2 Sheets—Sheet 1.

H. CURTIS.

GRAIN-BINDER.

No. 188,861. Patented March 27, 1877.

Fig. 1.

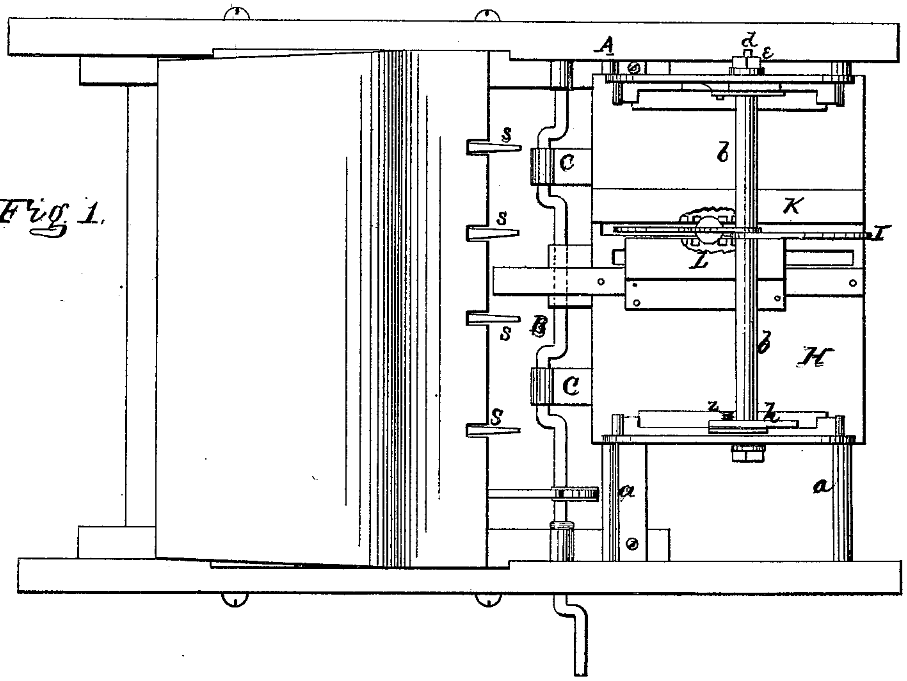
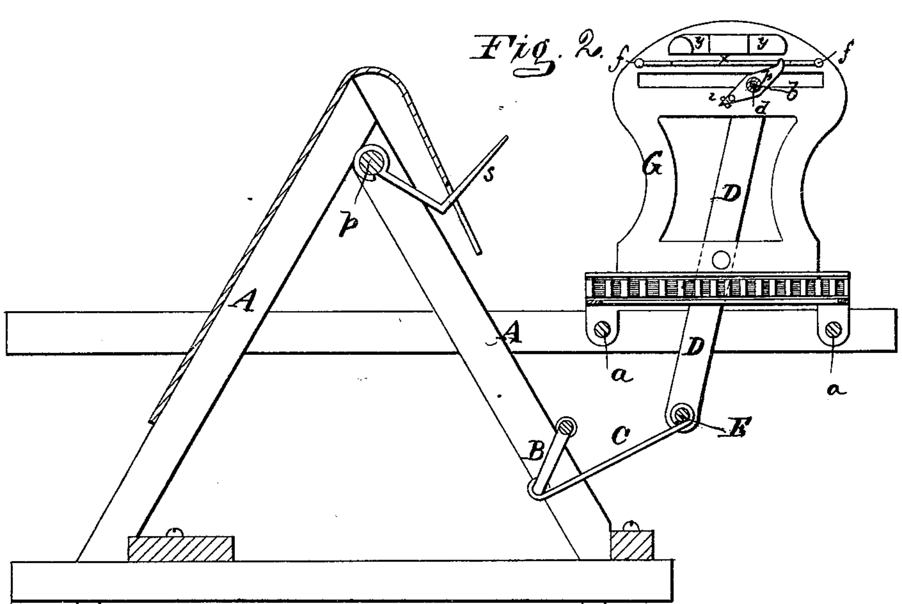


Fig. 2.



WITNESSES

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2 Sheets—Sheet 2.

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GRAIN-BINDER.

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Fig. 3.

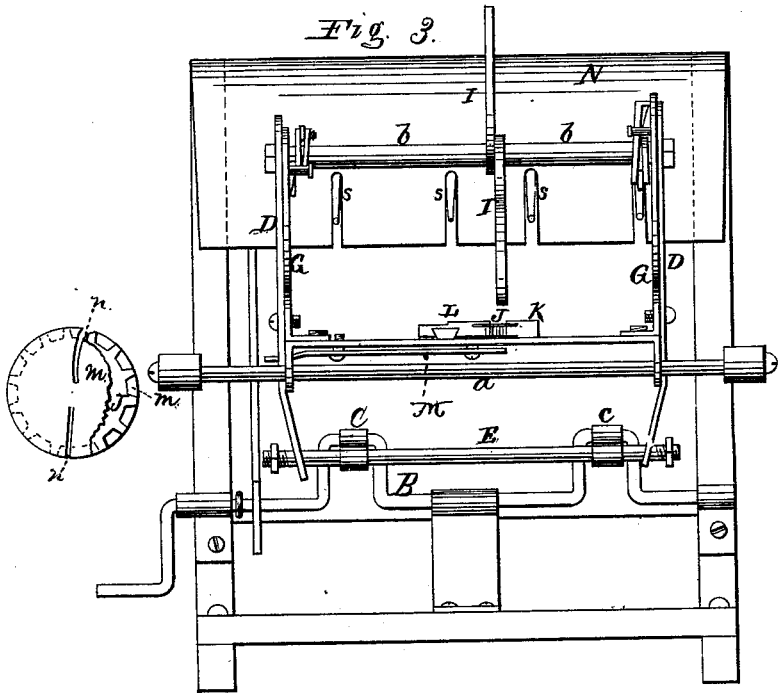
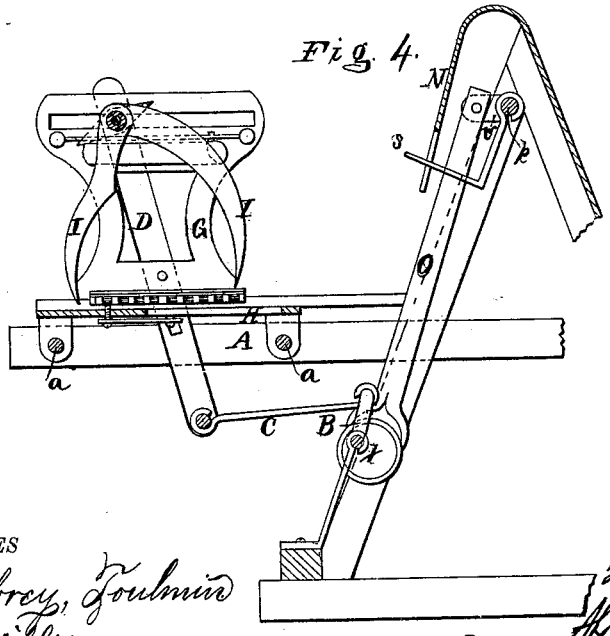


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

HENRY CURTIS, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN GRAIN-BINDERS.

Specification forming part of Letters Patent No. **188,861**, dated March 27, 1877; application filed July 17, 1876.

To all whom it may concern:

Be it known that I, HENRY CURTIS, of Chicago, in the county of Cook, and in the State of Illinois, have invented certain new and useful Improvements in Grain-Binders; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my invention consists in the construction and arrangement of a grain-binder, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a plan view of my invention. Fig. 2 is a vertical section, and Fig. 3 a side elevation, of the same. Fig. 4 is a vertical section of a part thereof.

My grain-binder is operated by power from the main shaft of the harvesting-machine, either by gear-wheels or chain-belt, that will give motion to the crank-shaft that operates the binding attachment.

A is the frame-work, in suitable boxes upon which the crank-shaft B is placed. From this crank-shaft pitmen or connections C C lead to a bar, E, connecting the lower ends of two side levers, D D, which are pivoted to standards G G on a frame or platform, H.

The pitmen or connections C C are placed at some distance apart, and the crank-shaft braced, so that it will allow the whole binding arrangement to move backward or forward, so as to bind the right distance from the butts of the grain, as circumstances may require, when the grain is long or short.

The frame or platform H moves on two rods, *a a*, running through gibs attached to the frame.

The operation of the pitmen C gives a swinging and easy motion to the side levers D D, which levers operate the binding and compressing arms I I, said arms being attached to hollow tubes *b b*, and secured in position by a rod, *d*, running through them and through horizontal slots in the upper ends of the standards, as well as through vertical slots in the upper ends of the swinging levers, and secured by a nut, *e*, to prevent the levers from slipping off the end of the rod.

It will be seen that as the crank revolves it will vibrate the side levers, and as the rod across the top is loose in the slots and connects the upper ends of the swinging levers, said rod will vibrate across the machine, and as the binding and compressing arms I I are attached to the tubes *b b*, they carry the bundle away from the grain which is accumulating from the apron to the outside and off the machine.

At the outer end of each of the tubes *b b* is a short lever, *h*, one end of which has a pin or roller, *i*, that runs in a groove, *x*, parallel with the slot that guides the rod *d*, and as the rod moves backward or forward this short lever strikes against a pin or friction-roller, *f*, at the end of the grooves, at a point above or below the center of the turning-point, and as the rod and tubes are carried along toward the end of the slot, it will roll the tubes on the rod, and open or close the binding-or compressing arms. The pin *i* on this short lever describes an eccentric circle, and at the end of the vibration it has again reached the groove *x* by running upon an incline, *y*, that presses it back against a spring, *z*, on the opposite end of the lever, which also throws it with certainty into the groove, ready to perform the same operation at the other end of the vibration.

The device for twisting the wire after it has been passed around the bundle is, by a small cog-wheel, J, held in position between two racks, K and L, for it to mesh into. The rack L is movable, and operated through gibs by a lever, M, on the under side of the table or binding-frame by connecting with one of the side arms oscillating on a pin at a distance sufficient to give the required movement.

The twister or cog wheel J has a flange, *m*, on its upper and lower sides, projecting beyond the cogs, to keep it in place without the use of a center, which would interfere with the twisting.

The spool containing the supply of wire is to be supported at a point as high as the binding-arms, and the wire is passed through the extreme end of the binding-arm and down to the twister-wheel J, which has two slots, *n n*,

on opposite sides, running toward the center, in one of which slots the wire is fastened by a suitable clamping arrangement.

The grain, as it comes from the apron of the harvesting-machine, accumulates on the apron of the binder, between the wire which is fast in the twister and the binding-arm, and as the arms move forward the arm with the wire passes over and around the bundle, and carries the wire down into the opposite slot of the twister-wheel, and as the arms move back with the bundle motion is given to the twisting-wheel, and at the end of the vibration the wire is cut off, releasing the bundle, retaining the end of the wire, and ready for another operation.

p is a shaft, provided with a series of curved or bent teeth, *s*, forming a separator or cut-off, for the purpose of holding the grain as it comes from the elevator long enough to make a division for the binding-arm to pass through unobstructed to connect the wire with the twister, and as soon as the bundle is started back and being bound, the teeth *s* are drawn back again, and allow the grain to accumulate for another bundle.

This separator or cut-off is placed under the binder-apron N, a little below the top of the elevator, and the teeth are made to work out and back through the slots in said apron by means of an eccentric, *t*, on the crank-shaft B, connected by a rod, O, with an arm, *v*, projecting from the shaft *p*, for giving it the required movement, and at the proper time.

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

1. The combination of the crank-shaft B, pitmen C C, swinging side levers D D, and rod E with the binding and compressing arms carried by said levers, substantially as herein set forth.

2. The combination of the binding and compressing arms I I, tubes *b b*, rod *d*, slotted standards G G, and slotted swinging levers D D, substantially as and for the purposes herein set forth.

3. In combination with the tubes *b b*, carrying the arms I I, the levers *h*, with projecting pins *i*, the standards G, with grooves *x*, projections *f*, inclines *y*, and springs *z*, all constructed and arranged to operate substantially as and for the purposes herein set forth.

4. The combination of the stationary rack K, the movable rack L, and the twister J, all constructed substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 25th day of May, 1876.

HENRY CURTIS.

Witnesses:
T. ORMSBEE,
H. ODELL.