

(No Model.)

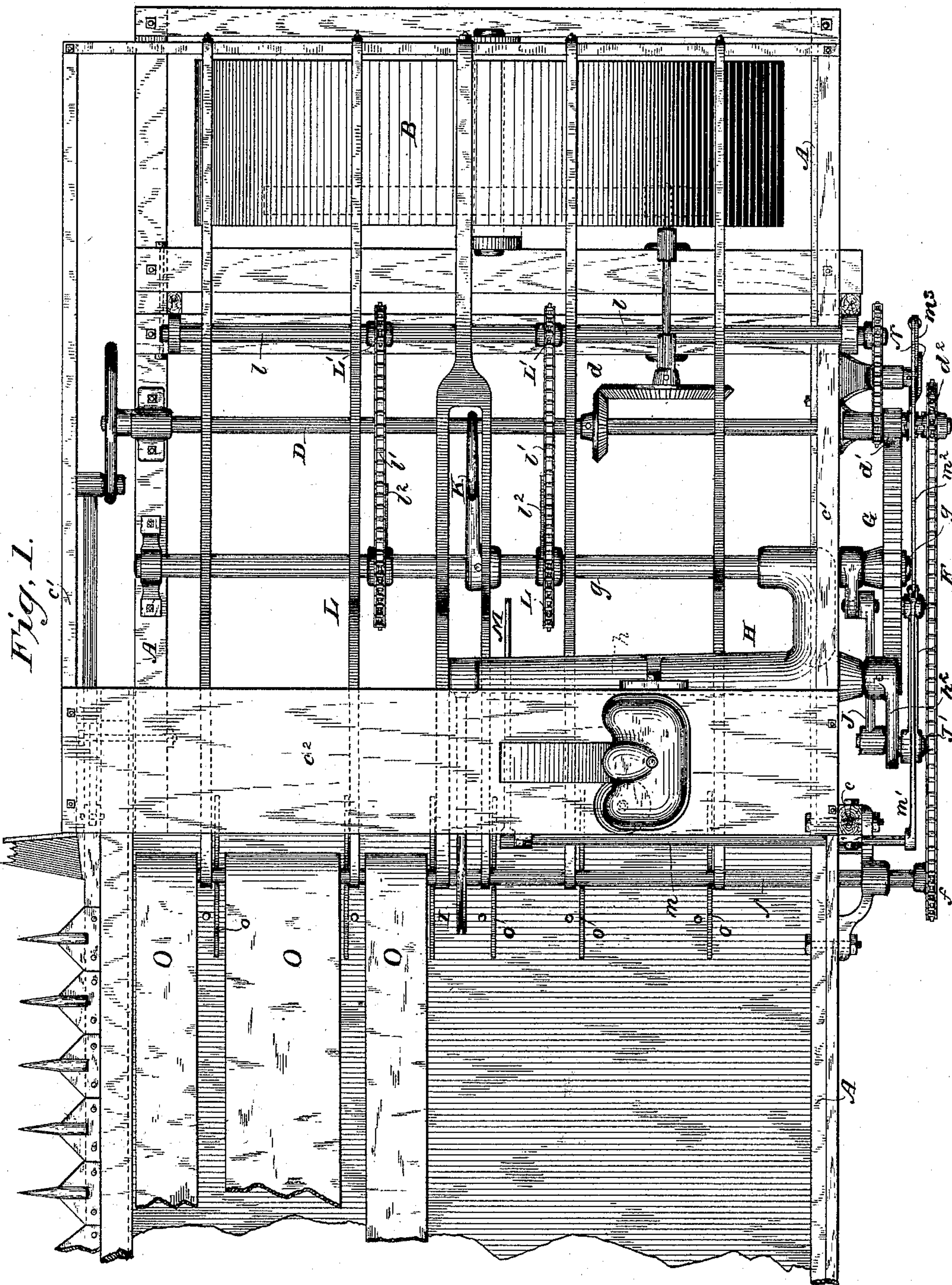
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E. W. JENKINS.

HARVESTER BINDER.

No. 324,772.

Patented Aug. 18, 1885.



WITNESSES

Wm A. Skinkle
Geo W. Young

INVENTOR

Edward W. Jenkins.

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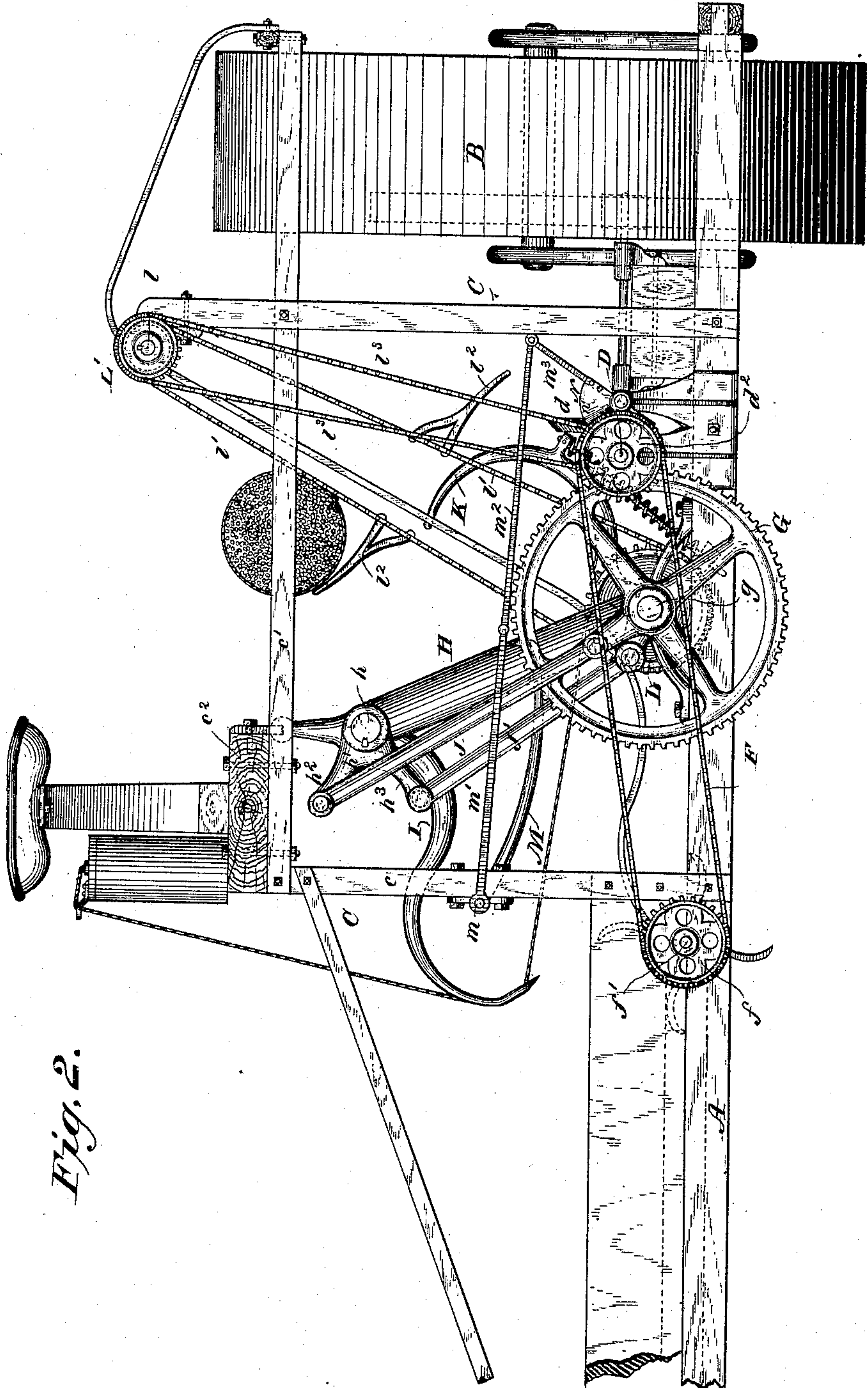


Fig. 2.

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(No Model.)

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Fig. 3.

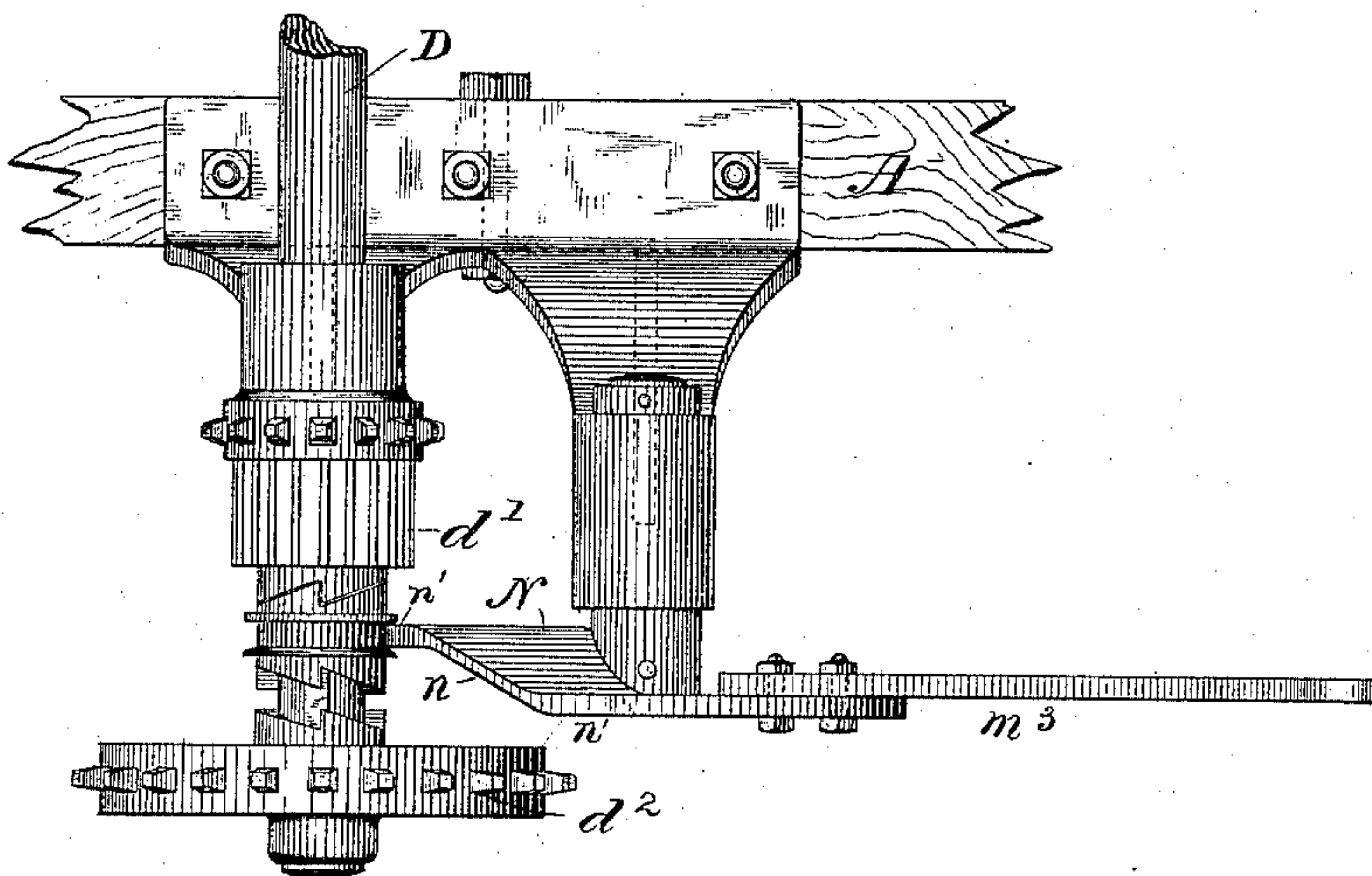
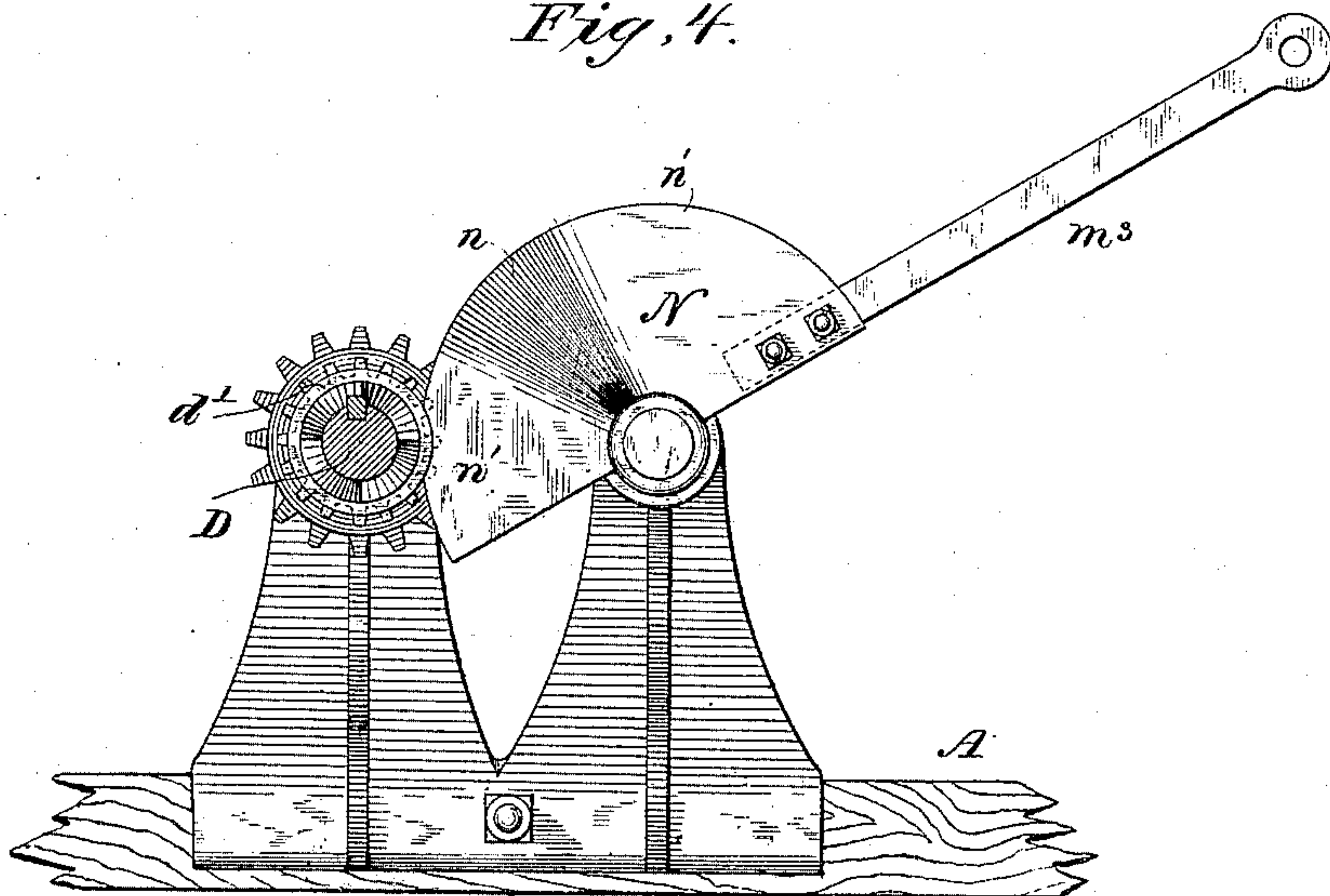


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

EDWARD W. JENKINS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE McCORMICK HARVESTING MACHINE COMPANY, OF SAME PLACE.

HARVESTER-BINDER.

SPECIFICATION forming part of Letters Patent No. 324,772, dated August 18, 1885.

Application filed February 12, 1883. (No model.)

To all whom it may concern:

Be it known that I, EDWARD W. JENKINS, of Chicago, in the county of Cook and State of Illinois, have invented certain new and
5 useful Improvements in Harvester-Binders, of which the following is a specification.

Grain-binders as heretofore made have generally been intended for attachments to harvesters of that type known as the "Marsh,"
10 and have received the grain from the head of the elevator of such machines and bound it on the outer or stubble side of the main wheel. These Marsh harvesters have been made with
15 an endless carrying-apron forming the surface of the platform and receiving the cut grain as it fell and carrying it toward the elevator, and upon this elevator either two carrying-aprons, one supporting and the other pressing
20 upon the grain as it is borne up toward the head, or else one supporting-apron and an overlying float or presser composed of guide boards or bars.

While the advantages of this type of harvesters, so far as they go, have been undeniable in making a more compact machine by
25 bridging the main wheel instead of pushing it out beyond the whole mechanism, and perhaps in affording the straw an opportunity to straighten as it is lifted and to approach the binding mechanism in better shape for the
30 operation of the latter, yet, on the other hand, it has been found that great power is required for driving, particularly for driving the elevator belts or aprons, owing to their slip or
35 drag, and also a certain tendency to clog when stuffed with grain. If the upper apron is dispensed with, the saving is very slight, as there must be in its place a presser or guide
40 to hold the grain to the surface of the apron, and the friction against the longitudinal bars of this presser will at times be commensurately great. Then, also, when the grain is ripe, the
45 heads are badly thrashed out in this passage up the elevator, as they are pressed and rubbed against each other with considerable force, and finally, being discharged over the head down the chute into the binding-receptacle, will lose yet more of their contents.

It has been attempted to overcome these defects by constructing binders upon a plan

known as "low level," the platform-carrier delivering directly to the binding mechanism, and the bound sheaf being discharged immediately beyond at the stubble end of the platform, or else ejected by a fork or "kicker." 55
In these low-level machines the main or driving wheel has been either in front of the platform, which would be connected thereto by a hinging-frame, or, perhaps, by a rigid rear extension of the draft-frame, or else this
60 wheel has been out at the stubble end beyond the space through which the bound sheaf was discharged. In the first case the platform was badly supported and difficult of control, and there would be a constant tendency to
65 twist or warp, the natural result being that in a short period of time it would fail to work satisfactorily. In the second, while the control of the platform was retained under good command, the frame-work had to be length-
70 ened some feet to permit the discharge of the sheaf; therefore the distance between the main wheel and the grain-wheel would be more than compatible with properly supporting or
75 bracing the parts between them, and the two longitudinal sills, bearing all this heavy mechanism, and having no contact with the ground except through these end wheels, would sink or sag in the middle, or give way.

The object of my invention is, while retaining the desirable features of the Marsh harvester as to compactness, strength, and easy control, to do away with the existing objectionable features of the elevator, the extraordinary driving-power required, the loss of
85 grain, and so forth. To this end I propose to convey the grain by an endless platform-apron directly to binding apparatus occupying the position heretofore represented by the junction between the platform and the elevator, 90
and from this binding apparatus take the bound sheaf by a light elevating rake or carrier over the main wheel and discharge it to the ground. For greater efficiency this mechanism is combined with automatic tripping
95 devices, which, being acted upon by the accumulating gavel, throw the platform-carrier out of action, and at the same moment start the binding mechanism and the elevating-rake to bind the sheaf and remove it from the recep- 100

tacle, then resetting the carrier-apron in action as the binder resumes its position of rest.

In the drawings, Figure 1 is a top plan view of a harvester and binder embodying my invention, part of the platform being broken away, as immaterial to the proper understanding thereof. Fig. 2 is a rear elevation of so much of the machine as is shown in Fig. 1; and Fig. 3, a detail in top plan, and Fig. 4 in side elevation, of mechanism for operating the double clutch.

A is the main frame of the machine, and B the driving-wheel mounted therein in the usual manner. At the inner end, in the position heretofore occupied by the elevator-frame, is a rectangular upright frame, C, composed of posts or standards c and cross-timbers c' , supporting the plank c^2 for the seat-standard, and affording bearings and points of attachment for the various shafts and castings of the binding mechanism. The shape of this latter frame may be somewhat modified or varied, and may assimilate itself to a greater extent than represented to the ordinary construction of the elevator-frame heretofore used in the same position. It has simply been adopted herein as a convenient exponent.

The cutter crank-shaft D, driving the cutter-bar by a crank at its front end, runs entirely through from front to rear, being journaled in boxes attached to front and rear sills, and is driven from the main wheel by a prime pinion shaft and beveled gears, d , in the ordinary manner. At the rear end of this shaft is a loose pinion, d' , and beyond this a loose chain-wheel, d^2 , the two being provided with opposing clutch-faces. Between them is a sliding clutch-half having two clutch-faces—one to engage with the pinion and the other with the sprocket or chain wheel; and this clutch-half is caused by any suitable means—such, for instance, as hereinafter described—to engage alternately with the pinion and with the wheel, to drive the one or the other. A chain, F, connects this loose sprocket-wheel with a fast sprocket-wheel, f , upon the shaft or drum f' at the inner end of the platform-carrier, so that whenever the sprocket-wheel on the crank-shaft is clutched to said shaft the carrier will be driven to bring the grain in toward the main wheel.

The loose pinion engages with the gear-wheel G, running loosely upon a shaft, g , which extends parallel with the crank-shaft, and, like that, is journaled in boxes attached to the front and rear sills, but is between the crank-shaft and the inner end of the carrier apron or aprons. A bracket or frame casting, H, extends diagonally up from the shaft g , to which, for convenience, as a support, its lower end is sleeved, and at its upper end is secured to the foot plank or board supporting the seat-standard, or to any convenient part of the frame. The shape of this casting is substantially the same as that used in the McCormick binders of the present day for carry-

ing the binding-arm—that is, it is composed of a vertical post and an overhung arm extending to a point practically above the center of the gavel, and receiving within its longitudinal bore a rock-shaft, h . To the inner end of this rock-shaft is attached the binding-arm I, and to its outer end, above the gear-wheel, is keyed a crank-piece, h' , having two arms, one of which, h^2 , is connected by a pitman, J, with the wrist-pin upon the gear-wheel, and the other of which, h^3 , by a pitman, J' , with a crank or arm from the shaft g , upon which this gear-wheel runs loosely, as stated. This shaft g , which subtends the decking or grain-receptacle, has fixed to it, at a point opposite to or in the same vertical plane with the binding-arm, a compressor-arm, K, opposing said binding-arm. When, therefore, the clutch-half is moved from the sprocket-wheel and toward the loose pinion, disengaging the former and locking the latter to its shaft, the gear-wheel G will be driven, and through the pinion will depress the binding-arm to carry the cord around the gavel and to the holding, knotting, and cutting devices located beneath the receptacle, and not herein shown, as their specific construction forms no part of the present invention. At the same time the second pitman, being caused by the movement of the upper rock-shaft or binder-arm shaft to descend, rocks the shaft g without interfering with the gear-wheel, and raises the compressor to meet the binder-arm and compress the gavel before the knot is tied. Upon said shaft g , as a convenient bearing, are two loose sprocket-wheels, L, one on each side of the compressor, suitably spaced relatively to each other for their purpose. Diagonally above these sprocket-wheels, in a position corresponding to or nearly to the usual head of the elevator, are two other sprocket-wheels, L' , mounted upon and fast to the shaft l , and receiving chain belts l' from the lower wheels. Each belt is provided with two curved fingers, l^2 , the fingers on one being directly opposite or abreast with the fingers of the other, and the two fingers on each belt being so spaced that there shall be half a length of the belt between them.

A chain, l^3 , connects a sprocket-hub upon the loose pinion which drives the binder with a sprocket-wheel upon the rear end of the shaft L, and thereby drives these two chains, which form elevating-chains to carry the bound sheaf from the binder, their motion obviously taking place only when the pinion is clutched in order to drive the binder, at which time the chain-wheel driving the platform-carrier is out of action and the latter at rest, the action of the sliding clutch-half alternately causing the platform-carrier to be driven, and then the binder and the elevating-chains.

This action of the binder and elevating-chains may be brought about by positive means at regular intervals, and variance in the growth of crops compensated for by change-speed gearing, if it be so desired. It is bet-

ter, however, to control it by automatic tripping mechanism actuated by the gradual accumulation of the grain in the well-known way. No specific mechanism for this purpose is essential. Almost any one of the usual forms of trips may be adapted to the machine and to the purpose by those having knowledge of the art. However, in order to a complete description I propose the following arrangement:

10 A tripping-arm, M, fixed to a rock-shaft, m , above the entrance to the binding-receptacle, overlies the median line of the gavel, to one side, however, of the binder-arm and between the latter and the rear of the machine. At
15 the rear end of the rock-shaft is fixed a lever-arm, m' , to which is pivoted a link, m^2 , connecting it with the free end of an arm, m^3 . The lower end of this latter arm is fixed to a disk, N, which has upon its periphery a feather-cam entering into a groove in the clutch-half and shaped as shown—that is, having a jog, n , or inclined portion just sufficient to throw the clutch-half into engagement with either the loose pinion or the loose chain-wheel, according to the direction in which the
25 disk is rotated, and beyond this jog straight portions n' , calculated to hold the clutch in engagement with that instrumentality against which it has been thrown. Thus the tripping-arm will be permitted a further indefinite movement after it has caused the engagement of the clutch-half, such movement being sometimes required by the exigencies of the machine, as in compressing the gavel or removing it from
30 the receptacle it may elevate the arm beyond the distance required for the tripping action, and without some such compensating feature might wrench or strain it.

The platform rake or carrier may be of any
40 suitable and approved style, as a broad endless apron or chains carrying folding or knuckling teeth. It is desirable, however, to have packers at the inner end thereof to force the grain steadily and constantly into the binding-receptacle. For this reason the apron is shown
45 in sections O, between which rise recurved or back-set teeth o from the drum or shaft at the inner end as said shaft revolves. A different type of packers may be used and the rake conformably altered or varied. With an unbroken apron the packers may be arranged between the inner drum and the receptacle, or chain-rakes can be employed that will themselves serve as packers.

55 Now, supposing the carrier to be delivering grain at the inner end of the platform, this grain, being forced onward into the receptacle by the packing-arms, will accumulate beneath the tripping-arm and gradually raise it until
60 finally it will disengage the clutch-half from the loose sprocket-wheel, stopping at once the carrier and the packers; and at the same moment engage it with the loose pinion, starting the main gear of the binder and bringing down the binding-arm to meet the compressor. The
65 elevating-chains at the same moment starting will bring their unemployed fingers around to

the rear side of the gavel, directly after the latter has been completely bound, and as the binder-arm and compressor open will carry it
70 up toward the head of the elevator, resting in the fingers as in a cradle. As soon as the sheaf has been carried out from beneath the trip-arm, the latter will fall by its own weight or assisted by a spring, throwing binder and
75 elevating-chains out of gear and starting the platform-carrier. The bound sheaf will now be supported part way up the elevator and carried in its cradle until the next binding operation, when it will be taken to the head and
80 discharged thereover upon the stubble, while the second set of fingers receive the new sheaf and take it, in like manner as before, from beneath the tripping-arm and out of the grain-receptacle.

I claim—

1. The combination of the main wheel, the cutter crank-shaft, the loose pinion and loose chain-wheel thereon, the chain-wheel driving the platform-carrier, and the chain connecting it with the loose chain-wheel on the crank-shaft, the main gear-wheel of the binder intermeshing with the loose pinion, and the double clutch-half between said loose pinion and loose chain-wheel adapted to engage with the
90 one and with the other alternately to clutch them to the shaft.

2. The combination of the main gear-wheel of the binder, the bracket with its overhung arm, the rock-shaft passing through said
100 arm, the binder-arm at the inner or front end of said rock-shaft, the double-crank casting at the outer end of said overhung arm keyed to the rock-shaft, the pitman connecting one arm of said casting with the wrist-pin upon
105 the main gear, and the second pitman connecting the second arm of said casting with the arm upon the rock-shaft subtending the grain-receptacle and bearing the compressor.

3. The combination of the main gear-wheel
110 of the binder running loose upon the rock-shaft, the bracket-casting with its overhung arm, the binder-arm shaft journaled in said overhung arm, the double-crank casting keyed to the outer end of said shaft, the pitman
115 connecting one arm of said casting with the wrist-pin upon the main gear, the second pitman connecting the other arm of said casting with a crank-arm from the same rock-shaft upon which the main gear turns, and
120 the compressor keyed to said latter rock-shaft and opposing the binding-arm.

4. The combination of the main gear of the binder turning loosely upon the rock-shaft which subtends the grain-receptacle, the
125 bracket-casting supporting the binder-arm shaft, the double-crank casting keyed to the outer end of said shaft, the pitman connecting one arm of said casting to the wrist-pin upon the main gear, the second pitman connecting
130 the other arm with a crank from said rock-shaft, the compressor fixed to the rock-shaft and operated by the second pitman, the sprocket-wheels turning loosely upon the rock-shaft,

and the chain belts and their fingers connecting said sprocket-wheels with other sprocket-wheels upon the elevated driven shaft, whereby the bound sheaves may be discharged over
5 the main wheel by said chains and fingers.

5. The combination of the automatic binding mechanism, its main gear-wheel, a loose pinion upon the driven shaft intermeshing with said gear-wheel, a loose chain-wheel upon
10 said driven shaft connecting by chain belt with another wheel upon the shaft or drum which drives the platform-carrier, the elevating-chains and their fingers, and the upper shaft by which they are driven, the sprocket-
15 hub upon the loose pinion connected by chain with the sprocket-wheel upon said upper shaft, and the shifting-clutch between the loose pinion and the loose sprocket-wheel, whereby the platform-carrier may be thrown out of action
20 and the binder and elevating-chains simultaneously started.

6. The combination of the main gear-wheel of the binder, the rock-shaft upon which it turns loosely, the compressor fixed to said
25 rock-shaft, the sprocket-wheels, also turning loosely upon the rock-shaft, the chain belts connecting said sprocket-wheels with other sprocket-wheels upon the upper driven shaft, the loose pinion and its sprocket-hub, and the
30 chain belt connecting said sprocket-hub with

a sprocket-wheel upon the upper shaft to drive the binder and sheaf-elevator simultaneously.

7. The combination, with a low-down grain-receptacle and automatic binding mechanism working in connection therewith, of the two
35 elevating-chains, having fingers abreast of each other to carry up and eject the bound sheaf.

8. The combination of the platform-carrier, the grain-receptacle at the inner end thereof,
40 the packers intermediate between the carrier and the grain-receptacle, the binding mechanism working in connection with said receptacle, the tripping-arm actuated by the accumulation of the gavel in the receptacle, the
45 binder main gear-wheel, the loose pinion on the cutter crank-shaft, the loose chain-wheel, also on said shaft, connected by chain belt with the chain-wheel on the shaft which drives the platform-carrier, the sliding clutch-half
50 between the loose pinion and the loose sprocket-wheel, actuated by the tripping-arm, the sheaf-elevator, and the chain belt connecting the chain-wheel on the driving-shaft of the latter with the chain-hub on the loose pinion.

EDWARD W. JENKINS.

Witnesses:

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B. HALE JENKINS.