(No Model.)

J. F. APPLEBY.

KNOTTING MECHANISM FOR GRAIN BINDERS.

No. 335,332. Patented Feb. 2, 1886.

Figure 2.

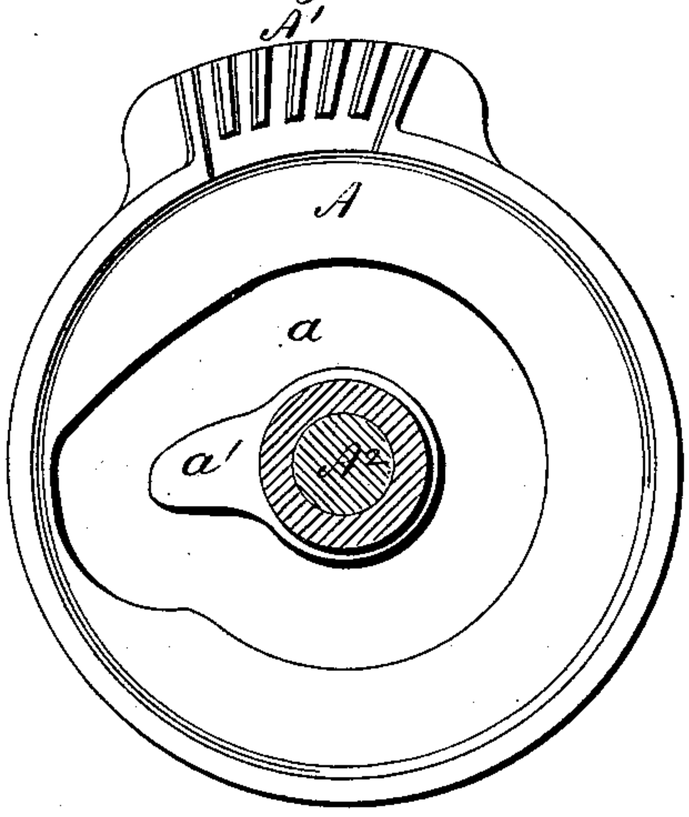


Figure 1.

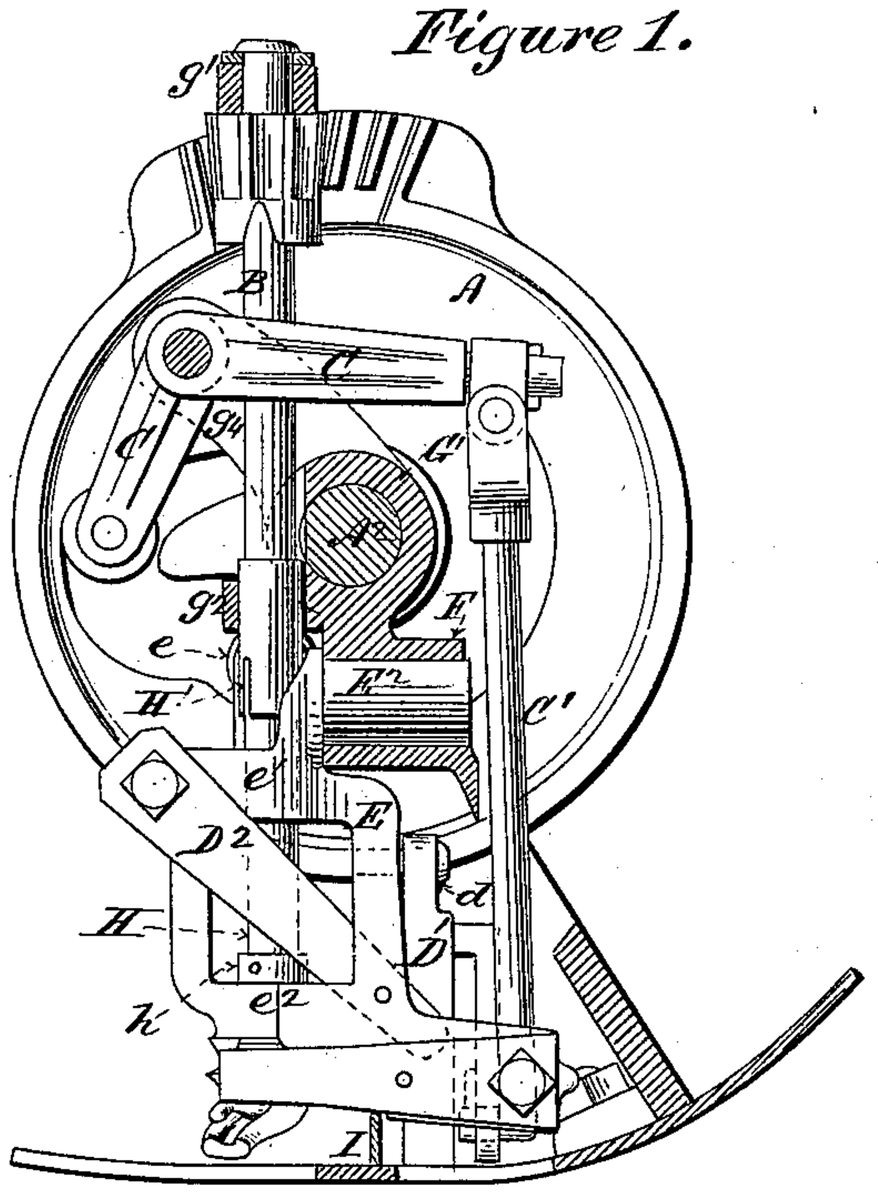


Figure 4.

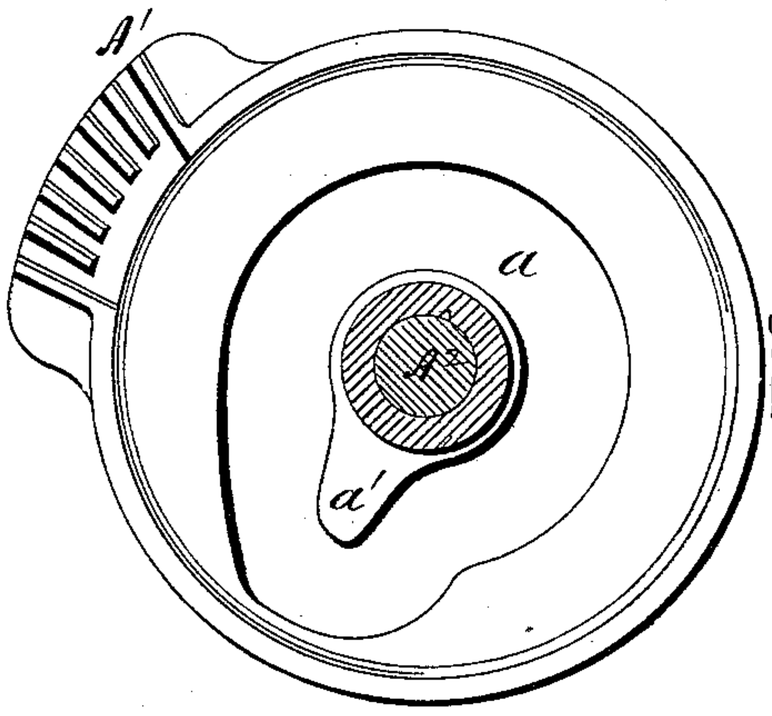
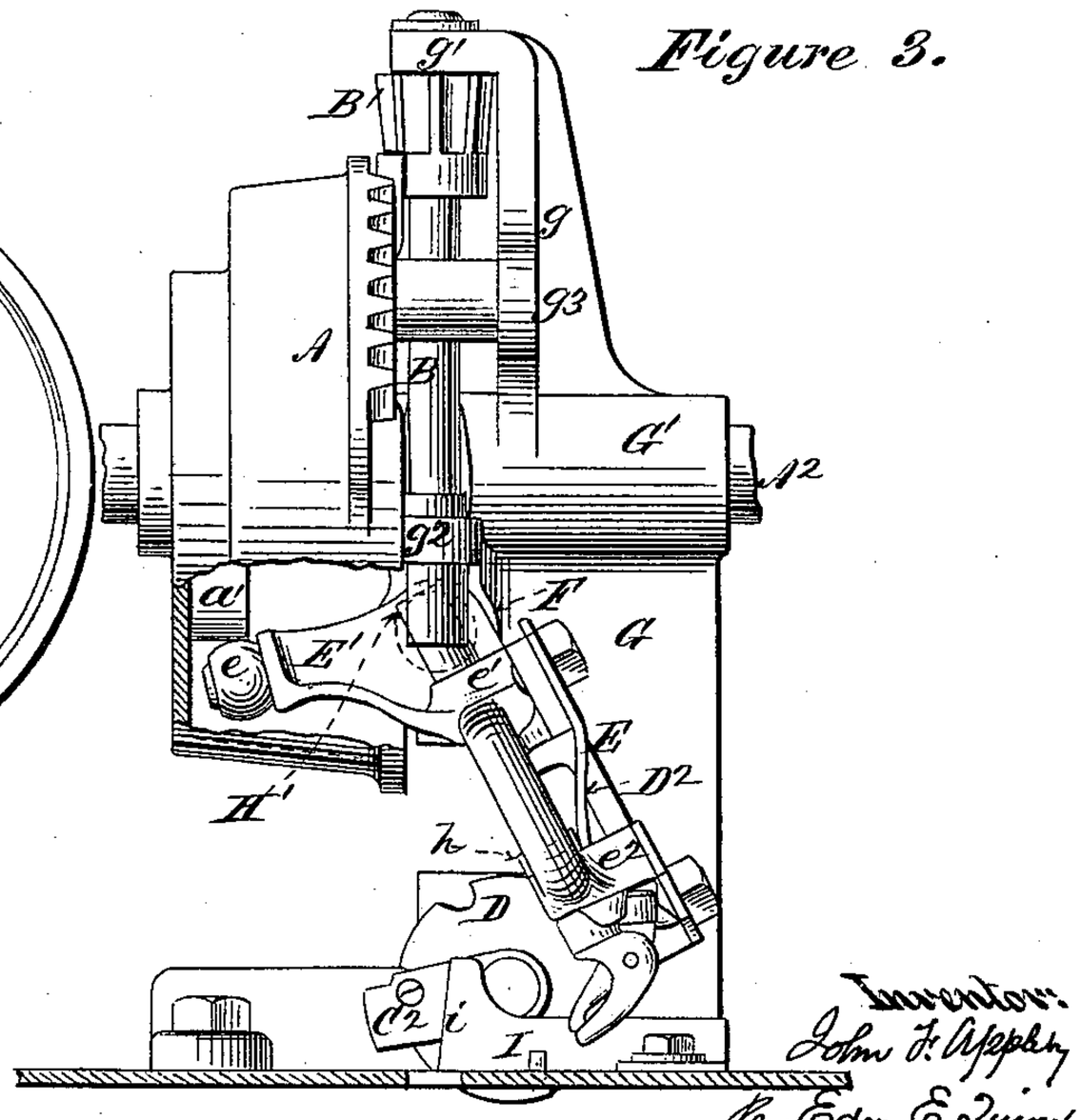


Figure 3.



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KNOTTING MECHANISM FOR GRAIN-BINDERS.

SPECIFICATION forming part of Letters Patent No. 335,332, dated February 2, 1886.

Application filed December 29, 1883. Serial No. 115,961. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. APPLEBY, of Minneapolis, Minnesota, have invented a certain Improvement in Knotting Mechanism for Grain-Binders, of which the following is a specification.

My improvement relates to knotting mechanism of the type in which a single rotary cam and gear-wheel serves to operate the gripping device, and also to impart a lateral movement to the knotter after the knot is partially formed, whereby the binding-cord is severed, and the formation of the knot is completed and the knot stripped from the knotter.

The accompanying drawings of knotting mechanism containing my invention are as follows: Figure 1 is an elevation, partly in section, looking toward the face of the knotter-operating cam and gear-wheel, showing the bell-crank lever and pitman for imparting motion to the pawl by which the cord-gripping disk is impelled in the positions which they occupy at the conclusion of the working-stroke of the pawl. Fig. 2 is a face view of the knotter-operating cam and gear-wheel in the position which it is represented as occupying in Fig. 1. Fig. 3 is an elevation, partly in section, looking toward the edge of the cam and gear-wheel, and showing the knotter swung laterally outward by the action of the cam-groove upon the arm projecting laterally from the upper end of the oscillating frame in which the knotter-shaft is mounted. Fig. 4 is a face view of the cam and gear-wheel in the position which it is represented as occupying in Fig. 3.

Referring to the drawings, it will be seen that the cam and gear-wheel A is cup-shaped, and that its edge is in close proximity to the driver-shaft B, and is provided with the radially-projecting segment A′, in which are formed, at the proper angles, relatively, a number of teeth equal to the number of teeth on the bevel-pinion B′, affixed to the upper end of the driver-shaft, so that during each revolution of the operating cam and gear-wheel A the driver-shaft B is turned once around by its engagement with the teeth of the segment A′.

The cam-groove *a*, at the proper time during the rotation of the cam and gear-wheel, rocks back and forth the bell-crank lever C C, connected by means of the pitman C′ with a rocking pawl-carrier, C^2, of ordinary construction, the pawl of which engages the teeth of the usual ratchet-wheel affixed to the shaft of the ordinary cord-gripping disk, D.

By the progressive movement of the cam and gear-wheel A from the position in which it is shown in Fig. 2 to that in which it is shown in Fig. 4, the oscillating frame E is rocked into the position in which it is shown in Fig. 3. This is effected by the engagement of the cam or wiper *a′* of the cam and gear-wheel with the anti-friction roller *e*, mounted upon the end of the arm E′, projecting laterally from the upper end of the frame E.

The axis upon which the frame E oscillates is a boss, E^2, cast upon or otherwise formed in one with the frame E, and projecting laterally from the upper part thereof, as shown in Fig. 1, and having its bearing in the horizontal box F, formed in the frame G. A horizontally-perforated box, G′, affords the bearing for the shaft A^2 of the cam and gear-wheel.

A standard, *g*, projecting upward from the box G′, has a horizontal bend, *g′*, at its upper end, which is perforated to afford the bearing for the upper end of the driver-shaft B. The lower bearing for the driver-shaft is formed in the vertically-perforated ear g^2, projecting horizontally from the box G′.

The shaft of the bell-crank lever C C has one of its bearings formed in the flange g^3, projecting laterally from the standard *g*, and the other in an elongated ear, g^4, projecting radially from the end of the box G′ next to the wheel A.

The bearings for the knotter-shaft H are formed, respectively, in the transverse members *e′* and e^2 of the frame E. A collar, *h*, pinned to the knotter-shaft, bears upon the top of the transverse member e^2 of the frame E, and thus prevents the knotter-shaft from slipping down in its bearings.

The upper end of the knotter-shaft is formed into a tongue, H′, which is seated in a slot formed in the lower end of the driver-shaft B. At the time when the rotatory motion of the knotter-shaft is required it occupies a position in longitudinal alignment with the driver-shaft, and by its tongue-and-slot connection therewith is made to partake of the rotatory

movement imparted to the driver-shaft by the gear-segment A′. On the other hand, when the knotter is required to be moved laterally, the driver-shaft B has come to rest in such a position that the plane of the groove in its lower end is parallel with the plane in which the frame E oscillates.

The shaft of the cord-gripping disk D has its bearing in an arm extending transversely from the lower part of the frame E. This gripping-disk is provided with the usual notches, and upon one edge engages a groove formed in the face of the swinging bar D′, hung upon the pivot *d*, inserted in one of the upright members of the frame E. The grooved bar D′ is held with elastic pressure against the cord-gripping disk by the flat spring D^2, which is also secured to the frame E. It will thus be seen that the cord-gripping mechanism is carried by and partakes of the motion of the frame E.

When the frame E is swung outward, the binding-cord is swayed against the cutting-edge *i* of the stationary knife I, by which the binding-cord is severed between the knotter and the cord-gripping disk.

I claim as my invention—

1. The cam-wheel A, the driver-shaft B, suitably geared to a segment-gear upon the cam-wheel, and the knotter-shaft H, mounted in the oscillating frame E, provided with a laterally-projecting arm, E′, in combination with a suitable cam-groove formed in the cam-wheel A, for engaging the end of the arm E′ and imparting oscillatory motion to the frame E, substantially as described.

2. In knotting mechanism for grain-binders, a cord-gripping device and a knotter, and means for simultaneously swinging the gripping device and the knotter bodily in the same direction during each knotting operation, in combination with a knife for severing the binding-cord during the said swaying movement of the gripping device and the knotter.

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