

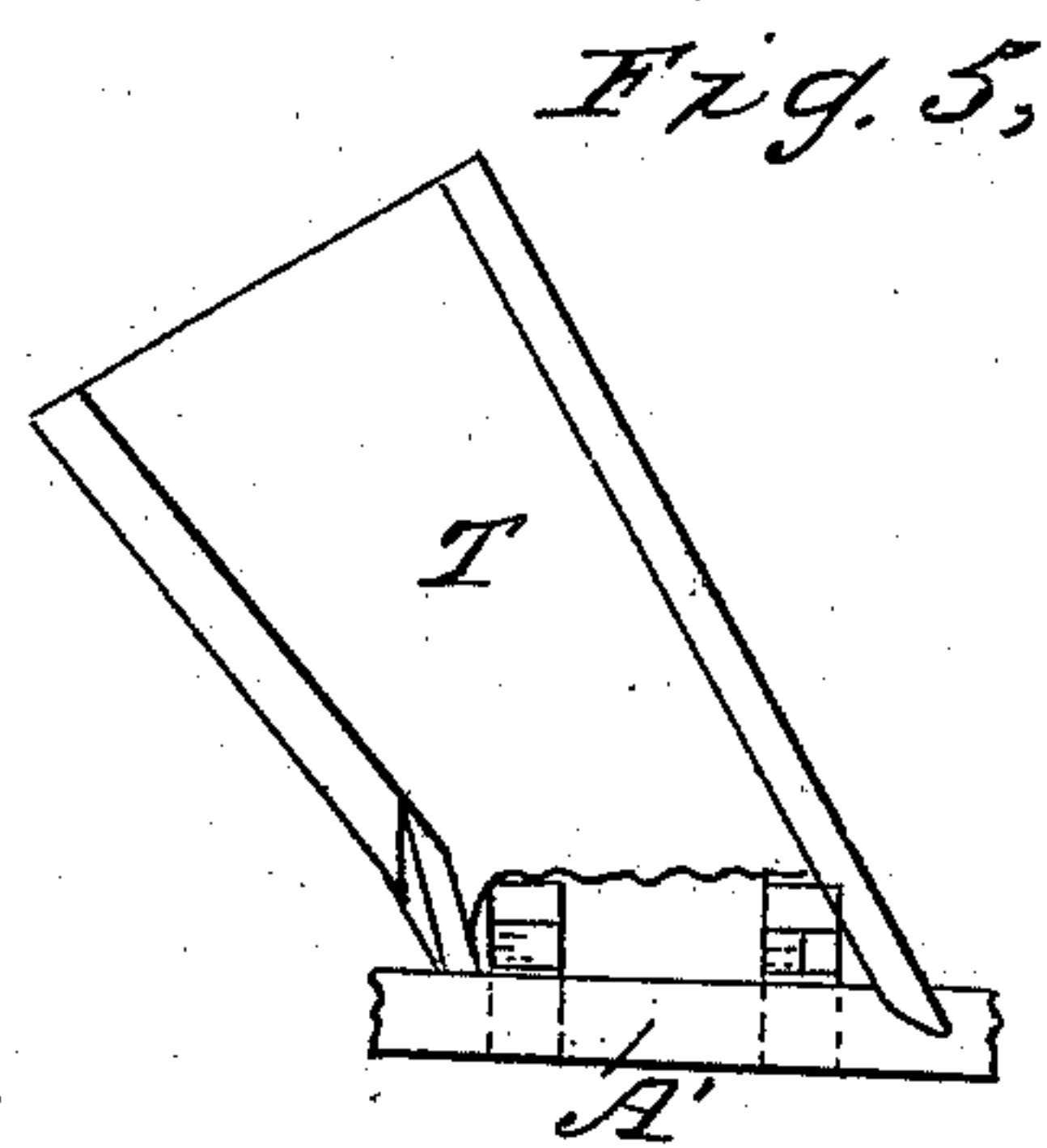
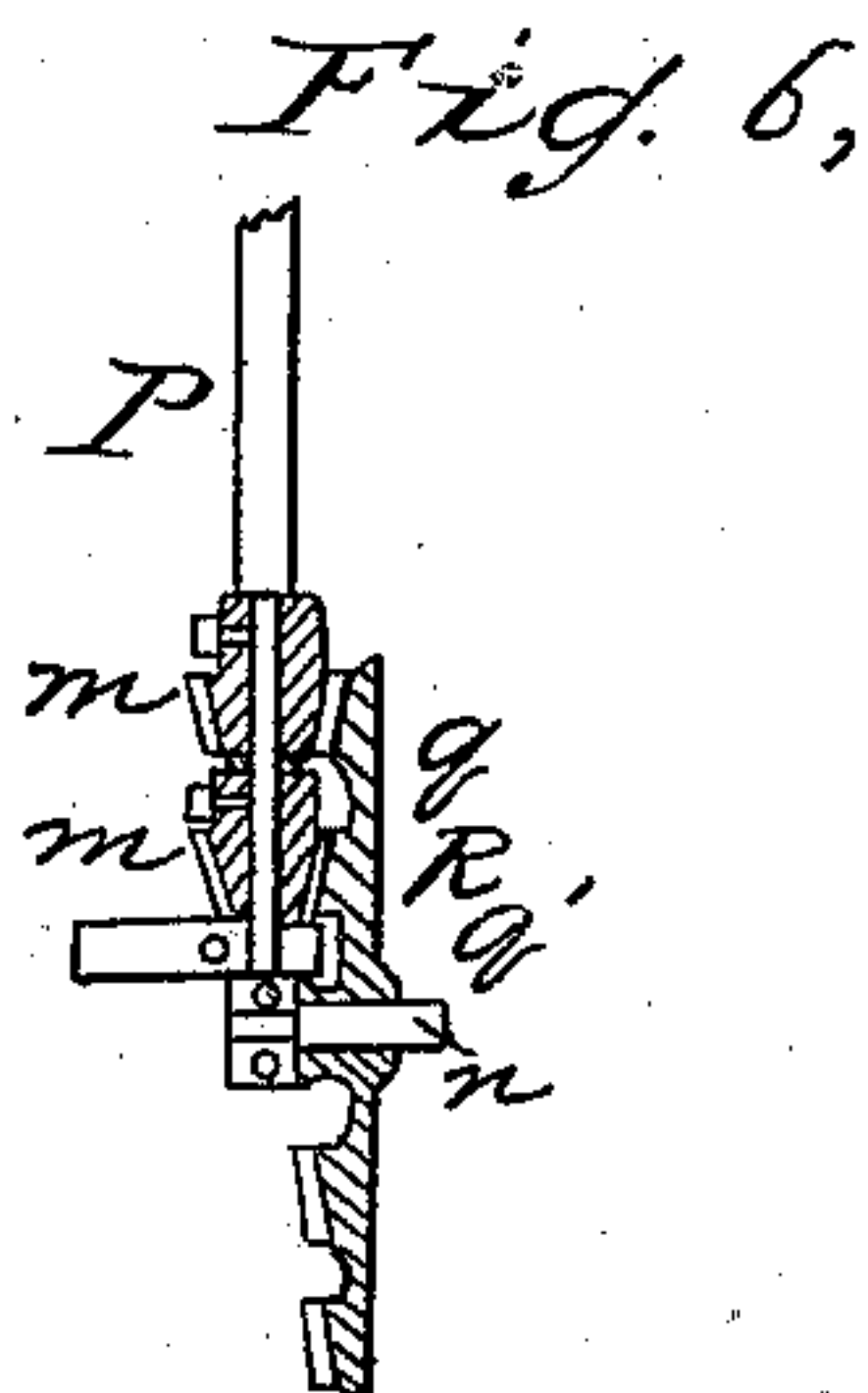
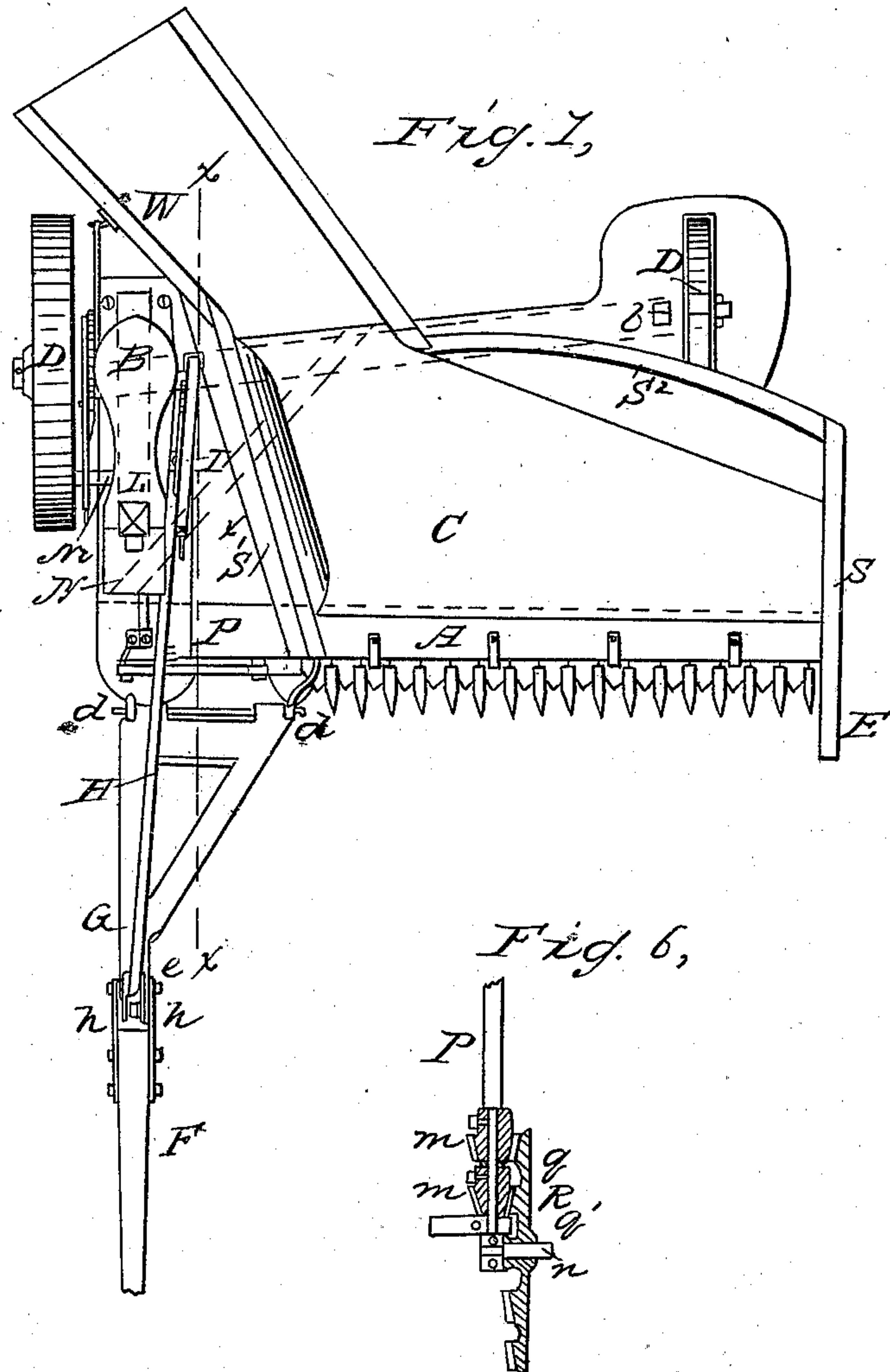
D. L. EMERSON.

3 Sheets—Sheet 1.

Harvester.

No. 39,526.

Patented Aug. 11, 1863.



Witnesses:
Andrew Anderson Jr
W B Bennett

Inventor
D. L. Emerson
by his attorney
C. J. Pennock

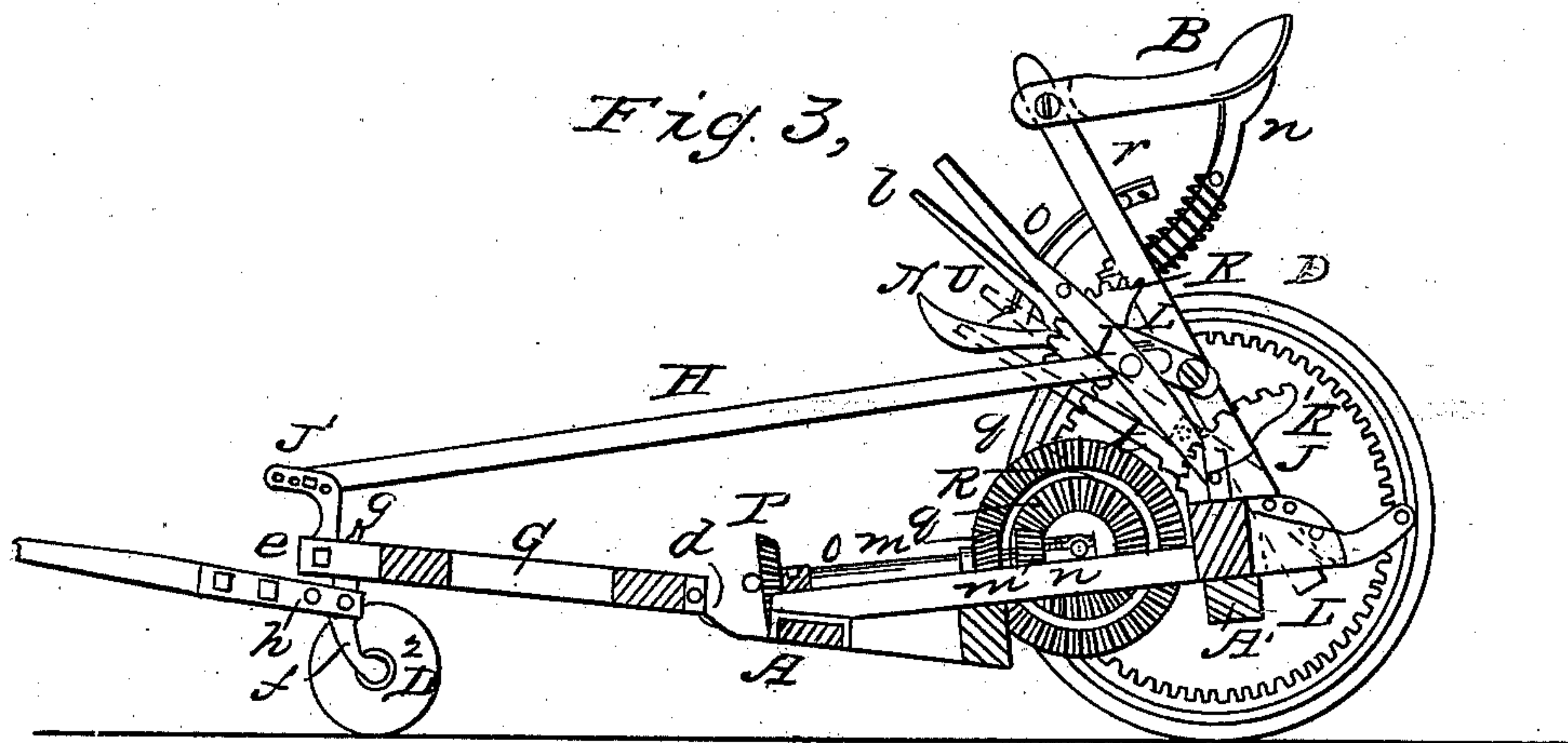
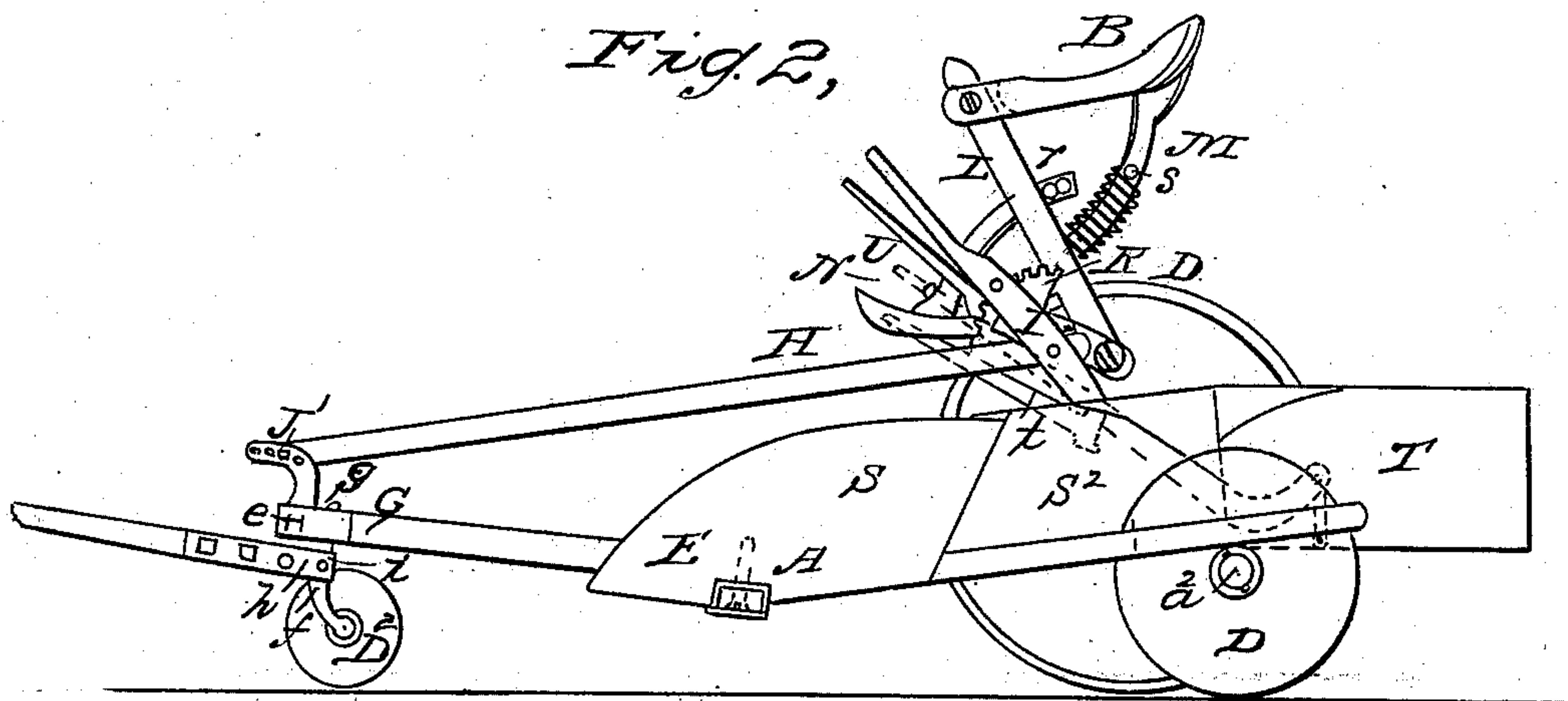
D. L. EMERSON.

3 Sheets—Sheet 2.

Harvester.

No. 39,526.

Patented Aug. 11, 1863.



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3 Sheets—Sheet 3.

Harvester.

No. 39,526.

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Fig. 7.



Fig. 4.

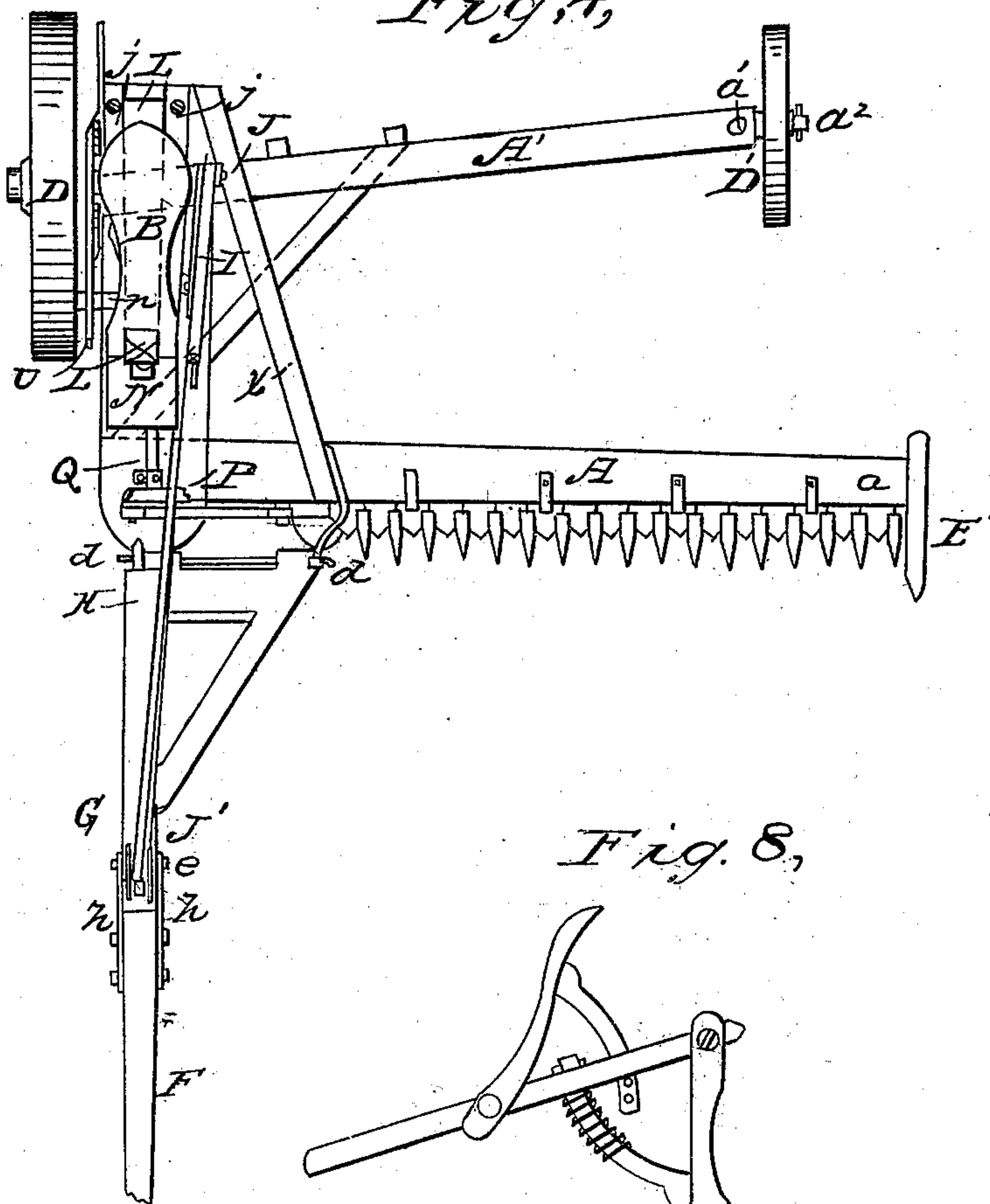


Fig. 8.

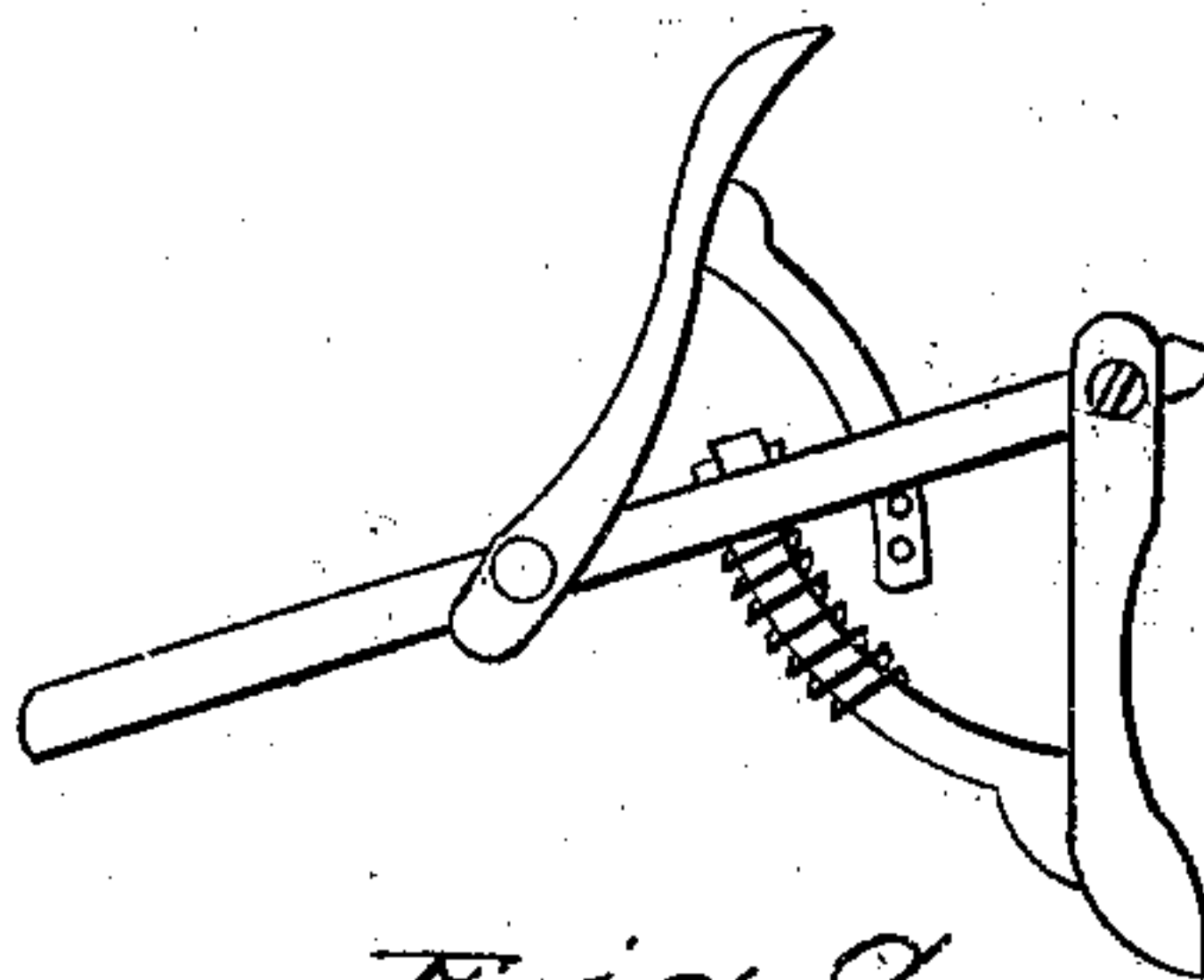
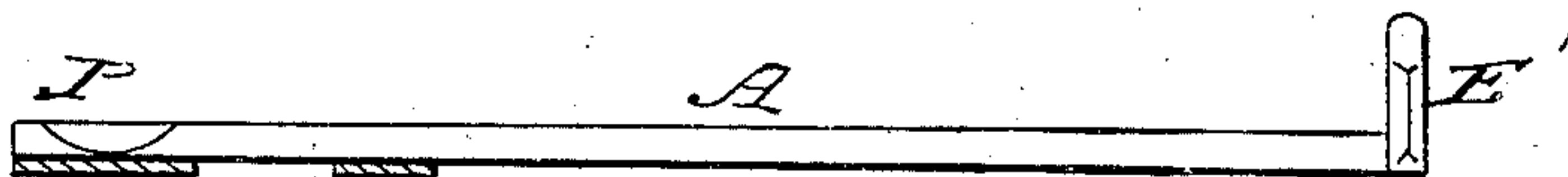


Fig. 9.



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UNITED STATES PATENT OFFICE.

D. L. EMERSON, OF ROCKFORD, ILLINOIS, ASSIGNOR TO MARY MANNY,
OF SAME PLACE.

IMPROVEMENT IN HARVESTERS.

Specification forming part of Letters Patent No. 39,526, dated August 11, 1863.

To all whom it may concern:

Be it known that I, DANIEL L. EMERSON, of Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in Harvesters; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 represents a plan of a combined machine embodying my improvements. Fig. 2 represents a side elevation of the same. Fig. 3 represents a vertical section of the same at the line *xx* of Fig. 1. Fig. 4 represents a plan of the machine stripped for mowing; and Figs. 5, 6, 7, 8, and 9 represent views of parts of the machine detached from the remainder.

My invention consists of a number of parts and has reference to various parts of a harvesting-machine.

The first part of my invention has reference to the frame of that class of harvesting-machines in which the raking-platform is carried by two wheels, both behind the finger-beam. In this class of machines it has been customary to connect the finger-beam and a back beam (that is parallel, or thereabout, with the finger-beam) by means of a cross-bar or cross-bars at the grain end of the frame, and to apply the grain-wheel to an arm secured to this bar or bars, or to an axle also secured to said cross-bar at a point intermediate between the finger-beam and back beam. These connecting cross-bars are in the way of the cut grass when the machine is used as a mower, while on the other hand the presence of a grain-wheel at the grain side of the frame is useful to support the weight of the frame, and also to run over the cut grass and to prevent it from being dragged forward by the finger-beam by pressing it to the ground. The object of the first part of my invention is to retain all the advantages that result from the presence of a grain-wheel (by which I mean a supporting-wheel in the vicinity of the side of the machine which is nearest the uncut crop) and at the same time to dispense with the connecting cross-bars; and it consists in securing the arm or axle of the grain-wheel to the grain end of the back beam in such manner that the grain-wheel supports the back beam directly when the machine is cutting grass,

and that the employment of a cross-bar between the grain ends of the cutter-beam and back beam may be dispensed with, thus freeing the grain end of the finger-beam from a connection with a cross-bar on which cut grass could lodge.

The object of the second part of my invention is to obtain the advantages that result from the omission of the connecting cross-bar at the grain side of the machine when the machine is used for mowing, and at the same time to retain the advantages of a rigid connection between the finger-beam and the back beam when the machine is used for reaping. To this end the second part of my invention consists in the combination of a finger-beam and back beam, without a connecting cross-bar at the grain side of the machine, with the removable raking-platform or parts appertaining thereto in such manner that when the platform is in place for reaping the finger-beam and back beam are rigidly connected together at the grain side of the machine, by the platform or its appurtenances, and when the machine is stripped of the platform and its appurtenances for mowing the finger-beam and back beam are disconnected at the grain side of the machine, there being then no connecting-bar for the grass to lodge upon.

The third part of my invention has reference to the draft of the machine. It is well known that farmers are divided in opinion as to the relative advantages of a tongue that is stiff laterally and a tongue that is limber laterally, the latter being undoubtedly preferable in turning the machine, as it enables the horses to turn either way without the machine turning until the horses' heads are in the new direction, and then to pull the machine round by direct draft instead of bearing it off sidewise by side draft upon the horses' collars. The object of this part of my invention is to enable the same machine to be used interchangeably, either with a stiff tongue laterally or a limber tongue laterally, as the user may deem best in any particular case; and it consists in constructing and combining together a tongue, a reach or other part of the frame of the machine, and a caster-wheel pivoted to the reach or to that part in such manner that the hinder end of the tongue may be secured either to the reach (or its equivalent for this purpose) or to the yoke

of the caster-wheel. In the former case the tongue is stiff laterally, the caster-wheel merely turning on its spindle to accommodate itself to the movement of the machine, while in the latter case the tongue is limber laterally, and the position of the caster-wheel is controlled by the tongue.

The fourth part of my invention has reference to harvesting-machines in which there is a reach (or other hinged piece) in advance of the cutter-carriage, which is connected with the cutter-carriage by a thrust-bar, by means of which the finger-beam carrying the cutting apparatus can be raised or lowered. This part of my invention consists in combining the thrust-bar with the machine by means of an adjustable pivot-bearing, by means of which the pivot can be set in different positions to vary the range of motion of the lever by which the thrust-bar is operated.

The fifth part of my invention relates to the driver's seat. In those combined machines in which the frame and finger-beam are rigidly connected the raising and lowering of the cutting apparatus cause the frame to change its relation to the ground, and if the driver's seat be rigidly secured to the frame the former moves with the latter. Hence if the driver's seat be secured to the frame in a proper position for supporting the driver when the finger-beam is running on the ground for mowing it is an inconvenient position when the finger-beam is raised for reaping. The object of this part of my invention is to permit the position of the driver's seat to be changed to suit the particular circumstances under which the machine may be used. Various plans have been devised for this purpose previous to my invention. My improvement consists in combining the driver's seat with the carriage of the machine by means of an adjustable standard so connected at its foot with the frame of the carriage that the position of the seat may be varied by varying the connection of the foot of the seat-standard with the carriage in the manner hereinafter described.

The object of the sixth part of my invention is to enable the driver's seat to be sustained by a spring, and to permit the tension of the spring to be adjusted to the weight of the driver, so that the driver, whether a man or a boy, whether light or heavy, may be sustained on a spring-seat at the proper mean height for doing his work with convenience to himself. This part of my invention consists in combining a hinged driver's seat with a curved brace and spring, the brace being fitted with pin-holes and a pin to regulate the tension of the spring, or with the equivalent of this device.

The seventh part of my invention has reference to the driver's foot-board; and it consists combining a hinged foot-board with an adjustable brace, the object of this part of my invention being that the position of the foot-board may be adjusted to the length of the legs of the driver.

The eighth part of my invention relates to

the gearing by means of which the sickle is operated. It is well known to farmers that the mowing of grass requires the sickle to be driven at a faster speed than is required when reaping grain. On the other hand, when the sickle is driven at a high speed more power is required than when it is driven at a less speed. Hence, as a combined machine must have its sickle driven with sufficient speed to mow grass efficiently, a considerable amount of power is uselessly expended in driving the sickle at the same speed when reaping grain. The object of this part of my invention is to enable the sickle to be driven with either a faster or a slower speed interchangeably, so that either speed may be used, according to the work which is to be performed. Various plans have been devised for producing such a change of speed. My improvement consists in combining two beveled pinions upon the crank-shaft of the sickle with a double-rimmed beveled wheel on the next shaft, nearer the driving-wheel, the said pinions being fitted with set-screws or their equivalent, so that while both pinions are always in gear either one may be made fast to its shaft while the other runs loosely on its shaft. Moreover, as the teeth of the pinions on the crank-shaft are subjected to a greater amount of wear, by reason of the speed, than the teeth of any of the other cog-wheels, and are therefore more rapidly worn out, the arrangement described provides two pinions in place of one to sustain the wear, the one pinion working, while the other turns without working. Hence the wear is divided between two pinions, and the duration of the gearing is increased, which is an important advantage for the farmer.

The object of the ninth part of my invention is to enable the fingers to be secured to a plate-metal finger-beam by means of ordinary wood-screws; and it consists in a finger-beam constructed of a trough-formed iron plate inlaid with wood in the hollow of the plate, so that the finger-beam is composed of wood and iron in a particular manner, which renders it stronger than if of wood-alone and stiffer than if of the same weight of iron alone, and also furnishes an elastic substance to hold the screws or screw-bolts of the fingers.

The object of the tenth part of my invention is to permit the sickle to be readily withdrawn and inserted in that kind of harvesters in which the pillow-block of the shaft of the crank that drives the sickle is secured to the finger-beam. This part of my invention consists in forming the finger-beam with a recess, in which the crank of the sickle revolves, so that the said crank revolves behind the line of the rear edge of the sickle. Hence the sickle can be drawn out and replaced without displacing the crank and after merely disconnecting the pitman.

The object of the eleventh part of my invention is to dispense with the operation of binding the grain by furnishing a means of depositing it in large masses on the ground out of the way of the machine when cutting the

succeeding swath, so that the grain may be left on the ground until sufficiently cured to be stacked or housed in a barn. I am aware that a machine has been devised for this purpose; but the parts which composed it were so combined that elevating machinery was required to transfer the grain from the raking-platform to a receptacle, in which it was retained until a sufficient quantity had collected to be discharged in one mass. This part of my invention enables me to dispense with any elevating machinery; and it consists in combining the raking-platform of a harvester with a tipping dumping-box, which is on the same level with the platform or below that level, and is also skewed laterally in such manner that the cut grain may be forked directly into the dumping-box, to be thence discharged, when a sufficient mass has collected, in the rear of the horses, so that it is entirely out of the way of the machine when cutting the next swath.

The object of the twelfth part of my invention is to enable the driver to do the raking; and it consists in a driver's seat located sufficiently far back on the machine to enable him to operate with a rake upon the grain on the platform without leaving his seat, and in combination therewith I use a tipping dumping-box or its equivalent, which will contain a large mass of cut grain, so that the operation of raking may be performed at longer intervals than is necessary in raking for binding where the amount raked is limited by the size of the sheaves into which the grain is to be bound.

All parts of my invention are embodied in the machine represented in the accompanying drawings.

In this machine the cutter-carriage is preceded by a reach, which is hinged at its hinder end to the cutter-carriage, and is supported at its front end by a caster-wheel. The cutter-carriage carries the finger-beam *A*, the gearing by which the sickle is driven, the driver's seat *B*, and the raking-platform *C* when the machine is used as a reaper. It is supported by two running-wheels, *D* and *D'*. The former of these wheels is at the stubble side of the machine, and has the main cog-wheel of the cutter-gearing secured to it. The other wheel, *D'*, is at the side of the machine nearer the standing crop, or at the "grain side," as it is commonly called.

In order to embody the first part of my invention, the back beam, *A'*, of the main frame and the finger-beam are connected permanently only at the draft side of the machine, which is the side nearer the horses, the grain ends *a* and *a'* being disconnected when the machine is stripped of the raking-platform for mowing, as shown at Fig. 4, and the arm *a*², on which the grain-wheel *D'* revolves, being the prolongation of the back beam, *A'*. The grain-wheel *D'* thus supports the back beam directly instead of through the intervention of a cross-bar extending from the back beam to the finger-beam. If deemed expedient, the grain-wheel, instead of revolving upon an arm

secured to the back beam, may be a caster-wheel pivoted to a back beam.

When the machine is used as a reaper the raking-platform *C* is replaced, and in order that the rigidity due to a connection between the finger-beam and back beam may be secured when the machine is reaping the platform is secured to the grain end of the back beam by a screw-bolt, *b*, Fig. 1, and to the grain end of the finger-beam by means of a second screw-bolt that passes through the divider *E*, which is made fast to and is an appurtenance of the raking-platform. The removable raking-platform and its appurtenances thus constitute the connection between the finger-beam and back beam. As the divider for reaping thus constitutes an appurtenance of the removable platform, and is removed therewith, and as it is expedient to have a divider for mowing, I have provided a small removable divider, *E'*, which is secured to the grain end of the finger-beam, as shown at Fig. 4, when the machine is used for mowing, the same bolt being used to secure this supplementary divider to the finger-beam that is used for the grain-divider.

The reach, which precedes the cutter-carriage, is connected at its hinder end with the carriage by a hinged joint, *d*, so that the finger-beam can be raised and lowered in reaping or permitted to accommodate itself to the surface of the ground in mowing. The front end of the reach is supported by a caster-wheel, *D*², whose yoke *f* terminates in a spindle, *g*, which is pivoted in the forward end of the reach, so that the caster-wheel can turn laterally. The forks of the yoke are fitted with pins *i*, and the hinder end of the tongue *F* is fitted with a pair of cheek-plates, *h*. The distance between the cheek-plates is sufficient to receive the yoke of the caster-wheel, and the cheek-plates are pierced with holes which fit the pins *i* of the yoke. Hence when the cheek-plates are applied to the pivots the yoke and caster-wheel are compelled to turn upon the caster-spindle whenever the pole is moved sidewise, so that the caster-wheel performs the function of a leading truck in supporting the reach and turning with the tongue whenever the horses are turned to one side or the other.

In order to embody the third part of my invention, the front end of the reach *G* is made of the same width as the space between the cheek-plates *h* of the tongue, and is perforated with a hole in a proper position to receive a bolt that can be passed through the holes in the cheek-plates when the cheek-plates are applied to the front end of the reach. The cheek-plates are secured to the tongue by screw-bolts. Hence when the user of the machine wishes to have the tongue stiff laterally the cheek-plate bolts are slackened sufficiently to permit the cheek-plates to be withdrawn from the pins of the caster-yoke. The bolts are then tightened, the tongue, with its cheek-plates, is applied to the end of the reach, and the bolt *e* is inserted through the holes of the cheek-plates and the hole in the reach to attach the former to the

latter. The reach is now compelled to move laterally with the tongue, the latter being stiff laterally, while the caster-wheel, being no longer controlled by the tongue, turns freely on its spindle to accommodate itself to the lateral movement of the front end of the reach. By this combination, therefore, the user of the machine has it in his power to have a stiff tongue laterally or a limber tongue, as he may deem expedient, the transformation from the one to the other requiring but a few minutes' work.

In order to raise and lower the cutting apparatus, a thrust-bar and means for operating it are provided. This thrust-bar H is pivoted at its hinder end to an upright lever, I, which is pivoted at its lower end to a pivot-bearing, J, secured to the frame, and extends up in the vicinity of the driver's seat B, so that the driver can manipulate the lever. The front end of the thrust-bar is pivoted to a pivot-bearing, J', on the reach, and the lever and thrust-bar thus form a flexible and extensible connection between the front end of the reach and the cutter-carriage. Hence by working the lever forward or backward the connection between the two pivot-bearings J J' is lengthened or shortened, and the finger-beam is raised or lowered. In order to hold the finger-beam in any position to which it may be raised, a cog-segment, K, is secured to the thrust-bar concentrically with its pivot at the lever I, and a lever-pawl, L, is pivoted to the lever in such a position that its finger catches in the space between the cogs of the segment which happens to be opposite the finger, and thus locks the lever and thrust-bar in their respective positions. The lever-pawl is manipulated by the same hand which operates the lever I, to which it is pivoted.

In order to embody the fourth part of my invention, the pivot-bearing J' at the reach is extended forward, and is pierced with a series of holes, to any pair of which the pivot of the thrust-bar can be transferred. The pivot-bearing thus constitutes a means of adjusting the length of the flexible connection formed by the thrust-bar and its lever, and puts it in the power of the user to set the handle of the lever in the most convenient position for raising and lowering the finger-beam, according to the mean height above the ground at which the grain is to be cut. I prefer to locate the adjustable pivot-bearing, as shown in the drawings, at the front end of the reach, because when there its projecting front end forms a stop to prevent the too great dropping of the caster-wheel at the front end of the reach into a sudden depression by coming in contact with the tongue when the latter is connected directly with the reach. If deemed expedient, the adjustable pivot-bearing may, however, be applied to the lower end of the hand-lever I, so as to enable its position to be changed when the handle of the lever is to be set to operate the finger-beam more readily at a different mean height.

The driver's seat B in the machine represented is supported by a standard, L, and in order to embody the fifth part of my invention this standard is not made rigidly fast to the frame of the machine, but is adjustable thereon. In order to obtain this capacity for adjustment, the lower end of the standard is passed through an opening between a pair of cheek-pieces, J, secured to the main frame, and holes are made through the said cheek-pieces and through the lower end of the seat-standard, so that a bolt can be inserted to hold the seat-standard and the seat carried by it. The upper end of the standard inclines forward, its lower end being supported on the pin as a fulcrum bears against the hinder side of the opening in the frame of the machine in which it is received, and determines the position of the seat over the frame. The holes in the seat-standard are arranged in a series lengthwise with the standard, and the holes in the cheek-pieces are arranged in a series crosswise to the standard, so that by varying the position of the bolt the seat can be raised or lowered, and the standard can be permitted to incline forward more or less to throw the weight of the driver more or less forward, as may be found necessary to balance the machine on its wheels.

In order to embody the sixth part of my invention, the driver's seat B is hinged at its front end to the standard, and is secured at its hinder extremity to a curved brace, M. This brace is curved in an arc of a circle, of which the hinge-pivot at the front end of the driver's seat is the center, and it passes freely through a slot in the standard. The brace is perforated with a series of holes, to which a pin, S, is fitted, and the spring which sustains the driver's weight and which in this instance is of metal, coiled upon the brace, abuts at one end against the hinder face of the seat-standard, and at the other against the pin S, so that by changing the pin from one hole to another the spring is more or less compressed and its tension varied to suit the weight of the driver who is to direct the machine; or the mean inclination of the driver's seat to the cutter-carriage may be changed according to the greater or less height of the finger-beam.

In order to prevent the brace from being displaced by the spring when the driver rises from his seat, a pin is inserted through a hole in the front end of the brace in advance of the seat-standard to limit the upward movement of the seat and brace by the spring. This part of my invention is not confined to the use of a coiled metal spring, as it is obvious that a bar-spring of either wood or metal may be secured to the hinder side of the seat-standard, with its upper end in a proper position to act against the pin of the seat-brace.

In order to embody the seventh part of my invention, the driver's foot-board N is connected with the seat-standard by a hinged joint, so that its front extremity, against which the driver's feet bear, may be raised or lowered to suit the length of the driver's legs. In order

to hold the foot-board in any desired position, it is connected with the seat-standard by a curved brace, O, which is similar to that of the seat, and passes through a slot in the seat-standard. It is also perforated with a series of holes, to any one of which a pin, r, can be applied to hold the brace and the foot-board in any desired position.

The cutting apparatus of the machine represented in the accompanying drawings consists of a vibrating scalloped sickle working through slotted guard-fingers. The sickle is driven by a pitman, which is operated by the crank-pin of a revolving fly-wheel, P, that is secured to the front extremity of a crank-shaft, Q. The crank-shaft is caused to revolve by cog-gearing, which imparts motion to it from the running-wheel D, to which the master cog-wheel is secured. The cog-wheel drives a pinion secured to the counter-shaft n, and the latter imparts motion to the crank-shaft Q by means of beveled cog-wheels.

In order to embody the eighth part of my invention, the beveled wheel R on the counter-shaft is made with a double rim, and two beveled pinions, *m m'*, are fitted upon the crank-shaft Q. Both beveled pinions have the same number of teeth; but the two rims *q q'* of the beveled wheel R have different numbers of teeth. Hence the two pinions *m m'* will be caused to revolve with different speeds, and if either one be made fast to the crank-shaft this shaft will revolve faster or slower, according to which one of the pinions is made fast to it. The beveled pinions and rims of the beveled wheel are made of such relative sizes that when the fast-running pinion *m* is made fast to the crank-shaft the crank-pin will drive the sickle at the fastest speed required in mowing, and when the slow-running pinion *m'* is fast to the crank-shaft the crank-pin will drive the sickle at the most expedient speed for reaping.

In order to make fast either wheel to the crank-shaft, the hub of each is provided with a set-screw, which may be tightened to fasten its respective pinion to the crank-shaft or slackened to permit its pinion to run loosely on the crank-shaft. The farmer thus has it in his power, by putting one pinion or the other at work, to change the speed of the sickle as found expedient. Moreover, as sometimes one pinion and sometimes the other will be put to work while the loose pinion is doing no work, the wear is divided between two pinions instead of being all thrown upon one, and consequently the duration of the gearing as a whole is greatly increased, in addition to the advantage resulting from the capacity to change the speed.

The finger-beam A of the machine is firmly secured to the frame-work at the stubble side of the machine in the rear of the reach G. The finger-beam is formed of plate-iron so bent as to have two flanges at its edges, the whole having the general form of a trough open at the ends, and in this instance is inverted. In a finger-beam of this section the two flanges

flat part of the bent plate between them opposes flexure in a horizontal direction. As the strains in the latter direction are heavy, I find it advisable to make the breadth of the flat part at the grain end rather more than double the height of the flanges, and to increase this breadth toward the stubble end.

In order to embody the ninth part of my invention, the hollow space between the flanges of the trough-formed finger-beam is filled in with wood, which not only adds to the stiffness of the finger-beam by preventing its distortion under strains and by the addition of its own strength, but also furnishes an elastic material in which the screws or screw-bolts that secure the fingers are embedded, so that they do not tend to work loose by the tremulous movement resulting from the rapid vibration of the sickle. The sickle is caused to vibrate, as before described, by the rotation of a crank-pin secured to the wheel-crank P, forming a fly-wheel.

In order to embody the tenth part of my invention, this crank, instead of being placed in front of the front edge of the finger-beam, is placed in a recess, *p*, of the finger-beam, which is made to receive it. By this improvement the arm of the crank is behind the line of the hinder edge of the sickle, and consequently the sickle may be drawn out and reinserted past the face of the crank without displacing the crank and by merely disconnecting the pitman.

When the machine is employed for reaping the raking-platform is in place behind the finger-beam, as shown at Fig. 1, and the grain falling upon it is retained at the grain side of the machine by the side board S, which is a continuation of the divider. It is also retained at the gearing side of the machine by a grain-board, S', against which the cut grain can be raked or forked before it is projected backward from the platform. The hinder side of the platform is guarded by a back board, S², which extends from the side board S toward the grain-board S', but is separated from the latter by a space through which the cut grain is projected into a dumping-box, T, behind the platform. This dumping-box has the form of a trough open at the two ends. It is hinged at its front end to the back beam, A', of the frame of the machine, so that its bottom is at its front end on the same level with the platform, of which it is a continuation, and that the grain drawn to the gearing side of the platform may be projected directly into the dumping-box. As its front end is hinged to the machine, its bottom can be set at any desired slope by moving the box upon its hinges by means of a lever, U, that is pivoted to the frame of the machine, and has its hinder arm connected by a link with the dumping-box. The dumping-box can be retained with its bottom in any desired position by means of a catch, *t*, which is fitted to the lever U, and catches upon one of the teeth of the segment K', and can be tipped to dump the grain by

disconnecting said catch. The dumping-box is also skewed sidewise, so that the grain passing from it is entirely out of the track of the machine in cutting the next swath. In using this dumping-box the driver, seated upon the seat B sufficiently back of the finger-beam to rake with facility, holds the lines by which he drives the horses by passing them over his head, so that they rest upon and lead from his shoulders. As the horses soon learn to walk in their proper places along the straight sides of the plot of grain being cut, the driver's hands are at liberty the greater part of the time to handle his fork or rake, so that he can draw the grain toward the grain-board S' and project it backward into the dumping-box. When the dumping-box is full he can discharge the grain therefrom by merely letting its hinder end down to the ground when the slope of the bottom-board is great enough; or he may aid the discharge of the grain by his fork, as circumstances require. If deemed expedient, the hinder end of the dumping-box may be carried by one or more caster-wheels, and it may be permitted to run upon these wheels all the time. As the dumping-box holds a considerable quantity of grain, the discharge of grain may be done at much longer intervals than when raking for binding. This difference in frequency also gives the driver the entire use of his hands for driving when turning the corners of the plot of grain, and as the dumping-box is skewed laterally the grain is dropped from it behind the horses and driving-wheel at one side of the track of the sickle, where it is entirely out of the way of the machine or the horses in cutting the next swath, and therefore may lie undisturbed where it falls. The dumping-box is also useful in mowing thin or short grass, which could not be cut with profit if spread in the usual way after the passage of the cutting apparatus. The dumping-box permits the grass to be collected in masses, from which it may be spread only sufficiently to insure its drying, thus saving the cost of raking the entire field to secure a small amount of grass.

The location of the driver's seat so far back on the machine, in connection with the employment of a dumping-box the front end of whose bottom is not above the part of the platform with which it connects, enables the driver to do the work of raking, thus saving the cost of one laborer and the drawing of his weight through the field. As the dumping-box is not wanted when the platform is removed, it also is made removable. To this end its hinges are like the ordinary strap-hinges of gates, so that the hinge-pins, which are fast to the dumping-box, can be disconnected from the parts of the hinge that are fast to the back beam by moving the dumping-box laterally toward the grain side of the machine. In order to prevent disconnection when the machine is running, the hinder end of the grain-board S' is made to overlap the side board w of the dumping-box T, and as this side board

is retained in place by the brace x, Fig. 4, and the adjacent side of the removable platform, between which it is inserted, the dumping-box cannot become accidentally disconnected.

Having thus described a machine embodying all my improvements, what I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the grain-wheel directly with the back beam of the harvester, as set forth, so that the employment of a cross-bar connecting the grain ends of the finger-beam and back beam for the purpose of connecting the grain-wheel, arm, or axle with the finger-beam and back beam is unnecessary.

2. The combination of the grain ends of the finger-beam and back beam (without a connecting cross-bar) by means of a removable raking-platform or its appurtenances, substantially as set forth.

3. The combination of the front end of the reach, the tongue, and the caster-wheel in such manner that the machine may be used interchangeably with a stiff tongue laterally or a limber tongue by shifting the connection of the tongue from the caster-wheel yoke to the front end of the reach, or vice versa, substantially as set forth.

4. Combining the thrust-bar of a harvesting-machine with the machine by means of an adjustable pivot-bearing, substantially as set forth.

5. The combination of the driver's seat with the machine by means of an adjustable seat-standard connected at its foot with the frame in such manner that the seat can be adjusted by varying the connection of the foot of the standard, as described.

6. The combination of the driver's seat with its support by means of an adjustable brace and spring, substantially as set forth.

7. The combination of the driver's foot-board with its support by means of an adjustable brace, substantially as set forth.

8. The device herein described for imparting two different speeds to the sickle of a harvester, consisting of the combination of a double-rimmed cog-wheel upon one of the shafts of the gearing with two pinions which are connected with the next shaft in such manner that one is fastened to the shaft while the other runs loose upon it, and vice versa.

9. The combination of a finger-beam of plate metal bent into a trough form with a wood filling in the hollow of the trough, substantially as set forth.

10. Constructing the finger-beam with a recess in which the crank of the sickle can revolve, so that the sickle can be withdrawn past the face of the crank without displacing the crank, substantially as set forth.

11. The combination of the raking-platform of a harvester with a tipping or hinged dumping-box, whose bottom is not above the level of the adjacent part of the raking-platform, and which is also skewed sidewise, so that the cut grain can be discharged from the platform

directly into said dumping-box, and can be dropped therefrom, butt downward, at the side of the track of the sickle, so as to be entirely out of the way of the machine and the horses when cutting the next swath, substantially as set forth.

12. The combination of a tipping dumping-box with a driver's seat located sufficiently behind the finger-beam to permit the driver

supported thereon to rake the grain from the raking-platform and drop it upon the ground, substantially as described.

In testimony whereof I have hereunto subscribed my name.

D. L. EMERSON.

Witnesses:

E. G. RICHER,

J. G. MANLOVE.