingly suspending the compressor, comprising parts on the upper and lower portions of the compressor, spring members fixed at one end to the frame structure and passing at their free ends through said parts for yieldingly suspending the compressor, whereby the compressor is movable upon and with respect to said spring members.

2. In a hay loader, the combination with hay gathering and elevating means, of a compressor, and flat spring members fixed at one end to the frame structure and having freely yieldable portions upon which the lower and upper end portions of the compressor are yieldingly suspended and movable lengthwise upon and with respect to said members.

3. In a hay loader, the combination with hay gathering means and inclined elevating means, of an inclined compressor positioned over the elevating means, spring members fixed at one end to the lower frame structure and arranged to yieldingly suspend at their free ends the lower end of the compressor so that the same is free to yield with respect to the elevating means, and spring members fixed at one end to the upper frame structure, arranged so that their free ends yieldingly hold the upper end of the compressor in operative relation to the elevating means and capable of yielding with respect thereto, the connection between the compressor and upper spring members allowing the compressor to slide longitudinally upon and with respect to said members.

4. In a hay loader, the combination with a frame structure and hay gathering and elevating means, of a transverse supporting member fixed with respect to the frame adjacent to the lower end of hay elevating means, a lower compressor cross-bar, a series of compression slats connected laterally in spaced relation to said cross-bar, spring members mounted on said transverse supporting member and having a loose slidable connection with the cross bar, links pivotally connected to the lower ends of the compression slats and pivotally connected to said transverse supporting member so as to hold the compression slats against lengthwise displacement with respect to the elevating means, and means yieldingly supporting the upper end of the compression slats in operative relation with the elevating means.

5. In a hay loader, a compressor structure comprising a series of inclined slats fixedly joined in spaced relation to upper and lower cross bars so as to provide a substantially rigid structure, a transverse fixed supporting member spaced rearwardly of the lower ends of the compression slats, links pivotally interposed between the compression slats and said transverse member for holding the compressor structure against

lengthwise displacement but permitting it to swing upwardly and downwardly, spring members fixed to said transverse supporting member and having yieldable free ends upon which the lower portion of the compressor structure rests and is movable lengthwise with respect thereto, and means yieldingly maintaining the upper portion of the compressor structure in operative position.

6. In a hay loader, the combination with hay gathering and elevating means, of a compressor including a series of longitudinal slats arranged lengthwise above the elevating means, means permitting the upper end of the compressor to yield with respect to the elevating means, a plurality of upwardly arched spring members rigidly attached at one end to the same structure and at the other end yieldingly suspending and supporting the lower end of the compressor, in such manner that the latter is movable lengthwise upon and with respect to said supporting ends and rearwardly extending links pivotally connecting the lower end of the compressor to a rear fixed frame structure for holding the compressor in proper lengthwise relation to the elevating means and allowing the compressor to swing freely toward and from the elevating means through the agency of said arched spring members.

7. In a hay loader, the combination with hay gathering and elevating means, of a compressor adapted to function above the elevating means, a transverse member positioned in fixed spaced relation at the rear of the lower end of the compressor, means interposed between the compressor and said transverse member and pivotally connected respectively to said compressor and member forming substantially a continuation of the compressor and serving to flexibly connect the latter to the supporting member and to hold the compressor against lengthwise displacement with respect to the elevating means yet allowing the lower end of the compressor to move toward and from the elevating means, and other means for yieldingly suspending the lower end of the compressor in operative position.

8. In a hayloader of the character described, a compressor overlying the hay elevating means, and means supporting the compressor including flat spring members upon the free ends of which the compressor is supported and slidable lengthwise of the spring members.

9. In a hayloader of the character described, a compressor structure overlying the hay elevating means, and means supporting the compressor structure comprising a resilient member for each corner of the compressor structure, said members being mounted on the loader frame and having free ends upon which the compressor structure is slidably supported.

10. In a hayloader of the character described, a compressor structure overlying the hay elevating means, and means supporting the compressor structure including resilient members attached to the loader frame and having free ends supporting the compressor structure and upon which ends the compressor structure is relatively movable to permit greater relative movement between the compressor structure and the bed of the loader.

11. In a hayloader, the combination of a main frame, a U-shaped frame, the side arms of which are attached to the main frame and extend rearwardly therefrom with the cross portion at the rear of said main frame, a pair of resilient members attached in laterally spaced relation to the cross portion of said U-shaped frame member, each of said resilient members being arched upwardly and terminating in a forwardly extending resilient compressor supporting part, a compressor structure the lower end of which is mounted upon said resilient parts and free to move lengthwise thereon, and means operative between the compressor structure and the cross portion of the U-shaped frame for preventing lengthwise displacement of the compressor structure.

12. In a hayloader, the combination of a main frame having an inclined hay elevating bed, a compressor structure overlying the bed, means holding the upper end of the compressor structure in coöperative relation to the bed comprising a resilient spring member attached to the frame at each side of the compressor structure and arched downwardly and terminating in an upwardly and forwardly inclined resilient supporting arm, and a supporting connection between the compressor structure and said resilient ends whereby the compressor structure is supported by said ends and is movable lengthwise thereon.

13. In a hay loader, the combination of a main frame having an inclined hay elevating bed, a compressor structure overlying the bed, and means holding the upper end of the compressor structure in coöperative relation to the bed comprising resilient members fixed to the frame and having upwardly and forwardly inclined resilient ends upon which the compressor structure is slidably supported.

14. In a hay loader, the combination of a main frame having an inclined hay elevating bed, a compressor structure overlying the bed, and means holding the upper end of the compressor structure in coöperative relation to the bed comprising a resilient member at each side of the compressor

structure, each fixed intermediate its ends to the frame and having a rearwardly turned end serving as an abutment, the opposite end being arched downwardly and then extending upwardly and forwardly over and beyond its respective abutment and the compressor structure being supported upon the upwardly and forwardly inclined ends of said members.

15. In a hayloader of the character described, the combination of a frame having a stationary transverse part above and at the rear of the hay gathering means, a compressor structure overlying the head elevating means, means yieldingly supporting the compressor structure at its corners and permitting movement of the compressor structure in a direction lengthwise of the bed, and means operative between the transverse frame member and the lower end of the compressor structure for limiting said lengthwise movement of the compressor structure without interfering with the function of said supporting means.

16. In a hayloader, the combination of a frame including a transverse part above and at the rear of the hay gathering means, a compressor structure including a plurality of laterally spaced slats connected in a relatively rigid relation so as to constitute a relatively rigid compressor structure, means supporting said compressor structure from the frame and permitting a yielding movement of the compressor structure relatively to the bed, and links interposed between said transverse frame part and the slats in longitudinal alinement with the latter and pivotally connected at their forward and rear ends respectively to the slats and said frame part for limiting lengthwise movement of the compressor.

CALVIN R. DAVIS.