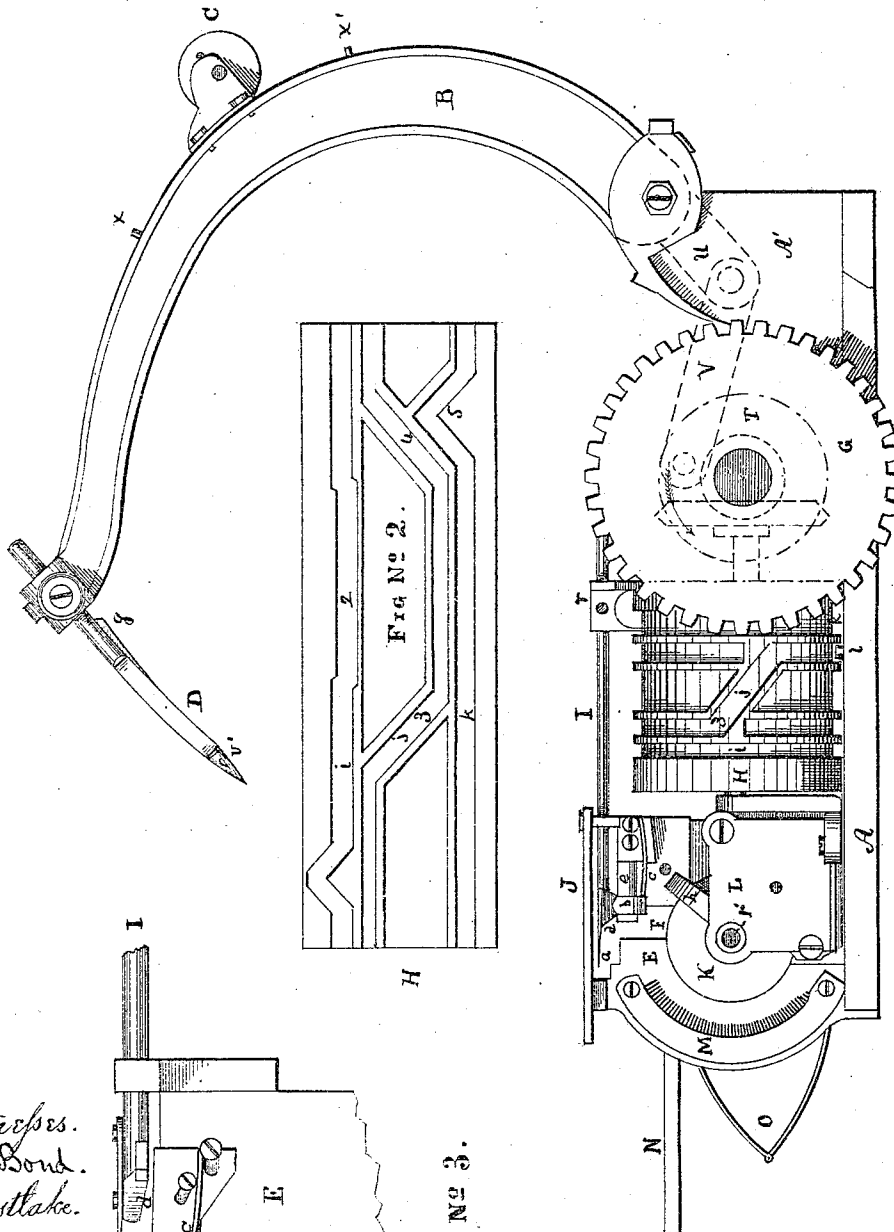


EDWARD H. CLINTON.

Improvement in Grain-Binders.

No. 126,129.

Patented April 30, 1872.



Witnesses.
O. W. Bond.
H. M. Nestlake.

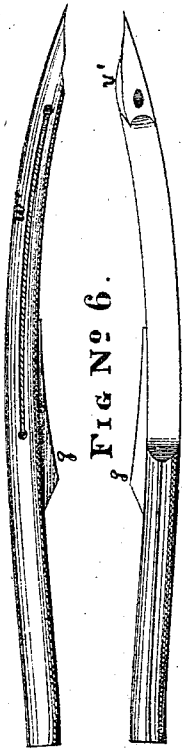
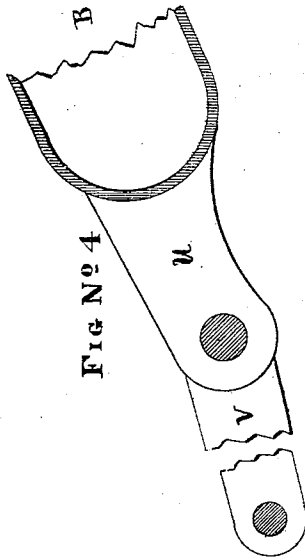
Edward H. Clinton
By West & Bond
His Attys.

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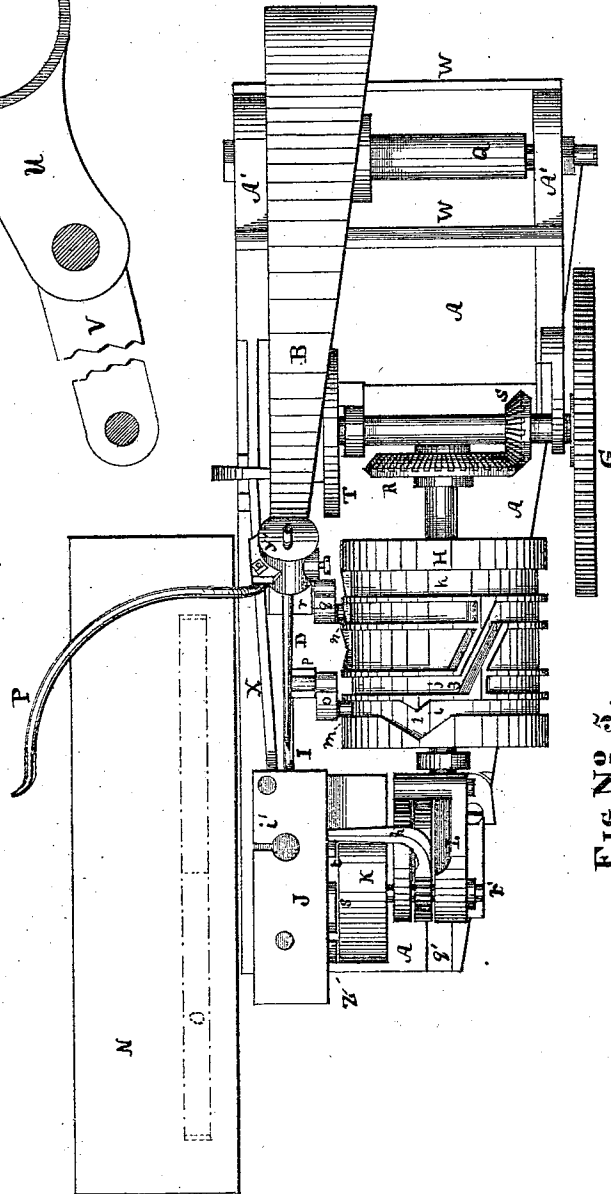
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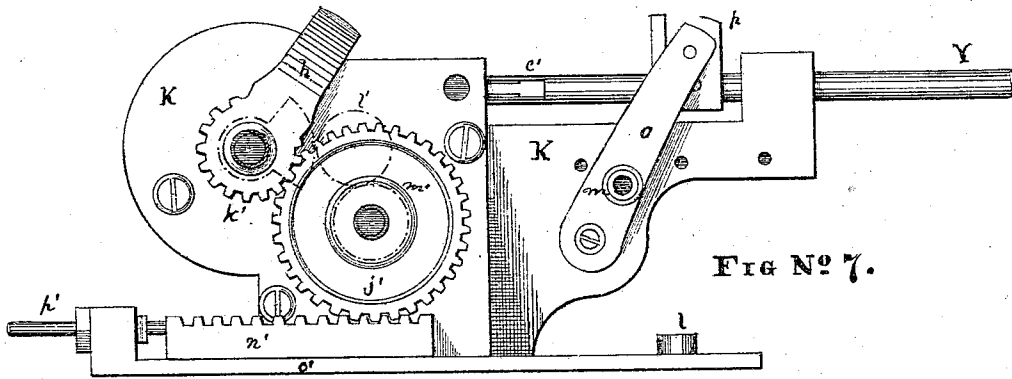


FIG No 7.

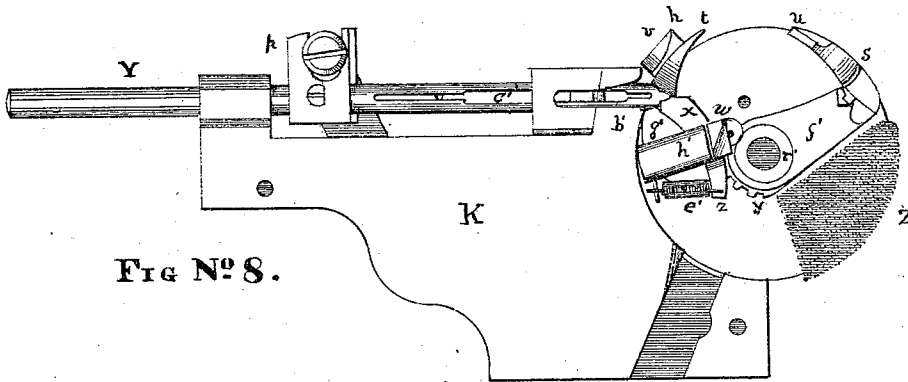


FIG No 8.

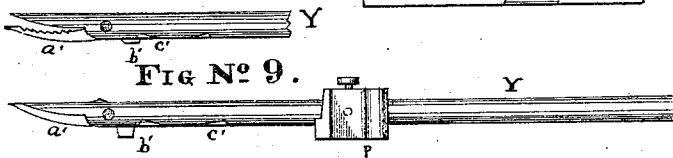


FIG No 9.

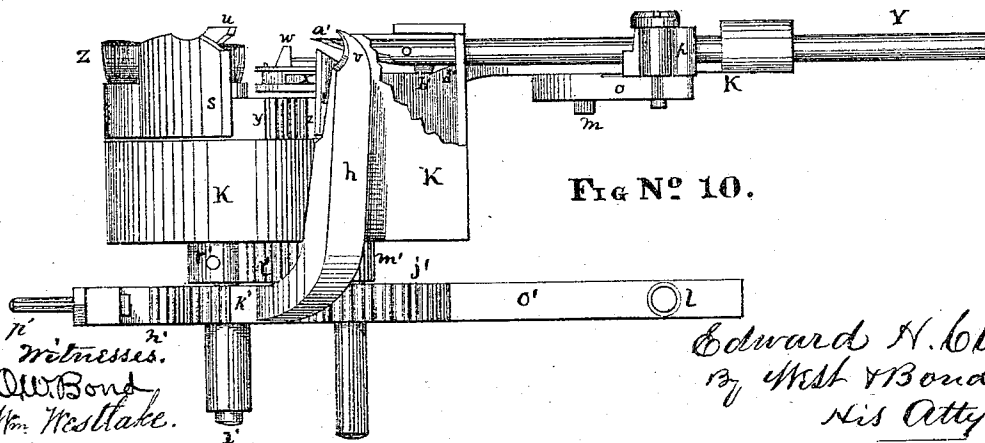


FIG No 10.

Witnesses.
O. W. Bond
Wm. Westlake.

Edward H. Clinton
by Wm. Bond
his Atty

UNITED STATES PATENT OFFICE.

EDWARD H. CLINTON, OF IOWA CITY, IOWA.

IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. 126,129, dated April 30, 1872.

SPECIFICATION.

I, EDWARD H. CLINTON, of Iowa City, in the county of Johnson and State of Iowa, have invented certain new and useful Improvements in Grain-Binders, of which the following is a full description, reference being had to the accompanying drawing making a part of this specification, in which—

Figure 1 is a side elevation; Fig. 2, a plan view of the grooves and cams of the roller; Fig. 3, a detached view, showing the construction of the device for holding the cord, with a detail giving a front view of the device; Fig. 4, a view of the lower end of the needle-arm; Fig. 5, a top or plan view; Fig. 6, views of the needles detached; Fig. 7, a top view of the block or supplementary frame containing the tying devices; Fig. 8, a reverse view of the same frame; Fig. 9, views of the tying-needle; and Fig. 10, a top or plan view of the supplementary frame, having a small portion cut away to exhibit the cam for opening tying-needle. Figs. 1, 2, and 5 are one-fourth of the full-sized machine; Figs. 3, 4, 6, 7, 8, 9, and 10, one-half full size.

This invention relates to that class of machines for binding grain by means of a cord; and its nature consists in certain improvements in the needle, in the devices for tying the knot, holding the cord, and in operating the several devices.

In the drawing, A represents the main frame; B, vibrating arm; C, tension-regulator; D, needle; E, the vertical portion of the main frame; F, slot or opening for the needle; G, driving-wheels; H, cam-cylinder; I, knife-rod; J, top plate; K, supplementary frame containing the tying devices; L, journal-plate; M, brush for holding the end of the cord; N, platform for supporting the sheaf; O, spring supporting the platform N; P, arm for grasping the sheaf; Q, shaft for supporting and operating the needle-arm; R S, miter-wheels for driving the cam-cylinder; T, wheel or arm for carrying the wrist-pin of the pitman; U, part of the needle-arm extending below the shaft; V, pitman; W, cross-bars for supporting the frame; X, a vertical part of the frame, against which and the part E the supplementary frame K is placed and held in position; Y, tying-needle; Z, brush for holding the cord in position to be caught by the tying-needle; a, knife;

b, cam or eccentric wheel for holding the cord when the knife is operated; c, spring for operating b; d, an incline or projection for opening or moving the wheel b; e, spring operating against the wheel b; f, projection for opening wheel b in connection with the incline d; g, projection on the inside of the needle for forcing the cord between the wheel b and spring e; h, arm for carrying the end of the cord under the brush M; i, groove with cam-projection for operating the tying-needle; j, cam-groove for operating the bar o' and rack n'; k, groove with cam-projection for operating the knife-rod I; l, pin or projection running in the groove j for operating the bar o'; m, pin running in groove i for operating the needle Y; n, pin running in groove k, operating the knife-rod I; o, arm pivoted below the pin m, connected at its upper end with a block or socket, p, attached to the needle Y; q, a similar arm connected at its upper end to a block or socket, r, attached to the knife-rod I; s and t, jaws, forming a clamp to hold the cord for the ascent of the needle; u, loopers attached to the jaw s; v, hook at the end of the arm h; w, projection to keep the cord in position when the needle descends; x, spring-cam for opening the jaws of the tying-needle; y z, gear-cogs for operating the jaws s t; a', movable jaw of the tying-needle; b', projection attached to the heel of the jaw a'; c, spring passing under the heel of the jaw a'; d', incline for opening the jaw; e', spring for operating the cam or bar x; f', arm of the jaw s; g', arm of the jaw t; h', arm or projection in which the spring-bar x is pivoted; i', needle-hole in the plate J; j' and k', gear-wheels by which the arm h is operated; l', intermediate wheel between the pinion m' and the cogs on the side of the shaft r'; n', rack for operating wheel j'; o', movable bar supporting the rack n'; p', nut and screw for adjusting the rack n' on its supporting-bar; q', groove in bed-plate for guiding the bar o'; r', shaft for operating the arm f' with the jaw; s', projection for separating the cord to insure perfect operation of the tying-needle; t', roughened projection on the plate E, operating in conjunction with the brush Z to prevent the displacement of the cord when the tying-needle advances; u', pin in plate E, under which the cord is drawn by the tying-needle, the object being to prevent

the cord from being drawn to so sharp an angle as to interfere with the operations of the main needle; v' , groove near the point of the needle D, through which the spring e passes to part the cord from the needle and insure its entrance into the holding device $e b$; w' , groove on the opposite side of the needle to prevent injury to the cord, and also prevent the cord from interfering with the operation of the needle; $x' x''$, cord-eyes on the needle-arm; y' , hole in the head of the needle-arm; 1, cam in groove i to advance and retract the tying-needle; 2, cam in same groove, by means of which the projection b' is forced onto the incline d' to open the jaws a' and release the knot; 3, incline or cam in the groove j , by which the rack-bar o' is advanced; 4, similar groove, by which it is returned; 5, cam-projection in groove k , by which the knife a is advanced and returned.

The principal part of this machine is made of cast-iron or other suitable material, and the needle and springs are usually made of steel. It will be well to provide the pins l , m , and n with sleeves or collars to prevent wear and reduce friction.

This binder can be applied to any reaping-machine, but will be most easily applied to that class of reapers which are provided with sweep-rakes. When applied to one of these reaping-machines it is located at the reel end of the platform, in such a position that the grain will be swept against the cord, and between the point of the needle D, when elevated, and the plate J; and the gear-wheel G in this class of reapers can be connected directly with the machinery for moving the rake. It will also be advisable to house or cover this binder in a suitable box to prevent dust and dirt from getting into it or interfering with its operation. It is also so located that the plate J will be level with the platform of the reaper. A suitable spool or reel for carrying the cord is attached to or placed near the lower end of the arm B. From this spool a cord is carried through the eye x' , around the tension device C, through the eye x'' , then through the hole y' , then through the eye in the point of the needle, through which it is drawn, leaving the cord to project at a length about equal to the length of the needle.

In operation the needle descends into the opening F, when the loose end is caught in the hook t of the arm h , and is carried by it under the brush M, where it is held, and also under the brush Z. At the same time it is carried over the looper u , when the jaws $s t$ close and hold it as placed. The needle then rises, which movement completes the loop around the looper u . The machine is now ready to receive the grain, which is swept between the needle and plate J onto the platform N, when the needle again descends. The arm P passes over the sheaf, and assists the cord in compressing it into form. In this second descent the needle passes through the loop previously formed

on the looper u , and, as soon as the eye of the needle D has passed below the tying-needle Y, the tying-needle advances, passing between the needle and the cord, when the projection b' of the jaw a' strikes against the pivoted bar x , which opens the jaws, which continue to advance, and take hold of the cord previously carried under the brush Z. As soon as the projection b' has completely passed the bar x , the spring c' closes the jaws on the cord. In returning, the projection b' passes over the upper end of the bar x , so that the jaws are not opened on the return movement. After the tying-needle has returned, the needle D rises, which completes the knot. On the return movement of the needle D the clamping-jaws $s t$ open and release the loop. The knife a then advances and cuts the cord between the knot just formed and the needle D, which has risen far enough to leave a sufficient length of string for forming the next loop. The tying-needle then (by means of the cam 2) recedes, so as to bring the projection b' onto the incline d' , which opens the jaws a' and allows the sheaf to roll off from the machine.

In order to prevent the slack cord from being taken up by the band of the sheaf the cord, in the second descent of the needle, is made to pass between the spring e and the eccentric b , by means of which it is firmly gripped and held. The spring e projects somewhat beyond the eccentric b , so as to pass through the groove v' of the needle and between the needle and the cord. The projection g near the upper end of the needle drives the cord in between this spring and the eccentric. When the knife a returns to position it passes over the eccentric b , and by means of the projection f and incline d the clamp is opened and the cord let out.

In order to insure the perfect operation of the tying-needle a small plate, s' , is made to project in the needle-opening F, so as to part the cord from the needle to give room for the tying-needle to pass between the tying-needle D and the cord. The roughened projections t' prevent the cord from being crowded so far back as to be out of the reach of the tying-needle. The arm h is provided with a hub, through which the shaft v' passes, so that they may have separate movements. The rack n' is adjusted with the wheel j' and the teeth on the arm h , so that at the first descent of the needle the arm h passes around under the brush M. The same movement also, by means of the gear-wheels and the cogs m' , l' , y , and z , closes the clamping-jaws $s t$, in which position they remain until the needle has ascended and descended, when the return movement of the rack n' opens the clamping-jaws and returns the arm h to its original position. By locating the platform N on the spring O or other suitable spring the band is made to accommodate itself to any size sheaf, and it also prevents the breaking of the band in case an unusually-large sheaf is placed in the binder.

The knot as completed is shown and described in a patent heretofore granted to me July 13, 1869.

What I claim as new is—

1. The combination of the cylinder H, provided with the cam *i*, with the arm *o* and tying-needle Y, substantially as described.
2. The combination of the cylinder H, provided with the cam-groove *j*, with the sliding bar *o'* and rack *n'*, wheels *j' m'*, and arm *h*, substantially as specified.
3. The combination of the cylinder H, provided with the cam-groove *k*, with the arm *g*, bar I, and knife *a*, substantially as described.
4. The combination of the tying-needle Y, constructed as described, with the spring-bar *x* and incline *d'*, substantially as and for the purposes set forth.
5. The combination of the spring *e* with the eccentric *b* and spring *c* for holding the slack cord, substantially as set forth.
6. The needle D, when provided with the heel or projection *g* for drawing the cord back, substantially as specified.
7. The needle D, when provided with the

groove *v'*, in combination with the spring or projection *e* for separating the cord and needle, substantially as described.

8. The projection *s'*, in combination with the needle D, having its sides flattened or cut away, for opening and supporting the loop, substantially as specified.

9. The projection *t'*, in combination with the brush Z, for holding the cord in position to be grasped by the tying-needle, substantially as set forth.

10. The combination of the arm *h* with the brushes M and Z, substantially as and for the purposes specified.

11. The combination of the jaws *s* and *t* with the arm *h*, brush Z, tying-needle Y, cord-needle D, and knife *a*, substantially as specified.

12. The combination of the yielding platform N with the arm P, for compressing and holding the sheaves, substantially as set forth.

EDWARD H. CLINTON.

Witnesses:

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CHAS. H. BERRYHILL.