No. 639,840. Patented Dec. 26, 1899.

W. C. WILKA.

AUTOMATIC STRAW STACKER ATTACHMENT.

(Application filed Apr. 28, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

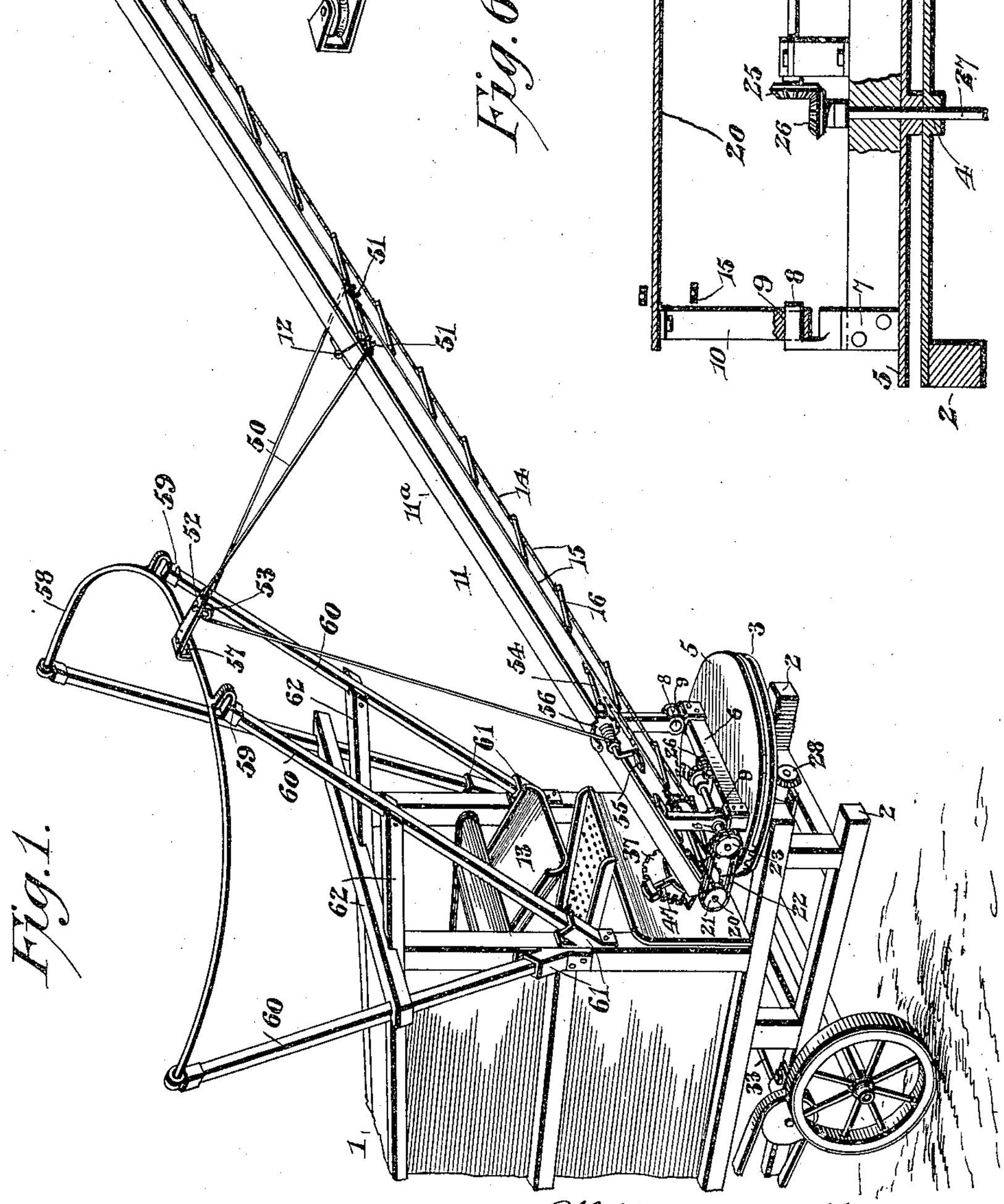

Fig. 6.

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(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

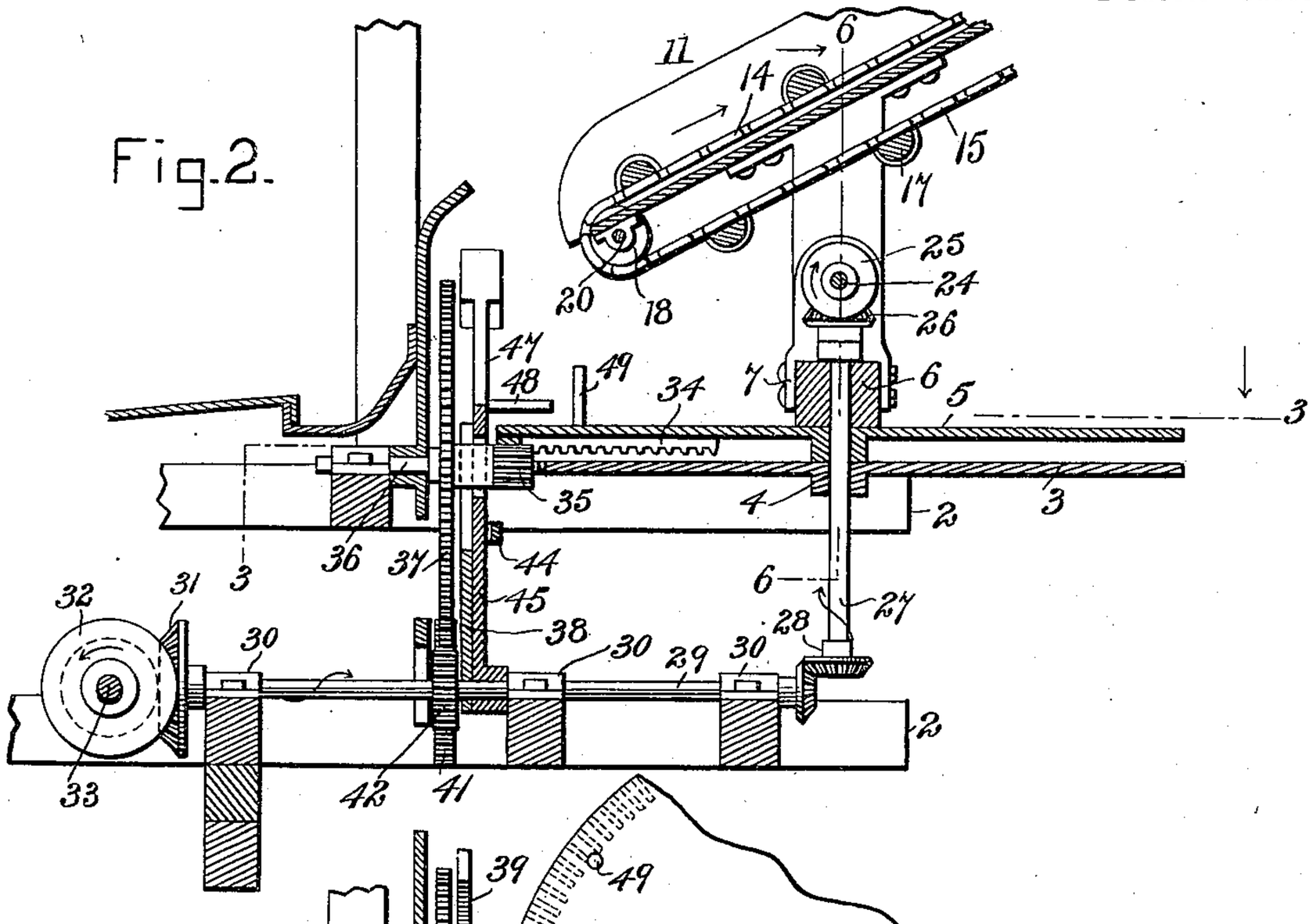


Fig. 3.

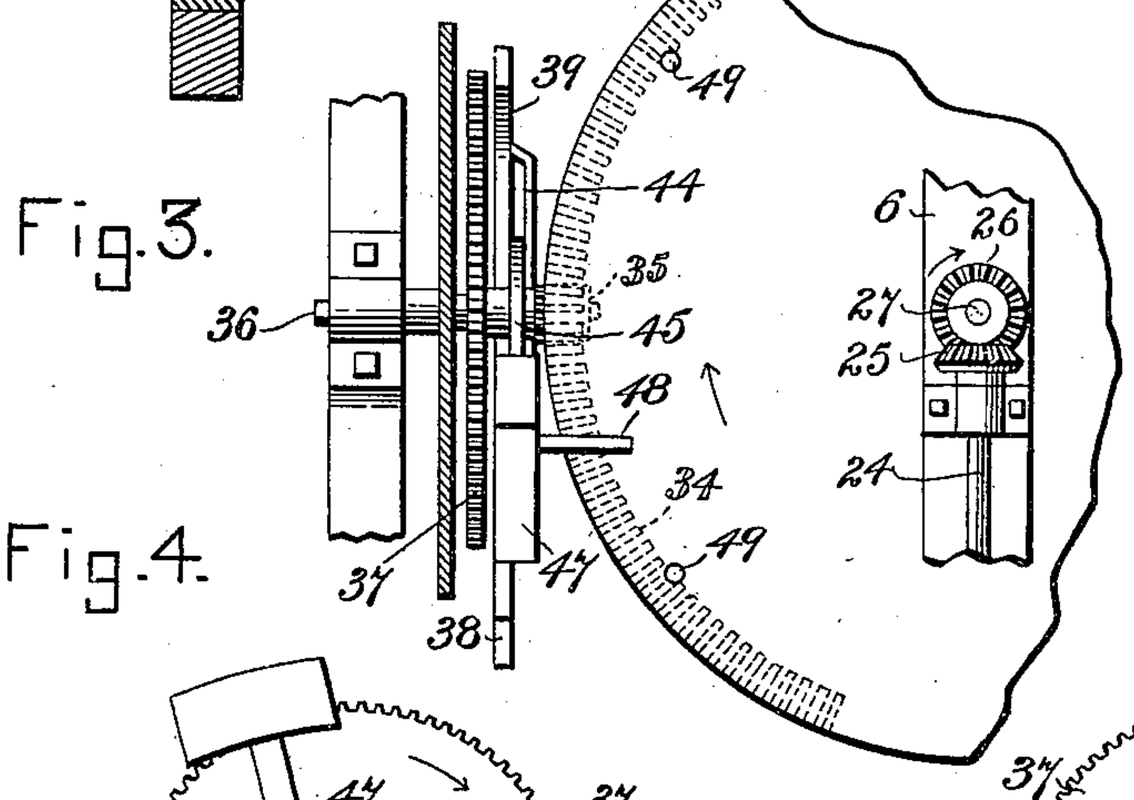


Fig. 4.

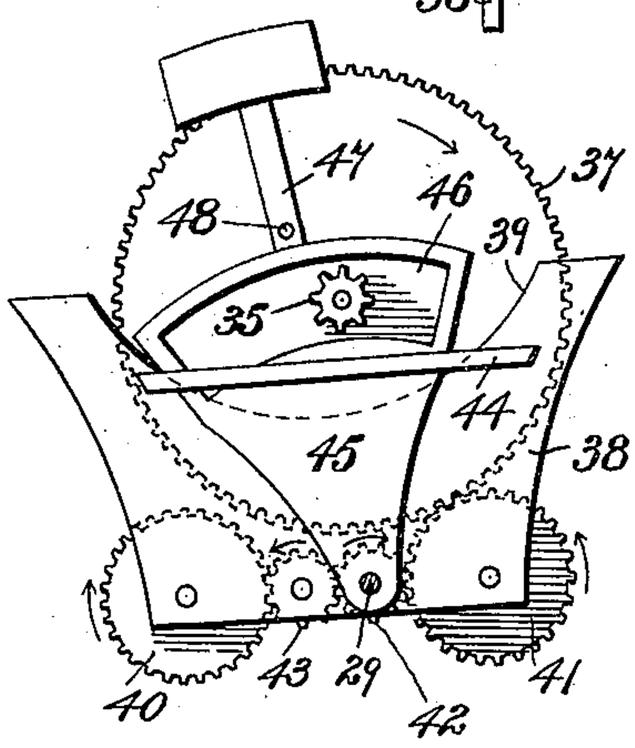
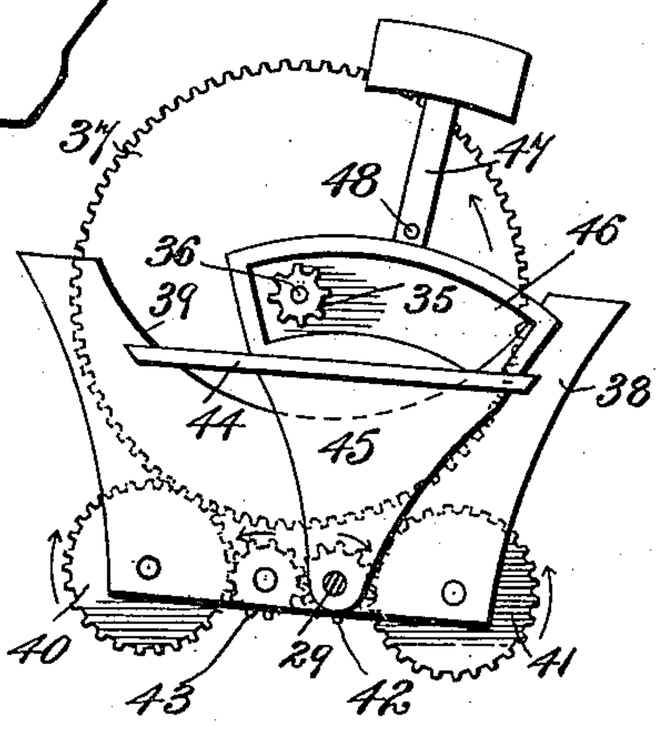


Fig. 5.



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AUTOMATIC STRAW-STACKER ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 639,840, dated December 26, 1899.

Application filed April 28, 1899. Serial No. 714,891. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. WILKA, a citizen of the United States, residing at Rock Rapids, in the county of Lyon and State of Iowa, have invented a new and useful Automatic Straw-Stacker Attachment, of which the following is a specification.

This invention relates to an improved automatic straw-stacker attachment for threshing-machines; and it has for its object to provide a new and useful apparatus of this character having simple and reliable means for automatically swinging the elevator back and forth in a lateral direction to provide for evenly distributing the straw onto the stack.

A further object of the invention is to provide a novel trip-gear mechanism which positively insures the swinging of the elevator with accuracy and precision; and the invention also contemplates improved means for suspending the elevator, whereby the same may freely swing back and forth in a lateral direction under the actuating influence of the operating gearing or mechanism.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

While the essential features of the invention are necessarily susceptible to modification without departing from the spirit or scope thereof, still the preferred embodiment of the improvements is shown in the accompanying drawings, in which—

Figure 1 is a perspective view of an automatic straw-stacker attachment fitted to the rear end of a threshing-machine. Fig. 2 is an enlarged vertical sectional view of the trip-gear mechanism for the elevator. Fig. 3 is a detail sectional view on the line 3 3 of Fig. 2. Fig. 4 is a detail elevation of the trip-gear mechanism, showing one position thereof. Fig. 5 is a similar view of the trip-gear mechanism, showing a different position from that illustrated in Fig. 4. Fig. 6 is a detail vertical sectional view on the line 6 6 of Fig. 2. Fig. 7 is a detail in perspective of the traveler-sheave for the suspending-cable.

Like numerals of reference designate like and corresponding parts in the several figures of the drawings.

Referring to the accompanying drawings, the numeral 1 designates the casing of a threshing-machine, having at the rear end thereof the horizontal sill extensions 2, upon which is rigidly fastened a horizontal circular supporting-base 3, provided therein with a central bearing-opening 4 and revolubly supporting on the upper side thereof the horizontal circular oscillatory turn-table 5. The said oscillatory turn-table 5, which is mounted for partial rotation upon the supporting-base 3, is designed to support and carry therewith the inclined elevator for delivering the straw onto the stack, and to provide for the proper support of this elevator the said oscillatory turn-table has rigidly fastened to the upper side thereof a transverse bracket-beam 6. The bracket-beam 6 by reason of its rigid connection with the turn-table 5 is movable therewith, and said beam is provided at its opposite ends with the upstanding journal-plates 7, having at their upper extremities horizontal laterally-projecting journal-pins 8 8^a, the journal-pins 8 8^a of the upstanding journal-plates 7 being disposed in the same direction and adapted to detachably and loosely receive thereon the bearing-collars 9 at the lower ends of the hinge-arms 10, depending from opposite sides of the laterally-swinging inclined elevator-frame 11. The disposition of the pins 8 8^a in the same direction permits the elevator-frame being readily slipped laterally on and off of the said pins in setting up and taking the machine apart; but in the use of the machine the suspending device for the elevator-frame holds the latter so evenly balanced as to obviate any tendency thereof to slip from the said pins. The said inclined elevator-frame is of the ordinary construction, but in the present invention preferably consists of the separate sections 11^a and 11^b, joined at their contiguous or meeting ends by a hinge-joint 12, which permits of the outer section 11^b of the frame being folded upon the inner section when it is desired to arrange the parts of the apparatus in as compact relation as possible for transportation purposes. The elevator-frame 11 has the lower end thereof projected a sufficient distance inward from

the pendent hinge-arms 10 so as to receive thereon the straw which falls from the delivery-chute 13 of the threshing-machine at the extreme rear end thereof, and the straw which is thus directed onto the lower inner end portion of the elevator-frame is caught up by the endless elevator-apron 14 and elevated onto the stack. The said endless elevator-apron 14 essentially consists of a pair of offset parallel sprocket-chains 15 and a plurality of transverse regularly-spaced slats 16, connecting the opposite chains at intervals, and said slats 16 are preferably of a convexed form and are secured at their ends in sockets 17, projected inwardly from certain links of the chains, as plainly shown in Figs. 2 and 6 of the drawings. The endless elevator-apron 14 extends the entire length of the inclined elevator-frame 11, and the sprocket-chains 15 thereof pass over the chain or sprocket wheels 18, fitted on the upper and lower apron-shafts 19 and 20, which are respectively mounted at the upper and lower ends of the elevator-frame and transversely thereof. The upper apron-shaft acts in the capacity of an idler for the endless elevator 14, while the lower of said shafts 20 serves to impart motion to the apron and has mounted on one end thereof a chain-wheel 21, which in turn receives its motion from a chain 22, driven from a sprocket or chain wheel 23 on the outer end of a horizontal counter-shaft 24, journaled in suitable bearings on top of the bracket-beam 6 and carrying at its inner end a vertically-disposed bevel gear-pinion 25. The bevel gear-pinion 25 at the inner end of the counter-shaft 24 meshes with an adjacent horizontally-disposed bevel gear-pinion 26 at the upper end of a vertical pivot-shaft 27, turning in the central alined bearing-openings of the turn-table 5 and the supporting-base 3 therefor. The lower end of the vertical pivot-shaft 27 has a bevel-gear connection 28 with the outer end of the horizontal drive-shaft 29, journaled in longitudinally-alined bearings fitted to the sills of the threshing-machine casing and carrying at its inner end a bevel gear-wheel 31, meshing with an adjacent similar wheel 32, mounted on the transverse shaft 33, which is driven by a suitable belt connection with one of the working shafts of the threshing-machine. The connections described provide for imparting a continuous rotation not only to the drive-shaft 29, but also to the elevator-apron, whereby the latter will be in continuous motion during the operation of the gear mechanism for swinging the elevator-frame back and forth.

In connection with the mounting of the elevator-frame upon the turn-table it will be observed that by shifting the same laterally it will be readily engaged with or disengaged from the laterally-projecting journal-pins 8, as may be plainly seen in Fig. 6 of the drawings.

The horizontal oscillatory turn-table 5 is provided at one side of its pivot and upon the lower side thereof with a gear-segment 34, which meshes with a pinion 35, mounted on a horizontal stub-shaft 36, supported in suitable bearings fitted to the framework of the threshing-machine at the rear end thereof. At one side of the pinion 35 the stub-shaft 36 also has mounted thereon the vertically-disposed master-gear 37, with which is associated an oscillatory gearing-holder 38. The oscillatory gearing-holder 38 has the lower end portion thereof pivotally and loosely mounted on the horizontal drive-shaft 29, so as to be free to swing to either side of the said shaft, and at its upper edge the said gearing-holder is cut away to form a clearance-recess 39 for the stub-shaft 36 and the pinion 35, carried thereby. The oscillatory gearing-holder 38, which is preferably mounted upon the drive-shaft in the manner described, carries a pair of spaced gear-wheels 40 and 41, which are journaled within the holder respectively at opposite sides of said drive-shaft. The said spaced gear-wheels 40 and 41 are disposed in a vertical plane to the master-gear 37 below the latter and are designed to be alternately thrown into mesh therewith to provide for swinging the inclined elevator alternately in opposite directions, and between the pair of spaced gear-wheels 40 and 41 is arranged a drive-pinion 42 and an idler-pinion 43, which mesh with each other, said drive-pinion 42 also meshing with the gear-wheel 41 and the idler-pinion 43 meshing with the gear-wheel 40 to provide for imparting reverse rotations to said wheels. Both the drive and idler pinions 42 and 43 are arranged within the oscillatory gearing-holder 38; but the drive-pinion 42 is mounted fast on the drive-shaft 29, so as to be positively driven thereby.

The oscillatory gearing-holder 38, carrying the pair of reversely-rotating gear-wheels 40 and 41, is provided at one side thereof with an elongated keeper 44, within which plays an upright swinging trip-lever 45. The said upright swinging trip-lever 45 is pivotally and loosely mounted at its lower end on the drive-shaft 29 at one side of the gearing-holder and at an intermediate point is provided with a segmental yoke 46, which receives and freely plays over the stub-shaft carrying the pinion 35 and the master-gear 37. Above its yoke 46 the trip-lever 45 is provided with an upwardly-disposed weighted arm 47, which overbalances the trip-lever when thrown to either side of the axis of the master-gear 37, and thereby serves to hold either one of the reversely-rotating gear-wheels positively in mesh with said master-gear.

The weighted arm 47 of the upright swinging trip-lever 45 is provided with an offstanding horizontal trip-pin 48, which lies within the path of the upstanding spaced tappet-fingers 49, projected upwardly from the turn-table 5, contiguous to the periphery thereof, and adapted to alternately engage with the trip-pin 48 to provide for automatically shifting the position of the trip-lever from one side of the axis of the master-gear to the other.

Assuming the parts to be in the position shown in Figs. 3 and 4 of the drawings, with the gear-wheel 41 in mesh with the master-gear 37, the latter gear will be rotated in a direction to provide for swinging the inclined elevator to one side of the plane of the threshing-machine. This swinging movement of the elevator continues until one of the tappet-fingers 49 engages with the horizontal trip-pin 48, thereby throwing the trip-lever into the opposite end of the keeper 44 and beyond the axis of the master-gear 37. As the trip-lever is thus shifted the same, by reason of the overbalancing weighted arm 47 thereof, tilts the oscillating gearing-holder 38 upon its pivot, so as to disengage the gear-wheel 41 and throw the other reversely-rotating gear-wheel 40 into mesh with the master-gear 37, thereby reversing the rotation of the master-gear and swinging the inclined elevator in the opposite direction. This operation repeats itself, and thereby provides for automatically swinging the elevator back and forth in a lateral direction.

In further explanation of the operation of the reversing mechanism it may be assumed that with the weighted arm 47 in the position shown in Figs. 3 and 4 of the drawings the turn-table will be moving in the direction indicated by the arrow in Fig. 3, thereby causing the tappet 49 (shown in the lower portion of Fig. 3) to approach the trip-pin 48. When said tappet engages the trip-pin, the elongated keeper 44 permits the trip-lever 45 to be thrown past the dead-center before engaging with the opposite end of the keeper and overbalancing the gearing-holder 38, so as to disengage the gear-wheel 41 and throw the other reversely-rotating gear 40 into mesh with the master-gear. The gearing-holder 38 is prevented from following the initial movement of the trip-lever 45 on account of being weighted sufficiently at each side of its pivot to hold either of the gear-wheels 40 or 41 in mesh with the master-gear, and, as shown in the drawings, the clearance-recess 39 at the top of the gearing-holder produces heavy side arms, which combine with the weight of the wheels 40 and 41 to serve to hold the gearing-holder overbalanced in either position.

To provide for the adjustment of the inclined elevator in a vertical direction, while at the same time permitting a free lateral play thereof, there is employed a suspending-cable 50, which cable passes under the elevator-frame 11 at an intermediate point and engages in the notched plates 51, fitted to the under side of said frame contiguous to the hinge-joint 12 thereof. One end of the cable 50 fastens to a traveler-sheave 52, which has mounted thereon a guide-pulley 53, around which the cable passes, and the other end thereof is attached to a windlass-shaft 54, journaled transversely of the elevator-frame beneath the same and provided at one end with a crank-handle 55 and a pawl-and-ratchet check device 56 to prevent the same from turning after adjustment. Through the medium of the windlass-shaft 54 the elevator-frame 11 may be readily raised or lowered to adjust the same to any desired inclination.

The traveler-sheave 52 has mounted therein a traveler-wheel 57, which rides upon the horizontal curved track 58, sustained in an elevated position above the plane of the threshing-machine. The horizontal curved track 58 is of a segmental form and is provided at intervals with offset sockets 59 arranged out of the passage of the traveler-wheel 57 and receiving therein the upper ends of the supporting-standards 60. A plurality of the supporting-standards 60 are grouped around the rear end portion of the threshing-machine casing and are upwardly divergent to provide for the proper bracing and support of the segmental or curved track 58, and the lower ends of said supporting-standards 60 are detachably fitted in inclined sockets 61, fastened to the rear upright post of the threshing-machine framework, as plainly shown in Fig. 1 of the drawings.

All of the upwardly-convergent supporting-standards 60 have brace-arm connections 62 engaging therewith at intermediate points to provide a perfectly rigid supporting structure for the track, so that the same will easily withstand the weight of the elevator without interfering with the free operation thereof.

To provide for properly directing the cable 50 from the traveler-sheave 52 to the windlass-shaft 54, the guide-pulley 53 is preferably mounted in a sheave having a swivel or other equivalent connection with the traveler 52, as plainly shown in Fig. 7 of the drawings. Furthermore, it will be understood that in operating the windlass-shaft to provide for paying out or taking up the cable 50 the notched plates or brackets 51 permit of the cable readily slipping therethrough, so as to prevent twisting of the elevator-frame. When the said frame has been once adjusted at the proper inclination through the medium of the cable 50 and the windlass-shaft, the track 58 and the traveler 52 permit of the free oscillation of the frame without disturbing these adjustments.

From the foregoing it is thought that the construction, operation, and many advantages of the herein-described automatic straw-stacker attachment will be readily understood by those skilled in the art without further description, and it will be further understood that changes in the form, proportion, size, and the minor details of construction within the scope of the appended claims may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In an automatic straw-stacker, the com-

bination with the supporting-base, of a horizontal oscillatory turn-table carrying the straw-elevator, and provided with a gear-segment a pinion meshing with said segment, a master-gear for rotating the pinion, an oscillatory gearing-holder carrying a pair of spaced reversely and continuously rotating gear-wheels, an oscillatory trip-lever for oscillating said gearing-holder, and means for actuating said trip-lever by the movement of the turn-table, substantially as set forth.

2. In an automatic straw-stacker, the combination with the supporting-base, of an oscillatory turn-table carrying the straw-elevator and provided with a gear-segment and spaced tappet-fingers, a pinion meshing with said gear-segment, a master-gear for rotating said pinion, a drive-shaft, an oscillatory gearing-holder pivotally mounted on the drive-shaft, and provided at one side with a transversely-arranged keeper, a pair of reversely and continuously rotating gear-wheels carried by the gearing-holder respectively at opposite sides of the drive-shaft, and driven from the latter, an upright swinging trip-lever pivotally supported at its lower end on the drive-shaft and having a play within said keeper, said trip-lever being provided at its upper end with a weighted overbalancing-arm and with an offstanding horizontal trip-pin adapted to be alternately engaged by the spaced tappet-fingers of the turn-table, substantially as set forth.

3. In a straw-stacker, the combination of a supporting-table having a bracket-beam provided at its ends with upstanding journal-plates, said journal-plates having laterally-projecting journal-pins disposed in the same direction, an elevator-frame having a pair of pendent hinge-arms provided with bearing-collars loosely and detachably engaging the said journal-pins, and an endless elevator working over said frame, substantially as set forth.

4. In a straw-stacker, the combination of a curved track supported in a fixed position above the casing of a threshing-machine, an oscillatory turn-table, an elevator-frame supported upon said turn-table, a traveler-sheave carrying a traveler-roller riding upon said track, and a suspending-cable connecting the elevator-frame with said traveler-sheave, substantially as set forth.

5. In a straw-stacker attachment, the combination of a horizontal curved track supported in a fixed position above a threshing-machine at the rear end thereof, an oscillatory turn-table, a laterally-swinging elevator-frame hinged upon the turn-table, a traveler-sheave carrying a roller riding upon said track, a suspending-cable connecting said traveler-sheave with the elevator-frame, and an adjusting device mounted upon the elevator-frame and connected with the suspending-cable to provide for raising and lowering said frame, substantially as set forth.

6. In a straw-stacker attachment, the combination of a horizontal curved track supported in a fixed position above a threshing-machine, an oscillatory turn-table, an inclined elevator-frame hinged upon the turn-table, a traveler-sheave carrying a traveler riding upon the track, and also having a guide-pulley, an adjusting-windlass mounted on the elevator-frame, a suspending-cable attached at one end to a traveler-sheave and embracing the elevator-frame at an intermediate point, said suspending-cable passing around said guide-pulley and having its other end connected to the windlass, substantially as set forth.

7. In a straw-stacker attachment, the combination with the threshing-machine casing, of a plurality of sockets fitted to the framework of the casing at the rear end thereof, a plurality of upwardly-convergent supporting-standards fitted at their lower ends in said sockets, a horizontal curved track detachably supported upon the upper ends of the plurality of standards, a traveler-sheave carrying a traveler-roller riding upon the track, a laterally-swinging vertically-movable elevator-frame, and a suspending-cable connecting the traveler-sheave with said elevator-frame, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM C. WILKA.

Witnesses:
E. L. PARTCH,
B. L. RICHARDS.