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KNOTTING MECHANISM FOR SELF BINDING HARVESTERS.

No. 591,614. Patented Oct. 12, 1897.

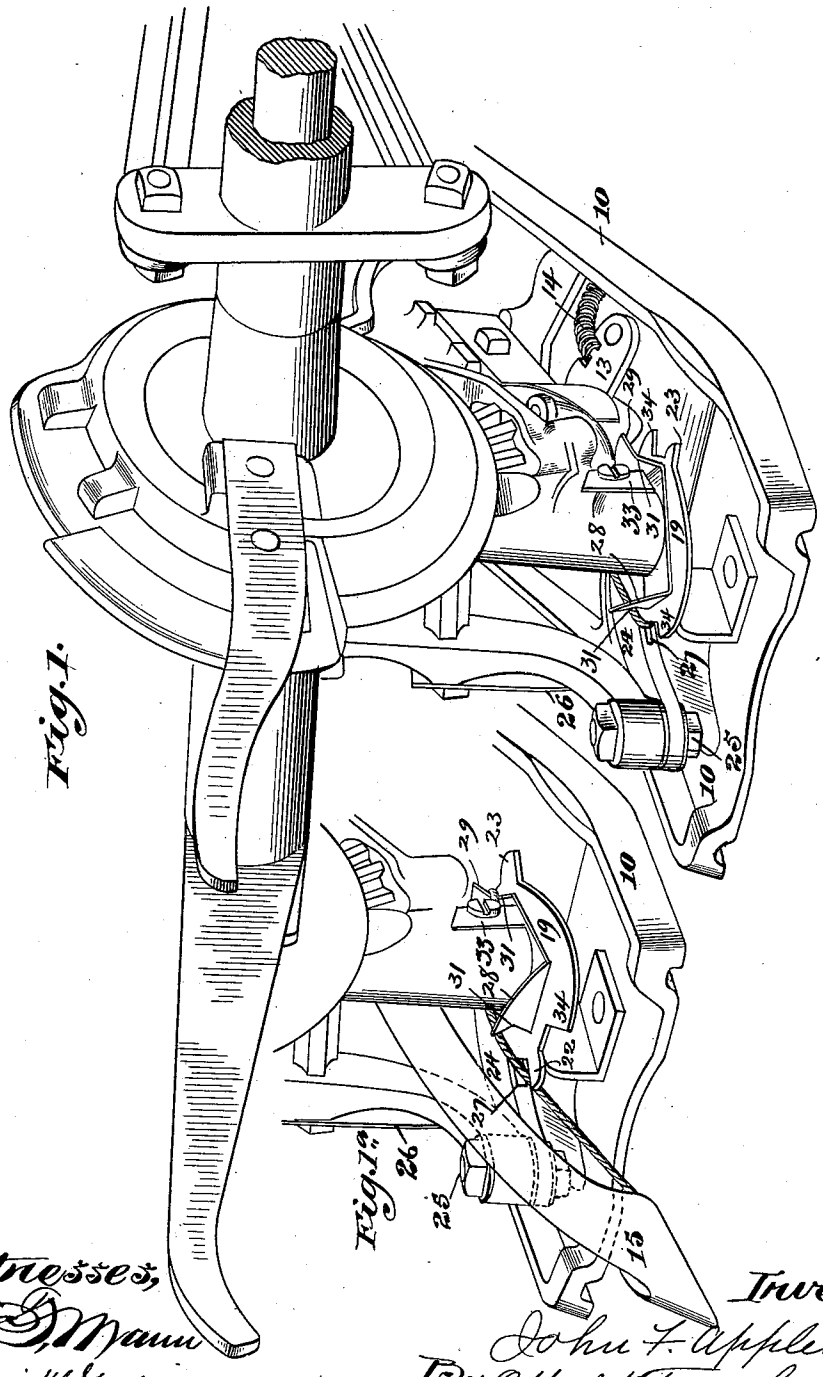

Fig. 1.

Fig. 1a.

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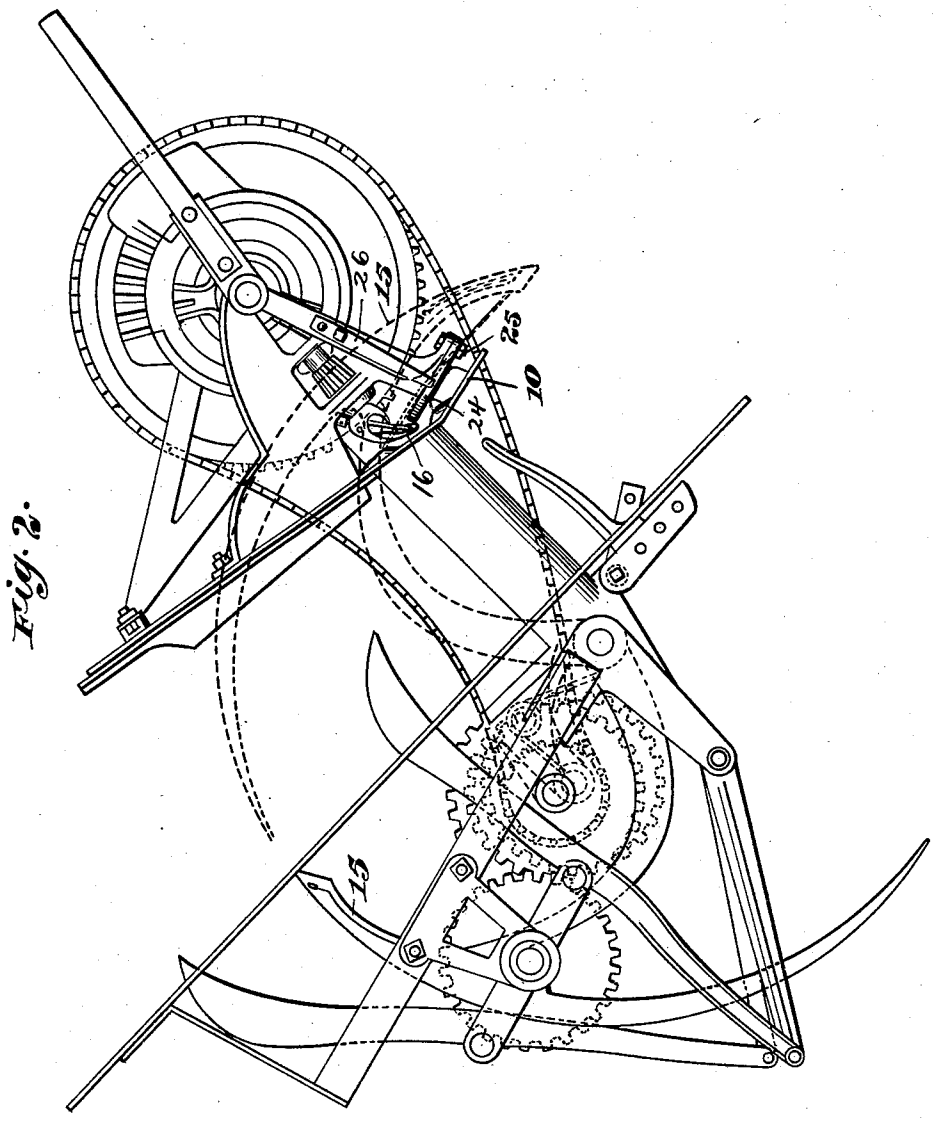

Fig. 2.

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Fig. 3.

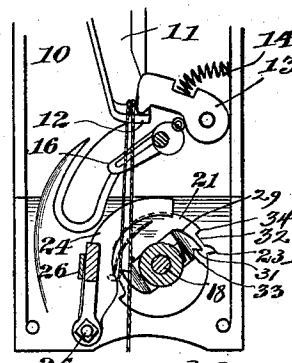
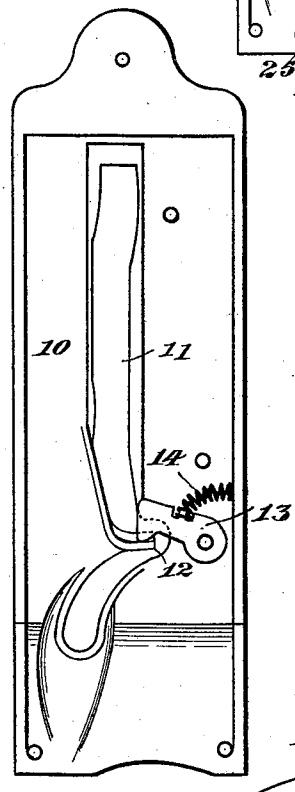


Fig. 4.

Fig. 4.a



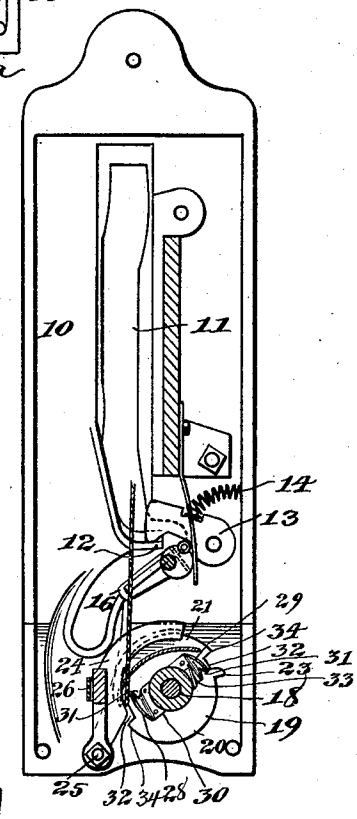
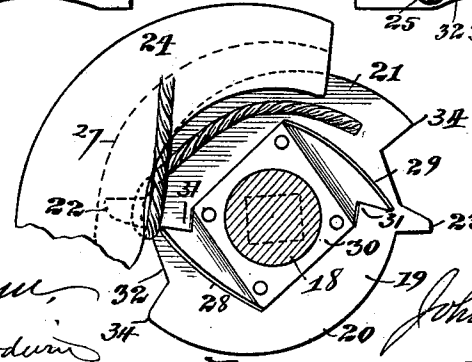


Fig. 7.



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KNOTTING MECHANISM FOR SELF BINDING HARVESTERS.

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Fig. 5a.

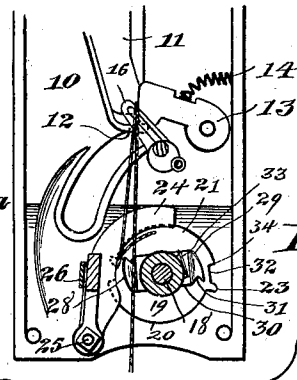


Fig. 6.

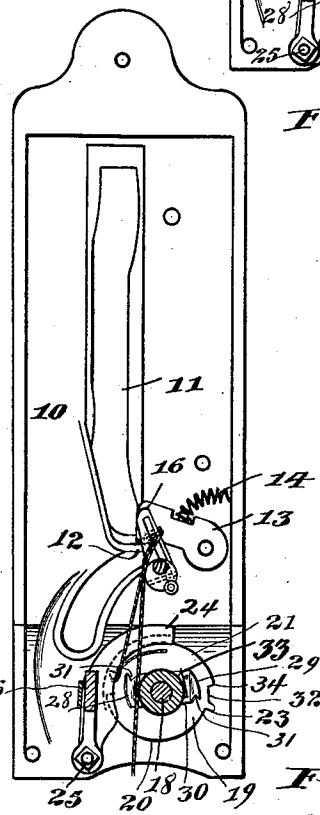


Fig. 5.

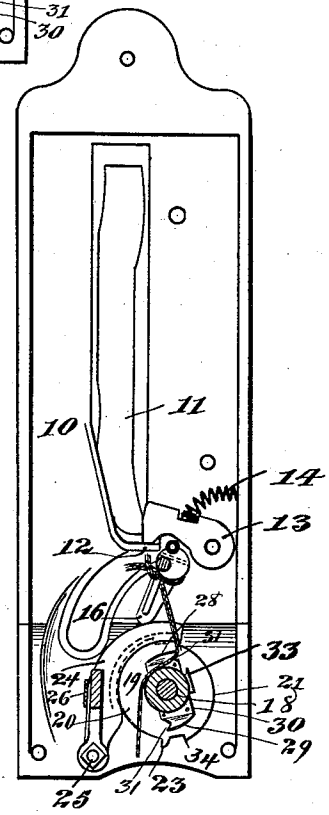
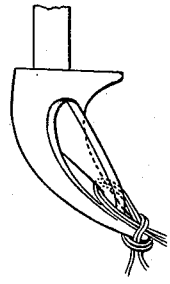


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN F. APPLEBY, OF HARVEY, ILLINOIS.

KNOTTING MECHANISM FOR SELF-BINDING HARVESTERS.

SPECIFICATION forming part of Letters Patent No. 591,614, dated October 12, 1897.

Application filed March 2, 1897. Serial No. 625,713. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. APPLEBY, of Harvey, Illinois, have invented certain new and useful Improvements in Knotting Mechanism for Self-Binding Harvesters, of which the following is a specification.

My invention relates to certain features of improvements in the knotting mechanism of a self-binding harvester, and more particularly to an improved cord carrier and holder and to a novel arrangement of the cord-latch with reference to the slot of the breastplate.

The object of my invention is to provide a cord-holder of very simple construction, having few parts not likely to get out of order, which will effect a certain holding and delivery of the cord to the cord-hook and which will present the cord to the severing-knife and deliver the cut ends out of the cord-holder without liability of clogging.

My cord-holder is also of such construction that the two strands of the cord are separated and kept separated during the period of rotation of the holder, whereby any entanglement of the strands or interference of one with the other is prevented.

In the accompanying drawings, Figure 1 is a perspective view of the knotter-head and breastplate, the needle withdrawn; and Fig. 1^a is a similar view showing the needle at the forward limit of its stroke. Fig. 2 is an elevation of the binder-head, showing also the deck and packer mechanism. Fig. 3 is a plan view of the breastplate and a latch for closing the cord-slot therein. Figs. 4, 5, and 6 are similar views of the breastplate, showing the latch, knotter-hook, and cord-holder in different positions, some of the other parts in section. Fig. 7 is an enlarged sectional plan showing the cord-holder and a grooved shoe coöperating therewith partly broken away. Fig. 8 shows the knotter-hook and knot.

My improvements may be readily applied to any of the leading types of self-binding harvesters, and the mechanism which I have shown is illustrative merely so far as said parts are not hereinafter particularly described and claimed.

I will merely designate parts whose construction is well known by reference-numerals, but without particular description.

Let 10 represent the breastplate, having a cord-slot 11 of outlines substantially such as heretofore employed, the slot being of irregular form and carried around a projecting shoulder 12, which serves, in conjunction with a latch 13, to retain the cord and prevent its passing into the forward part of the slot while the gavel is forming. The latch 13 is pivoted at one side of the slot and substantially in line with the shoulder 12 or opposite the extremity thereof. The latch is normally held against the forward or leading-in side of the shoulder 12 by the spring 14, and the end of said latch lies in a plane substantially at right angles to the forward face of the shoulder 12 and parallel to the path of the needle 15. When the needle advances to carry a strand of the cord to the cord-holder, as shown in Figs. 1^a and 4^a, the cord will be prevented from passing into the forward portion of the slot by the end of the latch and the two strands of the cord will be separated, as shown in Fig. 4^a, and will lie over the point of the hook 16. The latter then begins its revolution, carrying both strands of the cord, as shown in Fig. 5^a. The point of the hook moving in a circular path has a tendency, when advancing toward the position shown in Fig. 5^a, to carry the cord farther away from the axis of the hook, thus causing the cord to lift or raise upon the end of the latch, lifting the latter out of contact with the shoulder 12 and permitting the cord to pass into the forward portion of the slot.

The latch mechanism, while very simple in its construction and automatic in its operation, it will be observed, is not controlled mechanically by a moving part of the binder mechanism, as usual, but is normally held in position to close the slot by a simple spring, and is lifted to uncover the slot by the action of the cord itself. The latch is so arranged that the pull of the cord is endwise upon the latch or in line with its pivot while the cord is being tightened around the bundle, and after the knotter-hook engages the cord the strain is eccentric to the pivot of the latch, so that the latter is lifted and the cord passes beneath.

My cord-holder mechanism is also of very simple construction. The cord-holder shaft is marked 18, and it is driven intermittently

in a well-known manner, the gearing being so timed that the cord-holder shaft performs a half-revolution during the tying of each bundle. On the lower end of the cord-holder shaft is fixedly mounted a flat disk 19, preferably of sheet-steel, which may be very thin, say one-eighth of an inch. This plate is shown in full size in Fig. 7, and it is arranged in a plane at right angles to its axis of revolution. In contour its periphery presents two eccentric segments 20 and 21, and near the base or narrow portion of each of said segments and in advance of the high point of the other of said segments are provided the offstanding prongs, teeth, or projections 22 23. These teeth serve to engage a strand of the cord and to carry or move it toward the knotter-hook. Working in conjunction with the disk 19 is a shoe 24, which is pivotally mounted, as upon the stud 25, and backed up by a flat spring 26. The shoe has a curved inner edge arranged concentric to shaft 18 and a groove 27 in its curved edge. Said groove is only slightly wider transversely than the thickness of the disk, as the cord does not necessarily enter the groove, but is impinged against the edges of the shoe at the opening or mouth of the groove by the edge of the disk, the forward movement of the cord being effected by the prong or tooth.

In order to separate the strands of the cord and to guide the strand carried by the needle, I employ the upstanding cord-deflecting plates 28 29. For convenience of construction said plates may be formed integrally with a plate or strip of sheet metal 30, apertured for the passage of the shaft 18 and secured to the disk 19. These plates are notched on their front edges, as shown at 31, and their outer sides form an acute angle with the disk 19. The edges of said plates are inclined preferably on a curved line. As the needle advances, carrying the cord across the cord-holder, the strand carried by the needle will be deflected toward the axis of the holder by the edge of the plate and thereby separated from the strand which is engaged by the prong of the disk. As the needle returns, the strand of the cord carried thereby will be deflected by the inclined edge of the deflecting-plate away from the center of the disk and into the notch 32, between the prong and the high point or shoulder of the adjacent segment, and the continued backward movement of the needle will then draw the strands of the cord back over and around said prong, as clearly seen in Fig. 7.

A cord-severing knife 33 is secured on the sleeve-bearing of shaft 18, the knife being positioned back of the knotter-hook. After the knot is tied the strand, which is then lying across the cord-holder and through the point of the needle, as seen in Fig. 6, is carried by the notched end 31 of one of the plates 28 or 29 into contact with the knife, and the cord is severed. By the time the severing of the cord is effected one of the ends thus severed is engaged by the prong or tooth of the disk and carried into contact with the grooved shoe. Thus it will be seen that the strands of the cord which pass across the cord-holder are kept separated from each other, so that their entanglement or interference is entirely prevented. Further, it will be seen that the needle carries the strand of the cord below the plane of the cord-carrying disk, so that said strand crosses the plane of the disk in position to be engaged by the tooth at the next actuation of the disk, the tooth lying in such a position that it engages the cord from the upper side and the return of the needle carrying the strand of the cord over and around the tooth, as previously described. It is also seen that but one strand of the cord is severed and that the severed end is relatively short. The points 34 of the disk 19 serve as clearers to insure the clearing of the groove, and the eccentric surface of the segments 20 21 serves also to assist in deflecting the cord into the notches 32.

I claim—

1. A cord-holder comprising in combination a disk having peripheral prongs or teeth extending in the plane of the body of the disk, a shoe having a portion thereof curved to conform to the disk and arranged adjacent thereto and a groove in the plane of said disk and into which said prongs may enter and said disk having upon its surface upstanding deflecting-plates, substantially as described.

2. A cord-holder disk having outstanding pins or prongs at opposite points of its periphery and upstanding plates on opposite sides of its axis, said plates having inclined edges arranged to deflect the strand of the cord carried by the needle, substantially as described.

3. A cord-holder comprising in combination a rotatable disk having its periphery composed of two eccentric segments each terminating in a shoulder, an outstanding prong or tooth projecting from each of said segments near its base, a coöperating shoe having a curved grooved edge adjacent to the edge of the disk, the prongs serving to carry the cord to the knotter and the shoulders serving to clear the groove, substantially as described.

4. A cord-holder comprising in combination a rotatable disk having pins or prongs projecting from its edge in the plane of its body, a grooved shoe arranged adjacent to the edge of the disk, said disk having upstanding deflecting-plates on opposite sides of its axis, said plates having notched ends, and a stationary knife to which the cord is carried by the notched ends of the plates, substantially as described.

5. The combination with a slotted breast-plate having a shoulder projecting into the slot of a spring-controlled latch pivoted opposite the shoulder and a cord-knotter hook rotatably mounted in such relation to the latch that by the rotation of the hook the cord

is caused to raise the end of the latch, the spring returning the latch to its normal position, substantially as described.

6. In a knotting mechanism for grain-binders the combination with a slotted breast-plate having an angular shoulder crossing the plane of the slot, a rotating knotter-hook and a pivoted latch having its free end parallel to the plane of the slot and its pivot so located that the strain of the cord against the end of the latch is radial to the pivot while the knotter-hook is stationary and said latch being adapted to be opened by the upward and outward strain of the cord during the rotation of the hook, substantially as described.

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