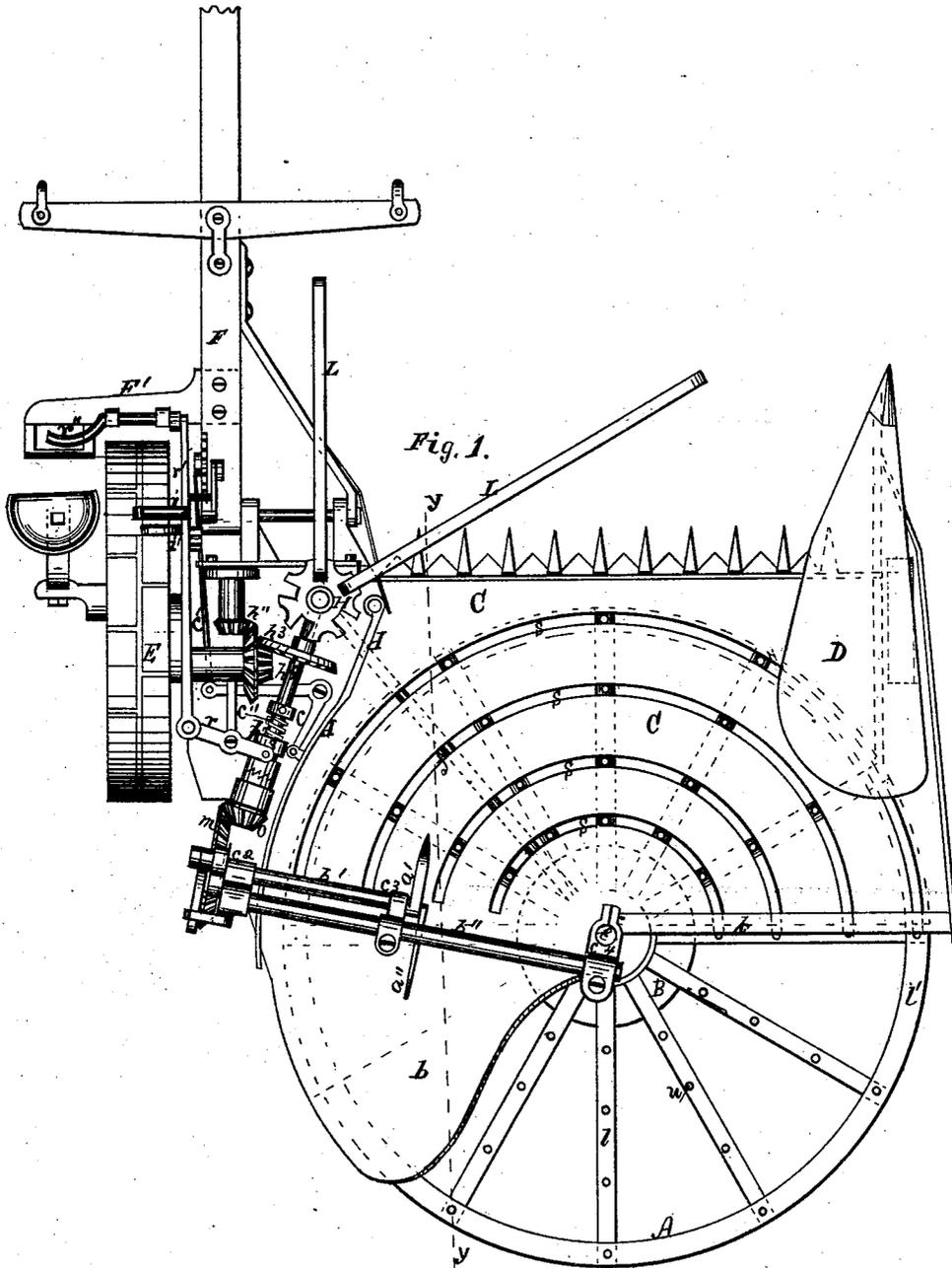


(No Model.)

3 Sheets—Sheet 1.

M. A. KELLER.  
Automatic Grain Binder.  
No. 243,050. Patented June 14, 1881.



Witnesses:

Allen P. Keller.

Byron, Orendorff.

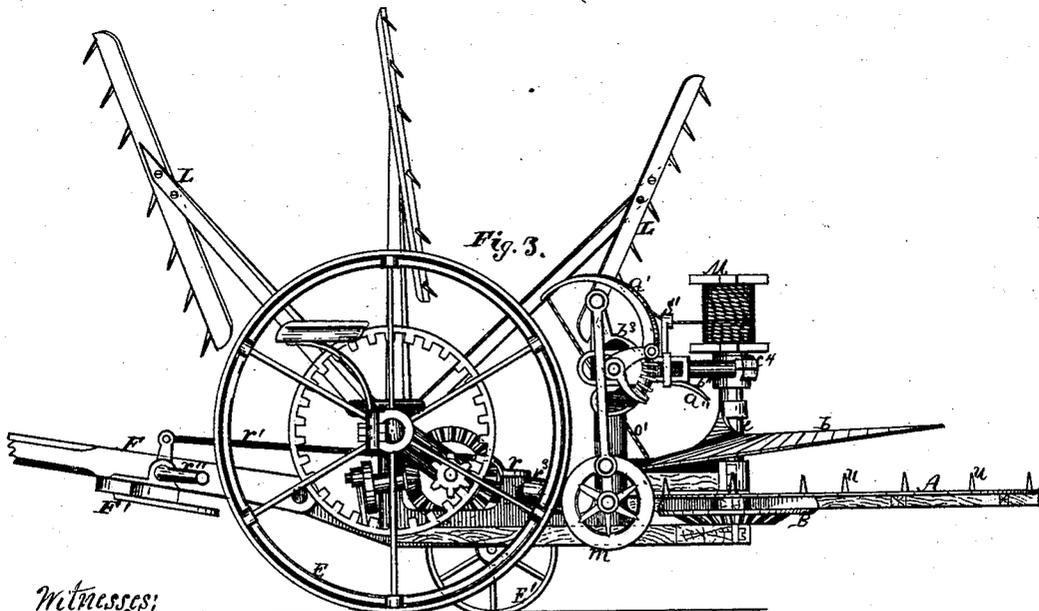
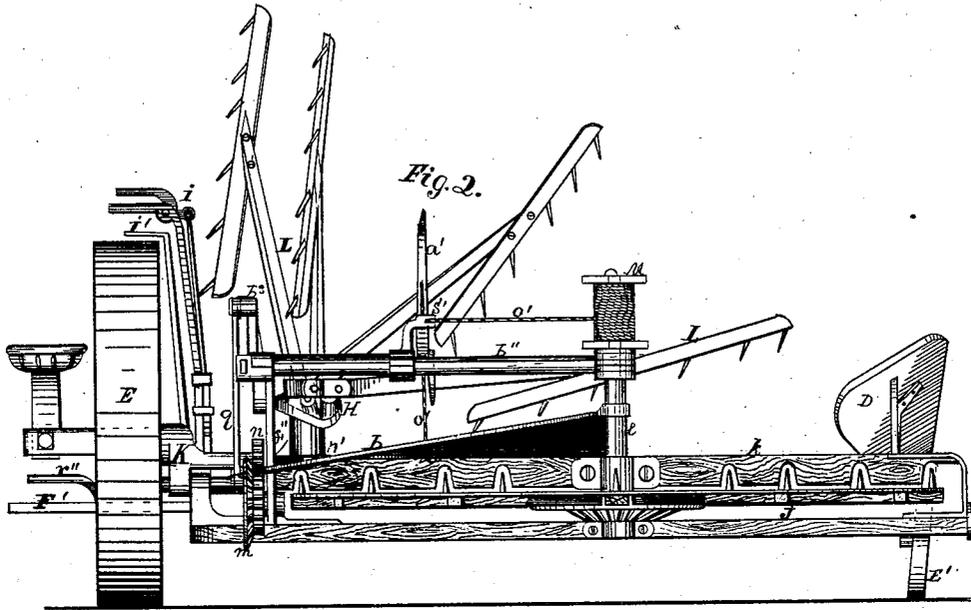
Inventor

Moses A. Keller.

(No Model.)

3 Sheets—Sheet 2.

M. A. KELLER.  
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Witnesses:  
Allen P Keller  
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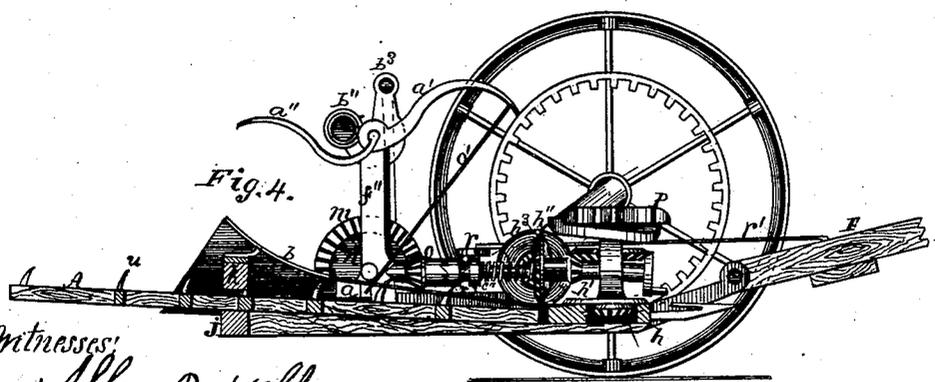
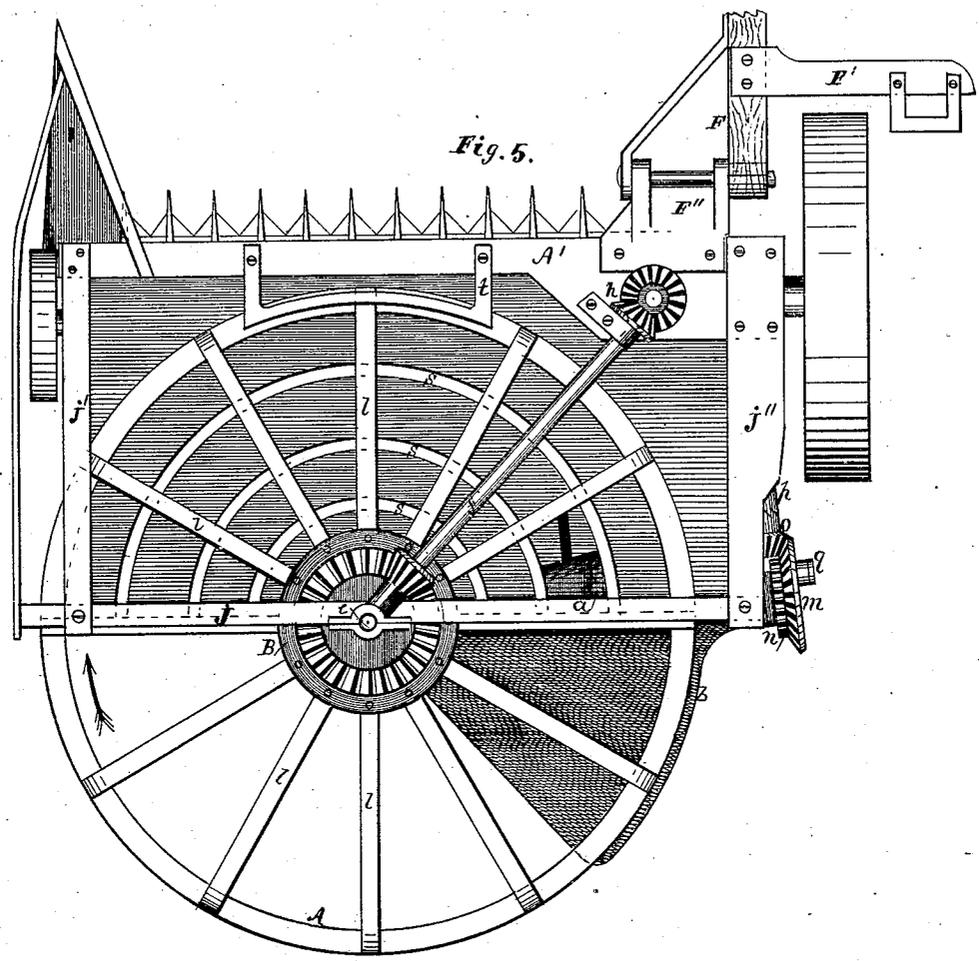
(No Model.)

3 Sheets—Sheet 3.

# M. A. KELLER. Automatic Grain Binder.

No. 243,050.

Patented June 14, 1881.



Witnesses:  
*Allen P. Keller.*  
*Byron Crendorff.*

Inventor  
*Moses A. Keller.*

# UNITED STATES PATENT OFFICE.

MOSES A. KELLER, OF BROCKPORT, NEW YORK.

## AUTOMATIC GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 243,050, dated June 14, 1881.

Application filed August 12, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, MOSES AARON KELLER, of Brockport, in the county of Monroe and State of New York, have invented new and useful Improvements in Automatic Grain-Binding Machines, of which the following is a specification.

The object of this invention is to produce an automatic harvesting and binding machine which will be lighter, simpler, and more practical than those now in use, which will do away with the usual canvas and chain elevating mechanism, and permit the use of the ordinary sweep-rake rear or front cut harvester with but little change therein, and which will under all conditions of the grain deliver the grain in proper shape to the binding device.

The invention may also be connected with any ordinary reel-machine; but it is practically well known that no reel-machine can be adapted to picking up badly lodged and tangled grain.

With these ends in view I combine with a sweep-rake harvesting-machine a circular rotating conveyer and a binding mechanism, and arrange them in the rear of the cutter-bar, substantially in the manner shown in Fig. 1. The platform upon which the grain falls as it is cut is provided with a series of semicircular slots, through which project and pass the teeth of the circular rotating conveyer, which carry the grain as fast as it falls upon the platform to the binding-receptacle.

The first part of my invention is designed to secure the delivery of the grain to the binding mechanism in a continual stream—in other words, as fast as it is cut—and deliver it into the binding-receptacle at right angles, or nearly so, to the position in which it falls upon the platform.

The invention also further consists in various arrangements and parts, as hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a top plan of a harvesting-machine with my improvements attached. Fig. 2 is a rear elevation of the same. Fig. 3 is a side elevation on the side next to the driving-wheel. Fig. 4 is a transverse sectional elevation taken on the line Y Y, Fig. 1; and Fig. 5 is a plan view of the under side, showing the arrangement of the gearing which drives the conveyer.

Similar letters of reference denote corresponding parts in the several drawings.

A represents the circular conveyer, which may be partly of wood and partly of iron, and is constructed as follows: To the disk B are bolted a series of spokes or arms, *l l*, and at their outer ends they are secured to a suitable rim, *l'*, which is preferably of wrought-iron. The arms *l* are provided with a series of upwardly-projecting teeth, *u*, which are slightly curved at their points, as shown in Fig. 4, for the purpose hereinafter described. The disk B is mounted loosely upon an upright shaft, *e*, that is secured to the beams *k* and *J* of the main frame in any suitable way or in the manner shown. The disk B is also provided with a suitable bevel-wheel, which gears with a corresponding pinion that is keyed or otherwise secured upon the shaft *f*. Motion is communicated to said shaft from the vertical rake-shaft by means of the miter-gears *h*, as shown in Fig. 5, and thereby the proper rotation is communicated to the conveyer A, as herein described.

The platform C is constructed with a series of semicircular slots, S, (plainly shown in Fig. 1,) which allow the teeth *u* of conveyer A to engage with the grain as it falls upon the platform C, and convey it into the binding-receptacle *b*, which is preferably of a concave form, as shown in Fig. 4. The slots of the platform C terminate in the binding-receptacle at or near the point where the conveyer-teeth *u* pass under the surface of the receptacle, and the grain is stripped from the teeth *u*. The curvature of said teeth, turned slightly backward, will prevent the grain from being drawn through the slots S. When a sufficient quantity of grain has thus been accumulated in the binding-receptacle the binding mechanism is set in motion, and the gavel bound in the manner next described.

In this application the general plan and arrangement of the gearing which drives the knife and rakes is similar to that of a harvester manufactured by the Johnston Harvester Company, known as their "Continental Reaper." In adapting my binding apparatus to this machine I extend the bevel-wheel shaft *h'* farther toward the binding mechanism, and mount thereon a suitable clutch-shipping mech-

anism,  $h^3$ , which engages and disengages with the pinion  $o$ , which is mounted loosely on the same shaft and gears into the bevel-wheel  $m$  of the binding mechanism. The wheel  $m$  is also provided with segment-gear  $n$ , which gives motion to the knot-tying mechanism  $a$  at certain periods of its revolution, as will presently appear. The pitman  $q$  is at its lower end mounted upon a wrist-pin on the wheel  $m$ , and at its upper end on a wrist-pin on the crank  $b^3$ . The hollow shaft  $b'$ , which is provided with the binding-arms  $a'$   $a''$ , is rigidly secured to the crank, and when the wheel  $m$  is set in motion by means of the clutch-shipping mechanism  $h^3$  it will cause the binding-arms to descend and compress the gavel and carry the binding-cord into the knotter  $a$ , at which moment the knotter is set in motion by means of the segment-gears  $n$  and shaft  $n'$ , and completes the tying of the gavel during the ascent of the binding-arms. When the said binding-arms have again assumed the position shown in Fig. 4 the clutch  $h^3$  is thrown out of engagement with the pinion  $o$  by means of the shipper  $r$ , rod  $r'$ , and foot-lever  $r''$ , and thereby all of the binding mechanism is brought to rest until it is desired to bind the next gavel. Whenever the lever  $r''$  is relieved the spring  $c''$  will drive the clutch  $h^3$  into gear with the pinion  $o$ , and the binding mechanism will be again set in motion, as before described.

A detail description of the construction and operation of the binding and compressing arms is not necessary, as the same is represented in another application filed by me previous to this one.

The tying mechanism may be any of those heretofore patented by me, and a detail description is not deemed necessary in this application. The point of its location is the main object, so far as the tyer is concerned. It is located immediately at the under side of the binding-receptacle, and so secured that the conveyer  $A$  will pass under it in the manner shown, and will not interfere with the teeth  $u$  of conveyer  $A$ .

Pivoted upon the platform  $C$ , and extending along the binding-receptacle, is an adjustable butting-board,  $d$ , or bundle-adjuster, which may be operated by hand by means of the lever  $l'$ , rod  $c'$ , and connected bell-crank  $c$ . The peculiar manner in which the grain is conveyed to the binding-receptacle offers special advantage in adjusting the gavel, so that it will always be bound near its middle instead of adjusting the binder to the gavel, as has been done heretofore, and dispenses with a large amount of complicated and heavy machinery which had necessarily to be employed in making the binding mechanism adjustable.

The outside divider-board,  $D$ , is arranged at an angle from its point toward the axis of the rotating conveyer  $A$ , which arrangement has the effect of causing the grain to fall diagonally to the cutters, but more at right angles to the circular slots of the platform; and thereby the grain will be conveyed more evenly into the

binding-receptacle  $b$ , which is nearly in a parallel line with the cutter-bar, or at right angles with the grain as it falls on the platform.

In order to secure perfect rigidity or stability to the binding-arms, which is essential to the successful working of the binding mechanism, I provide the stationary shaft  $b''$ , which is rigidly secured to the upper end of the standard  $f''$  and to the vertical stationary shaft  $e$ . (See Fig. 1.) To this shaft  $b''$  is secured the bracket-bearing  $c^3$ , which supports the shaft of the binding-arms.

The frame of the platform is composed of the wooden sills  $A'$ ,  $J$ ,  $J'$ ,  $J''$ , and  $k$ . To this frame is secured the entire raking, cutting, and binding mechanisms, operated in the manner already described. Bolted or otherwise secured to the under side of the beam  $A'$  is a guide,  $t$ , which supports the conveyer  $A$ , and also acts as a shield to the same.

The pole  $F$ , which is hinged to the shoe-casting  $F''$  and provided with a tilting-lever,  $I$ , forms means whereby the points of the cutters may be tilted up or down to secure lodged grain. The reel-arms  $L$ , which are provided with teeth, will rake up the lodged grain over the cutters and then rise out of action, so as not to interfere with the grain as it is conveyed into the binding-receptacle, in the manner before described.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the stationary semi-circular slotted platform  $C$ , of the circular revolving conveyer, with its upwardly-projecting teeth arranged underneath the same for carrying the cut grain as fast as it falls upon said platform into the stationary binding-receptacle, where it is bound automatically, as set forth.

2. The combination of a stationary platform,  $C$ , having semicircular slots  $S$ , a circular revolving conveyer,  $A$ , having upwardly-projecting teeth  $u$ , a horizontal adjustable butting-board,  $d$ , and a binding-receptacle,  $b$ , the whole combined and arranged for operating substantially as described.

3. The combination, with the vertical rakeshaft  $H$ , of the bevel-gears  $h$ , shaft  $f$ , and bevel-gears of disk  $B$ , for driving the conveyer  $A$ .

4. The combination of the stationary semi-circular slotted platform and the circular revolving conveyer arranged to carry the grain from the outside divider-shoe toward the inside end of the platform into the binding-receptacle, and vibrating binding and compressing arms, the whole arranged for operation substantially as specified.

5. In combination with the stationary semi-circular slotted platform  $C$ , circular rotating conveyer  $A$ , and stationary binding-receptacle  $b$ , of a binding-arm,  $a'$ , arranged above the binding-receptacle and between the inside end of the platform and the axis of the rotating gatherer.

6. In combination with the stationary semi-

5 circular slotted platform C, circular rotating conveyer A, and stationary binding-receptacle *b*, a vibrating binding and compressing arm placed above the same, and supported upon the standard *f''* at the inside end of the platform C, and the respectively horizontal and vertical stationary shafts *b''* and *e*, as set forth.

10 7. The stationary horizontal shaft *b''*, or its equivalent, secured to the axis *e* of the rotating conveyer A and standard *f''*, and provided with a bracket-bearing, *c<sup>3</sup>*, for supporting the binding-arm shaft *b'*, as shown, for the purpose specified.

15 8. In combination with the rotating conveyer and binding-arm mechanism, a stationary tying mechanism, secured and arranged for operation above the conveyer and between the teeth of the same, as set forth.

20 9. The combination, substantially as hereinbefore set forth, of the stationary vibrating binding and compressing arms *a' a''*, tying

mechanism *a*, stationary binding-receptacle *b*, stationary slotted platform C, circular rotating conveyer A, and horizontal vibrating adjustable butting-board *d*, these members being combined for operation substantially in the manner herein shown, and for the purpose set forth. 25

10. In combination with the circular conveyer and semicircular slotted platform, of the outside divider-board, D, arranged to extend over and toward the axis of the conveyer, so as to cause the grain to fall at right angles, or nearly so, with the circular slots of the platform C, thereby causing the conveyer A to secure and carry the grain in a more straight and even condition into the binding-receptacle. 35

MOSES A. KELLER.

Attest:

JOHN H. KINGSBURY,  
MORTON MINOT.