

(No Model.)

3 Sheets—Sheet 1.

A. O. SLENTZ.
GRAIN BINDER.

No. 418,241.

Patented Dec. 31, 1889.

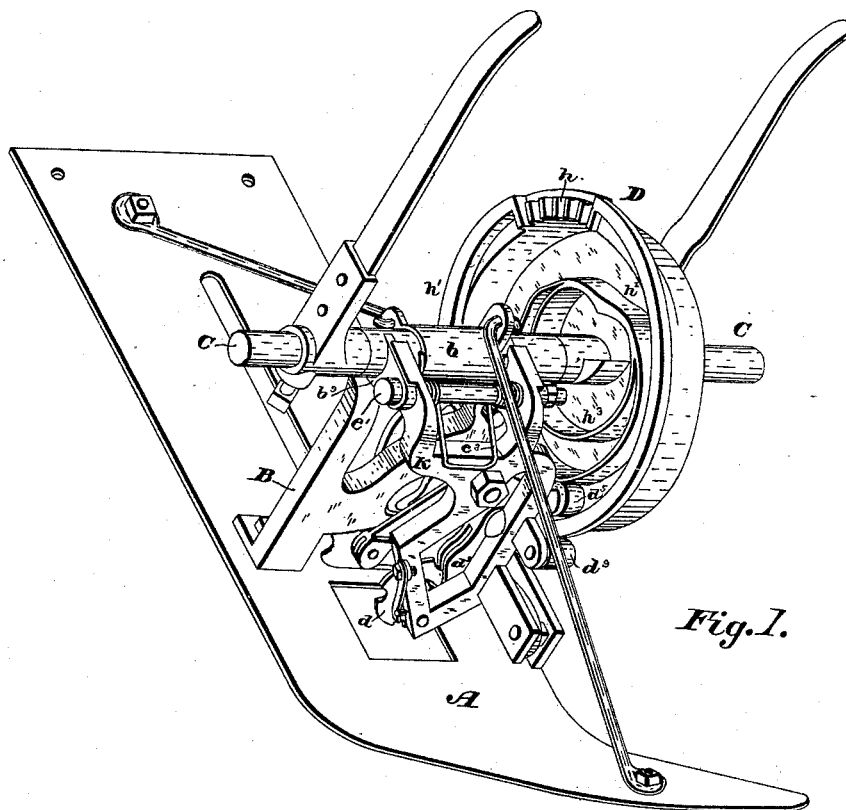


Fig. 1.

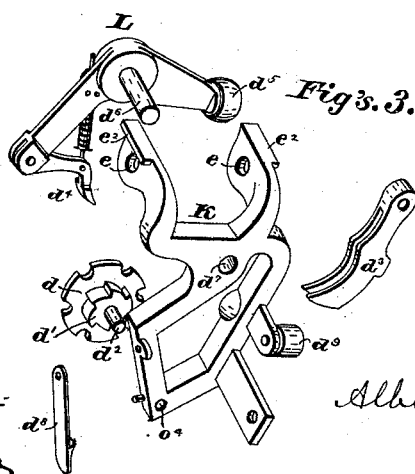


Fig. 3.

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W. K. Miller

ATTORNEY

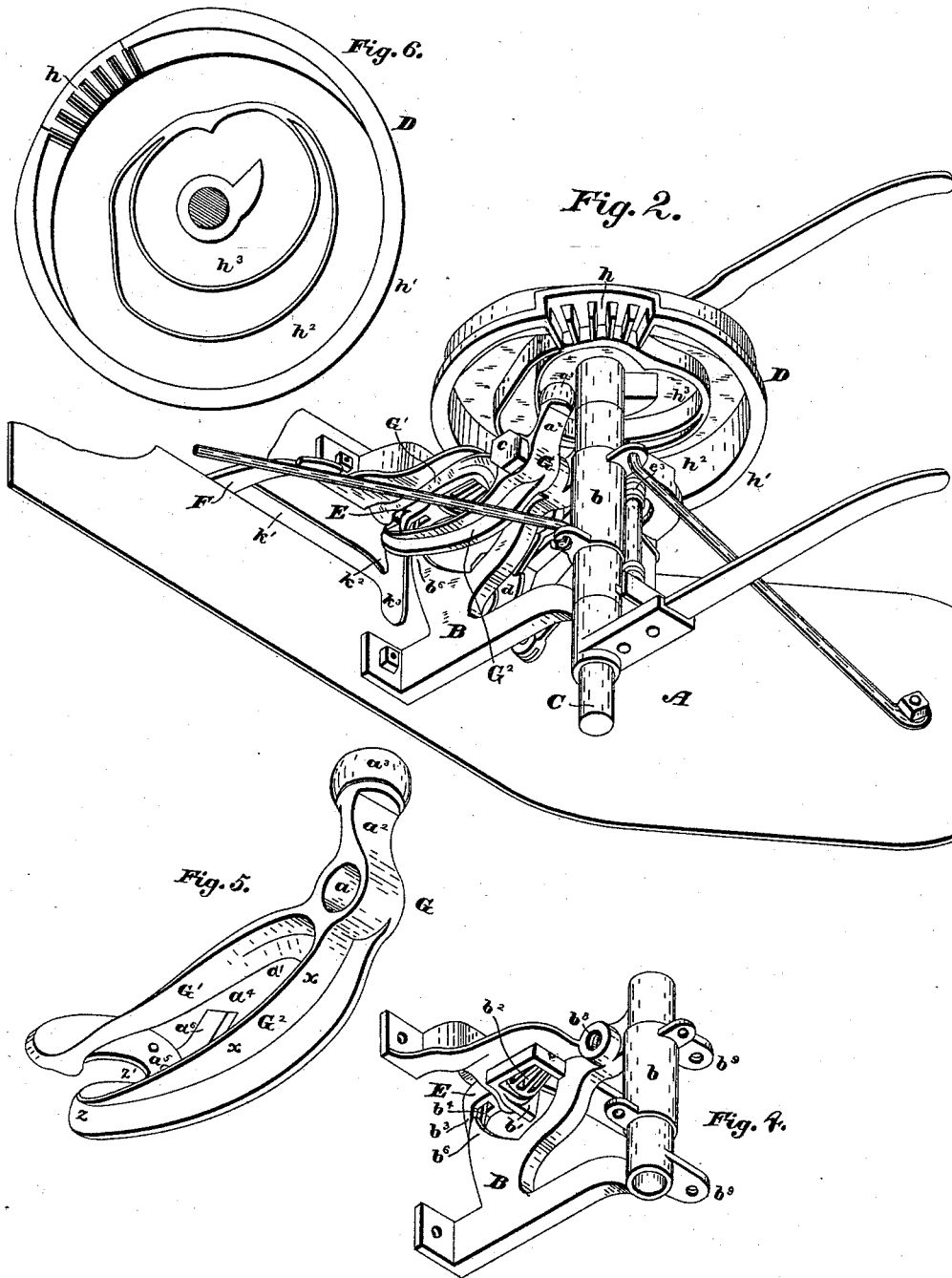
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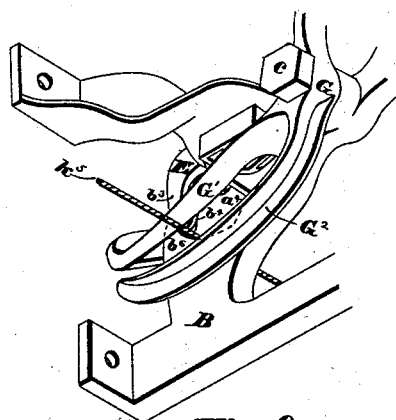
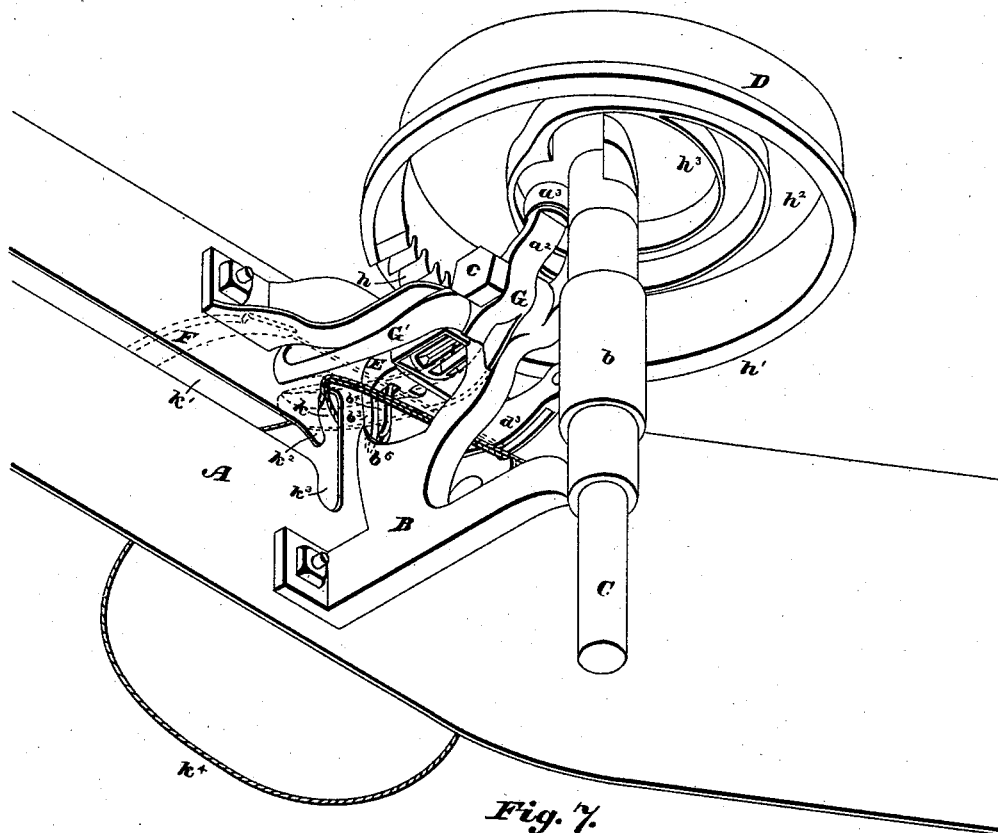
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Fig. 8.

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UNITED STATES PATENT OFFICE.

ALBURTICE O. SLENTZ, OF CANTON, OHIO, ASSIGNOR TO THE PEERLESS REAPER COMPANY, OF SAME PLACE.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 418,241, dated December 31, 1889.

Application filed August 25, 1886. Serial No. 211,853. (No model.)

To all whom it may concern:

Be it known that I, ALBURTICE O. SLENTZ, a citizen of the United States, and a resident of Canton, county of Stark, 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.

My invention relates to improvements in grain-binders, and more particularly to the construction and operation of the cord tying or knotting devices, in providing means by which a greater degree of certainty in tying may be secured, and, as well, uniformity and ease of action, as hereinafter described.

My invention also relates to the detail and combination of parts, as hereinafter described, and set forth in the claims.

Figure 1 is an isometrical view from the left front of a knotter or tying head embodying my improvements. Fig. 2 is an isometrical view of same from above and in rear, showing the parts in normal position. Fig. 3 is an isometrical view comprising detached parts, hereinafter lettered and described. Fig. 4 is an isometrical view of supporting-frame and knotter-head. Fig. 5 is an isometrical view of the cord-guiding and cord-cutting knife-supporting arm, enlarged for the purpose of elucidation. Fig. 6 is a plan view of the rack and cam-wheel enlarged. Fig. 7 is a view showing the position of the cord immediately before the tying process begins. Fig. 8 is a view of a fragment of the knotter, showing the position of the knife-supporting and cord-guiding arm after stripping the tied band from the knotter-nib and guiding the cord for the succeeding sheaf down to a place of rest upon the said nib until the tying process is repeated.

Similar letters of reference indicate corresponding parts in all of the figures of the drawings.

A represents the breast-plate; B, a supporting-frame for the knotting devices. Said frame is adapted at its lower end for bolts, by which it may be attached to the breast-plate A. The upper end is provided with a journal-box *b*, in which the actuating-shaft C

may be supported and rotated. There is also provided a laterally-projected lug *b'*, forming a support for the knotter-head E, the spindle of said head passing through said lug *b'* and the pinion *b²* into a perforation provided therefor in the frame above the pinion, and in which the said spindle may be rotated. On the lower end of the knotter-head E there is provided a nib *b³*, having a pivoted jaw *b⁴*, the heel of which is provided with a roller, (not shown,) which may be acted upon by a spring or shoulder for the purpose of closing the jaw upon the cord. These parts may be adjusted for the purpose of regulating the firmness of the hold taken by the knotter upon the cord. The frame B is also provided with a longitudinally-projected finger *b⁶*, extending to a point above and over the end of the knotter-nib. The object of this finger is to guide the cord *k⁵* (see Fig. 8) in its descent to a place of rest upon the knotter-nib, where it will remain awaiting the operation of tying. The importance of this simple device will be better appreciated when it is understood that in all preconceived plans it was not only possible for the cord to be deflected so as to drop past and below the nib, but the occurrence was frequent and the operation of tying the knot defeated; but in this case, as the binder-arm F recedes, the cord *k⁵* is drawn down over the finger *b⁶* and dropped down upon the knotter-nib.

A vibratory cord-guiding and cord-cutting knife-supporting arm G, of peculiar construction, is provided, as shown by Fig. 5, having at its upper section a perforation *a*, adapting it for a pivotal engagement with the frame B and a projected end *a²*, provided with a roller *a³*, adapted to a cam-groove *h³* on the rack-wheel D. In the lower section of said arm there is provided a slot *a⁴*, forming side bars *G¹* and *G²*, said slot extending from a point *a'* and terminating at *a⁵*, a point near the lower end, and of a width to allow the needle or binder-arm F to pass through. The upper end of said slot from *x* to *x* may be about vertical when the arm is at rest, as shown in Figs. 2 and 7, diverging slightly from *x* to *z* and from *z* to *z'* obliquely, on such lines as may be desirable, and the arm

is bent inwardly at z to a line at right angles to the vertical plane of the arm, as shown in Fig. 5, said bend to bring the end of the arm under the knotter-head. The object of this slot a^4 is to provide means by which a more positive control may be had of the binding-cord, for the reason that as heretofore constructed the knife-arm was liable to lose control of the cord because of the open side; but in this case the cord is confined between and controlled by the side bars G' and G^2 , which guide the cord down to the knotter-nib and the lower end of the slot. The arm G is connected to the frame B by an axle-bolt c , turned into a threaded perforation b^8 , about which it may be vibrated for the purpose hereinafter explained.

The frame B is provided with projected lugs b^9 , to which there is pivoted a vibratory frame K , on which there is mounted a cord-holder formed of a disk d , having a rack d' , supporting spindle d^2 , said spindle adapted to the perforation a^4 , these parts forming one of the well-known and approved cord-holders. On said frame K there is also a vibratory crank-lever L , having on one of its ends a pawl d^4 , adapted for engagement with the rack d . The other end is provided with a roller d^5 , adapted to a cam-groove h^2 on rack-wheel D . Said lever is also provided with an axle-pin d^6 , adapted to perforation d^7 , about which it may be vibrated by the cam h^2 on rack-wheel D , and when so vibrated, the pawl having engagement with the rack, will rotate the disk and force the cord into the shoe d^3 . There is also provided on said vibrating frame K a projected roller d^9 , adapted for engagement with a cam h' , formed on the periphery of rack-wheel D , by which engagement of roller and cam the frame K may be vibrated outwardly and held in said outward position during the period of time required to gather a sheaf. On the upper end of said frame K there is provided perforations e , that coincide with perforations in lugs b^9 on the frame B , through which a bolt e' may be passed to form a hinged connection. Between the frames B and K ribs e^2 are provided, that project over the lugs b^9 , by which the vibratory movement of the frame may be arrested at a given point, the roller d^9 resting against the cam on eccentric h' . A spring e^3 is provided, one end of which rests on frame B , the other on frame K , by the exertion of which the frame K may be vibrated inwardly at the instant the knotting mechanism is brought into action. The movement of the frame and cord-holder at this instant gives cord to form the knot outside of that which is about the sheaf, and brings the cord-holding disk close to the cord-cutting knife, by which a great saving of cord is effected.

The actuating-shaft C may be geared in any of the usual or well-known plans. Rack and cam wheel D is mounted upon and rotated by said shaft, said wheel having a rack

h to rotate the knotter-head, a peripheral cam or eccentric rim h' , adapted for engagement with the roller d^9 , for the purpose of vibrating frame K , as hereinbefore mentioned. A cam-groove h^2 is also on said wheel, and adapted to vibrate the crank-lever L at the proper time in the process of tying. After the cord has been placed in a notch of the cord-holding disk, and immediately before the knotter-head is rotated, and by said vibration, the pawl d^4 engaging with the rack d' , the disk d may be rotated, thus giving a positive movement to the disk. The cord, having been placed in one of the notches of the disk, is driven into the shoe d^3 , and is securely clamped and held by the disk and the jaws of the shoe. There is also provided on said rack and cam-wheel a cam-groove h^3 , adapted to vibrate the cord-guiding and knife-supporting arm G in the process of tying, so as to hold the cord k^4 that is about the sheaf (see Fig. 7) in the slot k in breast-plate A during the period of time occupied in rotating the knotter-head to form the knot, and then to vibrate said arm toward the opposite end of the slot k^3 , and in that movement the knife a^6 to cut the cord between the knot and the cord-holder, the tension of the cord at this point being sufficient to enable the cord to be easily severed by the contact of the knife a^6 against it, and the arm G being adapted to draw the knot from the knotter-nib and place the cord k^5 (see Fig. 8 and dotted line, Fig. 7) for the succeeding sheaf upon the knotter-nib as the binder-arm recedes, as shown by the dotted line, Fig. 7, the breast-plate A having a longitudinal slot k' , forming a passage-way for the binder-arm F , and a transverse slot k^3 , at the junction of which there is provided a finger k^2 , projected outwardly and downwardly into the opening formed by the said slots, forming a cord-holding finger, by which the cord that is about the sheaf may be confined in the lower end of the slot a^4 in the arm G , and held in that position when the knotter-head is rotated for the purpose of tying the knot.

The rotating and vibrating parts hereinbefore mentioned are necessarily intermittent in their movements, depending upon the gathering of the grain into sheaves of suitable size for binding, and may be brought into action by such automatic appliances as are well known and approved.

Having thus fully described the nature and object of my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a grain-binder, the combination, with a breast-plate, a frame secured to the plate, this frame having a laterally-swinging arm pivoted thereto, and a spring-actuated vibrating frame also pivoted thereto, a cord-holder in the vibrating frame, a bell-crank pivoted to this frame, said crank having a pawl adapted to operate the cord-holder, and a roller on the swinging arm, the vibrating frame, and the bell-crank, of a rotary wheel

having a cam-periphery and cam-grooves thereon, one for each roller, substantially as set forth.

2. In a grain-binder, the combination, with a breast-plate, a frame secured to the plate, this frame having a knotter-head journaled therein and a projected finger extending to a point over the end of the knotter, a laterally-swinging arm pivoted to the frame and straddling the knotter-head, this arm carrying a cord-cutting knife and having a roller journaled on one end and a spring-actuated vibrating frame pivoted to the fixed frame, said vibrating frame having a cord-holder therein, a bell-crank pivoted thereto, the latter having a pawl pivoted at one end and a roller journaled on the other, the vibrating frame itself having a roller journaled therein, of a rotary wheel having a cam-periphery and several cam-grooves therein adapted to engage the several rollers, and thereby actuate the parts on which the latter are journaled, and teeth on its face for operating the knotter-head, substantially as set forth.
3. In a grain-binder, the combination, with a breast-plate having an elongated slot, a transverse slot at the end of the latter and a finger projecting into said slot, a fixed frame secured to the plate in close proximity to the transverse slot and parallel thereto, a knotter-head journaled in this frame, the frame having a projecting finger extending to a point above the knotter-head, a swinging cord-guiding and knife-supporting arm pivoted to the frame and straddling the knotter-head, this arm having a roller on one end, a spring-actuated vibrating frame pivoted to the fixed frame, said frame carrying a cord-holder, a pivoted bell-crank having a pawl on one end adapted to engage the cord-holder and a roller on the other end, and a roller on the vibrating frame, of a rotary wheel having a cam-

periphery and cam-grooves therein, these cam devices receiving the rollers and operating the parts connected therewith, and teeth on one face of the rotary wheel adapted to drive the knotter-head, substantially as set forth.

4. The combination, with a breast-plate and a frame secured thereto, of a knotter-head journaled therein, a laterally-swinging arm pivoted thereto, a spring-actuated frame pivoted thereto, the laterally-swinging arm and the spring-actuated frame having rollers thereon, and a cam-wheel adapted to have engagement with the rollers and thereby operate the connected parts.

5. The combination, with a supporting-frame, of a rack and cam-wheel D, having on its side face a rack h , to rotate the knotter-head, a cam h^3 , to vibrate a cord-guiding knife-supporting arm G, a cam h^2 , to vibrate the lever L and thereby rotate the cord-holding disk d , and a peripheral eccentric cam h' , to operate the cord-holder-supporting frame K, substantially as shown and described, and for the purpose set forth.

6. A vibrating knife-supporting cord-guiding arm G, having a slot closed at each end, through which the needle may pass to place the cord in the holder, the walls of said slot to guide the cord to a point upon the jaw of the knotter, substantially as set forth.

7. The combination of the slotted vibrating knife-supporting cord-guiding arm G and the knotter-head-supporting frame B, having a cord-guiding finger b^6 , substantially as set forth.

In testimony whereof I have hereunto set my hand this 12th day of August, A. D. 1886.

ALBURTICE O. SLENTZ.

Witnesses:

W. K. MILLER,
CHAS. R. MILLER.