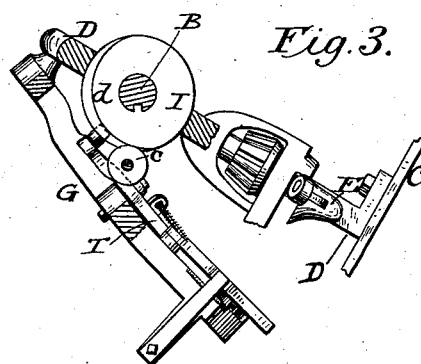
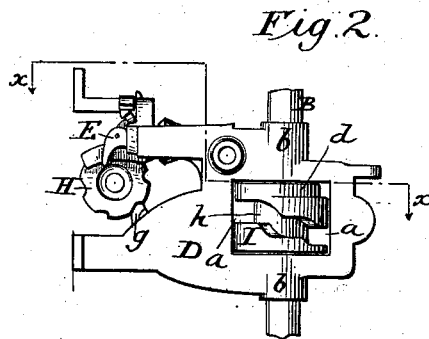
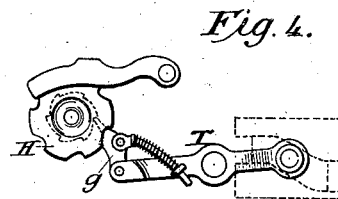
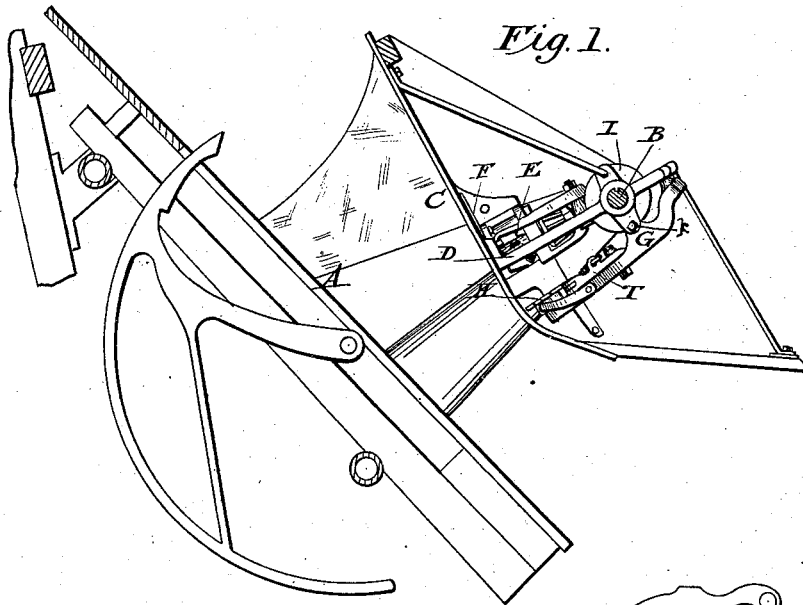


(No Model.)

S. NELSEN.
GRAIN BINDING MACHINE.

No. 260,496.

Patented July 4, 1882.



Attest.
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UNITED STATES PATENT OFFICE.

SAMUEL NELSEN, OF WHITEWATER, WISCONSIN, ASSIGNOR TO ESTERLY & SON, OF SAME PLACE.

GRAIN-BINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 260,496, dated July 4, 1882.

Application filed April 5, 1882. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL NELSEN, of Whitewater, in the county of Walworth and State of Wisconsin, have invented certain Improvements in Grain-Binding Machines, of which the following is a specification.

My invention relates to improvements designed more particularly for use in connection with the "Appleby Cord-Binder," a machine manufactured and sold in the market under Letters Patent No. 212,420, although differing in various minor features from the construction shown in the patent.

The improvements consist in an improved construction and arrangement of the parts for operating the cord-clamping devices, and for slackening the cord during the formation of the knot.

In the Appleby machines, as hitherto sold in the market, the cord clamping or retaining wheel was operated by means of an elbow-lever, which, together with supplemental devices, was actuated by means of a wheel having a cam-groove in its face. In place of this arrangement I now operate the clamping-wheel, which has ratchet-teeth on one side, by means of a pawl and lever, the latter pivoted near its middle, and provided at one end with a stud or roller seated in a peripheral cam-groove formed in a cylinder or wheel. The cord-clamping wheel I mount, as in the former machines, upon a rocking plate, so that during the formation of the knot the clamp may be moved toward the tyer or knotting head to slacken or yield up the cord thereto. Instead, however, of operating the rocking plate by the complicated devices previously used, I move it by the direct action of an eccentric portion of the cam cylinder or wheel used to operate the clamping devices, as before mentioned. The one cam-wheel is thus caused to actuate both the cord-clamping and the cord-slacking devices.

Instead of supporting the rocking frame, which sustains the clamping devices, by the usual means, it is pivoted to the under side of a fixed standard, which latter is provided with an opening to admit the operating cam cylinder or wheel, and provided also with bearings through which the main shaft passes to carry the cam.

Referring to the accompanying drawings, Figure 1 is a side elevation of the binding-table of an Appleby machine and the main parts of the tying mechanism with my improvements embodied therein. Fig. 2 represents a plan view of the knotting and clamping devices and the parts operating in immediate connection therewith. Fig. 3 represents a vertical section on the line *x x*, Fig. 2, looking in the direction of the arrow. Fig. 4 is a top plan view of the cord-clamping wheel and the devices for rotating the same, the operating cam cylinder or wheel being shown in dotted lines.

A represents the binding-table, upon which the loose grain is received and bound; B, the main shaft, arranged horizontally above the table in over-head supports, and provided with the various wheels and cams for operating the tying devices; and C, the shield or breast-plate, located between the shaft and table, as usual, to aid in compressing the grain and to give supports to minor parts.

D represents a rigid standard or frame, secured to the upper side of the breast-plate and serving as the direct support for the tyer spindle or head E, tucker or cord-placing arm F, and rocking plate G, on which the cord-clamping wheel H is mounted. The standard D, instead of being made in the usual form, is made in the peculiar form represented in Figs. 1, 2, and 3, with a central opening, *a*, in its upper end to admit the cam wheel or cylinder I, and with bearings *b b* for the admission of the main shaft B, by which the cam is supported and rotated.

The rocking plate G, which sustains the clamping-wheel and its actuating lever T, is suspended by horizontal pivots from the under side of the standard D, the pivots passing through ears on the two parts, as shown at K, Fig. 1. Near its upper end the plate is provided with a roller or projection, *c*, which bears beneath an eccentric circumferential portion, *d*, of the cam-wheel I, as plainly represented in Fig. 3. The clamping-wheel is located upon the lower end of the plate. The rotation of the cam-wheel I against the roller forces the lower end of the plate downward, carrying the clamp away from the tyer-head; but during the rotation of the tyer-head in forming the knot, the cam or cyl-

inder relieves the roller and permits the plate and clamp to swing upward and yield the cord to the tyer. The downward swinging motion of the rocking plate is limited by its upper end coming in contact with the under side of the standard from which it is suspended. This is an important feature in that it prevents the plate and clamp from falling down to a pendent position when released from the cord, in which event the clamp would fail to re-engage automatically with the cord.

The above arrangement, while answering all the purposes of the cord-slackening devices of the Appleby machine, avoids the use of many pieces and renders the machine much cheaper and more durable.

The cord-clamping wheel is provided, as usual, with a ratchet-wheel or ratchet-teeth on one side, and is rotated intermittently by a pawl, *g*, attached to the lever *T*. This lever is pivoted near its middle to the upper side of the rocking plate, and is provided at its upper end with a roller or projection seated in a cam-groove, *h*, formed in the periphery of the cam-wheel or cylinder *I*, as shown more particularly in Figs. 3 and 4. The rotation of the cam-wheel vibrates the lever, which in turn moves the wheel, the one cam-wheel thus serving both to operate the clamping-wheel and to effect the slacking of the cord. By constructing the standard *D* in the peculiar form shown, to admit the cam-wheel in its center, and giving the shaft a bearing therein on both sides of the cam-wheel, I maintain the parts in the exact positions demanded and prevent them from springing or binding when subjected to the severe strains encountered in practice. The construction also admits of the rocking frame and the lever being in smaller and more simple form.

My invention is limited to the features hereinafter specifically claimed, and as to the other features which may be shown or described no claim is made.

The combination of the vibrating lever and the grooved cam-wheel actuating the same I do not claim.

Having thus described my invention, what I claim is—

1. In a grain-binder, the rocking plate and the clamping-wheel and its actuating lever mounted on said plate, in combination with the cam wheel or cylinder provided with the eccentric portion to move the plate, and with the cam-groove to operate the lever.

2. The combination of the standard, the clamp-sustaining plate suspended from the standard, and limited in its motion by its upper end abutting against the standard, and the eccentric acting upon the plate to depress its opposite end, as shown.

3. In a grain-binder, a standard with the opening and the two shaft-bearings, in combination with the rocking plate pivoted thereto, the clamping-wheel, the lever mounted on the plate, and the cam-wheel provided with the eccentric periphery and with the cam-groove, as shown.

4. A grain-binder standard, *D*, provided with the opening to admit the cam-wheel, and the shaft-bearings on both sides of said opening and adapted to sustain the rocking plate, as shown.

SAMUEL NELSEN.

Witnesses:

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EDWIN J. CASS.