

J. H. ELWARD.

Harvesters.

No. 141,865.

Patented August 19, 1873.

Fig. 1

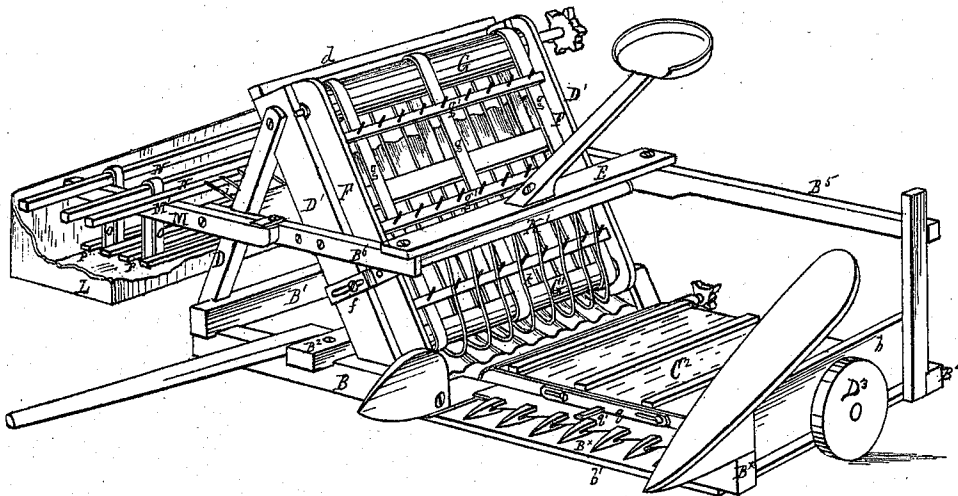


Fig. 2.

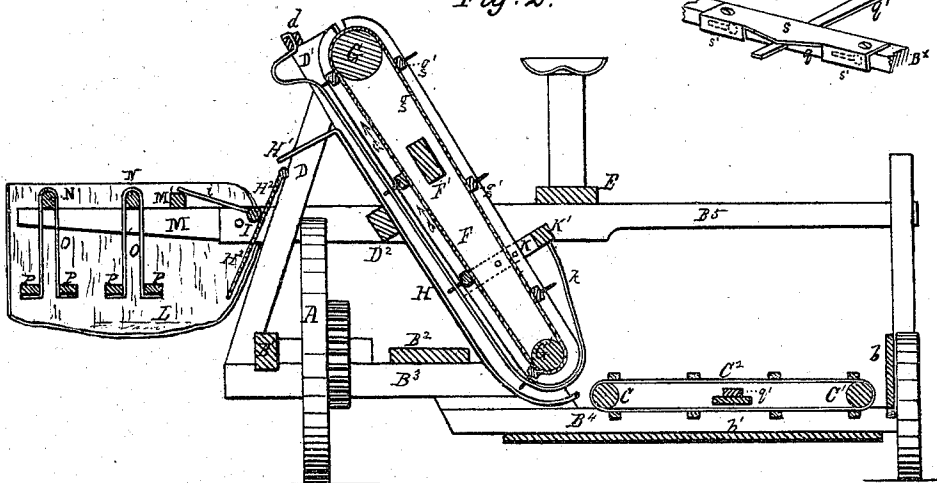


Fig. 4.

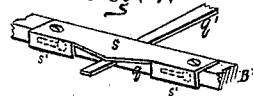
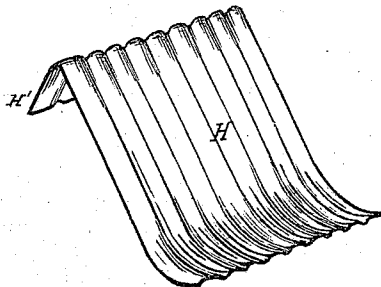


Fig. 3.



Witnesses.

Alex. Mahon
Jas. Sullivan

Inventor.

J. H. Elward,
by A. H. Smith
Attorney

UNITED STATES PATENT OFFICE.

JOHN H. ELWARD, OF ST. PAUL, MINNESOTA.

IMPROVEMENT IN HARVESTERS.

Specification forming part of Letters Patent No. **141,865**, dated August 19, 1873; application filed February 14, 1873.

To all whom it may concern:

Be it known that I, JOHN H. ELWARD, of St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Harvesting-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a perspective view of my improved harvester taken from the front grain-side with the reel removed. Fig. 2 is a vertical transverse section of the same. Fig. 3 is a view of the corrugated shield removed, and Fig. 4 a detached view of the sickle-lever slide and cap.

Similar letters of reference denote similar parts wherever used.

My invention relates to a novel construction and arrangement of the devices for effecting the elevation of the grain from the inner end of the horizontal apron, and delivering the grain in good condition to the binders riding on the machine; also, to the arrangement underneath the elevating and delivering devices and over the drive-wheel of the machine of a continuous shield reaching from a point at or near the inner end of the horizontal grain-receiving apron, on one side of the drive-wheel, over said wheel to and terminating in the receptacle for the shattered grain on the opposite side of the wheel for saving the shattered or shelled grain and short heads, and for assisting in the elevation and proper delivery of the grain. It further consists in a novel arrangement of the spring-rods, which hold the ascending grain down upon the elevating table or shield, assist in straightening it, and serve to clear the teeth of the elevator-rakes. It further consists in a novel construction of the binders' support and shattered-grain receptacle for diminishing the weight and draft of the machine; and it further consists in a novel arrangement for covering the slot through which the sickle-lever works in rear of the sickle, and for protecting the platform-canvas, all as hereinafter set forth.

In the accompanying drawings, A represents the drive-wheel mounted in bearings in the longitudinal frame-bars B¹ B², which are connected at their forward ends to a transverse

bar, B, extending from the outer frame-bar B¹ across the frame of the machine to and supporting the shoe or shoe-plate at the inner end of the platform, said shoe forming the support for the finger-bar B^x. The rear ends of bars B¹ B² are connected with the rear transverse bar B³ and a bar, B⁴, attached to the lower face at the inner end of bar B, extends to the outer end of the platform on a line parallel with the finger-bar B^x, and connected therewith by an outer bar, b, and flooring b', said bars B^x B⁴ serve as a support for the bearings of the platform-apron rollers C C¹ and apron C². The outer platform end is supported upon a carrying-wheel, D³, and the platform-frame is further strengthened by an upper transverse rear bar, B⁵, attached at its outer end to the upper end of an upright secured to the outer end of rear bar B⁴. The inner end of bar B⁵ is bolted to the rear of the elevator-frame, composed of outer uprights or braces D and inclined bars D¹ in front and rear, secured at their lower ends to the main frame-bars B B¹ B³, and at their tops to each other, as shown, and the front and rear pairs are connected by a longitudinal bar, D². This frame is further strengthened by the upper rear bar B⁵, and the front overhanging supporting arm or bar B⁶, which is united with the bar B⁵ by the bar D² and the seat-bar E, as represented by the drawings. The apron-frame is composed of the parallel inclined bars F, in front and rear, arranged within the frame D D¹ between the inclined bars D¹, and are united centrally and midway of their length by a longitudinal bar, F', and at their upper and lower ends by the elevator-apron rollers G G', the shaft of the upper roller G extending through or having bearings in the frame D D¹, as shown, and forming pivotal bearings to the upper end of the apron-frame, upon which said apron-frame may vibrate. The elevator apron or rake is composed of bands or straps g g passing around the rollers G G', and the toothed bars, slats, or rakes g', and is operated by a sprocket-wheel or pulley on the rear of the upper roller-shaft G, a chain or bolt connecting it with any suitable arrangement of driving sprocket-wheel or pulley operated by the gearing; or any other convenient arrangement may be used for driving the elevator-rakes. The movement of the toothed slats or rakes is

upward on the under side, in the direction indicated by the arrow, the teeth passing in close proximity to or within grooves or corrugations in the face of the inclined plane or shield H, and sweeping the grain up said incline or shield to its highest point, where it is discharged over a reverse incline, and drops upon receiving-fingers *i* attached to a shaft or pivoted head, I. The shield H may be made of corrugated sheet metal, as shown, or it may be made of wood, and with either grooved or plane face, and is supported upon the horizontal bar D², and at its lower end by the frame-bars B B² B³, or inclined bars D¹, as may be convenient, either rigidly or by springs which hold it up against the elevator-rake teeth with a yielding pressure, which allows the passing grain to vary in bulk, acting at all times with equal efficiency. I have preferred, however, to effect this object by pivoting the elevator rake-frame at its upper end, as above explained, which allows its lower end to vibrate to or from the shield H, as will be further explained, and the bearings of shaft G in the frame D D¹ may be slotted to permit a like movement at the upper end. The shield H is curved at its lower end in the arc of a circle concentric, or nearly so, with the roller G', underneath which said end rests, reaching to a point as near to the inner end of the horizontal apron as the slats on said apron will permit, for receiving the grain therefrom; thence under the roller G', as described, and upward at an angle of, say, forty-five degrees, more or less, to a point near the apex of frame D D¹, and sufficiently above the drive-wheel to permit the discharge of the grain over the same, where it is bent at an angle of about ninety degrees, more or less, and forms a reverse incline reaching out to or about to the outside of the main frame, where it is supplemented by a hinged portion, H², which extends to and terminates within the receptacle for the shattered grain, as shown, thus forming what I call the continuous guard or shield for catching the shattered or shelled grain, and carrying it over the drive-wheel to and depositing it in the receptacle on the opposite side, to which it is swept by the straw as it is carried over said shield. The pivoted apron or rake-frame may be held down upon the straw passing over the shield with any required pressure, as above recited, by weights or springs applied thereto in any convenient way; but ordinarily it is intended to so proportion it and to give it such an angle of inclination that its own weight will be sufficient for this purpose; or it may, if required, be held in a fixed relation to the shield by straps and set-screws, as at *f*; or the shield may be made yielding, as explained. To the bars F of the apron-frame, and about at right angles thereto, I attach arms K, connected at their outer ends by a bar, K', arranged transversely to the movement of said apron, and over the outer or upper face of the apron, said bar forming the support for a series of light elastic spring wires or rods, *k*, which extend from the bar K' downward underneath roller

G', and between said roller and the shield H; thence upward between the apron or rake-bars and shield to a point at or near the upper roller, where they are bent outward and back in U-shape to form strippers, and terminate in and are supported by a bar, *d*, secured to the apex of frame D D¹. Thus arranged, these spring-rods serve to hold the rakes down with a yielding pressure to their work; but the rods may at their upper ends be supported by a bar connected with the upper end of the vibrating rake-frame, and separate springs in such case may be used for holding the rake-frame down. The purpose of these wires is threefold: First, to hold the grain firmly, but with a yielding pressure against the inclined shield H; second, to retard and straighten the straw by resisting its forward movement until it (the straw) is acted upon at both ends by the positive movement of the teeth; and, third, to release the grain or strip it from the teeth after it has reached the top of the shield, as explained. The long straw after escaping from the rake-teeth slides down the outer incline H², and is caught upon the receiving-fingers *i*, which permit the shattered or shelled grain and detached heads to pass through them into a receptacle, L. The support for the binders who take the grain from the fingers *i* and bind it is composed of two horizontal arms or bars, M, pivoted one to the front and the other at the rear of frame D D¹ in such manner that they may be folded or turned up into a vertical position, out of way for transportation or for passing through gates, said bars being united by a longitudinal bar, M'. Upon these arms M two or more removable longitudinal bars, N, are placed, and upon these, contiguous to the bars M, are placed saddle-irons O, the lower ends of which are bent at right angles to form supports for stirrup or foot bars or rods P, as shown plainly in Fig. 2, and upon these the binders stand, either astride the bars N or between them, for taking the grain from the fingers and binding it into bundles, the bars N forming a convenient support for the grain while it is being bound. The receptacle for the shattered grain is represented, in this instance as formed of canvas, bagging, or other similar material, made to surround and inclose the binders' stand, the hinged portion of the continuous shield terminating within it, as explained. This construction of the binders' support and grain-receptacle enables me to make the machine much lighter, and consequently reduces the draft materially over machines where these parts are made solid and of the usual heavy materials, besides diminishing the liability of the machine to tip over on sideling ground.

Where the sickle is operated by a vibrating lever passing through the grain-receiving apron, and through a slot or perforation in the forward platform or finger-bar, difficulty has been experienced, from the fact that the short wet grass gets in and clogs up the slot or passes through into the apron, interfering seriously with its working. This difficulty I have rem-

edied by the employment of a reciprocating plate, *q*, covering the slot on its forward face, and moving with the forward end of the sickle-lever *q'*, passing through said plate *q*.

A stationary cover-plate, *s*, provided with the overhanging guide-lips *s'*, serves to prevent injury to the apron *C*² by the reciprocating lever-plate.

Having now described my invention, I would have it understood that what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the continuous shield *H*, elevator-rakes *g g'*, and spring-rods *k*, arranged and operating substantially as described.

2. The shield *H H*¹ *H*², extending from the horizontal apron to and terminating in the grain-receptacle *L*, substantially as and for the purpose set forth.

3. The combination of the shield *H*, rakes *g' g'*, spring-rods *k*, receiving-fingers *i*, and receptacle *L*, substantially as and for the purpose set forth.

4. The binders' support, composed of the overhanging pivoted arms *M*, saddle-bars *N*, stirrups or saddles *O*, and stirrup-bars *P*, substantially as and for the purpose described.

5. The binders' support, as recited in the last-preceding clause of claim, in combination with the canvas receptacle surrounding or inclosing said support, substantially as described.

6. The reciprocating sickle-lever plate *q*, arranged and operating substantially as described.

JOHN H. ELWARD.

Witnesses:

ALEXR. MAHON,
J. T. THOMAS.