J. F. STEWARD.

GRAIN-BINDER.

No. 173,511. Patented Feb. 15, 1876.

Fig. 1.

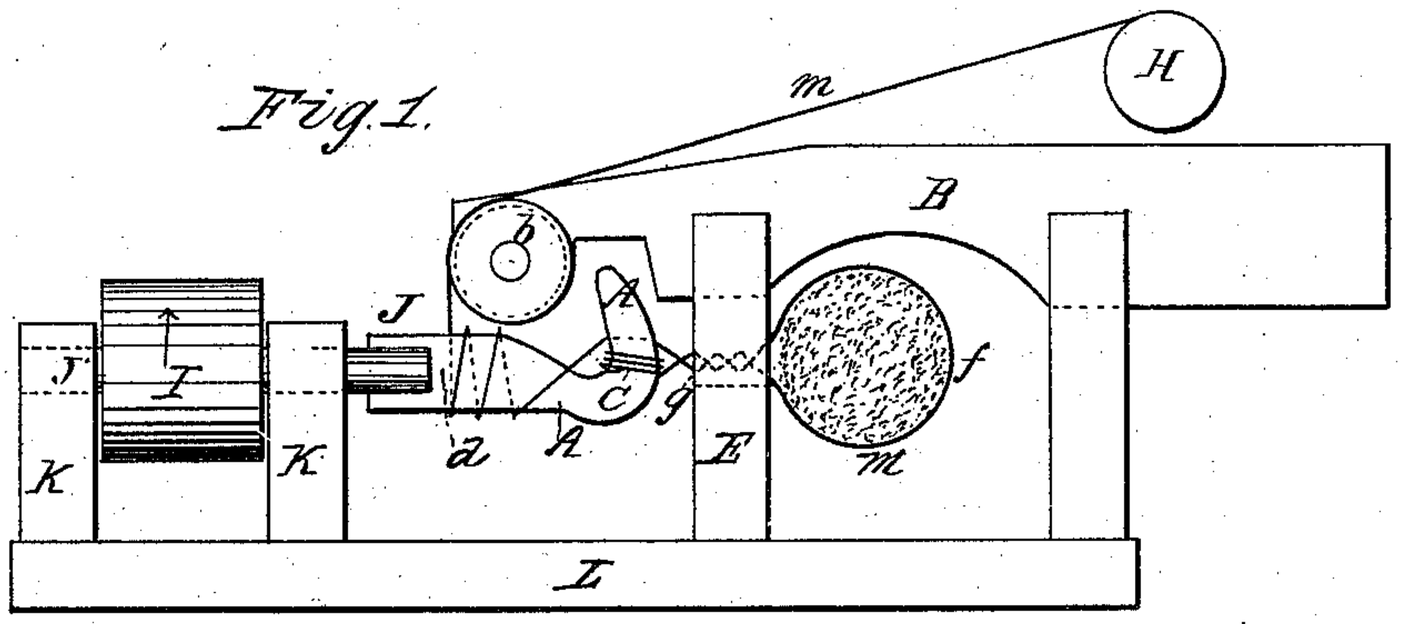


Fig. 2.

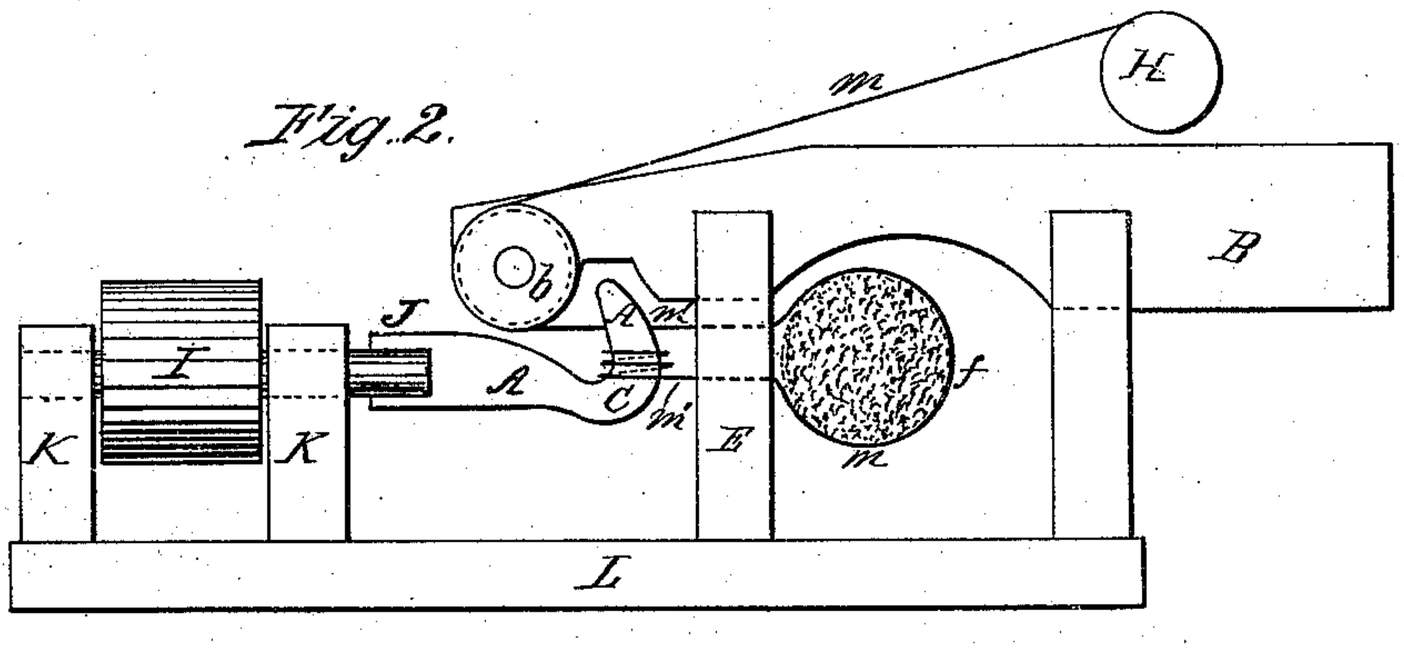
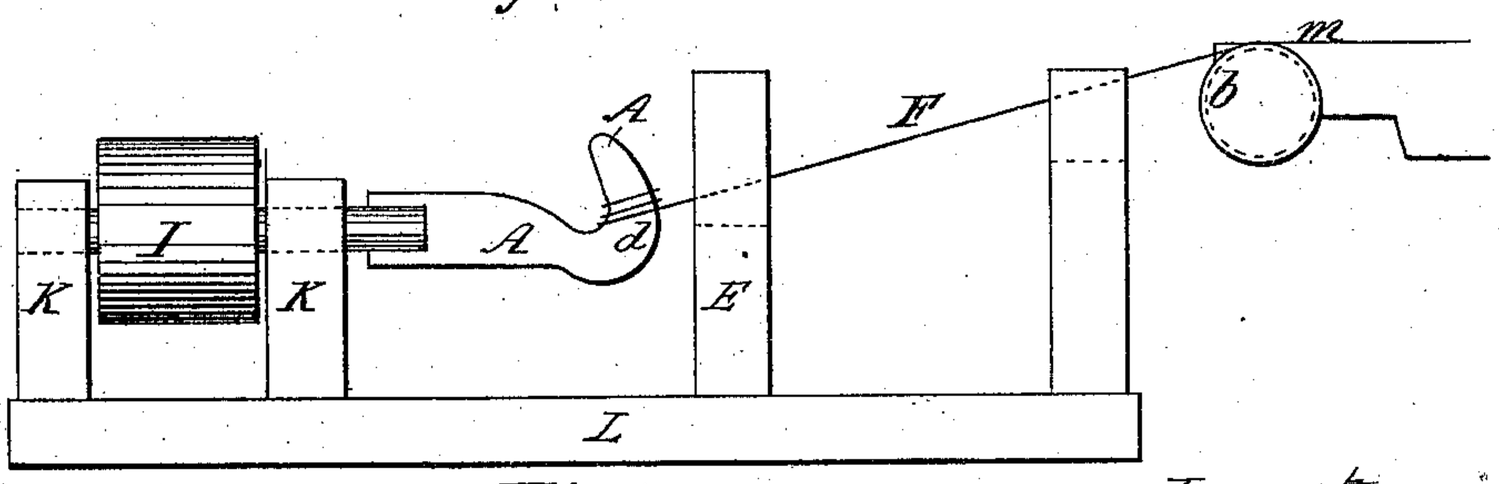


Fig. 3.



Witnesses.

Frank Lull
Edgar L. Henning

Fig. 4.

Inventor.

J. F. Steward,

UNITED STATES PATENT OFFICE.

JOHN F. STEWARD, OF PLANO, ILLINOIS.

IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. **173,511**, dated February 15, 1876; application filed October 7, 1875.

To all whom it may concern:

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

The side view, Figure 1, shows the twisting-hook, wire-arm, or needle-bar, and other parts in their proper relations and positions at the finishing of the twist which completes the band upon the bundle of grain. Fig. 2 shows the wires in position, ready for the twist. Fig. 3 shows the wire outdrawn to receive the gavel; Fig. 4, the twisting-hook, viewed on the line of its axis.

A represents the twisting-hook; B, Fig. 1, wire-arm; *b*, sheave on wire-arm, for the guidance of wire *m*; *c*, Figs. 1 and 2, coil of wire on hook in its secondary position; *d*, coil on hook in its primary position, Fig. 1, and secondary position, Fig. 3; E, portion of frame of binding apparatus; *f*, supposed bundle of grain; *g*, Fig. 1, twist which secures the ends of the band; H, spool of wire, which may be in any convenient position; I, pulley or gear on hook-shaft J, in its bearings K, the whole mounted upon the base L.

I construct my hook in such a manner that the main part is on and in line with its axis of rotation with a portion of its extremity bent nearly at right angles to said axis.

The object of my invention is to provide a simple means for holding its idle end while the thread of the wire is being carried by the wire-arm around the gavel, and also an efficient device for twisting the approximate threads *m' m'* of wire, Fig. 2, previous to setting free the completed band.

The wire, in its various evolutions, can be traced in Fig. 2 from the spool H around and beneath the sheaf *b*, behind the point of the hook A, around and beneath the gavel or bundle *f*, and back to its attaching-coil, upon the hook A, at *c*.

It will readily be observed that if the hook A is revolved in the direction shown by arrow, Fig. 1, a twist, *g*, Fig. 1, will be made in the parts *m' m'* of Fig. 2. Said twist is thus made near the axis-line, instead of being gyrated at some distance from said axis. It will be further noticed that, during these revolutions of the hook A, the wire drawn between the point of hook and sheaf *b*, Fig. 2, will be wound around the shank of the hook, making a new coil in the primary position *d*, Fig. 1. The necessary length of wire to form the convolution will be drawn from the spool H. If the wire now be severed at *g*, Fig. 1, by any cutting device, the finished bundle F will drop away, leaving upon the point of the hook A the coil *c*, now waste.

The wire-arm is next withdrawn to make the circuit of the succeeding gavel. The waste coil *c* will now be free to drop off at the next movement of the hook, or it will be forced off by the coil *d*, which takes its place when drawn from its original position, Fig. 1, by the proper tension upon the wire, crowding the coil *c* before it, to the position *d*, Fig. 3, where the hook is shown relieved of its original coil *c* of Figs. 1 and 2, and the end of the wire again secured with its thread drawn out to receive the next gavel upon it at F. Said gavel may be forced downward, in order that the wire-arm may return the wire over it to the position shown in Fig. 2, ready for the next operation of the twisting-hook.

Temporary supports for the retention of the wire-arm in position are omitted in the drawing for sake of clearness.

In the feature of holding the end of the wire by its being wound around the axial part of hook, I do not confine myself to any particular form. Said member may be round or angular. A revolving shank without the hook can, with some modifications, be used to hold the wire, but I prefer to claim this in another application.

The shank and hook are shown in a horizontal position, because I deem this preferable; but it can be used in almost any position, and therefore I do not wish to confine myself to the position shown.

The shank, at the point where the wire is wound about it, may be made slightly tapering, to facilitate the removal of the wire, but this is not a necessity.

The wire-carrier, as shown and described, has a reciprocating movement, but a carrier having any of the movements of ordinary wire-

carriers upon grain-binders will answer equally well.

What I claim as my invention, and desire to secure by Letters Patent, is as follows:

A rotating and twisting hook, adapted to gyrate and twist the proximate wires and wind the one from the carrier into a coil around its shank, in combination with the said carrier, operating to draw the coil from the shank upon the hook proper, substantially as described.

JOHN F. STEWARD.

Witnesses:
FRANK LULL,
EDGAR L. HENNING.