No. 647,459. Patented Apr. 17, 1900.

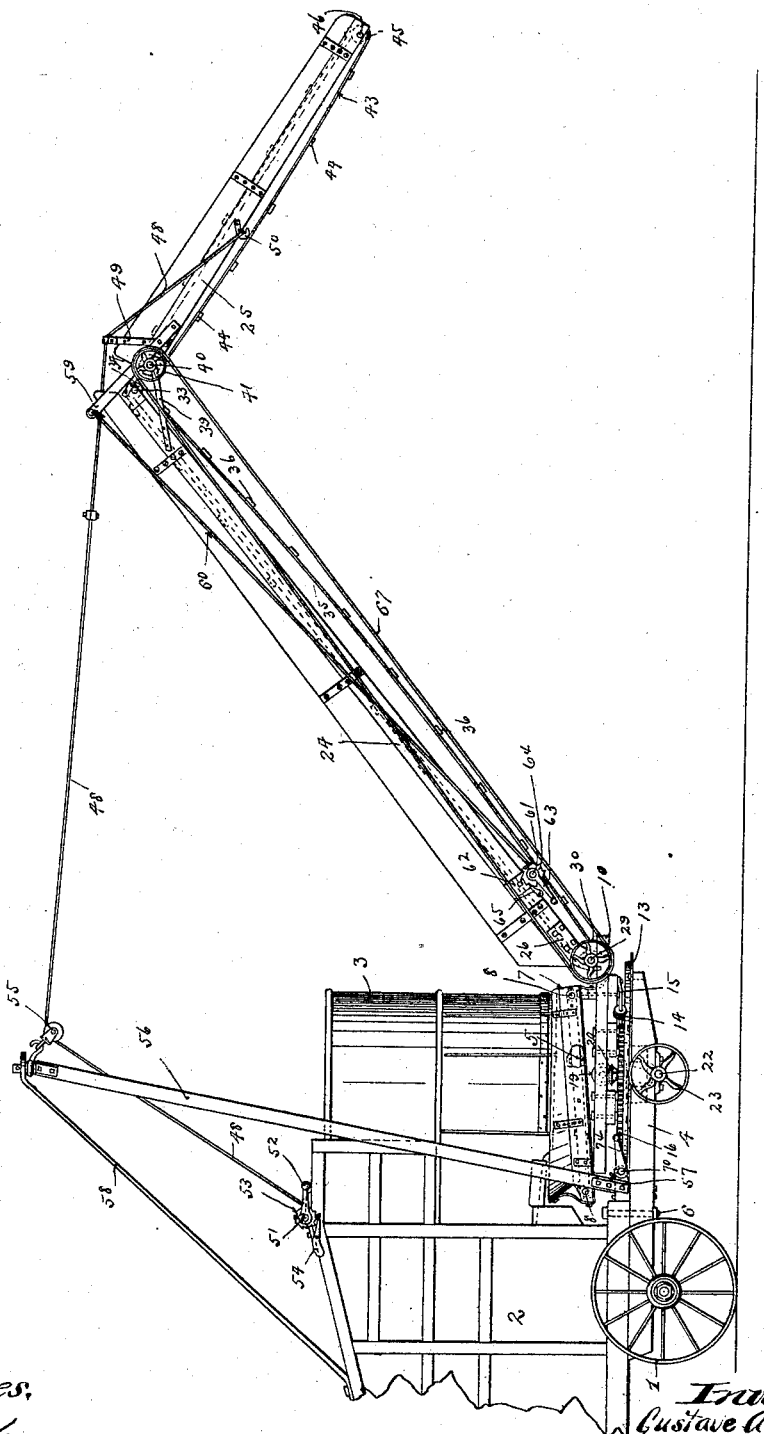
G. ANDERSON.

STRAW STACKER.

(Application filed July 15, 1899.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.



Witnesses,
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Inventor:
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(No Model.) 4 Sheets—Sheet 2.

Fig. 2.

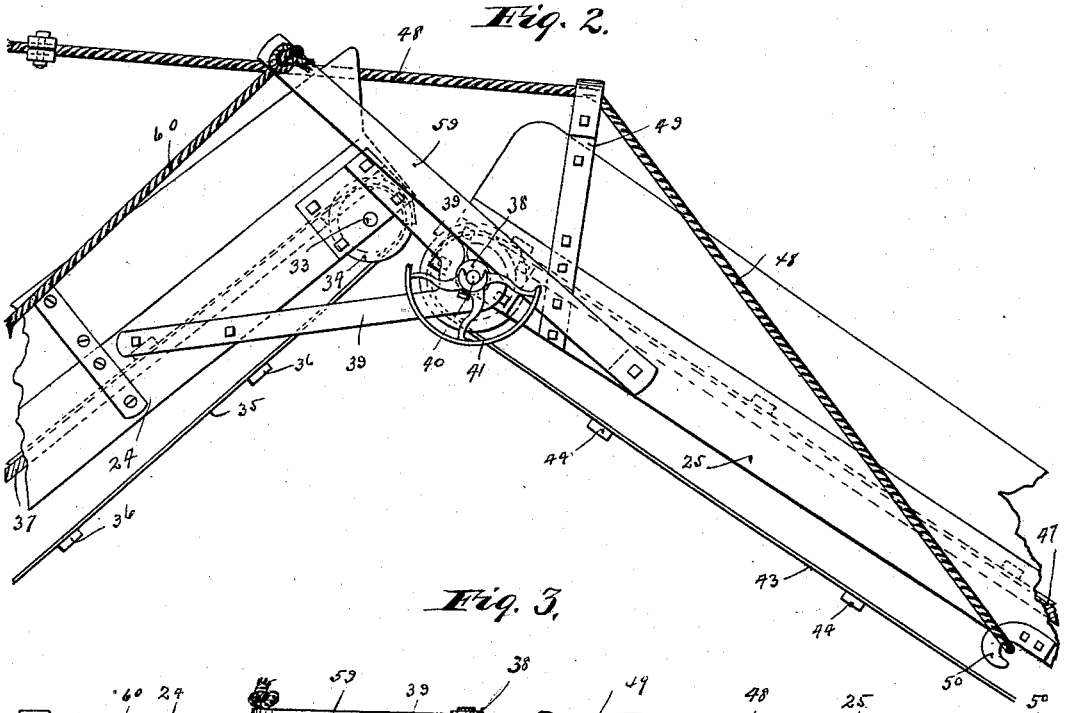

Fig. 3.

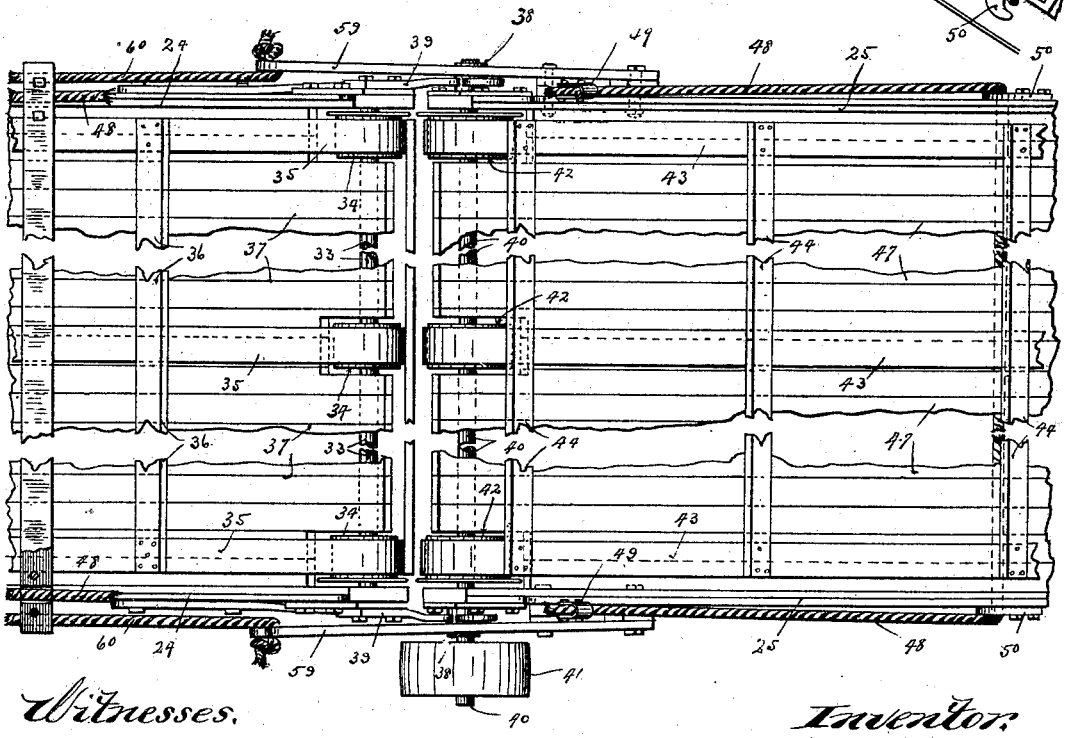

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Fig. 4.

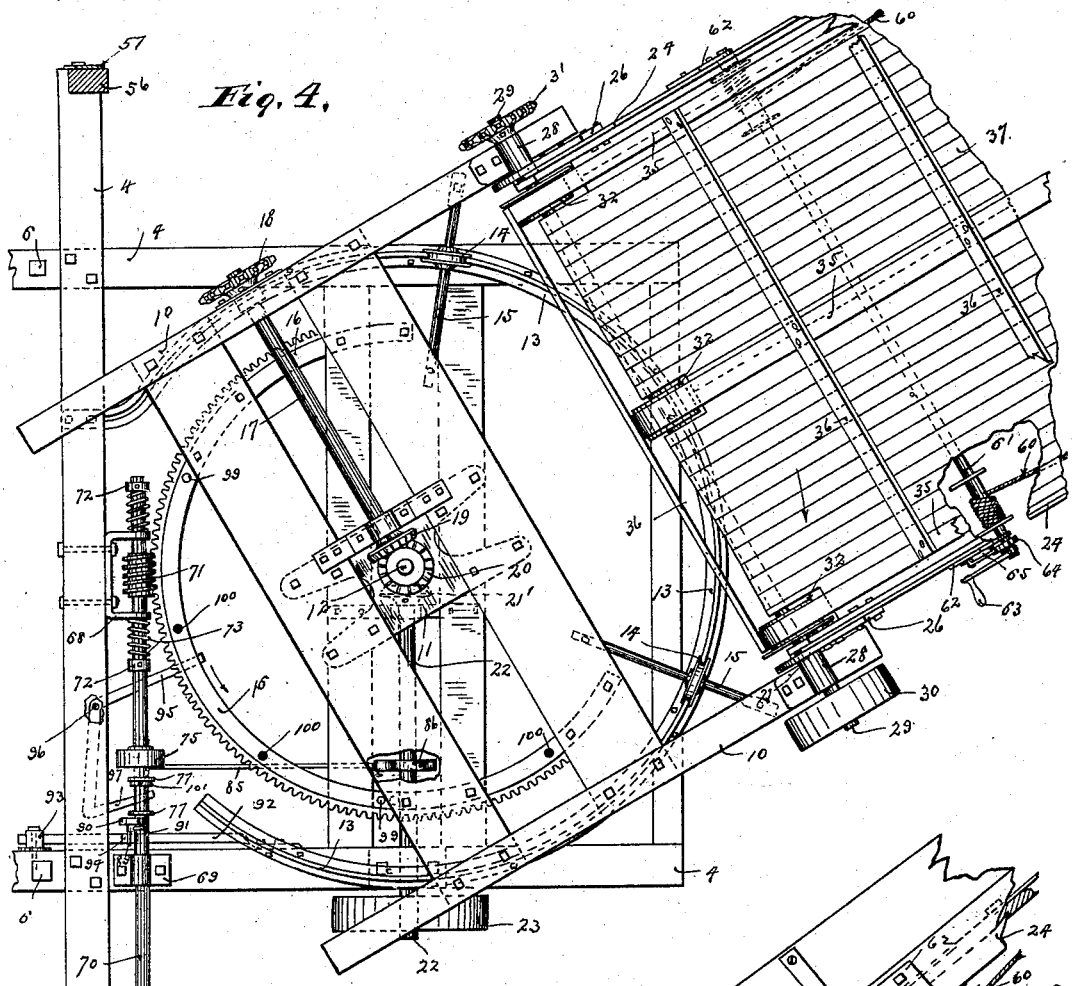

Fig. 5.

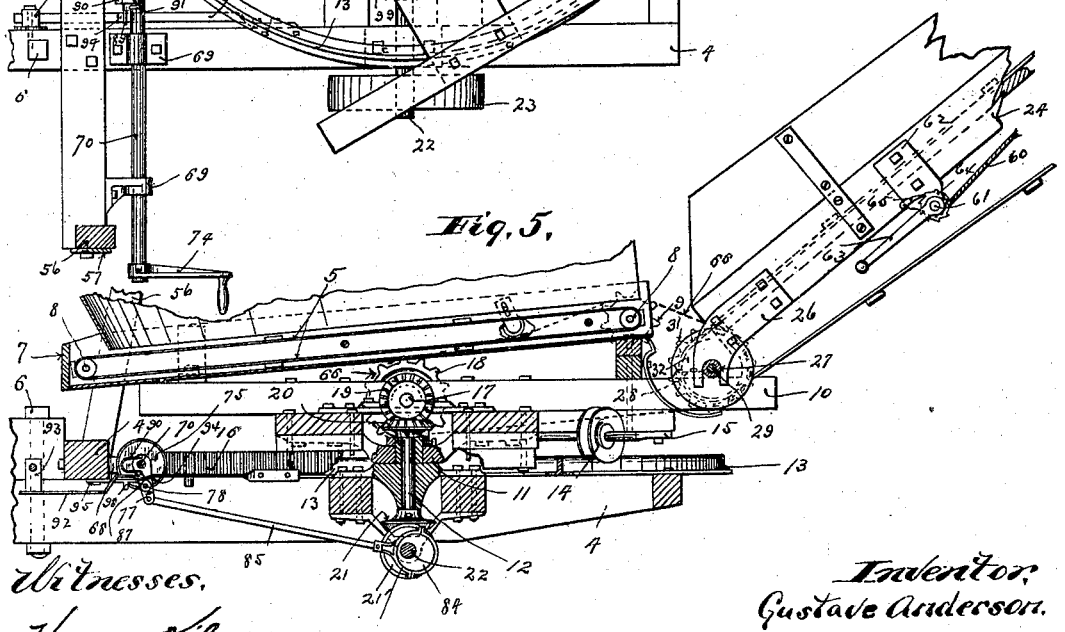

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Fig. 6.

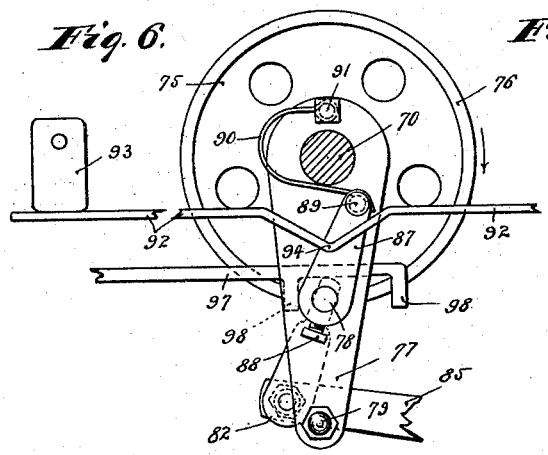


Fig. 7.

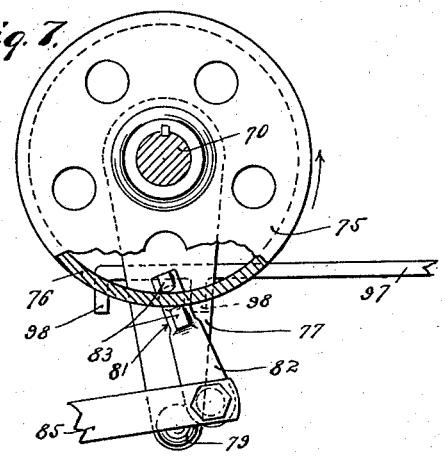


Fig. 8.

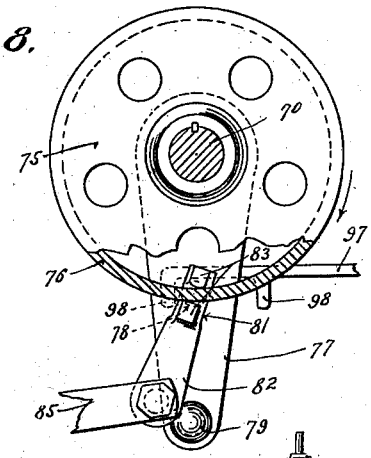


Fig. 9.

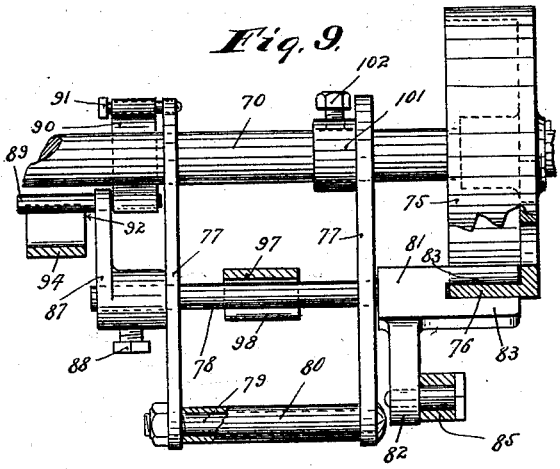
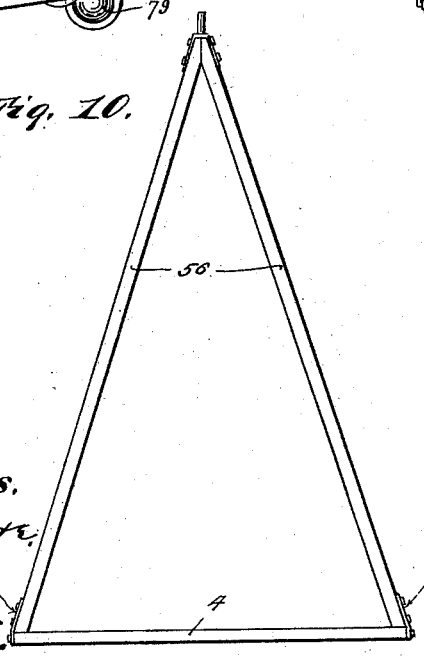


Fig. 10.



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Inventor.
Gustave Anderson.
By his Attorney.
Jas. F. Williamson

UNITED STATES PATENT OFFICE.

GUSTAVE ANDERSON, OF WELLS, MINNESOTA.

STRAW-STACKER.

SPECIFICATION forming part of Letters Patent No. 647,459, dated April 17, 1900.

Application filed July 15, 1899. Serial No. 723,951. (No model.)

To all whom it may concern:

Be it known that I, GUSTAVE ANDERSON, a citizen of the United States, residing at Wells, in the county of Faribault and State of Minnesota, have invented certain new and useful Improvements in Straw-Stackers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to straw-stackers for use in connection with threshing-machines; and it has for its object to improve the same, as hereinafter set forth.

To these ends my invention consists of the novel devices and combinations of devices hereinafter described, and defined in the claims.

The invention is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Figure 1 is a side elevation showing the rear end of a threshing-machine, the same being equipped with one of my improved stackers. Fig. 2 is a detail view, in side elevation, with some parts broken away, showing a portion of the stacker. Fig. 3 is a plan view of the parts shown in Fig. 2. Fig. 4 is a detail view in plan, some parts being broken away, showing the lower end of the stacker and that portion of the thresher-frame to which it is pivotally connected for vertical adjustments and horizontal oscillation. Fig. 5 is a view, partly in side elevation and partly in vertical section, showing the parts illustrated in Fig. 4. Figs. 6, 7, and 8 are detail views, in side elevation, some parts being broken away, showing the reversible friction-clutch and immediately-connected parts. Fig. 9 is a detail in front elevation, with some parts broken away, of the clutch illustrated in detail in Figs. 6, 7, and 8; and Fig. 10 is a detail view, in front elevation, showing a windlass-frame used in connection with the stacker-supporting device.

Of the parts of the thresher it is only necessary for the purposes of this case to note the wheels 1, the case or framework 2, the hood 3, the supplemental frame or support 4, and the endless deck apron or carrier 5, all of which parts are of the ordinary construction. The supplemental frame 4 is preferably detachably secured by nutted bolts 6. The endless carrier or apron 5 is shown as mounted in a box-like section 7, this being accomplished by means of guide-rollers 8, the outer member of which is provided on one projecting trunnion with a sprocket 9. The box 7 is secured upon and is carried by an oscillating frame 10, which is pivoted on a bearing 11, located at the central portion of the supplemental frame 4. A short shaft 12 is extended vertically through the bearing 11, as best shown in Fig. 5. Rigidly secured on the supplemental frame 4 and extended concentric to the shaft 12 is a segmental guide-rail 13. The oscillating frame 10 is provided with flanged wheels 14, as shown, mounted on shafts or rods 15. These wheels 14 run on the rail 13 and serve to support the frame 10 in its proper horizontal position, while permitting it to freely oscillate.

The oscillating frame 10 has rigidly secured to it a large segmental gear 16 for a purpose which will be presently noted, and it has also mounted in suitable bearings thereon a transversely-extended shaft 17, provided at its outer end with a sprocket 18 and at its inner end with a beveled gear 19, which meshes with a beveled gear 20, carried by the upper end of the shaft 12.

At its lower end the shaft 12 is provided with another beveled gear 21, which meshes with a companion beveled gear 21′, carried by the inner end of the transversely-extended shaft 22, which shaft is mounted in suitable bearings on the fixed supplemental frame 4 and is shown as provided at its outer end with a pulley 23, over which a power-driven belt (not shown) will be run to transmit the power and motion to the shafts 22 and 12 and parts driven thereby.

The stacker is made up of two sections—to wit, a body or main section 24 and delivery-section 25. The body-section 24 is pivoted for vertical adjustments on the forward portion of the oscilating frame 10, this being preferably accomplished by means of bearing-brackets 26 on said stacker-section, which engage the hub portions 27 of journal boxes or bearings 28 on said frame 10. To make the stacker removable, the lower extremities

of the brackets 26 are bifurcated, so that they simply straddle the said hubs 27. The power-shaft 29 is extended transversely of the frame 10, being mounted to freely run in the journals or boxes 28 just noted. This shaft 29 is shown as provided at one end with a pulley 30, at its other end with a sprocket 31, and at its intermediate portion with three belt wheels or sheaves 32. In the upper or outer end of the stacker-section 24 a transverse shaft 33 is loosely mounted, the shaft being provided with belt wheels or sheaves 34, which correspond in transverse position to the three belt-wheels carried by the lower shaft 29. An endless conveyer, as shown, made up of belts 35 and transverse slats 36, is mounted to run over the belt wheels or sheaves 32 and 34 and over a deck 37, which is secured to the said stacker-section 24.

The discharge-section 25 of the stacker is pivoted to the upper end of the body-section 24. To thus pivotally connect it, the said stacker-section 25 is provided with projecting bearing-hubs 38, which work in suitable seats formed in brackets 39, secured on said stacker-section 24. A shaft 40 is mounted to run in the bearing-hubs 38. The shaft 40 is provided at one end with a pulley 41, which stands in line with the pulley 30 on the lower shaft 29, and, as shown, said shaft 40 is provided at its intermediate portion with three belt wheels or sheaves 42. An endless conveyer, made up of belts 43 and slats 44, is mounted to run over the belt wheels or sheaves 42 and over similar belt-wheels 45 on the shaft 46, which is loosely mounted at the outer end of the said stacker-section 25. A deck 47 is secured to and transversely of the discharge-section 25 of the stacker for cooperation with the endless conveyer 43 44.

The stacker as an entirety is supported and adjustably held in different vertical positions by means of a rope or flexible connection 48, which is connected and controlled as follows: At its outer end said connection 48 is divided and run over posts or projections 49, that extend upward from the sides of the delivery-section 25 of the stacker, and they are then anchored or secured to the said stacker-section 25, as shown, by means of hooks 50. The other end of the said connection or rope 48 is wound on a windlass-shaft 51, which is mounted in suitable bearings on the top of the thresher frame or case 2. As shown, this windlass-shaft 51 is provided with a hand-crank 52, by means of which it may be turned, and with a ratchet-wheel 53, which coöperates with a retaining-pawl 54 to hold the said windlass-shaft against its unwinding movement until the said pawl is released. At its intermediate portion the rope or connection 48 runs over a guide-sheave 55, which is secured to the upper end of an inverted-V-shaped frame 56, the lower end of which is supported from the sides of the supplemental frame 4, as shown at 57, and the upper end of which is supported and prevented from falling by means of a strap or bracket 58, secured on top of the machine frame or case 2.

The weight of the delivery-section 25 of the stacker is such with respect to the leverage or lifting action thereon from the supporting rope or connection 48 that it will not be moved pivotally upward with respect to the body-section 24 of the said stacker. In order to adjust the said delivery-section 25 with respect to the body-section 24, it is provided with projecting arms or levers 59, to the ends of which ropes or flexible connections 60 are attached. At their lower ends the ropes or connections 60 are wound on a windlass-shaft 61, which is mounted in suitable bearings 62. At one end this shaft 61 is provided with a hand-crank 63 and with a ratchet-wheel 64, which coöperates with a retaining-pawl 65, pivoted on the said stacker-section 24. By turning the windlass-shaft 61, so as to wind up the ropes or connections 60, the discharge or delivery section of the stacker may be raised or straightened out with respect to the body-section 24. By letting out the said connections 60 the discharge-section 25 of the stacker may be lowered or turned down with respect to the body-section 24.

Motion is imparted from the shaft 17 to the shaft 29 and to the outer driving-roller 8 by a sprocket-chain 66, (best shown at Fig. 5,) which runs over the sprockets 18, 31, and 9, carried, respectively, by the said driven parts. Motion is transmitted from the shaft 29 of the lower stacker-section to the shaft 40 of the upper or delivery stacker-section by means of a belt 67, (best shown in Fig. 1,) which runs over the pulleys 30 and 41 on the said shafts, respectively.

The stacker is oscillated from side to side of the machine by mechanism now to be described.

Mounted in suitable bearings 68 and 69, secured on the fixed supplemental section 4 and extended transversely of the machine, just inward of the segmental gear 16, which is carried by the oscillating frame or base 10 of the oscillating stacker, is a shaft 70, which is provided with a worm 71, which is in mesh with the teeth of the gear 16. This worm 71 is positioned between the prongs or bearing portions of the bearing-bracket 68, and it has considerable end play between the same, so that the said shaft 70 is free for a considerable endwise movement. On each side of the bracket 68 the shaft 70 is provided with collars 72, between which and the prongs of the said bracket coiled springs 73 are compressed. These springs 73 tend to center the worm 71 and to normally hold the same in its intermediate position, (shown in Fig. 4,) and, furthermore, these springs are of such strength that they will resist the strains put upon them by the ordinary action of the screw 71 on the gear 16 in giving the stacker its movement in one direction or in the other. However,

when the movement of the stacker is suddenly reversed these springs will yield, and thus relieve the machine from the strains which it would otherwise receive. Furthermore, when the machine is being drawn from one place to another it often happens that one of the rear wheels will fall into a depression or strike an obstacle, which will suddenly lower or raise the wheel, thus suddenly throwing intense strains on the machine, tending to move it sidewise. These sudden movements, on account of the weight and length of the stacker and the leverage which it has on the connections which control its oscillations with the ordinary constructions, very frequently break out the gear-teeth or other parts of the oscillating mechanism. By spring-mounting one of the driving elements, as above described, the above danger of breaking the driving connections is avoided.

At its outer end the worm-shaft 70 is provided with a hand-crank 74, by means of which it may be turned. The shaft 70, however, is arranged to be ordinarily automatically driven, and in this illustration it is driven from the continuously-running shaft 22.

The device herein illustrated for converting the continuous movements of the shaft 22 into a reversible rotary movement which will automatically reverse the worm 71 is considered, broadly, new. Preferably this device is constructed as follows: Rigidly secured on the worm-shaft 70 is a wheel or disk 75, provided with a profile annular flange 76. Loosely pivoted on the shaft 70, close to the flanged wheel 75, is a lever 77, which, as shown, is made up of a pair of arms connected by a transverse tie-rod 79, which has a spacing-sleeve 80 placed around it, thus giving a rigid construction. A rock-shaft or rod 78 is loosely mounted in the arms of the lever 77 and is provided at one end with a pawl or head 81, which has a projecting arm 82 and a pair of biting-jaws 83. The jaws 83 embrace the annular flange 76 of the wheel 75 and are adapted to frictionally engage the same with a biting or clamping action, as hereinafter more fully described. The free end of the arm 82 is connected to an eccentric 84 on the continuously-running shaft 22 by means of a pitman or rod 85, which is provided with an eccentric-strap 86, that works on the said eccentric 84. At its other end the rod 78 is provided with a trip-arm 87, which, as shown, is secured to the said shaft 78 by a set-screw 88. At its free end the trip-arm 87 is provided with a pin 89, which projects at both ends. At its inner end the pin 89 is acted upon by a leaf-spring 90, the upper end of which spring is pivotally connected to the hub portion of one arm of the lever 77 by means of a stud 91. This spring 90, acting upon the pin 89, tends to hold the trip-arm 87 in either one of its extreme positions, either as shown in Figs. 6 and 7 or in its other extreme position on the other side of a dead-center, with the axis of the shaft 70. Extending under the outwardly-projected end of the pin 89 on the trip-arm 87 is a strong flat spring 92, one end of which is rigidly secured to the fixed supplemental frame 4 and the other end of which is subject to the action of a turn-button or pivoted stop 93, which, as shown, is pivoted to a projecting portion of the main frame of the thresher. Just below the said pin 89 the spring 92 is formed with a V-shaped depression or centering-cam 94. When the turn-button 93 is turned down, as shown in Figs. 5 and 6, the cam-section 94 will be held out of engagement with the pin 89 of the trip-arm 87; but when the said button is turned sidewise or upward the V-shaped cam-section 94 will be caused to engage the said pin 89 and throw the trip-arm 87 onto a dead-center, which is its intermediate position, against the tension of the spring 90, and this will throw the pawl 81 at the other end of the rod 78 into its intermediate position, in which position its jaws 83 will not act upon the annular flange 76 of the wheel 75, but will permit the said wheel and its flange to be freely turned in either direction by operating the hand-crank 74 at the outer end.

The pawl 81 and its jaws 83 are automatically thrown from one extreme position to the other when the stacker reaches the limits of its lateral oscillation by a device, one form of which is illustrated in the drawings and consists of the bell-crank lever 95, which is pivoted to the supplemental frame at 96 and is provided at one end with a laterally-turned arm 97, from the free end of which trip-fingers 98 depend. These fingers 98 straddle or embrace the rod 78 of the double-armed lever 77, but are spaced far enough apart to permit a full stroke of the said lever 77 without engagement with the said rod 78. Otherwise stated, when the rod 78 and parts carried thereby—to wit, the pawl 81, jaws 83, and trip-arm 87—are moved into the relation illustrated in Figs. 6 and 7 said rod 78 will be vibrated between the trip-fingers 98 without engagement therewith. Furthermore, in this relative position of the parts the biting action of the jaws 83 (see Fig. 7) on the annular flange 76 of the friction-wheel 75 is such that the said wheel will be driven in the direction indicated by the arrow marked on the said view.

The inner arm of the bell-crank 95 projects under the annular gear 16 and is subject to the action of the pair of trip-pins or projections 99, which are carried by the said gear 16. The pins 99 are preferably adjustably securable in any one of a series of seats or perforations 100 with which the said gear is provided. These pins 99 limit the oscillation of the stacker from side to side of the machine, and by varying the position of the said pins the zone of lateral oscillation of the stacker may be varied both with respect to the extent of movement and with respect to

the position of the movement or extremes of movement. It should have been noted that the vibrating lever 77 is prevented from sliding on the shaft 70 by a collar 101, provided with a set-screw 102.

Operation: From what has already been said it is probably clear that the stacker may be adjusted vertically to the proper altitude and that the so-called "discharge-section" 25 may be adjusted with respect to the body-section 24, so that the stack may be properly formed and so that the straw will not be dragged from the stack as the stack is piled close to the stacker. The pivotally-connected stacker-sections and the independent endless conveyers make the above result feasiable. The straw will of course be delivered from the thresher into the hood 3, thence onto the endless deck apron or carrier 5, and from thence to the lower end of the stacker in the ordinary manner. By the endless conveyers or carriers 35 36 and 43 44, respectively, of the body and delivery sections of the stacker the straw will be carried over the stacker. The said endless carriers are given their continuous movements through the connections already fully described, which connections permit the free lateral oscillation as well as the vertical adjustments of the stacker. The action of the clutch or biting-jaws 83 of the head 81, when the parts stand in the relative positions illustrated in Figs. 6 and 7, has already been considered, and we will now assume that the stacker is being oscillated in the direction indicated by the arrows marked on Fig. 4. When the upper trip-pin 99, as shown in the said view, strikes the free end of the bell-crank trip-lever 95, it will move the arm 97 thereof toward the left with respect to Figs. 4 and 6 or toward the right with respect to Fig. 7, and this movement of said arm 97 will cause one of the trip-fingers 98 to act upon the shaft or rod 78 when the lever 77 and parts carried thereby are moved to the other limit of their extreme throw, and thus will throw or force the trip-arm 87, pawl 81, jaws 83, and pitman-arm 82 into the other extreme position with respect to the said arm 77 or as shown in Fig. 8. The arm 97 and its fingers 98 now stand as shown in Fig. 8 and the rod or shaft 78 is for the time being free to vibrate between the trip-fingers 98, while the biting-jaws 83 will have a reverse action on the flange 76 of the clutch-wheel 75, so that the said clutch-wheel will now be given a step-by-step movement in the direction indicated by the arrow marked on Fig. 8. This movement of the clutch-wheel 75 and shaft 70 (indicated in Fig. 8) will be kept up until the upper trip-pin 99 again engages the free end of the bell-crank lever 95, and thereby forces the same back into the position indicated in Figs. 4, 6, and 7, in which position the parts will act as previously described. In this manner the oscillations of the stacker are automatically controlled.

It will of course be understood that the invention above described in detail is capable of many modifications within the scope of my invention.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. A device for oscillating a stacker, comprising a driven wheel or part, a continuously-vibrating pawl-carrier, a reversible pawl on said pawl-carrier coöperating with said wheel, and a pawl-shifting device operating to automatically reverse said pawl at the limits of the stacker's lateral oscillations, substantially as described.

2. A device for oscillating a stacker comprising a flanged clutch-wheel, a continuously-vibrating pawl arm or lever, a reversible pawl pivoted to said pawl-arm and provided with jaws that embrace the flange of said wheel for reverse actions thereon, and stops or trip projections on a part moved by said stacker for reversing said pawl, substantially as described.

3. A device for oscillating a stacker comprising the shaft 70 the flanged clutch-wheel 75, 76, the vibrating arm 77 on said shaft, the rod 78 mounted on said arm 77 and provided at one end with the pawl 81 having the jaws 83 embracing the flange of said wheel and provided with a projection 82 the pitman attached to said projection 82, the trip-arm 87 on the said rod 78, and a spring acting on said arm 87 and tending to hold the same in either one or the other of its extreme positions to one side of the dead-center, substantially as described.

4. A device for oscillating a movable part, such as a stacker, for example, comprising a clutch-wheel, a vibrating pawl lever or arm, a reversible pawl on said arm coöperating with said clutch-wheel, a spring tending to hold said pawl in either extreme position in which it is set, a continuously-vibrating rod or connection connected to said pawl, and a trip operated by the part oscillated for reversing the action of said pawl, substantially as described.

5. A device for oscillating a stacker or similar device comprising a clutch-wheel, a vibrating pawl-carrying arm, a reversible pawl on said arm coöperating with said wheel, a spring tending to hold said pawl in either extreme position in which it is set, and a device for holding said pawl in an intermediate inoperative position, substantially as described.

6. The combination with a support and a stacker pivoted thereto for lateral oscillations, of mechanism for automatically oscillating the same, involving a gear on said stacker, a shaft mounted on said support and provided with a worm engaging said gear, a flanged clutch-wheel on said shaft, a pawl-carrying lever pivoted on said shaft provided with a pawl having biting-jaws that embrace the flange of said clutch-wheel, a constantly-driven pitman or rod connected to said pawl, and a device for reversing the action of said

pawl at the limits of the stacker's movement, substantially as described.

7. The combination with an oscillating stacker and a portable support to which it is attached, of mechanism for automatically oscillating said stacker laterally, involving an intermediate motion-transmitting part connected for continuous action on said stacker, and a spring device interposed to yieldingly hold said motion-transmitting part for movement in either of two directions, substantially as described.

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

GUSTAVE ANDERSON.

Witnesses:

JAS. F. WILLIAMSON,

F. D. MERCHANT.