

(No Model.)

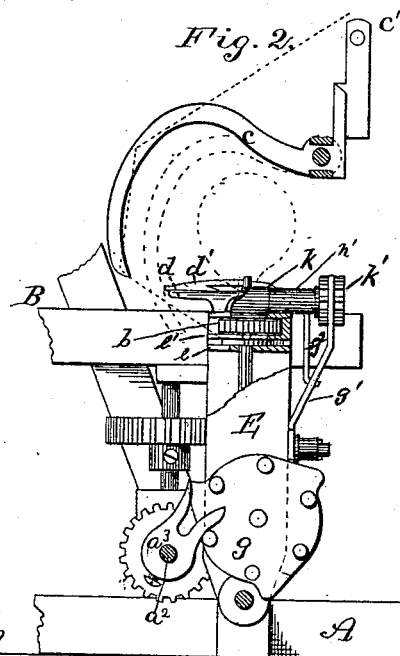
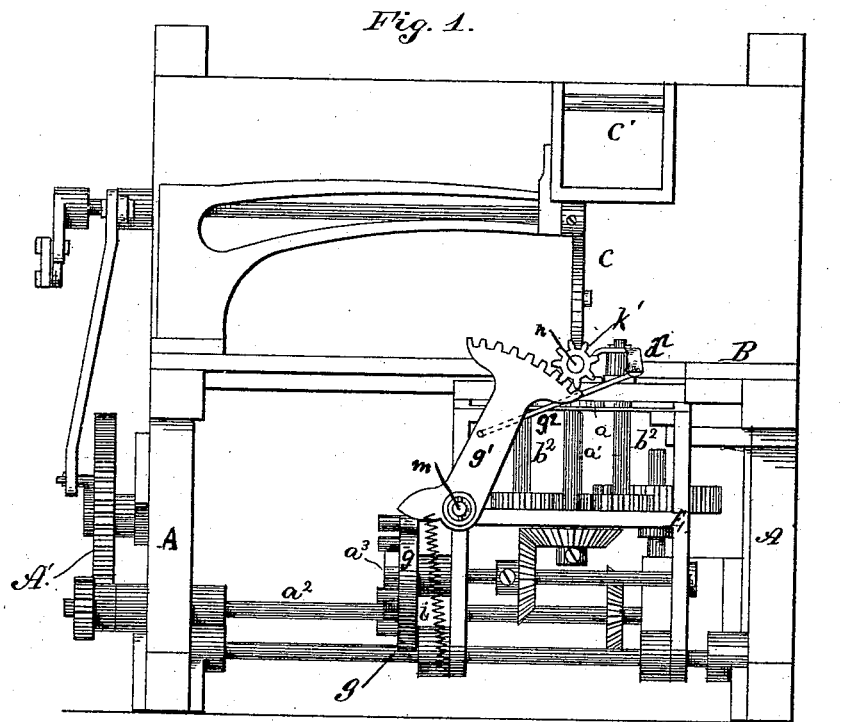
2 Sheets—Sheet 1.

A. GOODYEAR.

GRAIN BINDER.

No. 266,284.

Patented Oct. 24, 1882.



Witnesses:

J. W. Garner  
H. S. D. Haines

Inventor:

Albert Goodyear  
By *Chas. E. Foster*

(No Model.)

2 Sheets—Sheet 2.

A. GOODYEAR.

## GRAIN BINDER.

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*Fig. 3.*

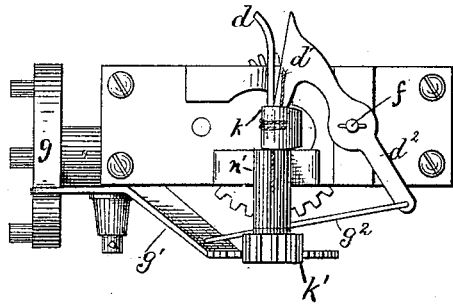
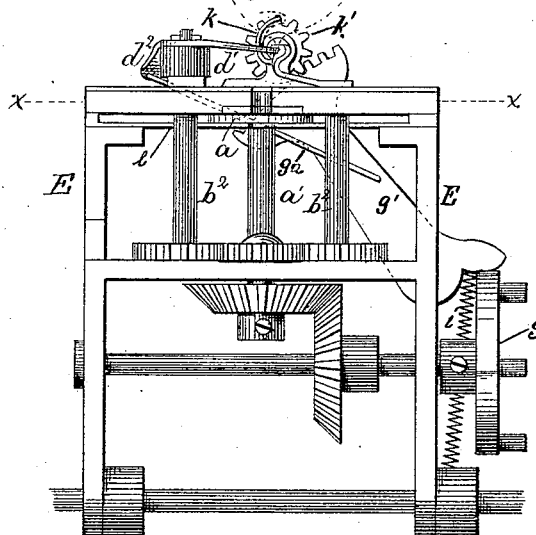


Fig 4.

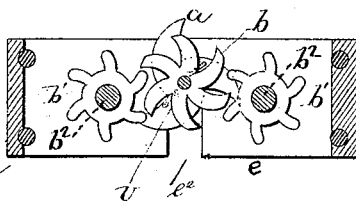


*Fig. 5.*

*Witnesses:*

J. W. Garner

W. L. Haines



*Inventor:*

Albert Goodyear

By Atty.  
Charles E. Foster

# UNITED STATES PATENT OFFICE.

ALBERT GOODYEAR, OF AKRON, OHIO.

## GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 266,284, dated October 24, 1882.

Application filed March 15, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, ALBERT GOODYEAR, of Akron, in the county of Summit and State of Ohio, have invented certain new and useful Improvements in Grain-Binding Machines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in grain-binders, and more especially to that portion of such machines whereby the extremities of the encircling band (it being of cord) are united by being twisted together, and subsequently so treated by mechanical means that the said ends cannot of themselves become separated.

The object of my invention is to provide means for securing the band around a bundle in such a manner that when released from the machine there will be no slack to be taken up by the expansion of the bundle.

My invention consists in the mechanical parts, combined and operated as more fully hereinafter described, and particularly set forth in the claims.

To enable others skilled in the art to make and use my invention, I will now proceed to describe the same with reference to the drawings forming a part of this specification, in which—

Figure 1 represents an elevation of the front or delivery side of a grain-binder with my improvements attached. Fig. 2 is an end view with a portion of the frame removed. Fig. 3 is a plan view of the same. Fig. 4 is a side view of the same, taken from the inner side. Fig. 5 is a horizontal section taken on the line *x x* of Fig. 4.

Only that part of a binder is shown in the drawings which is necessary to illustrate the operation of the device.

The cord used with my invention will be tarred.

In the drawings, A represents the binder-frame which supports the parts composing the operative mechanism of my invention; B, the

binder-platform, whereon the grain is delivered to be bound; C, the binder-arm, which has suitable guides and an eye at the end, through which the cord is passed; C', a cord-reel placed in any convenient place.

Before commencing the operation of binding the cord is threaded through the guides and eye of the arm C and the end secured in the cutter and holder *a*. As the grain is delivered onto the platform B the arm C descends, and the cord, yielding to the pressure of the grain, is laid around the bundle. The point of the arm C descends below the line of the platform B and the cutter and holder *a*, thus delivering the cord to said holder and to the twister *b*. The cutter and holder severs it and secures the end of the main cord for the next bundle.

The cutting, holding, twisting, clamping, and tucking mechanisms, which embody the essential elements of my invention, are arranged on a frame, E, attached to the binder-frame A, either in a position like that shown in Fig. 1 or otherwise, as may be best suited for the work.

The cutter and holder *a* consists of a rotating toothed wheel, the teeth of which radiate from a common center, and are hook-shaped, as shown in Fig. 5. It is mounted on a vertical shaft, *a'*, to which motion is communicated from a horizontal shaft, *a''*, having the bifurcated cam *a'''*, through intermediate gearing, Figs. 1 and 2. The cutter *a* runs between the plates *e e'*, in each of which is a slot, *e''*, as shown in Figs. 4 and 5. As the cutter *a* revolves its teeth pass across the edge of these slots. The edge of the upper plate, *e'*, is sharp, similar to the edge of shears. By reason of the peculiar form of the teeth of the cutter and holder *a* the cord is drawn toward its axis when it revolves, for reasons hereinafter stated.

The twister *b*, Fig. 5, also has radial hook-shaped teeth, and it revolves around an axle, U, which is formed by a continuation of the cutter-shaft *a'*. Motion is imparted to the twister *b* by the toothed wheels *b'* on the vertical shafts *b''*, which are actuated from the shaft *a''* through intermediate gearing. Motion is imparted to the shaft *a''* from a segmental gear-wheel, A', which is caused to revolve by power suitably communicated from

the drive-wheel of the harvester, and thus the parts are caused to operate in proper time and in unison.

Directly above the cutting, holding, and twisting wheels is located what I term a "clamping" and a "tucking" device. The clamp consists of a stationary arm, *d*, located and formed as shown, and an arm, *d'*, pivoted at *f*, formed as shown, and having the projecting lever-arm *d*<sup>2</sup>. The movable arm *d'* is operated by means of cams on the wheel *g*, through the lever-arm *g'*, with which it is connected by the rod *g*<sup>2</sup>. A spring, *i*, serves to retract into its normal position the lever *g'*, after having been operated by the cams on wheel *g*. The tucker *k*, located and formed as shown, is attached to the extremity of a short shaft, *n*, which is journaled in the bearings *n'*, and has the spur-wheel *k'* keyed to its other end. An intermittent rotary motion is imparted to the tucker *k* by means of a segmental rack on the upper extremity of the lever *g'*, which lever is pivoted at *m*, the teeth of the rack meshing with those of the spur-wheel *k'*, as shown.

The peculiarities and merits of my invention will be better understood by a description of its operation, which is as follows: The cord having been threaded through the guides and eye of the arm *C*, the end is inserted in the slots of the plates *e e'* from below, between the blades or teeth of the cutter and holder *a*, and the end clamped and held by it, and the plate *e'* being carried between them by the motion of the cutter and holder, the upper portion of the cord being forced within the grasp of the twister *b* by reason of the peculiar formation of the teeth of the cutter and holder *a*. The twister *b*, which would also be revolved about one-half of a revolution at this time, will also clamp and hold the cord through the medium of a simple but effective device, (not shown in the drawings,) and afterward, when the cord has been properly twisted, freed therefrom by the intervention of additional parts, all of which will be left for a full and clear description in a future application. On the descent of the arm *C* the second cord will be introduced into the slots and below the cutter and holder *a*, as represented by broken lines in Fig. 2, and the upper portion around the bundle between the teeth of the twister *b*. The cutter and holder *a*, revolving, cuts off the cord and leaves the ends of the band within the grasp of the twister *b*, still retaining the end from which the band was severed within its grasp. As the twister *b* revolves, twisting the ends of the band together, it so rotates as to untwist

the strands of the separate ends of the band to a certain extent, while at the same time it unites them all into one strand or cord. This peculiar feature of the untwisting and uniting of the ends of the band by the twister *b* is an important element of my invention, for by practical tests I have found it to be the only sure way of joining the ends of the cord effectively. After the twister *b* has made a sufficient number of turns the clamp-arm *d'* compresses the twisted and united cords firmly against the fixed arm *d*, in the manner indicated in Fig. 4, near to the bundle, and then holds them for a suitable time. The twisted cords are now released by the twister *b*, and the tucker *k* tucks them under the band, and between it and the bundle, in the same way as that operation is performed with a straw band. As the tucker rotates back to its normal position the clamps *d d'* release the bundle and it is forced from the machine, making way for the binding of another.

It will be observed, on an inspection of Figs. 2 and 3, that the extremity of the rotating shaft, to which the tucker is attached, does not extend quite over the center of the axle of the twister, and that the clamp-arm *d* abuts upon the end of said shaft, and that it will serve as a guide for the binding cord when being brought into contact with the cutter and twister by the binding-arm *C*. This arrangement, I have found by experiment, renders the work of the several parts more accurate.

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

1. In a device for uniting the ends of a band, the combination of a rotary cutter and holder and twister with a clamping device for holding the cord, after being united by the twister, between the twisted ends and the gavel, and a rotary reciprocating tucker, whereby the said ends are tucked beneath the band, substantially as shown and described.

2. A binder-arm for placing the band around the bundle, in combination with a rotary twister, a clamp independent of said arm, and located between the twister and the bundle, means for operating said clamp to hold the band after it has been united, and a rotary reciprocating tucker, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

ALBERT GOODYEAR.

Witnesses:

JAS. McNAUGHTON,  
W. W. ALEXANDER.