

(No Model.)

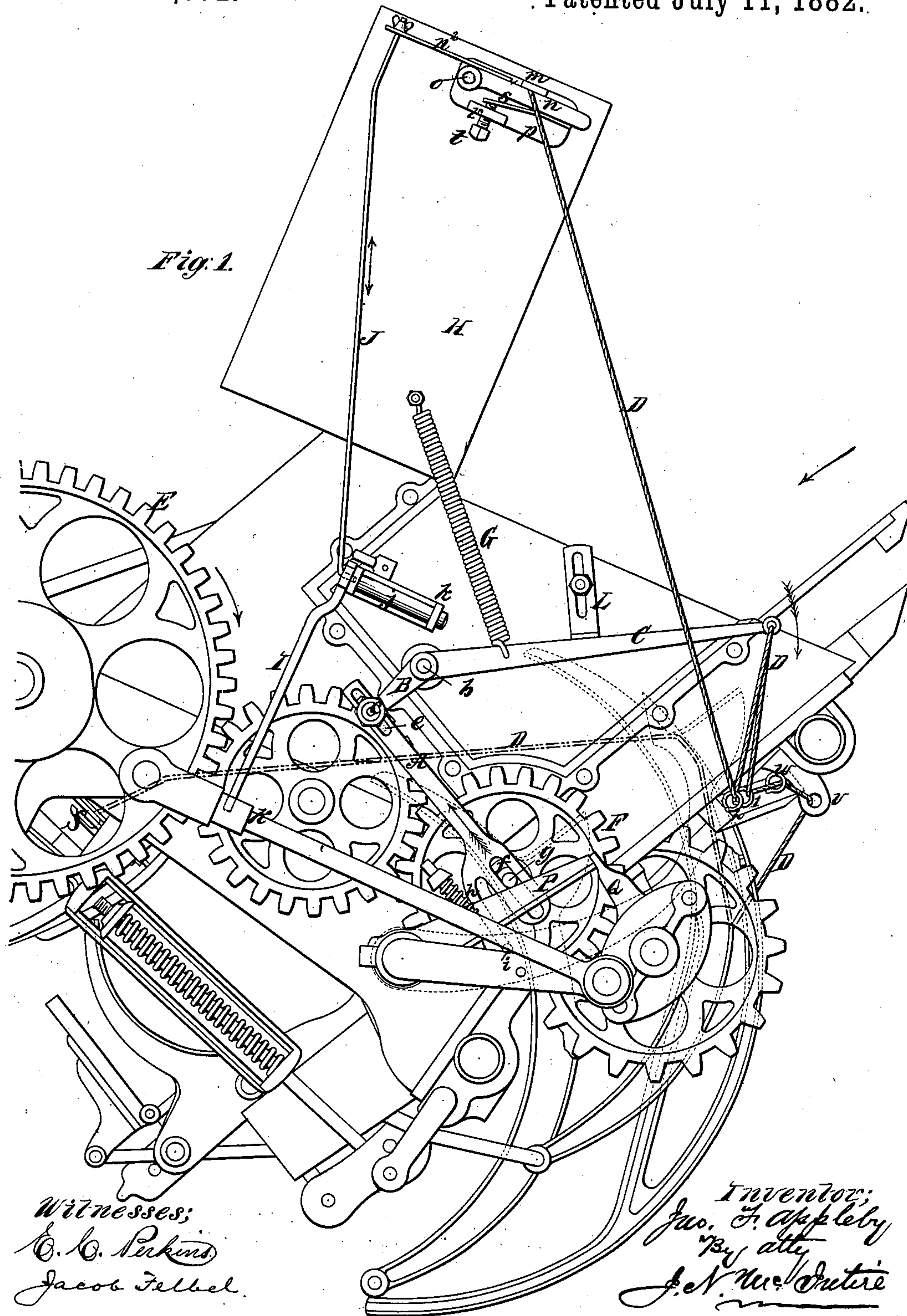
4 Sheets—Sheet 1.

J. F. APPLEBY.

GRAIN BINDER.

No. 261,072.

Patented July 11, 1882.



Witnesses;
C. C. Perkins.
Jacob Felbel.

Inventor;
Jas. F. Appleby
By atty
J. A. McCreary

(No Model.)

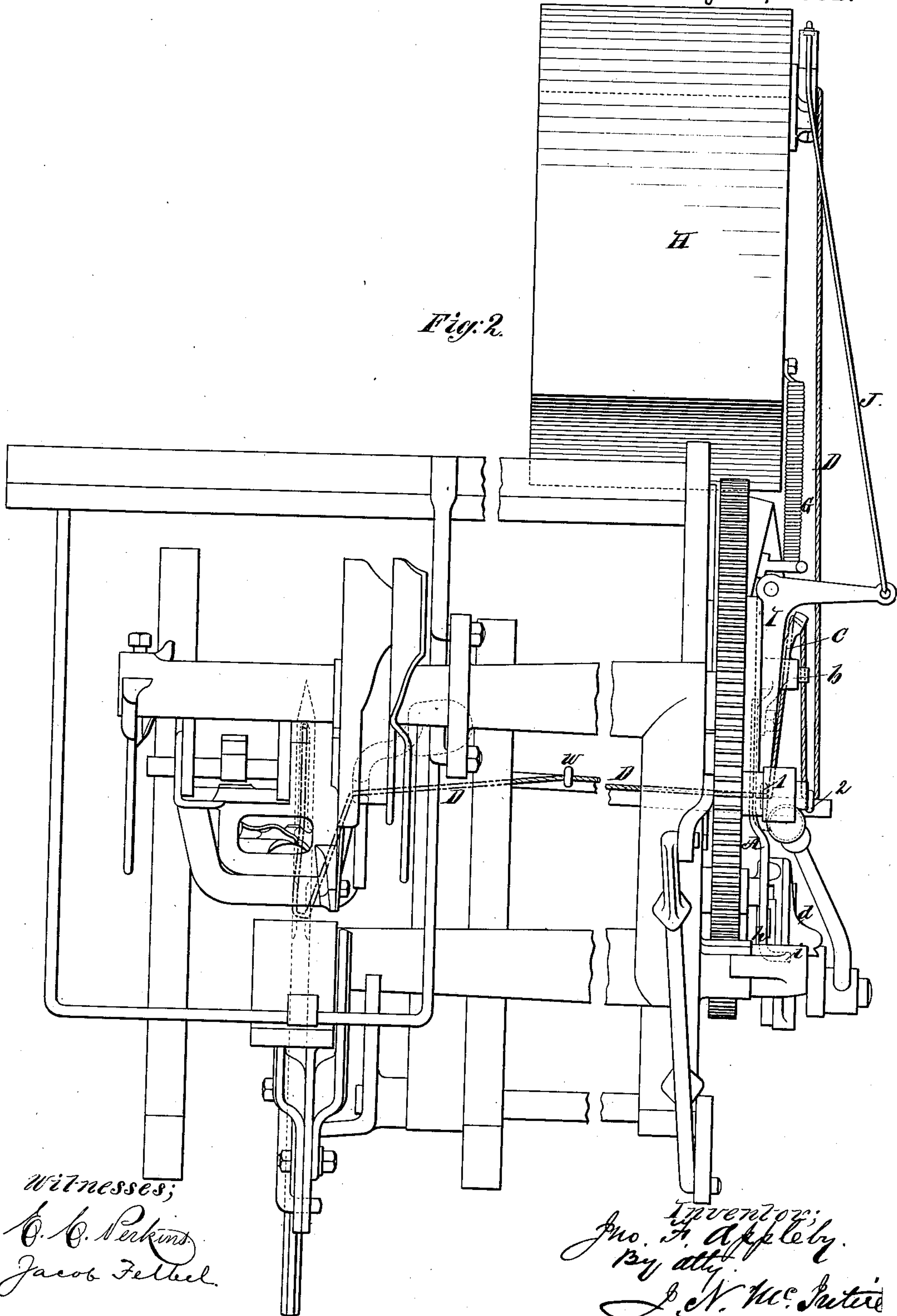
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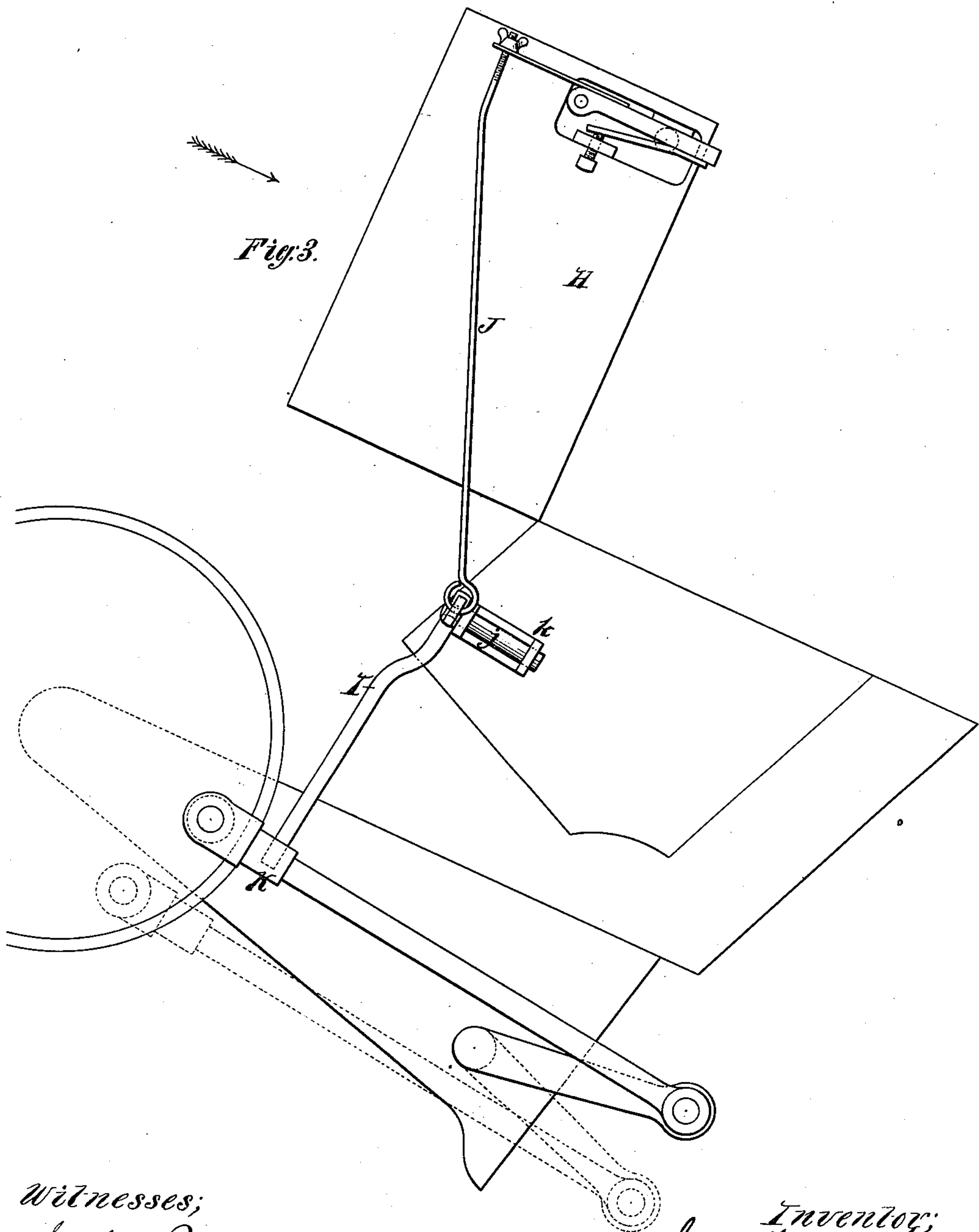
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4 Sheets—Sheet 4.

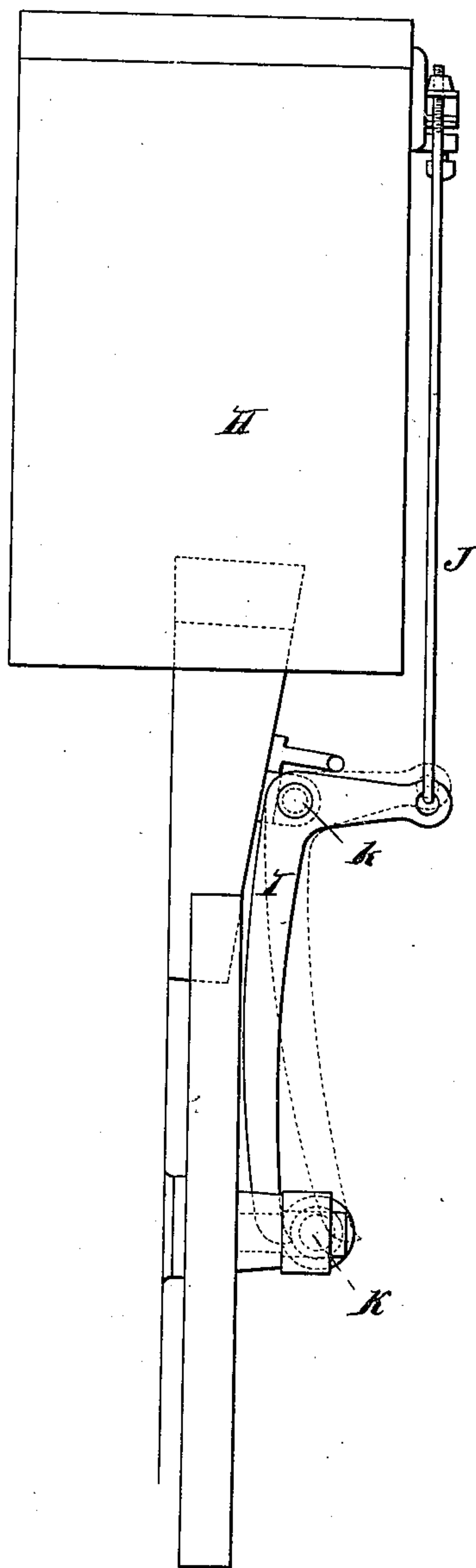
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Fig. 4.



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Jacob Feltel.

Inventor;
J. F. Appleby
per atty
J. H. MacIntire

UNITED STATES PATENT OFFICE.

JOHN F. APPLEBY, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO THE
MINNEAPOLIS HARVESTER WORKS, OF MINNESOTA.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 261,072, dated July 11, 1882.

Application filed February 7, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. APPLEBY, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Grain-Binders; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

My invention relates to a novel method of and means for effecting the tripping into operation of the binder devices or binding mechanism proper in that class of grain-binders in which the mechanism for encircling the gavel with a band of some sort remains at rest during the packing into the gavel-receptacle of the requisite quantity of grain to form a sheaf, and is then automatically set in motion or put into operation from some continuously-running motive device of the harvester.

Previous to my present invention it was common to operate the tripping device or mechanism of such machines—that is, the device or mechanism for throwing the binding mechanism into gear with the continuously-running driving device of the harvester—by or from some device or part of the machine against which the grain in the gavel-receptacle was compacted, and which device, by a movement induced by a pressure of the grain, operated to actuate other parts or devices for throwing the binder mechanism into gear and thus into operation; but all such heretofore-employed means for the purpose alluded to have been found more or less imperfect in practice, mainly because of the liability (under the varying conditions of the grain, &c.) of the binder mechanism being set into operation either at the wrong time or with the collected gavel in the wrong position relatively to the binder devices proper.

My invention has for its main object to provide a better mode of and means for effectuating the throwing into operation of the binding mechanism; and to this main end and object it consists in the employment of the cord or other sheaf encircling and banding material for actuating the tripping device, said cord operating at the proper time and by reason of the pressure upon it of the gavel collected

within its loop, (preparatory to the encirclement of said gavel by said cord,) while it is held fast at or beyond both ends of the loop, all as will be hereinafter more fully explained; and my invention further consists in certain novel combinations of devices by which the employment of the cord or other banding material for the purpose of imparting the necessary movement at the right time to the mechanism for tripping the binder devices into gear is rendered possible, all as will be hereinafter more fully explained.

To enable those skilled in the art to which my invention relates to understand and practice it, I will now proceed to fully explain the mode so far known to me as the best for carrying out my said invention, and in which I have so far successfully practiced it.

In the accompanying drawings, forming part of this specification, I have shown at Figure 1 in end view so much of a harvester-binder as seems to be necessary to illustrate my present improvements in such machines, and at Fig. 2 in side view the same mechanism. Fig. 3 is a partial or skeleton view taken from the same point of sight as Fig. 1, but showing only a few of the parts seen at Fig. 1, while Fig. 4 is an elevation of the parts shown at Fig. 3, viewed in the direction indicated by the arrow at the last-mentioned figure.

In all the figures the same part will be found designated by the same letter of reference.

For the purposes of illustrating my present improvements I have shown them applied to a machine substantially such as is made the subject of United States Letters Patent granted to me, No. 212,420, and which, somewhat improved, is known as the "Appleby binder."

I need not particularly refer to or explain any of the mechanism shown in the drawings, except that which embodies or is necessary to the operation of my present invention.

Instead of using a tripping-finger located near the outer side of the gavel-receptacle and connected by intermediate devices with the arm P, as heretofore, I now move said arm by the following-named means: A is a bar adjustably connected near its upper end (by a clamping-nut, c) and a stud passing through

the slot *e*, to the shorter arm B of a lever pivoted at *b* to the frame of the binder, the longer arm C of said lever extending forward some distance, as shown, and having in its free end
5 an eye for the cord D to pass through.

The lower end of bar A is slotted at *f*, so as to yoke around and be guided by a pin, *g*, projecting from the axis of the spur-gear F of the binder, and said lower portion of bar A is
10 formed or provided with an arm, *h*, the bent lower end, *i*, of which passes below and across the plane of vibration of the trip-arm P, all in such manner that if the bar A be moved bodily in the direction indicated by the arrow at
15 Fig. 1, and to a sufficient extent, the bent part *i* of its arm portion *h* will first come into contact with and will then move the trip-arm P on its axis of vibration, and thus release the dog Q of the clutch mechanism in a manner and for
20 a purpose well understood.

The proper movement of bar A (in the manner just alluded to) is effected by the vibration about its axis *b* of the lever just mentioned, the longer end C thereof moving in the direction indicated by the arrow, (see Fig. 1,) and the return of the parts to their original position (seen at Fig. 1) is effected by a movement of said lever in the opposite direction. This lever is moved in one direction by the
30 cord D, as I will presently explain, and in the other direction by a spiral spring, G, one end of which is fastened to the longer arm C of said lever and the other to the cord box or receptacle H, all as plainly illustrated in the
35 drawings.

I is a bent lever which turns at its angular part, having there a stud or axis, *j*, mounted in a stand or bracket, *k*, made fast to the binder-frame. The upper arm of this bent lever has
40 secured to it a rod, J, which extends upward, and is fastened at its upper end to the tension device of the cord-box, while the lower end of said lever I is so shaped and located as to be acted upon by the pitman of the spur-gear
45 E of the binder in a manner that I will presently explain.

The tension device on the cord-box H consists of a fixed projection or plate, *m*, beneath which the cord passes from the hole in the box,
50 and a movable or clamping arm, *n*, located beneath the cord, and between which and plate *m* the cord is squeezed more or less, as circumstances require.

The arm *n* is pivoted at *o*, (to the metal bracket
55 *p*, which carries the plate *m*,) and it is held up toward the plate *m*, so as to pinch the cord D between itself and said plate *m*, by a spring, *s*, which acts against the end of a set-screw, *t*, in the lug *r* of bracket *p*, all in a manner well
60 understood by those familiar with the Appleby binder.

Projecting from the arm *n* of the tension device is a bar, *n*², to which is secured the upper end of rod J, and whenever this rod may be
65 pulled in the direction indicated by the arrow at Fig. 1 the effect or result must be to clamp

the cord D between the arm *n* and the plate *m* more or less tightly.

L is an adjustable stop, which, being set in the proper position, predetermines the position to which the longer arm C of the lever
70 B C shall be pulled by the spiral spring G.

With what has already been said, and the following explanation, in connection with the drawings, of the operations of the different
75 parts, I think my invention will be fully understood.

Supposing, now, that the parts of the machine are in the relative positions seen at Fig. 1, and that the binding mechanism proper has
80 just come to a position of rest, the cord D, one end of which is held fast in the cord-holder at S, will extend in nearly a straight line from S to the eye of the needle-arm, and, passing from the needle-arm, will run through the usual stationary guide-eyes at V and W, and thence
85 runs through two fixed eyes, 1 and 2, and the eye in the end of the arm C of lever B C, and thence to the cord-box H, as clearly shown. As the grain is fed and packed down on top of the cord D and in the gavel-receptacle by the packers in the well known manner the cord D (that part of it beneath the grain) must perforce be pressed down into a hoop-like condition by the grain; but as the cord is
90 now securely clamped between and held fast by the arm *n* and plate *m* of the tension device (in consequence of the pull of the rod J on arm *n*²) that part of the cord taken up by the eyed end of arm C must be paid out in order to form the loop for the accommodation of
95 the grain, and as this previously-taken-up portion of D is paid out the arm C is of course pulled down until its eye nearly or quite reaches the locality of the eyes 1 and 2. This movement of the arm C, which is completed at just the right time, causes the shorter arm B to move the bar A in the direction indicated at Fig. 1, and thereby trip the arm P from beneath dog Q, setting the binder mechanism
100 proper into motion. As soon as this occurs the pitman K, moving from the position seen in Fig. 1 toward that seen in dotted line at Fig. 3, releases the lower end of bent lever I, and that lever assumes the position shown by the dotted lines at Fig. 4, thus permitting the
105 cord D to pull through the tension device and pay out, as may be required, in the operation of encircling the gavel and tying the cord. While the tension device is still left in this condition, the spring G next operates to draw the long arm C of the lever B C back to its original position against the stop L, and thus the requisite amount of cord is again pulled from the cord-box (through the tension device)
110 to permit a repetition of the operations just described when another gavel is to be bound; and at this time the pitman K will have returned to the position seen at Fig. 1, (the gear E having made one revolution,) and will again
115 act on the lower end of the bent lever I, causing it to resume its original position, and

through the media already described to effect the reclamping and holding fast of the cord D at the point where the latter passes through the tension device of the cord-box.

5 Of course, so far as the primary feature of my invention is concerned—viz., the employment of the cord to pull on some device when itself acted on by the grain for starting the binding mechanism proper into operation—
10 any other suitable means than those shown may be devised and used for imparting the pull on the cord (caused by the compacting of the grain against it) to devices for throwing the binding mechanism into gear and into op-
15 eration.

What I claim as new, and desire to secure by Letters Patent, is—

1. In that kind of grain-binders in which the binder mechanism proper is periodically thrown
20 into gear with some continuously-running motive device or part of the harvester, the combination, with the cord or other banding material, the said binder mechanism proper, and the said motive device, of a device or contriv-
25 ance which operates to throw the said motive device into engagement with the said binder mechanism proper, and which is actuated by

pulling the binder-cord taut between two points at which said cord is held fast, all substantially in the manner set forth.

2. The combination, with the means for throw- 30
ing the binder mechanism into gear with its motor, the cord, and the cord-holder, of a cord-clamp, means for automatically operating said clamp at the proper time, and means for trans- 35
mitting the pull on the cord (while clamped) to said mechanism, substantially as set forth.

3. The combination, with the binder mech-
anism, the mechanism for starting the same, and the banding cord or other material, of a 40
mechanism consisting essentially of an actuating-lever connected at one end to the starting mechanism and operated on at the other
by the cord, a spring for returning said lever
to its place, and a stop to regulate the amount 45
of cord taken up by the said lever at each operation of the binder, as set forth.

Witness my hand this 12th day of December, 1881.

JOHN F. APPLEBY.

In presence of—

HARRY L. STACY,
GEORGE DOTY.