2 Sheets—Sheet 1.

N. WERTS & J. G. GILMER.

GRAIN BINDER.

No. 190,993. Patented May 22, 1877.

Fig. 1.

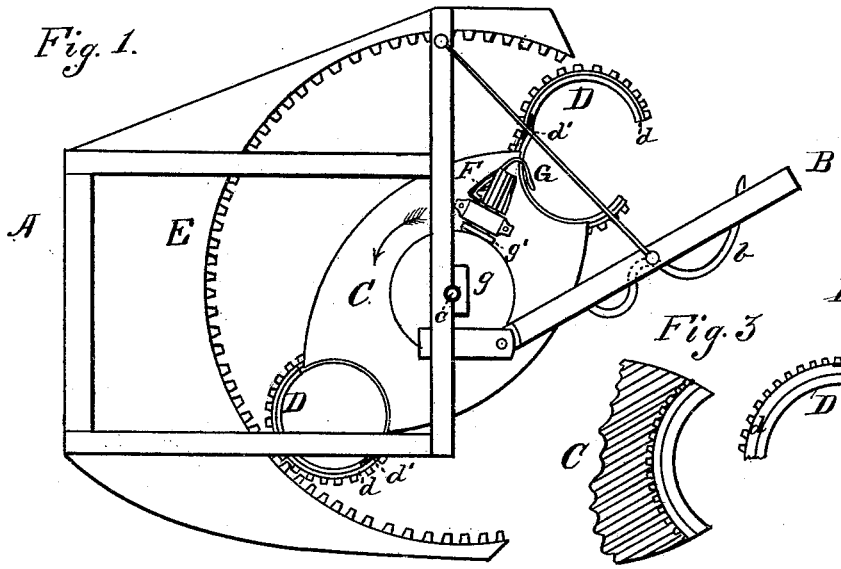


Fig. 3

Fig. 4

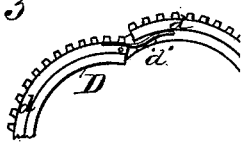


Fig. 2.

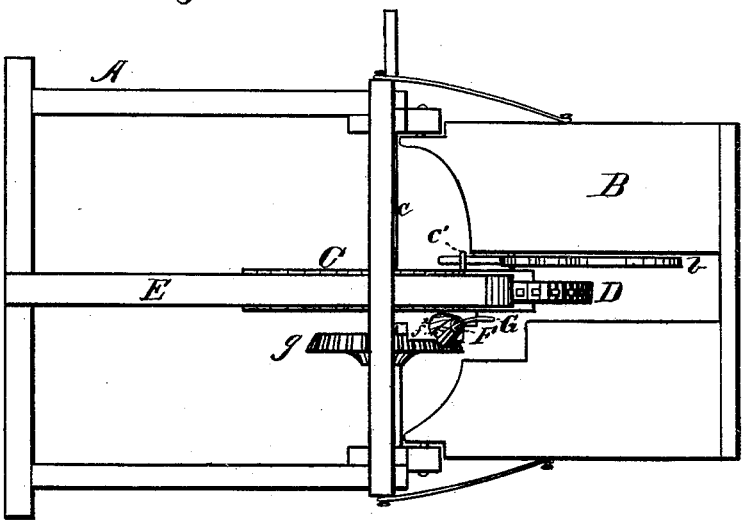
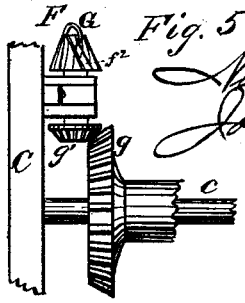


Fig. 5



WITNESSES

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2 Sheets—Sheet 2.

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GRAIN BINDER.

No. 190,993. Patented May 22, 1877.

Fig. 6

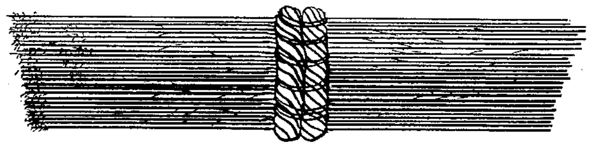


Fig. 7.

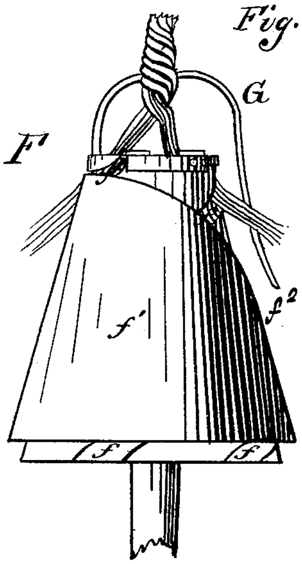
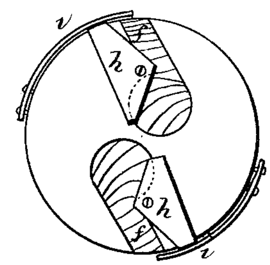


Fig. 8



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UNITED STATES PATENT OFFICE.

NICHOLAS WERTS AND JOHN G. GILMER, OF CONCORDIA; SAID NICHOLAS WERTS ASSIGNOR OF ONE-FOURTH INTEREST TO GEORGE W. WERTS, OF BELOIT, KANSAS.

IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. **190,993**, dated May 22, 1877; application filed June 8, 1876.

To all whom it may concern:

Be it known that we, NICHOLAS WERTS and JOHN G. GILMER, of Concordia, in the county of Cloud and State of Kansas, have invented certain new and useful Improvements in Grain-Binders; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification, and in which—

Figure 1, Sheet 1, is a side elevation of our improved grain-binder; Fig. 2, a plan view thereof; and Figs. 3, 4, and 5 are detached views of the same. Fig. 6, Sheet 2, is a view of the band made by our machine; and Figs. 7 and 8 are views of the twister.

Corresponding parts in the several figures are designated by like letters.

This invention relates to a certain improvement in grain-binders; and it consists of the construction of the twister of the mechanism for receiving or holding and rotating the gavel; and of the combination therewith of the twister and its operating mechanism, substantially as hereinafter more fully set forth.

In the annexed drawing, A refers to a frame, to which is hinged a table or leaf, B, to receive the gavel to be bound. In the table or leaf B is a curved lever or hook, *b*, the function and operation of which will be hereinafter described.

C is an oblong or other suitably-shaped disk, secured to an axis or shaft, *c*, bearing in the frame A, and rotated by a belt or other medium driven by gearing upon the reaper or harvester. The ends of this disk are recessed, to conform to the openings in circular clamps D D adjusted therein. The clamps D D are retained in the disk C by flanges *d d* upon their peripheries entering grooves in the disk. These clamps are each formed in two parts, hinged together at one side, and sprung open automatically to receive the gavel, when occupying the position indicated in Fig. 1, by the springs *d' d'*. It is when the clamps are sprung open the curved lever or hook *b* is brought into use, the hook or lever at this juncture being struck at its inner end by a pin or projection, *c'*, upon the disk C, causing its forward end, across which the gavel upon the table B has been placed, to throw the gavel into the open clamp. As the disk C continues to revolve in the direction of the arrow, the open clamp with its gavel will be closed by contact with the toothed segment E in the frame A, the end of the disk C having the open clamp approaching the said toothed segment until the clamp is closed, after which that end of the disk will maintain the same distance from the said segment. The clamp, with gavel at the opposite end of the disk C, when the open clamp has been closed, will have reached the lower extremity of the toothed segment E, and be sprung open and release or discharge its bound gavel, and ascend in an open position above the table or leaf B to receive a second gavel for binding. Upon the peripheries of the clamps D D are teeth or cogs gearing with the teeth or cogs of the segment E, by which an independent rotary movement is imparted to the said clamps for rotating the gavels. F is the twister, having its axis bearing in a journal-box, secured to the disk C in proximity to the open clamp and a beveled cog-wheel, *g*, upon the disk, shaft, or axis *c*, by which the twister is rotated to perform the twisting of the straw to make the band, a beveled gear-wheel, *g'*, upon the axis of the twister, gearing with the gear or cog wheel *g*. A duplication of this mechanism is used in connection with the clamp at the opposite end of the disk in binding two bundles or gavels simultaneously or alternately.

The twister F in its general outline is the frustum of a cone, which has two spiral grooves, *f f*, winding around the cone in opposite directions. Surrounding the grooved cone or twister proper is a casing, f^1, conforming to the shape of the cone, and having an opening, f^2, out through which the ends of the straws in the grooves of the twister or cone to form the band may project to avoid crowding, &c.

The casing f^1 does not partake of the rotary motion of the cone, it being fastened to the bearing of the axis of the cone or twister proper. Pivoted alongside of the orifices of the spiral grooves *f f*, and slightly overhanging the same, are triangular or other suitably-shaped cams *h h*, having their outer ends in contact with springs or plates *i i* fastened to the periphery of the cone, and having their free ends partially closing the entrances to the grooves *f f*.

This mechanism prevents the crowding of the grooves, as it will be seen that, should more straw be taken up by the twister than will be contained in the grooves, the surplus or excess will press against the plates or cams *h h*, which, in turn, will press the springs *i i* outwardly, enlarging the entrances to the grooves, and allow the excess or surplus of straw to escape. Attached at one end to the casing f^1, and overhanging the outer end of the twister or cone, is a bow, G. The gavel being in position in the clamp or clamps, and receiving a rotary motion, and the disk having the clamps a like motion, and the twister also rotated, the free end of the bow will take up straws from below the head of the gavel, small portions of which will be caught alternately by the hooks or points at the entrances of the grooves *f f* in the cone. The straws thus caught will be twisted over each other toward the butts thereof by the rotary movement of the cone F, and carried around the gavel by the rotary movement of the gavel, and this process continued until the band encircles the gavel one or more times, when the gavel is released from the clamps D D, and the twister F then ceasing to engage straws, the twisted portion of the straw last released from the twister F is thrust into the gavel, and the end of the band secured in place by mechanism not deemed necessary to be here described.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

1. The twister F, consisting of a grooved cone, having the orifices of its grooves provided with cams *h h* and springs *i i*, substantially as shown and described, and for the purpose set forth.

2. The twister F, composed of the double grooved cone and bow G, attached to a casing, f^1, encircling the cone, substantially as and for the purpose set forth.

3. The disk C, having the cogged clamps D D, rotated by and in combination with the toothed or cogged segment E, substantially as and for the purpose set forth.

4. The disk C, having the cogged clamps D D and cogged or toothed segment E, in combination with the table B, having the curved lever or hook *b*, operating in conjunction with the disk C, substantially as and for the purpose set forth.

5. The twister F, having its axis provided with a gear-wheel, g', cog-wheel *g*, and axis or shaft *c*, in combination with the disk C, having the cogged clamps D D and toothed segment E, substantially as and for the purpose set forth.

In testimony that we claim the foregoing as our own we hereunto affix our signatures in presence of two witnesses.

NICHOLAS WERTS.
JOHN G. GILMER.

Witnesses:
WM. MCK. BURNS,
DECK HOUSTON.