(No Model.) 2 Sheets—Sheet 1.

L. MILLER.

GRAIN BINDER.

No. 346,491. Patented Aug. 3, 1886.

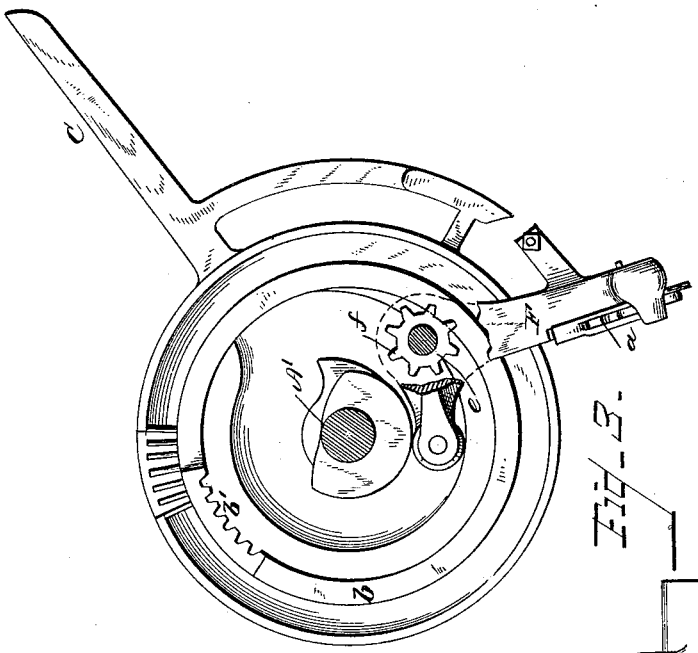

Fig. 2.

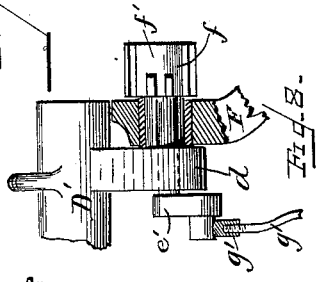

Fig. 8.

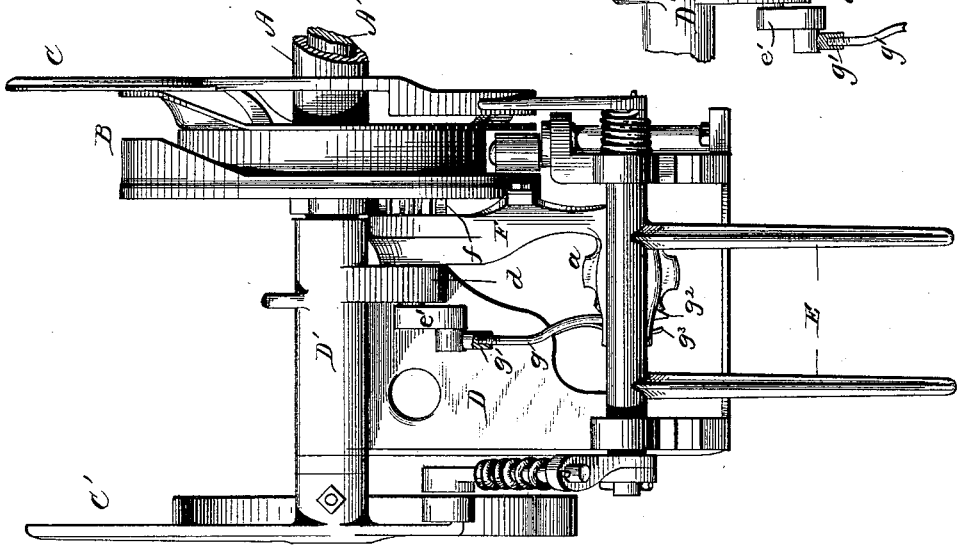

Fig. 7.

WITNESSES
Franck L. Ourand
Alex. M. Smith

INVENTOR
Lewis Miller
by A. M. Smith
Attorney

(No Model.) 2 Sheets—Sheet 2.

L. MILLER.

GRAIN BINDER.

No. 346,491. Patented Aug. 3, 1886.

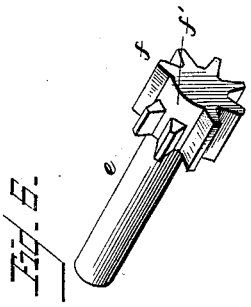

Fig. 6.

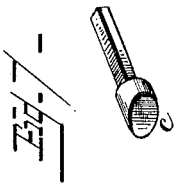

Fig. 7.

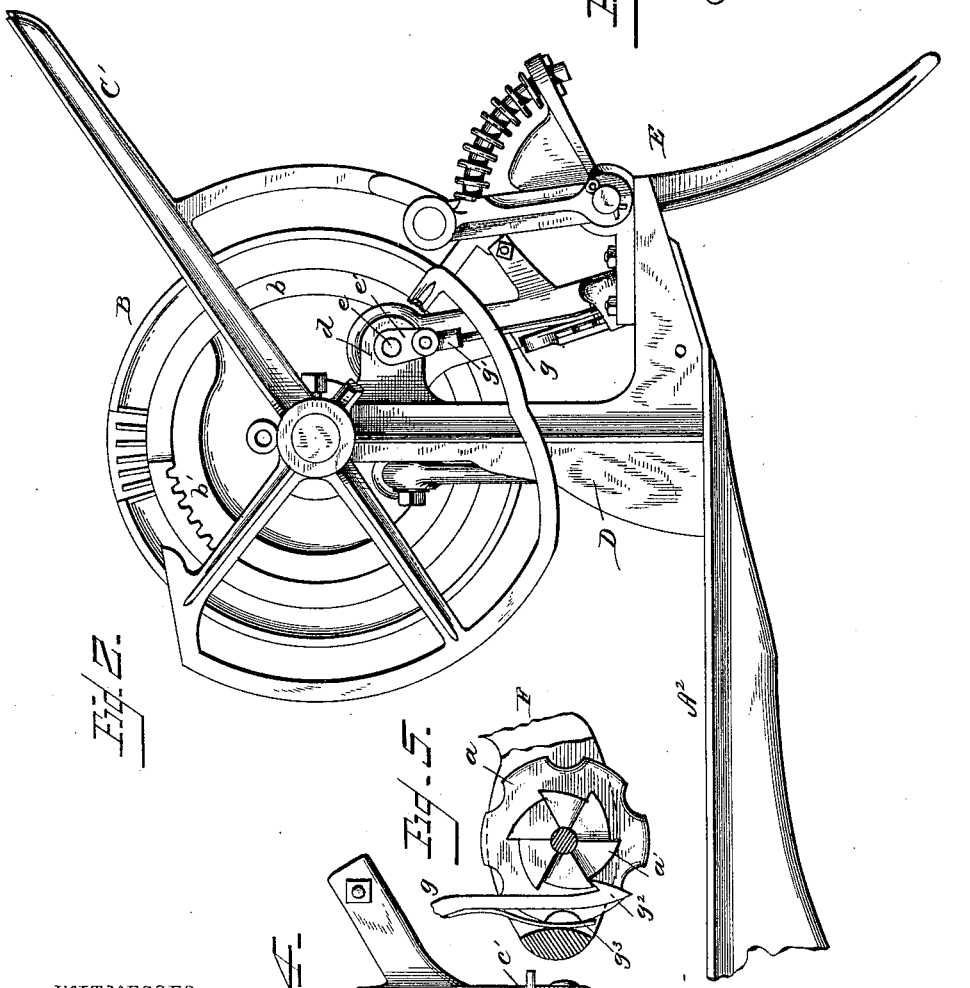

Fig. 2.

Fig. 5.

Fig. 3.

WITNESSES

Frank L. Ouyand

Rev. M. Smith

INVENTOR

Lewis Miller

by A. L. Smith

Attorney

UNITED STATES PATENT OFFICE.

LEWIS MILLER, OF AKRON, OHIO.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 346,491, dated August 3, 1886.

Application filed April 30, 1884. Serial No. 129,858. (No model.)

To all whom it may concern:

Be it known that I, LEWIS MILLER, of Akron, county of Summit, and State of Ohio, have invented a new and useful Improvement in Grain-Binders, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

This invention relates to the means for imparting an intermittent rotary motion to the cord-holding disk, and to the arrangement of the yielding pawl for holding said disk and preventing back movement or rotation thereof while its actuating-pawl is being moved into position for again operating the disk.

It consists in the combination, with the pivotal support of the vibrating arm or plate carrying the cord-holder and allowing it to yield up cord to the knotting devices, of a crank-shaft for actuating the pawl, through which an intermittent rotary motion is imparted to the cord-holding disk, and in the means for actuating the same; also, in a novel construction and arrangement of the ratchet-wheel connected with the cord-holding disk, and of the yielding pawl or latch for engaging said ratchet-wheel and holding it while the actuating-pawl is being moved into position for again acting upon said disk, as hereinafter explained.

In the accompanying drawings, Figure 1 represents an outer side elevation of so much of a grain-binding mechanism as is necessary to show my improvements. Fig. 2 is an end elevation of the same. Fig. 3 represents a vertical transverse section with parts broken away to show the arrangement of other parts; and Figs. 4, 5, 6, 7, and 8 are detail views of parts hereinafter described.

The binding mechanism, in its organization or general arrangement of parts, is similar to the well-known Appleby mechanism, and will therefore not be described in detail further than is necessary to an understanding of the improvement herein claimed.

A represents a portion of the binder-gear standard-sleeve, in which the knotter-actuating shaft A′ has its bearings, the latter having keyed to it a cam and gear wheel, B, carrying a discharging-arm, C. At its extreme end shaft A′ has a second arm, C′, secured to it, arranged in or nearly in the same longitudinal radial plane with arm C, and upon the shaft A′, between the cam-wheel B and the arm C′, is secured the pendent arm or plate D, by means of a sleeve, D′, at its upper end, within which the shaft A′ rotates freely. The plate or arm D is provided with usual bearings for the knotter-shaft, and also for the pivot of the upper compressor, E, and is secured at its lower end to the knotter shield A^2, which in turn is secured to some fixed part of the frame or machine, and serves to prevent the rotation of the arm D with the shaft A′. Upon the outer face of the arm D, adjacent to the cam and gear wheel B, is formed a perforated lug, *d*, to which the cord-holder supporting arm or lever F is pivoted, either upon a tubular projection on said lug, as in Fig. 8, or upon a crank-shaft, hereinafter described, journaled in said projection. The lower end of the arm F has the notched cord-holding disk *a* journaled to it, and carries also the yielding shoe in connection with which said disk works, the two forming the cord-holder. The upper or heel end of the arm or lever F projecting beyond the pivotal point *d*, carries a friction-roller, which is acted upon by a cam on the shaft A for vibrating the said arm F and cord holder from its normal position, in which it takes the cord from the needle toward the knotting devices for yielding cord to the latter, and then allowing it to move back again acted upon by gravity or the tension of the cord, in a manner well understood. The notched disk *a* has a ratchet-disk, *a′*, formed upon or secured to its rear face, adjacent to the laterally-extended part of the arm F of a form clearly shown in Fig. 5—that is, with the teeth which project beyond its periphery corresponding in number with the notches in the disk *a*, and having inclined rear faces inclining inward and forming a series of radial or slightly-curved teeth or ribs on the back of the ratchet-disk adapted to be engaged by a yielding retaining-pawl or cam-faced sliding pin, *c*. This pawl is made in the form of a headed pin, the outer face of the head of which is inclined like an ordinary bolt-latch, and it rests within a socket in the arm F, in the side adjacent to the ratchet-disk *a′*, immediately in rear of the latter and at one side of the supporting-pivot thereof. The shank or point end of the pin passes through a perforation in

the arm F, which serves to permit and guide or steady its endwise movement, and between the head of the pin and the bottom of the socket in which it rests is a light coiled spring, c', surrounding the pin c, and serving by its tension to press the head of said pin outward into engagement with the teeth on the rear face of the ratchet-disk a'. The inclined faces of said teeth, in connection with the inclined face of the head of the yielding pin, adapt the ratchet-disk a', and the notched cord-holding disk a, connected with the latter, to be turned or rotated in one direction, the square shoulders of the teeth and the pawl acting thereon preventing any backward movement or rotation of the disk.

For rotating the disk a the following mechanism is employed: The cord-holder arm, as stated above, is pivoted upon a crank-shaft, e, as in Fig. 1, or upon a tubular bearing for the latter on lug d, as in Fig. 8. This shaft has keyed to its forward end, or the end adjacent to the cam and gear wheel B, a small pinion, f, which has a portion of two or more of its teeth the ends thereof adjacent to the cam-wheel cut away, as shown at f', for a purpose which will be explained. The side of the cam and gear wheel adjacent to the pinion f has an annular flange or rim, b, formed upon it, which has formed within its inner face at b' a series of teeth sufficient in number to impart a single revolution to pinion f and adapted to engage therewith. The teeth b' are offset or project beyond the side face of the flange b, but their crowns are in the same circle as the inner edges of the interior surface of flange b, and they are adapted to engage all of the teeth, long and short, of pinion f. Two of the pinion-teeth are partly cut away, as before stated, leaving a blank space, f', of the width of the flange b, and underlying the inner-face teeth, and serving to lock the pinion against further action until the teeth b' advance again and engage said pinion-teeth. The rear or outer end of shaft e relative to the cam and gear wheel has a short crank, e', secured to it, to the wrist-pin of which is pivoted one end of a sliding rod or pawl, g, which, for the purpose of adjustment in length, is made in two parts, the shank or main portion (represented by g) provided at its outer end with a hook-pawl, g^2, adapted to engage and act upon the ratchet-disk a', and screw-threaded at its opposite end for adapting it to be coupled to the perforated head g', through which it is connected to the crank-wrist, and which has a correspondingly screw-threaded socket to permit its attachment and adjustment. By the adjustment of the shank portion g the pawl can be set in the required relation to the ratchet-disk to insure its proper action on the latter. The hooked end of the pawl slides between the notched cord-holding disk a and its supporting-arm, and is held up in engagement with the teeth of the periphery of the ratchet-disk a' by means of a spring, g^3, pressing against a shoulder or lug on arm F. The spring g^3 yields to allow the hook g^2 to pass outward and downward over the inclined rear faces of the ratchet-teeth, but insures the action of the pawl on said teeth on its inward operative throw, in a manner that will be readily understood.

Parts of the device or cord-holding mechanism not particularly described may be constructed in any usual or preferred manner.

Having now described my invention, what I claim as new is—

1. The combination, with the knotter-operating wheel adapted to vibrate the cord-holder and operate the disk-moving mechanism, of the cord-holding disk mounted upon a pivoted and vibrating arm, and a revolving crank-shaft and arm actuating the disk.

2. The cord-holding disk mounted upon and supported by a pivoted arm, the axis of which is concentric with the axis of the crank-shaft and arm actuating the cord-holding disk, and in combination therewith, substantially as described.

3. The combination, with the knotter-operating wheel adapted to vibrate the cord-holder arm and operate the disk-moving mechanism, of the cord-holding disk mounted upon and supported by a pivoted and vibrating arm, the crank-shaft and its arm, and the interposed pawl, arranged and operating substantially in the manner described.

4. The combination, with the knotter-operating wheel adapted to vibrate the holder-arm and operate the disk-moving mechanism, of the cord-holding disk mounted upon the pivoted arm and supported thereby, the intermittently-rotating crank-shaft, and an interposed arm and spring-pawl, substantially as and for the purpose described.

5. The combination, with the cord-holding disk, of the ratchet-disk provided with teeth on its periphery, extended inward on its outer face and forming radial or curved teeth, the latter having inclined faces, substantially as described.

6. The ratchet-disk for actuating the cord-holding disk, provided with the radial ratchet-teeth on its side face, in combination with the retaining latch or pawl, provided with the beveled end and sliding in a plane parallel with the axis of the cord-holding disk, and the spring for holding said pawl in yielding engagement with the ratchet-disk, substantially as described.

7. The combination of the vibrating cord-holder carrying-arm, the pawl actuating the cord-holding disk, the crank-shaft for actuating said pawl, the ratchet-disk connected with the cord-holding disk and the retaining-pawl, all arranged and operating substantially as described.

In testimony whereof I have hereunto set my hand this 26th day of April, A. D. 1884.

LEWIS MILLER.

Witnesses:
O. L. SADLER,
N. A. MEANS.