A. GOODYEAR.

Grain Binder.

No. 238,230. Patented March 1, 1881.

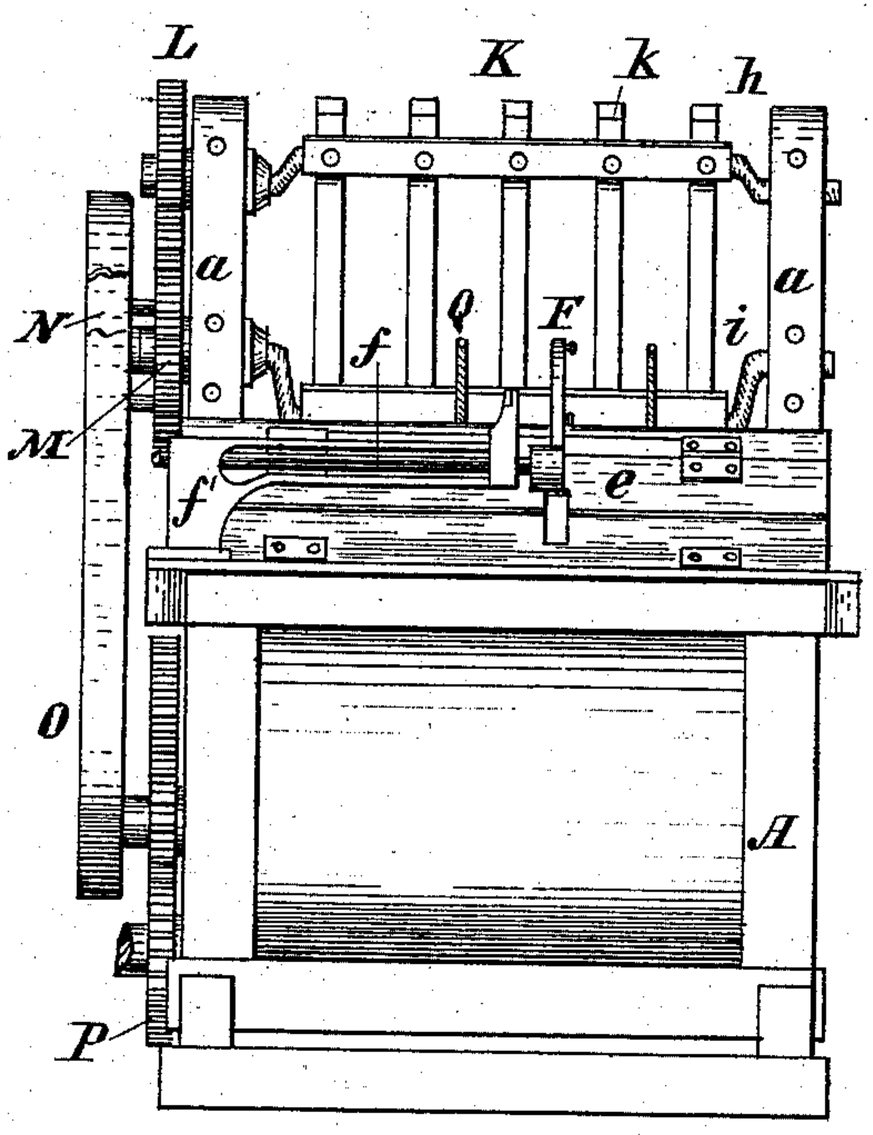

Fig 1

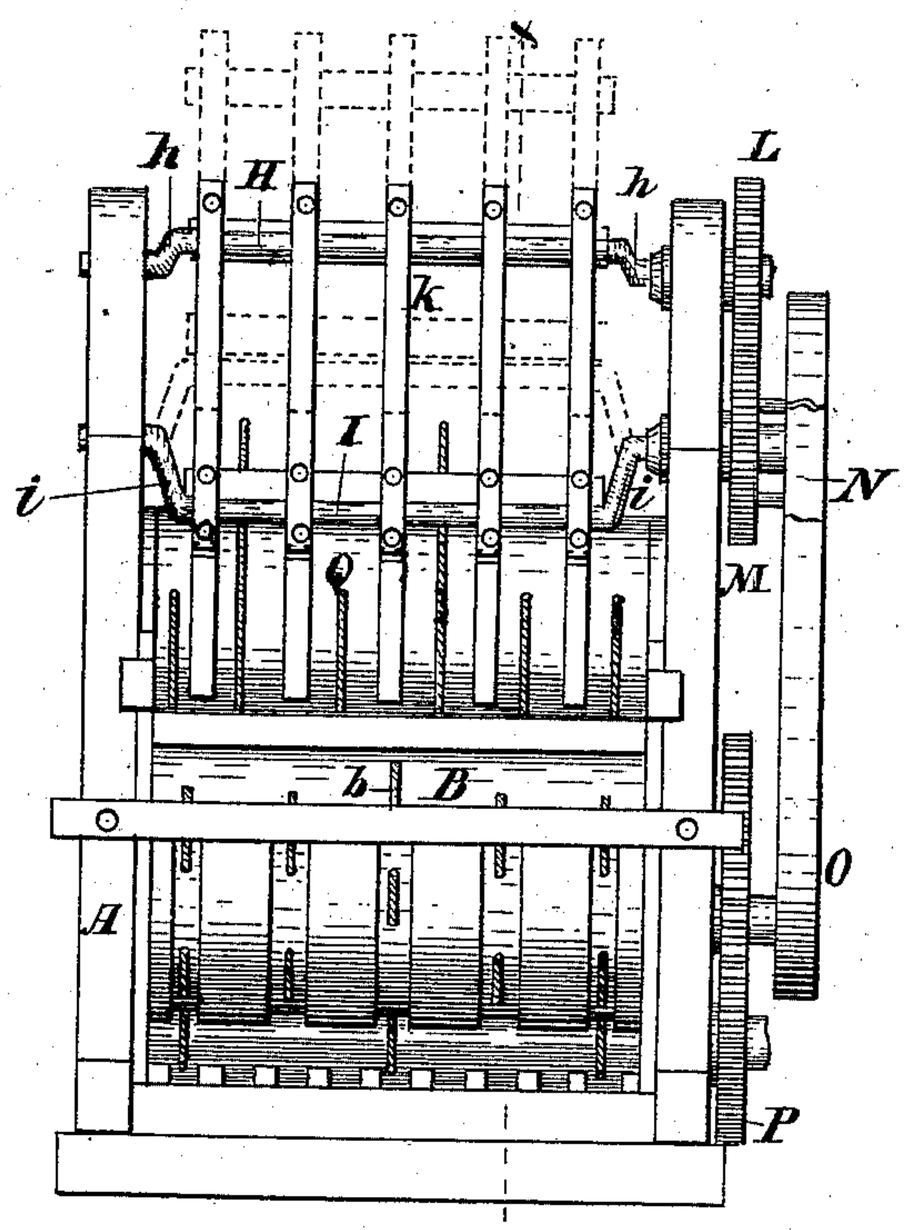

Fig 2

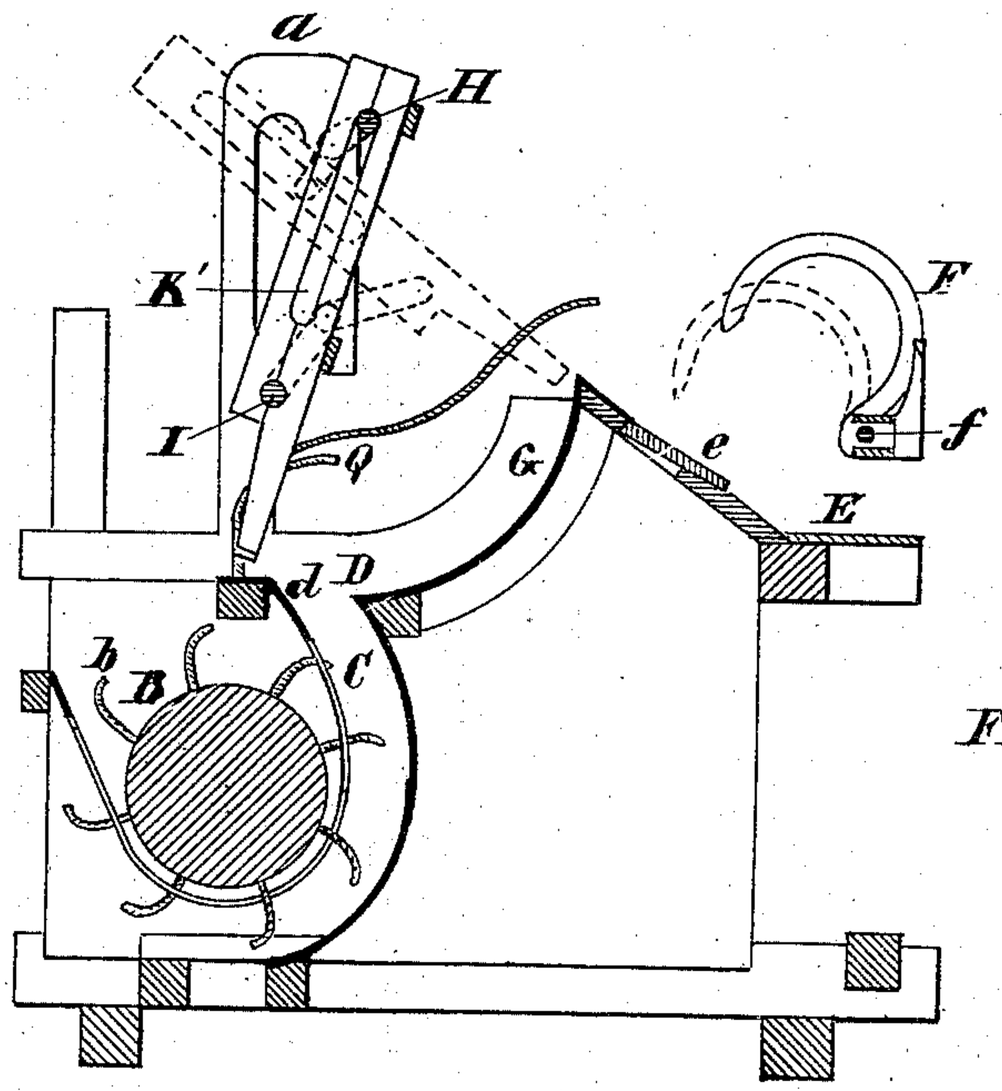

Fig 3

Witnesses

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UNITED STATES PATENT OFFICE.

ALBERT GOODYEAR, OF MINNEAPOLIS, MINNESOTA.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 238,230, dated March 1, 1881.

Application filed June 6, 1879.

To all whom it may concern:

Be it known that I, ALBERT GOODYEAR, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Harvesters with Automatic Binders, which are fully set forth in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents an end elevation of a harvesting-machine embodying my improvements, looking from the stubble side; Fig. 2, a similar view, looking from the grain side of the machine; and Fig. 3, a vertical section taken on the line *x x*, Fig. 2.

My invention relates to that class of harvesting-machines in which the grain is delivered into the receptacle at the bottom thereof, an illustration of which may be seen in Letters Patent No. 177,480, dated May 16, 1876; and the object of the invention is to provide a delivery mechanism, by means of which the grain is delivered in gavels from the receiver to an automatic binding apparatus.

The invention consists in special mechanisms and combinations of devices, all of which will be hereinafter fully set forth, and will be pointed out definitely in the claims.

The main features of a grain-harvester machine are well known, and I have not shown them in the drawings and shall not describe them. It will be understood, however, that the mechanism herein described is applied to a harvester with a grain-platform, cutting apparatus, and all other necessary devices which are ordinarily used in machines of this kind.

In the drawings, A represents that portion of the main or supporting frame which is located at the stubble end of the machine, and B is a revolving shaft or cylinder, provided with bars *b*, by means of which the grain is elevated from the inner end of the platform, to which point it is usually brought by means of an endless apron on the platform. The grain is carried up through the throat or channel C and discharged into the bottom of a receiver, D, through an opening, *d*, as in the patent mentioned above.

In this style of machine, when the grain is delivered into the bottom of the receiver some mechanism is necessary to take the grain from this receiver and deliver it to the binding-table or receiver in proper position to be bound up by automatic devices. This binding-table or gavel-receiver E is represented in the drawings some little distance outside of the elevating device, and in fact, as shown, is designed to be on the outside of the supporting-wheel, while the elevator is upon the inside. The incline *e* at the back of the table or receiver is made of two parts, hinged at their outer edges, and folding so as to meet at the middle, as in an application heretofore filed by me. A binding-arm, F, is mounted on a rock-shaft, *f*, having its bearings in a supporting standard or bracket, *f'*, and operated by any of the known devices in use for this purpose.

I have not shown the complete binding mechanism, as any automatic binder may be employed for binding the gavel after it is delivered upon the binding-table or receiver.

The outer side of the grain-receptacle is made in the shape of a concave, G, which extends from the opening at the bottom of the receiver upward and outward, and joins the upper edge of the incline *e*. Standards *a* rise from the upper portion of the main frame, both in front and rear thereof, and about in line with the toothed elevating-cylinder. Crank-shafts H and I are mounted in suitable bearings, the upper one, H, being near the upper end of the standards, and the lower one, I, some distance below the former, and in line therewith. The crank-arms *i* on the lower shaft are somewhat longer than the similar arms *h* of the upper shaft. A divider, K, is mounted on these two shafts, being composed of a series of bars, *k*, which are journaled, near their lower ends, on the lower shaft, I, and are provided with longitudinal slots *k'* in their upper portions, through which the upper shaft, H, passes. A gear-wheel, L, is mounted on the rear end of the shaft H, and a similar wheel, M, of the same size, on the shaft I, the two being arranged to mesh. A wheel, N, is also mounted on the shaft I, in rear of the wheel M, and is driven by gearing from the elevating-cylinder or from any other part of the machine suitable for this purpose.

I have shown in the drawings a band, O, and a band-wheel, P, on the rear end of the elevating-cylinder shaft, by means of which motion is communicated to the gear-wheels L

and M; but any other means may be employed which are adapted to this purpose.

From the inner portion or division *d* of the grain-receiver guard-rods Q project, being attached to the said part of the receiver, and extending upward and outward, some of them extending entirely over the concave, as shown in Fig. 3 of the drawings.

The crank-shafts, geared together as described, are rotated in opposite directions, and are so arranged relatively to each other that they operate in directions opposite to each other—that is to say, when the lower shaft throws the divider-bars outward the upper shaft will be acting to throw the upper ends of the bars inward.

From this description it will be evident that the divider will be reciprocated back and forth over the opening in the bottom of the receiver and the concave leading to the binder; and the crank-arms of the lower shaft, I, are of such length as to give the lower ends of the bars a sweep over the above-mentioned space. The upper crank-shaft, H, is the pivot upon which the bars vibrate; but as it also is rotated it is evident that it is a constantly-changing pivot, and will, therefore, necessarily effect the swinging of the bars. Of course, the operation of the lowering crank-shaft will be to swing the bars across the space designated in a depressed position one way and in an elevated position the other way, and the parts are so arranged that the former position of the bars will occur while it is sweeping over and from the receiver toward the binder, while the elevated position of the bars will be on its return movement, and so the lower ends of the divider-bars will be carried back above the grain in the receiver without interfering therewith. The effect of the upper crank-shaft is to give a greater swing or throw to the divider-bars than they otherwise would have, for it is evident that this shaft will operate to turn or vibrate the bars upon the lower shaft as a pivot, thereby throwing the lower ends of the divider-bars farther inward in one direction and outward in the other than they would have been carried by the simple operation of the lower crank-shaft alone. The crank-shafts and bars are so arranged with reference to each other that when the shafts are in the position shown in full lines in Fig. 3 of the drawings the divider will be depressed to nearly its lowest point, and its lower end will be swung back into the position shown in the same figure, just inside the opening in the bottom of the receiver. Starting from this position the simultaneous rotation of the cranks will carry the bars forward, the bars sweeping in the arc of a circle over the receiver and concave, carrying the grain which lies in the receiver before it, until, finally, it reaches the position shown in dotted lines in Fig. 3 of the drawings, when it will be seen at once that the grain has been swept along the concave by the divider, and discharged over the outer edge of the latter upon the binding-table in position to be taken by the binding-arm. It will also be seen from the position of the upper crank-shaft, H, (shown in dotted lines in the same figure of the drawings,) that the upper ends have been thrown inward and the lower ends outward by the rotation of said crank, thereby producing the effect above described. The continued movement of the crank-shafts from the position shown in dotted lines in Fig. 3 will now evidently raise the bars, and at the same time swing the divider backward or inward, the bars being elevated sufficiently to pass over the grain which has been and is being discharged into the receiver, until, finally, about over the opening in the bottom of the receiver, the divider will be in nearly a perpendicular position, as shown in dotted lines in Fig. 2 of the drawings, from which position it is carried downward, and the lower ends thrown still farther inward, so as to pass behind the guard-rods, and then sweep forward slightly into the position shown in Fig. 3 of the drawings, as first mentioned. Of course it will be understood that these movements above described are not at intervals, but that the bars have a continuous motion; although, if desired to accommodate unevenness in the fall of the grain, provision may be made for stopping the divider at certain points for the discharge of a sufficient amount of grain into the receiver to make a bundle of ordinary size.

It will be understood from the description above that this mechanism delivers the grain from the receiver to the bundle intermittently, and is intended to deliver at each vibration of the divider a sufficient quantity for a bundle, thereby differing from the delivery in ordinary harvesters, in which there is a constant stream of grain running to the binder, and which necessitates special provision for separating the gavel to be bound from the stream. This delivering-divider makes a clean and complete separation of the grain in the receiver as it passes across the open bottom thereof, and delivers the gavel in clean and proper shape for the operation of the binding mechanism.

The details of construction of the delivery mechanism described above may be changed somewhat without materially modifying my invention, and therefore I do not limit myself to special details of construction as herein shown and described.

The improvement may also be applied to harvesters of other types—that is, in which the grain is delivered from the platform in a different manner; but it is especially adapted to that type of harvesters already mentioned, in which the grain is discharged into the bottom of the receiver.

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

1. In a harvesting-machine, the combination of the following elements: a grain-receiver provided with an open bottom, an elevating device constructed and arranged to

elevate the grain from the platform and deliver it into the receiver through the bottom thereof, a binding-table independent of the receiver, a vibrating delivery-divider mounted on two revolving crank-shafts and arranged to sweep straight across the open bottom of the receiver to the binding-table, and a binding-arm independent of the divider, substantially as described.

2. An open-bottom grain-receiver, D, the outer side of which is curved and extended to form a concave, G, in combination with the delivery-divider K, crank-shafts H and I, binding-table E, and binding-arm F, substantially as described.

3. The toothed elevating-cylinder B, in combination with the open-bottom grain-receiver D, delivery-divider K, crank-shafts H and I, binding-table E, and binding-arm F, substantially as described.

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Witnesses:
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