

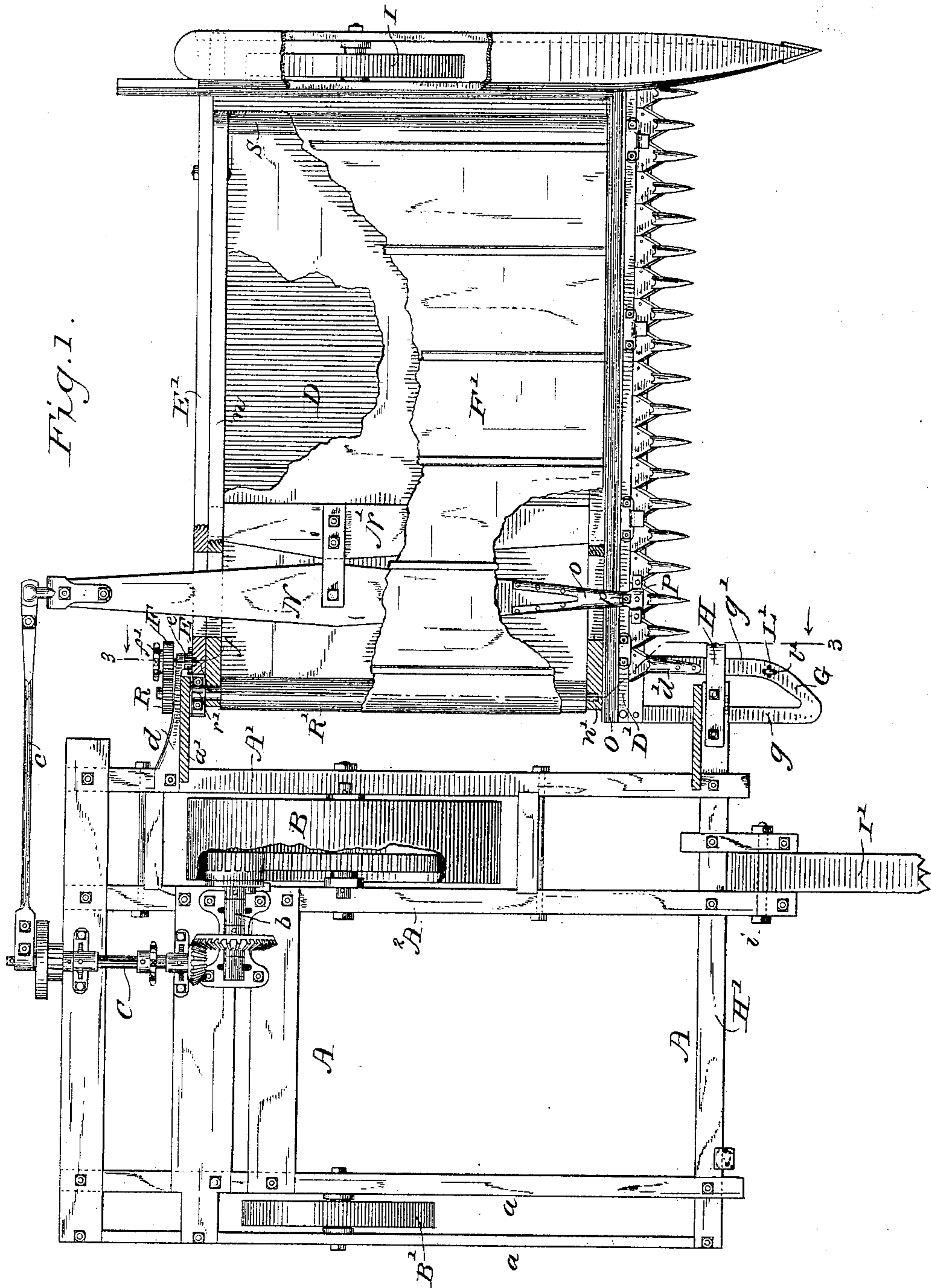
(No Model.)

4 Sheets—Sheet 1.

W. P. HALE.
HARVESTER.

No. 325,208.

Patented Aug. 25, 1885.



Witnesses

Wm A. Sprinkle
Geo W Young

Inventor
William P. Hale.

By his Attorneys

Palmer, Hopkins & Heydon.

(No Model.)

4 Sheets—Sheet 2.

W. P. HALE.
HARVESTER.

No. 325,208.

Patented Aug. 25, 1885.

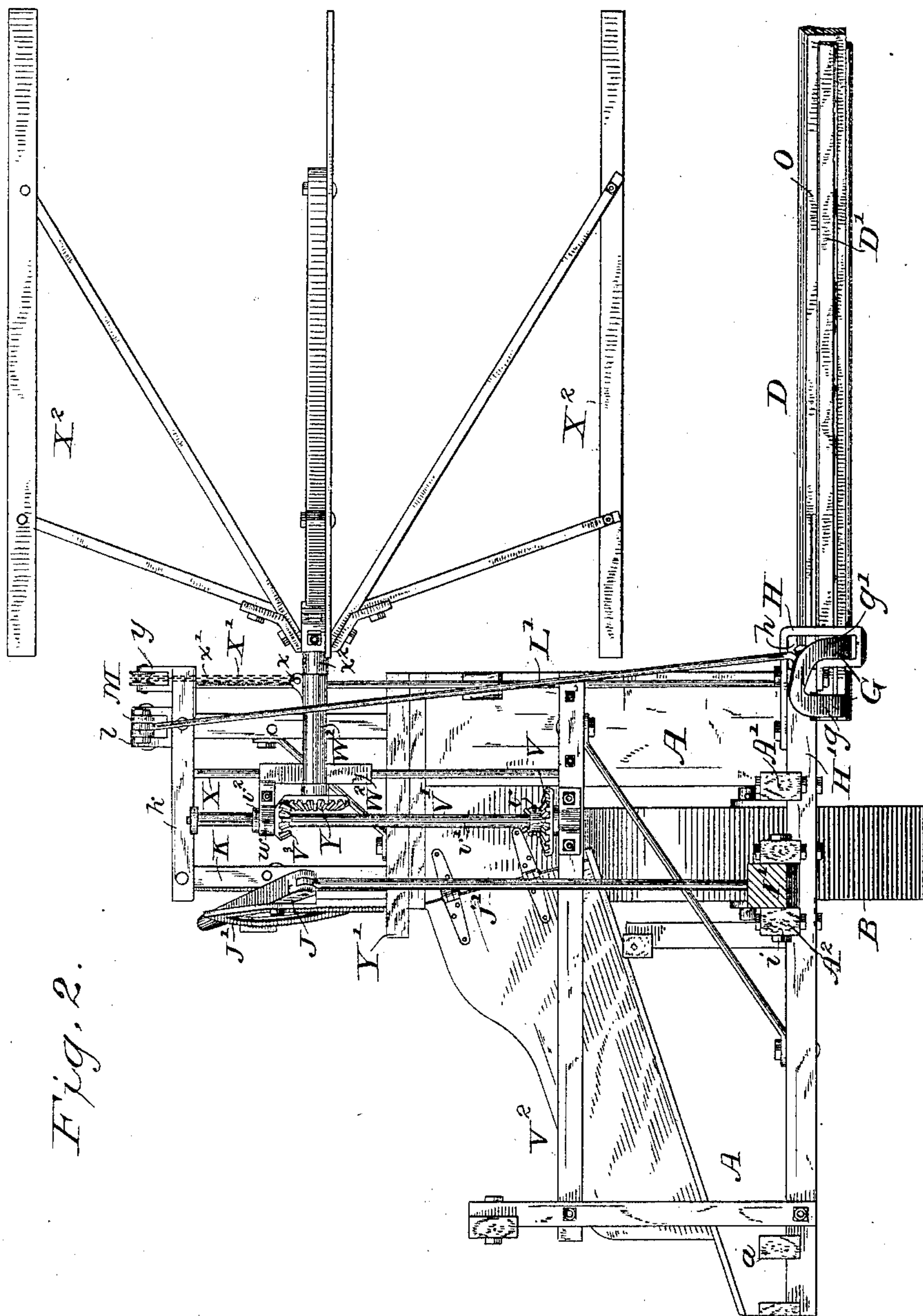


Fig. 2.

Witnesses

Wm A. Squire
Geo W Young

Inventor
William P. Hale.

By his Attorneys

Baldwin, Hopkins & Weston.

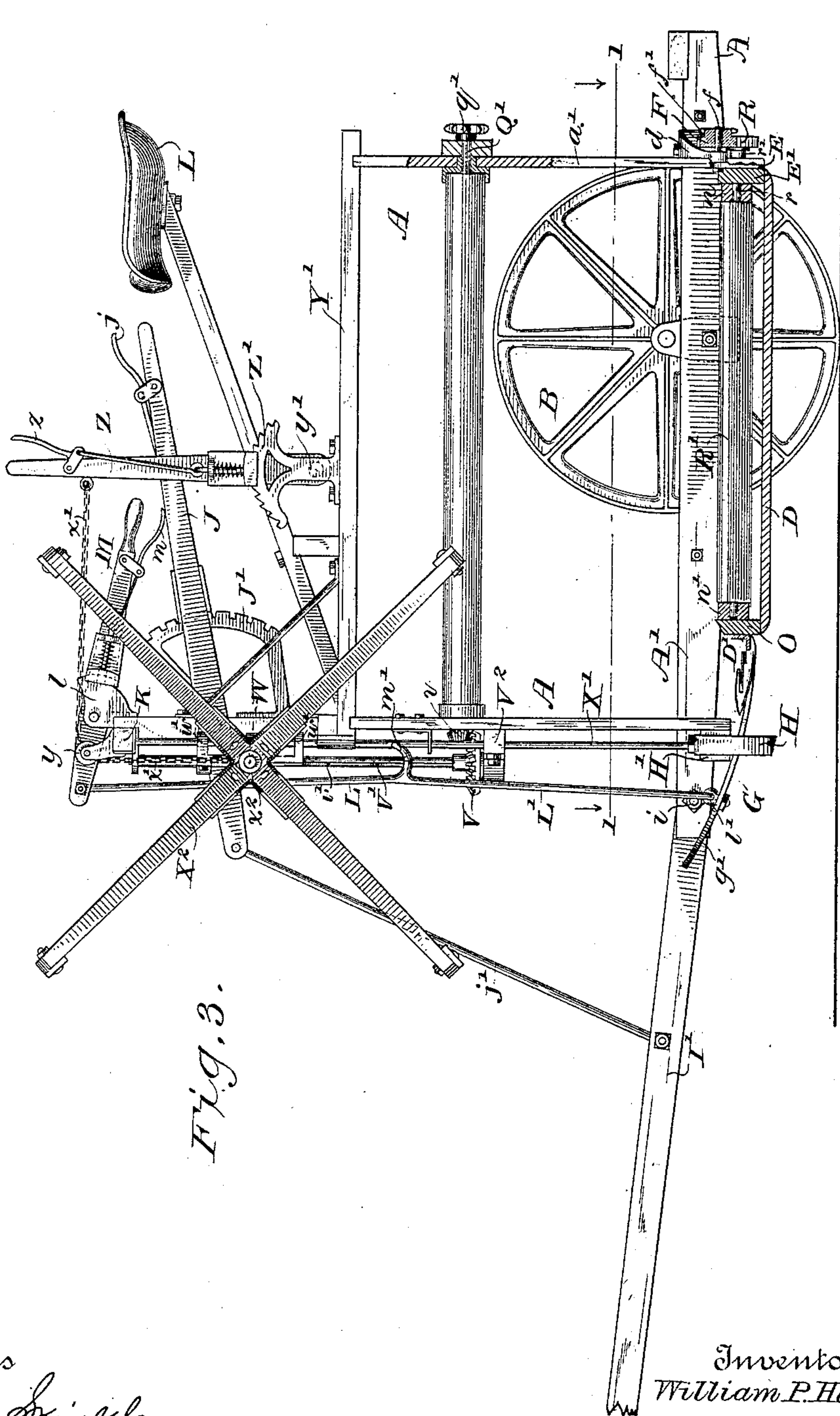
(No Model.)

4 Sheets—Sheet 3.

W. P. HALE.
HARVESTER.

No. 325,208.

Patented Aug. 25, 1885.



Witnesses

W. A. Brinkley
Geo W. Young

Inventor
William P. Hale.

By his Attorneys

Walden, Hopkins & Peyton.

No. 325,208.

Patented Aug. 25, 1885,

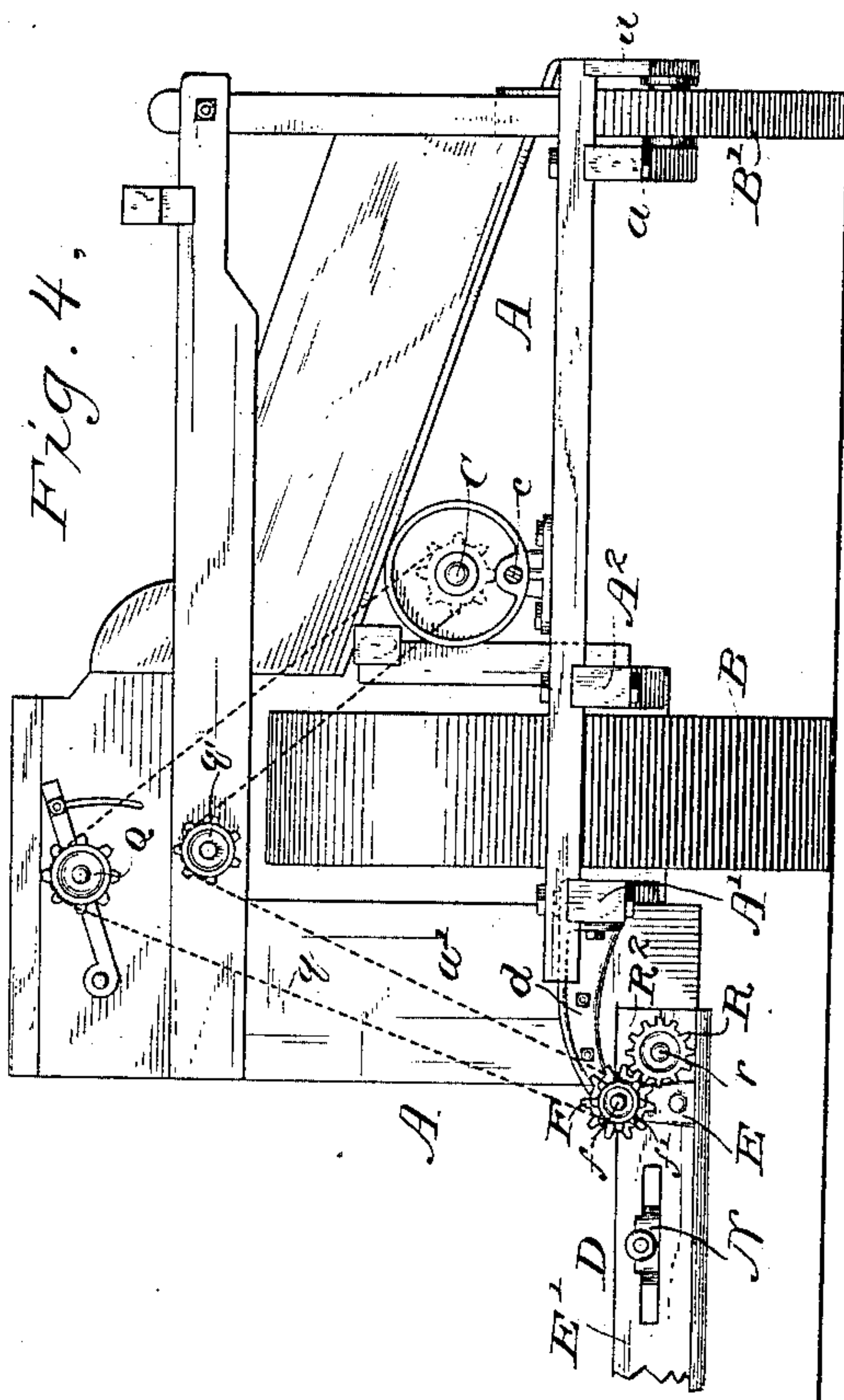


Fig. 7.

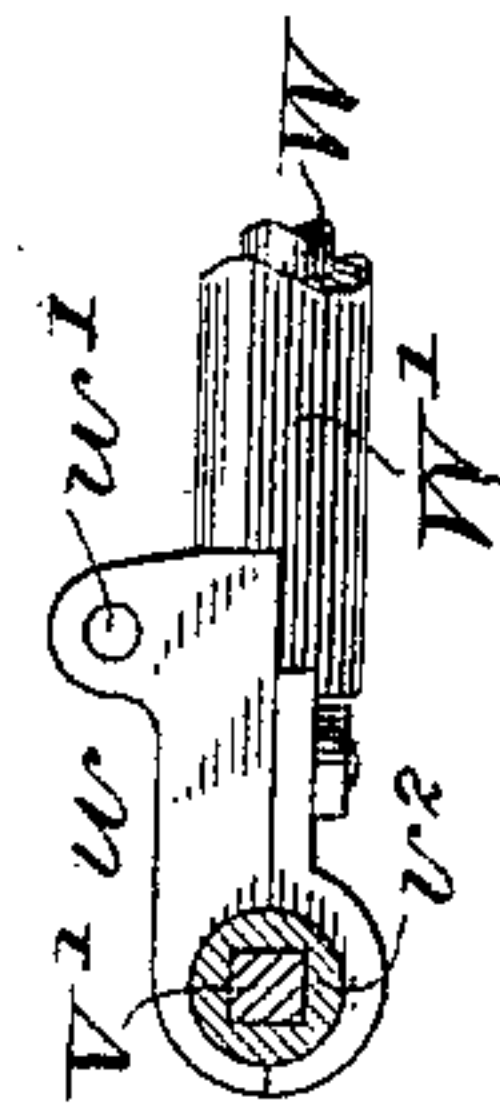


Fig. 5.

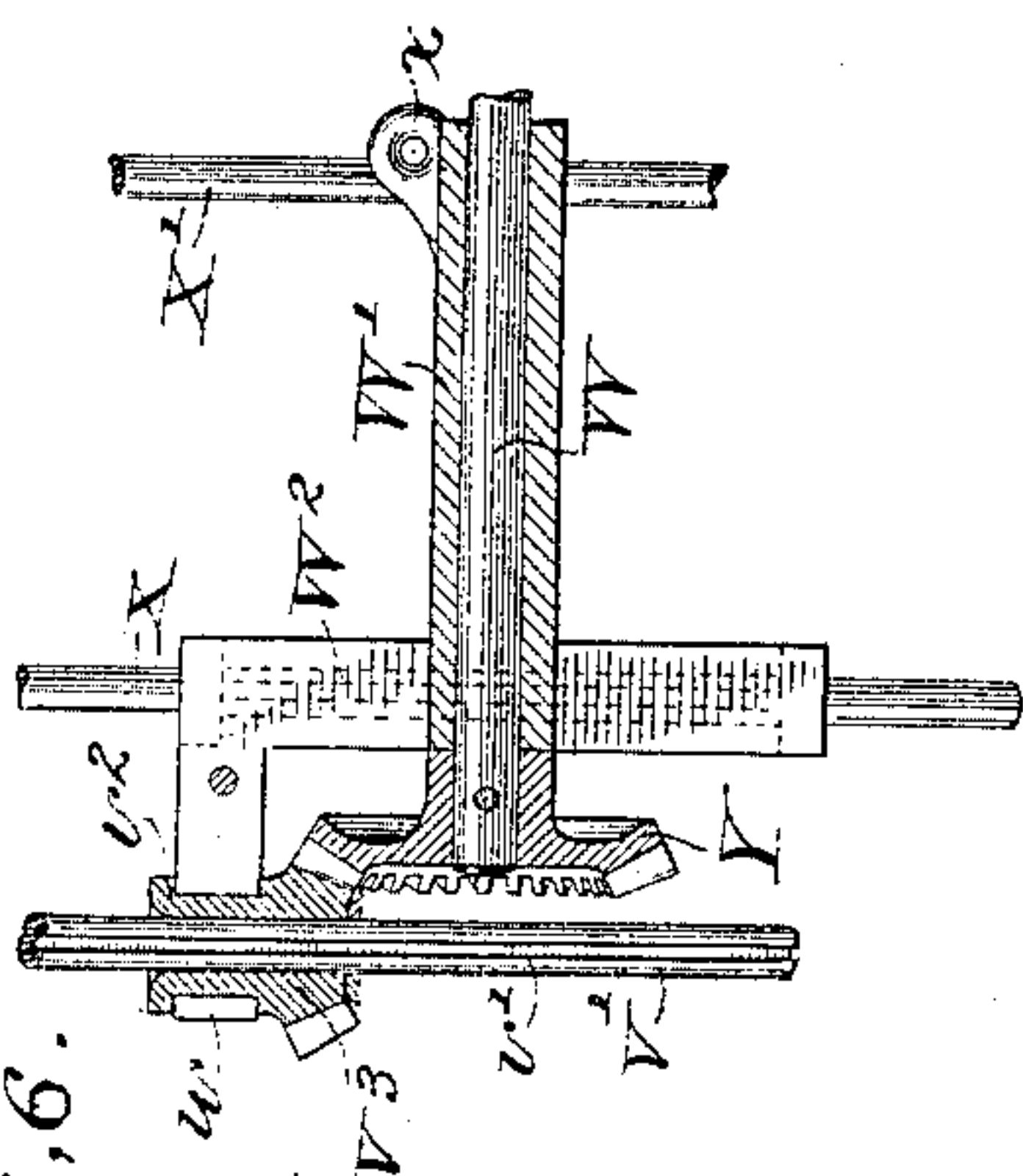
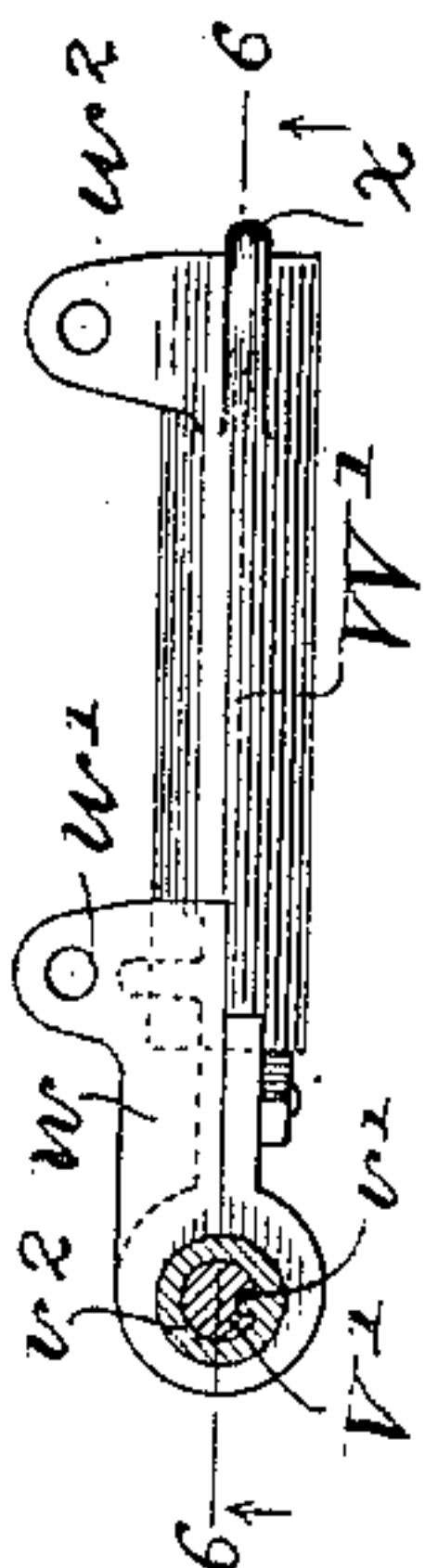
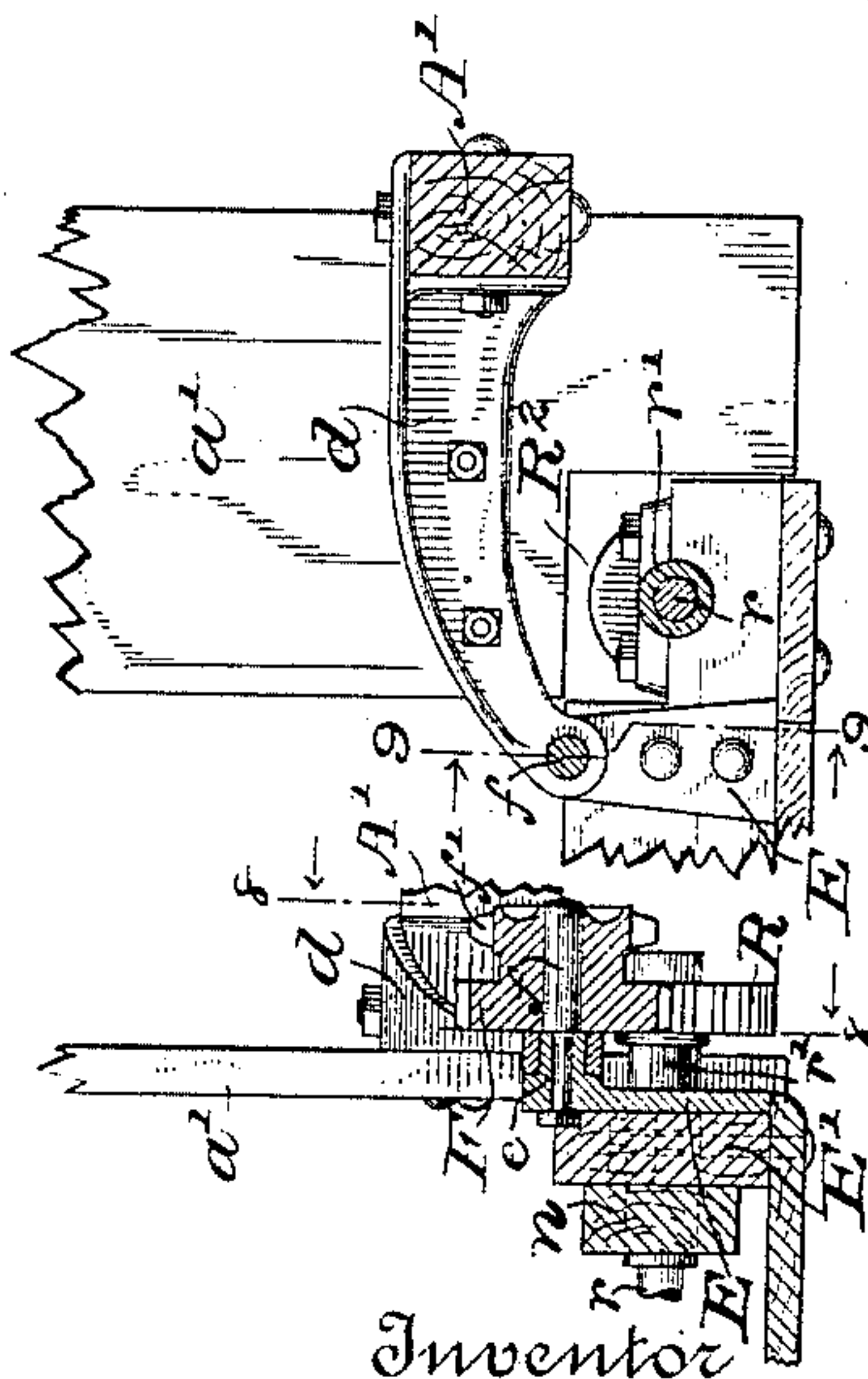


Fig. 8.



Witnesses

Wm A Skinkle

Geo W Young

Fig. 6.

Fig. 9.

Inventor

William P Hale.

By his Attorneys

Baldwin, Stephen Keyton.

UNITED STATES PATENT OFFICE.

WILLIAM P. HALE, OF BROCKPORT, NEW YORK.

HARVESTER.

SPECIFICATION forming part of Letters Patent No. 325,208, dated August 25, 1885.

Application filed September 12, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. HALE, of Brockport, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Harvesters, of which the following is a specification.

My invention relates to improvements applicable to harvesters (more especially grain-binding harvesters) of the class in which the grain-platforms and cutting apparatus have jointed connection with the main frames of the machines.

My objects mainly are to produce simple and inexpensive means by which to provide for folding up the grain-platform and cutting apparatus, in order that the machine may occupy less room and its transportation be facilitated; for rocking the grain-platform and cutting apparatus to elevate or depress the points of the guards, and for vertically adjusting the reel.

The means employed for effecting the above referred to objects and various minor features of my invention will hereinafter be particularly pointed out by the claims, after first being described by reference to the accompanying drawings, which show my improvements in connection with those parts of an appropriate grain-binding harvester, illustration of which is needed to convey a proper understanding of a suitable application of my invention.

Figure 1 is a plan view with many portions omitted, some parts broken away, and others in section on the line 1 1 of Fig. 3. Fig. 2 is a front elevation with parts broken away and the tongue in section. Fig. 3 is a side elevation partly in section on the line 3 3 of Fig. 1. Fig. 4 is a rear elevation with various portions omitted and parts broken away. Fig. 5 is a plan view of an adjustable bearing-bracket for supporting the reel shaft, with the hub of the reel-driving pinion and its shaft in section. Fig. 6 is a view, partly in front elevation and partly in section on the line 6 6 of Fig. 5, showing the bearing-bracket for the reel-shaft, and in part the means for supporting this bracket and driving the reel shaft. Fig. 7 is a plan view showing a modification of the way of connecting the vertically-sliding reel-driving pinion with its shaft. Fig. 8 is a rear elevation with parts in section on

the line 8 8 of Fig. 9, showing details of the jointed connection between the main frame and grain platform at rear. Fig. 9 is a view partly in side elevation and partly in section on the line 9 9 of Fig. 8.

A suitably constructed main frame, A, is supported upon two wheels, one a main or driving wheel, B, and the other a supplemental wheel, B', the respective axles of which are mounted in line with each other in the parallel inner bars, A' A², and the parallel outer bars, a a, of the main frame in suitable way. These supporting-wheels may be of like size.

Motion is imparted to a primary or driving shaft, b, from the driving and main supporting-wheel by gearing in well-known way, and this driving-shaft is geared with a secondary or driven shaft, C. These driving and driven shafts are mounted in suitable bearings secured to the main frame, and clutch mechanism for throwing the driving-shaft into and out of gear with the driving-wheel is provided as usual. The driven shaft projects beyond the main frame at rear, and is provided with a crank to which is attached the pitman c for actuating the cutters, as further on to be described.

A suitable grain platform, D, and a finger-beam, D', rigidly secured thereto, have jointed connection with the main frame in such manner that they may be turned up vertically about said jointed connection and folded against the main frame to facilitate transportation and storage of the machine and its passage through gateways, &c. Provision is also made for rocking the platform and finger-beam to tilt the guards for well-known purpose.

As shown, the details of the jointed connection of the grain-platform and the finger-beam of the cutting apparatus with the main-frame are as follows: A frame-bracket, d, is rigidly secured to the main frame at or near its rear inner corner by being suitably fastened to the frame-bar A' and to a rear upright bar, a', of the main frame. This frame-bracket is perforated at its downwardly-curved outer end to form a bearing for pivotally supporting a rounded tubular boss, e, formed with a platform-bracket, E, rigidly attached to the back beam, E', of the grain-platform. This jointed connection of the rear inner end of the plat-

form with the main frame is made sufficiently loose in well-known way (the bearing is made parallel with and somewhat larger than the boss) to allow of the slight play needed to permit of the vertical vibration of the platform required in rocking the guards by means in turn to be explained. The boss *e* of the platform-bracket is secured in its bearing in the frame-bracket by means of a bolt, *f*, provided with a nut, and serving to pivotally support a carrier actuating pinion, *F*, and a sprocket-pulley, *f'*, rigidly secured to or formed with the pinion. This pinion and attached pulley are mounted upon the rearwardly-projecting enlarged or shouldered portion of the bolt *f*, as shown. By means of the pinion and pulley so mounted to rotate about an axis coincident with that about which the platform plays in its adjustments an endless carrier, *F'*, is actuated, as in turn to be described, without liability to derangement of its actuating mechanism by the movements of the platform. At front the grain-platform and heel end of the finger-beam are adjustably connected with the inner front corner of the main frame by means of a shoe, *G*, and a guideway-bracket, *H*, with which the shoe has adjustable engagement. This guideway-bracket is of loop-like construction, being formed of a bar bent to provide an opening or way, *h*, for the shoe diametrically in front of or in the same vertical plane as the boss *e* of the platform bracket *E*, and it is removably secured by its bent ends or arms to the inner end of a front cross bar, *H'*, of the main frame, as plainly shown. The shoe is of skeleton form, being constructed of a bar bent into the shape shown and rigidly and strongly united at the inner ends of its two sides or branches, *g g'*, with the finger-beam. The attachment of the shoe to the finger-beam is strengthened by means of the inner guard finger, *d'*, which is somewhat enlarged, and riveted to the outer side or branch, *g'*, of the shoe. This branch of the shoe passes through the guideway *h* of the bracket *H*, and is supported therein at all times. The guideway of this bracket is long enough to admit of the slight vertical play of the shoe, which is necessary in rocking the guards. The grain-platform is supported at its outer end by the usually-provided grain-wheel *I*. The axle of this wheel is directly in line with the axles of the main and supplemental supporting-wheels of the main frame. The main frame has jointed connection at front with the heel end of the tongue *I'*, through which passes the pivot-bolt *i*, and means, such as next to be described, are provided for rocking the main frame, the grain-platform, &c., about the axles of the main and supplemental supporting wheels and the grain-wheel, and for rocking the grain-platform and cutting apparatus independently of the main frame. A frame rocking-lever, *J*, is pivoted near its front end to a post, *K*, of an upper portion of the main frame, and terminates at its rear end near the driver's seat *L*. This lever is provided with suitable detent devices, shown

as formed by the sector rack *J'*, fastened to the post *K*, and the usual endwise moving detent-tooth acted upon by a spring for engaging it with the rack, and provided with the pivoted handle *j*, for disengaging it from the rack in well-known way. A stiff link-rod, *j'*, is pivoted at its opposite ends to the tongue and the front end of the lever, respectively. This link-rod is inclined so as to connect with the tongue somewhat in advance of its pivotal attachment to the frame. By operating the lever *J*, as will be readily understood, the main frame and its attachments are rocked. A platform rocking lever, *M*, provided with suitable detent devices, is pivoted near its front end to a supporting-bracket, *l*, secured upon top of a cross-bar, *k*, of the upper portion of the main frame. The detent devices of this lever consist of a sector-rack formed with the supporting-bracket *l* and the ordinarily-used detent-tooth operated by a spring and a pivotal handle, *m*. A link rod, *L'*, is pivotally attached at its ends to the front end of the lever *M* and to the shoe *G*. This link-rod is connected to the shoe near its front end and to its branch *g'* by means of a hook at the lower end of the rod engaging an eye, *l'*, secured to the shoe. A rearward-projecting short curved arm or hook-shaped lug, *m'*, is provided about midway the length of the link-rod *L'* for a purpose in turn to be explained.

From the above description it will be seen that the platform and cutting apparatus are free to rise and fall at their outer ends that they may be rocked, and the parts secured in their adjusted position by manipulating the lever *M*, and that the connection of the link-rod *L'* with the shoe is such that the platform, &c., may be raised at the outer end and rocked or folded up to the main frame, the parts rocking about the bracket-bearing for the boss *e*, and the hook-joint between the shoe and link rod, and the guideway-bracket *H* preventing undue movement of the shoe in a horizontal direction or toward or away from the main frame. A sway-bar, *N*, has suitable jointed connection at its rear end with the pitman *c*, operated by the crank of the driven shaft *C*, which, as before described, is actuated by gearing-connection with the driving-wheel. The sway-bar, as usual, vibrates in front and rear slots in the frame of the grain-platform, and is pivotally connected about midway its length with a cross-bar, *N'*, of the platform frame. This cross-bar is between the upper and lower portions of the endless carrier, and secured at its opposite ends to cleats *n* and *n'*, respectively attached firmly to the back beam, *E'*, and to the front rail, *O*, of the grain-platform.

When the grain-platform is to be folded up to the main frame, it is necessary that the pitman *c* be disconnected from its crank, and this is done in obvious way.

The endless carrier *F'* is actuated by means as follows: A driving-chain, *q*, (see dotted

lines Fig. 4,) passes around a sprocket-pulley on the driven shaft C and around the before-mentioned pulley f' , which has supporting connection with the frame-bracket d and is formed with the pinion F. This pinion gears with a corresponding pinion, R, fast on the end of the rear journal, r , of the inner or driving roller R' of the endless carrier. Between this roller and the shaft C the chain q passes over an adjustable idle-pulley, Q, which serves to tighten the chain, and over a pulley, q' , fast on the end of the rear journal of a shaft, Q'. This shaft as it is represented would form one of the rollers of grain conducting apparatus. As I do not herein claim such apparatus, nor fully show it, and as its employment is not essential in connection with my present improvements, obviously an ordinary shaft may be substituted for the roller-shaft for the purposes of my herein-claimed invention, the function of the shaft being, as shown, to operate a reel by way of connecting mechanism, as further on to be described. The front journal of the roller R' has suitable bearing-support in the cleat n' of the front rail, O, of the platform, and the rear journal, r , of this roller is mounted in a bearing-sleeve, r' , which is secured to the back beam. The back beam is cut away at its inner end where the lugs of the bearing are secured to it, and the frame upright a' is cut out as at R² at one corner of its bottom to accommodate the roller-journal r and its bearing r' and permit of the proper vertical movements of the platform, as will readily be understood. The rear and front edges of the endless carrier overlap the cleats n and n' , respectively, and thus prevent access of grain, clogging matter, &c., to the bearings of the driving and driven rollers R' and S of the carrier.

The reel-operating shaft Q', actuated by the chain q , as before explained, is mounted at its opposite ends in suitable bearings at the front and rear of the main frame, and has a bevel pinion, v , fast to its front end. This pinion meshes with a bevel-gear, V, fast to an upright shaft, V', at or near its lower end. This upright shaft is mounted at its opposite ends to rotate in fixed bearings secured to the top cross bar, k , and to a cross-bar, V², of the main frame, and is provided with a longitudinal groove, v' . A pinion, V³, with an annularly-grooved elongated hub, v^2 , is fitted to rotate with the shaft V', while rendered capable of sliding vertically thereon by means of a rib or feather of the pinion-hub engaging the groove of the shaft in well-known way. Instead of this groove-and-feather-connection between the shaft and its pinion the construction may be made in equivalent way, as by squaring the shaft and similarly forming the opening in the pinion-hub, as shown by Fig. 7.

The reel-shaft W is mounted to rotate in a vertically-adjustable bearing-bracket, W', which is supported by and slides up and down guide-rods X X'. This bearing-bracket is

provided with a divided arm, w , for engagement with the annular groove of the hub of the pinion V³. As plainly shown by the drawings, this arm w engages with the pinion and has its two sections secured together by a nut and bolt, so that while the pinion is forced to move vertically with the bearing-bracket the pinion is left free to rotate with its shaft. The bearing-bracket is provided at one end with a vertically-extending cross arm, W², having perforated lugs $w' w'$ at its upper and lower ends for embracing the guide-rod X. At its opposite end the bearing-bracket has a perforated lug, w^2 , for embracing the guide-rod X', and is also provided with an eye, x , to which one end of a chain, x' , is attached. A reel, having any desired number of bats or beaters, X², is detachably secured by its head or carrier x^2 to one end of the reel-shaft W in suitable way, as by a set-screw or removable cross-pin, and at its opposite end the reel-shaft is provided with the detachably-secured fast bevel-gear Y engaging with the pinion V³. A reel-adjusting lever, Z, has connection by means of the chain x' with the reel-bearing bracket. This chain passes over a pulley, y , mounted in a bracket secured on top of the cross-bar k , and is fastened at its rear end to the lever Z near its top. This lever has pivotal supporting connection at its lower end with the main frame, and is provided with suitable detent devices. As shown, the lever is pivoted to a bracket, y' , secured to the bar Y' of the main frame, and formed with a sector-rack, Z', which is engaged by a spring-actuated detent-tooth controlled by the pivoted handle z in well-known way. The guide-rods X X' are rigidly connected at their opposite ends with the main frame, so as to afford a firm support for the reel-bearing bracket in connection with the chain by which this bracket is adjustably suspended.

From the above description it will be seen that the reel may readily and quickly be raised or lowered by the driver while in his seat; that its accidental descent to an extent such as would bring the beaters in contact with the cutting apparatus or platform is prevented by the lug m' on the link-rod L' of the platform-rocking devices, this lug serving to arrest the downward movement of the reel-bearing bracket; and that the reel may be detached from its shaft when the platform and cutting apparatus are to be folded up to the main frame. It will also be seen that in event of rocking the cutting apparatus upward at a time when the reel is set to work very low, the contact of the lug m' with the reel bearing bracket would elevate the reel and prevent breakage or improper action.

I do not wish to be understood as unqualifiedly claiming in a harvester either the combination of a main frame and a platform and cutting apparatus having jointed connection therewith, or the combination of a main frame, a platform and cutting apparatus, and means for rocking the platform and cutting appa-

ratus independently of the main frame, or with the main frame, or means for vertically adjusting the reel, as such combinations and means, broadly considered, are older than my invention. Neither do I wish to be understood as confining my invention strictly to the details of construction and precise arrangements of parts as hereinbefore particularly described, as my improvements may be modified in various ways, and some of them used without the others, or in connection with equivalents of omitted parts.

I claim as of my own invention—

1. The combination, substantially as hereinbefore set forth, of the main frame supported upon two wheels, the frame-bracket at or near the inner rear corner of the main frame, the grain-platform, the platform-bracket having pivotal connection with the frame-bracket, the finger-beam, and means by which the heel end of the finger-beam and the grain-platform at front have adjustable jointed connection with the main frame, for the purpose described.
2. The combination of the main frame, its supporting-wheels, the grain-platform, the frame-bracket with which the inner rear end of the grain platform has jointed connection, the finger-beam, and the shoe and guideway bracket by which the heel end of the finger-beam and the grain-platform at front have adjustable connection with the main frame, substantially as and for the purpose hereinbefore set forth.
3. The combination of the main frame, the grain-platform having adjustable jointed connection therewith at front, the frame-bracket secured to the main frame at or near the rear inner corner thereof, the platform-bracket provided with the tubular boss by which the grain-platform has pivotal supporting connection with the frame-bracket, the bolt by which said boss is secured in its bearing in the frame-bracket, and the pinion pivotally supported on this bolt, substantially as and for the purpose hereinbefore set forth.
4. The combination, substantially as hereinbefore set forth, of the main frame, the grain-platform having jointed connection at its rear inner end with the main frame, the finger-beam, the guideway-bracket secured to the inner front corner of the main frame, and the shoe formed with branches and secured to the finger-beam, and passing by one of its branches through the guideway-bracket, whereby the platform and cutting apparatus are adapted to be folded up and to be rocked, as described.
5. The combination of the main frame, the rigidly-united grain-platform and finger-beam, the guideway-bracket, secured to the main frame, the shoe adjustably engaging with the guideway-bracket, the jointed connection between the grain-platform and main frame in rear of the shoe, the platform rocking-lever, its detent devices, and the link-rod having jointed connection with the shoe and platform

rocking-lever, substantially as and for the purpose hereinbefore set forth.

6. The combination of the main frame, its supporting-wheels, the rigidly-united grain-platform and finger-beam having jointed connection with the main frame, the grain-wheel having its axle in line with the axles of the supporting-wheels of the main frame, the tongue having jointed connection at its heel with the main frame, the main-frame rocking-lever, its detent devices, and the link-rod connected with this lever and the tongue, substantially as and for the purpose hereinbefore set forth.

7. The combination of the main frame, the grain-platform having jointed connection therewith, the endless carrier, the driving-roller thereof, its attached pinion, and the carrier-actuating pinion mounted to rotate about an axis coincident with that about which the grain-platform plays as it vibrates about its jointed connection with the main frame, substantially as and for the purpose hereinbefore set forth.

8. The combination of the main frame, its supporting-wheels, the grain-platform having adjustable jointed connection at front and jointed connection at the rear with the main frame, the endless carrier, the driving-roller thereof, its attached pinion, the carrier-actuating pinion mounted to rotate about the pivot of the rear jointed connection of the grain-platform with the main frame, the sprocket-pulley attached to the carrier-actuating pinion, and the driving-chain, substantially as and for the purpose hereinbefore set forth.

9. The combination of the main frame, the driven shaft C, the pulley thereon, the driving-chain, the idle-pulley, the grain-platform having jointed connection with the main frame, the carrier-actuating pinion, its attached pulley, the reel-operating shaft, and the pulley thereon, substantially as and for the purpose hereinbefore set forth.

10. The combination of the reel-operating shaft Q', its attached bevel-pinion, the bevel-gear meshing with said pinion, the upright shaft mounted in fixed bearings and to which said gear is attached, the pinion rotating with and sliding on said shaft, the reel-shaft, its attached bevel-gear meshing with the sliding pinion on the upright shaft, and the vertically-adjustable bearing-bracket for the reel-shaft having engagement with said sliding pinion, substantially as and for the purpose hereinbefore set forth.

11. The combination of the reel, the reel-shaft, the bearing-bracket for the reel-shaft, the fixed guide-rods up and down which the bearing-bracket slides, the gear on the reel-shaft, the pinion meshing therewith and with which the bearing-bracket has engagement, the rotating upright shaft with which said pinion turns and up and down which it slides with the movements of the bearing-bracket, the reel-adjusting lever, its detent devices, and the chain connected with this lever and

the bearing-bracket, substantially as and for the purpose hereinbefore set forth.

12. The combination of the main frame, the grain-platform and finger-beam having jointed
5 connection with the main frame, the vertically-adjustable reel, means for supporting and adjusting it, the shoe, the platform-rocking lever, and the link-rod connecting the shoe
10 prevented from descending too low, substantially as and for the purpose hereinbefore set forth.

13. The combination of the main frame, its supporting-wheels, the grain-platform and
15 finger-beam having jointed connection with

the main frame, the grain-wheel, means for rocking the main frame and the grain-platform and finger-beam about the axles of the supporting and grain wheels, the shoe, and the lever having connection with the shoe, 20 and by which the platform and finger-beam may be rocked independently of the main frame, substantially as and for the purpose hereinbefore set forth.

In testimony whereof I have hereunto sub- 25 scribed my name.

WILLIAM P. HALE.

Witnesses:

R. H. STEWART,

P. G. VAN VLEET.