

(No Model.)

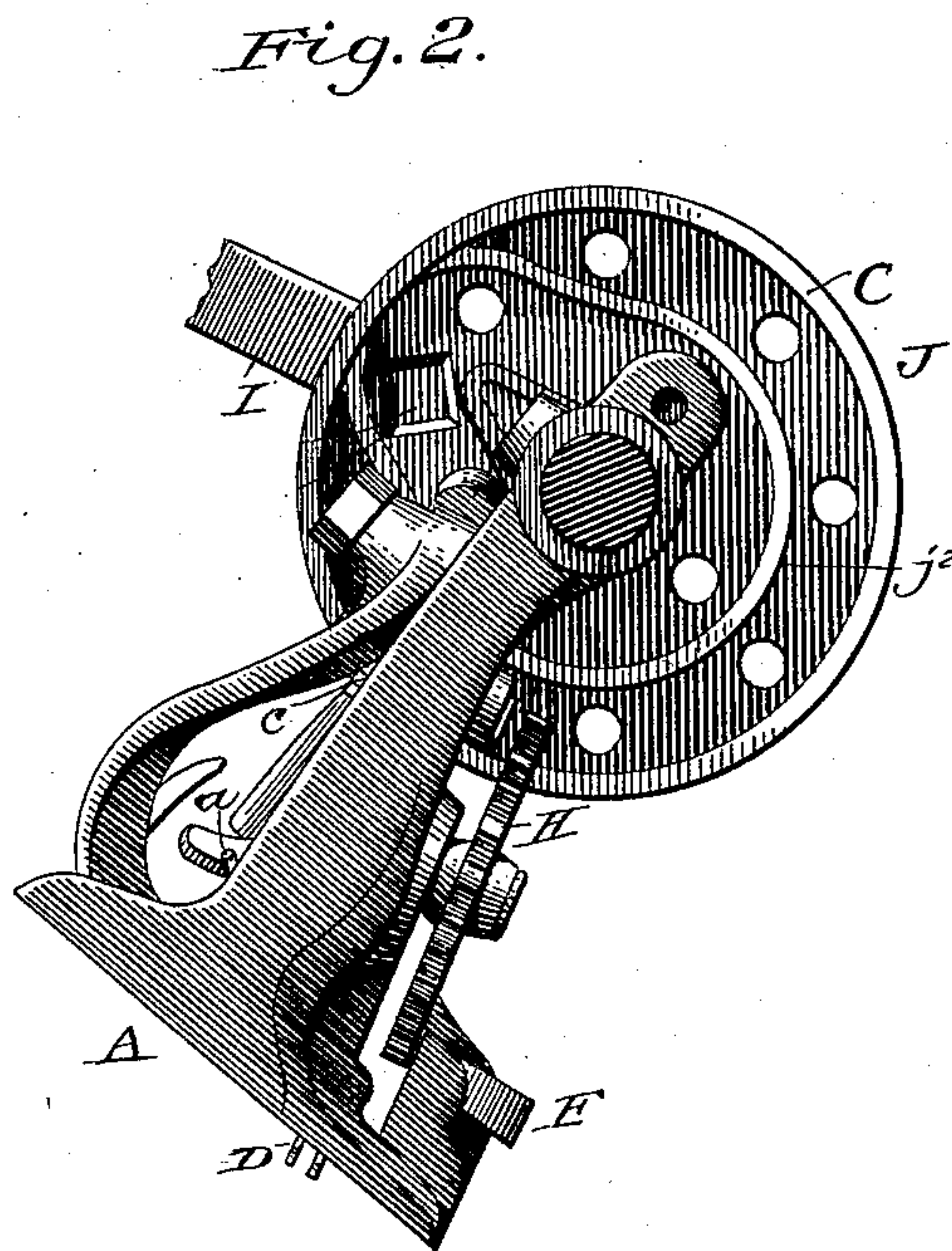
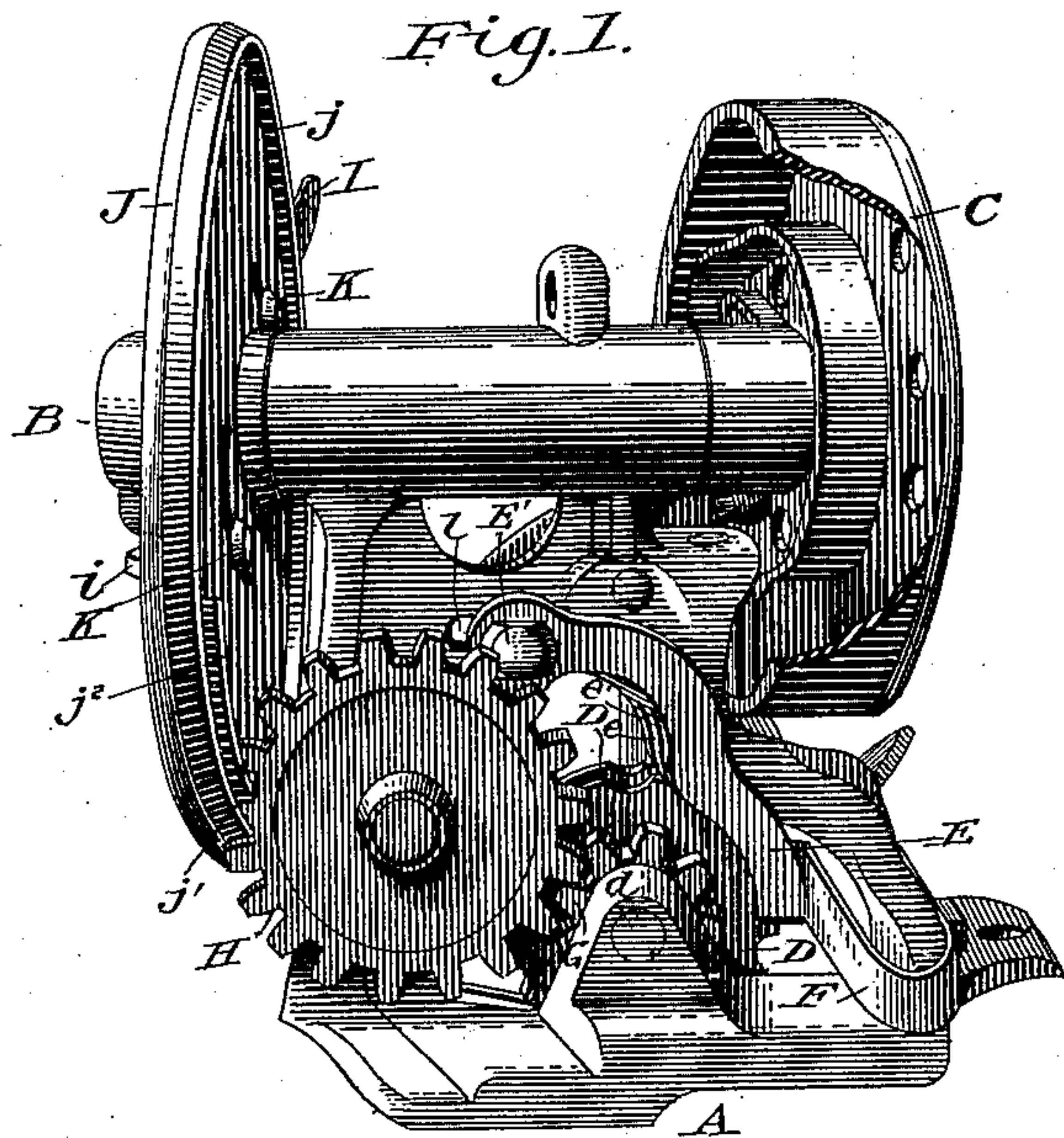
2 Sheets—Sheet 1.

O. COOLEY.

CORD HOLDER FOR GRAIN BINDERS.

No. 345,674.

Patented July 20, 1886.



Witnesses:  
B. E. Huntley.  
E. J. Mockford

Inventor:  
Orville Cooley  
By G. W. Ford Atty.

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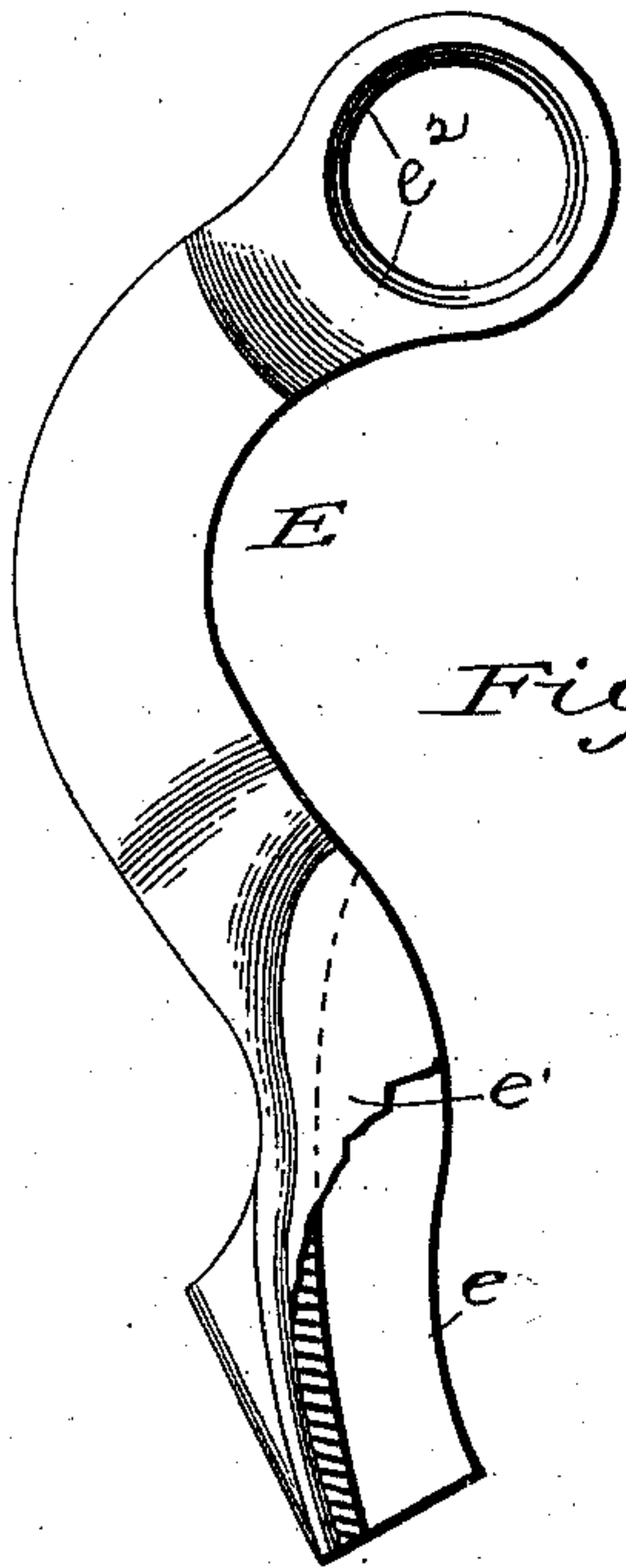


Fig. 4.



Fig. 3.

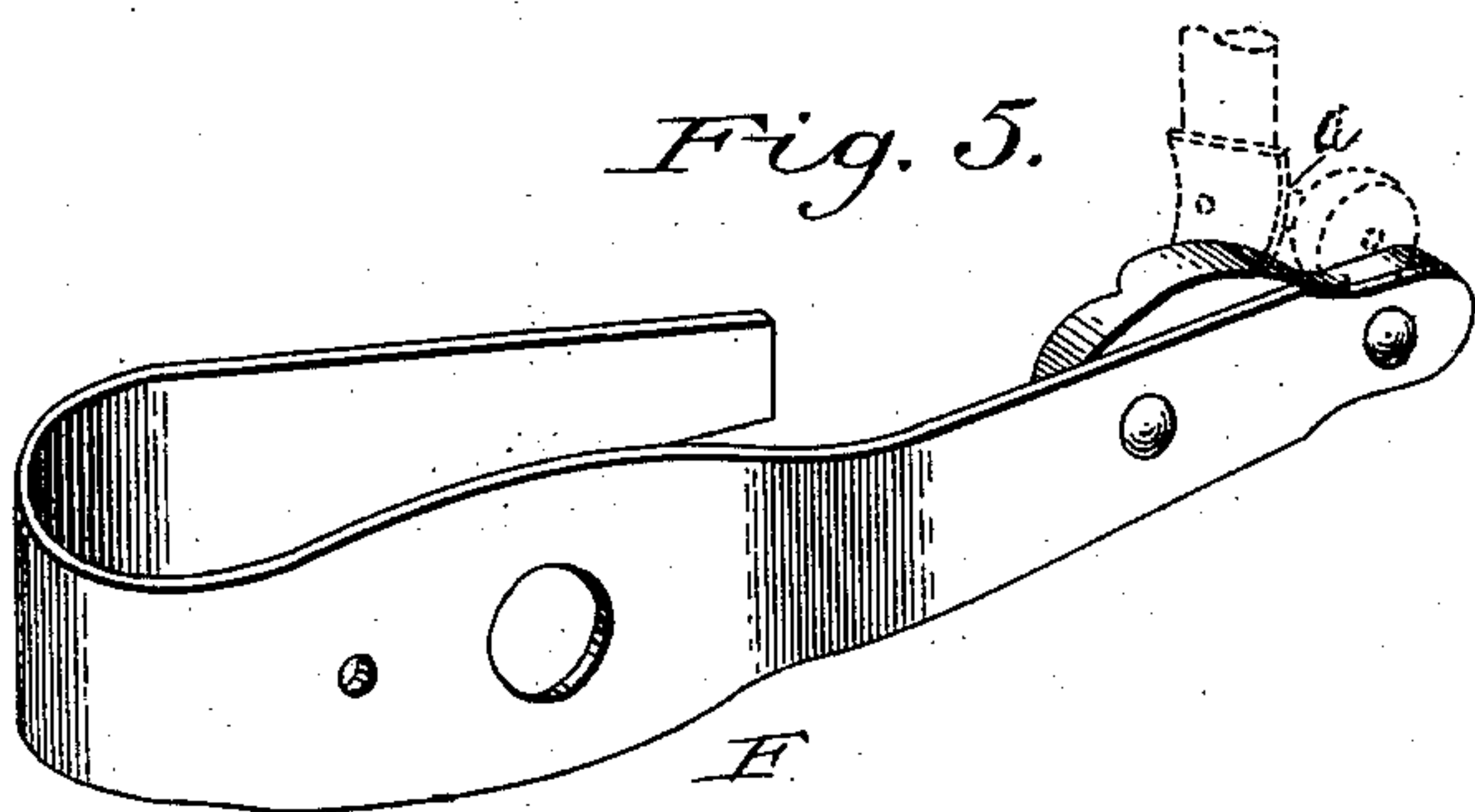


Fig. 5.

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# UNITED STATES PATENT OFFICE.

ORVILLE COOLEY, OF BATAVIA, NEW YORK, ASSIGNOR TO THE JOHNSTON HARVESTER COMPANY, OF SAME PLACE.

## CORD-HOLDER FOR GRAIN-BINDERS.

SPECIFICATION forming part of Letters Patent No 345,674, dated July 20, 1886.

Application filed May 13, 1885. Serial No 165,403. (No model.)

*To all whom it may concern:*

Be it known that I, ORVILLE COOLEY, a citizen of the United States, residing at Batavia, in the county of Genesee and State of New York, have invented a new and useful Improvement in Cord-Holders, of which the following is a specification.

My invention relates to improvements in cord-holding devices for grain-binders of the type commonly known as the "Appleby;" and the objects of my improvements are, first, to provide for an intermittent movement of the cord-holding disk by mechanism simple of construction and easy of regulation; second, to afford facilities for the proper adjustment of the cord-holding lever; and, third, to materially reduce the friction by dispensing with a large number of pieces heretofore used in similar kinds of cord-holding devices. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a rear perspective view with the knotter-driving disk broken away and the cord-holder pivot in dotted lines. Fig. 2 is a side view with the holder-driving disk removed, and looking toward the cam disk. Fig. 3 is a cross-section of the cord-holding disk. Fig. 4 is an inside view of the cord-holding lever, broken away to show depth of groove, and Fig. 5 is a detached view of the bent leaf-spring which assists in operating the cord-holding lever and knot-tying bill.

Similar letters refer to similar parts throughout the several views.

As the improvement relates only to the construction and manner of operating the cord holding and knotting devices, a description of the other portions of the binding mechanism will not be necessary, further than to indicate some of the co-operating parts.

A is the cast-iron frame for carrying the knotter, the cord-holder, and contributing parts.

B is the knotter-driving shaft; C, the cam and gear-wheel, mounted on said shaft and provided with a segment-gear, which, at the proper time, meshes with the pinion *c* of the knotter, for driving the latter.

D is a grooved cord-holding disk, provided with the usual cord-receiving notches on its periphery, mounted upon the stud *d*, and ca-

pable of turning upon the same. This cord-holding disk is provided with a central peripheral groove, within which centers the middle rib, *e*, of the cord-holding lever, designated E.

*e' e'* are the outside or face ribs of the lever E, which partially cover the cord-holding disk, thus forming a double-grooved cord-holding lever, instead of the single one found upon the well-known Appleby type of machines. It is necessary to have the cord-holding mechanism, as represented, in the lever E and disk D, so arranged relatively that the cord may be allowed to slip should any undue strain be had upon it by reason of unevenness of cord or otherwise. Now, by having several ribs upon the lever, and by arranging the same so that the ribs may enter within the grooves formed in the disk, numerous clamping-surfaces are obtained, and as the lever is allowed to rock laterally upon its pivotal connection by means of the hole in the lever being diametrically larger upon the outer sides than in the center, or countersunk, as at *e*<sup>2</sup>, one or more of the ribs will at all times impinge against the intervening cord, even when knots or other irregularities are met in the passage of the cord through this clamping device, thus holding the same without breakage, as is frequently done when only the single-grooved lever is used.

F is a bent leaf-spring, (shown in Fig. 5,) one end of which gives the required tension to the lever E, while the other helps to manipulate the pivoted bill of the knotter *a*.

G is a pinion upon the cord-holding disk.

H is a gear-wheel, which meshes with the pinion G of the cord-holding disk. The wheel H is partly rotated at the proper time to actuate the cord-holding disk by the following means:

I is a heel-extension of one of the bundle-discharging arms, which by means of the set-screws *i* is secured in the proper position to the knotter-driving shaft B.

J is a cam disk or wheel mounted loosely on said shaft, and adjustably secured to the arm I by means of the bolts K, passing through slots *k* in the cam wheel J. These bolts are provided with nuts, whereby the plate and arm may be clamped together in different rela-



tive positions for a purpose which is fully explained in the patent granted me February 6, 1886, No. 335,273; also, the wheel J, having at its periphery the rib *j*, was shown and described in said patent, as well as herein. This rib is not continuous, but is divided at one place, and its portions *j'* *j''* lap by each other, as shown, with a space between them equal to the thickness of one of the teeth on the wheel H. For the greater portion of its length the rib is concentric with the wheel, but its end portions are eccentric therewith, the portion *j''* being brought nearer to the center. The rib *j* thus forms a helical or scroll-like cam. The thickness of the rib corresponds with the space between two adjacent teeth of the gear-wheel H, with which wheel said rib is always in contact. By this means, when, by the rotation of the cam-wheel H, the concentric portion *j'* of the rib becomes engaged with the gear-wheel, the latter will be partly rotated, as well as the pinion G, and through this rotation the cord-holding disk D will be moved the distance from one notch to the next for each revolution of the cam-wheel J, and while the concentric portion of said rib is engaged the gear-wheel, and consequently the cord-holding disk, will be retained in position.

The above-mentioned cam-wheel, with its eccentric and concentric ribs, was shown in the previous patent heretofore mentioned; hence I only claim the use of the said cam-wheel in connection with the single intermediate gear-wheel, H. The difference between the said former patent and the present application consists more particularly in the removal of one gear-wheel, the enlargement of the cam-wheel J, and the reversal of the eccentric and concentric portions of the rib, so as to substitute for the two gear-wheels of the former the single gear-wheel of the present. By this arrangement the cord-holding disk is made to revolve in the right direction to carry the cord within the grasp of the cord-holder.

Another advantage gained by the use of a single wheel in place of two is in the reduction of the backlash of the gear, simplifying the machine and rendering the motion more positive. The cord-holding lever has a rolling motion on the pivot E', and a lateral adjustment upon the iron-frame, by means of the slot *l*, centrally over the cord-holding disk. By means of this compound adjustment of the cord-holding lever a compensation is had for the wear; also, it adjusts itself to any unevenness that may be found in the cord.

I am aware that cord-holding disks have

been heretofore advanced one notch at a time by means of a section of a worm-gear located upon the periphery of the knotter-operating disk and coacting with a single gear-wheel, which is made to mesh into the disk-pinion. I am also aware that bevel gear-wheels mounted upon suitable shafts, the whole driven by the knotter-shaft, have been employed to cause the rotation of the disk; also, that gear-wheels mounted upon the knotter-shaft and made to coact with an intermediate gear-wheel secured to a counter shaft carrying a spiral cam-wheel, the rib of which engages with peripheral teeth made in the cord-holding disk, is not new, when the same is broadly applied to cord-holders, consequently I do not thus claim such devices; but, as far as I am aware, I am the first to organize a cord-holder having the spiral cam-wheel mounted upon the knotter-shaft at a point remote and distinct from the knotter-driving cam, and causing the rotation of the disk by means of a single spur-gear meshing into the disk-pinion and driven direct, by having the spiral rib made to engage with the teeth of said gear-wheel, and thus turning the same intermittingly, as herein shown.

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

1. The combination, in a grain-binder, of the cam-wheel mounted upon the knotter-driving shaft, remote and distinct from the knotter-driving wheel, provided with the continuous spiral rib engaging the teeth of the gear-wheel journaled to the knotter-frame upon its outer vertical face and meshing into the pinion attached to the cord-holding disk, thereby forming a direct connection between the spiral cam-wheel and the disk, substantially as described.

2. The holder-shoe E, having the lobe at the pivotal end countersunk on both sides thereof, in order to permit a rolling motion of the shoe, in combination with the pivot-bolt, and the knotter-frame, having the longitudinal slot to receive the said bolt of the shoe and permit lateral adjustment of the shoe, substantially as set forth.

3. The combination of the cord-holder shoe, the pivoted knotter-jaw, and the U-shaped spring secured to the knotter-frame, one arm of said spring adapted to bear against the holder-shoe and the other acting to operate the knotter-jaw, substantially as set forth.

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Witnesses:

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