

P. F. McCLURE.

Knot-Tying Mechanism for Grain-Binders.

No. 219,169.

Patented Sept. 2, 1879.

Fig. 1.

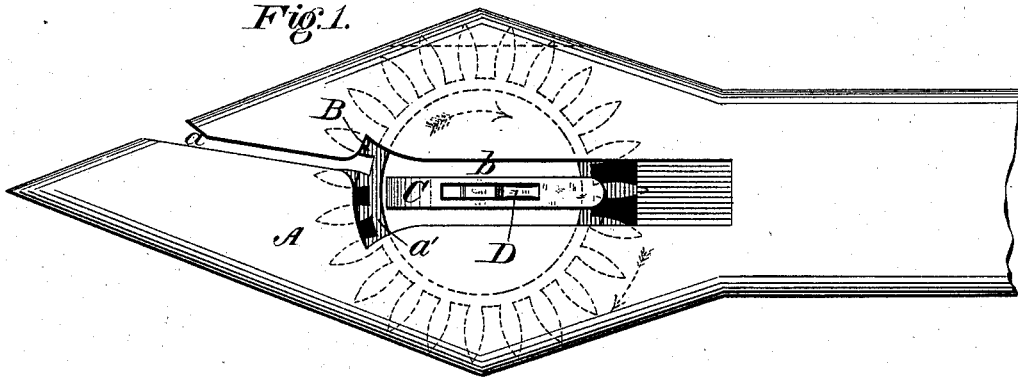


Fig. 2.

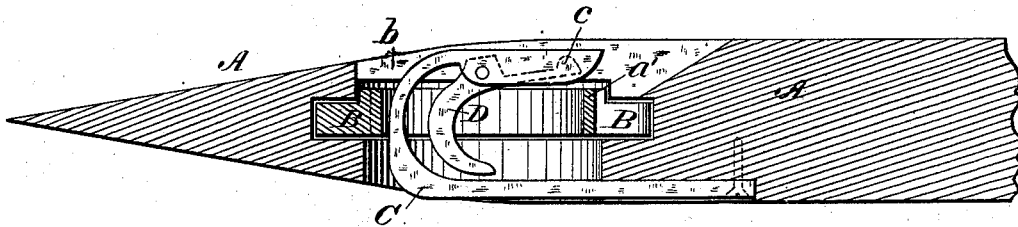
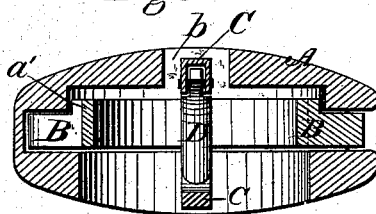


Fig. 3.



Witnesses:

Donn P. Fritchell.
Will W. Dodge

Inventor:

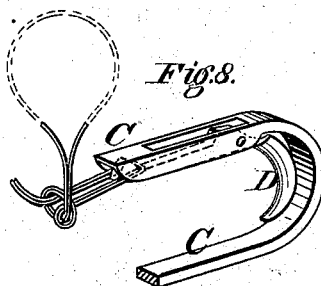
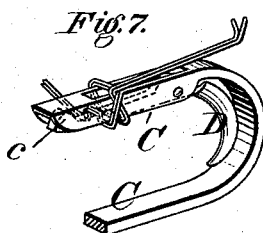
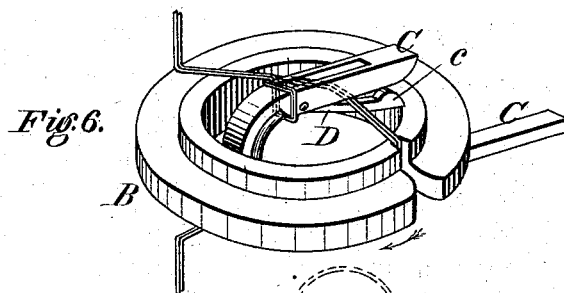
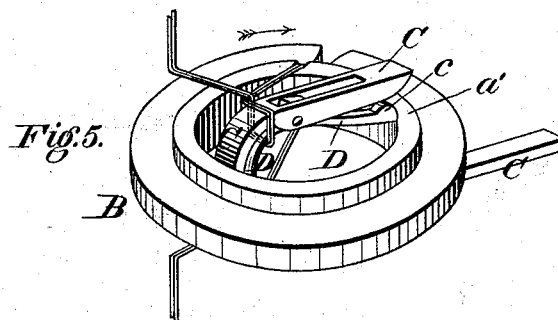
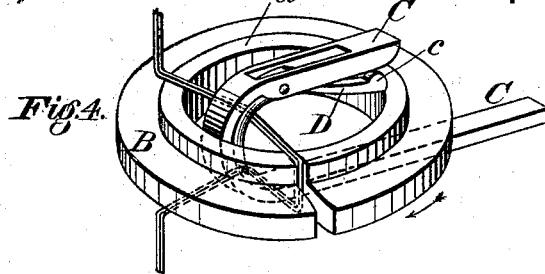
P. F. McClure,
By his atty.
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Witnesses:

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UNITED STATES PATENT OFFICE.

PATTISON F. McCLURE, OF JUNCTION CITY, KANSAS.

IMPROVEMENT IN KNOT-TYING MECHANISMS FOR GRAIN-BINDERS.

Specification forming part of Letters Patent No. 219,169, dated September 2, 1879; application filed December 27, 1878.

To all whom it may concern:

Be it known that I, PATTISON F. McCLURE, of Junction City, in the county of Davies and State of Kansas, have invented certain Improvements in Knot-Tying Mechanisms for Grain-Binding Machines, of which the following is a specification.

My invention consists in a knot-tying device composed of a fixed nipper or holding device and an annular or ring-like cord-carrier mounted and revolving around the nipper to present the cord thereto in such manner as to cause the formation of a single bow-knot.

The device is susceptible of modification in its details, and may be mounted and operated in any suitable manner. It is particularly valuable in that it may be substituted in existing machines for the wire-twisting devices, whereby the machines may be converted, at a trifling expense, from wire-binders to cord-binders.

The drawings represent the device applied to the end of a movable binder-arm of ordinary form.

Figure 1 represents a top-plan view of the binder-arm and knotting devices; Fig. 2, a longitudinal central section of the same; Fig. 3, a transverse section of the same; Figs. 4, 5, and 6, perspective views, showing the annular cord-carrier and the nippers with the cord thereon during different steps or stages in the formation of the knot; Fig. 7, a perspective view of the nippers and the cord thereon just previous to the completion of the knot; Fig. 8, a perspective view, showing the knot at the instant of completion as it is in the act of leaving the nippers.

A represents the pointed end of the binder-arm or the "shuttle," as it is sometimes called, provided in its front end with the usual slot *a* to admit the ends of the applied band to the fastening devices. The arm will be mounted and operated in such manner as to carry the cord around the bundle of grain and effect the entrance of the ends into the slot.

B represents a horizontal annular or ring-like pinion, supported at its periphery in the arm A in such manner as to turn freely therein, and with sufficient space around its edges to admit of the cord slipping between them and the inside of the binder-arm. The periphery

of the pinion, which serves as a cord-carrier, is provided with gear-teeth exposed on one side to engage with a rack, which will be used to give it a rotary motion in the arm. On its upper side the pinion has an annular rim or flange, *a'*, which serves the double purpose of fitting into a seat in the arm and preventing the shifting of the pinion, and also of sustaining the cord and facilitating its entry into the clamping devices. The binder-arm is cut away on the under side to correspond with the central opening in the pinion, and is provided with a slot, *b*, extending across the pinion, as shown.

As a means of holding and tying the cord I secure to the under side of the binder-arm a rigid finger, C, curved upward within the front side of the pinion-ring, and thence backward to a point at or near its rear edge, as shown. Within the upper end of the finger C, which is grooved or recessed on the under side, I pivot a nipper or latch, D, the upper end of which is provided with a raised stud, *c*, and arranged to shut into the end of the finger C, while the lower end is curved downward along the inner face of the upright portion of the finger. It is to be noted that the lower end of the latch or nipper is made heavier than the other, so that its weight causes the upper end and stud *c* to remain closed up within the finger C whenever the parts are left free. Instead of depending on the weight of the latch for the purpose named a spring may be applied.

The above-described devices constitute the whole of the knotting mechanism proper; but devices to hold, cut, and release the cord will be used in connection. These devices, which constitute no part of my invention, may be of any suitable construction and arrangement.

The operation of my devices is as follows: The two ends of the applied band are caused to pass backward within the slot *a* and enter one of the notches or spaces between the teeth of the pinion-ring B. The cords being held by guides at a point above or below the binder, or both, the pinion-ring is given two revolutions within the arm in the direction indicated by the arrow. The cord being caught and held in the edge of the pinion, the rotation of the latter first carries the cord around the upright portion of the finger C, as shown in Figs.

4 and 5. The cord thus applied acts upon the lower end of the latch or nipper D, and causes its upper end to open or swing downward away from the end of finger C, as shown. The second rotation causes the pinion to pass the cord between the upper end of the finger and the latch, as shown in Fig. 6, in which figure it will be seen that the cord forms a loop, encircling the upper ends of the finger and latch. After the cord has been thus applied the ring is permitted to remain at rest, during or immediately previous to which the severance of the applied band from the main cord is effected, and the ends of the band below the pinion thus released. The band is then drawn toward the end of the finger D, the effect of which is to cause the loop around the finger to slide off over its end, as shown in Fig. 8, the ends of the cord being meanwhile retained by the latch or nipper and drawn through the loop in a bow form, as shown, thereby completing a bow-knot and securing the ends of the band firmly together. The strain of the loop around the finger and latch causes the latter to hold the cord firmly and secure the tightening of the knot before the cord is released. The passage of the loop over the end of the finger and latch releases the latter, which in turn releases the knot.

The latch may have a shoulder or hook of such form as to retain the ends of the cord and draw them completely through the loop, so as

to produce a dead or lock knot instead of the bow-knot.

The essential feature of my invention is the combination of a rotary cord-carrier, in connection with fixed central holding devices to secure the formation of a knot, and so long as the general construction and mode of operation remains unchanged the details may be modified as desired.

Having thus described my invention, what I claim is—

1. In a knot-tying mechanism, the combination of an immovable finger, C, a latch or nipper, D, attached thereto, and an annular cord-carrier, B, arranged to rotate around the finger and latch, as shown.

2. The combination of the slotted binder-arm A, the pinion-ring B, the fixed curved finger C, and the double-ended latch D, substantially as shown and described.

3. The combination, with a movable binder-arm, a cord-nipper or holding device, substantially such as shown, attached thereto, and an annular cord-carrier sustained and adapted to be driven directly at its periphery, and arranged to revolve around the cord-nipper or holding device, substantially as shown.

PATTISON FRANCIS McCLURE.

Witnesses:

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