

(Model.)

3 Sheets—Sheet 1.

J. P. BULLOCK.

GRAIN BINDER.

No. 286,899.

Patented Oct. 16, 1883.

Fig. 1.

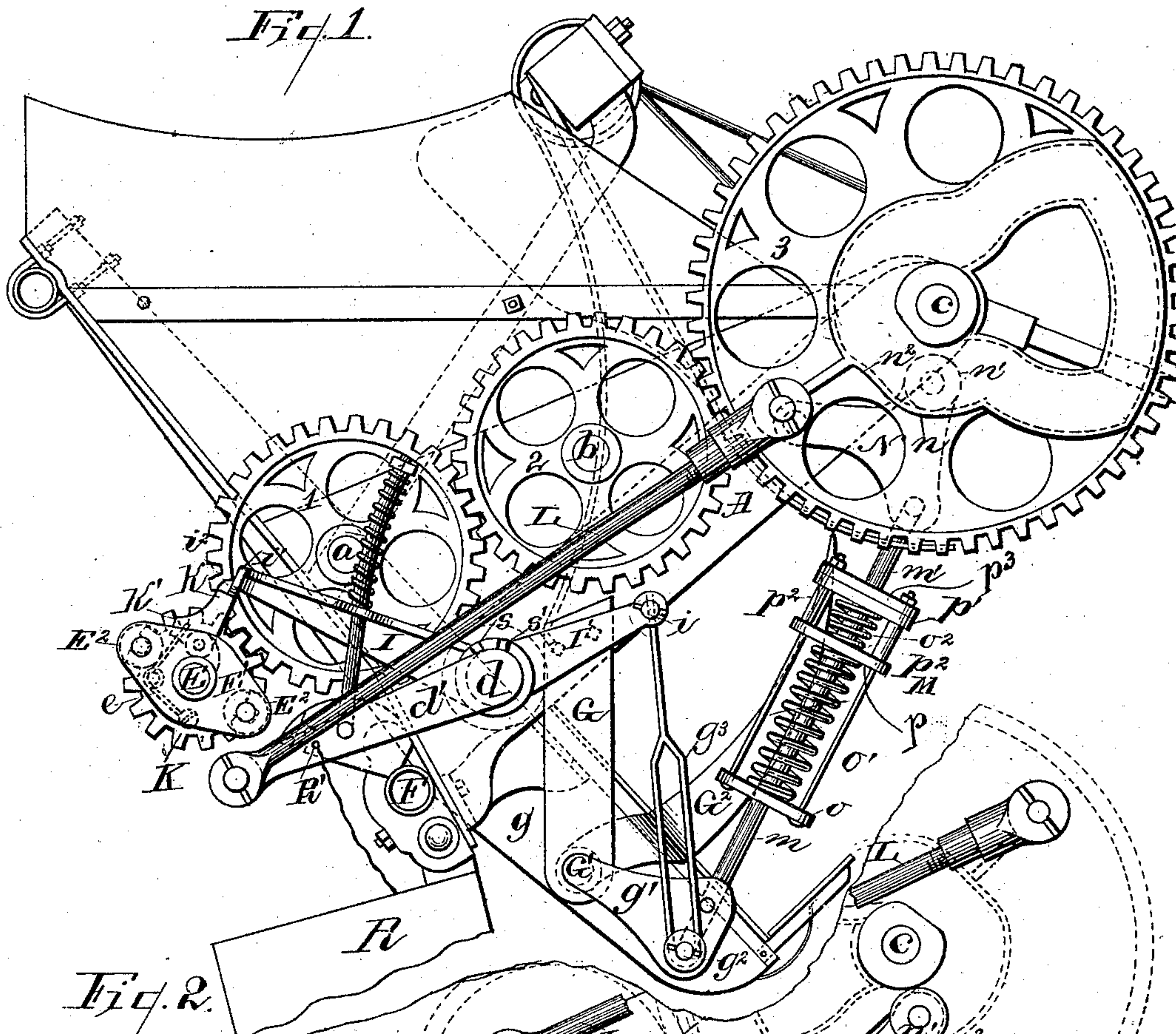
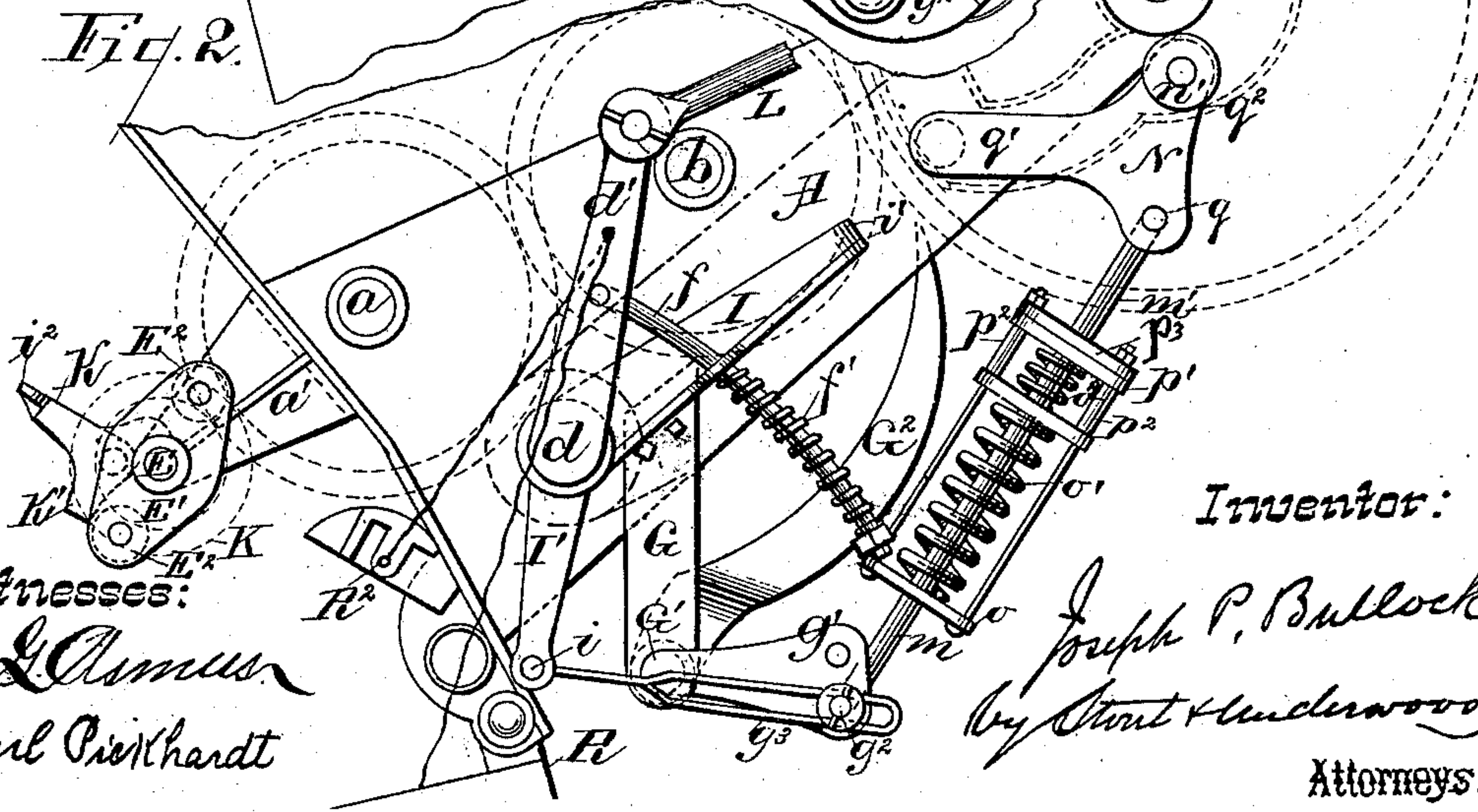


Fig. 2.



Witnesses:

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Carl Prekhardt

Inventor:

Joseph P. Bullock
by Stuart & Underwood
Attorneys.

(Model.)

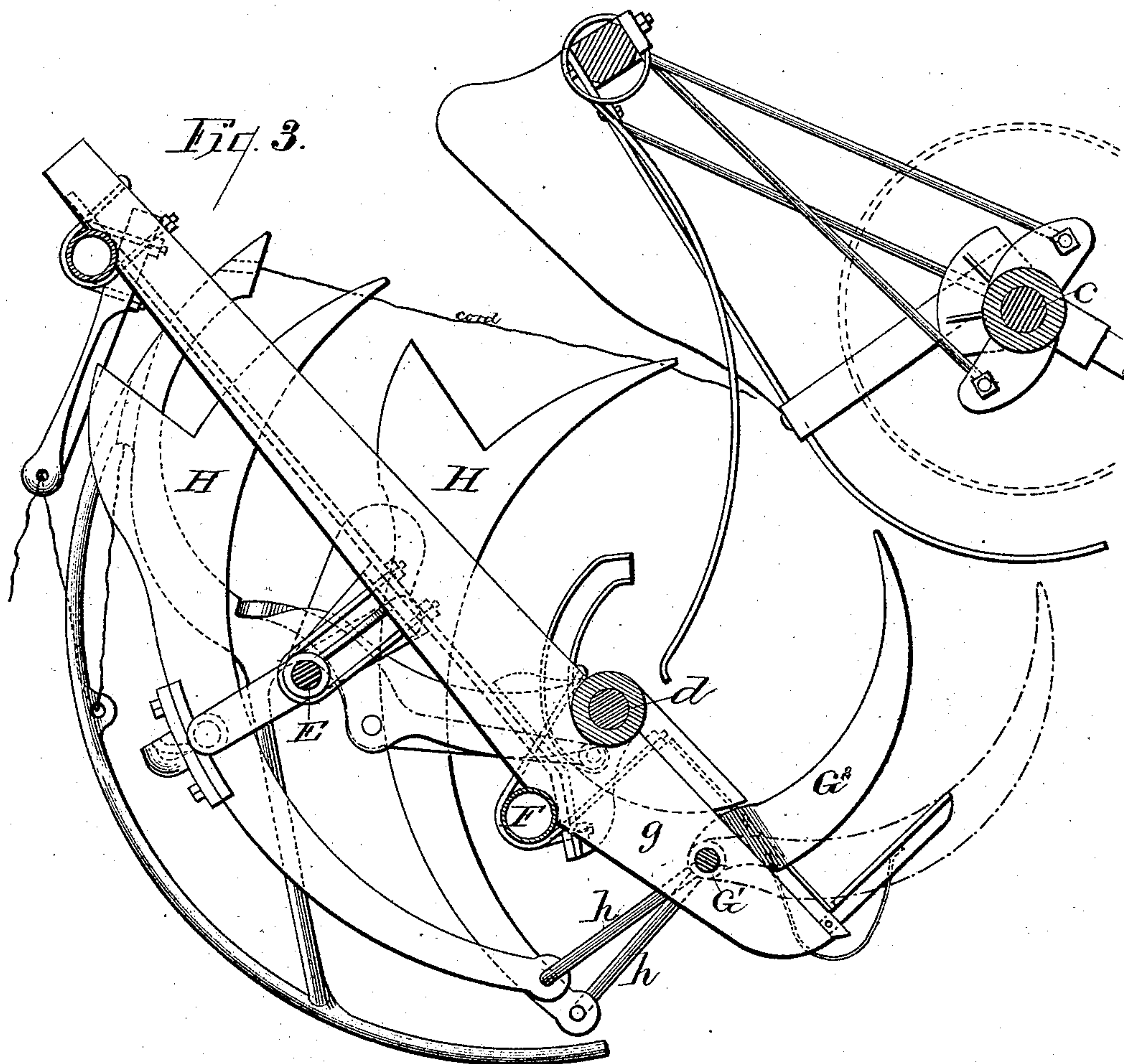
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(Model.)

3 Sheets—Sheet 3.

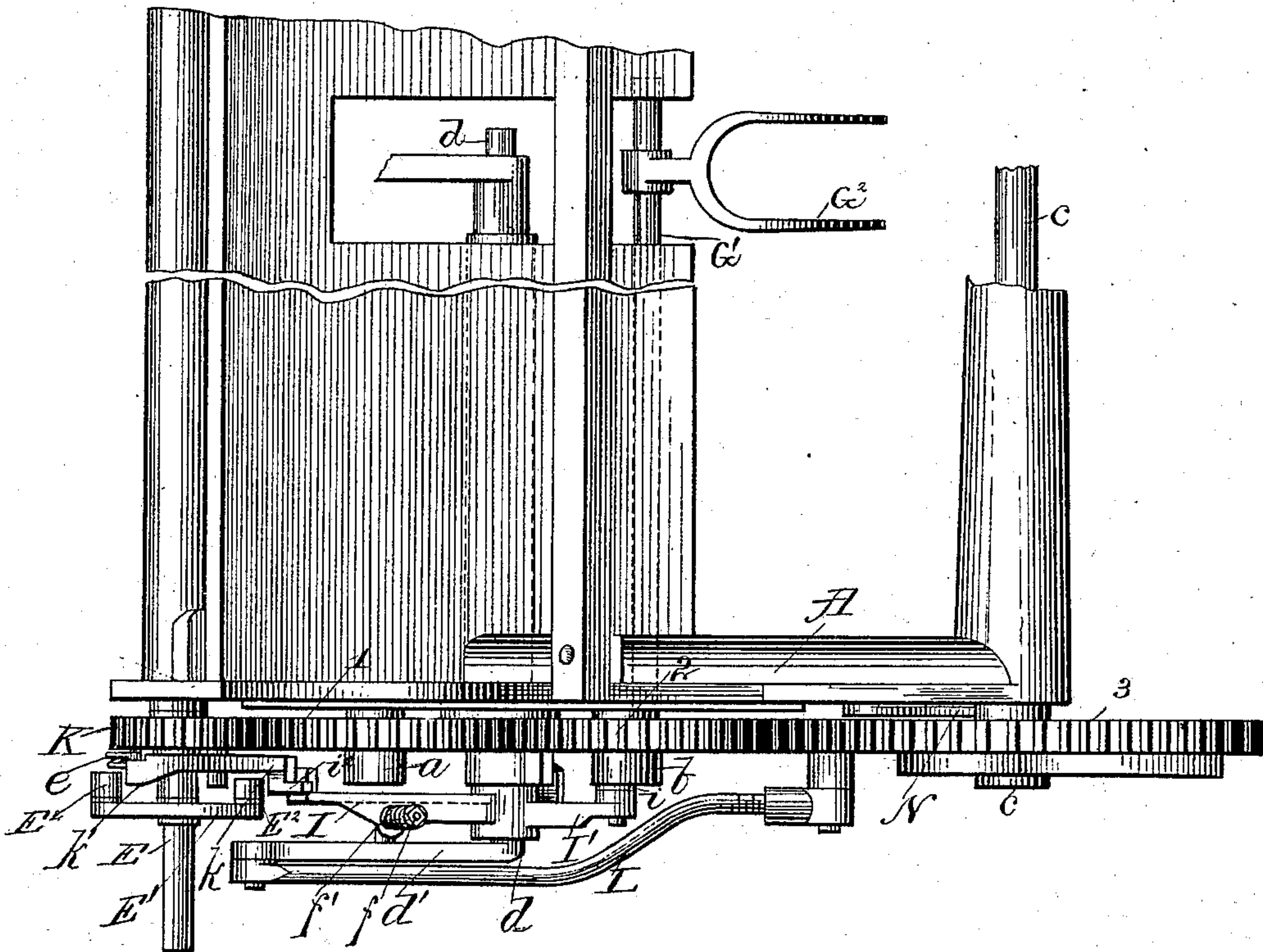
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Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

JOSEPH P. BULLOCK, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO THE DENNETT HARVESTING MACHINE COMPANY, (LIMITED,) OF SAME PLACE.

GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 286,899, dated October 16, 1883.

Application filed January 23, 1882. (Model.)

To all whom it may concern:

Be it known that I, JOSEPH P. BULLOCK, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, 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.

My invention relates to grain-binders, and will be fully described hereinafter.

In the drawings, Figure 1 is an end view of a grain-binder embodying my invention, and showing the position of the parts when the binding mechanism is at rest. Fig. 2 is a like view, showing the position of the parts when the binding mechanism is in operation and the cam-wheel has made a half-revolution; and Fig. 3 is a section taken just inside of the standard when the binding mechanism is at what is called "half-travel." Fig. 4 is a plan view of parts shown in Fig. 1.

A is the cast-iron standard common to binders, from which project outwardly studs *a b*, that form bearings for cog-wheels 1 and 2, and in which are also the bearings for shafts *c d*. An arm, *a'*, that projects from the rear of the standard A, affords a bearing for the shaft E, that operates packers H.

G' is a rock-shaft that turns in bearings in the arm or bracket G, and in a slanting beam, *g*, and this rock-shaft G' forms an axis for the links *h h*, that are loosely sleeved on the shaft and hold the lower ends of the packers H. Between the hubs of the links *h h*, with suitable sleeves interposed, I key the compressor G² on the shaft G', so that when the rock-shaft G' turns it will carry the compressor with it. The crank-arm *g'* of shaft G' is connected with the short arm I' of a pivoted trip-lever, I, by a link or strap, *g³*, that is screwed into a wrist-pin, *i*, that turns in the end of said arm I', and is slotted to slide upon a wrist-pin, *g²*, in crank-arm *g'*. Just above the pin *g²* the lower end of a sectional spring-rod, M, is swiveled to the crank-arm *g'*, and the other end of this rod is swiveled to one arm, *q*, of a T-shaped lever, N, the long arm *q'* of which is pivoted to the inside of the standard A, and the arm *q²* of this T-shaped lever carries a roller, *n'*, that

travels in a cam-groove in main binder-wheel 3. The main binder-wheel 3 is connected by rod L with the crank-arm *d'* of a shaft, *d*, upon which the trip-lever I is loosely sleeved, and which shaft *d* extends through the machine, carrying and operating the needle. The crank-arm *d'* is connected with the pivoted trip-lever I by rod *f*, that passes through the long arm of the trip-lever. A spring, *f'*, is interposed between the top of the lever I and the nut on the end of rod *f*, to permit the trip-lever I to be rocked independently of the crank-arm *d'* of the binder-arm shaft.

E is the continuously-operating driving-shaft, and this shaft has cranked to it the packers H H, by which the grain is packed against the compressor. The driving-shaft E has a pinion, K, upon its end, just outside of its bearing in standard A, and upon this wheel K a pawl, *k*, is pivoted, a spring, *e*, serving to hold it in position for its nose *i²* to engage with the trip end *i'* of the lever I. When the trip end *i'* of the lever I is in contact with the nose *i²* of the pawl *k*, the rollers E² of a casting, E', fixed on shaft E, will just clear the heel *k'* as the shaft revolves, and consequently the pinion K, which fits loosely on the shaft E, will be unaffected by the revolution of said shaft as it continuously operates the packers, until enough grain has been packed against the compressor to depress it, as shown in dotted lines, Fig. 3, when it will partially revolve its shaft G', and cause crank-arm *g'*, through the link or strap *g³*, to draw upon short arm I' of trip-lever I and raise its long arm, so as to disengage the end *i'* from contact with nose *i²* of pawl *k*, and permit spring *e* to throw the heel *k'* out into position to be struck by one of the rollers of casting E', so that as it revolves with the driving-shaft it will revolve the pinion K, which latter, through gears 1 and 2, will revolve the main binder-wheel 3, that has up to this time been stationary. The cam-groove in the main binder-wheel 3 has about the same outlines as that in the main binder-wheel of the well-known Appleby machines, except that it has an additional curve or depression, *n*, in which the roller *n'* rests when the tying mechanism is at rest, and just beyond this curved de-

pression is a raised portion, n^2 , which, as it passes under the roller n' , lifts it and causes lever N to draw upon rod M and lift the crank-arm g' , so as to revolve its shaft and cause the compressor to advance upon the gavel, while the main binder-wheel revolves shaft C to tie the knot in the cord that the needle has carried around the gavel, for in its revolution the wheel, acting through rod L , has drawn the crank-arm d' from the position shown in Fig. 1 to that shown in Fig. 2, which revolved the shaft d just far enough to carry the eye of the needle into the tyer.

That the trip-lever I may be held out of the way of the pawl k while a knot is being tied, I provide a stop, s , on the butt of the crank-arm d' , and another, s' , on the hub of the lever I , so that when the crank arm is carried into the position shown in Fig. 2 it will draw the trip-lever I over with it.

I make the spring-rod M in two sections, m and m' . Over section m , I pass a plate, o , and then a heavy spring, o' . I then pass another plate, p , onto it, and on that I place a spring, o^2 , very much more flexible than o' , and on top of this another plate, p' , and interposing sleeve p^2 between plates p and p' . I pass rods p^3 through them all and through a plate, m^2 , that is headed on rod or section m' , and tighten the whole by heads and nuts. The plate p' is headed on rod or section m' , and the sleeve p^2 slid loosely through it. The operation of this rod M is very simple. It is the medium through which the crank-arm g' is supported to hold the compressor up in position to receive the grain, and its spring o^2 is just strong enough to support the arm g' until a bundle of grain of the proper size has been packed upon it, while the spring o is strong enough to resist the tension required to compress the gavel, and yields only when a bundle of such bulk has been accumulated as would strain the machine but for such yielding.

R is the cord-box of my improved binder, which I secure to the standard A , so as to be out of the way of the machinery, as well as below it, and from this box I carry the cord or twine up and pass it through a perforation, R' , in the arm d' , and thence through the eye R^2 to the needle. When the arm d' travels forward to carry the eye of the needle to the tyer, it will draw enough of the cord out of the box to leave a loose string for the next gavel to come down on.

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

1. The combination, in a grain-binder, of the clutching mechanism, a pivoted trip-lever, and the compressor, with intermediate mechanism between the compressor and the trip-lever, whereby the trip-lever and the compressor are permitted to move independently of each other during the binding operation, but when at rest be in such a position that the accumulated grain will cause the compressor-shaft to throw the trip-lever off of the clutching mechanism, substantially as set forth.

2. The trip-lever, in combination with the compressor-shaft and its crank-arm, and a slotted connecting-strap, as set forth.

3. The combination of the main binder-wheel, having the curve or depression in its cam-groove, of the compressor-shaft, the spring connecting-rod, and the pivoted lever having a roller taking into the cam-groove, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 10th day of January, 1882.

JOS. P. BULLOCK.

Witnesses:

S. S. STOUT,
ERNEST DERRY.