J. F. GORDON.
Grain-Binder.

No. 210,520. Patented Dec. 3, 1878.

Fig. 1.

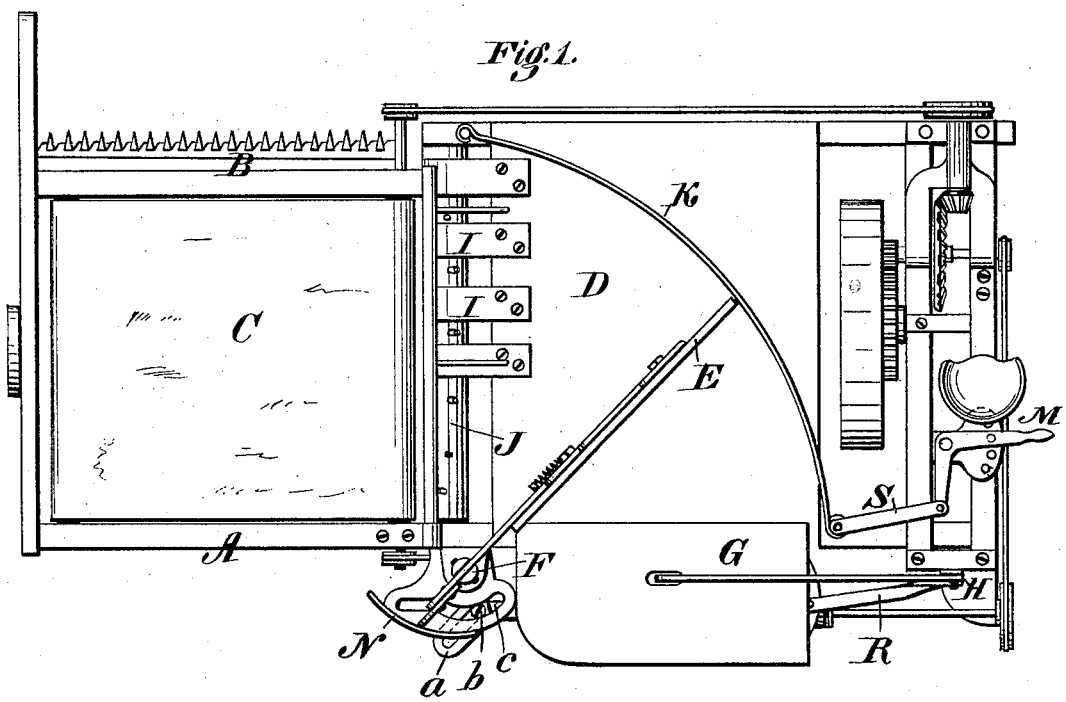
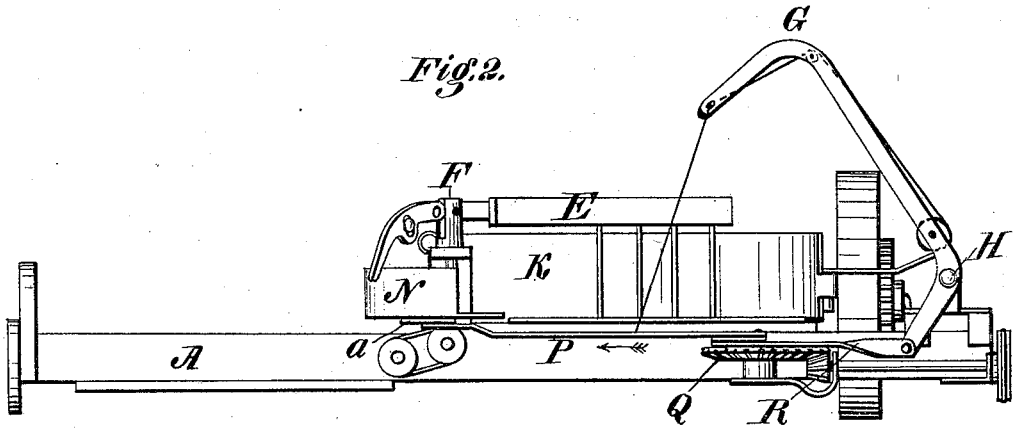


Fig. 2.



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UNITED STATES PATENT OFFICE.

JAMES F. GORDON, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. **210,520**, dated December 3, 1878; application filed May 7, 1878.

To all whom it may concern:

Be it known that I, JAMES F. GORDON, of Rochester, in the county of Monroe and State of New York, have invented certain Improvements in Automatic Grain-Binders, of which the following is a specification:

The object of my invention is to produce a cheap and simple grain-binding machine, which shall overcome the two great difficulties experienced in the practical operation of such machines—namely, the delivery of the grain from the cutters to the binding devices in suitable shape for being bound, and the application of the band to the middle of the grain, whether the same be long or short.

With these ends in view the invention consists, first, in the particular construction and arrangement of the conveying mechanism and binding devices in such manner that the grain is carried squarely across the platform of the harvester, and then turned or swung at a right angle, and thereby presented to the binding devices; secondly, in the peculiar construction and arrangement of an adjustable board or guide, arranged at an inclination to the path of the moving grain, so as to act upon the butts of the grain and move the same endwise to a greater or less extent, as may be required, in order to present it in the desired position to the band-applying devices.

The invention also further consists in the construction and arrangement of various devices and combinations of devices of secondary importance, as hereinafter described in detail.

Referring to the accompanying drawings, Figure 1 represents a top-plan view of one form of my improved machine; Fig. 2, a rear elevation of the same.

Referring to the drawings, A represents a reaping-machine, which may be made of any ordinary or suitable construction, so far as the general arrangement of the frame and cutting mechanism and driving-gear is concerned, provided only that it has a platform of rectangular, or substantially rectangular, form. B represents the knife or cutter bar, arranged, as shown, at the front of the platform; and C, an endless conveyer extending endwise of the platform over rollers at its ends, for the purpose of receiving the grain as it is cut, and carrying the same squarely across the platform, and delivering it therefrom at the inner or stubble side of the machine. The conveyer, in the present instance, consists of an endless canvas apron; but it may consist of a series of chains or belts, arranged in any ordinary manner, or may be of either of the other common forms of conveyer known in the art which are adapted to deliver the grain squarely or at right angles across the platform. D represents a secondary quadrant-shaped platform, arranged at the inner end of the main platform, to receive the grain as it is delivered from the main platform. E represents a sweep-rake arm, pivoted at the point F, and arranged to receive the grain as it is delivered from the main platform or conveyer, and swing or sweep the same around toward the rear, and at right angles to the position in which it falls upon the machine.

G represents a binding or wire-carrying arm, pivoted at the point H, and arranged to have a vertical reciprocation, the front end of the arm closing downward into wire-fastening devices located at the rear end of the quadrantal platform D, which platform is extended backward, as shown, to serve the purpose of a grain-receiver and binding-table.

The arm and the wire-fastening mechanism may be constructed and arranged in any ordinary or suitable manner, the construction of these parts forming no part of the present invention, the only requirement being that they shall be of such character that one end of the wire shall be retained by the fastening devices, and the other carried by the binding-arm, so that as the grain is carried against the wire the descent of the arm will carry the wire around the bundle, where it will be fastened by the mechanism below.

I represents a series of guards or bridges to support the grain in its passage from the conveyer-apron C to the platform D, and J represents a rotary shaft, provided with a series of arms, for the purpose of assisting in the delivery of the grain from the apron to the platform.

K represents a curved guard or guide, extending around the outer side of the quad-

rantal platform D, from the front to the rear, this guard being pivoted at its front end, and connected at its rear end by a link, S, and a hand-lever, M, arranged within reach of the operator, and provided with devices by which to lock it in position.

By moving the hand-lever the guard K may be adjusted eccentrically to the pivoted rake, and its rear end thrown nearer to or farther from said pivot. The purpose of this guard is to act upon the butts of the grain as it is being delivered to the binding devices and move it endwise, so as to present it in such position in relation to the binder that the latter will apply the binding-wire at the middle.

When the grain is of full length the guard K is in its outermost position; but as the length of the grain decreases, the guard is adjusted inward, so as to crowd the grain over endwise as it is carried backward by the rake to the binding devices.

It will be seen that by means of the guard I am enabled to deliver the grain in the exact position required with regard to its length without employing either a movable conveyer or a movable binding mechanism.

In operating the machine, as above described, the grain cut by the knife B falls backward upon the apron C, and is carried thereby squarely across the platform to its inner end, where, by the action of the rotary picker J, it is delivered to the secondary platform, D. The rake E, descending behind the grain, swings forward and sweeps the same around before it against the binding-wire, the grain being presented to the wire in a position at right angles to that in which it fell upon the apron. The binding-arm, being elevated at the time the grain is delivered against it, subsequently descends and applies the wire around the bundle, where it is secured by the twisting or fastening devices, after which the bound bundle is discharged from the machine, and the parts resume their former position preparatory to the binding of the next bundle.

The construction of the rake E may be of any ordinary or suitable character, the rake represented in the drawings consisting merely of the arm pivoted in a vertical rock-shaft, and provided at its rear end with a pivoted latch or dog arranged to act in conjunction with a fixed cam, N, which serves to elevate the rake during its forward movement, and to permit it to sweep over the platform during its backward movement.

In order that the grain may be held under compression closely and compactly against the wire as the binder-arm descends, I so arrange the parts that the rake E stands at rest against the grain in line with, or in close proximity to, the binder-arm during the descent of the latter. This movement of the rake-arm is effected by providing its rock-shaft F, on the lower end, with a slotted crank-arm, *a*, and providing the crank-wheel Q with a pitman, P, having a pin, *b*, which extends through the crank-arm of the rake, and also through an irregularly-curved slot, *c*, in the stationary plate, the last-mentioned slot having one end arranged radially with reference to the center of the rake. As the pitman moves in the direction indicated by the arrow, it causes the rake to sweep the grain toward the binder-arm; and as the rake reaches the point at which it is to stop, the pin *b* slides outward into the radial portion of the groove *c*, and thus serves to hold the rake-arm rigidly in position. During the reverse movement of the pitman it is first drawn out of the radial portion of the groove, and then into the curved or eccentric portion of the same, whereby it is caused to give the swinging motion to the rake. The pitman P is actuated by means of the crank on a rotating wheel, Q, which will be used to operate the twister-pinion, and which is provided with a second crank, operating a pitman, R, which actuates the binder-arm, as represented in Figs. 1 and 2.

By constructing and arranging the parts of the machine in the manner above described, I am enabled to deliver the grain to the binder in a compact and regular shape without employing the elevators and other expensive parts usual in this class of machines, and this without materially increasing the width or size of the machine.

Having thus described my invention, what I claim is—

1. In an automatic grain-binding machine, the combination of a fixed binding mechanism, a quadrant platform and rake, and an eccentrically-curved board or guide to act against the butts of the moving grain, having one end adjustable to and from the axis of the rake, substantially as shown.

2. In an automatic grain-binder, the combination of an adjustable inclined guide, to act against the butts of the moving grain, and a rake having, while in action, an endwise movement in addition to the ordinary movement, whereby it is caused to adapt itself to the different positions of the inclined guide.

3. The combination, in an automatic harvester and binder, of a conveyer, C, and binder-arm G, and an intermediate platform, D, and sweep-rake E, as shown.

4. In combination with the sweep-rake E, the pivoted guard K, the link S, and the hand-lever M, arranged in position to be operated by the driver while occupying his seat on the machine.

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