(No Model.)

4 Sheets—Sheet 1.

E. E. WITTER.

CORN HARVESTER.

No. 537,095. Patented Apr. 9, 1895.

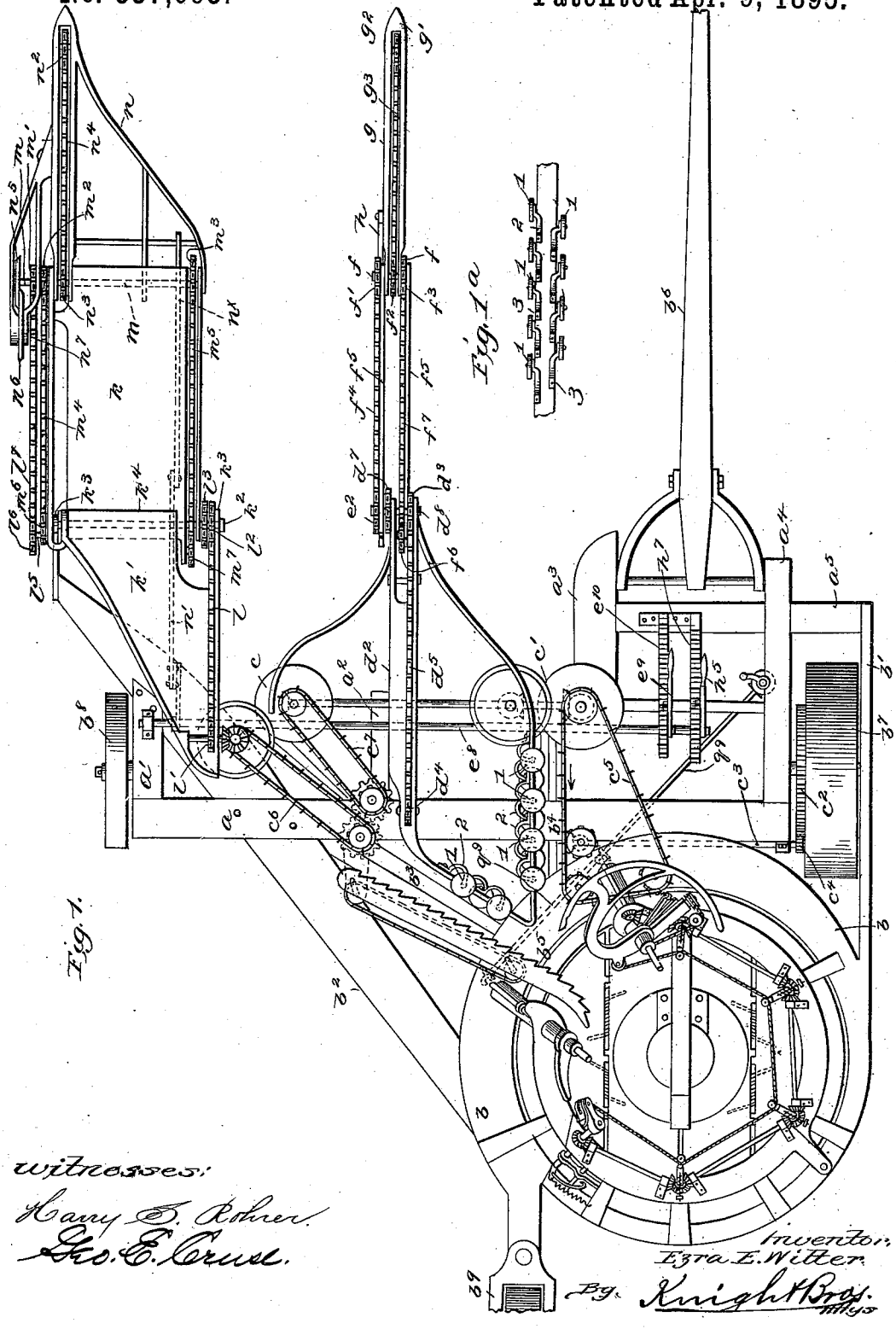

Fig. 1.

Fig. 1a.

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(No Model.)

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CORN HARVESTER.

No. 537,095. Patented Apr. 9, 1895.

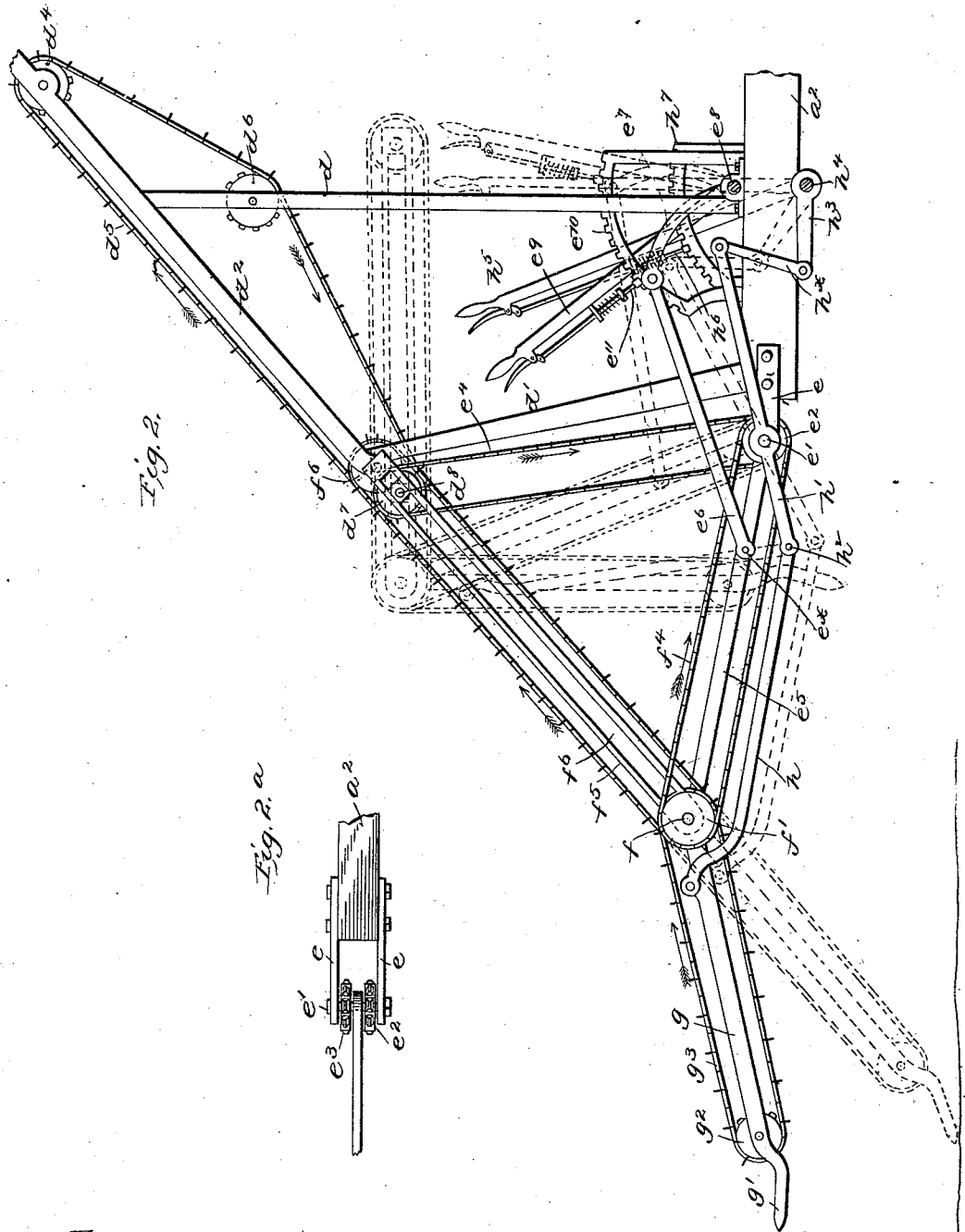

Fig. 2.

Fig. 2. a

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Fig. 3.

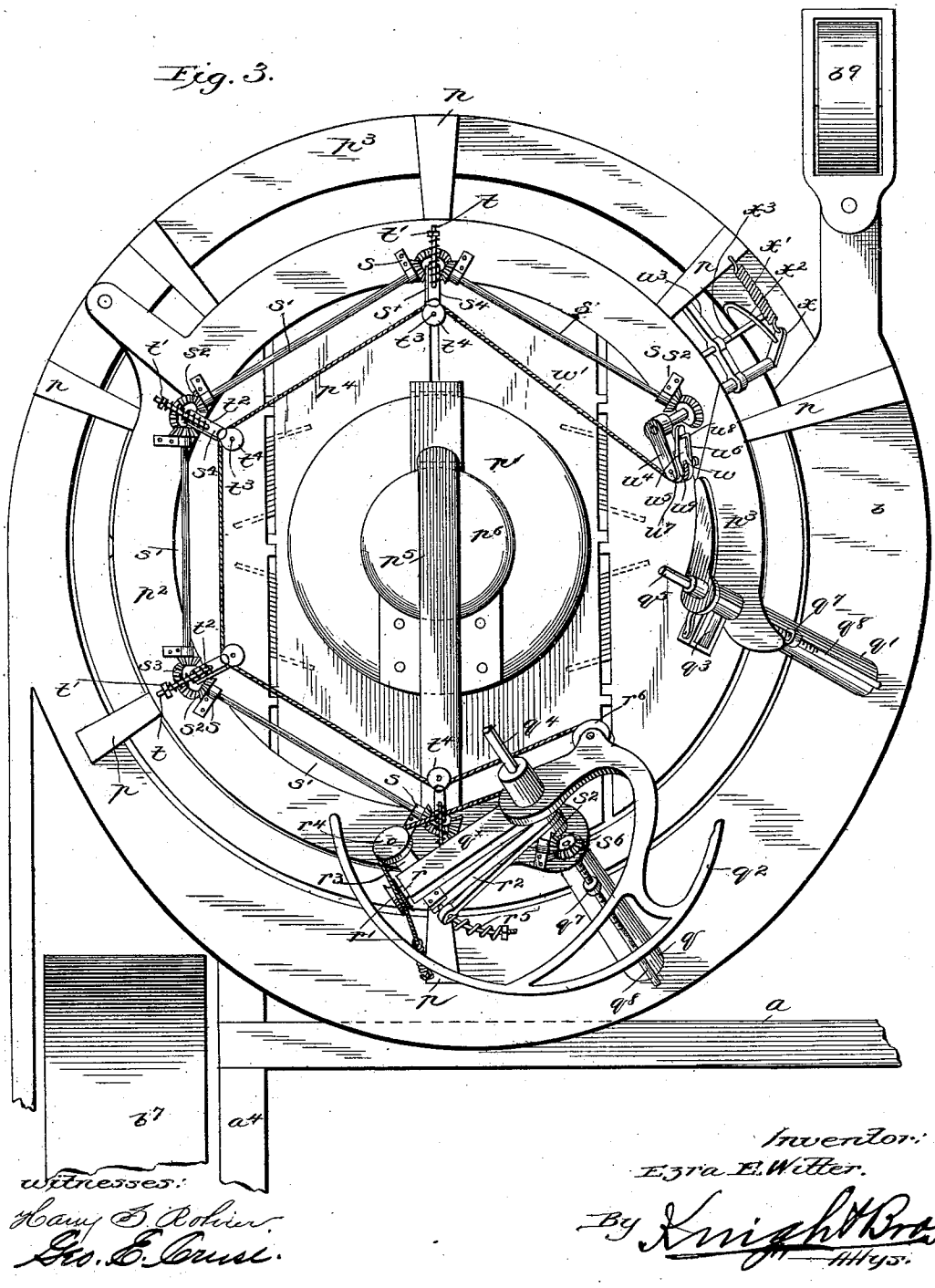

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Fig. 4.

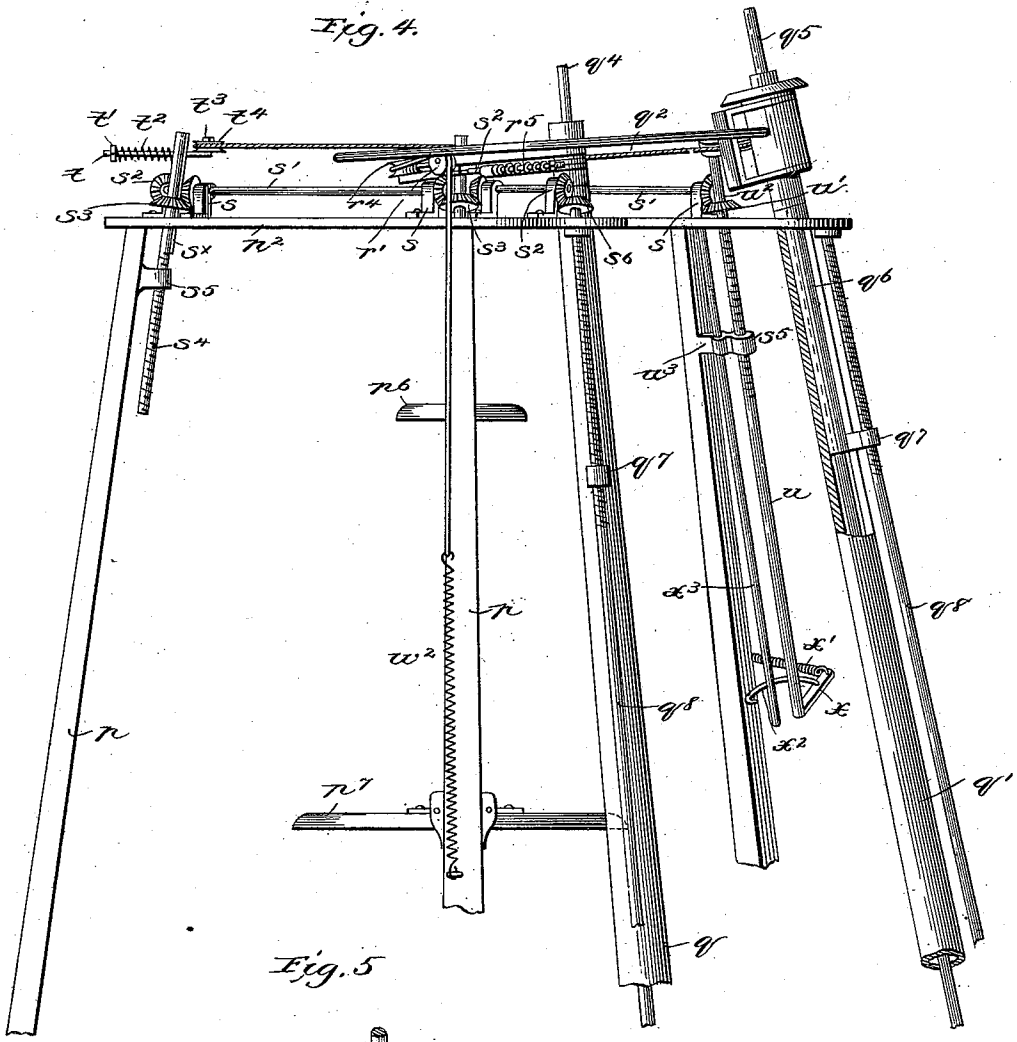
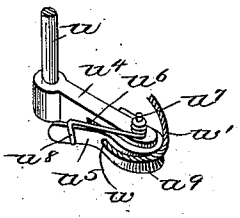


Fig. 5.



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UNITED STATES PATENT OFFICE.

EZRA E. WITTER, OF MILFORD CENTRE, OHIO.

CORN-HARVESTER.

SPECIFICATION forming part of Letters Patent No. 537,095, dated April 9, 1895.

Application filed April 21, 1893. Serial No. 471,253. (No model.)

To all whom it may concern:

Be it known that I, EZRA E. WITTER, a citizen of the United States, residing at Milford Centre, in the county of Union and State of Ohio, have invented certain new and useful Improvements in Corn-Harvesters, of which the following is a specification.

My invention relates to improvements on the corn-harvesters covered by my patents numbered 458,088 and 470,609, and its object is principally to make the harvester smaller than heretofore, and to so construct it that it may be stored in less space, transported in more compact form, and may turn corners more easily than heretofore.

To these and other ends my invention consists in constructing a harvester with folding gathering points so that they will not interfere with the standing corn when the machine is turning.

My invention also consists in providing mechanism whereby the gathering points may be readily folded from the driver's seat.

My invention also consists in an improved form of compressor mechanism, which automatically raises and lowers the compressor, simultaneously with the knotter and needle. This mechanism also allows the compressor to contract at the top when elevated and to expand when lowered.

My invention also consists in other features of novelty and combinations of parts to be hereinafter described and then particularly pointed out in the claims.

In order that my invention may be fully understood, I will now proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a plan view of the harvester. Fig. 1^a is a detail view of the spring-supported friction rollers for keeping the stalks pressed against the advancing mechanism. Fig. 2 is a side elevation of the mechanism for operating the inner gathering point. Fig. 2^a is a detail view of parts shown in Fig. 2. Fig. 3 is a plan view of the shock gathering frame enlarged, and Fig. 4 is a detail side view of the upper parts thereof. Fig. 5 is a detail view of the pivoted extension of the compressor arm.

The main frame of the harvester comprises the rear beam a, forwardly projecting beams a', a^2 a^3 a^4 and cross-beam a^5. These parts are similar to those described in my patents referred to; but there is a distinct difference between the present and my previous inventions in that the main frame and the shock gathering frame are formed integrally, or are firmly connected.

b is the base of the shock gathering frame, which at its forward edge is firmly secured to the rear beam a, and b' is a connecting brace or beam between the cross-beam a^5 and the base b.

b^2 is a brace connecting the inner sides of the shock gathering frame with the main frame. b^3 b^4 are floors over which the incoming stalks pass to the entrance b^5 of the said frame. b^6 is the tongue of the machine, and b^7 b^8 b^9 are respectively the master-wheel, the grain-wheel and the caster-wheel, which are located at the rear of the shock-gathering frame.

For the purpose of keeping the incoming stalks pressed against the advancing mechanism, I provide a series of spring-pressed rollers 1, which are journaled in the free ends of curved spring arms 2, which are secured to the frame of the machine in the cut-out portions 3. These rollers are arranged alternately above and below the supporting-frame piece, so that their peripheries will overlap as shown.

The cutters c and c' are driven by mechanism from the master-wheel in a manner similar to that disclosed in my above-named patents, and a detailed illustration and description herein would be superfluous.

c^2 is the toothed wheel driven by the master-wheel b^7 which in turn rotates shaft c^3 through the intermeshing pinion c^4. This shaft drives the toothed chain c^5 which revolves the cutters c' and through suitable connections, not shown, revolves cutters c and drives toothed chains c^6 c^7.

Having thus described in brief the main portions of my machine, I will now proceed to a detailed description of the gathering points and the mechanism whereby they are folded.

Referring to Figs. 1 and 2, d is a standard supported on beam a^2 in front of which standard is supported a forwardly leaning or slanting post d'. The upper ends of standard d and slanting post d' support a downwardly

inclined bar d^2. At each end of the bar d^2 are respectively located sprocket-wheels d^3 d^4 around which passes a toothed sprocket chain d^5 which is driven from a sprocket-wheel d^6 journaled in the standard d. This wheel d^6 may be driven in any suitable manner, but I prefer the mechanism such as described in my co-pending application, Serial No. 463,200, filed February 21, 1893.

Sprocket wheel d^3 together with a sprocket-wheel d^7 are fixed on the short shaft d^8 which journals in the lower forward end of the inclined bar d^2.

From the forward end of beam a^2 project two lugs or strips e, see Fig. 2^a in which is journaled a short shaft e', carrying sprocket-wheels $e^2 e^3$. A downwardly extending drive-chain e^4, passes around the sprocket-wheels d^7 and e^3.

Extending forwardly and pivoted at its lower rear end on shaft e', is a crane-arm e^5, which is upheld by means of a link e^6 pivoted to it at $e^\times$. The rear end of link e^6 is pivoted to the outer end of a rock-arm e^7 which is operated by a rock-shaft e^8, from which it projects. This rock-shaft e^8 is journaled upon the beams a', a^2, a^3 and is rocked by a lever e^9 located near the driver. The lever may be adjusted and held in any desired position by means of a quadrant rack e^{10} and a pawl e^{11} carried by it.

In the outer end of the crane-arm e^5 is journaled a short shaft f, on which are fixed three sprocket-wheels f', f^2 f^3 respectively. Over sprocket-wheels e^2 and f' passes a drive-chain f^4.

Pivoted at its lower end on the short shaft f is an inclined bar f^5 which is provided with a longitudinal slot f^6 extending nearly its entire length. This slot receives the short shaft d^8 at the lower end of the inclined bar d^2, the bar f^5 being thereby permitted to be slid backwardly on the shaft the entire length of the slot. At the upper end of the sliding bar f^5 is journaled a sprocket-wheel f^6 around which and around the sprocket-wheel f^3 on the short shaft f at the lower end of said bar f^5 a toothed sprocket-chain f^7 passes. This sliding, downwardly inclined bar f^5 forms part of the gathering point. The other portion in the shape of an extension thereof, consists of a forwardly projecting bar or secondary crane-arm g pivoted at its rear end on the shaft f, and provided with a pointed forward end g'. Near the end g' is journaled a sprocket wheel g^2 over which passes a toothed sprocket chain g^3 which extends rearwardly and also passes over the sprocket-wheel f^2.

The bar or secondary crane-arm g is raised and lowered independently of the crane arm e^5, by means of a link h, which is pivoted at its rear end to the lever h', by pivot h^2. The lever h' is fulcrumed on the short shaft e' and is connected at its rear end, by means of the link $h^\times$, to the upper end of the rock-arm h^3 which is carried by the rock-shaft h^4. This rock shaft is journaled underneath the main frame parallel with rock-shaft e^8 and is operated by the driver through the medium of a lever h^5 which is adjusted and held in desired position by means of a pawl h^6 adapted to engage the quadrant rack h^7. The toothed sprocket chain d^5 being started, the drive chains e^4, and f^4 will be set in motion, thus operating the toothed sprocket-chains g^3 and f^7. The direction of motion of the elevator and drive-chains is indicated by arrows.

It will be observed that by properly manipulating the hand-levers, the parts of the inner gathering point, will fold into the position indicated by dotted lines, so that the standing corn will not be swept down while the machine is turning corners. The other gathering point is jointed and operated the same, and simultaneously by the same levers as the inner one.

k is the lower portion of the chute-board, which corresponds to the sliding bar f^5 and which is adapted to slide under the upper portion k' of the chute-board. The part k slides over and is supported by the shaft k^2 which is journaled in lugs k^3 projecting from the part k'. The part k' of the chute has a lip k^4 which projects over the part k so as to close the space that might otherwise be between them when the part k is slid down.

The drive-chain l passes over a sprocket-wheel l' at its rear end and over a sprocket-wheel l^2 fixed on the shaft k^2 at its lower end, and thus operates said shaft. Over a sprocket-wheel l^3 fixed on the shaft k^2 a drive-chain not shown, (corresponding to drive-chain e^4) passes and operates the shaft l^5 in a similar manner to that in which the shaft e' is operated. This shaft l^5 carries a sprocket-wheel l^6 which operates a drive-chain l^7 corresponding to drive-chain f^4.

Journaled in the outer end of the lower portion k of the chute, is a shaft m which carries a sprocket-wheel m' over which the front end of the drive-chain l^7 passes, whereby said shaft is operated. The shaft m carries two sprocket-wheels m^2 m^3, which drive toothed elevator chains m^4 m^5 respectively located at opposite sides of the chute-board. These chains correspond to the chain f^7 and pass at their upper ends over sprocket-wheels, m^6 m^7, mounted at the upper end of the part k. The latter is supported and operated by a lever or crane arm (not shown) similar to and corresponding with the carne arm e^5.

Pivoted on the shaft m is the gathering point n, moved up and down on its pivot by the rock-shaft h^4, through the links n and n', corresponding to links h and h'. At the front end of gathering point n, a sprocket-wheel n^2 is journaled, and over this and a sprocket-wheel n^3 on shaft m a toothed sprooket-chain n^4 passes.

Side cutters n^5, n^6 similar to and performing the same functions as those in my aforesaid patents, are respectively mounted on the shaft m and in the rear end of a rearwardly extending arm n^7 of the gathering point n.

The gathering point n and the lower chute portion k are folded and operated simultaneously with the other gathering point as stated and the corresponding parts perform the same functions.

The base b of the shock gathering frame supports the posts p, which are connected at their upper ends by the curved top pieces p', p^2 of the gathering frame. p^3 is the gate hinged at the rear of the gathering frame; p^4, the revolving table; p^5, the vertical partition, and p^6 and p^7 the upper and lower formers respectively. These parts of the shock gathering frame are substantially as in my patents referred to and a more detailed description is unnecessary.

The hollow columns q, q', at each side of the entrance of the shock-gathering frame, slant inwardly in order to tie the knot as closely to the shock of corn as possible, at the varying heights at which the needle and knotter are elevated. As usual the needle q^2 and the knotter q^3 are connected by a tongue-and-groove joint with their respective shafts q^4, q^5, which turn within the hollow columns, and are raised and lowered by means of sleeves q^6 provided with lugs q^7 which project through the columns, and receive the elevating screws q^8. These screws are in the present instance located on the inner instead of the outer sides of the columns, q, q', and operated in any suitable manner by the driver through the medium of a rotary shaft q^9.

In this machine a compressor for the top of the shock is employed, and in order to compensate for the narrowing and widening of the shock, by causing the compressor to contract as it is elevated and to widen out as it is lowered, mechanism now to be described is employed. The needle q^2 is of the usual form and has an arm $q^\times$ projecting therefrom which terminates near the heel or rear end of the needle. At the outer end of the needle-arm $q^\times$ is a pin r which projects outwardly toward the heel of the needle, and carries a pulley r'.

The sleeve q^6 on the needle shaft carries a bar r^2 located under the needle, and provided at its outer end with a lateral extension r^3 which carries a sheaved pulley r^4. Projecting rearwardly from the extension r^3 and in line therewith is a coil-spring tension bar r^5. On the front portion of the needle carrying arm is located a sheaved pulley r^6.

Rising from the top of the shock gathering frame are boxes s in which are journaled the shafts s', the contiguous ends of which are provided with bevel gear wheels s^2. These bevel gear wheels s^2 intermesh with bevel gear wheels s^3 which are located on the screw-threaded upright elevating shafts s^4 and connected therewith by tongue-and-groove connection $s^\times$ which shafts pass through internally screw-threaded lugs s^5 projecting from the posts p. The shafts s' are revolved by means of the needle elevating screw q^8 which is provided with a bevel wheel s^6 that intermeshes with one of the bevel wheels s^2, thus causing the elevating shaft s^4 to raise or lower as is desired.

Passing loosely through the upper ends of the elevating shaft s^4 are horizontal screw threaded movable rods t which radiate from the shock gathering frame. Screwed onto the rods t are nuts t', between which and the shafts s^4 are confined the spiral tension springs t^2, the tendency of which is to hold the rods t outwardly as far as possible. The inner ends of the movable rods t, are turned up to provide journals t^3 for sheaved pulleys t^4.

Elevating shaft u located near the knotter shaft is also screw threaded like shaft s^4 and has a bevel gear wheel u' located on and connected therewith by a tongue-and-groove connection u^2. This shaft u passes through an internally screw-threaded bracket u^3 projecting from one of the posts p. At the top of the elevating shaft u is a crank-arm u^4 provided at its outer end with a pivoted extension u^5 in lieu of the pulleys t^4 of elevating shafts s^4. A spring u^6 is coiled around the pivot u^7 of the extension u^5 and has a free end u^8 which bears against the latter and folds it outwardly and rearwardly as shown. The heel u^9 of the pivoted extension u^5 is rounded or formed like a half pulley.

Connected to the pivoted extension at w and passing around the half pulley heel u^9 thereof, and around the pulleys t^4 carried by the movable spring retracted rods t, is a flexible medium w' such as rope, twine or even wire rope. This flexible medium constitutes the compressor proper, being in the form of a girth. The compressor-rope also passes over pulleys r^6 r^4, in succession, and extends downwardly and is connected with the shock-gathering-frame by a resilient medium w^2 such as a spiral spring. The elevating shaft u is simultaneously raised and lowered with the elevating shaft s^4 by the rotary shafts s'.

The elevating shaft u has at its lower end another crank-arm x, which is drawn inwardly by a spring x'. This arm carries a limit hook x^2 which catches against the stop-bar x^3 as the elevating shaft u is turned by the pull of the compressor rope w', thus preventing said shaft rotating too much.

As the needle arm starts in the act of binding, the pulley r^4 being substantially fixed, the pulley r moves with the arm and draws the compressor-rope with it, drawing the said rope or other flexible medium taut and firmly around the top of the shock. The pivoted extension or compressor arm u^5 will at the same time be thrown inwardly, against the resistance of its spring, and press against a portion of the shock that the compressor-rope does not touch.

Slight changes in the construction of the various parts, will readily suggest themselves to skilled mechanics, without departing from the scope and spirit of my invention.

Having thus described my invention, what I claim is—

1. In a harvesting machine, the combination of the inwardly and rearwardly folding gathering and elevating points pivotally attached to the machine and each comprising two or more sections pivotally attached together, with an endless elevating chain carried by each of said sections upon pulleys which journal on the section pivots, said chains being adapted to assist in feeding the stalks to the machine, means for operating the elevating chains, and means for folding the gathering points to any desired position, substantially as set forth.

2. In a harvesting machine, the combination of an adjustable folding gathering point pivotally connected to the machine and comprising two or more hinged sections, elevator chains carried by the sections of the gathering point, upper elevating chains leading from the gathering point, means for operating the chains, an operating lever, and suitable connections between the operating lever and the sectional gathering point, substantially as and for the purpose set forth.

3. In a harvesting machine, the combination with an inclined movable bar, a support for its rear end, a crane-arm connected to its front end, means for operating the crane-arm to slide back the said movable bar, an elevator chain for the said bar, and a forward gathering point extension, substantially as set forth.

4. In a harvesting machine the combination with a crane-arm pivoted to the frame, means for operating the crane-arm, a forward gathering point extension, connected to the crane-arm and an elevator chain on said extension, of a secondary crane-arm pivoted to said extension, and means for operating said secondary crane arm for depressing said extension, substantially as set forth.

5. In a harvesting machine, the combination with a forward gathering point extension, and a crane-arm to which it is pivotally connected, of a rock-shaft provided with an operating lever, a rock-arm on said shaft, and a connecting link between the crane-arm and rock-arm, substantially as set forth.

6. In a harvesting machine, the combination with a forward gathering point extension, and a crane-arm to which it is pivotally connected, of a secondary crane-arm pivoted to the extension, a pivoted lever connected to the secondary crane-arm, a suitably operated rock-shaft provided with rock-arms, and links connected with the rock-arms and with the lever and firrst-named crane-arm respectively, substantially as set forth.

7. In a harvesting machine, the combination with the gathering point, suitable elevating chains, an upper chute-board portion supported adjacent to the gathering point and elevating chains, and a lower movable chute-board portion supported over the gathering point and adapted to be slid under the upper portion, substantially as set forth.

8. In a harvesting machine, the combination of the inclined sliding bar or gathering arm carrying the elevating chain, a support for the rear end of the bar upon which it slides, a chute board supported adjacent to the bar, a movable portion of the chute board having sliding connection with the stationary portion and connected with the sliding bar so as to be moved thereby, means for operating the elevating chain and means for operating the inclined movable bar with the connected movable portion of the chute board, substantially as and for the purpose set forth.

9. In a harvesting machine, the combination of a suitable shocking frame, yieldingly supported guide pulleys mounted upon the frame, a shock compressing rope supported in the pulleys and extending around the frame, and suitable devices carried by the needle shaft for producing tension on one end of the rope and compressing the shock, substantially as set forth.

10. In combination with the shock-gathering frame a compressor rope or such flexible medium, vertically adjustable pulleys therefor, the needle shaft pulleys carried by the needle around which the rope passes the sleeve on the needle shaft for raising the needle, an arm carried by the sleeve, and a pulley on the arm over which the compressor rope passes, substantially as set forth.

11. In combination with the shock-gathering frame, a compression rope, or such flexible medium, spring retracted tension rods, and pulleys carried by the rods, over which the rope passes, substantially as set forth.

12. In combination with the shock-gathering frame, elevating shafts, pulleys at the upper ends of the shafts, and a compression rope, or like flexible medium passing around the pulleys, substantially as set forth.

13. In combination with the shock-gathering frame, the compressing devices, elevating shafts therfor having external screw-threads, loose bevel gear wheels on the shafts, adapted to rotate therewith and slide thereon, and suitably operated shafts provided with bevel gear wheels to intermesh with aforesaid wheels, whereby the elevating shafts are raised and lowered, substantially as set forth.

14. In a harvesting machine, the combination of the shocking frame, the internally screw-threaded lugs on said frame, the screw-rods working in said screw-threaded lugs, schock-compressing devices supported by said rods, beveled wheels splined to said rods, a series of horizontal shafts extending around the shocking frame between the rods, beveled gear wheels keyed to the opposite ends of said horizontal shafts and gearing with the beveled wheels of the screw-rods, and means for imparting rotary motion to one of said shafts, whereby all of the screw-rods can be raised and lowered simultaneously, substantially as set forth.

15. In combination with the shock-gathering frame, a compression rope, or such flexible medium, means for drawing on it at one

end, a rotary crank-arm, a pivoted extension carried by the latter and to which the opposite end of the rope is secured, and a spring also carried by said crank-arm and engaging the pivoted extension, substantially as set forth.

16. In combination with the shock-gathering frame, a compression rope, or such flexible medium, means for drawing on it at one end, a rotary crank-arm at the other end with which the rope is connected, a limit hook operated by said crank-arm, and a stop for the hook, substantially as set forth.

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