No. 676,481. Patented June 18, 1901.

E. A. WRIGHT.

STRAW STACKER.

(Application filed July 3, 1899.)

(No Model.) 5 Sheets—Sheet 1.

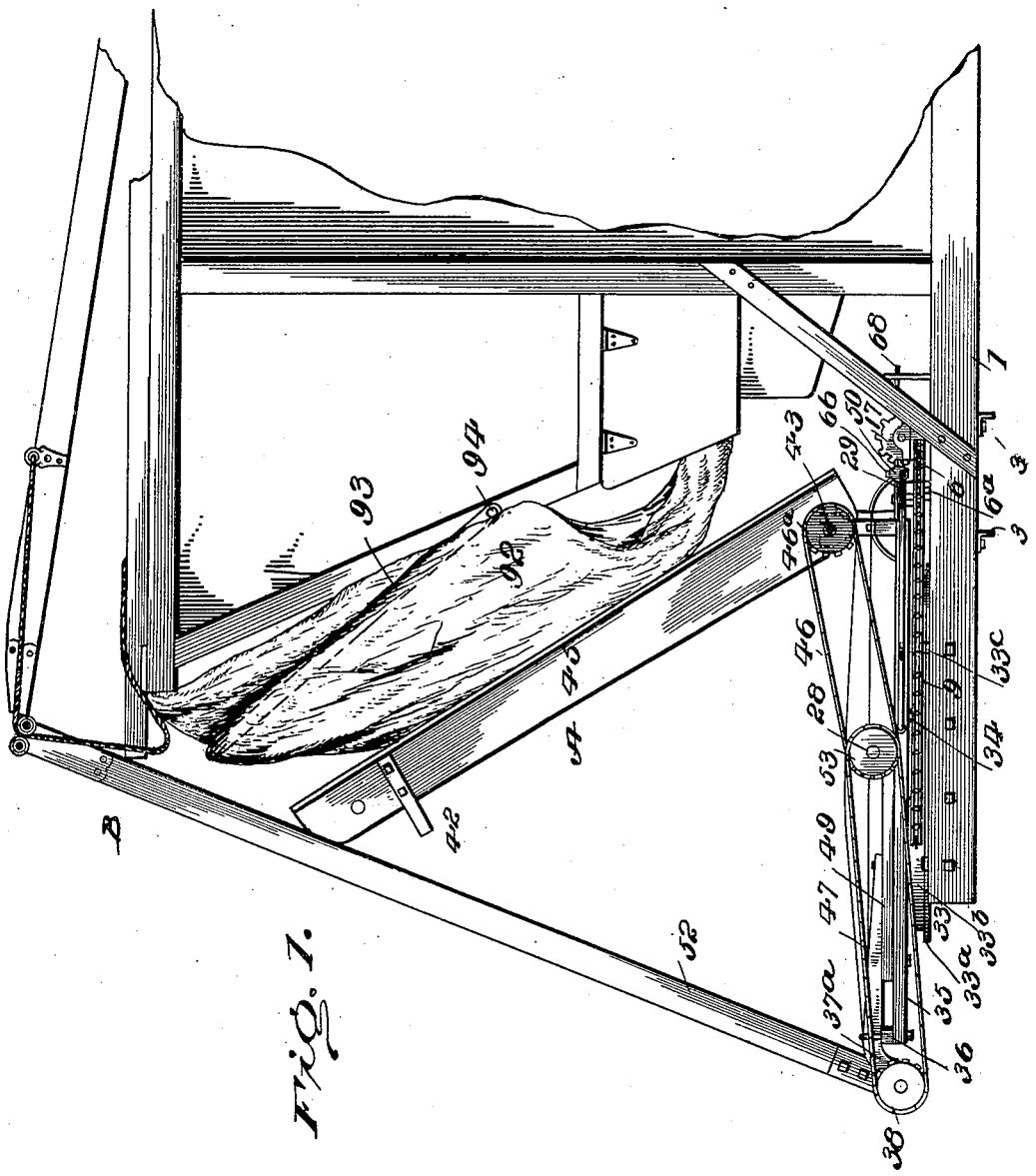

Fig. 1.

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(No Model.) 5 Sheets—Sheet 2.

Fig. 11.

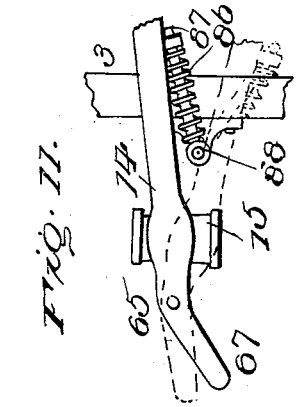

Fig. 2.

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(No Model.) 5 Sheets—Sheet 3.

Fig. 3.

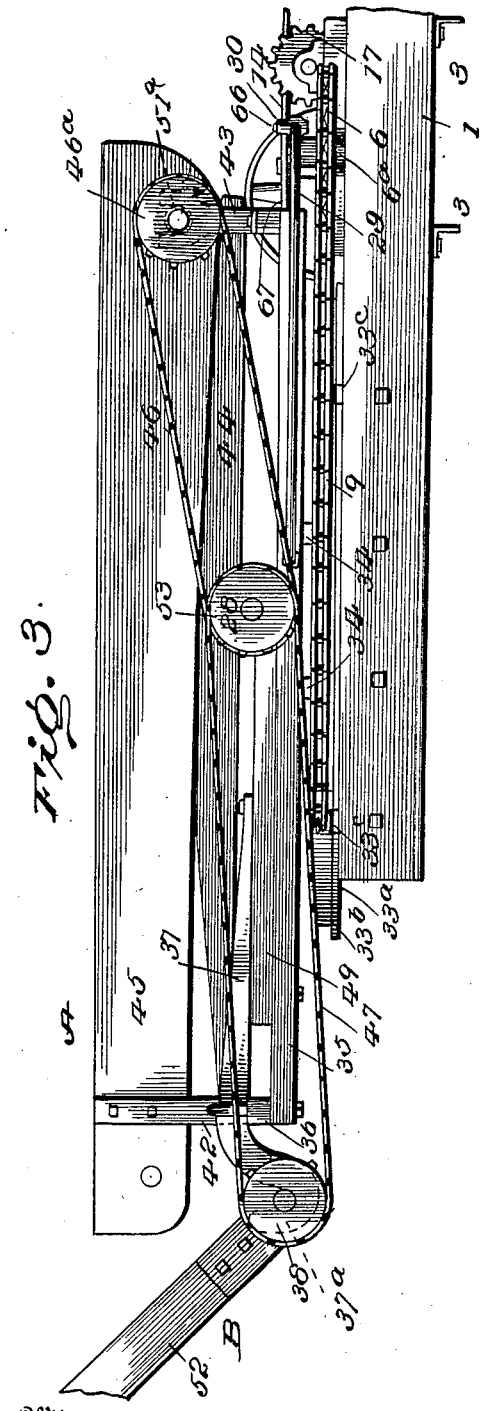
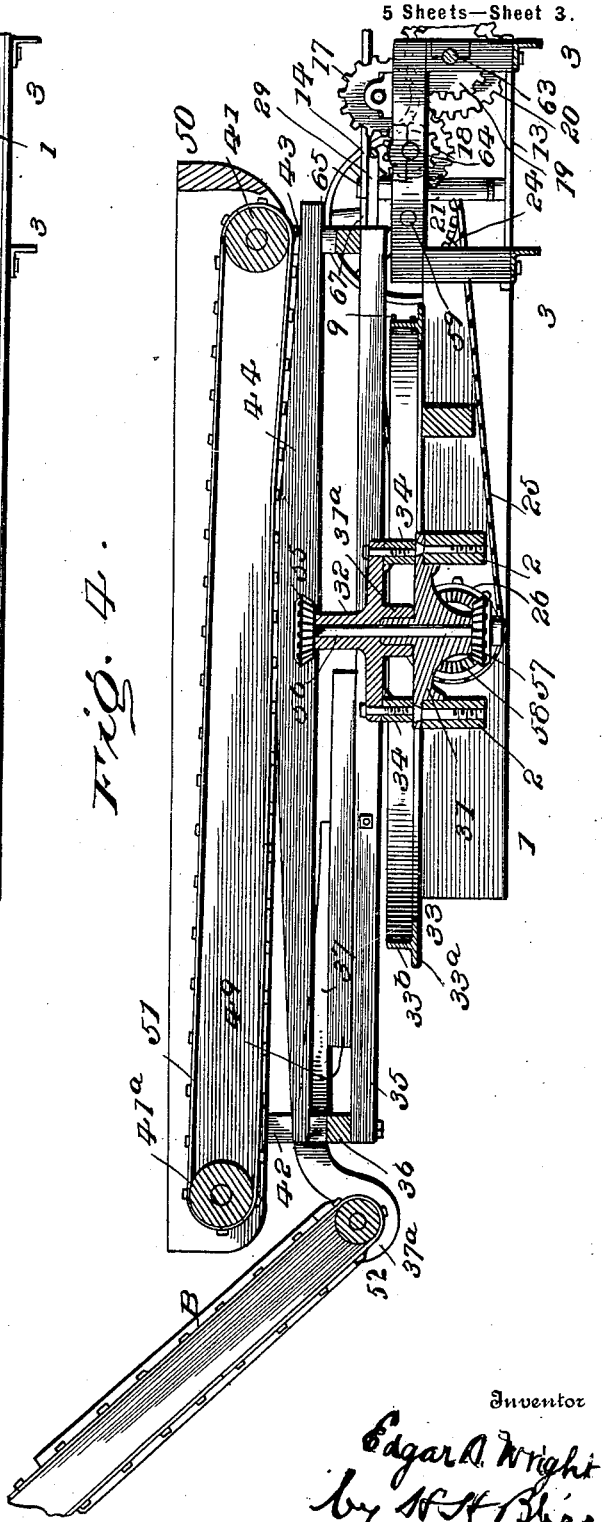


Fig. 4.



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(No Model.) 5 Sheets—Sheet 4.

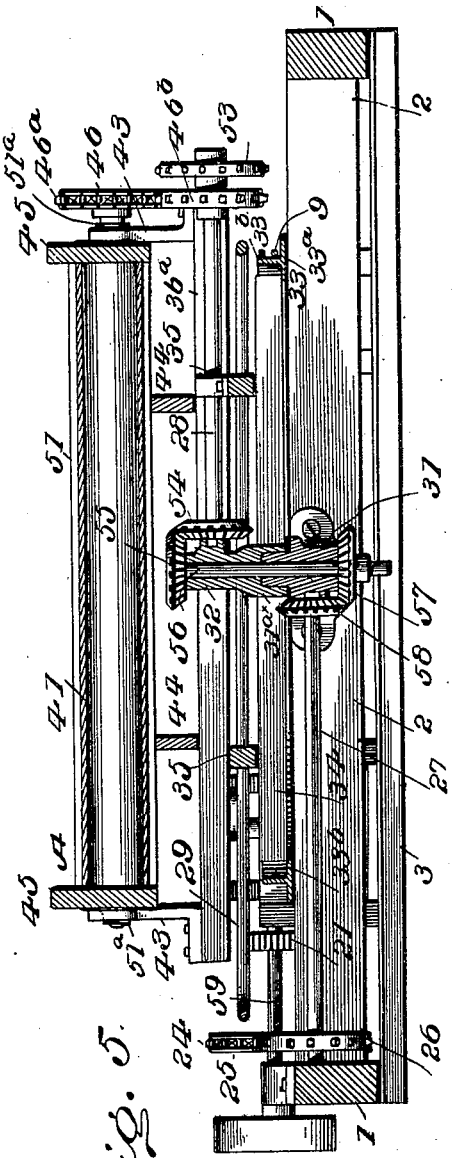

Fig. 5.

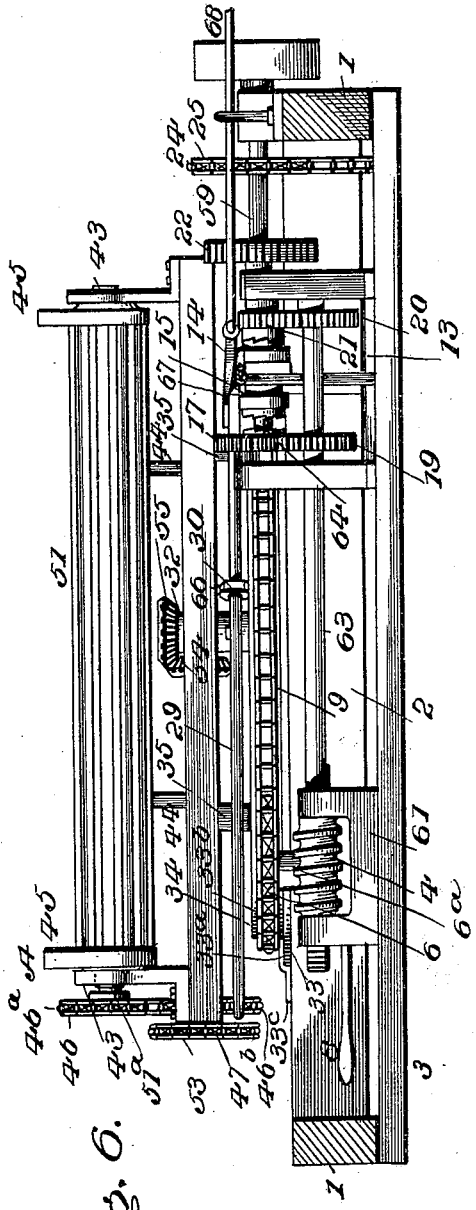

Fig. 6.

Witnesses

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(Application filed July 3, 1899

(No Model.) 5 Sheets—Sheet 5

Fig. 8.

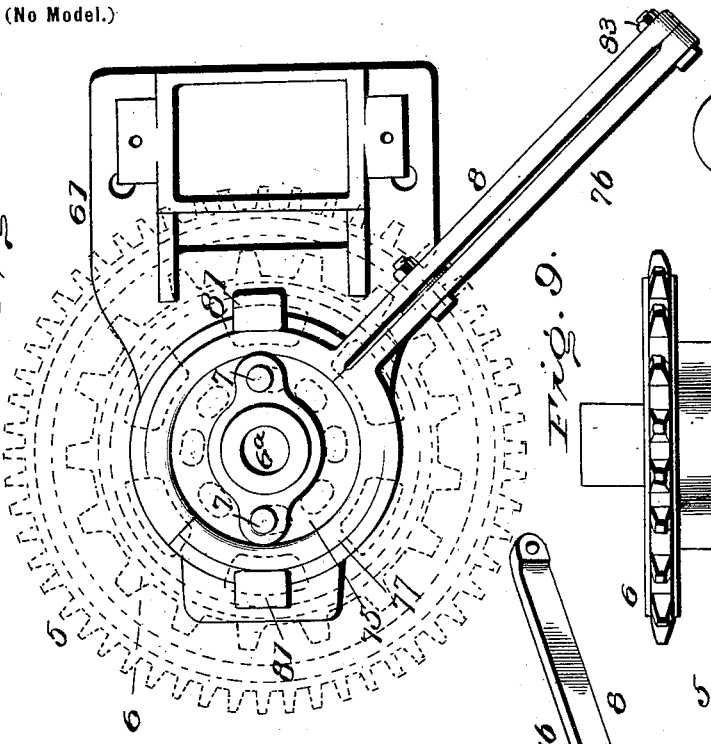


Fig. 9.

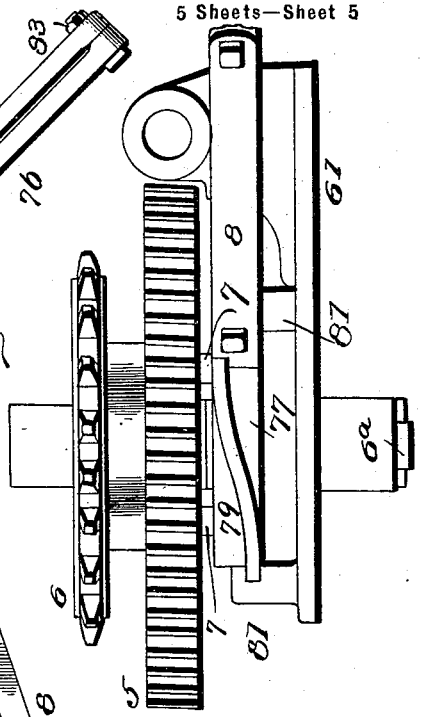


Fig. 7.

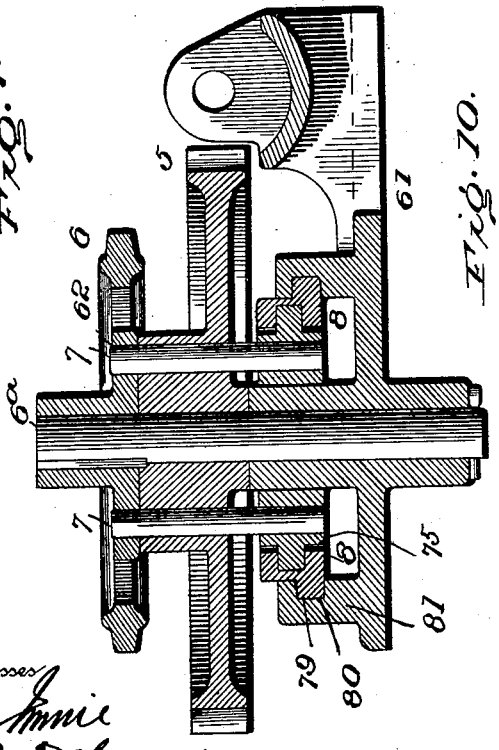
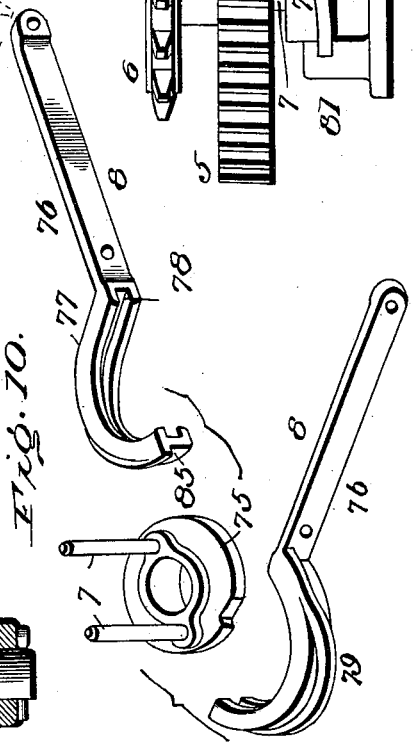


Fig. 10.



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UNITED STATES PATENT OFFICE.

EDGAR A. WRIGHT, OF CANTON, OHIO, ASSIGNOR TO THE AULTMAN COMPANY, OF SAME PLACE.

STRAW-STACKER.

SPECIFICATION forming part of Letters Patent No. 676,481, dated June 18, 1901.

Application filed July 3, 1899. Serial No. 722,705. (No model.)

To all whom it may concern:

Be it known that I, EDGAR A. WRIGHT, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Straw-Stackers, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a side elevation of part of a thresher and separator mechanism and of a straw-stacker embodying my improvement. Fig. 2 is a plan view of the frame and mechanism by which the stacker is supported and rotated horizontally and showing a part of the main stacker-carrier. Fig. 3 is a side elevation of the stacker-frame and mechanisms, showing the two carrier-sections in the positions occupied when at work. Fig. 4 is a central vertical longitudinal section. Fig. 5 is a central vertical transverse section. Fig. 6 is an elevation from the inner or front end. Fig. 7 is a vertical transverse section of the clutch for freeing or disconnecting the stacker-frames from the rotating mechanism. Fig. 8 is a bottom plan view of the parts in Fig. 7. Fig. 9 is a side elevation of the same. Fig. 10 shows detached some of the details in Figs. 7 to 9. Fig. 11 shows the spring device for throwing the clutch.

In the drawings I have shown a portion of a threshing and separating mechanism to which those devices are adapted to be connected which particularly embody the present invention; but it will be understood that so far as the thresher and separator are concerned they can be of any preferred sort.

The main frame, which supports the stacking mechanism, is rigidly secured to and extends backward from the rear end and the lower part of the frame of the thresher. This stacker-frame is shown as having the longitudinal sills 1 1, extending backward from the bottom sills of the thresher. These longitudinal sills are connected by cross-girts 2 2 and 3 3, the latter being preferably metallic bars extending from one sill 1 to the other and secured to the under side thereof. The cross-girts 2 2 may be lighter and made of wood and have their upper surfaces in higher planes, being preferably about level with the tops of the sills 1. At the center, transversely of this main bottom frame and at a point suitably near the rear end thereof, there is placed a strong bracket 31, which is bolted to two of the cross-girts 2. Preferably it is a strong casting and is formed with an upwardly-extending tubular bearing or post 31^a. Around it turn the movable parts of the stacking mechanisms and their frame, which are constructed and arranged as follows:

33 indicates a ring concentric with the axis of the aforesaid bearing at 31^a. It has a horizontal base-plate part 33^a and a vertical flange 33^b.

33^c indicates clips or retaining-ears bolted to the girts 2 2 of the frame and engaging with the horizontal part 33^a.

34 34 are cross-bars rigidly secured to the ring 33 and extending transversely of the main bottom frame.

35 35 are bars fastened to those aforesaid at 34 and to the ring 33 and extending longitudinally. At their rear or outer ends they are secured to a cross-bar 36, and from the outer end of the latter there extend forward and inward inclined braces 37 37, which are also firmly fastened to the ring or adjacent framework. These bars 37 are at their rear ends extended beyond the cross-bar 36 and are shaped to have or are connected to bearings, as at 37^a, for the supporting of the longer rear part of the stacker-conveyer. The longitudinal bars 35 are preferably made of angle-irons; but to increase the strength of such material I generally supplement them with reinforcing-bars, as shown at 49.

At 32 there is a bracket rigidly secured to the upper frame, being preferably fastened to the aforesaid bars 34. It is placed so as to coincide with the bearing-bracket 31 on the lower stationary frame, it having a pivotal connection with the latter, preferably by means of the tubular extension 31^a.

From what has been above described it will be seen that the upper frame is rotatable upon the lower stationary one, the centering thereof being effected by the bracket-castings 31 32, and it is around their vertical axis that the rotation occurs.

Upon the top rotary frame are mounted the two parts of the carrier and elevator. The

first of these is indicated as a whole by A and the second by B. The part A is composed of side boards 45 and the inner end board 50 and suitable cross-framing pieces. In this frame and casing is mounted the endless straw-carrier 51, its belts or chains passing over the rollers 41 41ª. Power is transmitted to the inner or rear roller by means of a chain 46, which engages with a sprocket-wheel 46ª, connected to the roller 41 and receiving the power from the sprocket-wheel 46ᵇ. The inner end of this part A of the carrier is hinged to the rotary frame, it having hinge-bars 51ª, which rest in bearings supplied by standards or posts 43, which rise upward from and are secured to the inner part of the rotary frame. The outer or rear end of the carrier-frame is supported by the legs 42, which extend downward a suitable distance and can rest upon the cross-bar 36. The other longer rear inclined part B of the straw-carrier is at its inner end hinged to the outer end of the rotary frame, there being laterally-projecting hinge arms or bars 52 at the axis of its lower roller. This part B of the straw-carrier may be of any of the usual constructions as concerns its framing and its carrier-belt. The carrier is driven from the inner roller, and the latter receives power from the chain 47, which engages with the sprocket-wheel 38 and is driven by the sprocket-wheel 53. The two aforesaid sprocket-wheels 53 and 46ᵇ are secured to a transverse shaft 28, mounted in the upper revolving frame. This shaft is driven by bevel-gearing, comprising the wheels 54 at the inner end of the shaft 28, the horizontal bevel-gear 55 on the vertical shaft 56, mounted at the axis of the mechanism in the said brackets 31 and 32, a second horizontal bevel-wheel 57 at the lower end of the shaft 56, and the bevel-wheel 58. The bevel-wheel 58 is secured to the shaft 27, which is mounted in the lower stationary frame. It extends to the side of said frame and has a sprocket-wheel 26, which is driven by the chain 25, engaging with a sprocket 24 on the prime power-shaft 59, the latter receiving motion through a belt from the thresher engaging with its belt-wheel 60.

From the train of devices above described the motions are transmitted to the carrier-sections in the two parts A and B simultaneously. At the same time the upper rotary frame, together with the carrier-sections, is oscillated horizontally as follows: 9 indicates a chain which extends more or less around the ring 33, it engaging with a vertical flange 33ᵇ thereof. Its ends may be fastened to the ring at suitable points, or the ring can be provided with teeth to engage an endless chain. The central part of this chain engages with a sprocket-wheel 6 on the vertical shaft 6ª, this shaft extending upward from the bracket-plate 61, fastened to the cross-bars 3 3. The sprocket-wheel 6 is secured to the shaft and can be engaged with any suitable rotary driving device. As shown, the driving device consists of the worm-wheel 5, loosely mounted on the shaft 6ª and adapted to be engaged with the sprocket-wheel 6 by movable clutch-pins 7. These pins can be slid into and out from the apertures 62 in the sprocket-wheel, they sliding through corresponding apertures in the worm-wheel. 8 is a clutch-lever by which the pins can be thrown into or out of engagement with the sprocket-wheel. This can be accomplished in any suitable way. As shown, it is effected as follows: The pins 7 are secured rigidly to a plate 75. The lever 8 is formed in two separable halves 76 76, each half at its inner end carrying a half-ring 77. On the inner side of the ring halves there are grooves 78, which coincide and provide a seat for the edge of the plate 75. On the outer face of the ring there are spiral or cam-like ribs 79, which are fitted in ways at 80 in the lugs 81, that extend upward from the frame-plate 61. When these several parts are properly assembled, it will be seen that the plate 75 and the pins 7 can be raised or lowered by merely moving the lever 8 to the right or to the left, this causing the ring part to be elevated or lowered by reason of the action of the spirals or cams 79 in their guideways. By these devices the wheels 5 and 6 can be quickly disconnected or connected, as desired.

The worm-wheel 5 is driven by the worm 4 on the shaft 63. This shaft can be driven in either direction, it having two wheels 19 and 20 secured to it at a suitable distance apart.

64 is a shaft for driving the wheels 19 and 20, it receiving power from the aforesaid shaft 59 through the pinion 23 and the wheel 22. This shaft 64 has two loose pinions 18 and 21, respectively meshing with the aforesaid wheels 19 and 20. Between these loose wheels is the sliding clutch 15, splined to the shaft 64 and adapted to engage with said wheels 18 and 21 alternately. The clutch is moved by the lever 14, pivoted at 65 to a suitable frame-bar 13, this lever being connected to the clutch by shipping pins or jaws of any preferred sort. When the clutch engages with the wheel 21, the worm-shaft 63 is driven directly by the wheels 20 and 21 in one direction, and when the clutch engages with the pinion 18 the worm-shaft 63 is driven in the opposite direction, there being an idler-wheel 17 interposed between the wheels 18 and 19 for reversing the motion.

When the shaft 63 is rotating in one direction, the ring 33 and the top rotary frame are, together with the stacker-sections, moved to the right. When the clutch is reversed and the shaft 63 is driven in the opposite direction, the aforsesaid parts are moved to the left.

The clutch is provided with parts by which it can be reversed by hand and others by which it can be reversed automatically. To move it automatically, the following devices are used: 29 is a trip-rod whose operative part is concentric with the axis of rotation

of the stacker, the ends of the rod being fastened to the rotary frame. It is provided at suitable intervals with adjustable collars 66, held by set-screws 30, and which can be placed as desired. The aforesaid lever 14 has an arm 67 lying in the path of the trip-collars, and the latter alternately strike it and operate the reverse lever and clutch. The other arm of the lever 14 is pivoted to the sliding rod 68, which has the handle 69, whereby the operator can throw the clutch whenever he desires.

To insure that the clutch shall promptly and quickly travel to the end of its path and engage with the wheel 18 or 21, toward which it has been started by the above devices, I combine with the lever 14 a spring 86, which is compressed while the lever is swinging to its central position and then expands and acts to carry the lever to the end of its path after crossing the center line. Such a spring can be arranged in any of several ways, as shown it being arranged to bear against a lug at 87, which guides the spring-sustaining rod 86, the latter being pivoted at 88 to a suitable support secured to the frame.

The entire train of devices for oscillating the stacker can be thrown out of action or into action by means of the clutch 89 on the main driving-shaft 59, this clutch being splined to the shaft and the pinion 23 being loose thereon. The clutch can be moved in any suitable way, as by a lever 90 and a hand-rod 91.

When devices similar to those above described are employed, it will be seen that I can accomplish several important ends. It is very desirable on many occasions to temporarily disengage the stacker from the mechanism which operates it and leave it free to vibrate, although disconnected from the power-driven parts, (which latter can continue in their normal movement,) so that the operative who may be on the stack can easily by hand move the elevator around the axis at 31 32 from point to point or even hold it stationary at any point for a time, as he may deem fit, in order to shape the stack properly. To attain this, it is only necessary to move the lever 8 in the proper direction to withdraw the pins 7 from the wheel 6, for after this is done, while the power parts continue in their normal movement, the stacker-frames are free to be turned by hand, as desired. Again, it is frequently necessary to stop the stacker-frame at some point and hold it there a longer or shorter time; but the action of the wind—even a light wind—will prevent this if the stacker is free and disengaged in the manner last described, and therefore it becomes necessary at such times to have a lock. To thus permit the stacker to be stopped at any point, and at the same time to hold it there locked, it is only necessary to move the clutch 89 to its inactive position, for thereafter the entire train of oscillation-causing mechanism will be stopped, and the worm 4 and worm-wheel 5 act as a rigid lock to prevent the stacker-frames from turning, the pins 7 in such case being in their upper position and engaging with the wheel 6. With respect to the arrangement of these parts for causing the oscillation of the stacker-frames it will be noticed that there is considerable difference when compared with the arrangement in other constructions. One of my purposes is to vertically shorten the mechanism or place compactly the frames and the horizontal carrier, and to accomplish this I have removed a great part of the gearing and shafting which has heretofore been placed at the principal center of vertical oscillation and have placed them at points remote from that center, and particularly have placed them where their weight can be more advantageously provided for. The arrangement which I have devised is of great importance in stackers whose base-frames are rigidly and permanently attached to the rear of the separator-casing. I bring the gearing and the heavy metallic parts forward and inward and place them where their weight is carried easily by the rear axle of the main machine and prevent them from exerting a powerful leverage behind said axle, and, again, by arranging them in this way I am enabled to bring the topmost part of the stacker devices to a low horizontal plane and insure that not only shall all of the straw from the upper part of the separator be caught, but also that the section A shall be low enough to properly receive the chaff and material that is thrown out by the winnower.

To prevent the straw from being carried laterally away from the lines of the stacker by the wind or otherwise, I employ a curtain or flexible chute 92, which is secured to the rear end of the separator and is of such shape and dimensions as to allow the straw to freely descend and at the same time furnish at the sides guards against their being deflected. The curtain is indicated by 92, and with it is combined a supporting rod or hoop 93, which when the curtain is down lies in about the central horizontal plane of the separator and holds the curtain in proper position, but which can be turned up on its pivot-axis at 94 when the parts of the machine are to be folded, the positions occupied when folded being illustrated in Fig. 1. This figure shows that the several parts which I have above described can be arranged compactly when out of use. The outer roller of the section A when the machine is at work is in or close to the vertical planes of the roller of the outer section, so that the straw can be delivered immediately from the section A to the section B; but the overhanging part of the inner section does not interfere with the throwing back of the outer section close to the separator when the parts are to be packed.

What I claim is—

1. In a straw separating and stacking mechanism, the combination with the separator, of a lower stationary frame rigidly secured to

the separator-frame, the rotary frame thereon, the horizontal carrier hinged at its inner end to the inner end of the rotary frame, the rear endless carrier hinged at its inner end to the outer end of the rotary frame, and the driving devices on the rotary frame for the carriers having separate permanent connections therewith, whereby said carriers are independent of each other in their movements on their hinges substantially as set forth.

2. In a straw separating and stacking mechanism the combination with the separator, of a lower stationary frame rigidly secured to the separator-frame, the rotary frame on the stationary frame, the horizontally-arranged inner straw-carrier vertically adjustable on the rotary frame about an axis at its inner end, the outer carrier hinged to the outer end of the rotary frame, a driven shaft on the rotary frame under the inner carrier, a chain extending rearward therefrom to the hinge-axis of the outer carrier, a chain extending therefrom to the axis of the inner carrier, and means for driving said chains, substantially as set forth.

3. In a straw separating and stacking mechanism, the combination of a lower rigid frame, a rotary frame mounted thereon, a horizontal carrier-section hinged at its inner end to the rotary frame, the rear carrier-section hinged at its inner end to the rotary frame, endless carriers in the said carrier-sections, and driving mechanism on the rotary frame for the carriers extending respectively to the axes of the said hinged carrier-sections, whereby the said sections may be adjusted independently of each other without disturbing the said driving-gearing, substantially as set forth.

4. In a straw separating and stacking mechanism, the combination of a lower stationary frame, the rotary frame, the rear outer stacker-carrier having its inner end hinged to the outer part of the rotary frame, the horizontal inner carrier having its carrying parts arranged when in operation to extend across the vertical planes of the inner end of the outer carrier, both said inner and outer carriers being adapted to be folded or turned back and rest against or upon the separator, and separate actuating means for said carriers whereby the latter are independent in their folding movements, substantially as set forth.

5. The combination of a lower stationary frame, the rotary frame thereon, the inner horizontal carrier hinged to the rotary frame, the outer carrier hinged to the rotary frame, the vertical power-shaft at the center of rotation of the rotary frame, the bevel-gear at the lower end of said power-shaft, means on the lower frame for transmitting power to said gearing, a horizontal shaft on the rotary frame driven by said vertical shaft, a power-transmitting connection between said horizontal shaft and the inner carrier, and a separate connection between said horizontal shaft and the outer carrier, substantially as set forth.

6. The combination of a lower fixed frame, a rotary frame thereon, the stacker-section carried by the said rotary frame, gearing arranged to impart an oscillatory movement to the rotary frame, and arranged to lock the same against accidental rotation or oscillation when the gearing is not operating, a clutch device by means of which the rotary frame may be separated from or connected with the said gearing, whereby when it is disconnected the rotary frame is free to be moved by hand, and another clutch device arranged between the aforesaid gearing and the prime motor therefor, substantially as set forth.

7. In a straw-stacker, the combination of a lower fixed frame, a rotary frame thereon, the stacker-section carried by the rotary frame, mechanism arranged to impart rotary movements to the said rotary frame, a prime power device for the aforesaid mechanism, a clutch interposed between the said power device and mechanism, whereby they may be connected or disconnected, and means for locking the rotary frame from accidental movement when the said clutch is moved to disconnect the mechanism from the power device, substantially as set forth.

8. The combination of a lower fixed frame, the rotary frame thereon, the horizontal carrier hinged to the top of the rotary frame, the rear inclined carrier hinged to the rotary frame, the chain connected to the rotary frame for rotating it, the horizontally-arranged sprocket-wheel engaging with the chain, a worm for actuating said sprocket-wheel, the reversible mechanism comprising a clutch for turning the worm alternately, in opposite directions, means for disconnecting the worm and sprocket-wheel, and a second clutch for driving or throwing out of operation said reversible mechanism, substantially as set forth.

9. The combination of the lower stationary frame, the rotary frame thereon, the horizontal carrier hinged to the rotary frame, the rear inclined carrier hinged to the rotary frame, the chain connected to the rotary frame for moving it horizontally in opposite directions alternately, the horizontally-mounted chain-wheel, the reversible turning mechanism for actuating the chain-wheel, the clutch for throwing the chain-wheel into and out of action, a main driving mechanism, and a second clutch between the latter and said reversible mechanism, substantially as set forth.

10. The combination of a lower stationary frame, the rotary frame, the horizontal carrier on the rotary frame, the rear inclined carrier hinged to the rotary frame, the horizontally-arranged driving-wheel for transmitting rotary motion to the rotary frame and mounted eccentric to the axis of rotation of said frame, a reversible shaft for actuating said drive-wheel, two sets of power-wheels for

rotating said reversible shaft, the clutch for alternately engaging and disengaging the sets of power-wheels, a main driving mechanism, a clutch between the latter and said first-mentioned clutch, and means for driving the carriers leading from said main driving mechanism outside of or beyond the latter clutch.

11. The combination with the rotary frame and the stacker-carrier supported thereby, of a horizontally-mounted sprocket-wheel, a wheel 5 for driving the sprocket-wheel, the detachable clutch-pins connecting the sprocket-wheel and its driving-wheel, a lever oscillating in planes transverse to said pins, and a cam connection between said lever and pins for moving the latter longitudinally.

12. The combination with the rotary frame and the stacker-section carried thereby, of gearing for imparting rotary movements to the said rotary frame comprising a pair of wheels arranged close face to face, one of the wheels being geared with the rotary frame, and the other with the power or driving devices, and a clutch for connecting the said wheels, it being arranged upon one side of one of the said wheels and extending through the same and adapted to detachably engage with the other wheel whereby said wheels and clutch can be arranged in a limited space longitudinally of their shaft, substantially as set forth.

13. The combination with the rotary frame and the stacker-carriers supported thereon, of the mechanism for rotating the rotary frame, the clutch for throwing it out of action, and the reversible power devices for moving it alternately in opposite directions, and a second clutch between the said reversible devices and the main power mechanism substantially as set forth.

14. The combination with the rotary frame and the stacker-carriers supported thereon, of the reversible shaft, means connecting said shaft with the rotary frame, two sets of driving devices for the reversible shaft, the clutch between the two sets of driving devices, the clutch-shifting lever, trip devices on the rotary frame for moving the said lever, and hand operating devices connected to the clutch, substantially as set forth.

15. The combination of the separator and its frame, the stacker base-frame attached to the separator-frame extending rearward therefrom, the rotary frame on the base-frame, the horizontal carrier and the inclined carrier connected to the rotary frame, means at the axis of the rotary frame for driving the carriers, and means between said axis and the separator-frame comprising a worm, a clutch between the latter and the rotary frame, a transverse shaft driving said worm, a reversible shaft driving said transverse shaft, a main power-shaft driving the reversible shaft, and a clutch on the latter shaft for imparting rotation to the rotary frame, substantially as set forth.

16. The combination of the separator and its frame, the stacker base-frame attached to the separator-frame, the rotary frame on the base-frame, the ring on the rotary frame, the driving-wheel 6 remote from said ring, means for rotating the said wheel 6 alternately in opposite directions, comprising a worm, a chain connecting the said wheel with the said ring, a clutch or disconnecting device intermediate of said worm and chain, and a second clutch or disconnecting device between said worm and the main power device substantially as set forth.

17. The combination with the rotary frame and the stacker-carrier supported thereby, a rotating driver for the rotary frame, power devices for actuating the driver, and adapted to be moved continuously, means for disconnecting the driver from the rotary frame whereby the latter is free to be moved in either direction independently of the power devices, and separate means for disconnecting said driver from the main power device, substantially as set forth.

18. The combination of the rotary frame, the stacker-carrier supported thereby, the driver for rotating the rotary frame, the power devices for actuating the driver, means for disconnecting the power devices from the driver, and means for locking the rotary frame independent of the carrier and its operation, substantially as set forth.

19. The combination with the rotary frame, the carrier thereon, the driver for rotating the carrier, power devices, the reversing-clutch, the gearing for actuating the driver alternately in opposite directions, the clutch between the reversing-clutch and the driver, and the clutch between the power devices and the reversing-clutch, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

EDGAR A. WRIGHT.

Witnesses:
PRIMUS PHILIPPI,
W. R. BAXTER.