W. H. PAYNE.
Grain-Binder.

No. 214,790. Patented April 29, 1879.

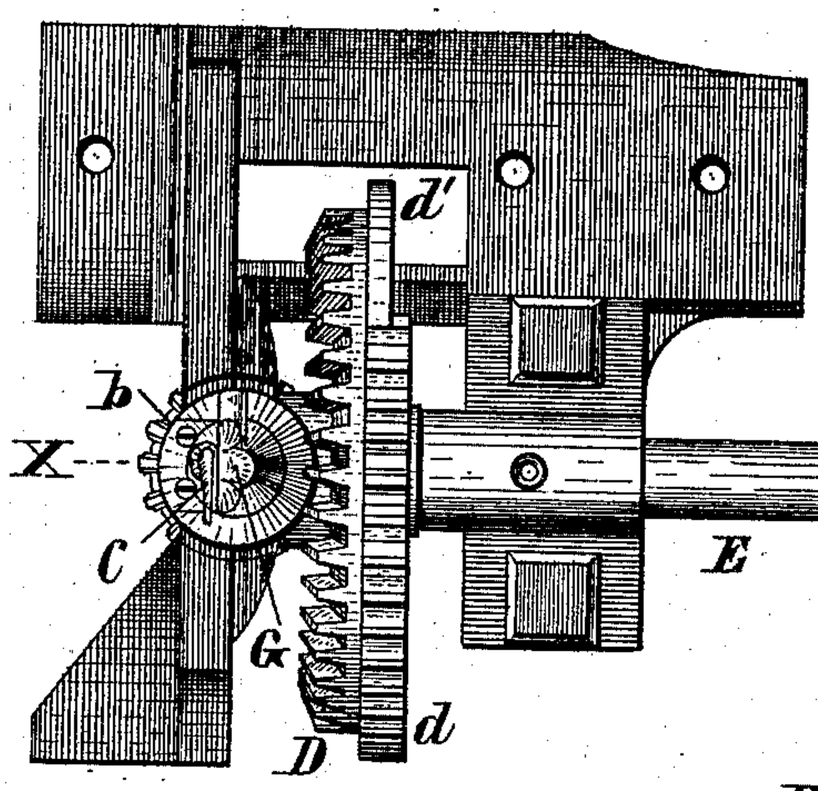

Fig 1

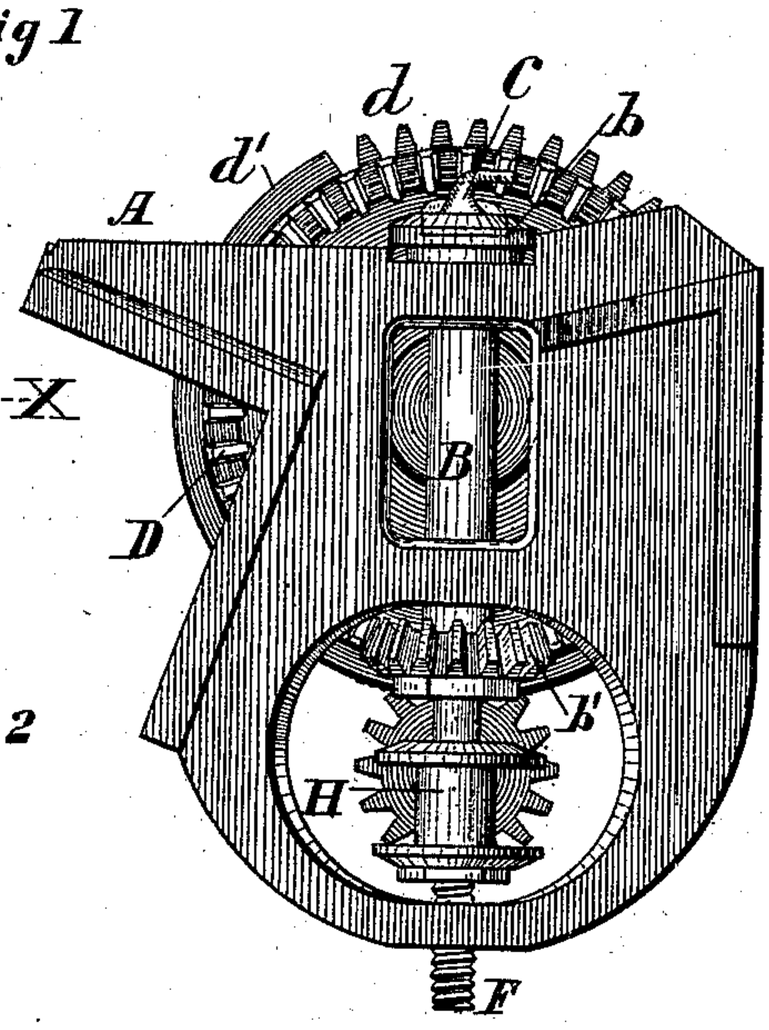

Fig 2

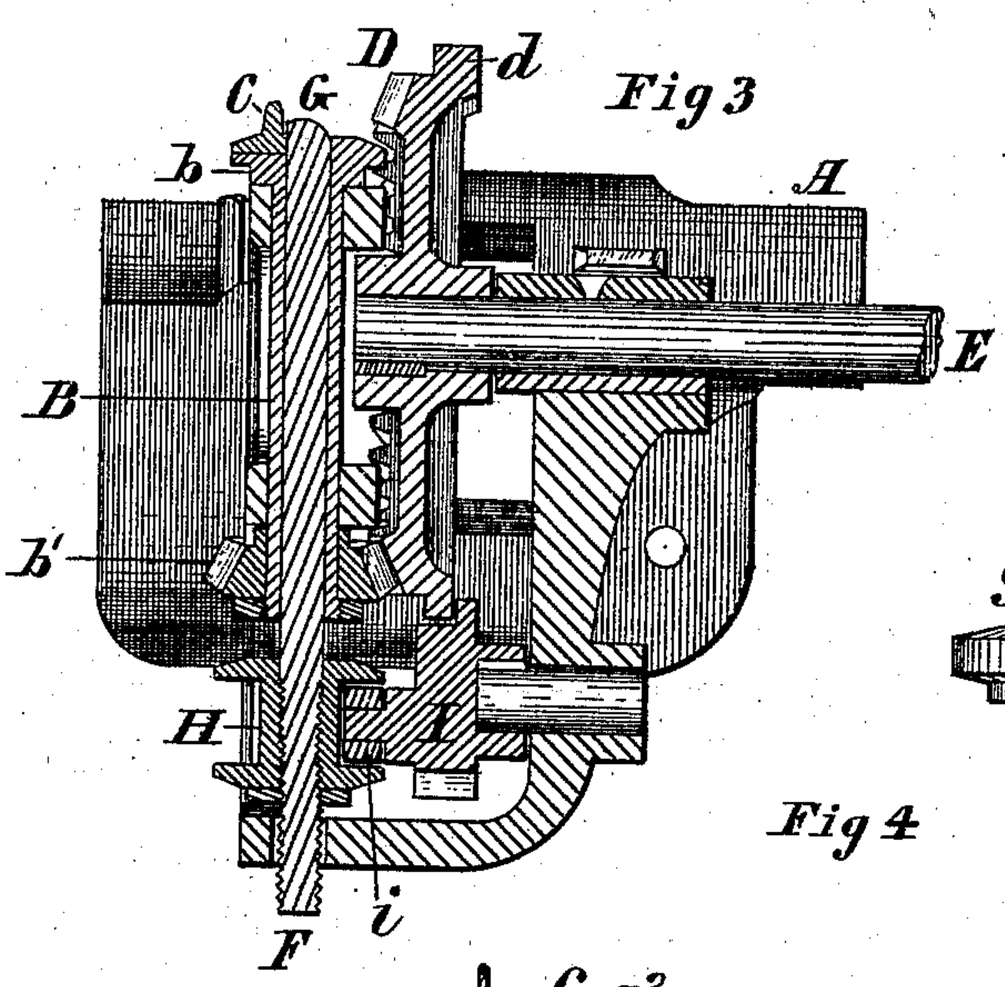

Fig 3

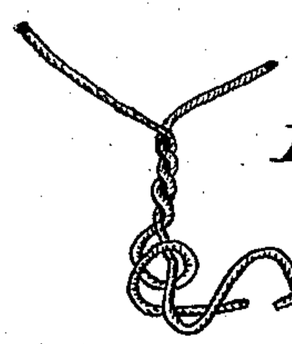

Fig 9

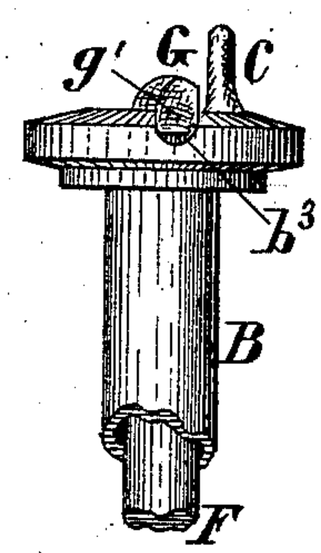

Fig 4

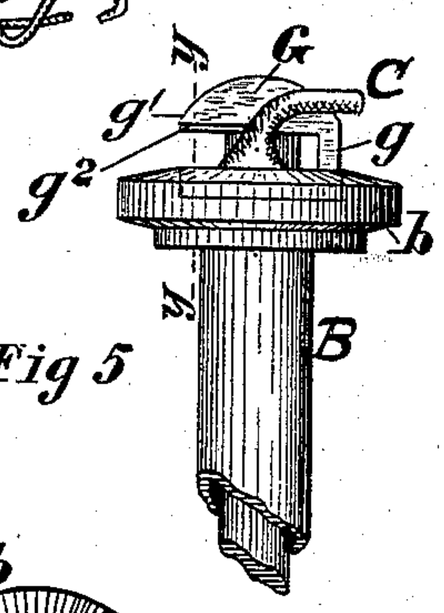

Fig 5

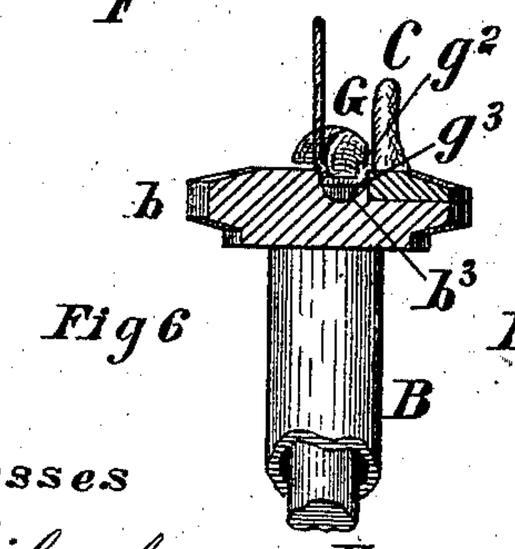

Fig 6

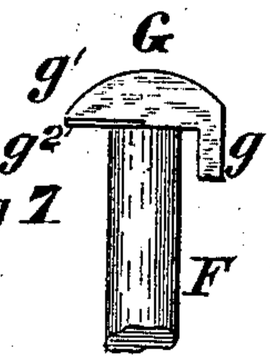

Fig 7

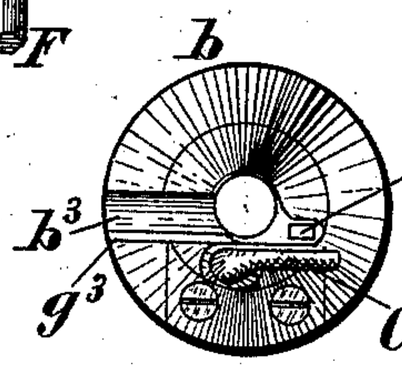

Fig 8

Witnesses
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WILLIAM H. PAYNE, OF SANDWICH, ILLINOIS.

IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. **214,790**, dated April 29, 1879; application filed December 14, 1878.

To all whom it may concern:

Be it known that I, WILLIAM H. PAYNE, of Sandwich, in the county of De Kalb and State of Illinois, have invented a new and useful Improvement in Grain-Binders, which is fully described in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a plan view of so much of a grain-binder attachment as is necessary to illustrate my invention; Fig. 2, an end elevation of the same; Fig. 3, a vertical section thereof, taken on the line *x x*, Fig. 1; Fig. 4, a detail of the upper portion of the twister and cutter on an enlarged scale; Fig. 5, a similar view, showing the cutter raised; Fig. 6, a vertical section taken on the line *y y*, Fig. 5, but with the cutter lowered; Fig. 7, a detail view of the upper portion of the cutter detached; Fig. 8, a plan view of Fig. 4; and Fig. 9, a view of the twist which secures the band.

My invention relates to that class of grain-binders in which a twister-hook is used; and its object is to improve the band-cutter and mechanism for operating the same.

The invention consists in a wire-cutter arranged on a shaft placed loosely within the twister-shaft, and raised at suitable intervals to cut the wire after the twist is formed.

It also consists in constructing the cutter with a hook or projection, which serves the purpose of a clamp to hold the free end of the band-wire.

It also consists in the special mechanism for operating the wire-cutter, and various combinations of devices, all of which will be hereinafter fully described, and more particularly pointed out in the claims.

In the drawings, A represents a supporting-bracket frame, in which the twisting apparatus is mounted, and which is fastened to the binder-frame by any suitable means in the position required for the twister-hook to take the wire as it is delivered by the binding-arm. In this frame is mounted a hollow vertical shaft, B, at the upper end of which is an enlargement or head, *b*, on which the twister-hook C is placed, being arranged eccentrically to the center of motion of the shaft. At the lower end of this tubular shaft is a bevel-pinion, *b'*, with which a bevel-gear wheel, D, engages, the latter being secured to a horizontal shaft, E, which, in turn, is driven from some part of the main gearing of the binder, and thereby the necessary rotation is imparted to the twister to form the fastening-twist in the band, the gearing being arranged, of course, to provide for the stops in the revolution of the twister at the proper intervals.

A shaft or rod, F, is mounted loosely in the tubular shaft B, so that it is free to slide up and down therein. The upper end of this rod projects above head *b*, and is provided with a cutter, G. This cutter constitutes a cross-head at the upper end of its shaft, and is arranged at one side of the latter, so as to slide up and down by the side of the twister-hook. It may be circular in form on its upper edge, and is provided at one end with a stud, *g*, which is arranged to enter an aperture, b^2, in the head *b*, thereby serving as a guide for the cutter, and preventing its shaft from turning within the shaft B. The other end, g^1, is the cutter, and is provided with a cutting-edge, g^2, as shown in Figs. 6 and 7 of the drawings, and is arranged to enter a groove, b^3, in the head *b*, for the purpose of clamping and holding the free end of the wire after it is severed, as will presently be described.

A grooved nut, H, is arranged on the lower end of the shaft F, projecting below the tubular shaft B, the lower end of the former being threaded, so that the nut may be adjusted vertically.

A pinion, I, is mounted on a short horizontal shaft, and is provided with an eccentric-pin, *i*, arranged to enter the annular groove in the nut H, as shown in Fig. 3 of the drawings, so that the rotation of the pinion will raise and lower the cutter-shaft F by the action of the eccentric-pin on the nut H. The pinion I is rotated intermittently by a segmental gear, *d*, on the gear-wheel D, and is prevented from rotating when disengaged from this gear by a stop-flange, *d'*, on the same wheel.

The free end of the wire is clamped and held under the end g^1 of the cutter, as shown in Fig. 6 of the drawings, and the twister stands in the position shown in Fig. 1 of the drawings.

At the proper moment, when the second strand of wire is delivered to the twister, the latter is rotated, thereby twisting the two strands of wire together in the well-known way.

The lifting mechanism is so timed that just as the twister is to make its last revolution the cutter is raised, so that the last turn of the twister will draw the feeding-wire in underneath the cutting end g^1 of the cutter-head, and as the twister is about completing its last revolution the cutter is drawn down and the wire severed between the cutting-edges g^2 on the cutter-head and g^3 on the twister-head.

It will be seen that the wire is severed just as the end g^1 comes into the groove in the twister-head, so that the free end of the wire is instantly caught and clamped underneath this end of the cutter-head, and the twister again stops in the position shown in Fig. 1 of the drawings. This construction and arrangement of the twister and cutter produce a long twist, as shown in Fig. 9 of the drawings, the coils found on the twister-hook being left on the twist and shed off from the hook as the bundle is discharged when the twister stops. This twist obviates the objection, which has heretofore been made to a short twist with clean-cut ends, that it is quite too easily pulled apart, thereby occasioning more or less annoyance in handling bound grain.

The twist shown in Fig. 9, with long ends, cannot be pulled out under any ordinary strain, and is therefore much more desirable than the short clean-cut twist referred to above.

In constructing and arranging the several devices above described, I have adapted the mechanism to work in connection with my revolving-arm binder heretofore patented by me; but the devices are applicable to other styles of binders, it being necessary only to change the construction and arrangement of the different parts to suit the machine in which they are to be placed, and I do not therefore limit my invention to the precise construction and arrangement of all the parts as herein set forth and shown.

The provision for the adjustment of the nut on the cutter-shaft admits the movement of the latter to be nicely regulated, so as to clamp and hold the band-wire with certainty. The nut is held fast in any adjusted position by a jam-nut, which in the drawings is shown arranged below the groove-nut.

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

1. In a grain-binder, a tubular shaft carrying the twister-hook, in combination with a band-cutter arranged upon a shaft mounted loosely within the twister-shaft, with which it is connected, so as to turn therewith, but is free to move longitudinally therein, substantially as described.

2. A revolving twister-hook, in combination with a reciprocating cutter timed to move up above the wire at the last turn of the twister, whereby the wire is drawn in underneath the cutter by the last revolution of the twister and severed as the cutter is drawn back, substantially as described.

3. The twister-head provided with a groove, in combination with the reciprocating cutter, constructed and arranged to clamp the free end of the wire within said groove when it is severed, substantially as described.

4. The tubular twister-shaft B, in combination with the cutter-shaft F, mounted loosely therein, the grooved nut H on the cutter-shaft, and the revolving eccentric-pin i, substantially as described.

5. The tubular twister-shaft B, in combination with the reciprocating cutter G, provided with a guide-stud, g, and the twister-head b, provided with a guide-aperture, b^2, substantially as described.

6. The twister-head b, provided with a groove, b^3, and a cutting-edge, c, in combination with the reciprocating cutter G, the end g^1 of which is provided with a cutting-edge, g^2, and is arranged to clamp the severed wire in the groove b^3, substantially as described.

7. The tubular shaft B, in combination with the twister mounted on a head at the end of the shaft, the cutter G on the reciprocating shaft F, within the twister-shaft, the adjustable grooved nut H on the cutter-shaft, and the pinion I, provided with an eccentric-pin, i, substantially as described.

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Witnesses:
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E. M. HILLS.