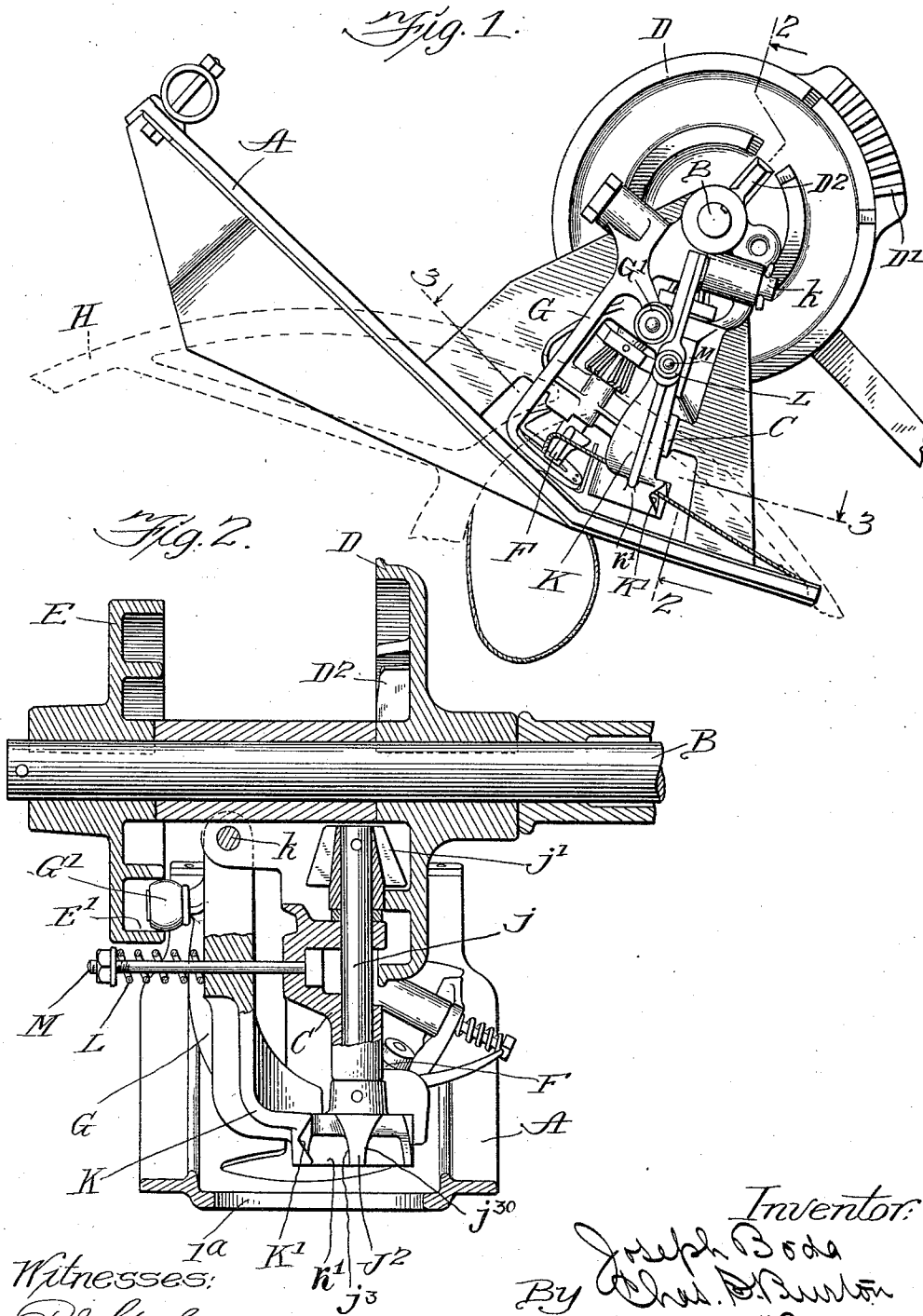


J. BODA.
CORD KNOTTER FOR GRAIN BINDERS.
APPLICATION FILED DEC. 14, 1910.

1,006,177.

Patented Oct. 17, 1911.

2 SHEETS—SHEET 1.



Witnesses:
P. J. Gathmann
Rolt. H. Buntin

Inventor:
Joseph Boda
By Chas. B. Buntin
of Buntin & Buntin
his Attorneys:

J. BODA.
CORD KNOTTER FOR GRAIN BINDERS.
APPLICATION FILED DEC. 14, 1910.

1,006,177.

Patented Oct. 17, 1911.

2 SHEETS-SHEET 2.

Fig. 3.

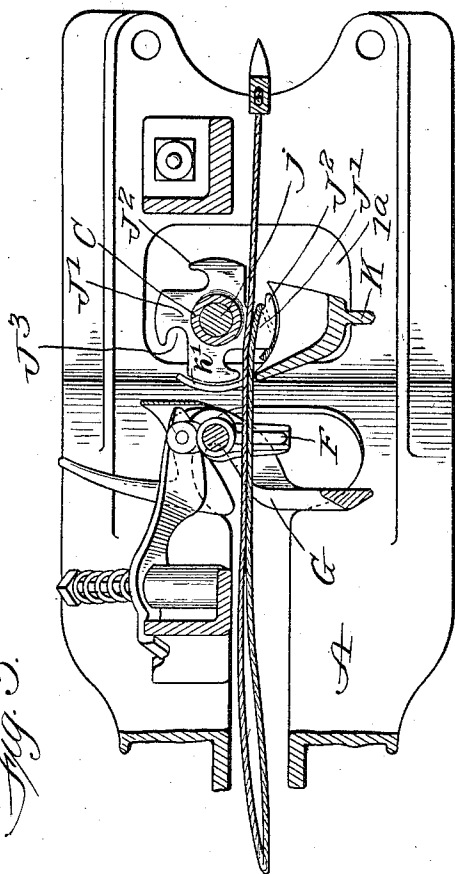


Fig. 5.

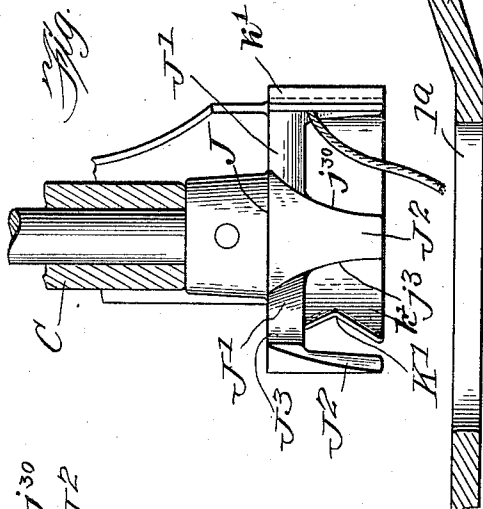


Fig. 6.

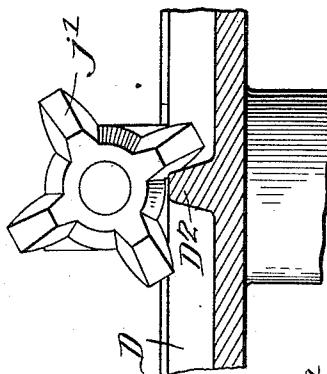
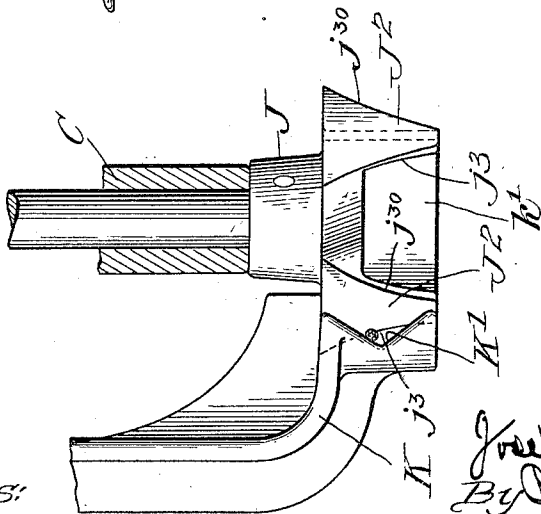


Fig. 4.



Witnesses:

P. J. Gathmann
Robt. H. Burton

Inventor:
Joseph Boda
By Chas. E. Burton
of Burton & Burton
Attorneys:

UNITED STATES PATENT OFFICE.

JOSEPH BODA, OF PLANO, ILLINOIS, ASSIGNOR TO INDEPENDENT HARVESTER COMPANY, OF PLANO, ILLINOIS, A CORPORATION OF MAINE.

CORD-KNOTTER FOR GRAIN-BINDERS.

1,006,177.

Specification of Letters Patent.

Patented Oct. 17, 1911.

Application filed December 14, 1910. Serial No. 597,192.

To all whom it may concern:

Be it known that I, JOSEPH BODA, a citizen of the United States, residing at Plano, in the county of Kendall and State of Illinois, have invented certain new and useful Improvements in Cord-Knotters for Grain-Binders, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved construction in cord knotters for grain binders, particularly with reference to means for guiding, holding and cutting off the cord.

It consists in the elements and features of construction shown and described as indicated in the claims.

In the drawings: Figure 1 is a side elevation of a knotter embodying this invention, having the rear cam wheel removed. Fig. 2 is a section on the line 2, 2 of Fig. 1. Fig. 3 is a section at the line 3—3 on Fig. 1, showing the parts at the position of rest. Fig. 4 is a delivery side elevation of the holder. Fig. 5 is a rear side elevation of the holder, showing the parts at the position occupied a little after the holder starts its rotary movement, and the breast plate in vertical section at the plane of the needle's path. Fig. 6 is a sectional detail view, showing the holder pinion engaged with the driving tooth of the gear wheel, the latter being shown in section transverse to the axis of the pinion.

The customary parts of the knotter will be enumerated for convenience of reference.

A is the breast-plate; B, the main driving and supporting shaft; C, is the knotter hanger; D is the knotter-bill and holder-actuating gear wheel; E is a cam wheel, at the opposite end of the hub or bearing of the hanger from that at which the gear wheel D is positioned. The knotter-bill F is actuated in the customary manner by a gear segment D¹ on the gear wheel D. Cord guard and knife arm G is pivoted to the hanger C at a point as far from the breast-plate and as near to the plane of the needle arm H, as can conveniently be done in order to give it as long a radius of swing as possible, and cause its path of swing across the plane of the needle to be as nearly as possible at right angles to that plane. For actuating this knife arm, in view of the posi-

tion of its pivot being as above stated, which brings it quite close to the gear wheel D, it is not practicable to actuate it in the more customary manner, by a cam on the back face of said gear wheel; and there is therefore provided the second cam E, as above stated, mounted on the opposite end of the hub of the hanger, having on its inner face, the cam track E¹, which engages the offset lever arm G¹ of the knife arm, said lever arm extending off from the knife arm near to the fulcrum of the latter, so that the knife arm becomes in effect a bell-crank lever, which is actuated by the cam engaging the end of one of its arms, which is substantially horizontal, in order to swing the other arm, which carries the knife and the cord-guiding features, across the needle-slot of the breast-plate.

The cord-holder shown in the drawings is of the crown-disk or cup type,—that is, the type in which the cord-engaging fingers project transversely of the plane of rotation of the holder; but it is distinguished by the fact that it is inverted,—that is, the fingers project toward the breast-plate and bundle-space, instead of away therefrom, as is the usual construction with this type of holder. It comprises a hub, by which it is secured to its shaft *j*, which is journaled in the hanger C, and carries the gear pinion *j*¹, which meshes with the gear segment D² on the knotter-actuating wheel D, for giving the holder its proper rotary movement in steps with rest intervals, as usual. The web element of the rotating member J of the holder is cut away between the radial planes in which the fingers J² project, forming spokes J¹, the recesses or notches J³, thus formed, being necessary to admit the cord laid by the needle to the lower side of the path of rotation of said web, and into the path of rotation of the fingers as they advance toward the clamp or shoe K. The operation of the holder in the process of tying the knot is substantially that which is customary with this type of holder, and need not be described in detail. The fingers J² of the rotating member are cut back or sloped on the advance edge *j*³, so that they extend over the cord as they approach it to force it downward as it is carried into engagement with the clamp or shoe K, and the end of said clamp or shoe toward which the cord is thus forced by the fingers is provided by a

V-shaped notch K^1 , into whose apex the cord is crowded by the sloping edge of the finger. The relative positions of the holder, knotter-bill and needle, at the limit of the cord-laying stroke of the needle are such that the cord, drawn taut from the point at which it is lodged on the bill, across the holder, is within the path of the sloped edge j^3 , and opposite the V-shaped notch K^1 . One purpose of the sloped edge and notch is to insure that the cord shall be carried between the shoe and the holder at a plane lying well within the width of the shoe and below the plane of the spokes. The slope of the edge j^3 also causes the finger to tend to feed the fag end of the cord down and out from the grasp of the shoe, while carrying it, after severance, to the end of the shoe. The opposite edge j^{30} of each of the fingers J^2 is sloped similarly to the edge j^3 in the opposite direction, so that the finger is substantially symmetrical about a plane radial to the rotation of the holder. The purpose of the edge of the slope j^{30} is to cause it to extend at such an angle to the pull of the cord, which is folded back about it by the retreat of the needle, that that pull shall not tend to cause the cord to slip toward the end of the finger and off therefrom. Preferably, to prevent the cord slipping either way along the finger, the slope of said edge j^{30} is such that the cord laid by the retreating needle trends across said edge substantially at right angles thereto. The shoe or clamp K ,—which is pivotally mounted at one end at k , on the hanger, and is pressed against the rotating member by a spring L , coiled about the guide stud M , which is rooted in the hanger,—has its clamping flange k extending about the path of the fingers J^2 at the side of the holder nearest the path of the needle, and thence on around the side toward the knotter-bill, to a point which makes its total extent substantially 180° about the path of the fingers; and when the fag end of the cord, which remains between the shoe and the finger which first engaged it until that finger passes by the farther end of the shoe,—that is, the end opposite that having the V-shaped notch,—is finally released by the finger passing off of said farther end of the shoe, it is entirely on the outer side of the finger and unsupported by any portion of the holder, and drops freely through the opening 1^a in the breast-plate, which is overhung by the holder, and escapes with the bundle.

I claim:—

1. In a cord-knotter, in combination with a driving shaft, a hanger thereon; a breast-plate rigid with the hanger; a gear wheel mounted on the shaft at one end of the hanger; a knife-arm and cord-guide pivoted on the hanger near said end thereof; a cam wheel mounted on the shaft at the opposite

end of the hanger; the knife-arm and cord-guide having a lever arm extending off from its pivot, engaged with the cam on said cam wheel for swinging said knife arm and cord-guide.

2. In a cord-knotter, a cord-holder comprising a rotary member having a hub by which it is mounted for rotation; cord-engaging fingers projecting transversely of the plane of rotation, and spokes connecting such fingers with the hub, said fingers being extended off from the spokes at the side thereof toward the bundle space; and a clamping shoe which bears against the outer side of the fingers between the plane of the spokes and the breast-plate.

3. In a cord knotter, a cord-holder comprising a rotating member consisting of a hub by which it is mounted for rotation; cord-engaging fingers projecting transversely to the plane of rotation, and spokes which connect the hub with said fingers; a clamping shoe which presses against the outside of the fingers and extends about a segment only of their path of rotation, said fingers being extended off from the spokes toward the bundle space, the shoe having the end first reached by the fingers in their rotation provided with a V-shaped notch, whose apex is between the plane of rotation of the spokes and the plane of the end of the fingers, whereby the cord is guided for its engagement between the shoe and the fingers into a plane below the plane of rotation of the spokes.

4. In a cord knotter, a cord-holder comprising a rotating member consisting of a hub by which it is mounted for rotation; spokes projecting off from such hub, and fingers projecting from the ends of the spokes transversely to their plane of rotation, and in a direction toward the bundle space, and a clamping shoe which presses against the outer side of the fingers, and encompasses a segment of their path, the fingers having their edges which are forward in their path of rotation oblique to the plane of rotation, and the shoe having the end first encountered by the fingers provided with a V-shaped notch whose apex is situated in a plane intermediate the planes of rotation of the spokes and the finger ends.

5. In a cord-knotter, in combination with the needle, a cord-holder comprising a rotating member consisting of a central portion by which it is mounted for rotation; spokes extending therefrom in the plane of rotation; cord-engaging fingers projecting downward from the ends of the spokes, respectively; a clamping shoe which presses against the outside of the fingers, and extends about a segment only of their path of rotation, said fingers being extended off from the spokes at the side opposite the path of the needle in laying the cord, the clamping

shoe having the end first reached by the fingers in their rotation provided with a V-shaped notch for guiding the cord in its engagement between the shoe and the fingers, the fingers having their edges which are forward in their path of rotation sloped obliquely to the plane of rotation backward and downward in respect to the path of rotation to cause the end of the finger to engage over the cord upon encountering it for forcing it against the shoe.

6. In a cord-knotter, in combination with the needle, a cord-holder comprising a rotating member consisting of a central portion by which it is mounted for rotation; cord-engaging fingers projecting transversely to the plane of rotation away from the path of the cord laid by the needle; a clamping shoe which presses against the outside of the fingers and extends about a segment only of their path of rotation; means for cutting the cord positioned at the opposite side of such segmental shoe from the rotating member, whereby the fag end of the cord is carried between the rotary member and shoe after severance, the forward

edge of the fingers being sloped back and down from the upper to the lower end for feeding the fag end of the cord downward out of engagement with the shoe. 30

7. In a cord-knotter, in combination with the needle, a cord-holder comprising a rotating member, consisting of a metal portion by which it is mounted for rotation; spokes extending therefrom, and cord-engaging fingers projecting from the ends of the spokes in a direction away from the path of the needle; a clamping shoe which presses against the outside of the fingers and extends about a segment only of their path of rotation, the edges of the fingers which are rearward in their path of rotation being sloped obliquely to the plane of rotation downward and forward in the direction of rotation. 45

In testimony whereof, I have hereunto set my hand, at Plano, Illinois.

JOSEPH BODA.

Witnesses:

O. G. SOUTHWYD,
CHAS. A. HUNTER.

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