(No Model.) 6 Sheets—Sheet 1.

L. F. DIETER.

STRAW STACKER.

No. 399,188. Patented Mar. 5, 1889.

Fig. 1

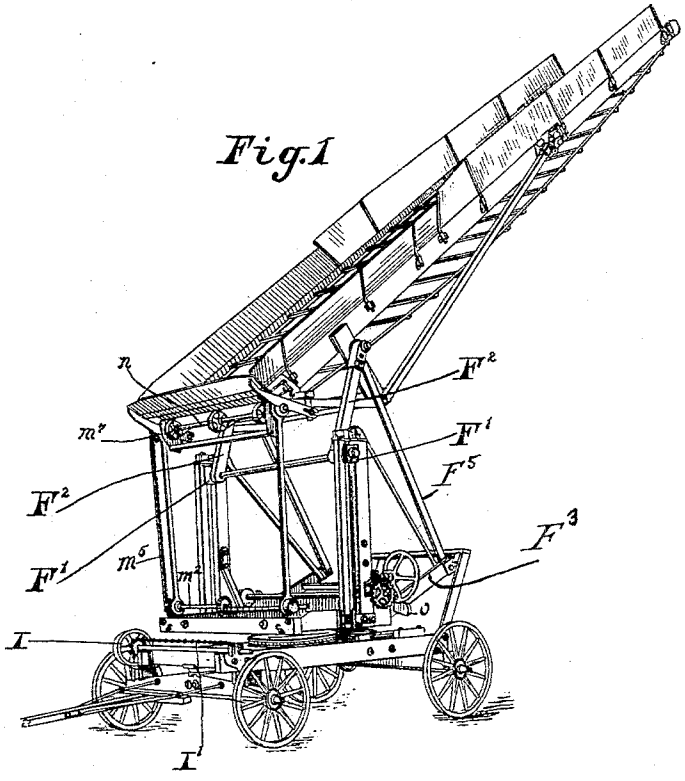
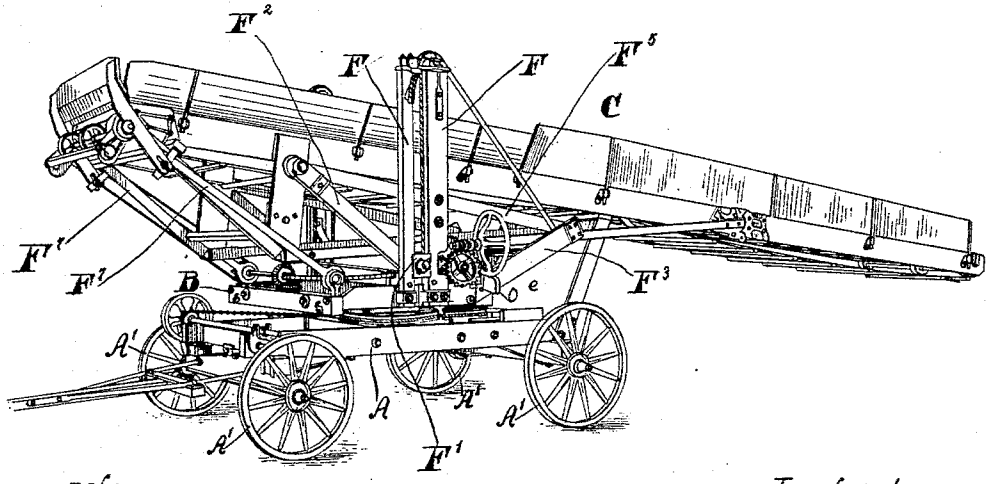


Fig. 2



Witnesses,
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By Paul A. Staats
Atty.

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(No Model.) 6 Sheets—Sheet 2.

L. F. DIETER.

STRAW STACKER.

No. 399,188. Patented Mar. 5, 1889.

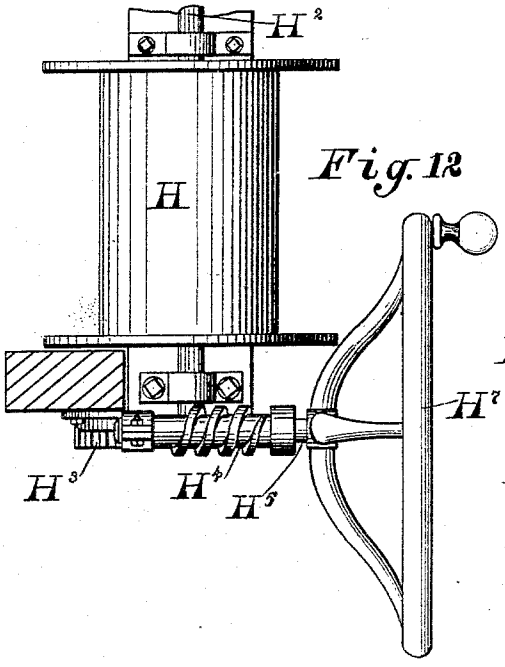


Fig. 12

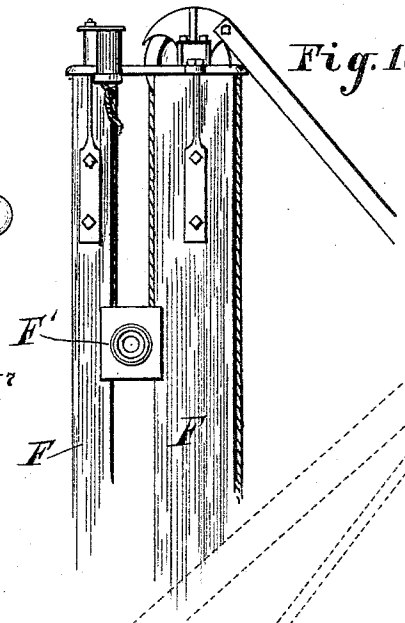


Fig. 13

Fig. 3

Witnesses
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(No Model.) 6 Sheets—Sheet 3.

L. F. DIETER.

STRAW STACKER.

No. 399,188. Patented Mar. 5, 1889.

Fig. 4

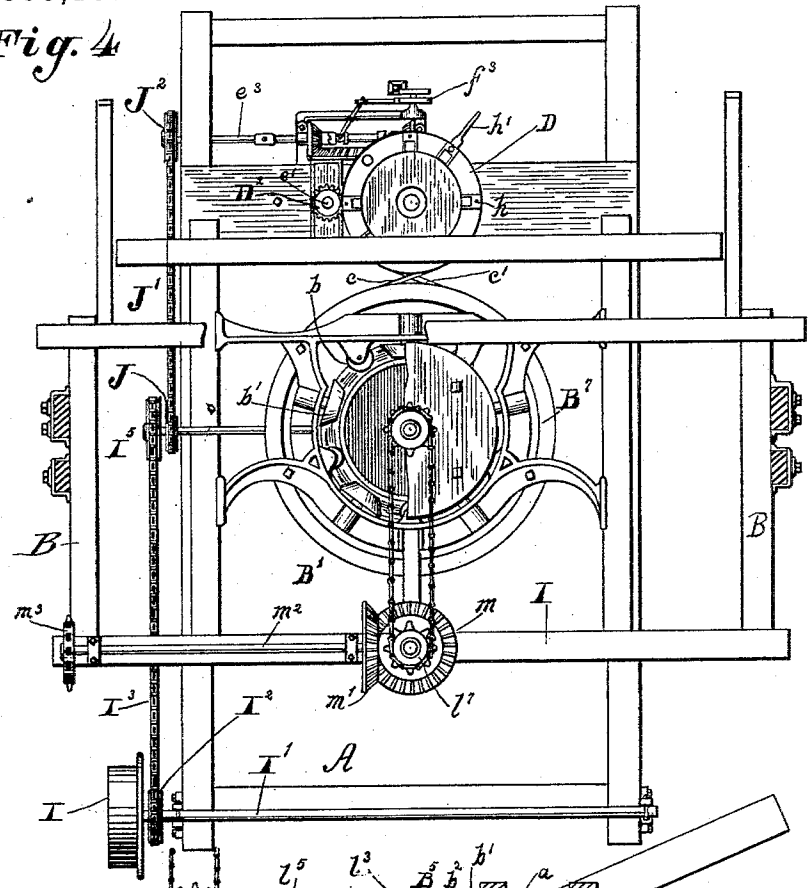


Fig. 5

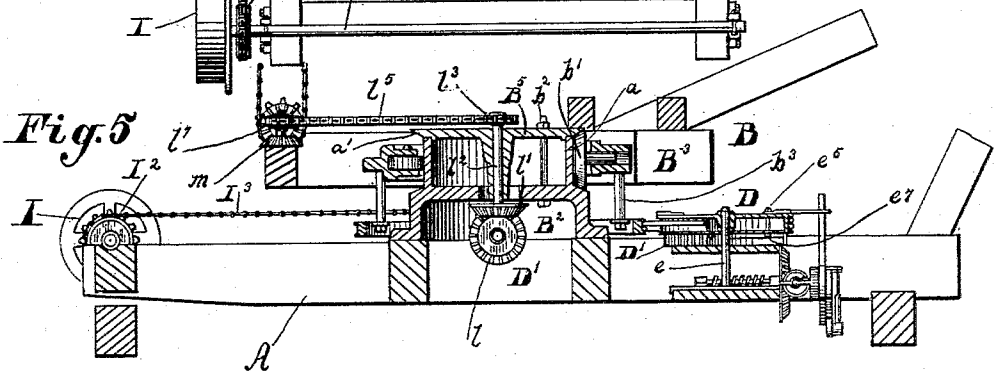
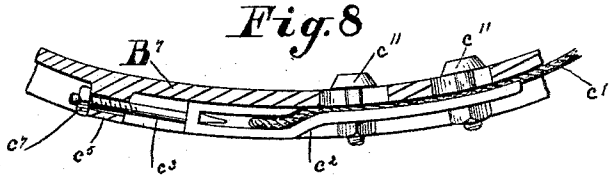


Fig. 8



Witnesses

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(No Model.) 6 Sheets—Sheet 4.

L. F. DIETER.

STRAW STACKER.

No. 399,188. Patented Mar. 5, 1889.

Fig. 6

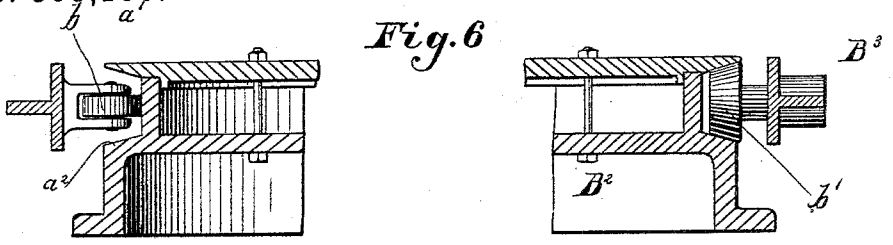
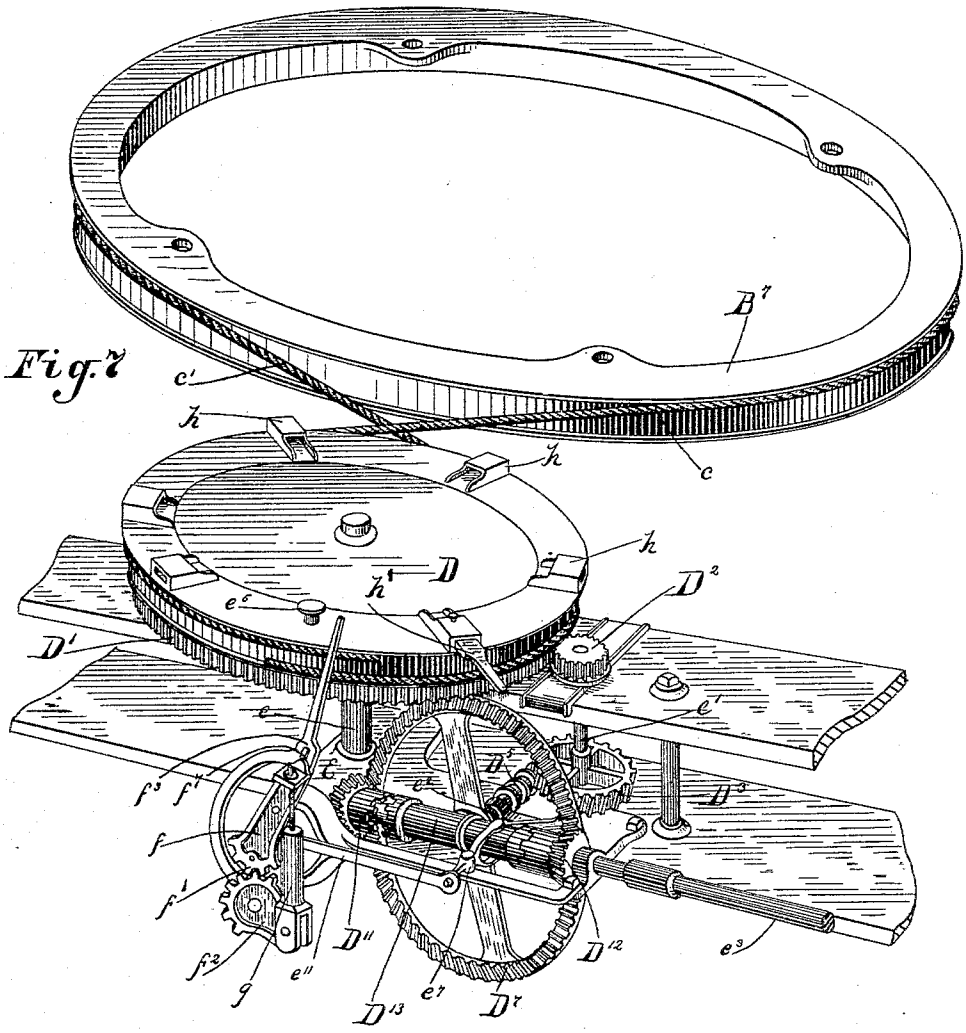


Fig. 7



Witnesses

Chas. L. Bressler

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(No Model.)

6 Sheets—Sheet 5.

L. F. DIETER.

STRAW STACKER.

No. 399,188. Patented Mar. 5, 1889.

Fig. 9

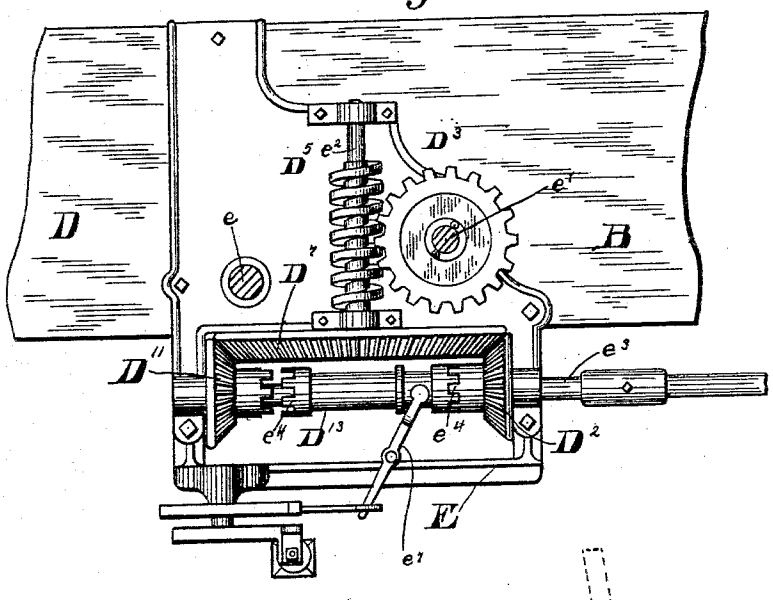


Fig. 10

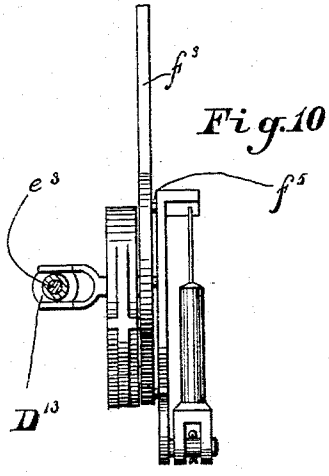
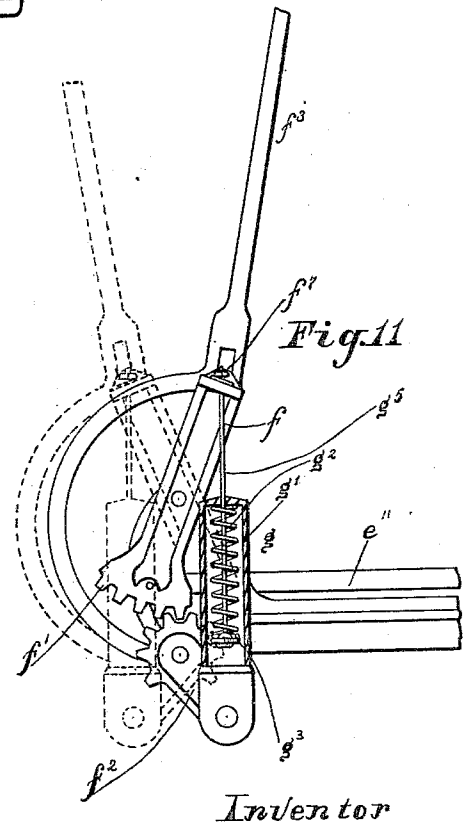


Fig. 11



Witnesses.

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(No Model.) 6 Sheets—Sheet 6.

L. F. DIETER.

STRAW STACKER.

No. 399,188. Patented Mar. 5, 1889.

Fig. 18

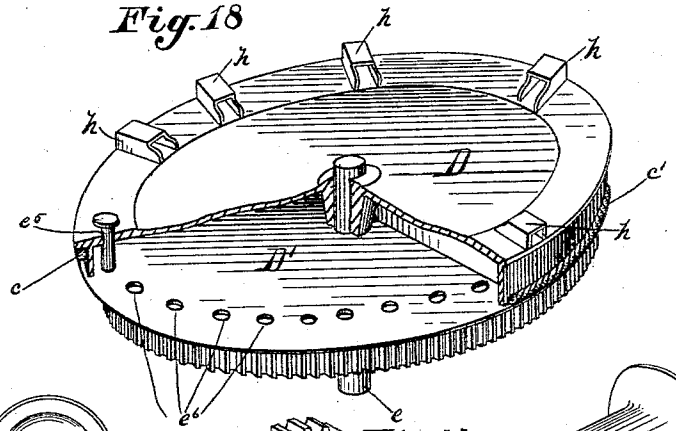


Fig. 15

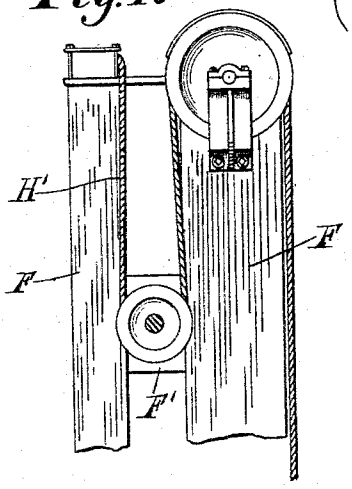


Fig. 14

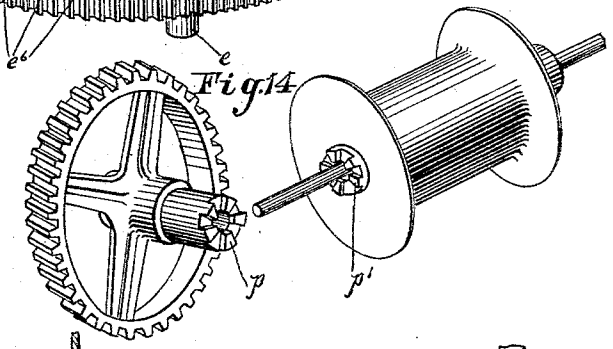


Fig. 16

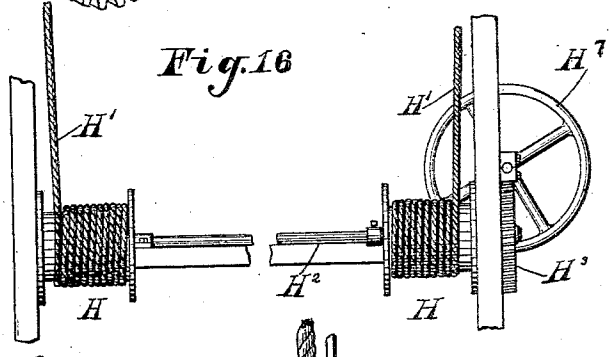
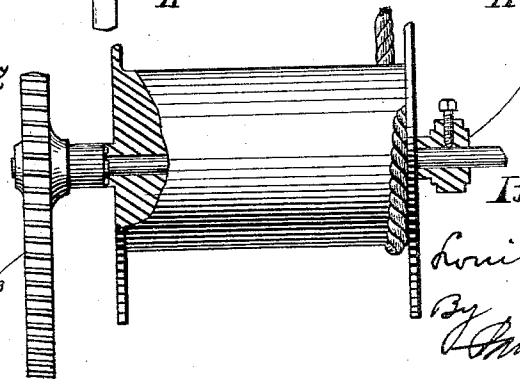


Fig. 17



Witnesses
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UNITED STATES PATENT OFFICE.

LOUIS F. DIETER, OF SPRINGFIELD, OHIO.

STRAW-STACKER.

SPECIFICATION forming part of Letters Patent No. 399,188, dated March 5, 1889.

Application filed August 20, 1888. Serial No. 283,286. (No model.)

To all whom it may concern:

Be it known that I, LOUIS F. DIETER, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Straw-Stackers, of which the following is a specification.

My invention relates to improvements in straw-stackers particularly adapted for use in connection with thrashing-machines.

The objects of my invention are to provide a stacker of novel construction in which an automatic swinging movement of the carrier is obtained with means for adjusting the stroke of the same to secure stacks of different lengths.

A further object of my invention is to provide novel mechanism for raising and lowering said carrier on a series of movable pivots in such a manner that the outer end of said carrier will be raised in a vertical line, and thus be adapted to swing over the center of said stack, no matter at what height it may be operated.

A further object of my invention is to provide a novel tripping mechanism adapted to automatically change the motion of the carrier at any desired point in the movement thereof.

My invention consists in the various combinations and constructions of parts hereinafter more fully pointed out in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a view in perspective of a machine embodying my invention with the elevator or carrier shown elevated. Fig. 2 is a view in perspective of the same with the elevator or carrier lowered. Fig. 3 is a side view showing the manner of raising or lowering the outer end of said elevator or carrier in a vertical line, the said elevator or carrier being shown elevated in dotted lines. Figs. 4 and 5 are respectively a plan and a sectional elevation of the platform and turn-table and their operating devices. Fig. 6 is a sectional view in detail of the turn-table. Fig. 7 is a detailed view in perspective of the tripping mechanism and the platform-operating devices. Figs. 8, 9, 10, 11, and 18 are respectively detail views of the same. Figs. 12 to 17 are detail views of the mechanism for raising or lowering the elevator or carrier.

Like parts are indicated by similar letters of reference throughout the several views.

In the said drawings, A represents the main supporting-frame, mounted on carrying-wheels A′ in the usual manner.

B is the movable platform on which the stacker proper is supported, the said platform B being connected to and supported on the main frame A through the medium of a turn-table, B′, which permits the said platform B to turn in a horizontal plane on the said main frame A. The turn-table B′ consists of an inner hub or bearing support on the main frame A and an outer movable encircling frame, B^3. The inner stationary hub or bearing-support, B^2, is provided at its upper portion with a plane peripheral bearing, a, having at each end beveled bearing-flanges a' and a^2. The movable encircling frame B^3 is provided at intervals with horizontal bearing or friction rollers b, adapted to travel on the plane peripheral bearing a, and beveled supporting-rollers b', adapted to travel on the beveled flanges a' and a^2. Any suitable number of these bearing and supporting rollers may be used in the movable frame B^3, the said plane bearing-rollers and beveled supporting-rollers being preferably alternated with each other, as shown in Figs. 4, 5, and 6. The upper beveled flange, a', of the stationary bearing-support B^2 is preferably formed on a plate, B^5, adapted to be secured to the main portion of the bearing-support B^2 by suitable bolts, b^2, or other suitable fastening devices, so that by removing said plate and flange the movable platform B and the outer portion of the turn-table B′ may be removed from said bearing-support without detaching the supporting or guiding rollers forming a part of said turn-table.

The elevator or carrier C is supported on the platform B in the manner hereinafter more fully set forth, and is adapted to turn with said platform. Immediately about the turn-table B′, and connected rigidly to the encircling frame B^3, is a flanged wheel or ring, B^7, preferably suspended from said frame B^3 by small pillars or studs b^8. Located in the same horizontal plane with the said flanged

ring B^7 is a flanged tripping-wheel, D, preferably of half the diameter of the flanged ring B^7. Attached at each end to the flanged ring B^7 and tripping-wheel D are small cables $c\,c'$, which pass in opposite directions about the said wheels, as shown in Figs. 4 and 7. One end of each of these cables is preferably secured rigidly to the tripping-wheel D, said cables being attached at their other ends to the flanged ring B^7 in such a manner that the length or tension of the same may be readily adjusted. This is preferably accomplished as shown in Fig. 8. A small clamping-frame, c^2, is provided within the flanged periphery of said ring, in which the end of the cable c' is secured. A screw-threaded adjusting-rod, c^3, is attached to said frame, and, passing through lugs c^5 on the periphery of said flanged ring B^7, is provided with an adjusting-nut, c^7. Clamping-bolts c^{11}, passing through slotted openings in the periphery of the flanged ring B^7, are also provided for holding the clamping-frame c^2 in position when properly adjusted.

The tripping-wheel D is mounted loosely on a small vertical shaft, e, and is adapted to turn freely thereon. Immediately under the tripping-wheel D, and secured rigidly to the shaft e, is a spur-gear, D′, which meshes with a spur-pinion, D^2, on a vertical shaft, e'. The vertical shaft e' carries at its lower end a worm-gear, D^3, which receives its motion from a worm, D^5, on a horizontal shaft, e^2, which carries at its forward end a bevel-gear, D^7. The bevel-gear D^7 is engaged on each side by bevel-pinions D^{11} and D^{12}. These pinions turn loosely on a horizontal shaft, e^3, which extends across the platform B at right angles to the worm-shaft e^2. Located on the shaft e^3, between the pinions D^{11} and D^{12}, is a clutch, D^{13}, provided at each end with clutching-faces e^4, adapted to engage with similar clutching-faces on the pinions D^{11} and D^{12}. The clutch D^{13} is secured to the shaft e^3 in such a manner as to turn positively therewith, but at the same time is adapted to move longitudinally thereon, so as to engage with either of the pinions D^{11} or D^{12}, one of said pinions being disengaged when the other is engaged, as shown in Fig. 9. The shaft e^3 rotates constantly in one direction, while the gear-wheel D^5 and the intermediate mechanism between the same and the spur-gear D′ move in either direction, depending upon which of the pinions D^{11} or D^{12} is in engagement with the clutch D^{13}.

As before stated, the tripping-wheel D is secured loosely on the shaft e, while the spur-gear D′ is attached rigidly to said shaft. The tripping-wheel D, however, is adapted to be engaged by the spur-gear D′ and turn positively therewith by means of a pin, e^5, which passes through an opening in the said tripping-wheel D and engages with one of a series of openings, e^6, in the spur-gear D′. By this means the tripping-wheel D may be connected rigidly to the said spur-gear and turn therewith, while at the same time the relative positions of the said gear and tripping mechanism may be varied as desired; or the tripping-wheel may be detached from the said spur-gear, so as to move independently thereof or remain at rest while the said spur-gear and its operating mechanism continue to revolve.

The operating mechanism between the shaft e and the small horizontal shaft e^2 is preferably supported on a main frame, E. Pivoted to the frame E at or near its center is a bifurcated lever, e^7, the forked end of which is adapted to engage with the clutch D^{13} in a well-known manner to produce a longitudinal movement of said clutch by a vibrating movement of said lever. Attached to the outer end of the bifurcated lever e^7 is a connecting-rod, e^{11}, which is attached at its other end to a vibrating arm, f. This vibrating arm f is pivoted to the frame E, and provided at its lower end with a segment of gear-teeth, f', adapted to engage with teeth on the end of a similar segmental arm, f^2, also pivoted to the frame E. The pivoted lever f is connected to a tripping-lever, f^3, by means of a small projection, f^5, on said pivoted arm, which engages in a slotted opening, f^7, in said tripping-lever. The tripping-lever is preferably curved at its lower end and pivoted to the frame E below the intersection of the pivoted arm f and the segmental arm f^2. Connected at the bottom to the lower end of the segmental arm f^2 and at the upper end to the pivoted arm f, and extending between the same, is a spring-connection, g. This spring-connection g consists, preferably, of a spring-box, g', containing a coil-spring, g^2, adapted to rest at one end against the top of the box g' and at the other against a head or projection, g^3, on the connecting-rod g^5. The said connecting-rod g^5 and the spring-case g' are connected, respectively, to the arms f and f^2 in such a manner that the tension of said spring will tend to draw the outer ends of the respective arms toward each other when they have passed the line connecting their pivotal points in either direction.

The tripping-lever f^3 is projected upwardly in close proximity to the tripping-wheel D. This tripping-wheel D is provided on its upper face with a series of pockets or receptacles, h, each of which is adapted to receive a finger, h', which, as the wheel D revolves, comes in contact with the tripping-lever f^3. The tripping-wheel D being of half the diameter of the ring B^7, one complete revolution of the wheel will produce a half-revolution of the ring B^7 and the platform B, to which the said ring is attached. As the finger h' strikes the tripping-lever f^3 from either side the said tripping-lever is forced against the pivoted arm f, which in turn moves the segmental arm f^2, thus pressing the said spring g^2 until the said pivoted arm and the segmental arm pass the center of the joint, at which time the elasticity of the springs g^2 forces the said arms and the tripping-lever to an equal distance on the

other side of a line connecting their pivotal centers, and at the same time the clutch D^{13} is moved out of engagement with one of the beveled pinions on the shaft e^3 and into engagement with the other. It will be seen that by this construction, when the tripping-wheel D is connected to the spur-gear D′ and the shaft e^3 is set in motion, the direction of the tripping-wheel D is reversed just as the tripping-finger h' reaches the line passing through the pivotal points of the pivoted arms f and f^2. If but one tripping-finger is used, the tripping-wheel D makes a complete revolution and changes its direction exactly in a line passing through the pivotal point of the pivoted arms f and f^2. The tripping-wheel D may be made to change direction and move over any portion of its revolution desired by using additional tripping-fingers located at any desired point about the periphery of the said tripping-wheel in the receptacles provided for that purpose. By the use of the pivoted arms f and f^2 in connection with the trip-lever f^3 and the spring-connection g between said pivoted arms, as described, it will be seen the spring-connection always maintains a vertical position, and serves to draw the pivoted arms positively together as soon as the said spring-connection has passed the line passing through the pivotal points of the said arms. The tripping-wheel D being connected by means of a cable, c', to the flanged wheel B^7, which in turn is connected to the platform B, it will be seen that as the tripping-wheel D is turned in either direction the platform B will be correspondingly moved in the opposite direction. The carrier or elevator C, as before stated, is supported upon the platform B and moves therewith. As the platform B is revolved the carrier C will be moved over a corresponding arc of a circle, thus distributing the straw, which is discharged on the lower end thereof in an even and steady stream along the path of the moving carrier. Now, in order to provide for raising or lowering the outer end of said carrier to accommodate it to the height of the stack as the same is increased by the addition of the straw from the thrasher, and at the same time to provide for dropping the straw in the same circumferential line, I support the platform upon movable pivots, and provide means for raising or lowering the same that will cause the outer end of the said carrier to be raised in a vertical line, while the angle of the elevator or carrier is changed to suit the different heights to which the straw is to be elevated. This I preferably accomplish as follows: On each side of the platform B are secured two guiding-pieces, F F, between which are sliding bearings F′ F′. Pivoted to each of the sliding bearings F′ F′ on the guides F F are raising-arms F^2 F^2, which are pivoted at the other end to the frame-work of the carrier C. Extending upwardly from the platform B at an angle thereto are supporting-pieces F^3, to which are pivoted supporting arms or levers F^5, each of which is pivoted at one end to the said supporting-pieces F^3 and at the other to the carrier-frame concentric with the upper ends of the raising-arms F^2. Located at the other end of the platform, and connected at their upper ends to the carrier-frame at a point back of or below the pivotal point of the raising-arms F^2, are connecting-arms F^7 F^7, said supporting and connecting arms being of different length, as shown.

Connected on each side of the platform to the top of one of the guides F, and passing downwardly under the sliding bearing F′ and upwardly through the top of the other guide F, thence downwardly to a windlass, H, is a raising-rope, H′. The windlasses H are supported on a shaft, H^2, which is provided at one end with a worm-gear, H^3, engaging with a worm, H^4, on a shaft, H^5, provided with a hand-wheel, H^7. As the hand-wheel H^7 is revolved each of the ropes H′ is wound about the windlasses H, the sliding bearings are thus elevated, and the raising-arms F^2 forced outwardly against the carrier-frame, which, by reason of the pivoted connections heretofore described, is brought to an elevated position, as shown in Figs. 1 and 3. The relative length of the pivoted arms which support the elevator and the distance between their pivotal points are such that the end of the elevator or carrier will be raised in a vertical line, so that the straw discharged thereby will fall in a circumferential line as the carrier is moved to or fro by the automatic device heretofore described.

In order that the sliding bearings on either side of the machine may be raised uniformly, and at the same time compensate for the lengthening of the raising-ropes due to atmospheric changes or otherwise, I provide means for lengthening or shortening one of said ropes, so that they may be kept of a uniform length, and thus produce a uniform movement of the sliding bearings and the raising device. This I preferably accomplish as shown in detail in Figs. 14 to 17, inclusive. The windlass H, next to the hand-wheel H^7 and worm-gear H^3 is mounted loosely on the shaft H^2. The worm-gear is fastened rigidly to said shaft, and is provided at one end with a clutch, p, adapted to engage in small clutching-faces p' on the end of the windlass H. The windlass H is held in engagement with the clutching-faces on the worm-gear H^3 by means of a small collar, p^2, adapted to be secured to said shaft on the opposite end of said windlass from the clutch. By this arrangement the windlass H is permitted an independent movement on the said supporting-shaft, so that the rope attached thereto may be wound onto or off from said windlass to compensate for any variation of the said ropes, and thus keep the same of a uniform length.

The power to drive the elevator and the operating devices is transmitted to a pulley, I, upon a transverse shaft, I′, located at one end of the main frame A. On the shaft I′ is

a sprocket-wheel, I^2, over which passes a chain, I^3, connected at its other end to a sprocket-wheel, I^5, on a shaft, I^7, also supported on the main frame A and parallel with the shaft I'. The shaft I^7 is provided on its inner end with a small bevel-gear, l, which meshes with a similar gear, l', on the lower end of a vertical shaft, l^2, which passes upwardly through the turn-table B', and is provided at its upper end with a sprocket-wheel, l^3, over which passes a chain, l^5, to a similar sprocket-wheel, l^7, journaled on a suitable bearing on the platform B. Secured rigidly to the sprocket-wheel l^7 is a bevel-gear, m, which engages with a similar gear, m', on a shaft, m^2, which extends to the side of the platform B, and is provided with a sprocket-wheel, m^3, connected by means of a chain, m^5, to a similar sprocket-wheel, m^7, on the driving-shaft n of the elevator or carrier C. The centers of the shafts m and n correspond with the pivots of the connecting-arms F^7 F^7, so that no matter what position the elevator or carrier may occupy the driving-chain m^5 will always remain of the same tension.

Located on the shaft I^7 is a sprocket-wheel, J, over which passes a chain, J', leading to a sprocket-wheel, J^3, on the shaft e^3, heretofore described. It will thus be seen that the power to drive all the operating parts is derived from the shaft I' and its pulley I in such a manner that the respective operating parts receive their motion in a constant and uniform manner, no matter what position the carrier may occupy in relation to the platform or the platform in relation to the main frame.

The periphery of the hand-wheel H^7, which operates the windlass-shaft H^2, is preferably made plain, and a brake-block, o, attached to the platform B, provided and adapted to bear against the periphery of said hand-wheel, so that in lowering the carrier the hand-wheel may be started, and the carrier will descend by its own weight. When sufficiently lowered the motion of the hand-wheel may be checked by bringing the brake-block in contact with the periphery thereof.

It will be seen that by the constructions above described a straw-stacker is provided in which the automatic action necessary to discharge the straw along the center of the stack in a constant and uniform manner is secured, means being provided for operating the carrier to secure large or small stacks, as desired.

By the raising and lowering mechanism described the carrier may be readily lifted or depressed to suit the conditions under which it is to operate, the outer end of the elevator always moving upwardly in a straight line, so that the straw discharged therefrom falls in the center of the stack, no matter what the height of the stack may be.

It is obvious that various modifications may be made in the parts of a stacker as thus described and its operating mechanism. I do not, therefore, limit myself to the exact constructions set forth, but claim as my invention—

1. The combination of a platform, vertical guides on each side thereof, sliding bearings in said guides, pivoted raising-arms connected to said sliding bearings and to the carrier-frame, supporting-arms and connecting-arms of different length, each pivoted at one end to the platform and at the other end to the carrier-frame, and means, substantially as described, for raising and lowering said sliding bearings, substantially as and for the purpose set forth.

2. The combination, with a platform having vertical guides thereon and sliding bearings in said guides, of raising-ropes passing under said sliding bearings, raising-arms connected at one end to the sliding bearings and at the other to the carrier-frame, supporting and connecting arms of different lengths, each pivoted at one end to the platform and at the other to the carrier, and operating mechanism for winding said ropes to raise the sliding bearings, substantially as and for the purpose set forth.

3. The combination, with the main frame and movable platform, of a turn-table consisting of a stationary hub or bearing-support secured in said main frame, an encircling frame secured to the platform, and the alternating guiding and supporting wheels in said encircling frame, adapted to travel on the bearing-support, substantially as set forth.

4. The combination, with the main frame and the movable platform, of a turn-table having the inner bearing-support, with a plane peripheral bearing and beveled flanges, as described, and an encircling frame secured to the platform and provided with alternating beveled supporting-rollers and plain horizontal guiding-rollers, substantially as set forth.

5. In a straw-stacker, a turn-table, substantially as described, consisting of an inner bearing-support provided with a plane peripheral bearing having flanges at each end thereof, and an encircling frame provided with beveled supporting-rollers adapted to travel on said beveled flanges, and alternating horizontal guiding-rollers adapted to travel on said plane peripheral bearing, substantially as described.

6. The combination, with the main frame and the movable platform, of a flanged ring, B^7, attached to said platform, the tripping-wheel connected to said ring by a cable, as described, and means for operating said tripping-wheel, substantially as and for the purpose set forth.

7. The combination, with the tripping-wheel D and the shaft e^3 and the intermediate moving mechanism, of a tripping-lever, f^5, the pivoted arms connected thereto, and a spring-connection connecting said arms, substantially as and for the purpose set forth.

8. The combination, with the driving-shaft and the loosely-revolving pinions thereon

adapted to engage on opposite sides of a gear-wheel and drive the same in opposite directions, of a moving clutch adapted to engage either of said pinions to said driving-shaft, a trip-lever connected to said clutch, and a segmental arm geared to said trip-lever carrying at one end a spring-connection, which is connected at the other end to said trip-lever, whereby the trip-lever is forced into position to cause the clutch to change its engagements with the respective pinions when the said trip-lever is moved across a line passing through the pivoted bearings of said trip-lever and segmental arm, substantially as specified.

9. The combination, with the clutching mechanism, as described, of a trip-lever, a segmental arm geared thereto, and a spring-connection between said trip-lever and arm, said spring-connection being attached to the trip-lever and arm, respectively, on opposite sides of their respective centers of oscillation, substantially as specified.

10. The combination, with the movable platform and the flanged ring secured thereto, of a tripping-wheel connected to said flanged ring by cables, as described, suitable driving mechanism attached to said tripping-wheel, and means, substantially as described, for reversing said driving mechanism when the tripping-wheel D has reached a given point, substantially as specified.

11. The combination, with the movable platform and the flanged driving ring or wheel secured thereto, of a tripping-wheel connected to said driving-wheel by cables passing in opposite directions around said wheel, and means for adjusting the tension of said cable, substantially as specified.

12. The combination, with the movable platform, the tripping-wheel, and means, as described, for connecting the same, of a driving-gear secured rigidly on the same shaft on which the tripping-wheel is adapted to turn, and means, substantially as described, for connecting said tripping-wheel with or disengaging it from said driving-gear, substantially as specified.

13. The combination, with the driving-shaft e^3, the beveled pinions turning loosely thereon, adapted to be engaged by a clutch turning with said shaft, and a driving-gear meshing with said pinions, of a tripping-wheel connected by suitable intermediate mechanism to said driving-gear, a pivoted tripping-lever connected to said clutch, a tripping-finger on said tripping-wheel, and means, substantially as described, for connecting and disconnecting said tripping-wheel to or from the driving mechanism, substantially as set forth.

14. In a straw-stacker, a turn-table having an inner bearing-support and an outer inclosing-frame, the alternating supporting and guiding rollers in said frame adapted to travel on said bearing-support, and a removable plate on the top of said bearing-support, substantially as set forth.

15. In a straw-stacker, the combination, with the stationary base-frame, of a turn-table and a wheel-rim secured to the movable portion of said turn-table and connected by cables to the moving tripping-wheel on the stationary base-frame, substantially as specified.

16. In a straw-stacker, the combination, with the base-frame and tripping-wheel and mechanism to drive the same supported on said base-frame, of a wheel-rim on the movable portion of said turn-table, said tripping-wheel and wheel-rim being connected together by cables, substantially as and for the purpose set forth.

17. The combination, in a straw-stacker, of the raising mechanism having sliding bearings and raising-ropes passing at each side under said bearings, said ropes being each secured at one end to a stationary post and at the other to a windlass on the moving shaft, and means, substantially as described, for adjusting the windlass to which one of said ropes is attached in relation to said shaft, substantially as specified.

18. The combination, with the sliding bearings and the raising-ropes, of a revolving shaft having a rope-receiving windlass thereon, operating-gear on said shaft having clutching-faces adapted to engage with similar faces on one of said windlasses mounted loosely on said shaft, and means for holding said windlass in engagement with said clutching-face, substantially as specified.

In testimony whereof I have hereunto set my hand this 14th day of August, A. D. 1888.

LOUIS F. DIETER.

Witnesses:
CHASE STEWART,
PAUL A. STALEY.