

Aug. 16, 1927.

C. W. LIVINGSTON

1,639,632

GRAIN SHOCKER

Filed Jan. 21, 1925

3 Sheets-Sheet 1

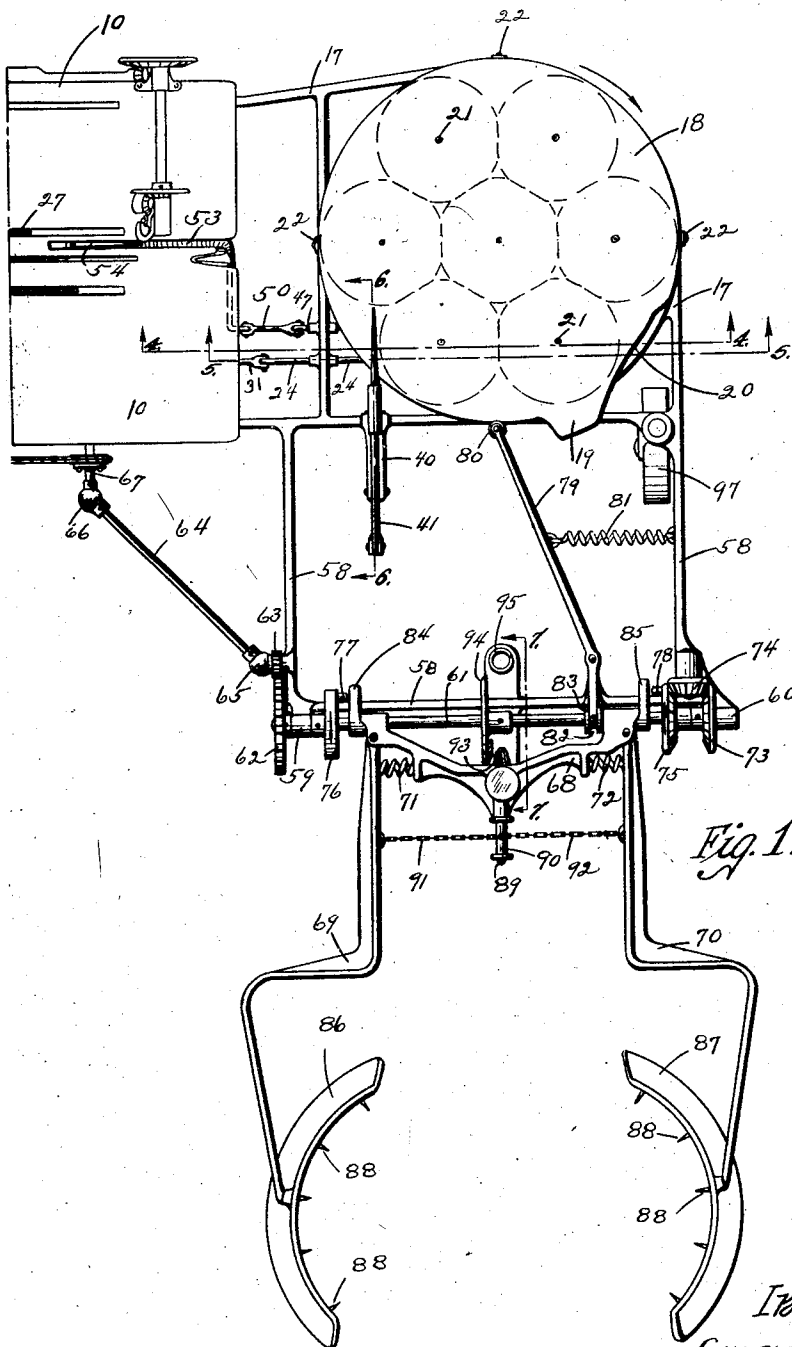


Fig. 1.

Inventor
CHARLEY W. LIVINGSTON

by M. Tallent Dick Atty

Aug. 16, 1927.

C. W. LIVINGSTON

1,639,632

GRAIN SHOCKER

Filed Jan. 21, 1925

3 Sheets-Sheet 2

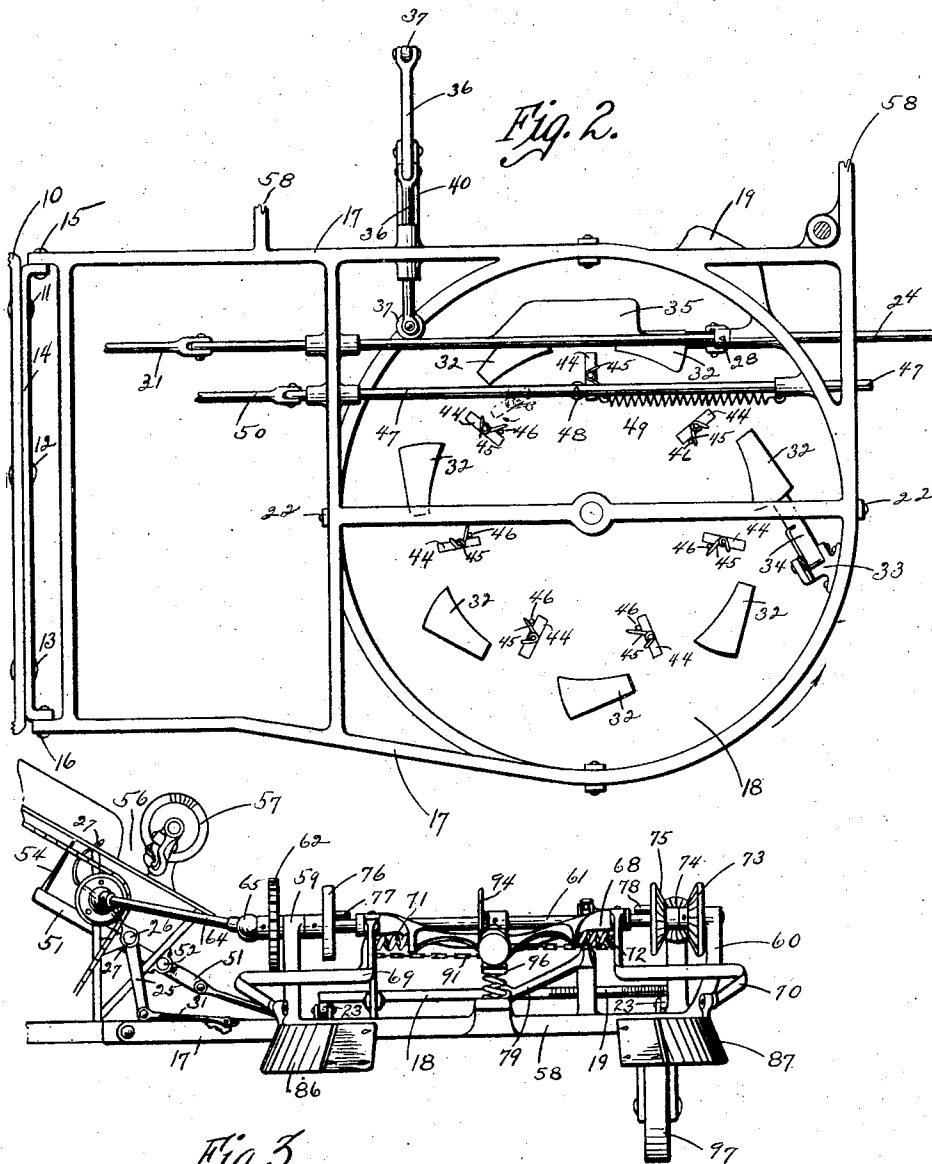


Fig. 3.

Inventor

CHARLEY W. LIVINGSTON

by M. Talbot Dick Atty

Aug. 16, 1927.

C. W. LIVINGSTON

1,639,632

GRAIN SHOCKER

Filed Jan. 21, 1925

3 Sheets-Sheet 3

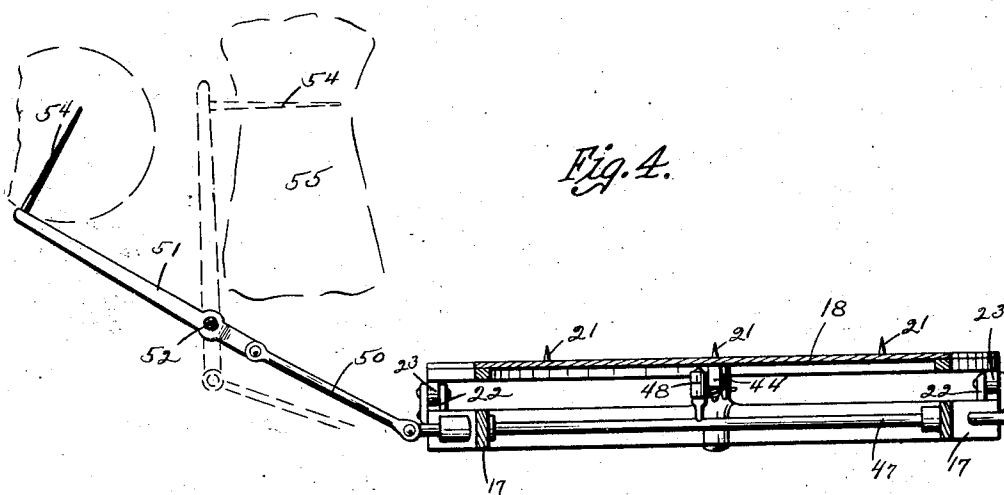


Fig. 4.

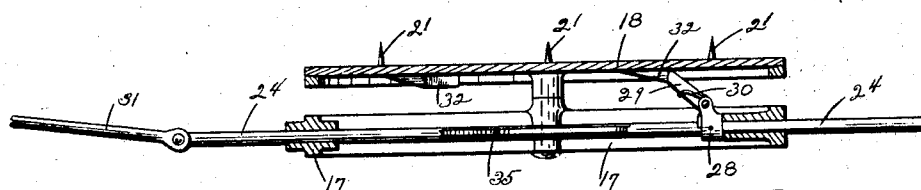


Fig. 5.

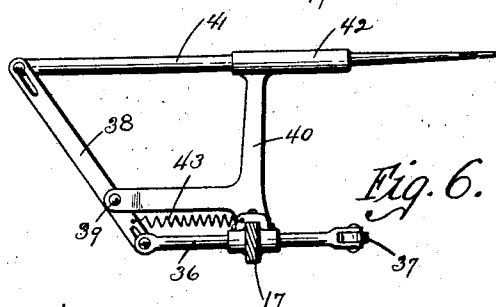


Fig. 6.

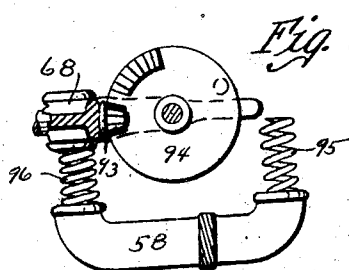


Fig. 7.

Inventor

CHARLEY W. LIVINGSTON
by M. Talbert Dick Atty

UNITED STATES PATENT OFFICE.

CHARLEY WESLEY LIVINGSTON, OF COON RAPIDS, IOWA, ASSIGNOR OF ONE-HALF TO
LYLE L. ETNER, OF GLIDDEN, IOWA.

GRAIN SHOCKER.

Application filed January 21, 1925. Serial No. 3,752.

This invention relates to automatic grain shockers secured to and operated by a grain binder.

The object of this invention is to provide an automatic grain shocker which is simple in operation and economical in manufacture.

A further object is to provide a grain shocker that is light in weight and may be easily secured to or removed from the frame of an ordinary binder.

A further object is to provide an automatic grain shocker that will deposit the shock on the ground with the bottom spread and the top compressed.

A further object is to provide a mechanism for shocking grain that will utilize the power of gravity for turning the bundles into vertical position.

These and other objects will be apparent to those skilled in the art.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, in which:

Fig. 1 is a plan view of my complete invention installed on an ordinary binder.

Fig. 2 is a bottom view of the rotatable platform and actuating mechanism relative thereto.

Fig. 3 is a rear end view of my invention mounted on an ordinary grain binder.

Fig. 4 is a sectional view of the rotatable platform and bundle placing arm taken on line 4-4 of Fig. 1.

Fig. 5 is a sectional view of the rotatable platform and ratchet means for preventing back lash. This showing is taken on line 5-5 of Fig. 1.

Fig. 6 is a side view of the bundle removing arm taken on line 6-6 of Fig. 1.

Fig. 7 is a sectional view of a part of the operating means employed to remove the shock from the platform and deposit it on the ground. This showing is taken on line 7-7 of Fig. 1.

My grain shocker is comparatively small and is designed to occupy the position usually occupied by the bundle carrier.

I have designated the ordinary binder by the numeral 10, a portion of which is shown in Figures 1, 2 and 3. Secured to the binder

by the bolts 11, 12, and 13, is the strap iron 14. Pivotaly attached to this member 14 by the bolts 15 and 16 is the frame 17 of my shocker. Rotatably mounted on a spindle 18' at one end of this frame is the platform 18. This platform is circular except for the cam lug 19 and the internal cam 20 on its periphery. The numeral 21 designates spurs on the top surface of the platform 18. The brackets 22 on the frame 17 support the rollers 23 which engage the under side of the platform 18 near its periphery. Slidably mounted in the frame 17 and below the platform 18 is the rod 24. Pivotaly secured to one end of this rod is the link 31 which is pivotaly secured at its opposite end to the crank arm 25 which is permanently secured to the shaft 26 of the binder needle 27. It will be noted here that if the needle 27 is actuated the rod 24 will also be reciprocated. Permanently attached to this rod 24 is the collar 28 which supports the operating pawl 29. This pawl is yieldingly retained in proper position by the spring 30 and is so positioned as to engage one side of one of the lugs 32, which are spaced apart in circular arrangement on the under side of the platform 18. The numeral 33 designates a bracket on the frame 17 which pivotaly supports the spring detent 34. This detent engages one side of the lugs 32 and prevents back lash of the platform 18. The numeral 35 designates a cam lug on the rod 24. Slidably mounted in the frame 17 is the rod 36 which has the roller 37 at one end. This roller is so positioned as to engage the cam 35 when the rod 24 is actuated. Pivotaly and slidably secured to the other end of the rod 36 is the lever 38. This lever is pivoted at 39 to the bracket 40 which is secured to the frame 17 by bolts. The other end of the lever 38 is pivotaly and slidingly secured to the rod 41 which is slidably mounted in the slide bearing 42 of the bracket 40. Therefore when the roller 37 engages the cam 35 the rod 41 will be reciprocated, the purpose of which will be hereinafter explained. Mounted for oscillation on the underside of the platform 18 are the bars 44. These bars are yieldably held in proper position by the coil springs 45. The numeral 46 designates pins which engage one end of the springs 45 and also limits the movement of the bars 44 to one direction. Slidably

mounted in the frame 17 is the rod 47. Mounted on this rod and so positioned as to engage the bars 44 is the roller 48. In other words when the platform 18 is rotated 1/7 of a turn one of the bars 44 will engage the roller 48 at its inner end and will force the rod 47 toward the binder until the roller 48 has traveled over the face of the bar and past its pivot whereupon the bar 44 will trip and release the roller. At this stage the spring 49 will return the rod 47 to its original position and ready for engagement with the following bar. Pivotaly secured to the end of this rod 47 is a link 50 which is pivotaly secured at its other end to the lever 51. This lever is pivotaly secured at 52 to the binder 10. This lever is so bent as to travel when actuated in the slot 53 of the binder 10. At its free end is the spike 54. The numeral 55 in Fig. 4 designates a dotted showing of a bundle of grain.

The practical operation of this part of my invention is as follows:

After enough grain has been deposited at 56 the needle 27 moves forward to the knoter 57 and ties the loose grain into a bundle in the ordinary way. By this operation the needle shaft 26 is rotated which in turn effects the arm 25 and pulls the rod 24 toward the binder. As the pawl 30 is in engagement with one of the lugs 32, that lug will also be pulled toward the binder, thus rotating the platform 1/7 of a turn. By the rotating of this platform one of the bars 44 will engage the roller 48 of the rod 47 and will pull that rod forward until the bar 44 trips. By this operation the spike 54 will pierce the new made bundle 55 near its top and will carry it toward the platform. At the time of piercing the bundle 55 it is laying in horizontal position but as it is swung and suspended on the spike 54 near its top it will, by the power of gravity be turned into vertical position. The lever 51 moves on toward the platform and deposits the bundle on one of the spurs 21 nearest the center of the platform. At this stage the rod 24 is pulled forward and the cam lug 35 will be engaging the roller 37 and the rod 41 will thereby be extended and will retain the bundle 55 on the platform until the spike 54 is withdrawn from the bundle. This withdrawal is accomplished by the bar 44 tripping and allowing the spring 49 to return the rod 47 to normal position. At this time the needle 27 of the binder returns to normal position and returns the rod 24 to its original position, thereby allowing the spring 43 to return the spike 41. As the platform is rotated 1/7 of a turn the detent 34 engages another of the members 32 and prevents the platform from returning with the rod 24. By this operation the pawl 30 must slide over the next lug 32 which is beveled at one edge and engages it for

the next action of the binder needle. The next bundle can not be deposited in the center due to the fact that one already occupies that position, therefore the spur 54 will swing the bundle as near to the center as possible and will deposit the bundle beside the center one. As the platform turns 1/7 revolution each time the needle of the binder actuates; in one revolution of the platform there will be deposited on the platform 7 bundles.

The rearwardly extending portion of the frame 17, I have designated by the numeral 58. This portion of the frame has two uprights 59 and 60 which have the shaft 61 journaled therein. At the end of this shaft adjacent the binder is permanently secured the spur gear 62. This gear engages the pinion 63 which is mounted on the frame 58. The numeral 64 designates a shaft having a universal joint 65 at one end and engaging the pinion 63. At the other end of this shaft is another universal joint 66 which engages the drive shaft 67 of the binder. Therefore when the binder is in operation the shaft 61 will be rotated. Loosely mounted on the shaft 61 is the yoke bracket 68. Pivotaly mounted on each end of this bracket are the arms 69 and 70. They are yieldably held in approximately parallel position by the springs 71 and 72. Securely mounted on the shaft 61 at the end furthest from the binder is the bevel gear 73 which engages a second bevel gear 74 mounted on the upright 60. This bevel gear engages a third bevel gear loosely mounted on the shaft 61. By this arrangement the last mentioned bevel gear turns to the right when the shaft 61 turns to the left. Mounted near the other end of the shaft 61 and permanently mounted thereon is the wheel 76 which has the inwardly extending lug 77. The numeral 78 designates a similar inwardly extending lug on the bevel gear 75. Pivotaly mounted on the frame 58 is the lever 79 which carries at one end the roller 80. This roller is held in engagement with the periphery of the platform 18 at all times by the spring 81. The other end of this lever is forked and engages a peripheral groove 82 in the loosely mounted wheel 83 on the shaft 61. This wheel 83 is permanently secured to the member 68. The numerals 84 and 85 designate projections on the arms 70 and 69. Rotatably mounted on the arms 69 and 70 are the gripping members 86 and 87. The numeral 88 designates teeth on these gripping members to facilitate these members in retaining the shock within their grasp. Rotatably mounted in the member 68 is the shaft 89. Secured to one end of this shaft is the drum 90 which has secured thereto the chains 91 and 92. These chains are attached at their opposite ends to the arms 69 and 70. At the other

end of the shaft 89 and attached thereto is the pinion 93. The numeral 94 designates a mutilated bevel gear which engages the pinion 93 at times. Mounted on the frame 58 are the cushion springs 95 and 96 and are positioned on opposite sides of the shaft 61. The numeral 97 designates a castor wheel designed to engage the ground and to support the side of the frame 17.

The practical operation of this last described part of my invention is as follows:

After the platform 18 has made a complete revolution there are seven bundles deposited thereon. At this time the cam lug 19 is in engagement with the roller 80 which actuates the lever 79 and slides the bracket 68 and members carried thereby on the shaft 61 until the projection 85 engages the lug 78 on the bevel gear 75. As the bevel gear 75 is turning to the right it will carry the projection 85 with it and thereby the arms 70 and 69 will rotate with the shaft 61 and will be deposited on each side of the shock resting on the platform 18. By the above operation the pinion 93 will be in engagement with the mutilated gear 94 which is turning with the shaft 61. This engagement rotates the drum 90 and thereby pulls the two arms 69 and 70 together and grips the shock between the members 86 and 87. As soon as this action is completed the roller 80 is in engagement with the internal cam 20 which slides the bracket 68 and members carried thereby in the opposite direction on the shaft 61 until the projection 84 engages the lug 77 on the wheel 76. As this wheel is traveling with the shaft 61 and to the left, it will carry the bracket 68 and members mounted thereon with it. The gripping members 86 and 87 that are also carried back by this last action will also carry back in their grasp the shock that was on the platform 18. These members will retain this shock until the proper moment for release due to the fact that the complete mechanism of this part of my invention is traveling with the shaft 61 and the teeth of the pinion 93 will be in engagement with the gear 94 and will prevent the drum 90 from unwinding and allowing the arms 69 and 70 from spreading. As the members 86 and 87 grip the shock near its top and are pivotally mounted on the arms 69 and 70, the shock will always be in vertical position. By the time the shock is in proper position above the ground the roller 80 is out of engagement with the internal cam 20 and the lever 79 will release the projection 77 from the lug 76 and the gear 94 will travel on and out of engagement with the pinion 93, thereby allowing the springs 71 and 72 to force the arms apart, unwind the drum and deposit the shock on the ground. All these actions are properly timed so as to obtain

the desired results. The bracket 68 and members carried thereon are released from engagement with the shaft 61 just before reaching horizontal and thereupon fall to either the cushion spring 95 or 96 where they rest until the next operation.

Having fully described my invention, what I claim and desire to obtain by Letters Patent, is:

1. In combination with a binder, a grain shocker comprising a frame, a platform mounted on said frame, an arm capable of engaging the new made bundle near one end, so that when said arm carries said bundle to said platform the force of gravity will turn the bundle from a horizontal to a vertical position, a means for actuating said arm, and a means for holding said bundle on said platform while said arm is being withdrawn from said bundle, for the purposes stated.

2. In combination with a binder, a grain shocker comprising, a frame, a rotatable platform on said frame, a cam lug on the periphery of said platform, said platform also having a depression on its periphery, a means for rotating said platform, an arm, a spear on said arm capable of engaging the new made bundle near one end so that when said arm carries said bundle to said platform the force of gravity will turn the bundle from a horizontal to a vertical position, a means for actuating said arm, a lever pivotally mounted on said frame, a roller on said lever designed to engage the periphery of said platform and grasping members capable of embracing the new made shock near its top, so that when said grasping members carries the said shock to the ground the force of gravity will keep the shock in vertical position, said grasping members being in engagement with said lever and placed in operative position thereby.

3. In combination with a binder, a grain shocker comprising, a frame, a rotatable platform mounted on said frame, a crank arm secured to the needle shaft of the binder, a rod slidably mounted in said frame, a link connecting said crank arm with said rod, lugs mounted on the underside of said platform, a pawl secured to said rod and designed to engage said lugs, bars mounted on the underside of said platform for oscillation, springs for yieldingly holding said bars in normal position, pins for limiting the movement of said bars to one direction, a second rod slidably mounted in said frame, a roller mounted on said rod designed to engage said bars, a lever pivotally mounted on said binder, a link connecting said second rod and said lever, a spike mounted on the free end of said lever designed to pierce a bundle of grain near its top and carry it from the binder to the

platform, and a means for lifting a shock from said platform to the ground, for the purposes stated.

4. In combination with a binder, a grain shocker comprising a frame, a platform mounted on said frame, an arm capable of engaging the new made bundle near one end, so that when said arm carries said bundle to said platform the force of gravity will turn the bundle from a horizontal to a vertical position, and a means for actuating said arm.

5. In combination with a binder, a grain shocker comprising a frame, a rotatable platform mounted on said frame, a means for rotating said platform, an arm capable

of engaging the new made bundle near its top so that when said arm carries said bundle to said platform the force of gravity will turn the bundle from a horizontal to a vertical position, a means for actuating said arm, grasping members capable of embracing the new made shock near its top so that when said grasping members carries the said shock from the platform to the ground the force of gravity will keep the shock in vertical position, and a means for actuating said grasping members.

Signed at Coon Rapids, in the county of Carroll and State of Iowa, this 19th day of Dec., 1924.

CHARLEY WESLEY LIVINGSTON.