

(Model.)

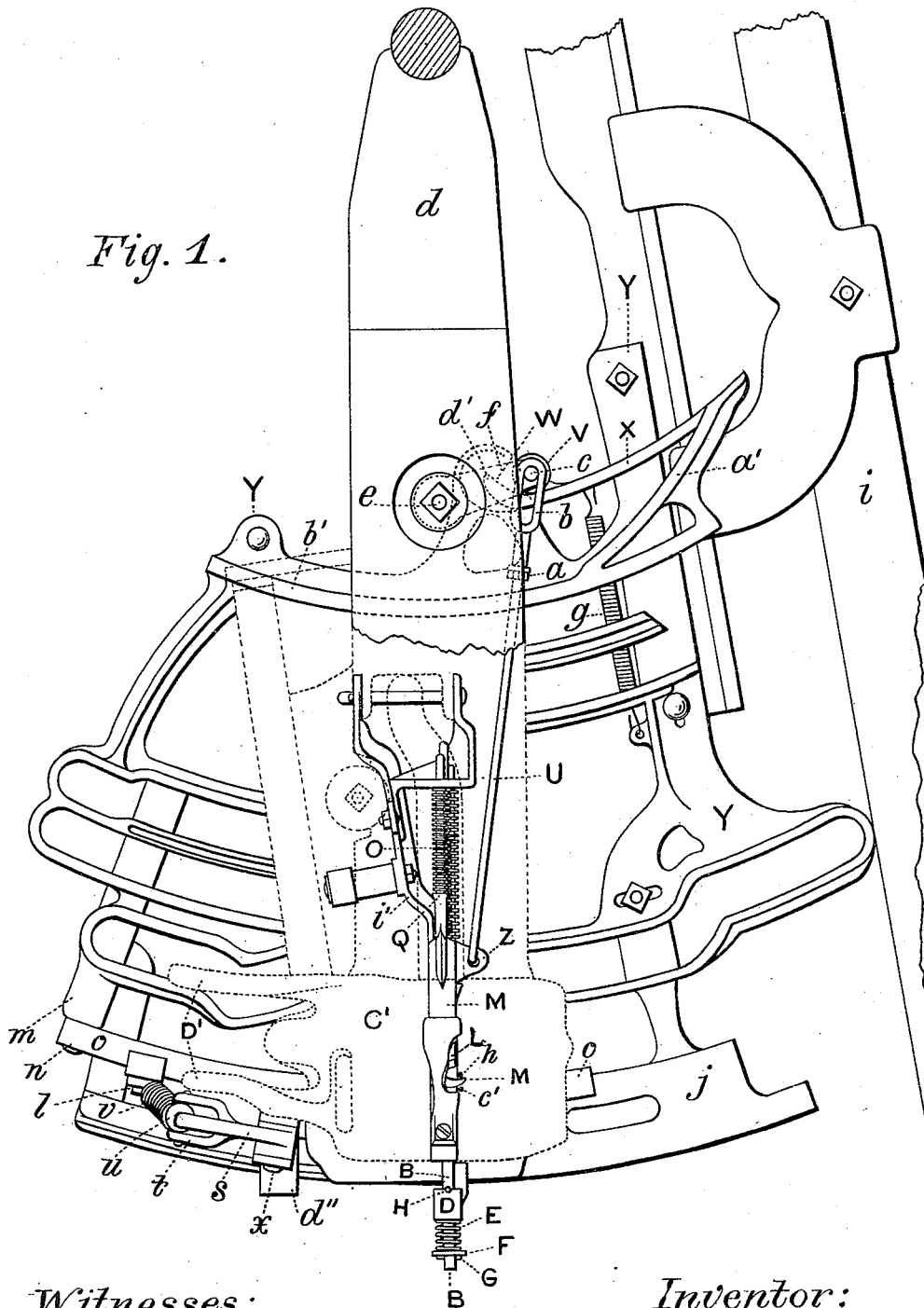
3 Sheets—Sheet 1.

C. WHEELER, Jr.
SELF BINDING HARVESTER.

No. 263,370.

Patented Aug. 29, 1882.

Fig. 1.



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Fig. 2.

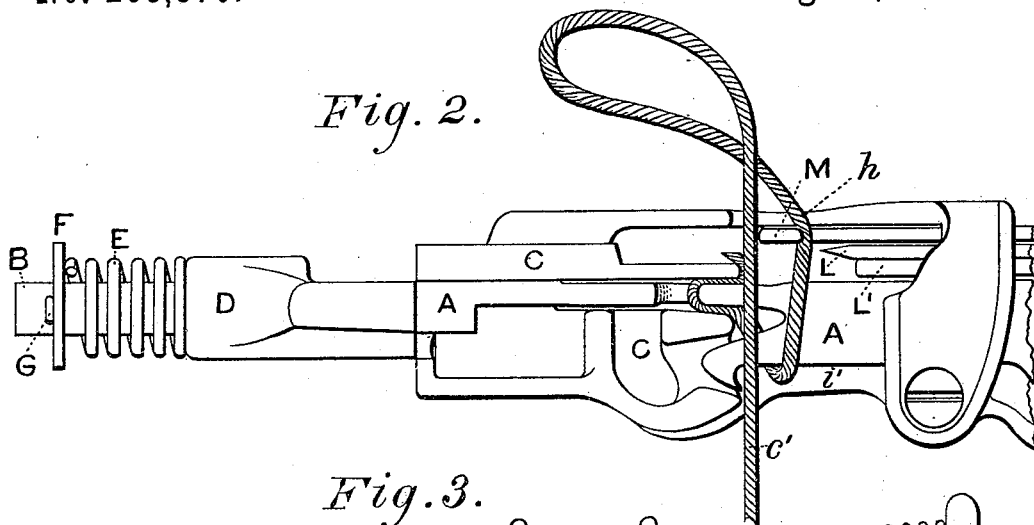


Fig. 3.

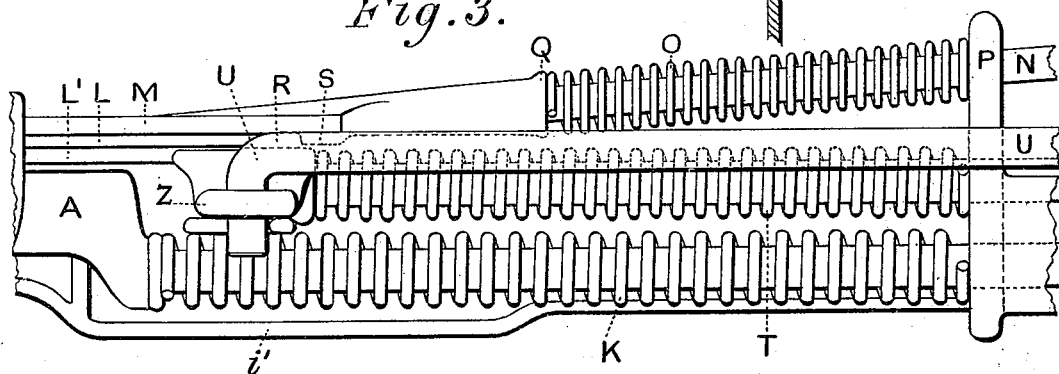
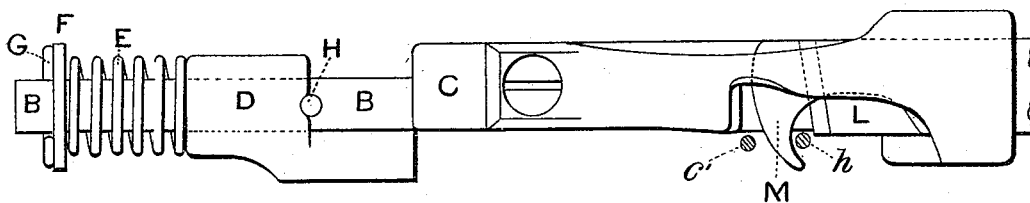


Fig. 4.



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(Model.)

3 Sheets—Sheet 3.

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Fig., 5.

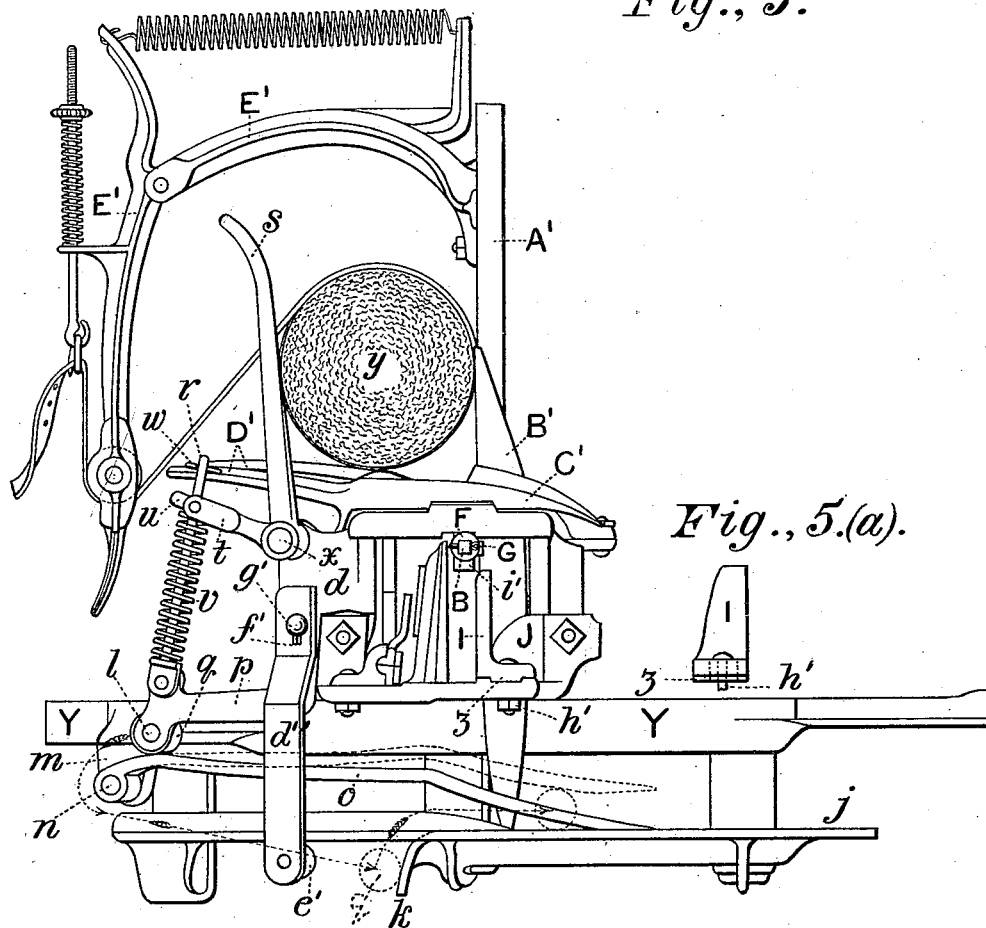


Fig., 5.(a).

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UNITED STATES PATENT OFFICE.

CYRENUS WHEELER, JR., OF AUBURN, NEW YORK.

SELF-BINDING HARVESTER.

SPECIFICATION forming part of Letters Patent No. 263,370, dated August 29, 1882.

Application filed October 29, 1881. (Model.)

To all whom it may concern:

Be it known that I, CYRENUS WHEELER, JR., residing at Auburn, in the county of Cayuga and State of New York, have invented certain new and useful Improvements in Self-Binding Harvesters, of which the following is a specification.

My invention relates to that class of self-binding harvesters in which twine is used as a binding material, and in which the binder-arm has a vertically-oscillating and horizontally-swinging movement and the knotter a horizontal vibration with the binder-arm.

It consists of improvements on grain-binding devices forming the subject of other applications filed by me in the Patent Office, said improvements being hereinafter described, and pointed out in the claims.

My invention further consists of an improved cord-holder, and a device having for its object the separation of the ends of the cord previous to the tying of the knot and removing the end of the cord from the cord-holder after the latter is opened and before it closes upon the cord again; also, in an improved device operating the bundle-compressing finger. I attain these several objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a top or plan view of the cord-holder and compressing-finger with their operating mechanism. Figs. 2 and 3 are broken continuous views, in side elevation, of the operating parts of the cord-holder. Fig. 4 is a top plan view of the outer end of the cord-holder. Fig. 5 is an end view of such portions of the binder as are necessary to show the connection and operation of the compressing device, and Fig. 5^a is a detached view of the fixed and adjustable cam-piece.

Similar letters refer to similar parts throughout the several views.

The cord-holder in its general features is similar to that forming the subject of another application filed by me. It is positively vibrated in a vertical direction at proper intervals to give up slack to the knotter.

In Fig. 2, which shows a portion of the cord-holder *v*, A is the movable jaw, having its end B extended beyond the fixed jaw C, on which said extension is placed a sliding piece, D, out-

side of which, on the extension B, is placed a coil-spring, E, which is firmly held against the piece D by the washer F and the pin G, which passes through a hole in the extension B. A pin, H, Fig. 4, passing through the extension B on the opposite or inside of the sliding piece D, serves to limit its movement inward.

A cam-piece, I, the form of which is shown in a detached view in Fig. 5^a, is bolted to the knotter-head J. The cord-holder *v*, in its downward movement, will cause the piece D to slide down the cam-edge of the cam-piece I, thus forcing the movable jaw A of the cord-holder *v* outward and locking it, the spring E allowing for the varying size of the string between the movable jaw A and the fixed jaw C. The cam-piece I has a slot in its foot, and is fastened to the knotter-stand J by the bolt *h'*, passing through said slot, whereby it may be adjusted for a greater or less tension upon the sliding piece D. It has also a guideway upon its bottom, by which it may always be assured of its correct relative position to the piece D. (See Figs. 5 and 5^a.)

As the cord-holder *v* is opened (by means hereinafter described) only when at its highest elevation and above the top of the cam-piece I to release and again receive the cord, it will be seen that the cord is more securely held when there is a strain on it, which occurs in the passage of the cord around the gavel prior to the tying of the knot, than it would be by the pressure only of the spring K at the opposite end of the movable jaw.

Resting upon the upper surface of the knife L is the cord-hook M, shaped as shown in Fig. 4. This cord-hook is extended into a rod, N, upon which is placed a spiral spring, O, said spring being placed between the ear P of the cord-holder *v* and a shoulder, Q, formed between the cord-hook M and the extended rod N. The cord-hook M is actuated by a shoulder, R, formed upon the knife-bed L', abutting against a corresponding shoulder, S, formed on the under side of the cord-hook extension, (see dotted lines in Fig. 3,) so that when the knife is drawn back it carries the cord-hook with it, and when released both it and the cord-hook resume their first position by the recoil of their respective springs O and T. The movable jaw A is also actuated by a simi-

lar device. The cord-hook M, the knife L, and the movable jaw A are timed for the several offices of seizing, cutting, and closing upon the cord at the proper moment. The actions of the cord-hook, knife, and movable jaw of the cord-holder are controlled by the link-rod U, the roller V, pivoted crank W, the pivoted cam-shaped track X, carried upon the cam-frame Y, and the camway b' , having a deflection, a' , and forming a portion of the cam-frame Y. One end of the link-rod U is attached to an ear, Z, formed upon the bed L', on which the knife L is secured. The other end of the rod U is screwed into a threaded loop, b , and is retained at the desired adjustment by the jam-nut a . The loop b passes into a vertical pivot-stud, c , at one end of the pivoted crank W. Under the center of this pivot-stud c , and to the outer end of the crank W, is placed the roller V. The opposite end of the crank W is pivoted to the knotter-arm d at e . A cam-shaped track, X, is pivoted to the cam-frame Y at f , and is kept in closed working position by the spiral spring g .

The operation of the cord-hook may be described as follows: As the knotter-arm d passes outward it carries with it the pivoted crank W and its roller V upon the rear or outer side of the cam-shaped track X. The roller V, through its several connections, already described, causes the knife and, by means of the shoulder thereon, the cord-hook to be drawn back sufficiently for the cord-hook to draw the cord h out of the way of the portion of the cord c' , carried by the descending needle-arm. When the roller V has reached the quick deflection d' of the cam-track X the movable jaw is opened and the cord-hook still further drawn back, pulling the cord h from between the fixed and movable jaws of the cord-holder. As the roller passes over the end of the deflection d' of the cam-track X the recoil of the springs O, T, and K causes the movable jaw to close upon the cord c' , carried by the needle-arm, the cord-hook to again seize the same and the knife to cut the cord, all of which movements are timed in such successive steps or for joint operation by the proper adjustment of their several parts as will best serve for their effective operation. The roller V is now, through the medium of the slot in the threaded loop b , free to swing inward against the side of the fixed camway b' . As the roller reaches the deflection a' in the fixed camway b' the knife and cord-hook, through their connections, are drawn back, and when the roller reaches the end of the switch-cam X next to the binder-frame i the switch-cam X is forced open to allow of the roller passing by, and is retracted when the roller has passed by the recoil of the spring g . The roller then again traverses the outside of the switch-cam X, as already described. It will thus be seen that the office of the cord-hook is to keep the two ends of the cord well apart, as well as to keep the jaws of the cord-holder free from obstruction for the reception of the cord carried by the binder-arm.

To the cam-frame Y, and under the front or outer end of the knotter-arm, is bolted a track, j . This track has a hanging lip, k , the office of which is to guide the roller q back upon the track in the return movement of the knotter-arm. The cam-frame Y has a lug, m , projecting downward, to which is pivoted, at n , a switch, o , constructed as shown in Fig. 5, its free end resting on the surface of the track j . To the front or outer side of the knotter-arm d is pivoted the lever p , which carries a roller, q , pivoted thereto at l , and a hinged upwardly-projecting spindle, r . Near the upper side of the knotter-arm d , and over the pivot-point of the lever p , is pivoted the compressing-finger s . Extending from the lower end of the compressing-finger s is a short forked lever, t , which carries at its outer end a thick washer, u , having trunnions projecting from either side into the forks of the lever t .

Through the trunnion-washer u passes the hinged vertical spindle r . Around this spindle r , and between the trunnion-washer u and a shoulder formed on the spindle near its hinged point, is coiled the spiral spring v . A pin, w , serves to keep the trunnion-washer u from being thrown off from the spindle r .

The operation of the compressor-finger and its actuating parts may be described as follows: In the outward movement of the knotter-arm d the roller q is carried upon the upper surface of the pivoted switch o , causing the lever p to rise, whereby the spiral spring v is brought to bear against the trunnion-washer u , which raises the forked lever t , which turns on the pivot at x and causes the compressor-finger s to bear against the side of the bundle y . This force, through the elasticity of the spring v , is of a yielding character, thus allowing the compressor to accommodate itself to the varying size of the bundles being bound. As the roller q passes off from the pivoted end of the switch o it falls and brings down with it the compressing-finger s , thus allowing of an unobstructed passage for the completed bundle. In the return movement of the knotter-arm the roller q is carried under the pivoted switch o , and is guided by the hanging lip k upward and onto the track j . This raises the roller q , and through its connecting parts causes a yielding upward pressure of the compressor-finger against the bundle. When the roller has passed under the free end of the pivoted switch o , and the outward motion of the knotter-arm takes place, the roller again rides upon the upper surface of the switch o , as already shown, causing a further upward movement, which is converted into a lateral pressure against the bundle.

A bracket, d'' , having at its lower end a roller, e' , and at its upper end a slot, f' , through which it is secured to the end of the knotter-arm d by the bolt g' , serves as a tie between the end of the knotter-arm d and the lower track, j , thus preventing any spring or yielding of the latter by the downward force exerted by the roller q upon the track j and

pivoted switch *o* by the action of the compressor-finger *s* against the bundle.

A' B' represent the cord-carrying or binder arm; C', the knotter shield-plate, having fingers D'; and E' is the upper compressing mechanism carried on the binder-arm. These parts, together with other parts herein shown and described, but not specifically claimed, are fully described and claimed in other applications filed by me in the Patent Office.

Having thus described the construction and operation of my improvements, what I desire to claim and secure by Letters Patent is—

1. In combination with the knotter-carrying arm, the vertically-vibrating cord-holder, its movable jaw provided with a yielding collar, and a cam fixed on said knotter-arm, whereby the cord is firmly clamped by the holder, substantially as set forth.

2. In combination with the vertically-vibrating cord-holder, having the movable jaw provided with the actuating-collar, the fixed cam and means for adjusting said cam, substantially as and for the purpose set forth.

3. In combination with the binder-arm and cord-holder, a sliding hook carried on the upper side of said cord-holder, and means for operating said hook, whereby the old end of the

cord in the holder is separated from the new portion presented by the binder-arm, substantially as set forth.

4. The swinging knotter-carrying arm, in combination with the hook for separating the cord, as described, a cam-track on the binder-frame, a link-rod, and intermediate operating mechanism for actuating the hook at the proper times, substantially as and for the purpose described.

5. The combination of the swinging knotter-carrying arm, the compressing-finger pivoted thereto, the fixed cam and pivoted switch on the binder-frame, and intermediate operating mechanism for actuating said finger, substantially as and for the purpose set forth.

6. The combination of the swinging knotter-carrying arm, the compressing-finger pivoted thereto, the fixed camway below said knotter-arm, intermediate operating mechanism, and the bracket attached to the knotter-arm and provided with a roller adapted to traverse the under side of said cam, substantially as and for the purpose set forth.

C. WHEELER, JR.

Witnesses:

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