

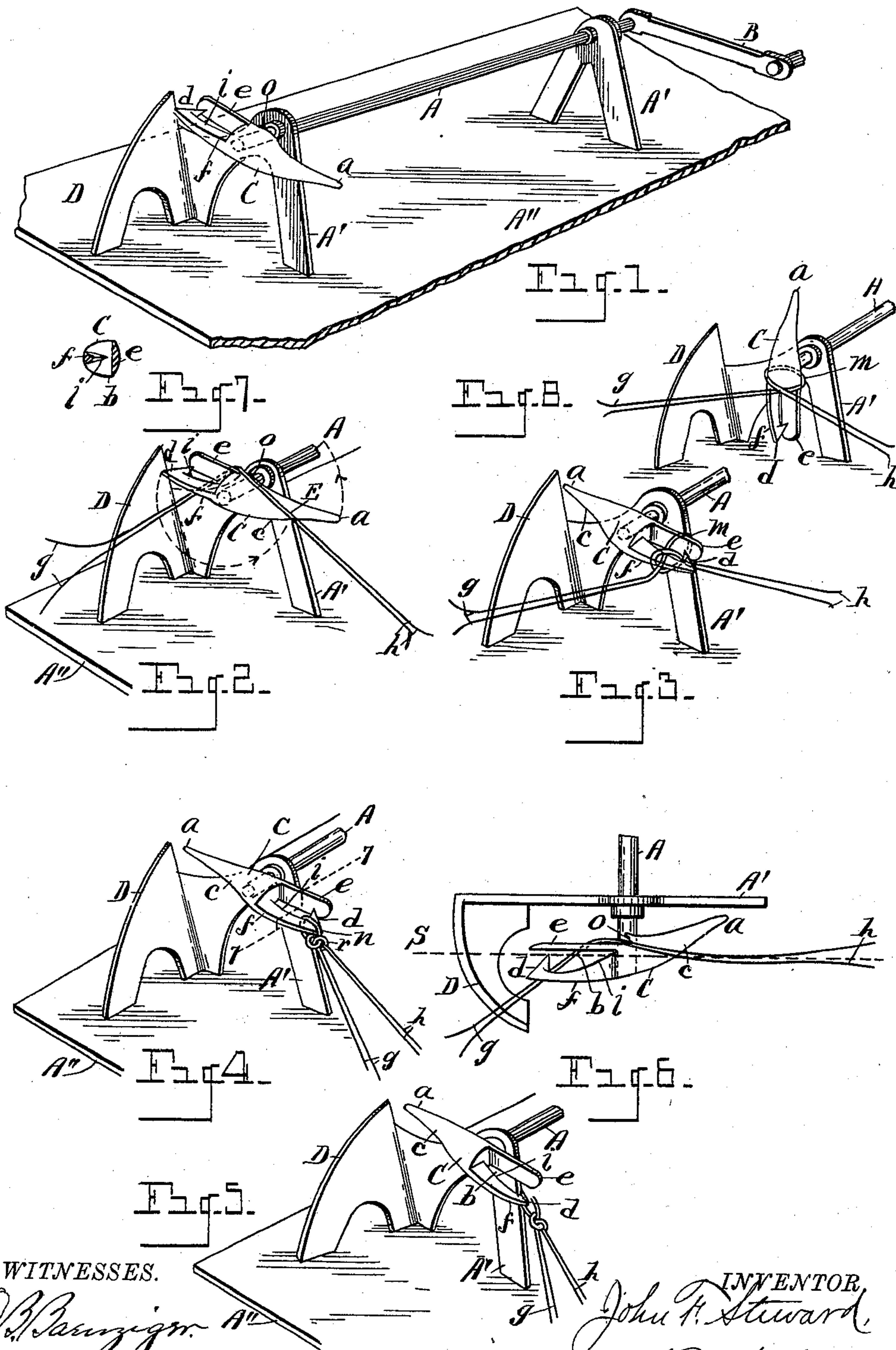
No. 617,545.

Patented Jan. 10, 1899.

J. F. STEWARD.  
KNOTTER FOR HARVESTING MACHINES.

(Application filed Nov. 26, 1897.)

(No Model.)



WITNESSES.

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# UNITED STATES PATENT OFFICE.

JOHN F. STEWARD, OF ADDISON, MICHIGAN, ASSIGNOR OF ONE-HALF TO  
FRANK BARNES, OF SAME PLACE.

## KNOTTER FOR HARVESTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 617,545, dated January 10, 1899.

Application filed November 26, 1897. Serial No. 659,798. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN F. STEWARD, a citizen of the United States, residing at Addison, in the county of Lenawee, State of Michigan, have invented certain new and useful Improvements in Knotters for Harvesting-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

15 This invention relates to new and useful improvements in knotters for harvesting-machines; and it consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

20 The objects of the invention are to produce a knotter for harvesting-machines of simple and inexpensive construction, in which the knotter-bill rotates in the arc of a vertical circle and stands when in a horizontal position parallel to and in line with the twine, and by a further arrangement of parts enable a knot to be perfectly and easily formed and the twine severed close to the knot, within the loop thereof, by means of a knife carried in the knotter-bill. These objects are attained by the mechanism illustrated in the accompanying drawings, in which—

25 Figure 1 is a perspective view of my knot-tying mechanism, showing the parts in their normal position. Fig. 2 is a like view in detail, showing the twine in position to begin the operation of tying. Fig. 3 is a like view showing the knot partially formed and about to slip over the end of the bill. Fig. 4 is a like view showing the knot formed, with the loop held by the hooked knife of the bill. Fig. 5 is a like view showing the twine severed by the knife of the bill as the bundle is discharged. Fig. 6 is a plan view of Fig. 2. Fig. 7 is a transverse section through the bill, as on line 7 7 of Fig. 4. Fig. 8 is a view showing the position of parts when the bill has partially completed its movement and formed the twine around it.

Referring to the letters of reference, A

designates a rotary shaft journaled in suitable supports A', mounted upon a base A''.

The shaft A is driven through the medium of the crank B or other suitable mechanical means to impart the desired movement thereto. The knotter-bill C is secured to the end of the shaft opposite the crank B and adjacent to the support A', said bill normally standing in a horizontal position, as shown in Figs. 1 and 2.

30 The knotter-bill C comprises a rounded oblong body and is mounted on the shaft A near its geometric center. One end of said bill is tapered to an acuminate point *a*, from which point the line of the outer face of said bill describes a bevel or incline *c*, extending longitudinally thereof. The opposite end of said bill is bifurcated, forming the two opposed members *e* and *f*, of which the member *e*, forming one of the prongs of the bill proper, serves as a guard for the opposed member or prong *f* of the bill, which is provided with an inner cutting edge *i* and at the outer end with an inwardly-projecting hook *d*, forming, in effect, a hooked knife. The prong *e* and the opposed knife *f* of the bill stand adjacent, forming a space *b* between them, the rounded end of the prong *e* projecting beyond the point of the hook of the knife, so as to serve as a guard therefor and prevent the twine as it slips from the end of the prong *e* in the forming of the knot from engaging said hook.

35 D designates a curved guide against which the twine is carried after crossing the bill and which deflects the twine from a straight line, causing it to cross the under face of the bill at an angle, as shown more clearly in Fig. 6, so that when the bill is rotated the hooked point of the knife will pass said twine, which will be carried toward the center of the bill upon the curved outer edge thereof as said bill rotates. Formed in the upper face of the bill when said bill is standing in its normal position is a groove *o*, (also shown in Fig. 6,) which serves to retain the twine properly in place when drawn into position across the upper face of said bill.

40 In the operation of this improved knotter the twine by means of a needle (not shown) or any other suitable mechanical means is



carried across the upper face of the bill when in the position shown in Fig. 1 and passed around the bundle and back across said bill, the bundle lying within the loop described by the ends *g* of the twine *E*, while the ends *h* of said twine are held by any suitable twine-holder, which position of parts is illustrated in Figs. 2 and 3. With the parts in the position above described the shaft *A* is rotated a one-half turn, causing the knotter-bill to make one-half of a revolution in the direction indicated by the arrows in Fig. 2, in which movement the opposed ends of the bill swing past the respective ends of the twine, causing the twine to ride upward on the outer face of the bill and form around the body thereof with the lines of the twine crossing, as shown in Fig. 8. Upon a further rotation of the bill the ends *h* of the twine are caused to enter between the prongs thereof and are engaged by the hook *d*, as shown in Fig. 3. At this point in the operation of the machine the discharge-arms (not shown) discharge the bundle, bringing a draft upon the twine, which causes the portion *m* thereof which encircles said bill to slip therefrom and pass over the twine, which is retained by the hook *d*, thereby drawing the twine held by said hook through said circle of twine which embraced said bill, forming a loop *n* around the knife *f* back of the hook, as clearly shown in Fig. 4, and tying the knot in said twine, as shown at *r*. The strain upon the twine not only closes the knot *r*, but draws the loop *n* against the knife, so as to sever the twine in said loop, permitting it to pass free from the bill, as clearly shown in Fig. 5, when the operation is completed. The bill is returned to its normal position by a backward rotation of the shaft *A* through the medium of the crank *B* or other suitable means, as shown in Fig. 1, ready for a succeeding operation.

The stipple-line *s* in Fig. 6 indicates a straight horizontal plane crossing the knotter-bill and serves to illustrate the deflection of the twine at its ends *g* from said plane by the curved guide *D*, which carries the end *g* of the twine across the path of the bill, so that it may be engaged by the outer face of the knife-prong *f* as said bill is rotated in the formation of the knot.

It will now be understood that by means of the mechanism herein shown and described a knot may be perfectly tied in the binding-twine in such manner as to firmly retain the bundle and at the same time sever the twine after the formation of the knot by means of a knife carried by the bill, which cuts the

twine within the loop of the knot and at a point closer thereto than would be possible by means of a knife independent of said bill.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A knotter-bill comprising a rounded oblong body tapered at one end and provided with opposed parallel prongs at the opposite end extending longitudinally of the knotter-bill, one of which prongs has a cutting inner edge and a hook at the outer end thereof.

2. In a knotter, the combination of a rotary shaft, the knotter-bill mounted on said shaft, said bill comprising a rounded oblong body tapered at one end and provided at the other end with opposed prongs which stand apart to form an open way between them, one of said prongs having a cutting inner edge and a hook at the inner end thereof which projects toward the face of the opposed prong of said bill.

3. In a knotter, the combination of a rotary shaft, a knotter-bill mounted upon the end of said shaft tapered at one end and provided at the opposite end with a projecting prong, and a hooked knife standing opposed to said prong, the point of the hook of said knife projecting inwardly and terminating at a point within the length of said prong.

4. In a knotter, the combination of a rotary shaft, a knotter-bill mounted on said shaft, said bill having the opposed prongs for engaging the twine, the inclined guide standing adjacent to said bill and crossing obliquely a line parallel to its longitudinal axis, the base of said guide passing well out of alinement with said bill to present the cord diagonally across the under side of the bill and beyond the line of its outer face.

5. In a knotter, the combination of a bifurcated knotter-bill adapted to rotate in the arc of a vertical circle and standing normally in a horizontal position parallel to the course of the twine, a way *o* in the upper side of said bill extending in the direction of the longitude thereof in which the twine is adapted to lie, a projecting prong and an opposed hooked knife at one end of said bill, and an inclined twine-guide adjacent thereto crossing obliquely the path of rotation of said bill its lower end being carried beyond a point of alinement therewith.

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

JOHN F. STEWARD.

Witnesses:

O. B. BOWEN,  
C. M. NICHOLS.