

**Reaper.**

Patented Nov. 21, 1871.

**PETER NICOLA.**

No. 121,061.

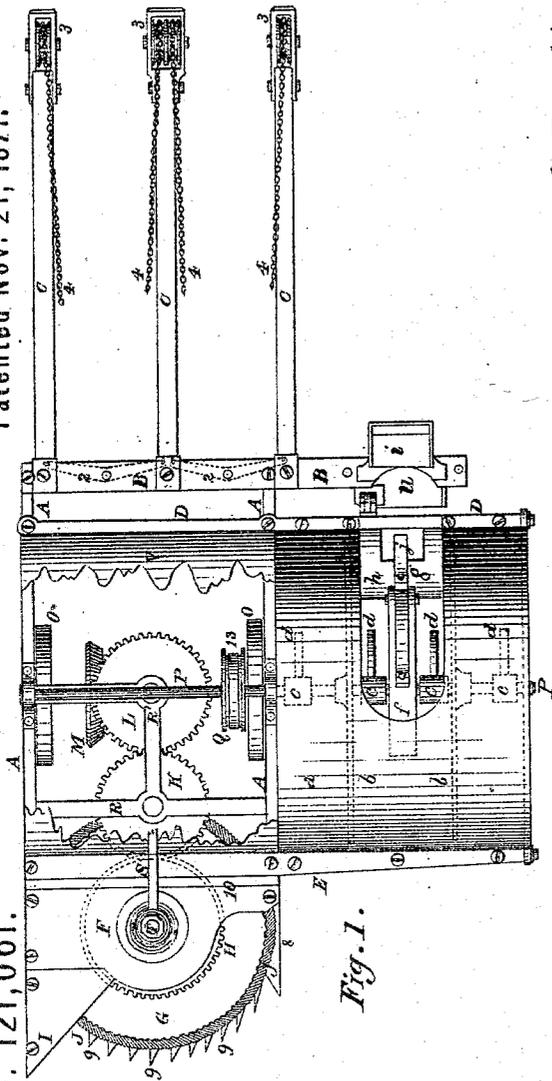


Fig. 1.

*Andrew Hoffman*  
*A. McConkey* } Witnesses.

*Peter Nicola, Inventor*  
*by Geo. Abbott, Attorney.*

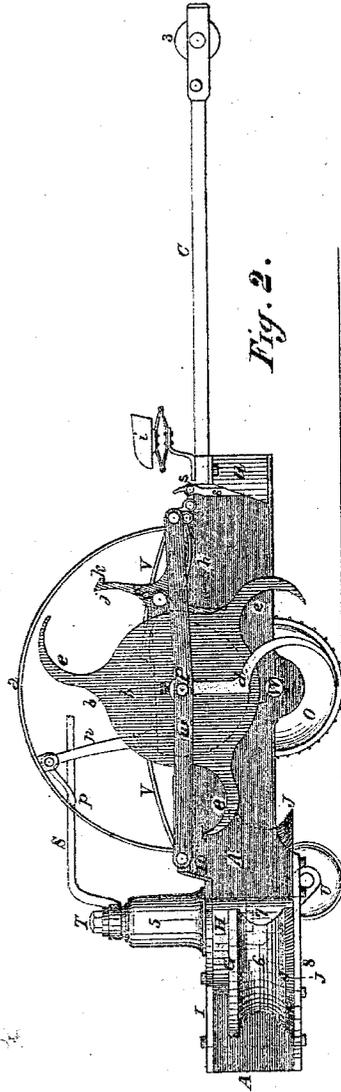


Fig. 2.

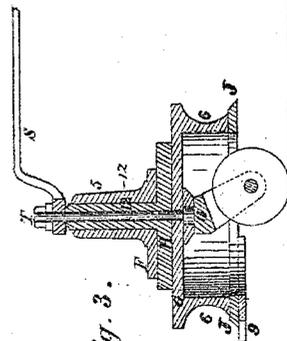


Fig. 3.

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2 Sheets.

Sheet 2.

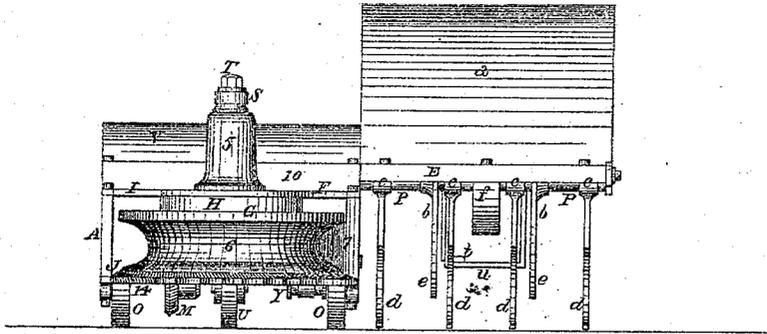


Fig. 4.

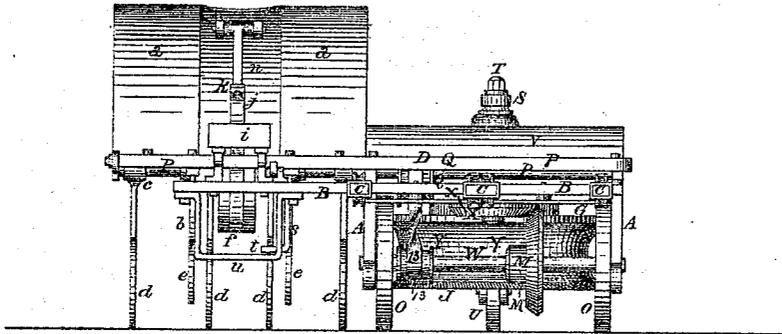


Fig. 5.

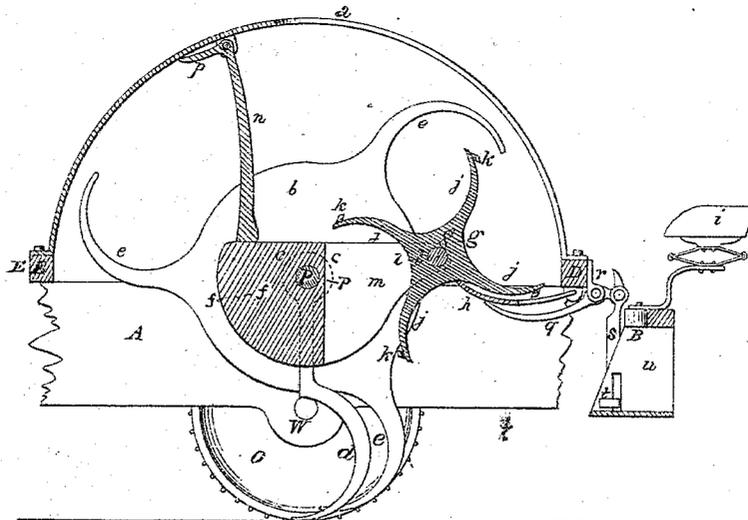


Fig. 6.

Andrew Chaffin  
Alvinley

Witnesses.

Peter Nicola, Inventor.  
by J. B. Abbott, Attorney

# UNITED STATES PATENT OFFICE.

PETER NICOLA, OF MASSILLON, OHIO.

## IMPROVEMENT IN HARVESTERS.

Specification forming part of Letters Patent No. 121,061, dated November 21, 1871.

*To all whom it may concern:*

Be it known that I, PETER NICOLA, of Massillon, Stark county, Ohio, have invented certain Improvements in Reaping-Machines; and that the following is a full, clear, and exact specification thereof, which will enable others skilled in the art to make and use the said invention.

My invention relates to the gearing, gathering, and binding mechanism of that class of reapers constructed with a horizontal rotary cutter or sickle; and the first part of said invention consists in the combination, with the bevel driving-wheel on the main shaft, of a combined bevel and spur-wheel, which meshes into the bevel driving-wheel, and of a train of spur-wheels driven by said combined wheel, and lying in a plane parallel to the main shaft and at right angles to the axis of the rotary sickle; the object being to obtain a short and simple train for communicating the power directly from the driving-shaft to the sickle, so arranged as to require as little frame room as possible. The second part of my invention consists in the combination, in a reaping-machine, of the following elements, to wit: a frame for the gearing and rotary sickle; a pair of driving-wheels for supporting the main weight of the frame and gearing and impelling the gear-train; a train of spur-gearing arranged between the side frame pieces, and in a plane parallel to the driving-shaft and at right angles to the axis of the sickle-cylinder, and gearing from a bevel-gear on the driving-shaft to a spur-gear on the sickle-cylinder; a rotary sickle-cylinder provided with a cutting-sickle and superimposed corrugated supporting disk; and a castor-wheel arranged within the periphery of the sickle-cylinder, and under the supporting disk thereof, and serving to support the sickle-cylinder and to guide the machine; the several parts being arranged substantially as shown, and the whole cutting mechanism so constructed being impelled by one or more animals placed between shafts at its rear, as is hereinafter described; the object of said combination and arrangement being to bring the whole of the propelling and cutting mechanism of the rotary reaper into a compact form in the rear of the width of grain to be cut at each passage of the machine, so that none of the cut grain or sheaves need be moved or touched in reaping. The third part of said invention consists in the construction of a raking

and gathering mechanism, composed of a series of rake-fingers which gather up the grain from the ground where it is laid by the cutting mechanism, and of a revolving sheaf-gatherer, which takes the grain in sheaves from the rake-fingers and carries it up to the binder in proper form to be tied up into sheaves, all substantially as is hereinafter more fully described. The fourth part of said invention consists in the combination, with the raking and gathering mechanism, of a holder-head and a revolving sheaf-holder, said holder-head being journaled on the shaft of the sheaf-gatherer and having the sheaf-holder journaled in its end, and the several parts being arranged so as to deliver the sheaves gathered by the sheaf-gatherer onto the sheaf-holder for binding, and to discharge them therefrom after binding by a partial rotation of said sheaf-holder. The fifth part of my invention consists in the combination of a hinged binding-apron, operated by the foot of the binder, with the holder-head and revolving sheaf-holder, by which the binder is enabled to control the movements of the binding mechanism entirely with his foot, so as to leave both his hands free for tying up the sheaves. The sixth part of said invention consists in the combination, in a gathering and binding mechanism for a reaper, of the following elements, to wit: a series of rake-fingers for gathering the grain from the ground; a revolving sheaf-gatherer for gathering the sheaves of grain from the rake-fingers; a revolving sheaf-holder for receiving the sheaves from the sheaf-gatherer, holding them while being bound and discharging them to the ground again; and a binding-apron operated by the foot of the binder, and serving to control the movements of the binding mechanism without aid from the hands of the binder; the whole forming a complete hand-binding apparatus, and operating substantially as is hereinafter more fully shown.

In the accompanying drawing, Figure 1 is a plan of a reaping-machine embodying my invention. Fig. 2 is a side view of the same taken from the delivery side of the machine. Fig. 3 is a sectional view of the sickle-cylinder. Fig. 4 is a front view of the machine. Fig. 5 is a rear view of the same. Fig. 6 is a cross-section of the gathering and binding mechanism.

A A are the side frame-pieces of the frame, and B D E the main cross frame pieces, said pieces E and D extending out over the inner

frame-piece A to form the frame for the binding mechanism, and the piece B extending out sufficiently to form a support for the binder's seat *i*. The cross-piece F is fastened on the frame-pieces A A, and has secured on it the post 5, which serves as a journal-box for the shaft 12 of the sickle-cylinder G 6 J. This sickle-cylinder consists of the supporting disk G, which is made with a corrugated edge, as shown in Fig. 1, and on the under side of which is the concave cylinder 6, to the lower edge of which is secured the rotary sickle J. The spur gear-wheel H is secured on the disk G, and on it is the hollow shaft 12, which fits in the post 5 and forms the axis of rotation for the sickle-cylinder. The semi-circular finger-plate 8 9 9 is fastened under the sickle J to the side frame pieces A A, and serves as a support for the sickle-cylinder. The sickle-cylinder G 6 J being in effect a single solid piece, and having the shaft 12 solidly secured thereto, it is seen that there is little liability of any derangement of its parts which would impede its easy rotation, while, by having the finger-plate serve as the direct support of the rotary sickle, a close fit is secured at all times between the sickle and fingers, which causes a clean cut by the sickle. The caster-wheel U is arranged in the center of the sickle-cylinder G J, and has a shaft, T, which extends up through the hollow shaft 12, and has the steering-lever S secured on its upper end, as shown in Figs. 2 and 3. The driving-shaft W is arranged in journal-boxes in the frame-pieces A A, and on it is secured the driving-wheels *o o*, bevel gear-wheel M, (see Fig. 1,) and the pulley-wheel Y. (See Fig. 5.) The combined bevel and spur gear-wheel X L has on its lower and inclined face the bevel gear-teeth X, which mesh into the teeth of the bevel driving-wheel M, (see Fig. 5,) and on its cylindrical edge are the spur gear-teeth L, which mesh into the teeth of the spur gear-wheel K, which meshes into the spur gear-wheel H on the sickle-cylinder G J, as shown in Fig. 1, the said gear-wheels H K L being all in a plane parallel to the driving-shaft W, and at right angles to the axis of the sickle-cylinder shaft 12. The gear-wheel K is secured on a journal in the cross-piece R, on the frame-pieces A A, and the wheel L X is secured on a journal in the arm R', extending from the center of the cross-piece R around to the frame-piece A, as shown in Fig. 1. The thill-pieces C C C, which may be two or more in number, according as one or more horses are to be used to impel the machine, are secured to the cross-piece B in the rear of the machine, and have the pulley-wheels 3 3 3 at their ends; and the chains 4 4, to which the horses are attached, are passed over these pulleys and along under the pieces C to the whiffletrees 2 2, which are secured on the under side of the cross-piece B, as indicated by dotted lines in Fig. 1. The horses are placed between the thill-pieces C C and move forward in the direction of the sickle-cylinder, so that the whiffletrees are in front of them, this being the most convenient arrangement on account of leaving the ends of the thills clear, so as to present no obstruction to

leading the horses to their places. The main shaft P of the binding mechanism is journaled in the frame-pieces A A, and in a cross-piece, *w*, uniting the ends of the pieces D E, and is driven by a belt, 13, passing over the pulley Y on the driving-shaft W, (see Fig. 5,) and the pulley Q on the said shaft P. On this shaft P are journaled the rake-fingers *c d*, which are made with the heads *c* of sufficient length to give the fingers the proper lateral bearing on the shaft, and which have the curved finger-ends *d*, which drag on the grain-stubble and gather up the cut grain into their hollowed fronts, as shown in Figs. 2 and 6. The two sheaf-gatherers *b e b e'* are fastened on the shaft P, and are made with one or more curved arms, *e*, which are at such distance from the shaft P as to gather the grain in sheaves from the rake-fingers *c d* as the gatherers *b* are revolved with the shaft P. The holder-head *f* is journaled on the shaft P, between the gatherers *b e b e'*; and in a slot, *m*, (see Fig. 6,) in said head is arranged the sheaf-holder *g j j*, which is journaled on the pin *l*, and has three or more arms, *j*, of the general form shown. The projections *k* on the arms *j* are notched to receive the cord or string with which the sheaves are to be tied up, said cord being laid in before the sheaf is dropped into the arm *j* by the gatherer-arms *e*. The cover *a* is attached to the frame-pieces D E, and has pivoted to it the stop-bar *v*, which has an arm, *p*, to prevent it from swinging off from the head *f* to the left, and which serves to hold said head in a horizontal position on the shaft P when not otherwise supported. The binder's seat *i* is attached to the frame-piece B, as shown, and beneath it is secured the foot-stirrup *u*, the one side of which is slotted to admit the treadle-bar *t* on the link *s*, as shown in Fig. 6. The lever *q* is pivoted in an arm, *r*, on the frame-piece D, and has the link *s* attached to its rear end, while its front end has a bearing on the under side of the binding-apron *h*, which is hinged on the under side of the frame-piece D, and is of such length as to serve as a support for the head *f* and sheaf-holder *g* when the apron is held up by the lever *q*, being drawn down by the foot of the binder pressing on the treadle-bar *t*. The cover V for the gearing is attached to the frame-pieces A A, and a plate, 10, is placed over the space between the frame-piece E and cross-piece F; and a V-shaped covering-plate, I, is secured on the end of the grain side piece A and to the front of the cross-piece F to keep the grain that is cut off by the sickle-edge 14, (see Fig. 4,) which is between the last grain-finger 9 and the dividing-end of the grain side piece A, from falling back onto the cross-piece F. The front end of the inner frame-piece A is rounded off and bent in to fit the face of the concave cylinder 6; or, if preferred, a separate piece may be attached for this purpose, the object being to throw off all the grain-butts at this point, in order to prevent them from dragging with and clogging the sickle.

The construction and arrangement of the several parts of the machine having been thus fully

shown, its operation will be readily seen. The dividing end of the grain frame piece A and the several fingers 9 9 push into the standing grain, and that portion between the outer finger 9 and the grain piece A is cut off by the inclined sickle-edge 14, and is held in an upright position and slid toward the supporting disk G by the inclined cover-piece I. The grain between the fingers 9 9 is cut off by the rotary sickle J, and is held in an upright position by the corrugated edge of the disk G, against which it bears when cut off by the sickle. The united rotary motion of both the sickle and disk brings the grain around to the delivery side 8, and at the same time swings the grain-heads outward, so that as the grain falls over the inner finger 8, upon losing the support of the standing grain, it will drop onto the cut stubble in a direction nearly parallel to the piece E and at right angles to the course of the machine. When, in very heavy grain, there is any difficulty in causing the grain to tilt over in the required direction, the inclined end 7, or a plate more nearly approaching the shape of a plow mold-board, can be extended from the piece E, over and above the end 7, and over the inner finger 8, above the disk G, to aid in directing the fall of the grain in the proper manner. The grain thus cut and laid on the stubble is gathered up by the rake-fingers *d d*, and is taken in sheaves from them by the gatherer-arms *e*, which deliver the sheaves onto the sheaf-holder arms *j*, where it is tied up with the string previously laid upon said arms by the binder seated upon the seat *i*.

The sheaf is reached by the hands of the binder through the hole shown in the cover *a* in Figs. 1, 5, and 6; and the binding-apron *h* is operated wholly by his foot on the treadle-bar *t*, being held up, as shown in Figs. 1 and 6, to support the head *f* while the arms *e* on the left with their sheaf are passing the bar *n*; then being dropped to allow a quarter turn of the holder *g j*, after the sheaf has been placed on it by the gatherer-arms *e*; then being raised again to support the sheaf while being tied; and being again dropped momentarily to allow another quarter turn of the holder *g j* to discharge the sheaf after it has been tied up.

The number of arms on the sheaf-gatherers *b e* can be varied to suit the size of sheaves or gavels required, or to adapt the machine to light or heavy grain; and these last-mentioned considerations will also affect the proper speed of rotation for the shaft P, which must therefore be left to the judgment of the constructor.

The lever S, which controls the caster-wheel U by which the machine is guided, is operated either by the person who rides upon and drives the horse, in which case the lever is extended back so as to be reached by the driver; or it may

be operated by a second person on a seat secured on the cover V, which second person or "pilot" can also watch in the standing grain for stumps or stones which might come in the way of the rotary sickle.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combined bevel and spur-wheel L X, in combination with the bevel driving-wheel M, the spur-wheel train K H, and the rotary sickle J, the several parts being arranged substantially as and for the purpose specified.

2. In a rotary reaping-machine, the combination of the following elements, to wit: A frame, A A D R E F, driving-wheels O O, bevel driving-wheel M, combined bevel and spur wheel X L, spur-wheel train K H, supporting disk G, rotary sickle H, and caster-wheel U, the several parts being arranged and operating, and the whole being impelled and guided, substantially as is herein specified.

3. The rake-fingers *d d d*, in combination with the revolving sheaf-gatherers *b e b e*, the several parts being arranged for joint operation, substantially as specified.

4. The holder-head *f* and revolving sheaf-holder *g j*, in combination with the revolving sheaf-gatherers *b e b e*, the said parts being arranged for joint operation, substantially as specified.

5. The swinging bar *n* with its stop-arm *p*, in combination with the holder-head *f* journaled on the shaft P, the several parts being arranged and operating substantially as specified.

6. The hinged binding-apron *h*, in combination with the swinging holder-head *f* and revolving sheaf-holder *g j*, the several parts being arranged as and for the purpose specified.

7. The combination, in a gathering and binding mechanism for a reaper, of the following elements, to wit: A series of rake-fingers for gathering the cut grain, a revolving sheaf-gatherer for taking the sheaves from the rake-fingers, a revolving sheaf-holder for receiving the sheaves, holding them while being tied up and discharging them to the ground, and a binding-apron, operated by the binder's foot and serving to control the movements of the sheaf-holder, the several parts being arranged substantially as is herein described.

8. The pivoted lever *q* and link *s*, with treadle-bar *t*, in combination with the hinged binding-apron *h*, the several parts being arranged and operating substantially as and for the purpose specified.

As evidence of the foregoing witness my hand this 6th day of June, 1871.

PETER NICOLA.

Witnesses:

JOB ABBOTT,  
ANDREW CHOFFIN.

(74)