

(No Model.)

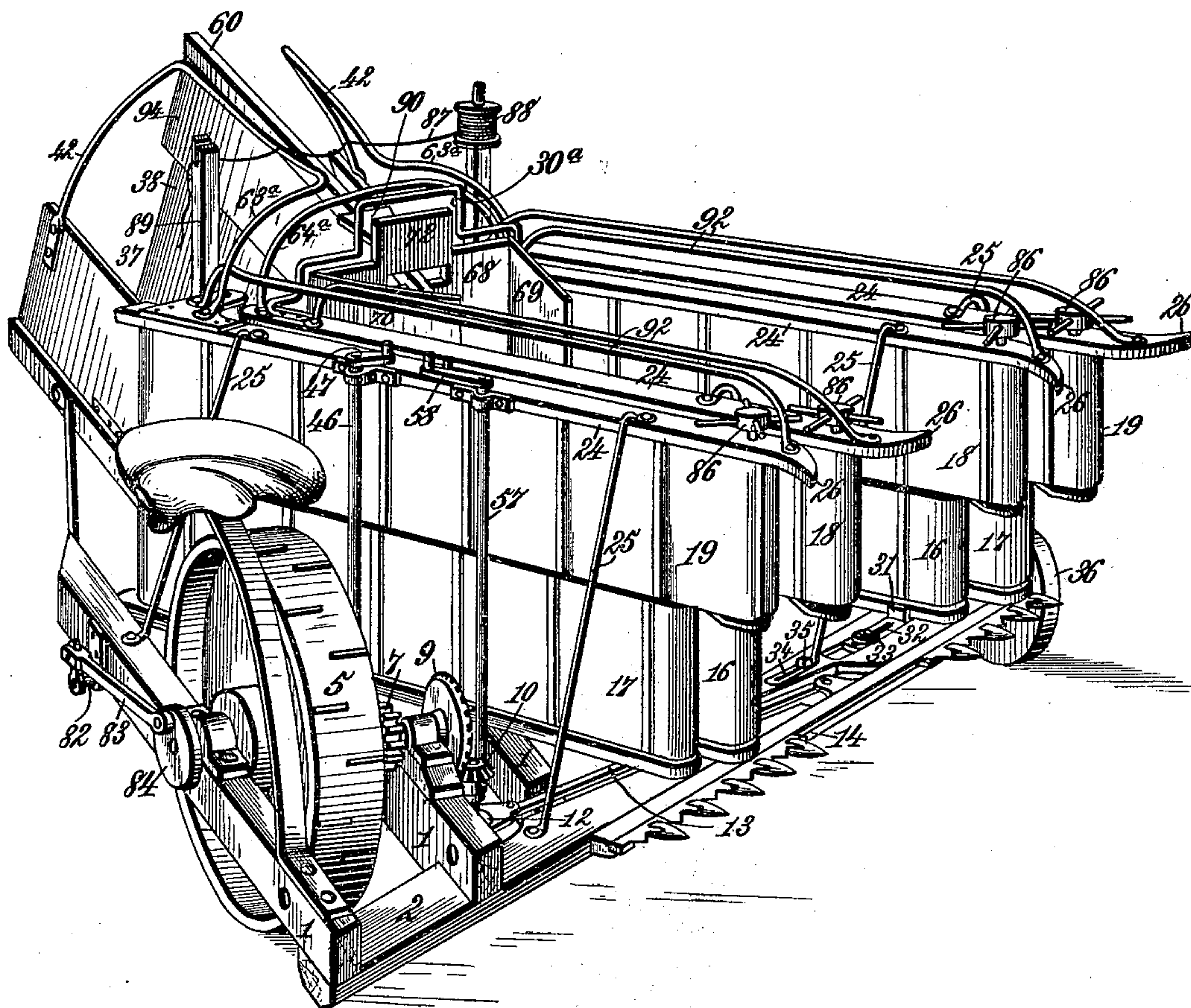
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R. S. RINKER.
CORN HARVESTER.

No. 481,059.

Patented Aug. 16, 1892.

Fig. 1.



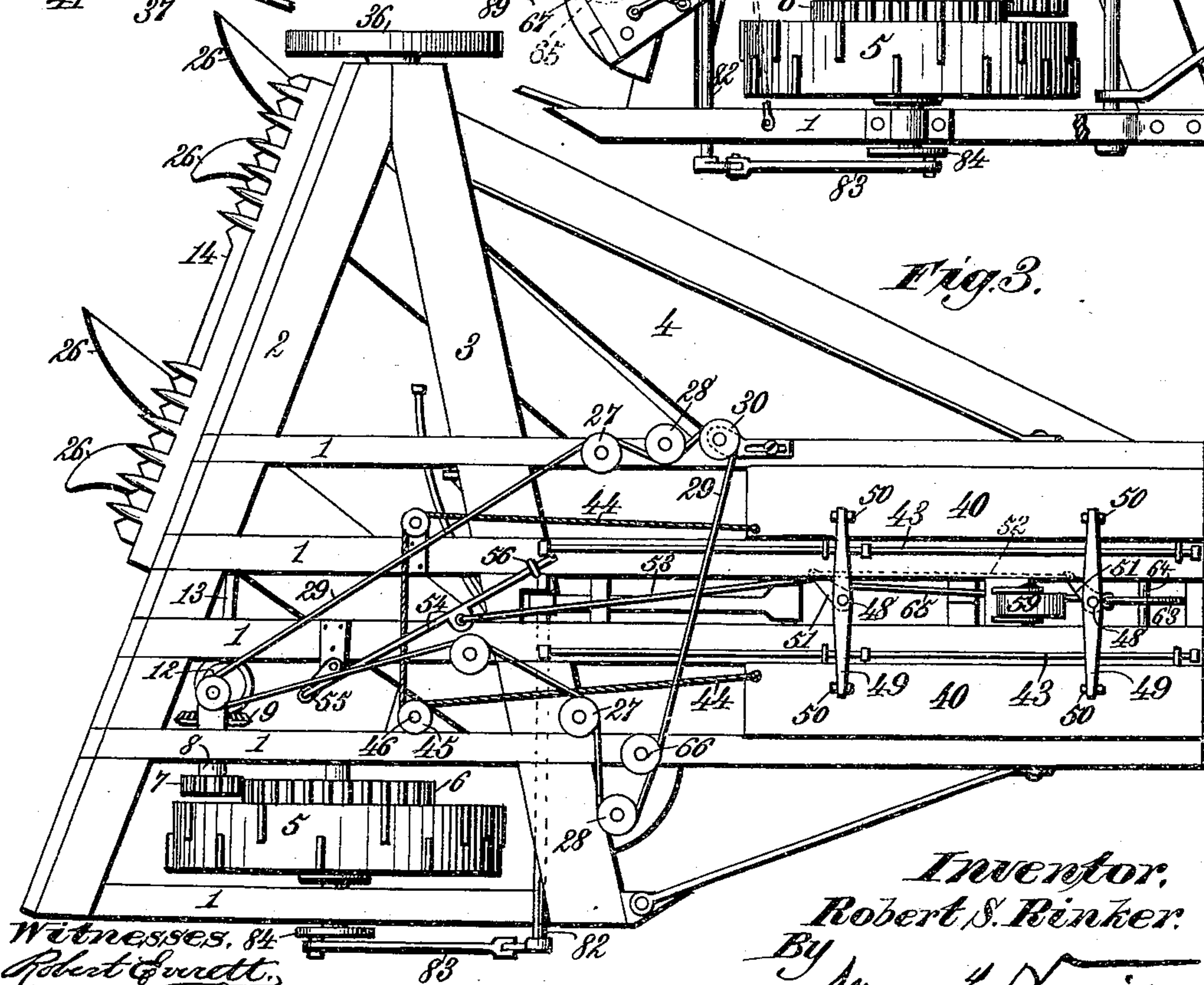
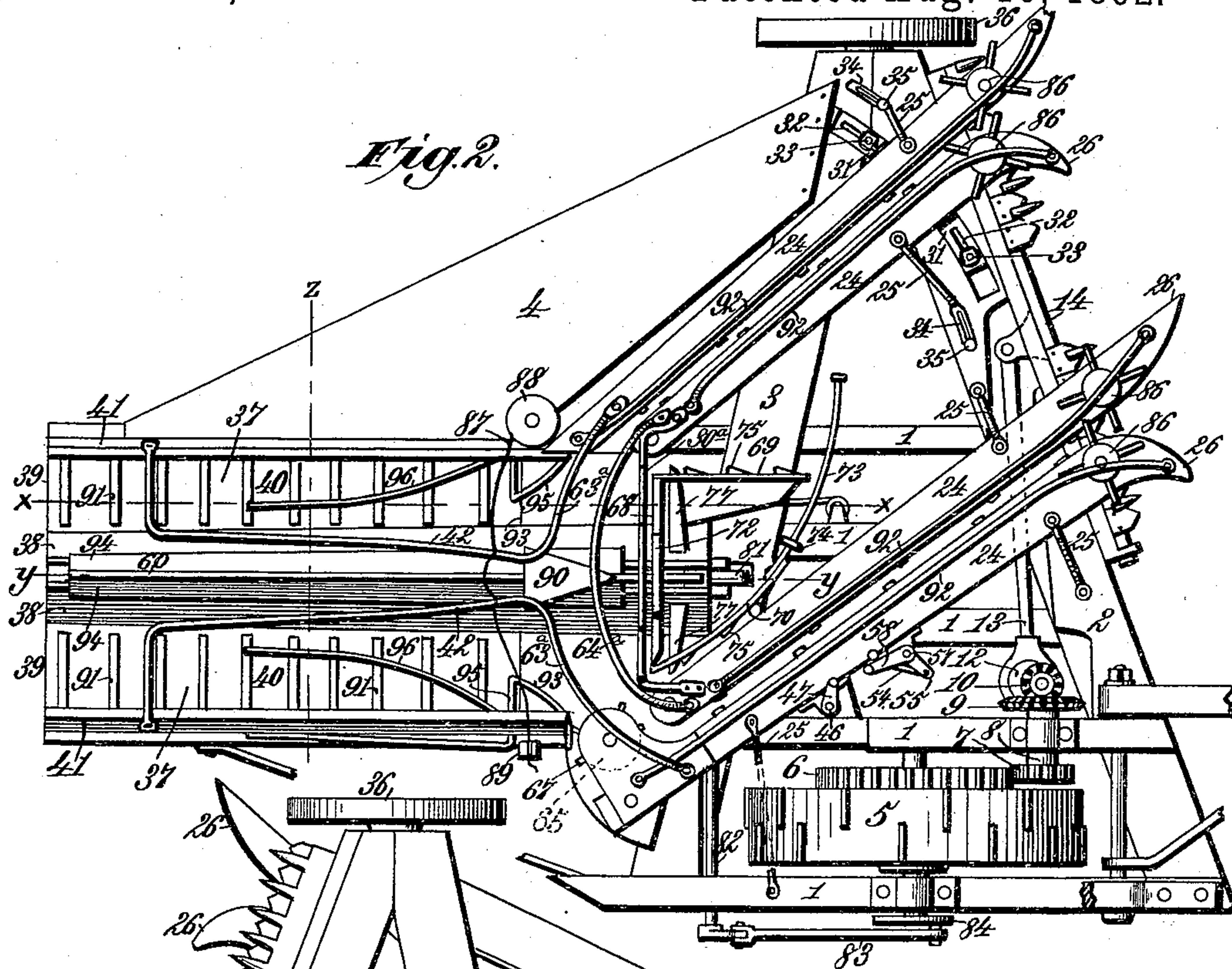
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Fig. 4.

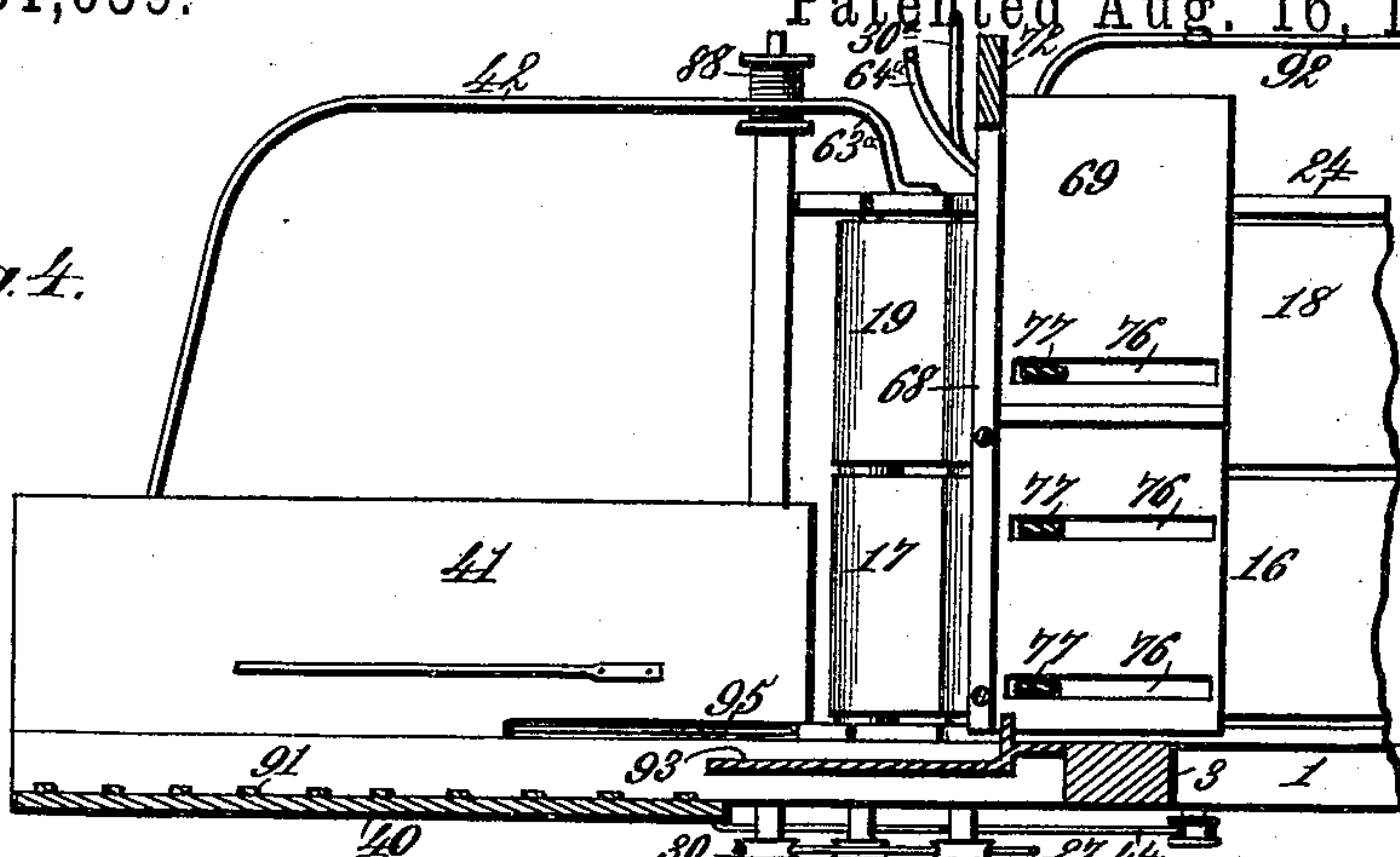


Fig. 5.

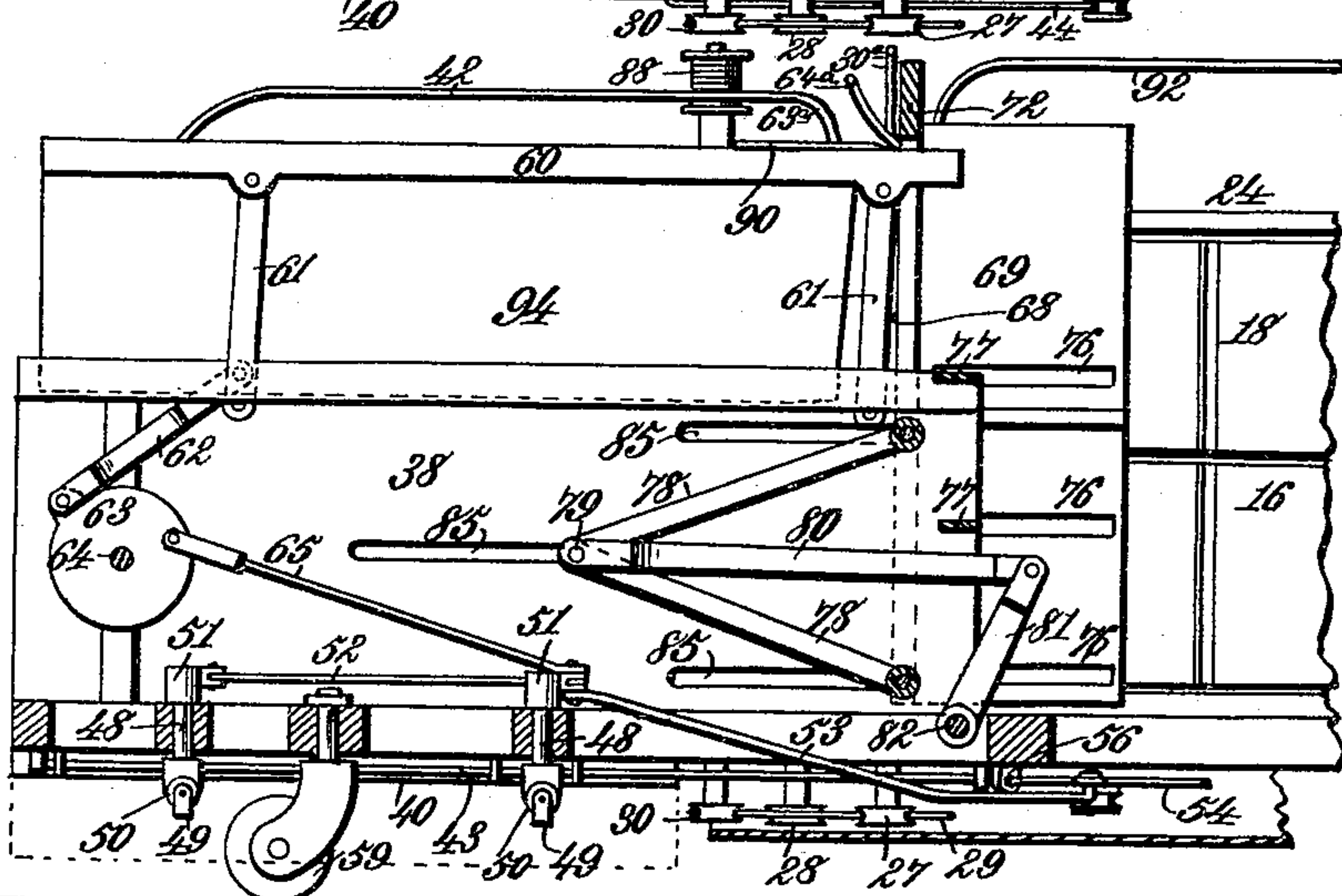
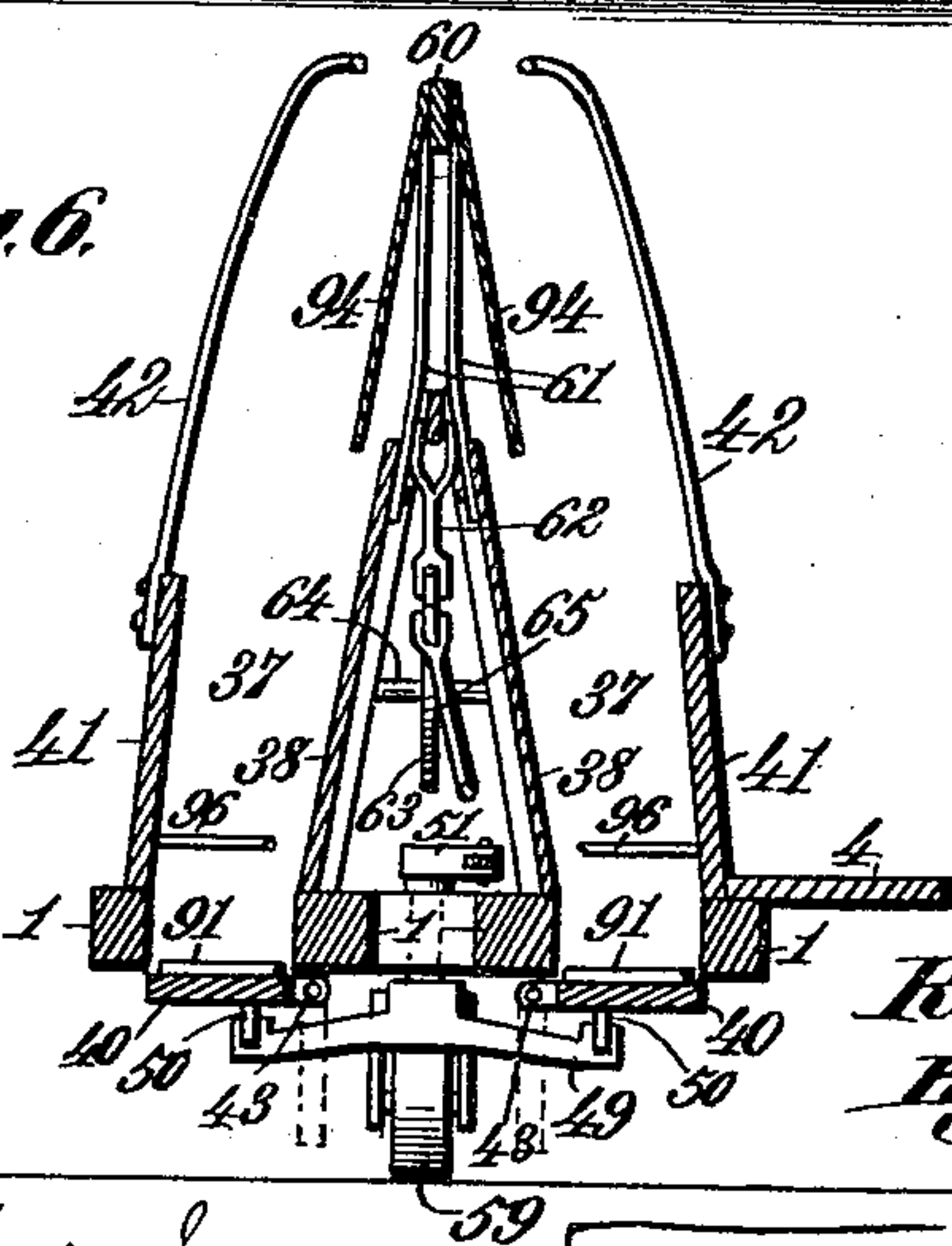


Fig. 6.



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(No Model.)

4 Sheets—Sheet 4.

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CORN HARVESTER.

No. 481,059.

Patented Aug. 16, 1892.

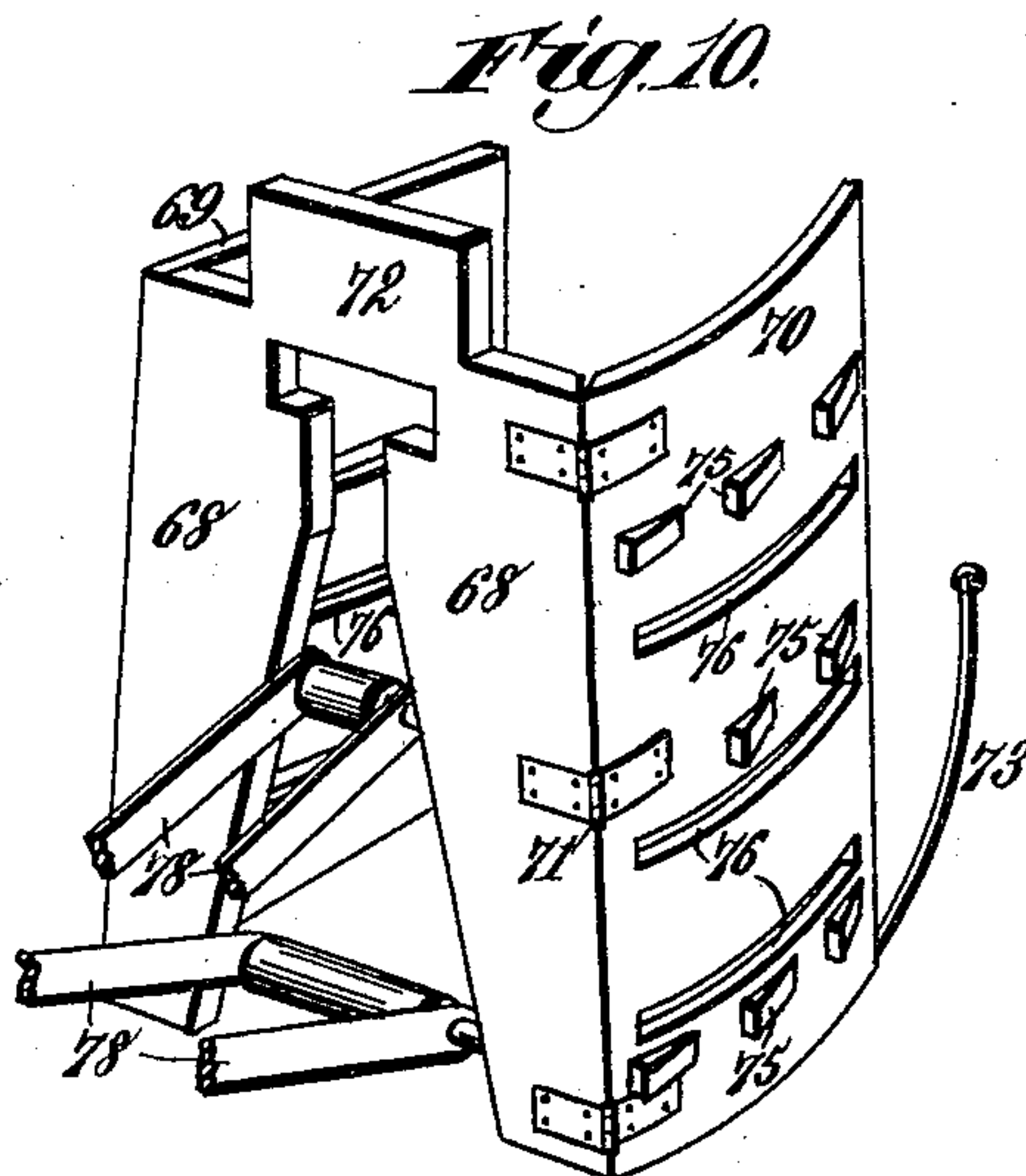
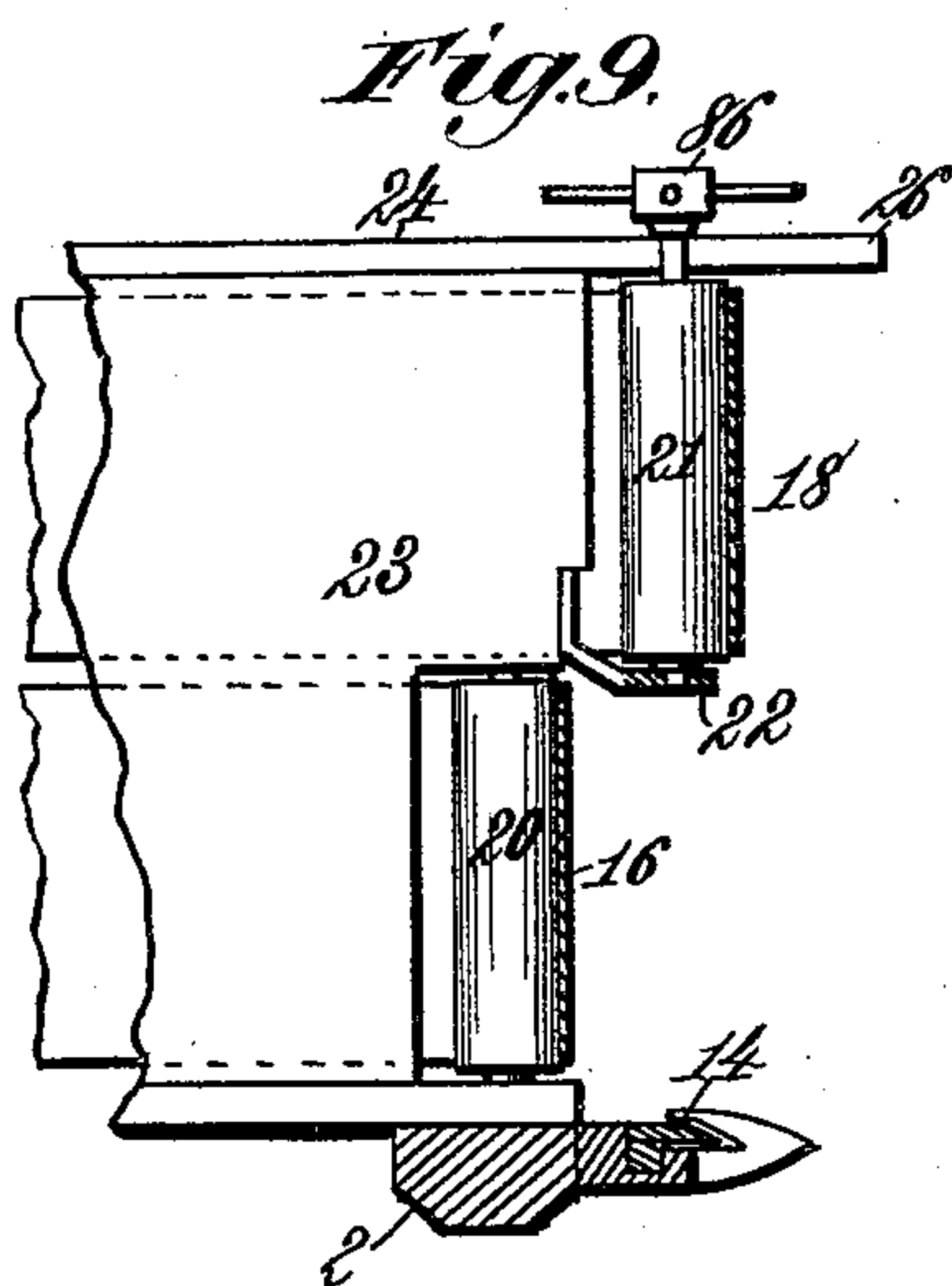
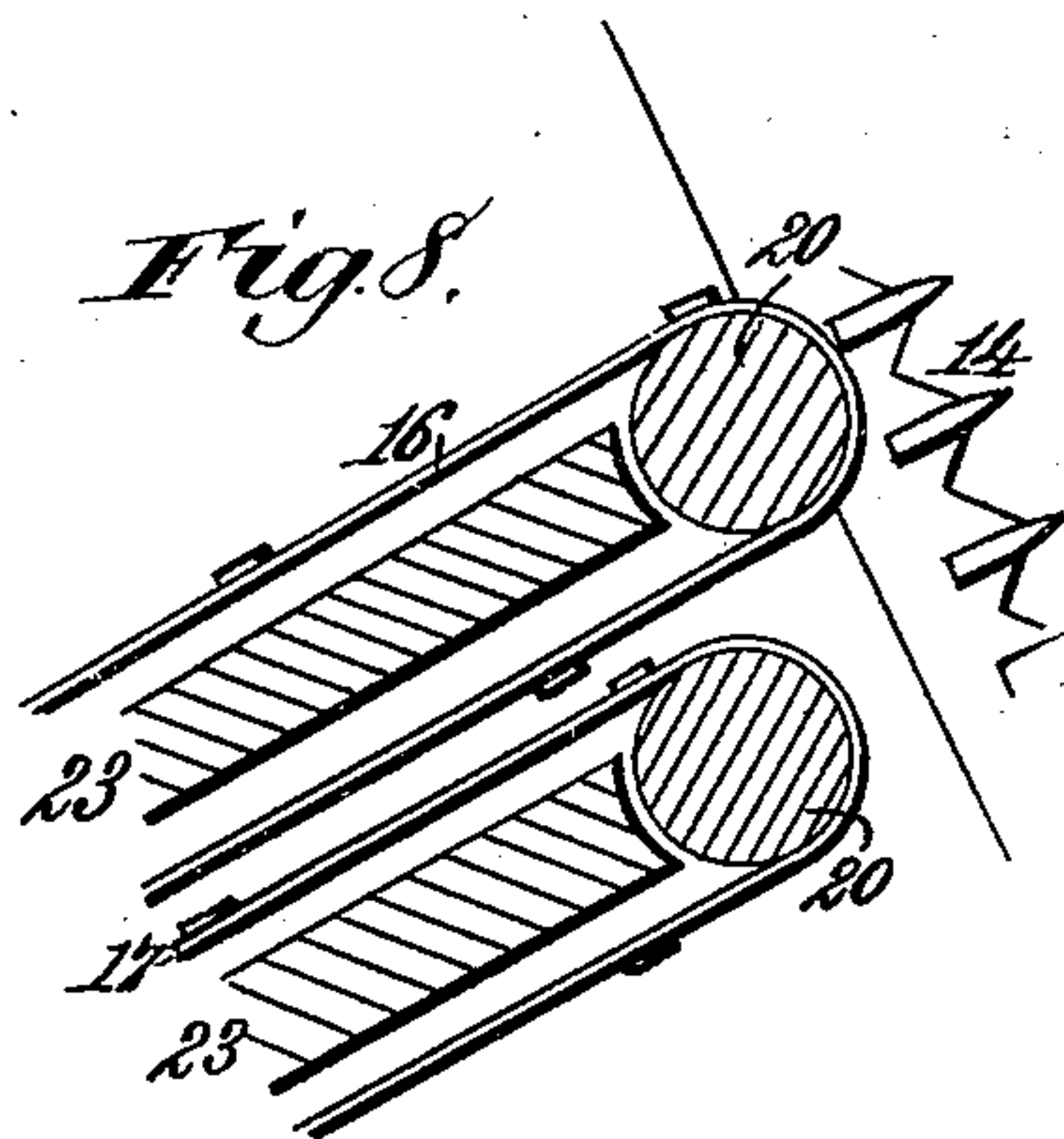
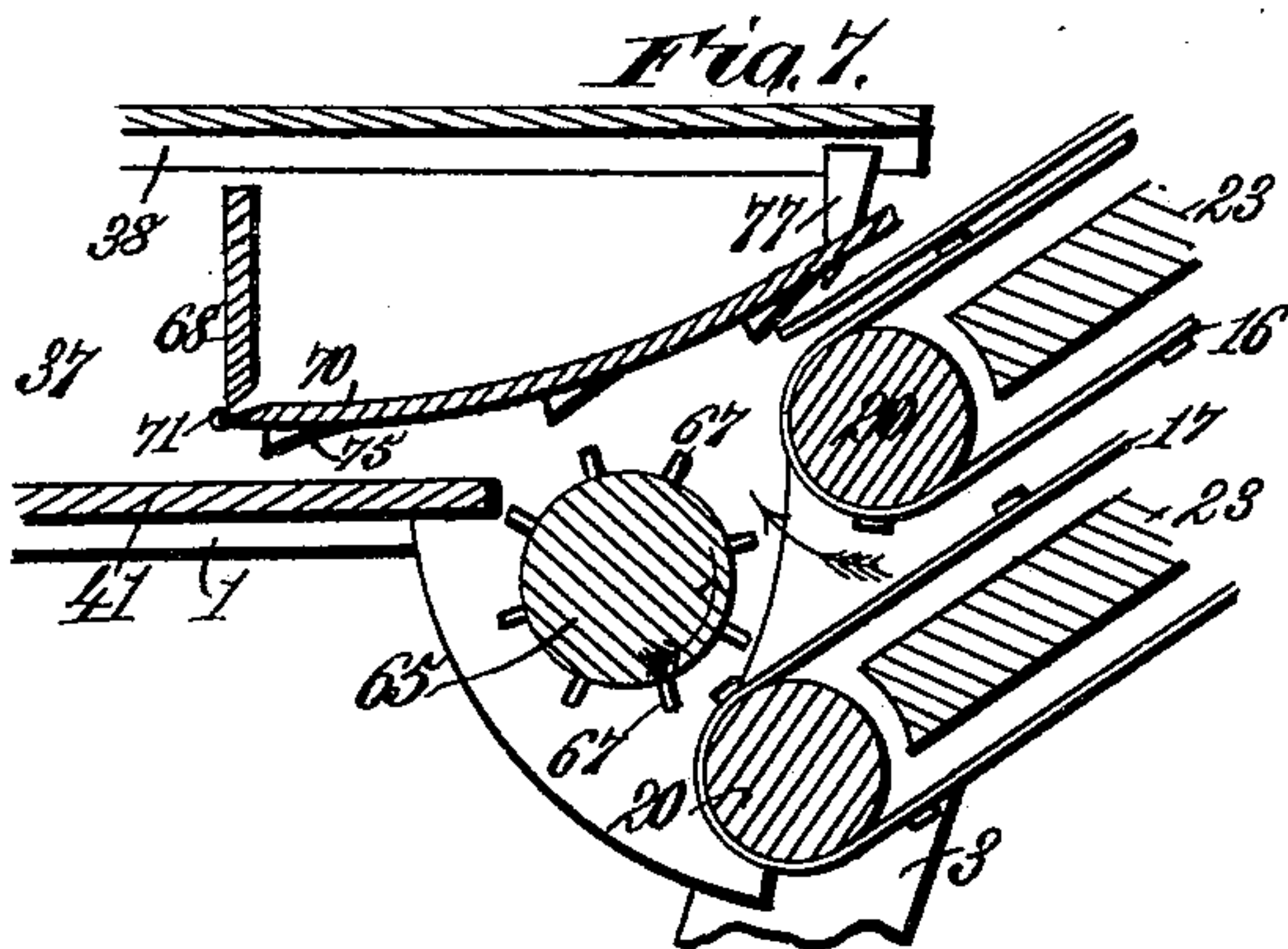
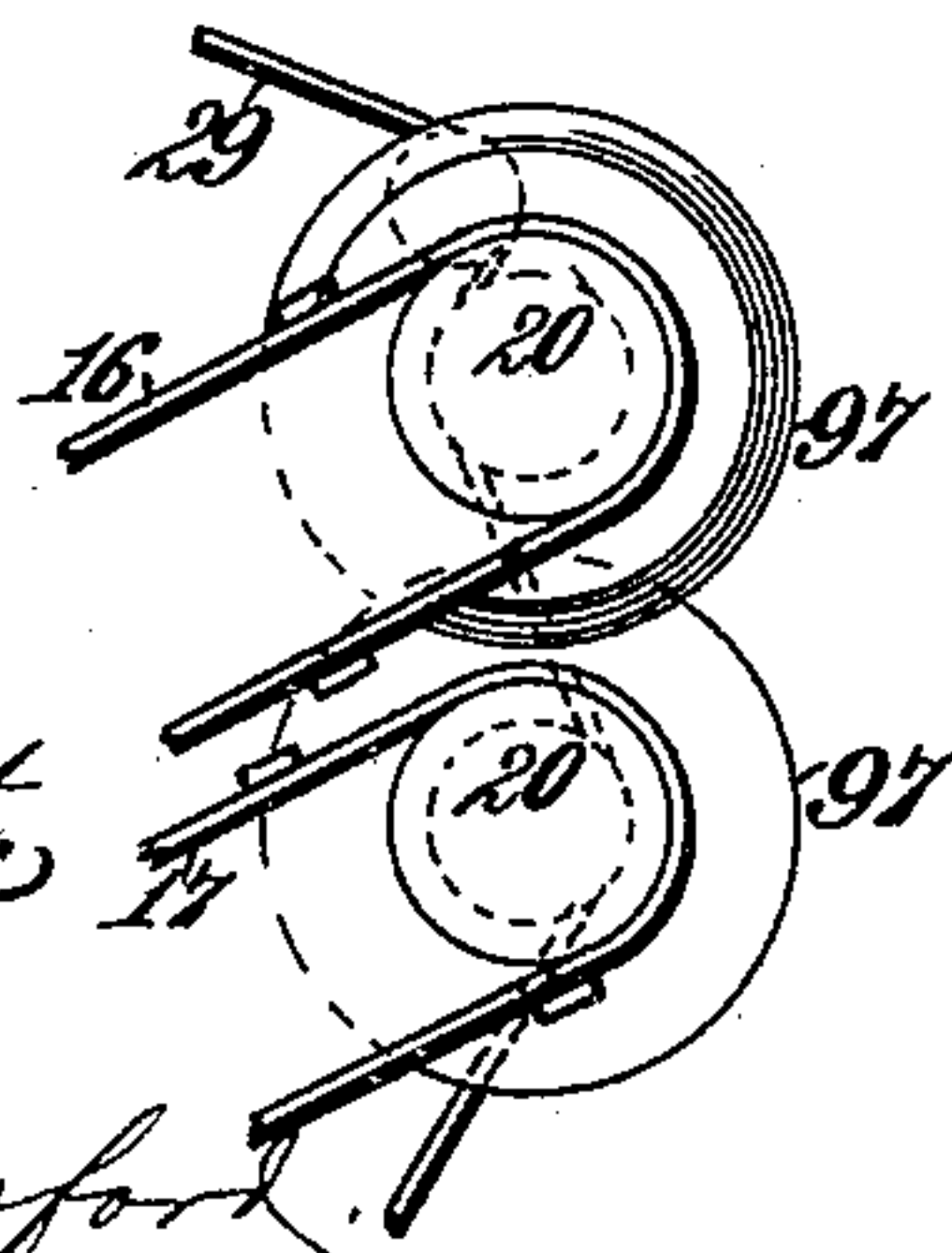


Fig. 11.



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UNITED STATES PATENT OFFICE.

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TO PHILIP S. RIDDELLE, OF WASHINGTON, DISTRICT OF COLUMBIA, AND
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CORN-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 481,059, dated August 16, 1892.

Application filed January 22, 1892. Serial No. 418,926. (No model.)

To all whom it may concern:

Be it known that I, ROBERT S. RINKER, a citizen of the United States, residing at Rinkerton, in the county of Shenandoah and State of Virginia, have invented new and useful Improvements in Corn-Harvesters, of which the following is a specification.

This invention relates to that type of corn-harvesters wherein the stalks after being severed by suitable cutters are carried rearward in an approximately perpendicular position and delivered into chambers, whereby the shock is formed and then dropped in an upright position on the field, as in Letters Patent No. 414,658, issued to me November 5, 1889.

The objects of my present invention are to improve and simplify the prior machine; to render the shock-forming mechanism more effective and reliable by insuring the discharge of the shocks in upright positions on the surface traversed; to counteract the forward impetus imparted by the machine to the shocks as they are dropped or discharged, and to provide novel stalk-carriers which seize and hold the upper portions of the stalks while the lower portions thereof are being severed and then direct the severed stalks into proper position between the coacting parts of the carrier for the proper conduct of the latter to the rear portion of the machine.

To accomplish all these objects my invention involves the features of construction and the combination or arrangement of devices hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a perspective view of sufficient of the corn-harvester to illustrate my present invention. Fig. 2 is a top plan view of the same. Fig. 3 is a bottom plan view. Fig. 4 is a detail longitudinal sectional view taken on the line *x x*, Fig. 2. Fig. 5 is a similar view taken on the line *y y*, Fig. 2. Fig. 6 is a transverse sectional view taken on the line *z z*, Fig. 2. Fig. 7 is a detail horizontal sectional view showing the rear end portions of the outer pair of carrier-aprons and the rotating cylinder or roller by which the stalks are directed laterally toward the stalk-packer. Fig. 8 is a similar view showing the forward

portion of one pair of carrier-aprons. Fig. 9 is a detail vertical sectional view to illustrate the extension of one of the upper carrier-aprons in advance of a lower carrier-apron. Fig. 10 is a detail perspective view of the packer; and Fig. 11 is a detail plan view showing a modified construction of cutter mechanism for severing the cornstalks.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, where it will be seen that the main frame of the machine comprises the longitudinal girders or sill-pieces 1, the diagonal front and rear beams 2 and 3, and a lateral platform or cover-plate 4; but as the main frame may be of any construction suitable for the conditions required further illustration is deemed unnecessary.

The main drive-wheel 5 at the outer side of the machine is provided with a gear 6, engaging a pinion 7 on a counter-shaft 8, having a bevel-gear 9, meshing into a bevel-gear 10 on a vertical spindle, which is provided at its lower end with a cam or eccentric 12, engaging an eccentric-strap on one end of a pitman 13, which connects with and reciprocates a cutter-bar 14, arranged approximately parallel with the front diagonal beam 2 for severing the cornstalks in proximity to the surface traversed. The severed stalks are carried rearward in a vertical position to stalk-collecting or shock-forming chambers, and to accomplish this I provide inner and outer carriers, each of which comprises a lower pair of parallel endless aprons 16 and 17 and an upper pair of similar aprons 18 and 19, which latter at their front ends project in advance of the front ends of the aprons 16 and 17 in such manner that the more flexible top portions of the stalks are caught and held while their lower portions are severed by the cutter-bar, so that the butt portions of the stalks are properly entered between the lower aprons 16 and 17. The lower aprons pass round front and rear vertical rollers—such as 20, Fig. 9—which are supported in suitable bearings on the main frame. The front portions of the upper aprons 18 and 19 pass round upper rollers 21, journaled at their lower ends in brackets 22, Fig. 9, secured to vertical boards

23, extending between the parallel parts of each upper apron and secured to the top rails 24, which are supported by the main frame through the medium of suitable braces, as at 5 25. The front ends 26 of the top rails 24 diverge for the purpose of acting as gatherers to gather and direct the top portions of the stalks into engagement with the upper carrier-aprons 18 and 19. The rear rollers of the 10 aprons are driven by sprocket-wheels 27 and 28, engaging an endless chain or drive-belt 29, substantially as in my patent above alluded to. I do not, however, confine myself to any particular mechanism for imparting a 15 traveling movement to the several carrier-aprons, as various mechanisms for this purpose will suggest themselves to those skilled in the art. If the arrangement exhibited in the drawings is employed, I provide an adjustable wheel 30, Fig. 3, which engages the drive-belt and serves to tighten or loosen the same 20 when the inner pair of carrier-aprons is adjusted laterally at the forward end for the purpose of adapting the machine for practical work where the distance varies between 25 the rows of stalks, as will be fully hereinafter explained.

The rear ends of the adjacent top rails 24 are braced, steadied, and sustained in proper 30 position through the medium of an arched brace-rod 30^a, Figs. 1 and 2, and the forward ends of the inner pair of carrier-aprons are rendered adjustable laterally by brackets or plates 31, secured to the carrier-frames 35 and having horizontal portions resting on the front diagonal beam 2 and provided with slots 32 for the passage of set-bolts 33, which enter the beam 2 and serve to secure the 40 brackets in any position to which they are adjusted. The inclined braces 25 of the inner pair of top rails 24 are furnished with slotted foot-pieces 34, held by set-bolts 35, in a manner similar to the slotted brackets or plates 31. The slots in the brackets or 45 plates and in the foot-pieces of the braces are formed in the arc of a circle struck from the center of the rear vertical roller, round which pass the rear portions of the carrier-aprons 16 and 18 of the inner pair of carriers. The 50 slotted brackets 31, the braces 25, with their slotted foot-pieces 34, and the set-bolts 35 constitute clamping devices for rigidly securing the frame of the stalk-carrier in a fixed position on the diagonal front beam 2. The 55 object of this construction is to enable the forward portions of the inner pair of carriers to be adjusted laterally toward and from the ground-wheel 36 at the inner side of the machine and the carrier-frame to be rigidly 60 locked or clamped in its adjusted position for the purpose of rendering the machine susceptible of practical use where the distance varies between the rows of stalks. If the forward portions of the inner pair of carrier- 65 aprons are adjusted toward the ground-wheel 36 at the inner side of the machine, the tightener-wheel 30, Fig. 3, must be adjusted to

loosen the drive-chain 29, and, conversely, if the forward portions of the said carrier-aprons are adjusted away from the ground-wheel 36 70 the tightener-wheel must be adjusted to tighten the drive-chain. By this means the distance between the two pair of carriers can be considerably altered to suit the conditions required if rows of corn be planted near or 75 far apart.

The upper endless aprons have their bottom edges arranged in such juxtaposition to the top edges of the lower endless aprons as to constitute practically-continuous surfaces 80 for acting on the cornstalks nearly their entire length. This is important, since cornstalks are difficult to handle and the leaves must be confined and acted on as well as the stalk-butts; besides, the stalks are frequently 85 broken along their length and if only acted upon at the top and bottom portions they cannot be practically carried rearward in a perpendicular position.

The carrier-frames can be constructed in 90 any suitable manner, and the endless aprons are preferably provided with attached vertical cleats or slats to facilitate carrying the stalks rearward into the stalk-collecting or shock-forming chambers 37, Figs. 2, 6, and 7, which 95 are separated from each other by a partition composed, as here shown, of two walls 38, converging toward their upper portions, as in Fig. 6, and having their rear end portions converging toward each other, as in Fig. 2, to 100 provide widened or divergent exits 39, which materially facilitate the discharge of the shock and avoid pulling the latter down as the machine advances after the shock is 105 dropped on the surface traversed by the opening of the hinged sliding doors 40 to the position indicated by dotted lines in Fig. 6.

The outer side walls of the stalk-collecting or shock-forming chambers 37 are formed by inclined walls 41, to which are attached the 110 rear ends of flexible or elastic guard-rails 42, which operate to press the upper flexible portions of the stalk toward each other above the inclined walls 38 of the central partition which divides or separates the stalk-collecting or 115 shock-forming chambers 37.

The hinged doors 40 are provided with eyes loosely engaging the horizontal rods or pintles 43 in such manner that these doors can slide longitudinally along such rods. To the forward 120 ends of the doors are connected the extremities of ropes or other cables 44, which connect with a winding-drum 45, secured to the lower end portion of a vertical shaft 46, having at its upper end a suitable handle 47, 125 by which the shaft can be turned to wind up the cables 44 after the doors 40 have been moved rearward by the accumulation of stalks in the stalk-collecting or shock-forming chambers, substantially as described in my 130 patent above mentioned. I do not, however, confine myself to doors which are hinged and slide lengthwise, for the doors may be otherwise arranged to open and close the base por-

tions of the stalk-collecting or shock-forming chambers, and, inasmuch as any suitable doors and mechanism for operating the same may be employed, I do not deem it essential to describe these features more in detail. It is desirable, however, to employ hinged doors which drop toward the ground to deposit the shocks thereupon, and therefore I provide simple means by which the doors can be opened and closed, which means I will now describe, reference being more particularly made to Figs. 3, 4, and 5. To suitable supports constituting a part of the main frame are centrally pivoted, as at 48, a pair of horizontal oscillatory levers 49, having at their extremities friction-rollers 50 to ride against the under sides of the doors 40. The pivots 48 of the levers are composed of spindles or shafts having attached crank-arms 51, connected together by a link 52. The foremost crank-arm 51 is also connected with one extremity of a pitman 53, which at its opposite or front extremity is jointed to a swinging and lengthwise movable rod 54, attached at one end to a crank-arm 55, and at its opposite end adapted to slide and swing in a suitable guide 56, secured to the main frame of the machine. The crank-arm 55 is attached to the lower end portion of a vertical shaft 57, having at its upper end a suitable handle 58, by which the shaft can be turned for the purpose of operating the rod 54 to move the link 53 lengthwise, and thereby rock the spindles or shafts 48 to oscillate the levers 49 and swing them into such position that their friction-rollers 50 are moved away from the doors 40 and the latter, being thus unsupported, must swing downward to their open position, as indicated by dotted lines in Fig. 6, for the purpose of dropping or depositing the shock upon the surface traversed. After the shock has been deposited the handle 58 is operated to turn the shaft 57 in a reverse direction for the purpose of restoring the levers 49 to the position indicated in Fig. 3, whereby the doors are swung upward to their closed position, after which the drum 45 can be operated by turning the shaft 46 to wind up the cables 44 and slide the doors 40 to their forward position. The caster-wheel 59, which sustains the rear end portion of the machine, is shown as mounted on the main frame intermediate the levers 49, but the caster-wheel can be otherwise arranged and, if desired, more than one wheel can be employed.

In my present invention the swinging doors 40 are suspended from the center girders or sill-pieces 1, so that the doors are thus hinged or pivoted at their adjacent edges in such manner that when released they swing downward toward each other. This arrangement enables me to close the doors by the action of the oscillatory levers 49, and furthermore the weight of the shock principally upheld by these doors is supported by the caster-wheel located directly under the center girders or sill-pieces 1. This construction and arrangement materially improves and simpli-

fies the machine described and shown in my former patent.

In the formation of a shock it is desirable that the stalks be supported centrally inside the shock in juxtaposition to the point where the binding or tying cord secures the stalks; but this has not heretofore been accomplished in corn-harvesters where the shock is dropped vertically to stand upright on the surface traversed, because any stationary device or contrivance employed to support the inside of the shock in juxtaposition to the point where the stalks are tied together would prevent the proper descent of the shock in a vertical plane to rest upon the surface traversed. In my invention I provide a ridge or ridge-pole 60, against which the upper portions of the stalks rest while they are being tied or bound, and this ridge or ridge-pole is so constructed that it can be moved while it remains horizontal from its stalk-supporting position after the stalks have been tied, so that the shock can then descend vertically to rest upon the ground. In the example here illustrated the movable ridge comprises a horizontal pole pivoted to the upper ends of supporting-arms 61, which at their lower ends are pivoted to the inner sides of the inclined walls 38, so that by a swinging movement of these arms the ridge-pole is moved rearward and downward when the shock is to be dropped. The rear pair of arms 61 are pivotally attached to a yoke-bar 62, which connects with an eccentric or crank wheel 63, journaled on a shaft 64, supported in any suitable manner, preferably by the inclined walls 38. The eccentric or crank wheel 63 is also connected to one end of a link 65, the opposite end of which is secured to the crank-arm 51 of the forward spindle or shaft 48 in such manner that when this spindle or shaft is operated to permit the doors 40 to open the ridge-pole is swung rearward and downward, and, conversely, when the spindle or shaft is operated to close the doors 40 the ridge-pole is swung upward and forward to its normal position for supporting the upper portions of the stalks which are being formed into a shock. By this means the ridge-pole 60 operates in unison with the opening and closing doors 40.

The forward end portions 63^a of the guard 42 operate in conjunction with a guide 64^a for the purpose of directing the stalks from the rear end portions of the endless carrier-aprons into the stalk-collecting or shock-forming chambers 37, substantially as in my patent before mentioned. In the present arrangement, however, it is desirable to provide means whereby the stalks are positively impelled from the outer pair of endless aprons toward the chambers 37, and to accomplish this I arrange directly in rear of the outer pair of carrier-aprons a vertical cylinder or roller 65, having at its lower end a sprocket-wheel 66, engaged with and rotated by the drive-chain 29, Fig. 3, for the purpose of imparting a ro-

tary motion to the cylinder or roller. This cylinder or roller is provided with projections in the form of teeth or ribs 67 to more effectually act on the stalks and propel them toward the chamber 37, which is nearest the outer pair of carrier-aprons.

It is desirable to pack the stalks in the stalk-collecting chambers for the purpose of forming compact shocks, and to this end I employ a packer, which is illustrated in Fig. 10. This packer comprises a vertical rear wall 68, a rigidly-attached side wall 69, and a side wall 70, which is adapted to vibrate, and for this purpose is hinged or pivoted, as at 71, to the wall 68. The upper edge of the wall 68 is constructed with an upward projection 72 for effectually pressing the upper portions of the stalks in a rearward direction. The lower end of the pivoted wall or wing 70 is provided with an attached segmental arm 73, which extends through a stationary guide 74 on the main frame, so that as the packer reciprocates the pivoted wall or wing 70 is vibrated. The object of this is to move the pivoted wall or wing 70 in a direction away from the outer pair of carrier-aprons on the backstroke of the packer. By this means the packer can reciprocate and be provided with side walls 69 and 70, while the space between the rear ends of the carriers and the shock-forming chambers can be reduced. Further, the carrier-aprons can run in a diagonal line, as shown, because the wall 70 on its backstroke moves inward toward the longitudinal center of the machine, so that it is not liable to carry with it stalks which are being moved toward a shock-forming chamber by the cylinder or roller 65.

The walls 69 and 70 of the packer are preferably provided with tapered projections 75 and with horizontal slots 76, through which extend stationary arms 77, Fig. 2, which arms hold the stalks from back motion on the backstroke of the packer and operate to clear the stalks from engagement with the projections or teeth 75. The packer is provided with two pairs of pivotally-attached links 78, which connect at their rear ends, as at 79, Fig. 5, with a pitman 80, which is pivotally secured to the crank-arm 81 of a rock-shaft 82. This rock-shaft extends to the outer side of the machine and is operated by a link 83, engaged with the wrist-pin of a crank-wheel 84 on the shaft of the main drive-wheel 5. By this arrangement the packer is reciprocated as the machine traverses the field. For the proper action of the links 78 and their connecting-pin 79 the front end portions of the inclined walls 38 are provided with horizontal slots 85. While I have described and shown a peculiar packer and means for reciprocating the same, I do not wish to be understood as confining myself to the employment of a packer or to the use of any particular packer, as various devices for this purpose can be employed. The specific construction described and shown is, however,

very desirable and useful in this type of harvester.

As the machine traverses the field, the front end portions of the upper carrier-aprons 18 and 19 will seize the upper portions of the stalks and hold them while they are being severed by the cutter-bar 14, after which the lowered severed portions of the stalks will be properly entered between the front end portion of the lower aprons 16 and 17. The divergent portions 26 of the top rail 24 act as gatherers to properly direct the upper portions of the stalks to the upper pairs of aprons. I may also employ, if desired, a pair of rotated armed wheels 86 for the purpose of driving the stalks rearward into positive engagement with the upper aprons. These armed wheels are rigidly attached to the rollers 21 and are rotated thereby. The adjacent surfaces of each pair of carrier-aprons co-operate to move the stalks rearward while they stand approximately perpendicular, and when the stalks leave the rear end portions of the aprons they will be forced against the binding or tying cord 87 into the stock-collecting or shock-forming chambers 37. The binding or tying cord 87 is carried at one end portion by a spool 88, and at the opposite end is secured to a suitable pin or standard 89. The stalks are forced rearward in the chambers 37 by the action of the reciprocating packer, and, owing to the inclination of the walls 38, the upper ends of the stalks will be crossed diagonally or knit together against the ridge-pole 60. The operation is such that a compact shock is obtained, and when secured through the medium of the binding-cord there is no danger of its becoming separated from any ordinary cause. While the shock is being formed it is supported centrally at its inside in juxtaposition to the point where the binding-cord is secured through the medium of the ridge-pole 60. When the shock has been formed, the handle 58 is operated to turn the shaft 57 for the purpose of opening the doors 40 and simultaneously therewith moving the ridge-pole to its lowermost position, so that it no longer supports the stalks. The shock thereupon descends in a vertical plane until it rests on the surface traversed while the machine advances. The discharge of the shock from the machine is materially facilitated by the widened or divergent exits 39, which entirely avoid pulling the shock down as the machine advances. This results from the fact that as the machine advances while the shock rests on the ground the pressure against the sides of the shock is gradually reduced by reason of the widening or diverging construction of the stalk-collecting or shock-forming chambers.

When the shock is dropped, it is desirable to counteract the impetus imparted thereto by the progressive movement of the machine, and to accomplish this I provide the ridge-pole 60 with a suitable head 90 at or near its front end portion. This head is preferably of

triangular form, the base of the triangle being presented to the stalks in the chambers 37. By this construction when the doors 40 are opened and the ridge-pole moves rearward and downward the head 90 abuts the shock and prevents any forward motion being imparted thereto by the forward motion of the machine.

As the stalks are accumulated in the chambers 37 the doors 40 will slide rearward by reason of the butt ends of the stalks acting against cleats 91 on the doors, Fig. 4, and after the shock has been dropped the doors are closed by the action of the levers 49 and are then slid forward by the cables 44 and drum 45, as described in my patent hereinbefore mentioned.

It is well-known that cornstalks are exceedingly difficult to handle mechanically, and for this reason care must be exercised in providing mechanical contrivances for the practicable manipulation of the stalks both before and after they are severed. For this reason I extend the upper carrier-aprons 18 and 19 in advance of the lower carrier-aprons 16 and 17, so that the upper and more flexible portions of the stalks will be seized and held while they are being severed by the cutter-bar, and subsequently the severed stalks will be directed into proper position for the coaction of the aprons in carrying the stalks rearward while they are approximately perpendicular. As the stalks are moved rearward it is desirable to support their extreme top portions, and for this purpose I provide each pair of top rails 24 with a pair of parallel guard-rails 92, having their front and rear ends secured, respectively, to such top rails, as will be clearly understood by reference to Fig. 1. This is a desirable and useful addition to the machine and materially facilitates the effective operation thereof.

As the stalks enter the stalk-collecting chambers 37 it is desirable that they have a slight fall vertically to rest squarely on the doors 40, and for this purpose I provide elevated platforms 93, one of which is located slightly above each door at the rear end portion of each pair of carriers, so that as the stalks move backward and leave the platform they drop upon the doors 40 for the purpose of producing uniform and compact shocks. The rear edges of the platforms 93 prevent forward movement of the stalks which have dropped upon the doors 40, and as auxiliary means for effecting this purpose I may employ the spring-guards 95, Fig. 2, but these are not indispensable. I also employ spring-pressers 96, Fig. 2, located in the lower portion of the shock-forming chambers for the purpose of pressing the butts of the stalks compactly against the base or lower ends of the inclined walls 38 for the production of more compact shocks. These spring-pressers converge toward the rear end of the machine and are arranged, respectively, in the two chambers 37, so that they will yield to accom-

modate the accumulating stalks, but are of sufficient power to hold the stalks with some firmness against the inclined walls.

In the practical use of the machines with a movable ridge-pole, as described, it is desirable to cover the space between the ridge-pole and the upper edges of the inclined walls 38 when the ridge-pole is in its highest position, as indicated by Fig. 6, for the purpose of preventing the upper portions of the stalks from entering between the upper edges of the inclined walls and the lower edge of the ridge-poles, because if such were to occur the descent of the ridge-pole would bind portions of the stalks against the top edge of the inclined walls 38, and consequently interfere with the proper discharge of the shock from the machine. I therefore provide the opposite sides of the ridge-pole 60 with pendent aprons 94, which may be composed of sheet metal or any other material and be of any construction which will permit the ridge-pole to rise and fall in a vertical plane. I prefer to construct these aprons of sheet-metal plates, which diverge toward their lower edges, so that when the ridge-pole is lowered the aprons will rest against the outer sides of the inclined walls 38.

I have described and shown a reciprocating cutter-bar for the purpose of severing the stalks; but I do not confine myself to any particular cutting devices, for various contrivances for this purpose may be employed. For example, I may use rotary circular cutters 97, Fig. 11, operated by the drive-chain 29. It will of course be necessary to employ a pair of these rotary circular cutters for each pair of stalk-carriers, and they should be so arranged as to project in advance of the lower aprons 16 and 17 in a manner similar to the forward projection of the cutter-bar exhibited in Fig. 1.

The guides 63^a and 64^a should be of such elevated or arched construction as to properly sustain the upper portions of the stalks as they move rearward to the stalk-collecting chambers, so that there will be no possibility of the stalks bending down and being obstructed by parts of the machine in their rearward travel.

By this invention my former machine is materially simplified and rendered more effective and reliable in operation. The ridge-pole is an important element in that it firmly supports the upper portions of the stalks at or near the point where they are tied or bound by the binding-cord, so that they can be more securely fastened together to produce a shock which is not likely to become separated. The head of the ridge-pole, which prevents forward motion being imparted to the shock by the advance of the machine, is a very desirable feature in that it insures the proper deposit of the shock in a vertical plane, so that it will stand upright on the field.

I may, if necessary, provide the forward portion of the machine with inclined gather-

ing belts or aprons, as in my former patent; but do not deem it essential to here illustrate these elements.

The vibratory wing of the packer is a desirable feature in this construction of harvesters, in that it prevents cornstalks from being carried back between the packer and the inner carrier-apron adjacent thereto.

I do not confine myself to two pairs of carriers, nor do I confine myself to operating on cornstalks, for by multiplying the number of carriers it is possible to harvest grain, in which event I may employ a grain-binder in connection with the packing-chambers; but as the binder constitutes no part of my present invention, I do not deem it essential to illustrate the same.

Having thus described my invention, what I claim is—

1. In a corn-harvester, the combination of a main frame having stalk-cutters, shock-forming chambers separated by a partition comprising a pair of separated walls, a rising and falling ridge-pole, movable supports for the ridge-pole located between the separated walls, movable doors or platforms for supporting the stalks, devices for operating the movable supports between the separated walls to raise and lower the ridge-pole, and means for opening and closing the doors or platforms, substantially as described.

2. In a corn-harvester, the combination, with shock-forming chambers and endless carrying-aprons for delivering stalks thereinto, of a ridge-pole interposed between the shock-forming chamber and against the opposite sides of which the cornstalks rest in reverse inclined planes while a shock is being formed, mechanism for moving the ridge-pole lengthwise from its stalk-supporting position to permit the shock to drop vertically, and movable doors or platforms for sustaining the stalks while a shock is being formed, substantially as described.

3. In a corn-harvester, the combination of shock-forming chambers, mechanism for delivering the stalks thereinto, movable doors which support the butt-ends of the stalks, a ridge-pole movable to different heights and against opposite sides of which the stalks rest in reverse inclined planes while a shock is being formed and tied above the ridge-pole, and means for opening the doors and simultaneously therewith moving the ridge-pole downward, substantially as described.

4. In a corn-harvester, the combination, with suitable cutting devices, shock-forming chambers, and stalk-carrying mechanism for delivering the stalks into the shock-forming chambers, of movable doors which support the butt-ends of the stalks in the shock-forming chambers, a movable ridge-pole, against opposite sides of which the stalks rest while a shock is being formed and tied above the ridge-pole, mechanism for moving the ridge-pole downward from its stalk-sustaining position, and means for opening the doors to drop

the tied shock in an upright position on the surface traversed, substantially as described.

5. In a corn-harvester, the combination, with stalk-cutting mechanism and stalk-carriers, of shock-forming chambers into which the severed stalks are delivered from the stalk-carriers, a partition which separates the said chambers one from the other, a movable ridge-pole pivotally connected with the partition, doors which sustain the stalks while a shock is being formed, levers for opening and closing the doors, connections between the levers and the pivotal supports of the ridge-pole whereby the latter is moved downward as the doors are opened, and means for operating the said door opening and closing levers, substantially as described.

6. In a corn-harvester, the combination, with suitable cutting mechanism and stalk-carriers, of shock-forming chambers separated from each other by a partition, a ridge-pole pivotally supported from the partition, a crank-wheel connected with the ridge-pole supports, doors which support the stalks while a shock is being formed, spindles or shafts having door opening and closing levers, connections between the spindles and the crank-wheel, and means for operating the spindles to open and close the doors and simultaneously therewith lower and raise the ridge-pole, substantially as described.

7. In a corn-harvester, the combination, with stalk-collecting or shock-forming chambers and opening and closing doors for sustaining the stalks while a shock is being formed, of a ridge-pole movable rearward and downward and provided with a head for acting on the shock to counteract the forward motion of the machine on the shock, substantially as described.

8. The combination, with the shock-forming chambers of a corn-harvester, separated by a partition, of a rising and falling ridge-pole provided with attached aprons for covering the space between the upper edge of the partition and the ridge-pole when the latter is elevated, substantially as described.

9. In a corn-harvester, the combination, with a cutting mechanism and stalk-carriers, of shock-forming chambers, movable doors which support the stalks while a shock is being formed, and platforms elevated above the doors and arranged at the rear end portions of the carriers so that the stalks drop vertically from the platform upon the doors, substantially as described.

10. In a corn-harvester, the combination, with a main frame having a cutting mechanism for severing the stalks, means for moving the severed stalks rearward, and shock-forming chambers having movable doors or platforms and separated by a partition composed of walls which converge toward their upper portions, of a rising and falling ridge-pole located above the inclined walls composing the partition and against opposite sides of which the stalks rest in reverse inclined positions

while a shock is being formed and tied, and means for lowering the ridge-pole from its stalk-supporting position after the shock has been tied, substantially as described.

5 11. In a corn-harvester, the combination, with a cutting mechanism, endless carrying aprons, and shock-forming chambers, of a movable packer having a vertical rear wall and a movable side wall or wing provided with an
10 attached segmental rod and a guide through which the rod passes for swinging the wall or wing laterally toward the longitudinal center of the machine on the back-stroke of the packer, substantially as described.

15 12. In a corn-harvester, the combination, with a cutting mechanism, stalk-carriers, and shock-forming chambers, of a reciprocating packer having side walls provided with slots and laterally-projecting teeth, and stationary
20 arms protruding through the slots of the side walls for holding the stalks against following the motion of the back-stroke of the packer, substantially as described.

25 13. In a corn-harvester, the combination, with a cutting mechanism, of a pair of co-operating endless carrier-aprons having their adjacent traveling portions acting to move the stalks rearward, a shock-forming chamber, and a rotating vertical cylinder located
30 in a space between the rear ends of the two carrier-aprons and the shock-forming chamber and provided with projections or teeth, and a reciprocating packer having a part co-operating with the toothed cylinder to force
35 the stalks from the rear ends of the two carrier-aprons toward the shock-forming chamber, substantially as described.

14. In a corn-harvester, the combination, with cutting devices and stalk-carriers, of a
40 shock-forming chamber having opening and

closing bottom doors and a divergent rear exit to facilitate the discharge of an upright shock as the machine advances, substantially as described.

15. In a corn-harvester, the combination, 45 with cutting devices and stalk-carriers, of shock-forming chambers separated by a partition comprising inclined walls which converge towards their rear extremities to provide widened or divergent exits, substantially 50 as described.

16. In a corn-harvester, the combination, with cutting devices and stalk-carriers, of shock-forming chambers having widened or divergent rear extremities and opening and 55 closing doors constituting the bottoms of the shock-forming chambers for dropping a shock on the surface traversed, substantially as described.

17. In a corn-harvester, the combination, 60 with stalk-carriers, and the shock-forming chambers separated by a partition comprising inclined walls, of the guard-rails 64^a and the guard-rails 42, secured at their rear ends to the outer walls of the shock-forming cham- 65 bers and having their forward ends extended substantially parallel with the guard-rails 64^a, said guard-rails 42 acting to force the stalks toward each other and cause them to assume inclined positions at opposite sides of the par- 70 tition which separates the shock-forming chambers, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

ROBERT S. RINKER. [L. S.]

Witnesses:

GEO. W. CLEM,
LEON HARDIE.