

(No Model.)

3 Sheets—Sheet 1.

R. J. CLARK  
GRAIN BINDER.

No. 261,431.

Patented July 18, 1882.

Fig. 1.

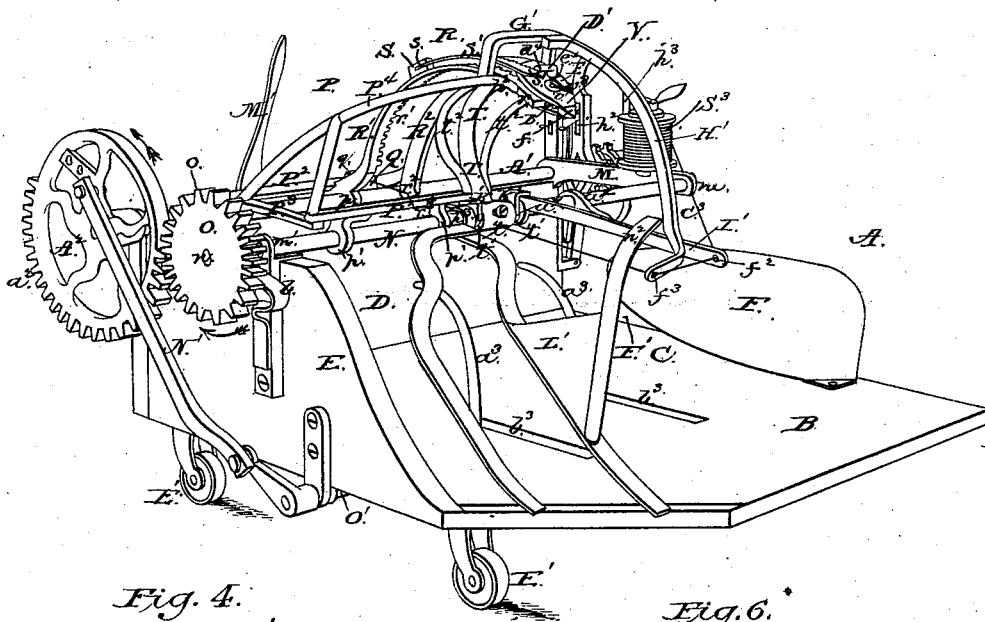


Fig. 4.

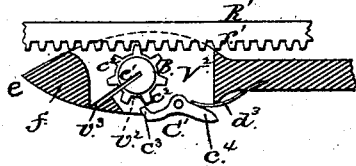


Fig. 6.

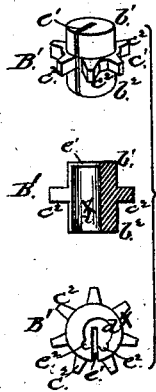
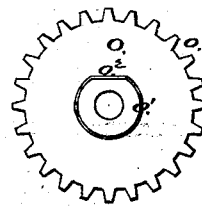


Fig. 5.

WITNESSES

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By his Attorneys

INVENTOR  
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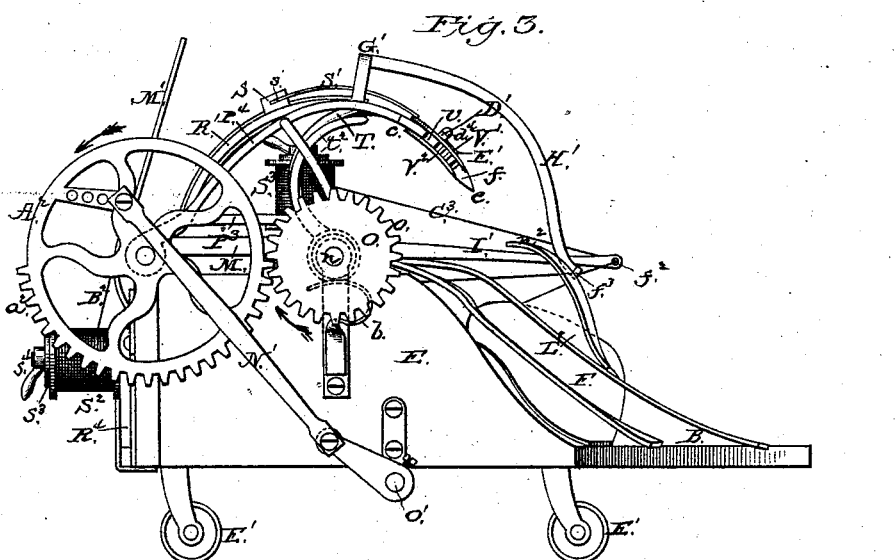
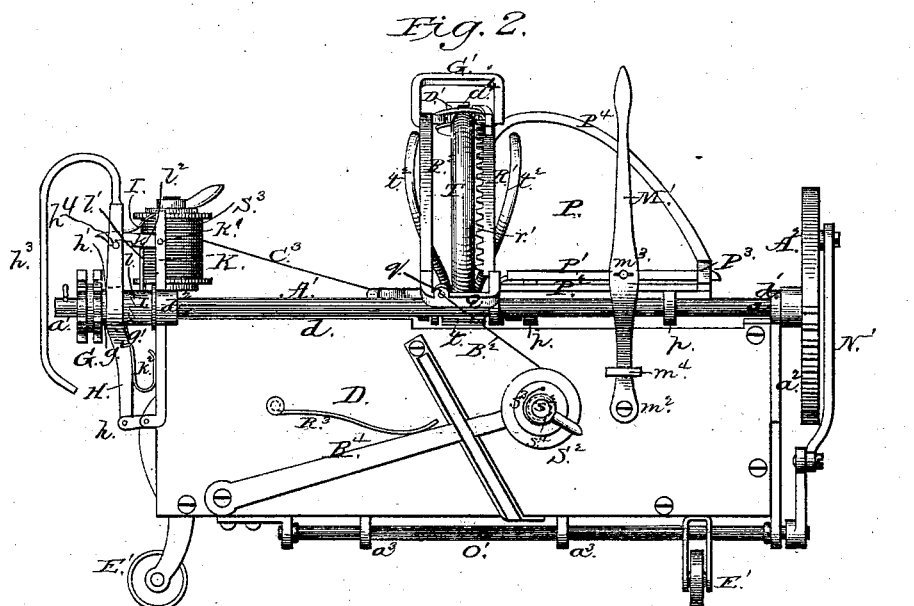
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3 Sheets—Sheet 2.

R. J. CLARK.  
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WITNESSES  
John A. Ellis.  
Philip Masini.

By his Attorneys

INVENTOR  
Robert James Clark.  
Anderson & Smith

(No Model.)

3 Sheets—Sheet 3.

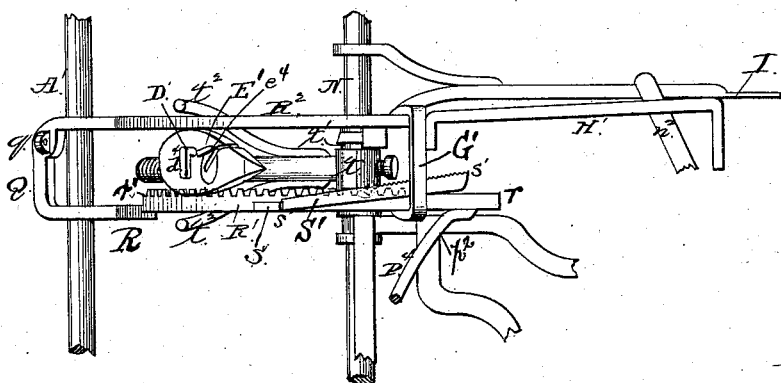
R. J. CLARK.

GRAIN BINDER.

No. 261,431.

Patented July 18, 1882.

*Fig. 1.*



WITNESSES

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# UNITED STATES PATENT OFFICE

ROBERT J. CLARK, OF CHESTNUT LEVEL, ASSIGNOR OF ONE-THIRD TO JOHN C. RUTTER, OF SUMMIT HILL, PENNSYLVANIA.

## GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 261,431, dated July 18, 1882.

Application filed January 8, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT JAMES CLARK, a citizen of the United States, resident at Chestnut Level, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Grain-Binders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, in which—

Figure 1 is a perspective view of the device. Fig. 2 is a front view. Fig. 3 is a side view. Fig. 4 is a detail sectional view of the rack and needle; Fig. 5, perspective sectional and bottom views of the twister-wheel. Fig. 6 is a detail of one of the gear-wheels. Fig. 7 is a detail view looking down on the device.

The invention consists in the construction hereinafter specified.

In the annexed drawings, A represents a binder, whose platform B consists of the receiving-board C, front D, and side E, and has the guide-shield F toward the open side F', which is adjoining the reaper-platform, the whole being supported upon suitable wheels, E'. Along the upper edge, *d*, of the front D, in bearings *d'* *d*<sup>2</sup>, is journaled a shaft, A', upon one end, *a*, of which is keyed a wheel, A<sup>2</sup>, a portion (somewhat less than half) of whose periphery is provided with teeth *a*<sup>2</sup>. Upon the other end, *a'*, is journaled a sprocket-wheel, G, whose hub or sleeve *g* projects inward, and is provided with teeth *g'*, having a rake toward the front.

H is an arm, hinged at *h* to the side of the front D, and having an eye, *h'*, through which passes the hub or sleeve *g*, the latter being capable of turning in said eye, but longitudinally held to arm H, so that the arm carries the sprocket-wheel. Above this eye *h'* the arm H has a slot, *h*<sup>2</sup>, running through it in the line of the axis of shaft A'. The arm H terminates in a finger-rod, *h*<sup>3</sup>, which curves over and passes down beyond the extreme end of the shaft A'.

Projecting upward from the bearing *d*<sup>2</sup> is a post, K, carrying the latch *k*, pivoted at *k'*, and extending out through the slot *h*<sup>2</sup>, a spring, I, pushing the latch downward.

Secured to the shaft A' just outside of the bearing *d*<sup>2</sup> is a ratchet-annulus, L, whose teeth *l* have a rake toward the rear, and which, with the sleeve of the sprocket-wheel, forms a ratchet-clutch. Extending radially from the annulus L is a finger, *l'*, whose length is a little more than the distance from the surface of the annulus L to the under side of latch *k* when the latter is pressed down. The end of the finger *l'* is beveled off toward the front, so as to better operate. The arm H is pressed away from the platform by a spring, *k*<sup>2</sup>.

Projecting rearward from the bearing *d*<sup>2</sup> is a bar, M, having at its end the bearing *m*.

Journalled in the bearing *m* and bearing *m'* upon the side E is a shaft, N, having keyed to its end *n* a wheel, O, with teeth *o*. The position of the two wheels A<sup>2</sup> and O and their relative number of teeth are such that the teeth *a*<sup>2</sup>, engaging with the teeth *o* at the beginning of the series of said teeth, operate to turn the wheel O and give it one revolution during the rotation of said wheel A<sup>2</sup>, said wheel O being at rest until the teeth *a*<sup>2</sup> come around and engage again. The hub *o'* of the wheel O is cut off on one side, forming a flat surface, *o*<sup>2</sup>; and *b* is a bowspring pressing up against said hub.

P is a frame, consisting of the front bar, P<sup>2</sup>, rear bar, P', upwardly-curved bar P<sup>4</sup>, and side connecting-bar, P<sup>3</sup>. This frame is held on the shafts A' and N by loops *p p'*. At the end *p*<sup>2</sup> of bar P<sup>4</sup> this frame carries the curved U-shaped guideway R, consisting of arms R' R<sup>2</sup>, connected by cross-bar Q, one arm, R', being longer at *r* and having the rack *r'* on its inner face, the other arm, R<sup>2</sup>, projecting downward at *r*<sup>2</sup> and having this end beveled downward at *r*<sup>3</sup>.

*q* is an eye upon the cross-bar Q.

S is a lug upon the arm R', to which is secured the end *s* of a knife or saw, S', whose other end, *s'*, projects backward and outward on an oblique line, so as to be on a line with the path between the bars R' R<sup>2</sup>.

T is the binder-arm or needle, which is held to the shaft N by a hub, *t*, having grooves *t'*. This binder-arm is provided with fingers *t*<sup>2</sup> *t*<sup>2</sup>, diverging from its stem toward the end, and at its outer end it has the head V. This head consists of two plates, V' V<sup>2</sup>; fastened to the outer end, *e*, of the arm T, pointed at *e*, with

a block,  $f$ , between, (or this block may be made with one plate,) and having an intervening space,  $v$ , between. These plates  $V'$   $V^2$  have registering holes  $v'$   $v^2$ , arranged vertically, and oblique slots  $v^3$  running into said holes.

$B'$  is the twister-wheel, having the journals  $b'$   $b^2$ , and the central portion,  $c'$ , having the gear-teeth  $c^2$ . This wheel is made cup-shaped—that is, the end  $b^2$  is hollowed out, either rounded or angularly, down into the body of the wheel nearly to the end  $b'$ , as shown at  $d^x$ , leaving a thin plate at the end  $b'$ . This wheel has a radial slot,  $e'$ , passing from its periphery somewhat beyond the center, and on each side of said slot where it opens into the cup  $d^x$  is a notch,  $e^2$ . This wheel  $B'$  is placed in the head  $V$ , with its ends  $b'$   $b^2$  resting in the holes or bearings  $v'$   $v^2$  in the plates  $V'$   $V^2$ , its teeth  $c^2$  projecting into the space  $v$ .

Pivoted between plates  $V'$   $V^2$ , on the side away from the rack  $r'$ , is a pawl,  $C'$ , whose toe  $c^3$  is held in engagement with the teeth  $c^2$  by a spring,  $d^3$ , and its heel  $c^4$  projects outward.

$D'$  is an arm upon the head  $V$ , back of the hole  $v'$ , to one side of the middle line, and having an arm,  $d^4$ , turned toward the arm  $R'$ .

Partially covering the hole  $v'$  is a plate,  $E'$ , whose edge  $e^4$  is on a line with the stem of arm  $D'$  and the inner end of slot  $v^3$  in plate  $V'$ .

The distance between the arms  $R'$   $R^2$  is such that when the head  $V$  is beyond said arms the heel  $c^4$  is back of arm  $R^2$ , and the pawl  $C'$  holds the wheel  $B'$  stationary. The arm  $R'$  has a thickness which permits it to enter between the plates  $V'$   $V^2$  and engage the wheel  $B'$  with its teeth  $r'$ , such teeth ending as the pawls  $C'$  engages the said wheel  $B'$ .

$G'$  is a U-shaped brace holding the rear ends of bars  $R'$   $R^2$ , and running from said brace is a strut,  $H$ , connected to a bracket,  $I'$ , whose inner end is held by eyes upon the shaft  $N$ .  $K'$   $K'$  are fingers reaching from this bracket  $I'$  and from the arm  $P'$ , spanning the hub  $t$  and resting in the grooves  $t'$ .

Between the hub  $t$  and the eye or loop  $p'$  is the eye  $p^3$  of a guide,  $L'$ , whose finger  $n^2$  rests on the bracket  $I'$ .

$M'$  is a lever, pivoted at  $m^2$  to the front  $D$  of the machine and at  $m^3$  to the frame  $P$ , whereby said frame and the needle and guide can be shifted for different lengths of grain, the action being limited by the loop  $m^4$ . As the lever  $M'$  moves the frame  $P$  the fingers  $K'$  in grooves  $t'$  of hub  $t$  cause the needle and bracket  $I'$  to be also moved.

$N'$  is a connecting-rod from a crank-pin on the wheel  $A^2$ , whereby motion is imparted to a rock-shaft,  $O'$ , running under the platform, and carrying the fingers or teeth  $a^3$ , which are curved forward and work through slots  $b^3$  in the platform.

$R^4$  is a swinging take-up arm, carrying the spool  $S^2$  upon the spindle  $s^2$ , its tension being regulated by the spring  $s^3$  and nut  $s^4$ . This arm  $R^4$  is held down by the spring  $R^3$ .

Upon the bar  $M$  is another spool,  $S^3$ , similar to the spool  $S^2$ , or it may be placed upon a take-

up arm held by a spring, like the arm  $R^4$ . The wire  $B^2$  passes from the spool  $S^2$  through the eye  $g$ , and another wire,  $C^3$ , from the spool  $S^3$  through eyes  $f^2$   $f^3$  upon the bracket  $I'$ . These two wires are tied together, the binding-head being elevated and placed just behind the guideway  $R$ .

The binder is attached to the rear of a reaper at the side of the grain-platform, a chain running from the reaper to the sprocket-wheel  $G$ . As the grain is cut it is raked from the reaper platform onto the binder-platform, passing in front of the shield  $F$ . The rake, passing the finger  $h^3$ , strikes it, driving the arm  $H$  with the sprocket-wheel  $G$  inward. The ratchet-sleeve of the latter engages with the ratchet-annulus  $L$ . The head of latch  $k$ , entering the slot  $h^2$ , engages with a pin,  $h^4$ , therein and holds the sprocket-wheel and shaft  $A'$  together. This causes the shaft  $A'$  to revolve. In its revolution it brings the teeth  $a^3$  up, and they compress the grain into a bundle, while the teeth  $a^2$  engage with the teeth  $o$  on wheel  $O$ , and the shaft  $N$  turns, causing the needle with the two fingers to descend. As the head comes down it strikes the wire, and this enters the head  $V$  through the slots  $v^3$ . As the head continues its rotation it carries the wire under the grain, and then catches it again on its upward path, thus holding both wires in the wheel  $B'$ . As the wheel  $B'$  enters between the guide-bars  $R'$   $R^2$  the heel of pawl  $C'$  rides up the bevel  $r^3$  of bar  $R^2$ , releasing the wheel  $B'$ , which, engaging with rack  $r'$ , turns and twists the two wires together inside the cup and also above the head. This twisting action is facilitated by the notches  $e^2$  in the twister-wheel, for the wires catch in these notches and are held from slipping. When the wires reach the knife  $S'$  they ride over the arm  $D'$ , and, coming between the edge of the plate  $E'$  and said knife  $S'$ , the latter severs them close to the head and midway of the twist, which leaves the bundle secured, and at the same time leaves the two ends of the wire secured together for another bundle. As the cut is made the completed bundle drops and slides off down the guide  $L'$  and the wires fall for another turn, the springs throwing the take-up arms back and pulling the wires taut. At this moment the finger on ratchet-annulus  $L$  lifts the latch  $k$ , the sprocket-wheel  $G$  is thrown off by the spring  $k^2$ , and the binder remains stationary until more grain falls on the platform. The spring  $b$ , resting on the flat surface  $o^2$ , prevents the shaft  $N$  from rotating.

What I claim is—

1. The twister-wheel  $B'$ , having the cup or cavity  $d^x$ , the notches  $e^2$ , and the slot  $e'$ , as set forth.

2. The twister-wheel  $B'$ , having teeth  $c^3$ , in combination with the pawl  $C$ , having toe  $c^3$  and heel  $c^4$ , and the guide-bars  $R'$   $R^2$ , the former having the rack  $r'$  and the latter the bevel  $r^3$ , as set forth.

3. The sprocket-wheel  $G$ , arm  $H$ , having pin  $h^4$ , and the spring  $k^2$ , in combination with the

ratchet-annulus L, having the radial finger *l'*, and catch *k*, as set forth.

4. The frame P, guide R, needle T, bracket *I'*, and guide *L'*, connected together, in combination with the lever *M'*, pivoted directly to the frame P, whereby the throw of the lever moves the other parts to adapt the machine to bind different lengths of grain, as set forth.

5. The guide R and knife *S'*, the latter arranged in an oblique line with the path in the former, in combination with the needle T, having the wire-carrying head V, as set forth.

6. The knife *S'*, in combination with the needle-head V, having the arm *D'*, and plate *E'*, as set forth.

In testimony whereof I affix my signature in presence of two witnesses. <sup>15</sup>

ROBERT JAMES CLARK.

Witnesses:

CHARLES W. PUSEY,  
GEO. H. ROUTH.