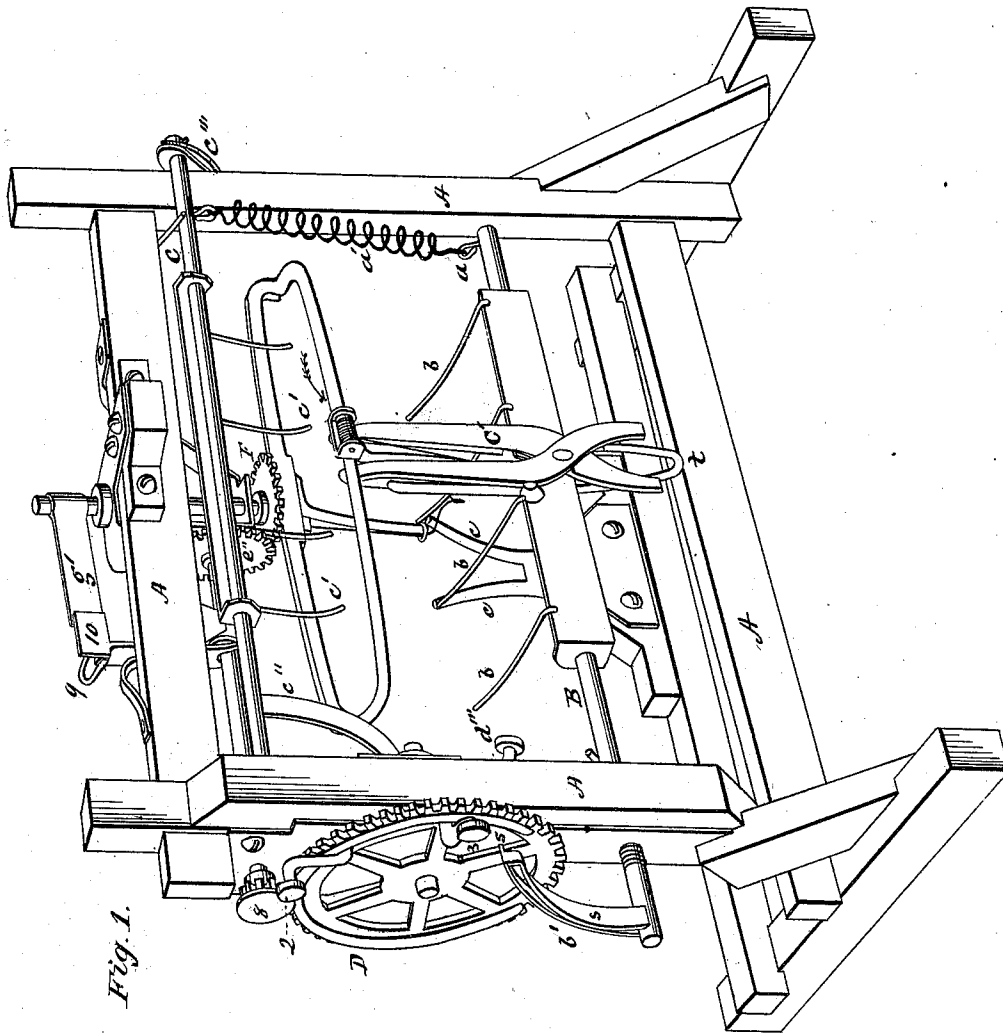


3 Sheets—Sheet 1.

J. NEIL.
HARVESTER.

No. 176,882.

Patented May 2, 1876.



Witnesses:

Clarence Poole
Phil W. Hale,
Will H. Moxon

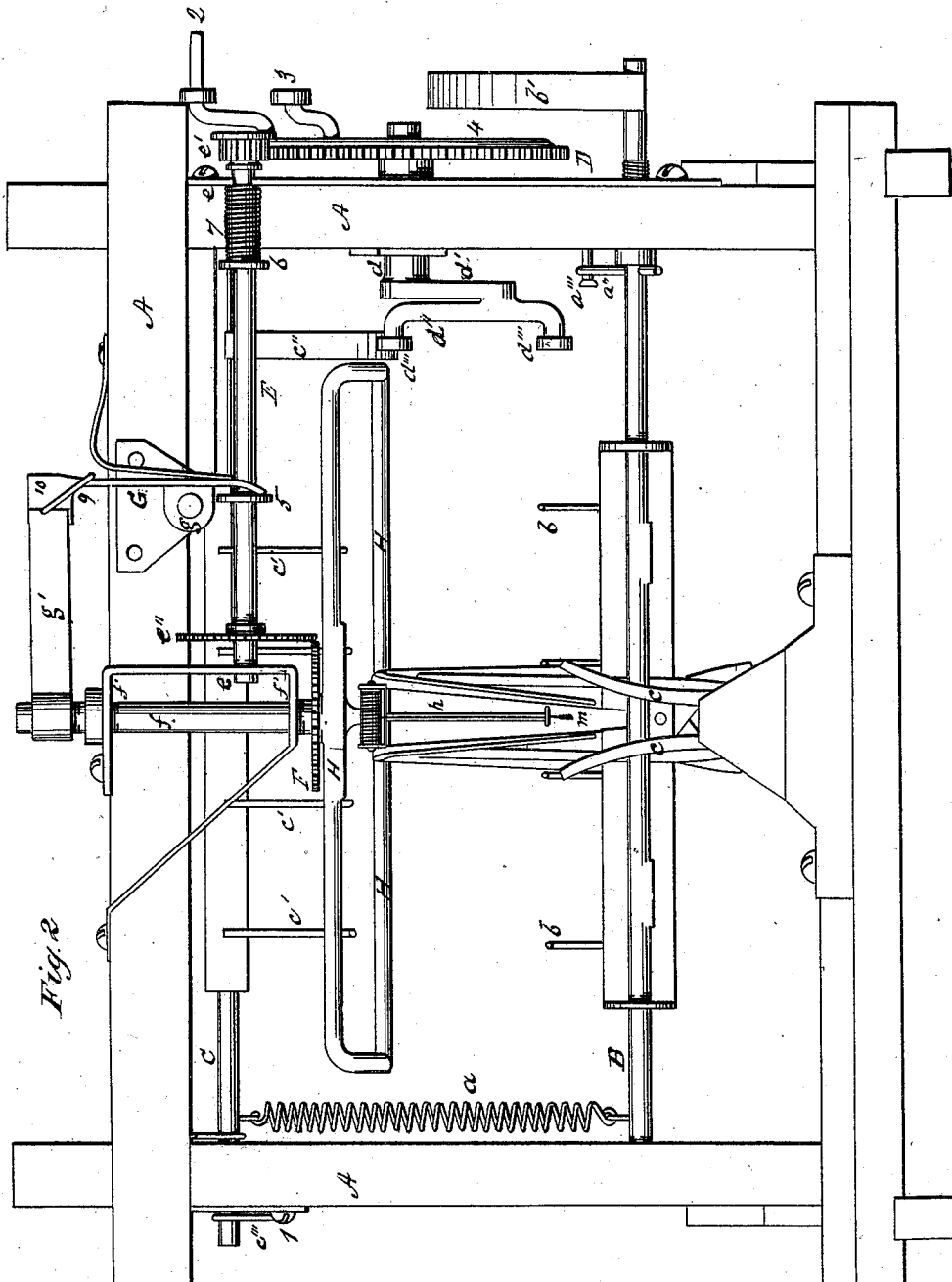
Inventor:

John Neil
per atty.
A. H. Evans & Co.

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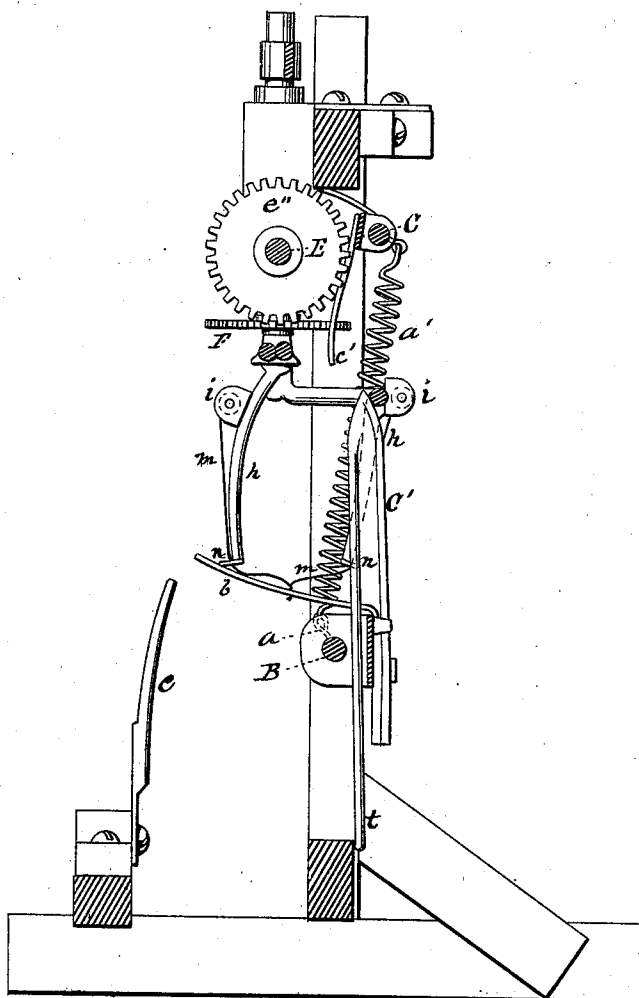
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Fig. 3.



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UNITED STATES PATENT OFFICE

JOHN NEIL, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN HARVESTERS.

Specification forming part of Letters Patent No. **176,882**, dated May 2, 1876; application filed March 3, 1876.

To all whom it may concern:

Be it known that I, JOHN NEIL, of Chicago, Illinois, have invented certain new and useful Improvements in Binding Attachments for Harvesters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a perspective view of my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical cross-section.

My invention relates to that class of binders which is attached to harvesters; and it consists in the several combinations of devices hereinafter explained and claimed.

To enable others skilled in the art to make and use my invention, I will proceed to describe the exact manner in which I have carried it out.

In the drawings, A represents the frame-work of the binder attachment, through which passes the shaft B, provided with the fingers *b b*, for catching and holding the grain during the process of binding. On the outer end of this shaft is secured the cam *b'*, for a purpose hereinafter explained. On the opposite end of the shaft B is a short lever-arm, *a*, to which is attached a coiled spring, *a'*, connecting with the upper shaft C, for a purpose to be hereinafter described. On the shaft B is also a short arm, *a''*, which acts as a stop when it comes in contact with the stud *a'''* on the side of the frame. On the lower portion of the frame, and immediately opposite to the shears C', is secured a bifurcated cam, having the arms *c c*, into which the blades of the shears pass when tilted down by the action of the shaft B, and as the blades are forced down between the arms *c c* they are caused to close upon and sever the wire at a proper time. The upper shaft C is also provided with the fingers *c' c'*, which act as a cut-off to stop the grain, intermittently, from passing into the binder after a sufficient quantity for a bundle has fallen upon the fingers *b b*. Near one end of the shaft C is secured the cam *c''* for operating the cut off; and on the other end of the shaft is a bent arm, *c'''*, which, striking against the screw-head 1, acts as a stop to check the revolution of the shaft C, and prevent the fingers *c c* from being thrown too far back when

they drop to allow the grain to enter the binder. On the end of the frame is secured the cog-wheel D by means of a short shaft, *d*, passing through the frame-work A, on the inner end of which shaft I rigidly secure the arm *d'*, provided with the curved cross-arm *d''*, having each outer extremity bent at right angles, so as to present bearings *d'''* to operate the cam *c''* as the wheel D revolves. The eccentric cam *b'* is provided with a double track, as shown in Fig. 1, and from the wheel projects two bent arms, 2 and 3, which, bearing alternately upon the cam *b'*, cause a partial revolution of the shaft B, and force the shears C' down between the arms *c c*, thereby causing the blades to close and sever the wire used in binding the bundles of grain. On the outside of the wheel D, and near its periphery, is secured the cam 4, for a purpose hereinafter explained. A short sliding shaft, E, has its bearings *e e* secured to the frame A, and is provided at its outer end with the pinion *e'* gearing into the cog-wheel D, from which it receives its motion. By this means the shaft E is revolved. On the opposite end of the shaft E is secured the cog-wheel *e''*, and the shaft is provided with shoulders 5 and 6. On the shaft between the shoulder 6 and the bearing is placed the coiled spring 7, to force the shaft toward the bearing 5, and cause the cog-wheel *e''* to mesh with and revolve the horizontal cog-wheel F, secured to the lower part of the vertical shaft *f*, which has its bearings *f' f'* secured to the frame-work A. On the outside end of the shaft E is secured the cap or flange 8, against which bears the cam 4, whereby the shaft is drawn out and the wheel *e''* ungeared from the horizontal wheel F. When the cam 4 has passed the cam 8, the coil-spring 7 again forces in the shaft E, and the wheel *e''* again meshes with and revolves the wheel F.

The shoulder 5 on the shaft E operates the pivoted spring-catch G, pivoted to the frame A at *g*, and which is designed to catch and hold the stop *g'* rigidly secured to the top of the vertical shaft *f*, whereby the revolutions of the twister H are arrested the moment the wheels *e''* and F are ungeared. As the shaft E is drawn back by the cam 4 and the wheels *e''* and F become ungeared, the shoulder 5

moves the lower end of the pivoted catch G, when the upper portion is thrown toward the stop *g*, and catches it between the finger 9 and plate 10, where it is held until the twister H is again ready to revolve. The twister H is formed as shown in Figs. 1 and 2, and is secured rigidly to the lower end of the vertical shaft *f*, so as to revolve with it. From the opposite sides of the twister descend two arms, *h h*, each having at its lower extremity an eye, *n*, through which the wire *m* passes from the spools *i i*, as shown in Fig. 3.

It is evident from the above description that if the wires extending from the spools come together at the point of junction the revolution of the twister H will cause the wires to twist tightly together. This point of junction is on the plane occupied by the shears when thrown by the shaft B into a horizontal position for cutting. It will also be seen that the stop *g'* is secured in a line with the greatest length of the twister, so that when the stop is arrested and held by the spring-catch the arms *h' h* will be in a line with the blades of the shears, and will allow the blades, after cutting the wire, to open by means of the spring *t*, pass up on either side of the arms, and assume a vertical position ready to be again called into requisition. The length of cam 4 is so adjusted as to allow the wheels *e''* and F to remain in gear a sufficient time to make as many revolutions of the twister as may be deemed necessary to secure the wire.

The cam *b'* upon the shaft B is constructed with two curved eccentric tracks, *s s*, thus imparting an irregular movement to the shears when acting as a compressor, and whereby they are made to clip the wire after compressing the grain.

The operation of my binder is as follows: The grain passes in in the direction of the arrow, Fig. 1, and is caught upon the wires *m* and the fingers *b b*. When a sufficient quantity has passed in for a bundle the shaft B carries the shears over upon it, while at the same moment the shaft C throws up the fingers *c' c'* and stops the flow. As the cam *b'* is forced back by the arms 2 and 3 on the wheel D the shears are forced down between the cams *c c*, carrying down the grain on the wires which unwind from the spools *i i*. When the shears have reached a horizontal position on a plane below the lower ends of the arms *h h* the cam on the wheel D frees itself, the coiled spring 7 forces the wheel *e''* and F into gear, the stop *g'* is freed from the pivoted catch, and the twister H, with its arms *h h'*, is allowed several rapid revolutions, whereby the wires *m m* are securely twisted together above the bundle of grain and immediately between the blades. An additional pressure upon the cam 4 by the arms

2 and 3 is transmitted through the shaft B to the shears, forcing them between the cams *c c* until the wires *m m* are severed at a point about the middle of the twister, so as to leave the wire twisted and secured around the bundle of grain, and leave the ends of the wire in the binder twisted together and ready to receive the next bundle of grain. The moment the wire is severed the cam 4 withdraws the sliding shaft B, the wheels *e''* and F are ungeared, the pivoted catch is thrown forward, the stop *g* is caught, the revolutions of the twister are arrested, the shears assume a vertical position, and the fingers *c' c'* of the cut-off fall to allow another bundle of grain to pass to the binder.

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

1. The wheel D, provided with the cam 4, in combination with the sliding shaft B, provided with the shoulder 5, for operating a stop mechanism and shoulder, 6, the pinion *e'*, spring 7, wheels *e''* F, and twister H, substantially as and for the purpose set forth.

2. The shaft C, provided with the cut-off fingers, in combination with the oscillating shears C' and twister H, substantially as set forth.

3. The wheel D and shaft *d*, provided with the arms *d' d''*, in combination with the shaft C, provided with the cam *c''* and cut-off fingers *c' c'*, substantially as and for the purpose set forth.

4. The twister H, shaft *f*, and stop *g*, in combination with the pivoted spring-catch G, substantially as and for the purpose set forth.

5. The wheel D, provided with the arms 2 and 3, in combination with the shaft B, provided with the eccentric cam *b'* and shears C', substantially as and for the purpose set forth.

6. The eccentric cam *b'*, constructed with eccentric tracks *s s*, to give an irregular movement to the shears, substantially as described.

7. The twister H, in combination with the oscillating shears C' and oscillating fingers *b b*, substantially as and for the purpose set forth.

8. The shears C', in combination with the cam-arms *c c*, substantially as and for the purpose set forth.

9. The shaft B, in combination with the shears C', substantially as and for the purpose set forth.

10. The oscillating shears C', in combination with the spring *t*, substantially as and for the purpose set forth.

JOHN NEIL.

Witnesses:

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F. S. WHEATON.