J. F. STEWARD.

Grain-Binders.

No. 211,354. Patented Jan. 14, 1879.

Fig. 1.

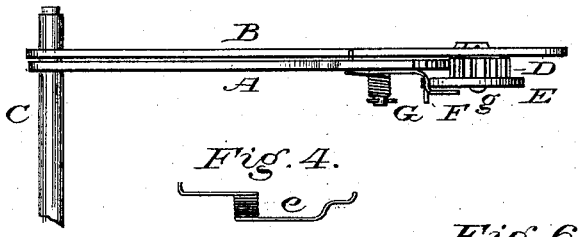

Fig. 4.

Fig. 6.

Fig. 5.

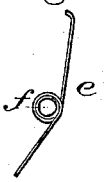

Fig. 2.

Fig. 3.

Witnesses:

J. D. Rouse

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UNITED STATES PATENT OFFICE

JOHN F. STEWARD, OF PLANO, ILLINOIS.

IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. **211,354**, dated January 14, 1879; application filed October 8, 1878.

To all whom it may concern:

Be it known that I, JOHN F. STEWARD, of Plano, in the county of Kendall and State of Illinois, have invented new and useful Improvements in Grain-Binders, of which the following is a full description, reference being had to the accompanying drawings, in which—

Figure 1 is a side view, and Fig. 2 is a plan view, while Figs. 3, 4, 5, and 6 are details.

My invention relates to that class of grain-binders in which the twisting devices are operated by a reciprocating rack, or where the said mechanism is operated by a pinion having a reciprocation along a stationary rack.

As shown, my invention is applicable to that class of grain-binders that advance toward the receptacle to gather the gavel and go through the several operations of completing the band in their outward movement.

The object of my invention is to provide for the rotation of the twisting device only while passing outward along the stationary rack, (when used in the form shown in the drawings,) and to provide against a retrograde rotary motion while passing inward over the same.

In the drawings, A is a curved rack, with its curved extremities untoothed, for the free passage of the lock-pinion when not in labor, supported on the post C. B is a sweep, pivoted upon the post C, carrying the pinion D, for operating the twisting mechanism and vibrating along the rack A. The disk E may be a gear for operating the twister, which, in practice, I locate in the opening at the outward end of the said sweep. G is a latch, retained in position by the spring *e*, and pivoted upon the stud *f* secured to the rack. This latch, it will be seen, is pivoted at one end of the toothed portion of the rack, while its other extremity is prolonged, as shown at *a*, and so bent downward that the disk E may pass over it. Beneath the bottom side of the disk E is the pin F. At H the rack is deeply cleft for the passage of the elongated tooth *i* of the pinion D. The gap H is partly closed by the portion *b* of the latch G, made of such a length as to reach the arc outlining the ends of the teeth of the rack A. The pinion D being designed to slide over the rack in one direction, its teeth upon one side are cut away and the tooth *i* lengthened into a shoe, so as to provide an adequate amount of surface. The stud *f*, upon which the latch G is pivoted, being lengthened, serves as a support for the spring *e*. The stud *g* serves as an axis for the pinion D. The part of the sweep B immediately above the pinion D is cut away in the drawing, Fig. 2, to expose the parts more clearly to view.

The operation of my invention is as follows: The pinion D, mounted upon the sweep B, starting in its reciprocation from the position shown in Fig. 2, the pin F of the disk E strikes the extension *a* of the latch G, causing said pinion to commence its rotation in the direction indicated by the arrow. By this partial rotation the tooth *h* is forced into engagement with the first tooth of the rack, when the pinion is caused to rotate to the completion of its revolution by the continued engagement of the teeth. During the last part of the revolution the tooth *i* will be carried into the space H, its greater length allowing it to step over the projection *b*, thus entering the notch and forcing *b* out of its way during its passage, when the part *b* is returned to the position of partly closing the space by the spring *e*. Upon the retrograde movement of the sweep, there being nothing to engage with the pin F, the pinion is not started in a reverse rotation, and the lengthened surface from *h* to *i* slides along the teeth of the rack. To provide against the pinion being made by any extraneous force to engage with the tooth *k* of the rack in its retrograde movement, the part *b* is supplied, and it will be seen that any attempt to force said engagement will be met by the tooth *i* coming in contact with its end and being caused to slide over. The pinion continuing its sliding movement, the pin F will come in contact with the latch *a*, but this being held in position by the spring *e* will readily yield, allowing the pin a free passage. The part *b* of latch G, acting in connection with the tooth *i*, is placed horizontally in relation to it; but the part *a*, acting with the pin F, which is below the disk, is thrown down accordingly, as shown in detail in Fig. 6.

The spring *e* may be made in any of the usual forms, but I prefer to use it as shown in Figs. 4 and 5.

It will be seen that is device is equally applicable whether the twisting head reciprocates over the rack or is stationary, and its mechanism operated by a reciprocating rack or disk; hence I do not wish to confine myself to the particular form shown.

a and *b* may be individual parts, each having a separate spring; but I prefer them combined, as shown.

I claim as of my invention—

1. The rack A, in combination with the pinion D and with the yielding projection or trip *a*, causing the teeth of the rack and pinion to engage at the proper time, substantially as described.

2. The rack A, in combination with the pinion D, having a shoe or delay-surface, and the yielding projection *b*, causing the shoe or delay-surface to slide over the teeth of the rack on the return movement, substantially as described.

3. The combination of a rack with a pinion vibrating or reciprocating along the face of the rack, and provided with a shoe or delay-surface, which slides upon the teeth of the rack in the return movement and locks the pinion against rotation, substantially as described.

4. The combination of the rack A, pinion D, and latch G, as and for the purpose specified.

JOHN F. STEWARD.

Witnesses:
F. J. HUSE,
R. H. DIXON.