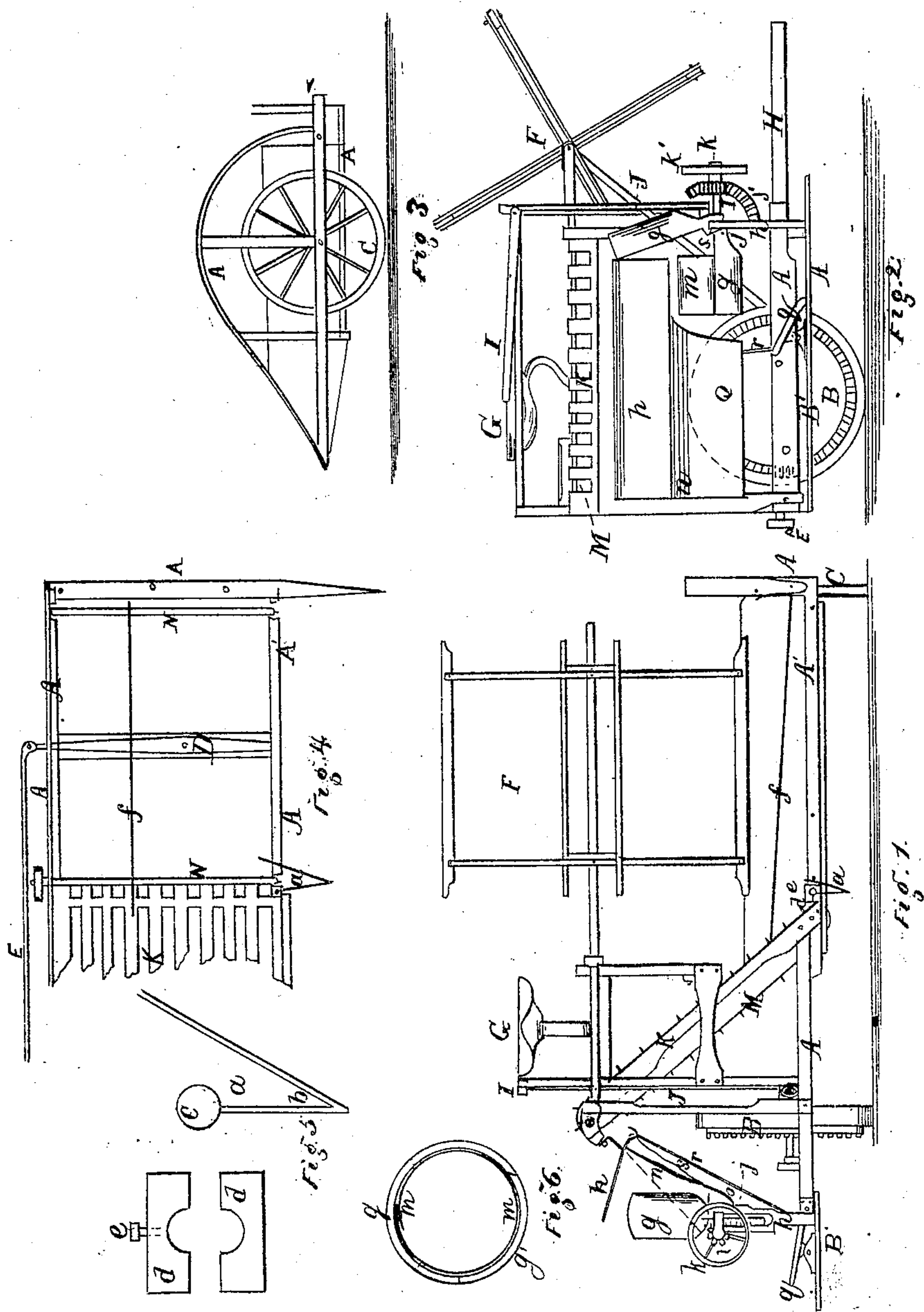


E. B. Rice,
Grain Binder.

No. 101,659.

Patented April 5, 1870



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN HARVESTERS.

Specification forming part of Letters Patent No. **101,659**, dated April 5, 1870.

To all whom it may concern:

Be it known that I, ELI B. RICE, of Madison, in the county of Dane and State of Wisconsin, have invented certain new and useful Improvements in Harvesters; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable others skilled in the art to which my invention appertains to make and use the same, reference being had to the accompanying drawings forming part of this specification.

Figure 1 is a front elevation of a grain-harvester, showing my improvements applied thereto. Fig. 2 is an end elevation of the same, showing the binding device. Fig. 3 is an end view, opposite the binding device. Fig. 4 is a detached plan view of the apron. Fig. 5 is a detail view of the gatherer and its boxes. Fig. 6 is an end view of the binding-press detached from the machine.

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

My invention has for its object to improve the construction and operation of grain-harvesters; and to this end, it consists, first, in attaching the grain-gatherer to the platform of the machine by a universal joint, whereby the same can be adjusted at any angle to gather a greater or lesser quantity of grain to the sickle. Secondly, in the combination of an inclined adjustable rod or bar with the endless grain-receiving apron of the platform for the purpose of causing the stalks of grain to be fed uniformly and evenly to the binder or grain-receiver. Thirdly, in attaching the rollers carrying the endless apron of the platform to the frame of the machine in such a manner as to prevent the grain from becoming twisted upon the journals of the rollers, and thereby retarding the operation of the endless apron. Fourthly, in the combination of a press of peculiar construction with a harvester, to form the sheaves of grain and to hold and compress them while being bound. Fifthly, in the construction of the press and in the combination therewith of certain parts of the harvester, as will be hereinafter more fully described.

In the accompanying drawings, A is the frame of the machine mounted upon the driving-wheel B and grain-wheel C in the usual

manner. The sickle is operated from the driving-wheel by means of the pivoted lever D and connecting-rod E, and suitable gearing. F is the reel, and G the driver's seat, mounted upon the frame, as shown. The cut of the sickle is regulated by raising and lowering the frame upon the tongue H by means of the lever I and connecting-rod J. K is a slotted frame or apron placed in an inclined position at the inner end of the platform L, and beneath which the endless carrier M passes. This carrier receives the cut grain from an endless belt or rake passing round the roller N upon the platform; and the carrier M is provided with pins or teeth, as shown, which project through the slots in the frame K, to prevent the grain from falling back upon the endless rake. All these parts are of the ordinary construction, and form no part of the present invention.

a is the gatherer formed of the angular rod *b*, having its shorter end secured firmly to a ball, *c*. This gatherer is located at the inner end of the platform, being secured in place by the boxes *d d*, which embrace the ball. By this construction a ball-and-socket connection is formed, which permits the easy adjustment of the gatherer, at any inclination, to collect a greater or lesser quantity of grain to the sickle. The adjustment is effected by means of the set-screw *e* passing through one of the boxes *d*, as shown.

In the use of an endless rake or apron moving at right angles to the draft of the harvester, the cut grain is carried to and up the incline frame K to a binder or receiver in a continuous gavel or swath. The principal difficulty attending this method of carrying off the cut grain is found in the fact that the heads of the grain falling over upon the apron first are moved forward faster than the butts, and therefore rest unevenly and irregularly upon the apron, and are carried to the binder or receiver in such a condition as to render their easy formation into bundles or sheaves extremely difficult. I propose to overcome this objection by the use of a rod or bar, *f*, placed at a greater or lesser inclination above the endless apron of the platform and parallel with the line of motion of said apron.

One end rests upon or in the frame near the grain-wheel C, and the other end bears at any

suitable point upon the lower end of the slotted frame K, as shown in Figs. 1 and 4. It is necessary that the rod shall be placed so near the sickle as to receive the falling grain at or near the heads.

By the use of the inclined rods the heads of the cut grain are retarded somewhat to permit the stalks to be carried forward to the inclined frame by the endless rake, at the same rate of speed and simultaneously with the heads, so that all the cut stalks shall be received by the endless carrier M, parallel to each other. By this means the gavels are formed and presented uniformly to the binder or receiver.

To prevent the grain from becoming entangled and twisted upon the journals of the rollers N, and thereby retarding their motion, recesses are formed in the side bars A' of the platform to receive the ends of the rollers and their journals. By this arrangement it is impossible for the grain to reach the journals to clog and arrest their motion.

My improved binder or press is located at the end of the frame A upon a suitable platform, B', immediately beneath the upper curved end of the slotted frame K, as shown in Fig. 1. This press is composed of a cylindrical tube divided longitudinally with the two parts, preferably halves, *g g'*, pivoted together and to the standard *h*, as shown at *i*. The lower half *g* is held firmly in a horizontal position, and the upper half is adapted to open and close upon the lower by any suitable means.

In this example of the press the arm *j* of the half *g* extends towards the front of the machine and furnishes bearings for a shaft, *k*, carrying the hand-wheel *k'* and pinions *l*. The forward end of the half *g'* is provided with a segmental rack, *j'*, which engages with the pinion *l*.

By operating the hand-wheel the press is opened and closed, as will be readily understood.

m is the lining of the press, composed of a sheet of thin elastic metal and secured at its center to the interior of the lower half *g* of the press. Its free edges extend upward and are lapped over each other and inclosed completely within the press when the latter is closed, as shown clearly in Fig. 6. *n* is an apron firmly secured to the upper end of the frame K, and, extending downward in a slightly inclined position, forms a concave grain-receptacle, *o*, on a line with the bottom of the press. *p* is a straight apron hinged to the apron *n* near its upper end and connected at its rear edge to a treadle, *q*, upon the plat-

form B' by means of the connecting-rod *r*. This apron should be of such a width that when thrown down its lower edge shall enter the press between the two upper edges of the lining *m*.

The operation of forming a sheaf is as follows: The grain is carried up the inclined frame K until a sufficient quantity is accumulated upon the apron *p* to form a sheaf, when the apron is swung down by pressing upon the treadle *q*, and the gavel discharged upon the concave apron *o* with the stalks or butts resting within the lining *m* of the press. The treadle is then released and the apron *p* thrown up by a suitable spring, *s*, to collect another gavel. To complete the formation of the sheaf the press is closed in the manner previously described by operating the hand-wheel *k*, compressing the sheaf into the required dimensions and holding the same in position until bound by suitable means, when the press is opened and the completed sheaf discharged.

The object of the lining *m* is to hold the stalks of grain within the press and prevent their being caught between the two halves *g g'* when the press is closed.

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

1. The grain-gatherer *a* connected to the platform of the harvester by a universal joint, for the purpose specified.
2. The inclined adjustable rod *f*, in combination with the endless rake-apron of a harvester, for the purpose specified.
3. The rollers N, carrying the endless rake-apron of a harvester when their ends and journals revolve within recesses formed in the frame of the platform, for the purpose specified.
4. In combination with a harvester, a press composed of two concave parts pivoted together at one end, and operating to form the sheaves of grain, and to hold and compress the same while being bound, substantially as described.
5. The press *g g'*, composed of two concave parts pivoted together and provided with an elastic lining, as and for the purpose specified.
6. In combination with the press *g g'*, the concave apron *n*, and hinged apron *p*, all constructed and operating as and for the purpose specified.

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