W. H. & H. F. KRUNFUS.

STRAW CARRIER.

APPLICATION FILED AUG. 6, 1915.

1,193,565.

Patented Aug. 8, 1916.

2 SHEETS—SHEET 1.

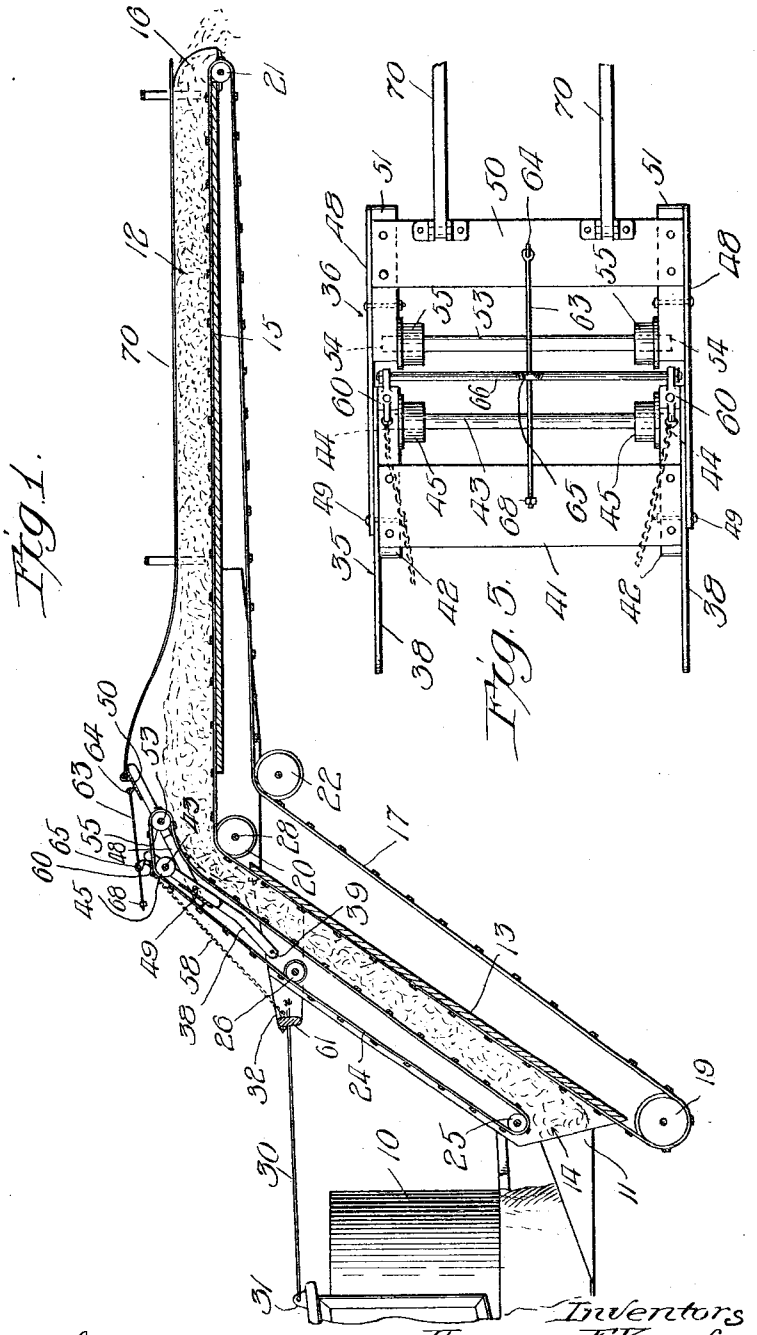


Fig. 1.

Fig. 5.

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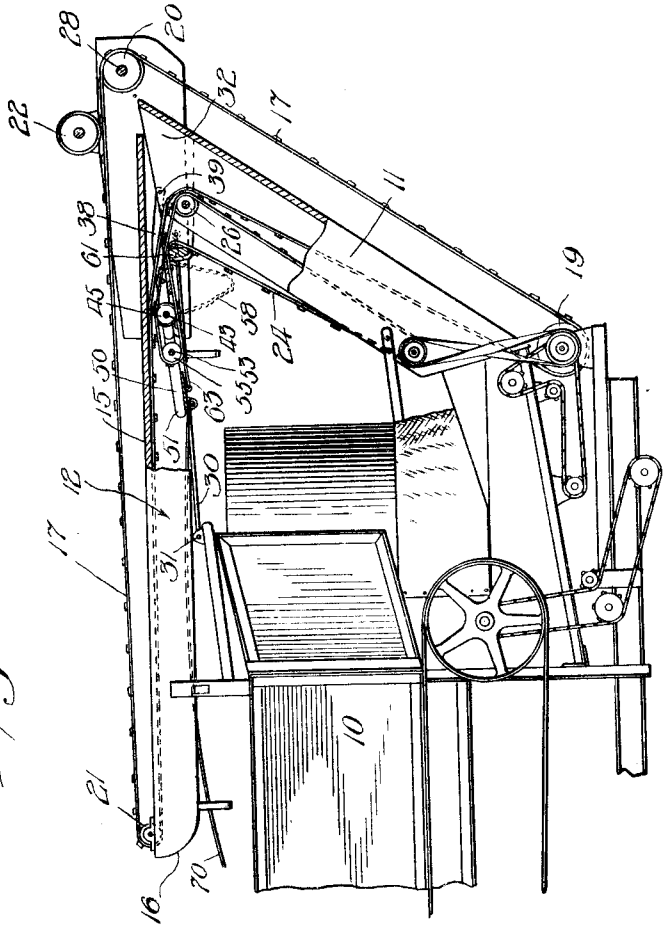


Fig. 2.

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UNITED STATES PATENT OFFICE.

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STRAW-CARRIER.

1,193,565. Specification of Letters Patent. Patented Aug. 8, 1916.

Application filed August 6, 1915. Serial No. 43,951.

To all whom it may concern:

Be it known that we, WILLIAM H. KRUNFUS and HERMAN F. KRUNFUS, citizens of the United States, and residents of Barrington, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Straw-Carriers; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

This invention relates to a novel attachment for straw carriers for threshing machines, and more particularly to that class of carriers which embraces a lower throat portion which receives the straw from the rear end of the machine and a swinging portion, usually hinged to the throat portion so as to be capable of swinging vertically relatively thereto, the carrier being provided with upper and lower conveyers, the lower one of which is carried by the throat portion and the swinging portion and the upper one of which is carried by the throat portion.

Among the objects of our invention is to provide an attachment for straw carriers of this general type so constructed and arranged as to facilitate the delivery of the straw from the throat portion or member of the carrier to the swinging portion thereof and to prevent the straw from bunching at the base of the swinging portion or member, notwithstanding the angle which the swinging portion assumes relatively to the throat member.

A further object of the invention is to provide an attachment of this character adapted to be used with straw carriers of this general type in which the swinging member is adapted to be folded over the machine, when the machine is moved from place to place, and our improved attachment is so constructed as to fold with the swinging carrier member and lie beneath said latter member when the same is so folded.

Other objects of the invention are to improve and simplify straw carriers for threshing machines, and the invention consists in the combination and arrangement of the parts hereinafter described and pointed out in the appended claims.

The embodiment which we have selected to illustrate our invention embraces, in general terms, an extension frame or section of the upper end of the throat member of the carrier which is provided with means whereby it may be hinged to said upper end of the throat member in a manner to extend beyond or overlap the lower or hinged end of the upper swinging carrier member. The extension frame is shown as provided with pulleys or other equivalent means for supporting a prolongation of the upper slat conveyer, herein shown as constituting an integral part of said upper conveyer. The construction and arrangement is such that the straw, as it is directed from the throat member to the swinging member is borne upon by the prolongation of the upper slat conveyer so as to be positively directed to the swinging carrier member, and so as to also prevent bunching of the straw at this point due to counter wind action. The said extension device so hinged to the throat member is shown as also comprising an upper section which is hinged to the first mentioned lower section or frame to extend farther rearwardly beyond the lower hinged end of the swinging carrier member and is provided with other pulleys or like devices to support the prolongation of the upper slat conveyer, said terminal section of the extension being free to rise and fall relatively to the lower section of the extension to which it is hinged. Preferably means are provided to limit the falling movement of the attachment and also to limit the falling movement of the terminal section thereof relatively to said lower section.

In the drawings:—Figure 1 is a vertical longitudinal section of a straw carrier, showing our attachment applied thereto, and illustrating a portion of the rear end of the threshing machine. Fig. 2 is a partial side elevation and partial section of said parts, with the swinging member of the carrier folded back on the machine for transportation. Fig. 3 is a plan view of the attachment.

As shown in the drawings, 10 designates, as a whole, the rear end of the threshing machine. 11 designates the lower or throat member of the carrier and 12 designates the swinging member thereof which is hinged to the throat member so as to be capable of being raised and lowered to any desired vertical angle relatively to the throat member. So far as these parts of the machine are concerned, they may assume any well known or preferred structure.

As shown in the drawings, the lower throat member of the carrier has the form of a

trough comprising a bottom wall 13 and side walls 14, and the swinging member thereof is also trough shaped and has a bottom wall 15 and side walls 16.

17 designates a lower endless slat conveyer which is trained about pulleys 19 located at the lower end of the throat member, other pulleys 20 located at the hinged end of the swinging member and a third pair of pulleys 21 located at the extreme rear end of the swinging member. The lower lap of the said conveyer is supported near the hinged end of the said swinging member by pulleys 22 which are carried by the throat member structure in any suitable manner.

24 designates an upper endless slat conveyer, spaced from the lower conveyer, and which, in the usual construction of straw carriers, is trained about lower pulleys 25 and upper pulleys 26, which latter are suitably supported on the throat member structure near its upper end. The swinging member is shown as hinged to the throat member structure through the medium of a shaft 28 which carries the pulleys 20 of the lower slat conveyer. The throat member of the carrier is partially supported from the machine through the medium of rods or wires 30 which are attached at 31 to a suitable part of the machine and are attached at their rear ends to plates 32 that are fixed to and constitute parts of the upper ends of the side walls of the lower throat member.

Referring now to our improved attachment by which the straw is positively carried from the upper end of the throat member of the carrier to the lower end of the swinging member thereof, the same is made as follows: The said attachment consists, in general terms, of a lower section 35 and an upper section 36 which are hinged together in a manner to be hereinafter described so as to be foldable or swingable relatively to each other. The lower extension section comprises side bars 38, 38 which are provided at their lower ends with openings to receive pivot pins 39 by which they are pivoted to the plates 32 at the upper end of the carrier throat member. Said side bars are attached rigidly together by means of a cross piece 41 which extends between and is bolted or otherwise rigidly secured to rails 42 which lie inside of and are attached to the bars 38 in any suitable manner. The said bars 38 are preferably made of metal while the rails 42 may be made of wood. 43 designates a shaft which extends between and is mounted at its ends in bearing sockets 44 in the inner faces of the rails 42. 45 designates pulleys which are fixed to or are mounted in said shaft, one at each side of the device.

The upper section of the carrier throat member extension comprises side bars 48, 48 which overlap at their lower ends the side bars 38 of the lower section and are pivoted thereto by means of pins 49. The said side bars 48 which may be made of metal, may be connected rigidly together by a cross piece 50 that extends between and is bolted or otherwise attached at its ends to the rails 51, which may be made of wood, that are attached in any suitable manner to the inner faces of the bars 48.

53 designates a shaft which extends transversely between the rails 51 and is mounted at its ends in bearing sockets 54 formed in the inner faces of said rails.

55 designates pulleys which are fixed to or mounted on the shaft 53 in line with the pulleys 45, before referred to.

The upper slat conveyer of the throat member, as herein shown, is prolonged beyond the usual length, as compared to straw carriers of this general type as they have heretofore been constructed, sufficiently to be trained about the pairs of pulleys 45, 55 carried by the lower and upper sections, respectively, of the throat piece extension attachment as best shown in Fig. 1, the prolongation of the upper conveyer being shown as made an integral part of said conveyer. The lower section of the throat piece attachment is held from swinging downwardly toward the lower carrier beyond a given point by means of cables or chains 58 which are attached at their upper ends to lugs 60 that are fixed to and rise from the upper sides of the rails 42, and are attached at their lower ends to a transverse bar 61 which extends between and is supported by the forward ends of the plates 32 of the throat member structure. The lower extension section will usually be adjusted by the cables or chains 58 to assume a fixed position in the normal operation of the carrier, and its hinged connection to the throat member structure permits it to be folded forwardly with and beneath the swinging member. The cables or chains 58 may, however, be arranged to permit a limited swinging movement of the lower section when said section is used alone.

The upper section of the throat member extension is free to rise and fall about its pivot or hinge bolts 49, but its downward movement is limited by means of a stop device which consists of a rod 63 that is loosely connected at its upper end at 64 to the upper extension and slides through a fitting 65 that is carried by a shaft 66 which extends transversely between and is shown as attached at its ends in any suitable manner to the lugs 60, before referred to. The rod 63 is provided at its front end with a stop nut 68, or other suitable stop device, which limits its forward movement with respect to the fitting 65 and thereby limits the downwardly swinging movement of the upper extension section relatively to the lower extension section. By reason of the screw-threaded engagement of the nut 68 with the

rod 63, the stop function of the device may be adjusted to permit the upper extension to swing more or less toward the swinging carrier member, as desired.

The upper extension section carries at its free end downholding fingers 70, 70 which extend rearwardly over the swinging carrier member to hold the straw passing therethrough on the slats of the conveyer. As herein shown, said fingers 70 are attached at their forward ends to the cross piece 50 of the said upper extension section.

In Fig. 1 of the drawing the parts are shown in the positions which they assume when straw is passing through the carrier. It will be noted that the extension device herein shown provide, not only a guide for the straw in passing from the throat member of the carrier to the swinging member thereof, but also provides a prolongation of the upper slat conveyer at this point to positively urge or carry the straw from the throat member to the swinging member. By reason of the fact that the upper section of the extension frame is hinged to the lower section thereof it will be noted that the attachment adapts itself readily to the relative angles between the upper swinging and lower throat members of the carrier. It will also be observed that the relative movements thus provided also enable the attachment to adjust itself to varying volumes of straw passing through the carrier while exerting a guiding and directing action on the straw to pass it from one member of the carrier to the other.

In Fig. 2 is shown the manner in which the extension attachment is capable of being folded beneath the swinging carrier and between said carrier and the top of the machine when the carrier is folded backwardly preparatory to moving the machine from place to place. When the parts assume the positions shown in Fig. 2 the upper lap of the upper slat conveyer breaks over the transverse bar 61, before referred to, and thereby holds the said conveyer in proper relation relatively to its supporting pulleys. It will be noted that the side bars 38 of the lower section of the extension attachment are curved upwardly between their ends so as not to clash with the adjacent slat conveyer supporting pulleys 26 and their bearings and with the transverse bar 61 before referred to. The curved arms also enable the hinge points between them and the carrier structure to be placed generally in line with the pulleys which carry the upper slat conveyer so as to avoid tendency of tension of said conveyer pulling the attachment forwardly away from the swinging member of the carrier. When the attachment is folded between the swinging member of the carrier and the top of the machine, said attachment lies between the side boards of the trough-like upper carrier frame, and the side bars 38 of the lower section lie between said side boards and the plates 32 at the upper end of the throat member of the carrier.

In the event that the upper or terminal section of the extension be not used, the prolongation of the upper slat conveyer will be trained about the pulleys 45 of the lower section and the downholding fingers 70 will be carried in any suitable manner by said lower section.

It will be understood that the structural details of our invention may be otherwise varied within the spirit and scope of the claims hereto appended, and that it is the intent to claim all of inherent novelty shown in the drawings and described in the specification.

We claim as our invention:—

1. The combination with a straw carrier comprising a lower throat member and an upper swinging member, of down-bearing means pivoted to the throat member below, and overlapping the hinged lower end of, the swinging member and embracing also traveling means to urge the straw rearwardly to prevent bunching of the straw as it passes from the throat member to the swinging member.

2. The combination with a straw carrier comprising a lower throat member and an upper swinging member, with upper and lower conveyers for the throat member, the latter extending along the swinging member, of down-bearing means carried by the throat member and overlapping the hinged lower end of the swinging member and provided with traveling means to coöperate with said upper conveyer to urge the straw rearwardly and to prevent bunching of the straw as it passes from the throat member to the swinging member.

3. The combination with a straw carrier for threshing machines comprising a throat member and a swinging member, with pulleys and upper and lower conveyers trained about the same, of an extension frame hinged to the throat member and overlying the lower hinged end of the swinging member and provided with pulleys about which a prolongation of the upper conveyer is trained.

4. The combination with a straw carrier comprising a lower throat member and an upper swinging member, with upper and lower conveyers for the throat member, the latter extending along the swinging member, a frame comprising upper and lower sections adapted to overlap the lower hinged end of the upper member, said lower section being hinged to the throat member, and pulleys carried by said sections over which said upper conveyer is trained.

5. The combination with a straw carrier for threshing machines comprising a throat

member, a swinging member hinged thereto and adapted to be folded backwardly over the throat member and the machine, and a lower conveyer carried by the throat member and swinging member, of an extension frame hinged to the throat member and overlying the lower hinged end of the swinging member, and an upper conveyer carried by the throat member and said extension frame and constructed to be folded, with the swinging member, backwardly over the machine.

6. The combination with a straw carrier for threshing machines comprising a lower throat member and an upper swinging member, a lower conveyer trained over pulleys carried by the said members and an upper conveyer carried by the lower throat member, of an extension hinged to the lower member and extending over the hinged end of the swinging member and pulleys carried by said extension over which a prolongation of said upper conveyer is trained.

7. The combination with a straw carrier for threshing machines comprising a lower throat member and an upper swinging member hinged to the throat member, a lower conveyer trained about pulleys carried by the throat member and swinging member, of an extension hinged to the throat member and comprising relatively foldable sections, each carrying pulleys, and adapted to overlap the lower hinged end of the swinging member, and an upper conveyer trained about the pulleys of said extension and other pulleys carried by the throat member.

8. The combination with a straw carrier comprising a lower throat member and an upper swinging member, with upper and lower conveyers for the throat member, the latter extending along the swinging member, of a frame comprising upper and lower sections adapted to overlap the lower hinged end of the upper member, said lower section being hinged to the throat member, pulleys carried by said sections over which said conveyer is trained, and means to limit the swinging movement of the said frame toward the swinging carrier member.

9. The combination with a straw carrier comprising a lower throat member and an upper swinging member, with upper and lower conveyers for the throat member, the latter extending along the swinging member, a frame comprising upper and lower sections adapted to overlap the lower hinged end of the upper member, pulleys carried by said sections over which a prolongation of the upper conveyer is trained, and means carried by the lower section to limit the swinging movement of the upper section toward the upper carrier member.

10. The combination with a straw carrier comprising a lower throat member and an upper swinging member, with upper and lower conveyers for the throat member, the latter extending along the swinging member, a frame comprising upper and lower sections adapted to overlap the lower hinged end of the upper member, said lower sections being hinged to the throat member, pulleys carried by said sections over which a prolongation of said upper conveyer is trained, means to limit the swinging movement of the said frame toward the swinging carrier member, and means carried by the lower section to limit the swinging movement of the upper section toward the upper carrier member.

11. The combination with a straw carrier for threshing machines comprising a throat member and a swinging member, with pulleys and upper and lower conveyers trained about the same, of an extension frame comprising side bars which lie at the sides of the throat member and are hinged thereto, and extend at their upper ends in overlapping relation to the lower hinged end of the swinging carrier member, a cross piece to connect the bars and pulleys carried by said bars over which a prolongation of the upper conveyer is trained.

12. The combination with a straw carrier for threshing machines comprising a throat member and a swinging member, with pulleys and upper and lower conveyers trained about the same, of an extension frame comprising side bars which lie at the sides of the throat member and are hinged thereto and extend at their upper ends in overlapping relation to the lower hinged end of the swinging carrier member, a cross piece to connect said bars and pulleys carried by said bars over which a prolongation of the upper conveyer is trained, said upper carrier member being foldable backwardly over the throat member and the machine and provided with side boards and said extension frame being adapted to be folded backwardly over the throat member beneath the swinging member with the side bars thereof lying between the sides of the throat member and the side boards of the swinging member.

13. The combination with a straw carrier for threshing machines comprising a throat member and a swinging member, with pulleys and upper and lower conveyers trained about the same, of an extension frame comprising side bars which lie at the sides of the throat member and are hinged thereto and extend at their upper ends in overlapping relation to the lower hinged end of the swinging carrier member, a cross piece to connect said bars and pulleys carried by said bars over which a prolongation of the upper conveyer is trained, said upper member being foldable backwardly over the throat member and the machine, and the extension frame being constructed to be foldable under the swinging carrier member, said side

bars being curved to pass over adjacent conveyer pulleys of the throat member.

14. An extension attachment for straw carriers comprising a frame adapted to be hinged at one end to the carrier structure and provided at its other end with conveyer supporting pulleys, and an extension member hinged to said frame and provided with other conveyer supporting pulleys.

15. An extension attachment for straw carriers comprising upper and lower foldable sections, belt conveyer supporting pulleys carried by both said sections, and means whereby one of said sections may be hinged to a carrier structure.

16. An extension attachment for straw carriers comprising upper and lower foldable sections, belt conveyer supporting pulleys carried by both sections, means whereby one of said sections may be hinged to a carrier structure, and stop means carried by said sections to limit the folding movement thereof.

In testimony that we claim the foregoing as our invention we affix our signatures in the presence of two witnesses, this 28th day of July, A. D. 1915.

WILLIAM H. KRUNFUS.
HERMAN F. KRUNFUS.

Witnesses:
W. L. HALL,
G. E. DOWLE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."