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W. J. DEAN.

HARVESTER.

No. 344,254. Patented June 22, 1886.

Fig. 1.

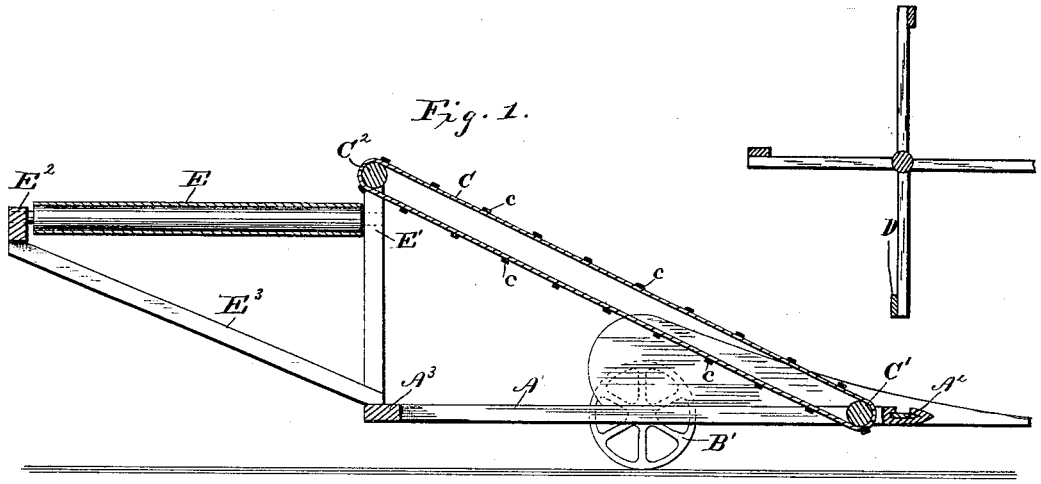
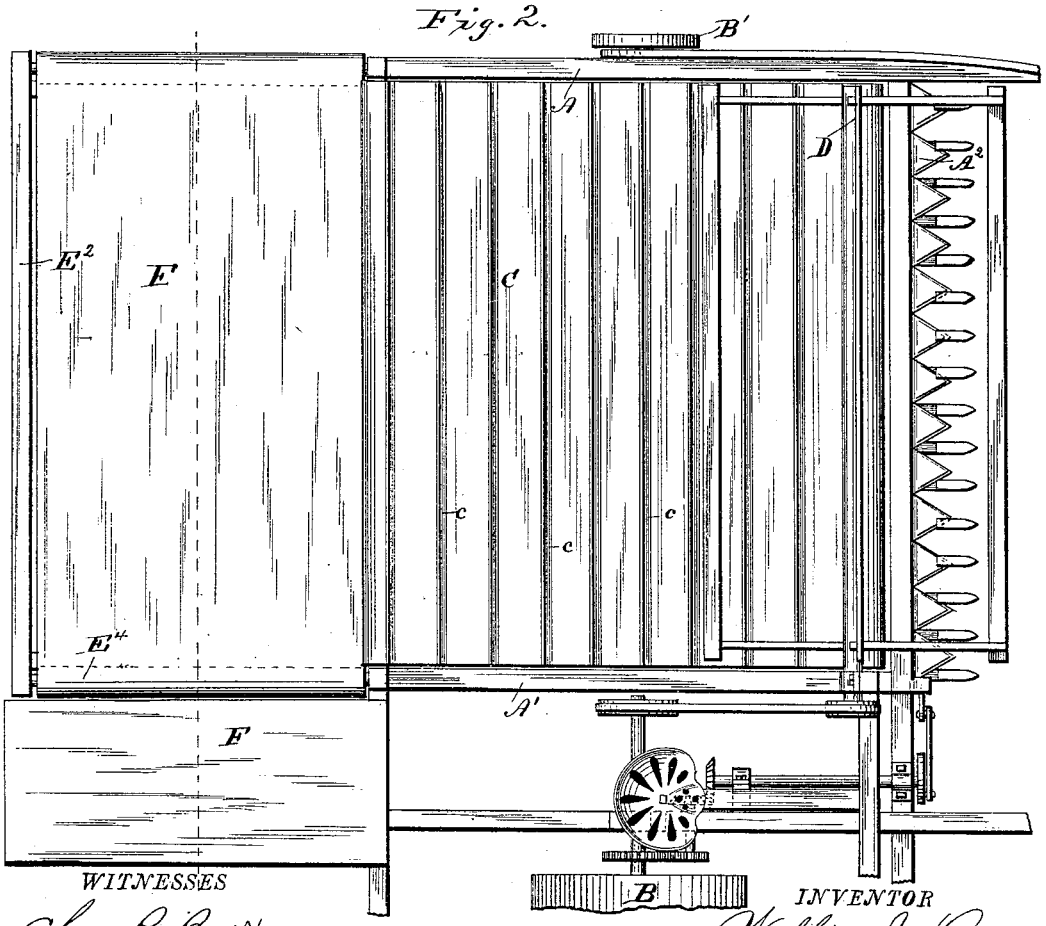


Fig. 2.



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(No Model.) 3 Sheets—Sheet 2.

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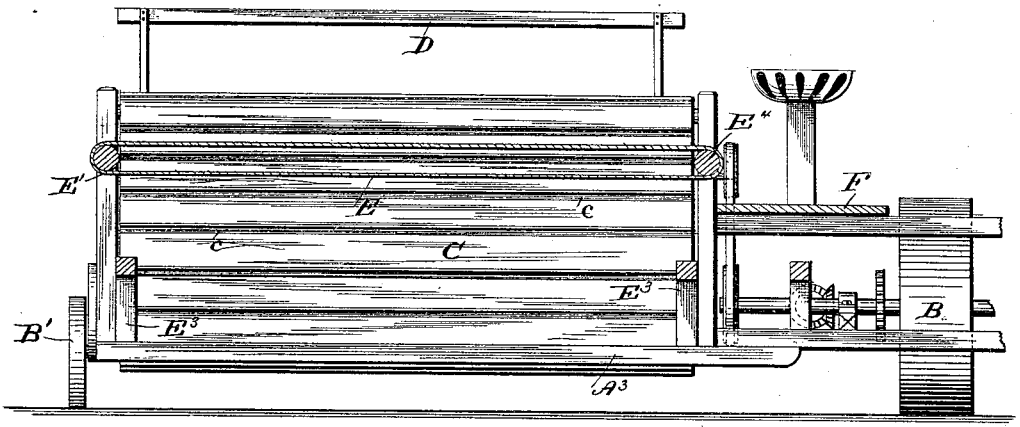
Fig. 3.



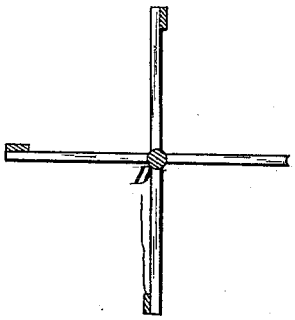


Fig. 4.

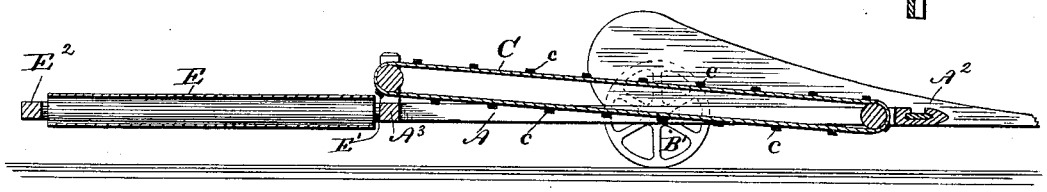


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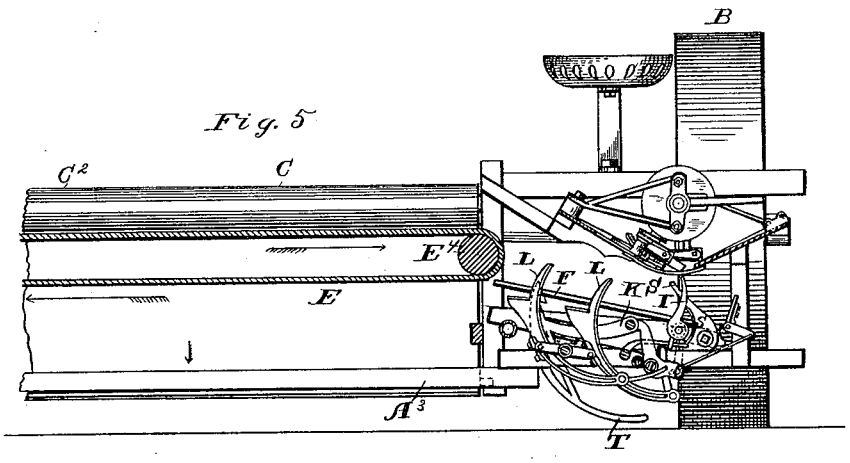
Fig. 5



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UNITED STATES PATENT OFFICE.

WILLIAM J. DEAN, OF MINNEAPOLIS, MINNESOTA.

HARVESTER.

SPECIFICATION forming part of Letters Patent No. 344,254, dated June 22, 1886.

Application filed December 26, 1884. Serial No. 151,211. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. DEAN, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Harvesters, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to the devices employed in harvesters for carrying the cut grain from a line immediately in rear of the cutter-bar to the point where the bundles are formed and the binding is effected either by hand or by automatic binding mechanism.

The object of the invention is to remove the grain from the cutter-bar more advantageously than it has been carried away heretofore.

Mechanisms now in use in machines which both automatically cut the grain and automatically bind the straws follow one or the other of two general principles. Some act to form bundles of loose gavels of straw immediately behind the cutters, which bundles are intermittingly swept or carried backward to the binding mechanism, and those of the second class carry the grain on endless carriers transversely to the path of the machine and on transverse lines immediately behind the cutter-bar. There are several species of the class wherein the gavels or bundles are intermittingly swept back, in some cases this being effected by a sweep-rake, in others by one of the bars of the reel, and in still others by an endless elevator or carrier, wherein the straws are temporarily stopped by means of an intermittingly-moving bar. Besides these mechanisms for cutting and binding the straws into bundles, have been those of the class known as "heading-machines," with which the purpose has been to sever the heads from the straws and carry them first backward by an apron and then transversely to a wagon or other receptacle by a second apron.

My object is to allow a binder to be located, if desired, in a low plane horizontally and on a transverse line more or less distant from the cutters, so that there shall be as full option as possible in regard to the place of location relatively to the drive-wheel, to the weight of the various parts, &c., and at the same time deliver to the binder the straws in a continuous stream. To do this I first allow the grain to fall immediately after being cut upon an endless carrier, which takes the straws endwise backward and deposits them upon a second transverse carrier in such a way that they shall be carried continuously to the binder. The first carrier—that is, the one which receives the grain immediately after it falls over the cutter-bar—may be arranged either horizontally or inclined, according to the preferred construction of harvester in which my invention is embodied.

In many machines heretofore used in which the grain was carried directly back to a cross-carrier, the reel was depended upon to unite in action with the carrier to move the grain backward. As a result, the grain was delivered to the second carrier in bundles or bunches; but when a construction is employed embodying my invention the grain is taken in a continuous mass of uniform thickness and delivered to the second carrier as a stream, and not in bunches.

Figure 1 is a section taken transversely to the cutter-bar, the first carrier in this case being inclined. Fig. 2 is a top plan view showing generally, and in some respects conventionally, the relations of the various parts of a harvester having my improvements applied thereto, those parts being omitted the details of whose construction and operation will be readily understood by those familiar with the art to which the invention appertains. Fig. 3 is a section taken longitudinally through the second carrier. Fig. 4 is a sectional view of a machine in which the carriers are arranged horizontally. Fig. 5 is a sectional elevation of a machine with the parts arranged as they are in Fig. 4, this figure being taken on a line at right angles to the line on which Fig. 4 is taken, and showing also the binder.

In the drawings, A represents the outer part of the frame of the platform; A′, the inner part; A^2, the cutter-bar; A^3, the rear part of the frame. At B the drive-wheel is situated, there being a grain-wheel at B′.

I have not shown the gearing and all the details by which the various operative parts of the machine are moved. These will be readily understood by those acquainted with

the art, and one or another form may be substituted, as preference may dictate. I have shown and will below call attention to devices which can be used for moving the parts which constitute the main features of the invention.

In or above the platform-frame above described there is mounted a continuously-moving endless carrier or apron, C, provided with cross-bars or cleats *c*. As shown in Figs. 1 and 3, this carrier is arranged at an inclination to the plane of the cutter-bar, so that the grain will be delivered at the rear on a plane somewhat above that on which it is received.

C′ is a roller mounted in the platform-frame as close as is practicable to the finger-beam, and C² is a second roller, mounted in the upper part of the rear frame, A^3.

D represents the reel, which, so far as the details of its construction and its operation are concerned, may be substantially similar to those commonly in use, it being requisite, however, in order to attain the ends at which I aim, that the blades or bars of the reel should be situated, as far as is practicable, from the apron or carrier C.

When carriers in any respect similar to the one which I employ have been heretofore used, they have generally been combined with reels the blades or bars of which were so arranged as to sweep through an arc in close proximity to the carrier, in order that they might act jointly with the apron in elevating the grain. In my case the reel acts entirely independently of the carrier, its function being simply to press or hold the heads of the grain backward while being acted upon by the cutters. As a result of this arrangement, the grain is carried back in a continuous stream of substantially uniform depth of thickness at all times, the reel not acting to form bunches or bundles. At the rear the carrier C delivers the grain to a cross-carrier, E, preferably consisting of a canvas apron or belt, which carries the grain toward the drive-wheel side of the machine. The relative dimensions of the various parts are in the neighborhood of those shown in the drawings, though I do not wish to be limited to them.

As shown, the length of the second carrier is but little greater than the width of the first, and the table or platform at F, where the grain is bound, is between the plane of the drive-wheel and the second carrier. These parts may be varied, as said above, and the binding table or platform may be on the inside of the drive-wheel, and the second carrier may be elongated sufficiently to carry the grain to any desired point.

As shown, the second carrier is arranged and mounted to move at right angles, substantially, to the first; but, of course, it will be understood that within certain limits the angle may be varied. E′ represents the inside part of the frame which directly supports the second carrier, and E^2 the outside part thereof. When the grain is taken to a higher plane, as in the construction shown in Figs. 1 and 3, braces of the character at E^3 can be employed; but when the parts are arranged to carry and bind the grain in a low plane horizontally, as in Figs. 4 and 5, one general horizontal frame will be sufficient.

The roller E^4 at the inner end of the second carrier adjacent to the binder may be arranged with relation to the latter as shown, or in any other preferred way.

One important requisite for successfully operating automatic binders, as has been well known for a long time, is, that the grain should be supplied to them in a uniform stream, and not in bunches or partial bundles, and I have found that the mechanism constructed substantially as I have shown and described overcomes many of the difficulties met with in using binders, and at the same time I do not have to elevate the grain over the drive-wheel in the manner heretofore necessary with many machines. In machines properly constructed the carrier may be arranged so as to take the grain from the cutters to the binder on substantially one horizontal plane.

Fig. 5 illustrates the parts when arranged in relation to each other in substantially the way above referred to. In said figure, for the purpose of illustrating the relation of the other parts to the binding mechanism, I have shown a sufficient part of the well-known "Appleby" binder; but there is no necessity in this case to illustrate or describe in detail any particular binding mechanism, and I wish it to be understood that I may employ a binder of any suitable character.

All of the necessary details of the binder shown will be fully understood upon reference to Patent No. 262,883, and others to J. F. Appleby, this binder being selected as a widely-known representative of those automatic binders which are used with aprons that carry the straw on transverse lines in a continuous stream, and therefore adapted to attain the object of my invention, there being two features incident to such binders—to wit, a stop of one form or another which temporarily retains the straw until the band is secured in place, and, secondly, devices which automatically form loose or unbound bundles of straw prior to their being bound.

My invention is intended to overcome the difficulties met with in using automatic binders of the Appleby and other types, when arranged as in those machines herein referred to, which elevate the grain over the drive-wheel on lines immediately behind the cutters.

In the construction illustrated in Fig. 3 the "stop" above referred to is provided by means of swinging arms I and S, which or the equivalents of which are found in machines of the above classes, and the devices for automatically forming the bundles consist of packing-arms L L, in conjunction with the aforesaid arms I and S, and the needle or cord carrying arm T; but, as said, I disclaim any of the features of construction of the particular binder represented.

It will be seen that the final tying or binding of the gavels does not enter essentially into all of the features of my invention, as this may be accomplished in any preferred way, the invention relating more particularly to the means described, or those substantially equivalent, for delivering the straw, whereby the regulating of the size of the bundles can be effected after the grain has left the first carrier; hence the forming of the bundles has a more important place in my case than the tying of them, although with a complete machine, such as indicated in Figs. 4 and 5 jointly, all of the ordinary steps, from the initial cutting to the dropping of the completed bundles, can be effected. The possibility of thus forming and regulating the size of the bundles at the rear of the machine is facilitated by having an automatic stop, as shown at I and S, for the stream of grain, and after sufficient has reached the stopping device to form a bundle the latter can be separated in any of the well-known ways, ranging from the action of an operator's hand to the automatic action of a needle. By having an automatic stop, in conjunction with the means for carrying back and delivering, it becomes possible to accomplish these matters in any preferred way at the rear of the machine, and in a low horizontal plane. In the mechanism shown this stop is connected with the binding devices; but this is not essential.

I herein refer to the initial carrier which removes the cut straw from the cutters immediately after it drops therefrom as a "continuously-acting carrier," meaning thereby a carrier which is so constructed and arranged that it acts to remove the grain in substantially a stream, in contradistinction from the machines which form, immediately behind the cutters, the loose or unbound bundles which are subsequently bound either on the machine or the ground, said machines being such as those which have a raking and reeling apparatus, comprising a series of revolving arms, of which several merely act to press the grain in against the cutters and allow it to fall in a heap, which is then pushed back by another arm of the series following those last alluded to.

I do not wish to be limited to exactly the form of carrier shown, as the end of the invention can be attained so long as the grain is delivered to the binder in such way that the bundle-forming devices connected with the binder can regulate the size of the bundles and make them uniform. This cannot be accomplished by those machines which form the entire bundles immediately behind the cutters.

In some machines the devices which carry the grain back from the cutters can be alternately arranged, first, so as to form heaps immediately behind the cutters, and, secondly, so as to deliver the grain in a swath at the rear end, and a carrier when arranged as last described can of course be used to carry out my invention. With a machine of this character, (by which I can first take the straw back longitudinally and then carry it transversely,) I preserve the well-known advantages of those machines in which the grain is taken in a continuous stream from the cutters by an endless carrier moving parallel to the cutter-bar, and is carried to a binder situated upon lines passing longitudinally through the said initial carrier, and at the same time I can attain other advantages which are not incident to those that carry the grain in a continuous stream on transverse lines immediately behind the cutter-bar. I can arrange my binder at option with relation to the drive-wheel and the other parts, so as to properly distribute the weight with respect to the said wheel, the draft devices, and the platform. Moreover, I can attain that end particularly aimed at in these machines at the present day and accomplished in some of them—namely, locating the binder at a low point, and yet, as above said, preserve the continuous feed, so that the binder can itself automatically regulate the sizes of the bundles to be tied thereby.

What I claim is—

1. In a harvesting and binding mechanism, the combination of the following elements, namely: the cutters, the binder, a continuously-acting carrier moving backward from the cutters, and a second carrier moving on lines transverse to the path of the first aforesaid carrier and interposed between the said first carrier and the binder, and arranged, substantially as set forth, to have the straws while unbound all carried thereby to the binder, as described.

2. In a harvesting and binding mechanism, the combination of the following elements, namely: a drive-wheel, a binder situated behind the axis of said wheel, the cutters, a continuously-acting carrier moving directly backward from the cutters, the space or path for the grain above said carrier being unobstructed, and a second carrier interposed between the first said carrier and the binder, all of said parts being arranged and operated substantially as set forth, whereby the straws to be bound are, as they fall from the cutters, at once moved backward in a continuous stream.

3. In a harvesting and binding mechanism, the combination of the following elements, namely: a drive-wheel, a binder situated behind the axis of said wheel and below the top thereof, a continuously-acting carrier moving directly backward from the cutters, and having the rear part situated below the top of the drive-wheel, and a second carrier interposed between the first aforesaid carrier and the binder and situated below the top of the drive-wheel and mounted transversely to the first aforesaid carrier, all of said parts being arranged and operated substantially as set forth, whereby the straws are delivered in a continuous stream to the binder on a low horizontal plane.

4. In a harvester and binder mechanism, the combination of the following elements, namely: the cutters, a carrier moving directly backward

from the cutters, and arranged, substantially as set forth, to have the front portion thereof in immediate proximity to the cutters, whereby the straws, as they fall from the cutters, are at once taken backward in a continuous stream, means, substantially as described, which receive the said stream of straws, and an automatic binder, substantially as described, which forms bundles of the straws after they reach the aforesaid means that take them from the first carrier, substantially as set forth.

5. In a harvesting and binding mechanism, the combination of the following elements, namely: the cutters, a carrier moving directly backward from the cutters, whereby the straws are withdrawn in a continuous stream, means, substantially as set forth, which receive the straws of the said stream and form therewith a counter or transverse stream, and an automatically-operating stop which intermittingly checks the progress of the straws after they have been received by the means last aforesaid, as described.

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

WILLIAM J. DEAN.

Witnesses:
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W. H. FULLER.