

C. Marston.
Grain Binder.

N^o 29610

Patented Aug. 14, 1860

Fig. 1.

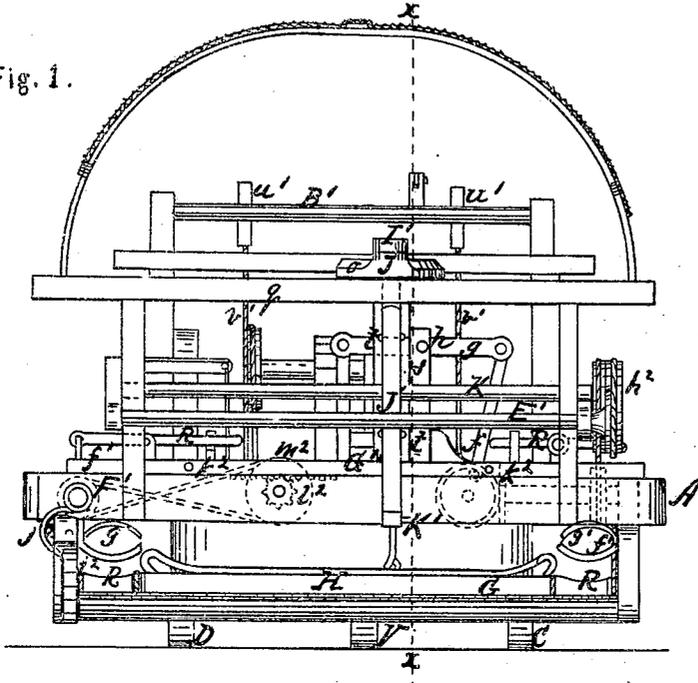
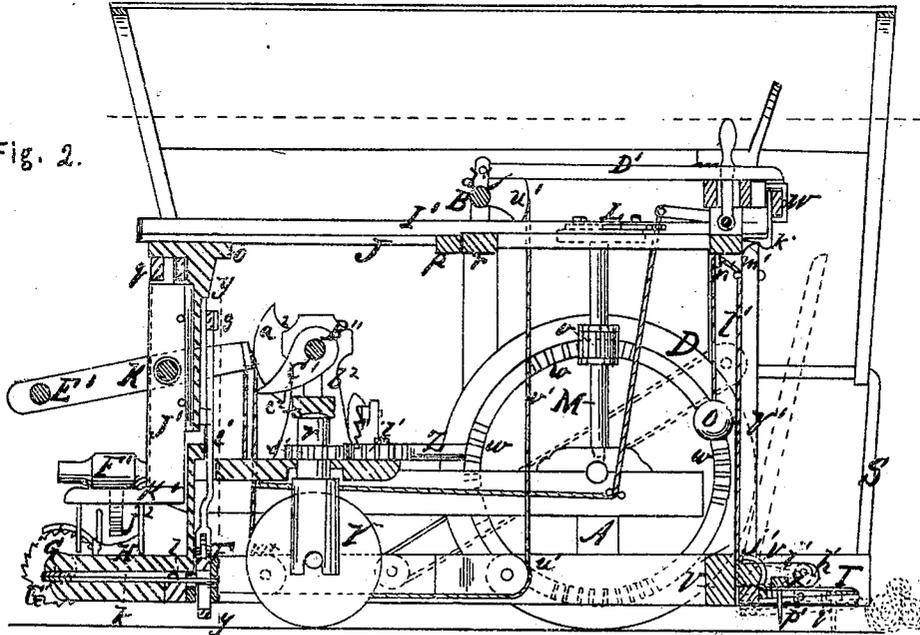


Fig. 2.



Witnesses.

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Fig. 3.

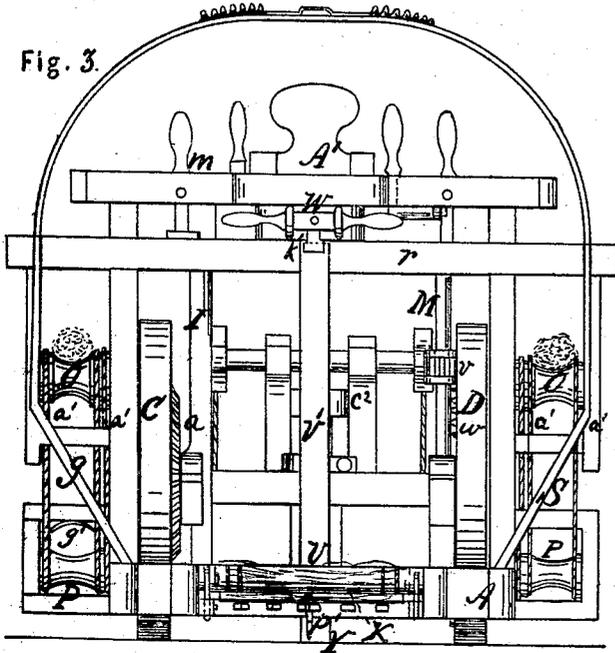


Fig. 4.

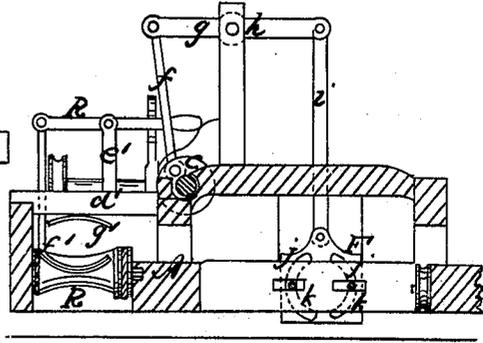


Fig. 6.

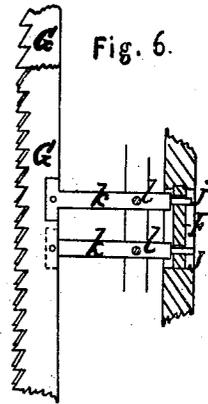
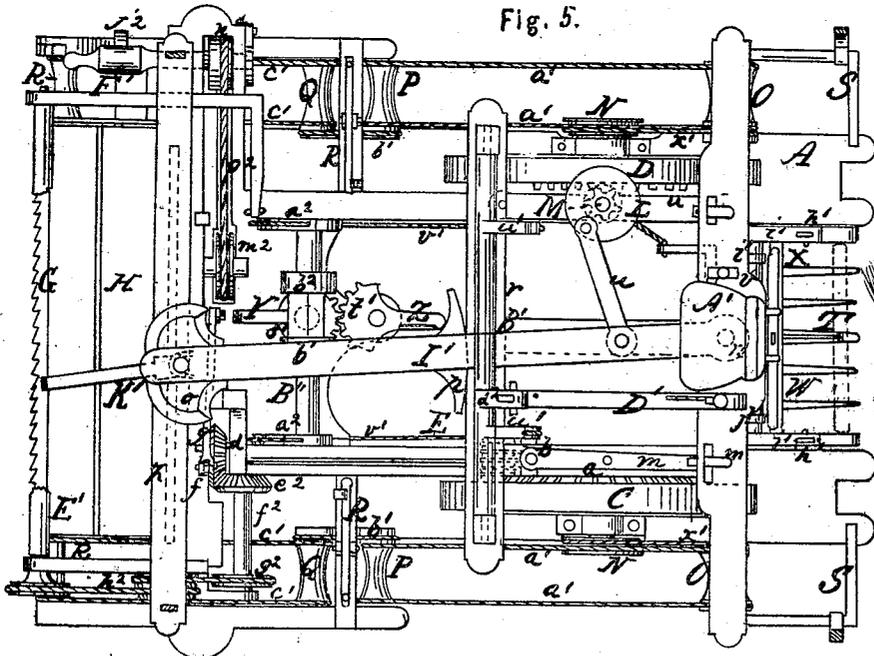


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES MARSTON, OF VIROQUA, WISCONSIN.

IMPROVEMENT IN GRAIN-HARVESTERS.

Specification forming part of Letters Patent No. 29,610, dated August 14, 1860.

To all whom it may concern :

Be it known that I, CHARLES MARSTON, of Viroqua, in the county of Badax and State of Wisconsin, have invented a new and Improved Grain-Harvester; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a front elevation of my invention; Fig. 2, a side sectional view of the same, taken in the plane *x x*, Fig. 1; Fig. 3, a back view of the same in elevation; Fig. 4, a section of the same, taken in the line *yy*, Fig. 2; Fig. 5, a plan or top view of the same; Fig. 6, a detached plan or top view of a portion of the cutting device with a portion of its driving mechanism.

Similar letters of reference indicate corresponding parts in the several figures.

This invention has for its object the obtaining of a machine by which standing grain may be cut, raked into proper gavels, bound, and discharged from the machine in shocks.

The invention consists in a peculiar arrangement of means employed for the end aforesaid, so that the grain will be cut and operated upon consecutively by the different parts, which are so devised as to admit of animal or steam power being applied to it.

To enable those skilled in the art to fully understand and construct my invention, I will proceed to describe it.

A represents the frame of the machine, which may be constructed in any proper way to support the working parts. The back part of this frame is supported by two wheels, C D, one being at each side of the frame. Both wheels C D have teeth at their inner sides, the teeth *a* of the wheel C gearing into a pinion, *b*, on a horizontal shaft, E, which is placed longitudinally in the frame, and has a crank, *c*, on its front end, and also a pinion, *d*. The crank *c* is connected to an upright, *f*, the upper end of which is attached to one end of a lever, *g*, having its fulcrum at *h*, and its opposite end attached to a bar, *i*, the lower end of which is connected to a plate, F, having two curved slots, *j j*, made in it, into which the inner ends of levers *k k* are fitted, said levers having their fulcra at *l*, and their front ends attached to sickles G G, which are placed at the front end of a platform, H, at the lower

part of the framing at its front end, the platform covering the levers and the back parts of the sickles.

The parts above described constitute the sickle driving mechanism; and in order to avoid confusion I will describe its operation, as well as the operation of the parts of the machine, separately.

It will be seen that as the machine is drawn or propelled along the wheel C will rotate the shaft E, and the crank *c* of the latter will give a rocking motion to the lever *g*, the bar *i* of which and plate F vibrate the levers *k k*, in consequence of the latter being fitted in the slots, said levers thereby actuating the sickles G G, which move simultaneously in opposite directions, the teeth working back and forth, one set over the other, and cutting similar to shears. The sickle-driving mechanism is shown in Figs. 2, 4, and 6. The operation of the sickles, it will be seen, is continuous, the sickles working whenever the machine is moved, except when the pinion *b* of shaft E is thrown out of gear from the teeth *a*—a result which may be obtained by adjusting a vertical bar, I, in the frame through the medium of levers *m m*, the bar I having the back journal of the shaft E fitted in it.

The grain as it is cut falls on the platform H, and it is raked therefrom by the following device: On the upper part of the frame A there is placed a sweep or bar, I', the back part of which works on a pintle, *n*. To the under side of this sweep or bar there is fitted longitudinally a slide, J, the latter being fitted in the sweep or bar with a dovetail, as shown in Fig. 1. The slide J has two lips or projections, *o p*, attached to it, the front one, *o*, of which bears against a cross-bar, *q*, on the frame, and the back one, *p*, against a cross-bar, *r*. To the front lip or projection *o* there is attached a pendent bar, *s*, which has a bar, J', attached to it by joints or hinges *t*. The bar J' works on a horizontal guide-rod, K, which is fitted in the frame A, just below the cross bar *q*. To the lower end of the bar J' there is attached a rake, K'.

The back part of the sweep or bar I' has a pitman or connecting-rod, *u*, attached to it, said pitman or connecting-rod being attached to a crank-pulley, L, on the upper part of a vertical shaft, M, which has a pinion, *v*, on it.

To the inner side of the wheel D there are

attached teeth w , in sections, each section having half the number of teeth that the pinion v is provided with. The sections of teeth w are all segments of a common circle, and spaces of certain and equal lengths are allowed between the sections. (See Fig. 2.)

As the machine is drawn along, the shaft M is rotated intermittingly, in consequence of the teeth w being in sections, and the sweep or bar I' is moved, by the crank-pulley L and pitman n , back and forth, or the top part of the frame A . The sweep or bar I , of course, moves the slide J and the rake K' , the latter raking the grain off at either end of the platform H , and resting or dwelling a certain time at the end of each stroke or movement, in consequence of the spaces within the sections of teeth w . The sections w , it will be seen, each give the pinion v one-half a revolution, and the sweep or bar I' , therefore, is moved the entire length of one vibration each time it is actuated, and a gavel is raked alternately off each end of the platform, the intervals or cessation of movement of the rake K allowing time for the platform H to be replenished with cut grain, and also giving time for the gavels to be bound into sheaves.

To the outer end of each of the axles of the wheels $C D$ there is attached a pulley, N , from which motion is communicated, by means of bands x' , to drums O , around which endless bands a^1 pass, said bands also passing around similar drums, P , at the lower part of the frame A . The endless bands a^1 have an inclined position, and the lower drums P , by means of belts or bands b^1 , communicate motion to a drum, Q , around which and drums R endless bands e^1 pass, the latter being on a level with the platform H , and at each side of it.

On the frame A , and directly over the spaces between the drums $P Q$, there are horizontal bars d^1 , to each of which an upright, e^1 , is attached. In the upper ends of the uprights e^1 there are levers R , fitted, one in each upright, and to the outer end of each lever there is attached a rod, f^1 , the lower end of which is bent in bow form, and in line with a semicircular rod, g^1 , attached to the under sides of the bars d^1 .

On the back part of the frame, and directly below each drum O , there are placed inclined bars S , said bars extending down to the bottom of the frame, as shown in Figs. 2 and 3.

The gavels are bound as follows: The endless bands $a^1 e^1$ are moved or operated from the wheels $C D$, through the medium of the pulleys N and bands x' . The cut grain is raked off from the platform I on the bands e^1 , and the latter conduct it over the lower curved parts of the rods f^1 . Each time the gavels reach this point, an operator at each side of the frame A depresses the inner ends of the levers R , and clamps the gavels between the curved part of the rods f^1 and the curved rods g^1 . The gavels are then bound

while clamped and held in the proper position by the rods f^1 and g^1 , the bands being previously prepared ready for use. As the gavels are bound they are carried upward by the endless bands a^1 , and are discharged off on the inclined bars S , which serve as chutes or guides, and conduct the sheaves on a slatted platform, T .

This slatted platform T is attached, by links h^1 , to the ends of arms $i^1 i^1$, which are at the ends of a shaft, U , which is fitted in bearings j^1 , attached to a bar, V , which is placed transversely in the frame A , and in such a manner as to admit of being readily lifted bodily out from the frame when necessary. The shaft U is provided with an arm or bar, V' , the upper end of which is retained or held in proper position by a catch, k^1 , attached to a lever, W , as shown clearly in Figs. 2 and 3. On the slatted platform T there is a bar, X , which has a rope or cord, l^1 , attached to it. This cord l^1 passes up at the back side of the arm or bar V' , and through an eye, m^1 , at the upper end of the bar, and thence through an eye, n^1 , on the frame, and has a weight, o^1 , attached to it. The bar X has a pin, p^1 , attached to it at its center, and this pin passes through a slot, q^1 , in a central slat of the platform. (See Fig. 1.) The bar X being placed loosely on the platform T , the weight o^1 keeps it drawn snugly against the back part of the platform T . When a sufficient number of sheaves has fallen on the platform T to form a shock, an operator or attendant who stands at a convenient point actuates the lever W , and releases the upper end of the bar V' , and the weight of the sheaves on the platform moves outward the upper end of the bar V' , and the platform is depressed until the pin p^1 catches into the earth. The forward movement of the machine then causes the sheaves to be discharged from the platform T , the latter being, in fact, withdrawn from underneath the sheaves. This will be understood by referring to Fig. 2, in which a second position of the bar X is shown. When the sheaves have been discharged from the platform T , the platform and bars $V' X$ are brought back to their original position by the weight o^1 .

If the machine be propelled by animal-power, the team is placed within the frame A , the bar V being movable, as before stated, to admit of the team passing into the frame.

The front part of the frame A is supported by a caster-wheel, Y , the arbor r' of which has a pinion, s' , placed loosely upon it, and connected thereto by a feather and groove. Into this a segment, t' , gears, said segment being at the end of a lever, z , which passes through the neck-yoke of the team, the team being attached to the bar V . By this arrangement it will be seen that the machine may be readily guided, as the driver from his seat A' has only to guide the horses with the ordinary lines, the movement of the horses to the right and left causing the caster-wheel to be turned in

the right direction, so that the line of draft will always correspond with it.

On the upper part of the frame A there is placed a horizontal shaft, B', which has two segments, $w' w'$, attached to it. To each segment w' there is attached a cord, v' , and these cords extend down underneath pulleys w' at each side of the lower part of the frame, and extend along toward the front part of the frame, and pass upward around pulleys w^x , and are attached to segments a^2 on a shaft, B'', which has its bearings in uprights b^2 on the frame.

On this shaft B'', at about its center, there is placed a cam, C', which bears on a cap, c^2 , on the upper end of the arbor r' of the caster-wheel. To the shaft B' there is attached, by an arm, d^2 , a bar, D', which extends back to the driver's seat, and by actuating which the shaft B' may be turned or rocked, and consequently the shaft B'', the cam C' of which acts upon the cap c^2 of the arbor r' , and causes the front part of the machine to be elevated, so that it may pass over any obstacles.

The pinion d of the shaft E gears into a pinion, e^2 , on a shaft, f^2 , in the frame, said pinion e^2 having a pulley, g^2 , on it, from which the reel-shaft E' is driven by belts h^2 .

On one of the drums R a toothed wheel, i^2 , is placed, which serves as a divider, separating the cut from the standing grain. Directly above the wheel i^2 there is placed a cylinder, F', which has a curved arm, j^2 , attached, for catching the straws and holding them up until the rake in its passage strikes projections k^2 on a bar, G', which has teeth on its under side, that gear into a pinion, l^2 , the axis of which has a pulley, m^2 , on it, around which pulley, and a pulley, n^2 , on the cylinder F', a cord or band, o^2 , passes, and operates the cylinder F'. Thus, at each vibration of the rake the cylinder F' is actuated, and the arm j^2 is made to throw the straw it held on the bands c^1 simultaneously with the rake.

I am aware that two sickles have been previously used for the cutting devices of har-

vesters, one being arranged to work over the other, and I do not claim such device separately or in itself considered; but

I do claim as new and desire to secure by Letters Patent—

1. Operating the two sickles G G through the medium of the levers $k k$, reciprocating slotted plate F, vibrating lever g , actuated by the crank c of the shaft E, which derives its motion from the wheel C, substantially as set forth.

2. Operating the rake K' intermittingly through the medium of the teeth w , arranged in sections on wheel D, and the pinion v on shaft M, and also the crank-pulley L, connected by the pitman u with the sweep or bar I, having the slide J, with the pendant s , and the rake-bar J' attached, all being arranged substantially as described.

3. The arrangement of the endless bands $a^1 c^1$ in connection with the binding-clamps $f^1 g^1$, and their operating mechanism, substantially as shown, whereby the gavels are conveyed to the clamps, bound, and the sheaves conveyed to the platform T, for the purpose of being discharged in shocks.

4. The platform T, attached to the shaft U, as shown and described, and provided with the bars X V', the bar X having a pin, p' , attached, and also a cord, l^1 , with the weight o^1 connected to it, the cord being arranged with bar V', and the latter provided with the catch k^1 , to operate as set forth.

5. The arrangement of the shafts B' B'' with the caster-wheel arbor r' , and the cam C', as shown, for the purpose of elevating the front part of the machine when required.

6. The arrangement of the caster-wheel Y, with the pinion s' on its arbor r' , the segment l' and lever z , connected with the neck-yoke of the team, or with the mechanism of any motor, to operate as set forth.

CHARLES MARSTON.

Witnesses:

CARSON GRAHAM,
JOHN DAWSON.