

No. 868,788.

PATENTED OCT. 22, 1907.

T. LAIT.
OPERATING MECHANISM FOR BINDER SAILS OR FANS.
APPLICATION FILED DEC. 29, 1906.

4 SHEETS—SHEET 1.

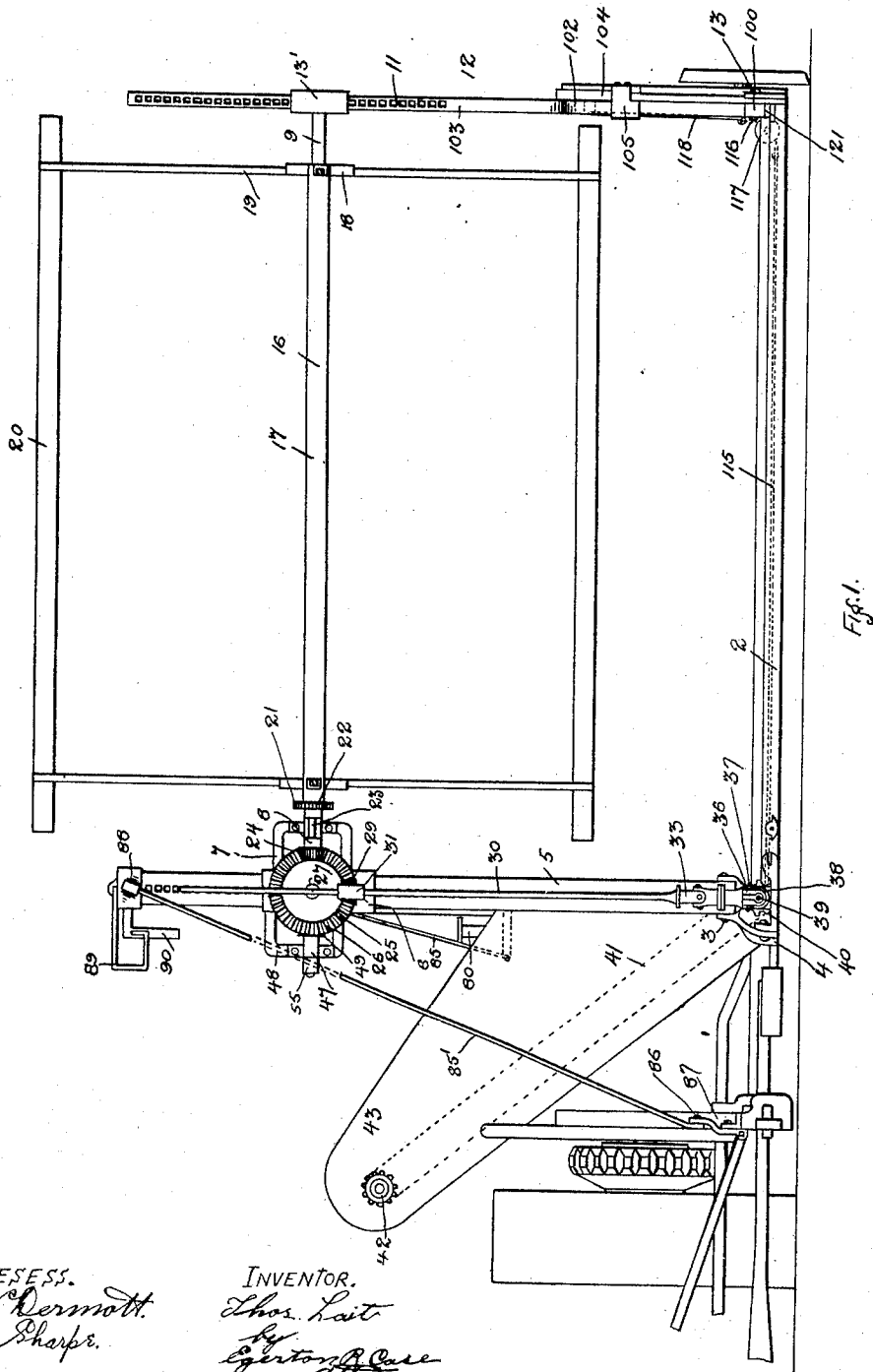


Fig. 1.

WITNESS.
F. M. Dermott.
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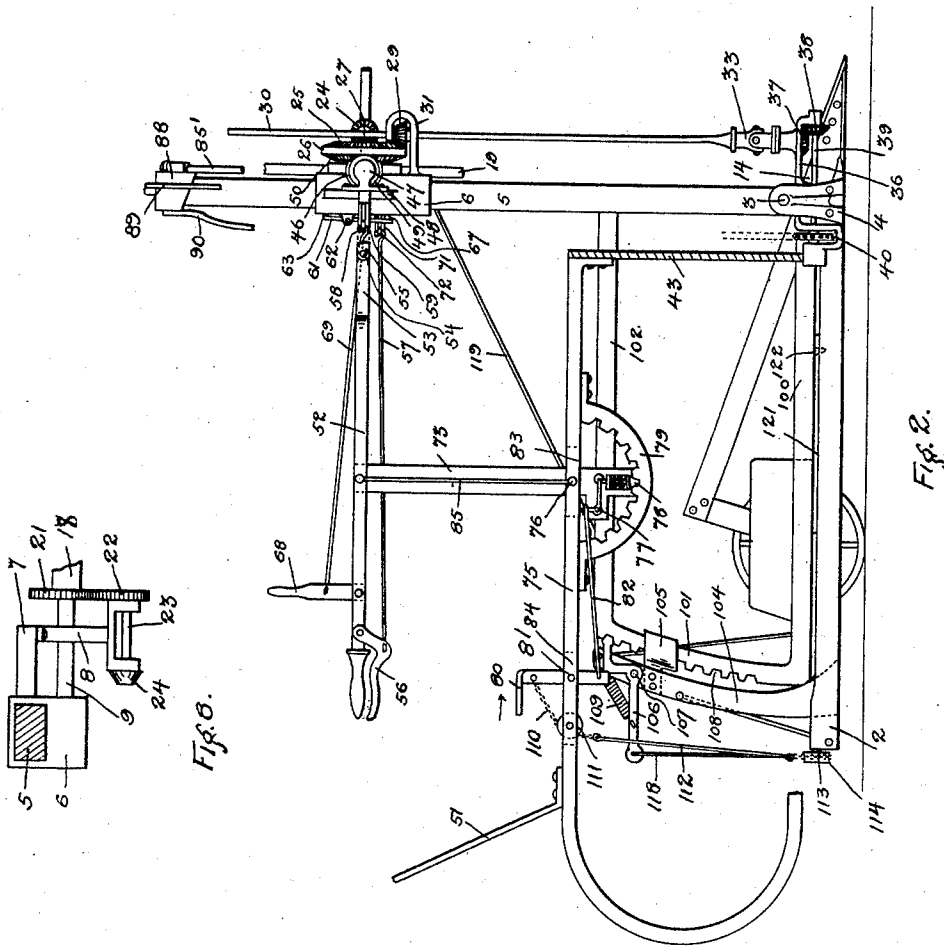
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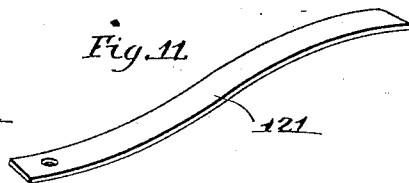
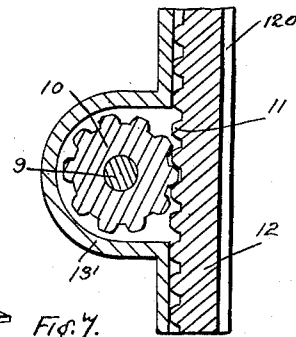
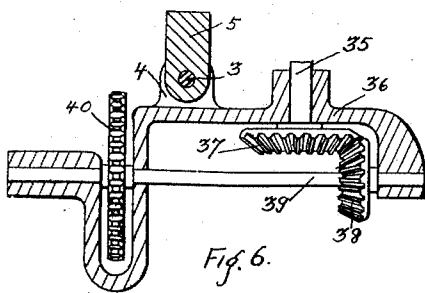
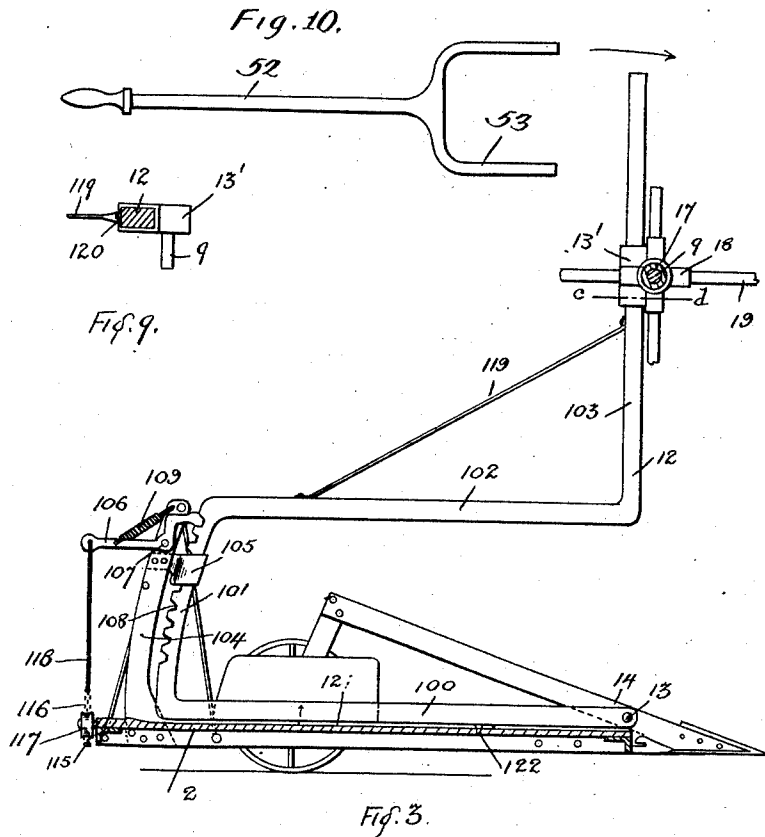
4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 4.

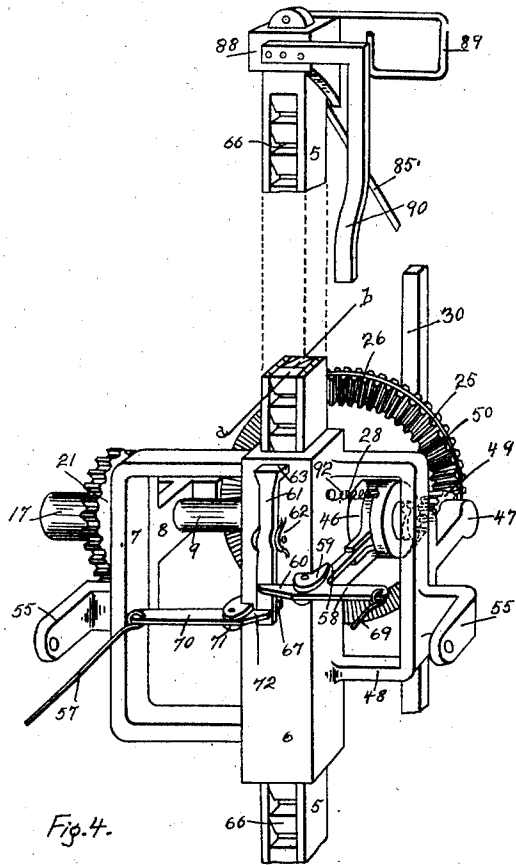


Fig. 4.

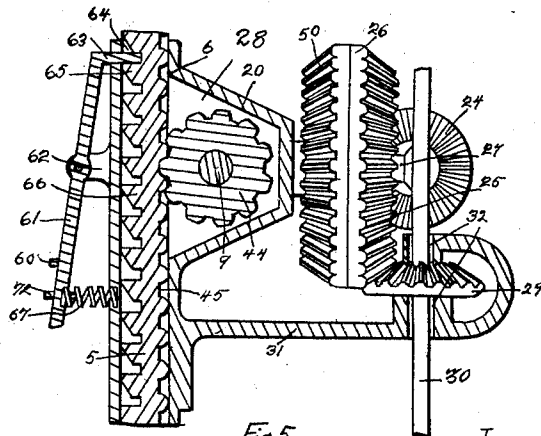


Fig. 5.

WITNESSES
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UNITED STATES PATENT OFFICE.

THOMAS LAIT, OF MEDICINE HAT, ALBERTA, CANADA.

OPERATING MECHANISM FOR BINDER SAILS OR FANS.

No. 868,788.

Specification of Letters Patent.

Patented Oct. 22, 1907.

Application filed December 29, 1906. Serial No. 349,958.

To all whom it may concern:

Be it known that I, THOMAS LAIT, a subject of the King of Great Britain, residing at Medicine Hat, in the Province of Alberta, Canada, have invented certain new and useful Improvements in Operating Mechanism for Binder Sails or Fans, of which the following is a specification.

My invention relates to improvements in operating mechanism for binder sails or fans, and the objects of my invention are: firstly, to provide an improved construction for the standard supported from the grain-wheel end of the binder so as not to interfere with the movement of the grain and so prevent any portion of the binder from becoming clogged thereby, and secondly, to provide improved means for releasing the standard at the grain-wheel end of the binder and the standard at the master-wheel end of the binder by one operation of the foot.

The construction of my invention will be hereinafter fully described, and the parts I claim as new will be set forth in the appended claims.

The present application covers an invention which is an improvement on my operating mechanism for binder sails or fans, filed May 31st, 1906, under Serial Number 319,475.

Figure 1 is a front elevation of my improved reel and the mechanism for operating same, showing same attached to the platform of a binder, portion of which only is shown. Fig. 2 is a side elevation of my improved mechanism for operating the reel, showing same supported by a binder, portion of which only is shown. Fig. 3 is a vertical cross-section through the platform of a binder machine, showing a side elevation of the standard supported at the grain-wheel end of the binder, and means for supporting same. Fig. 4 is an enlarged rear perspective view of the mechanism for rotating the reel, and showing the preferred means for supporting same on the standard hinged to the master-wheel end of the binder platform, only portion of said standard being shown. Fig. 5 is an enlarged section on the vertical plane passing through the line *a-b*, Fig. 4, showing portion of the driving means for the reel, and showing means for raising and lowering same. Fig. 6 is an enlarged vertical section through the operating mechanism at the lower end of the standard hinged to the master-wheel end of the binder platform. Fig. 7 is an enlarged vertical section through portion of the standard hinged at the grain-wheel end of the binder, showing the pinion secured to the reel-shaft and coöperating therewith. Fig. 8 is an enlarged plan view of the gearing for rotating the reel. Fig. 9 is a horizontal cross-section on the line *c-d*, Fig. 3, through the standard at the grain-wheel end of the binder, and the bracket operating therearound. Fig. 10 is a plan view of the lever 52 pivoted to the seat-board. Fig. 11 is an enlarged perspective view of the

spring secured to the platform and co-acting with the standard hinged at the grain-wheel end of the binder.

In the drawings like characters of reference indicate corresponding parts in each figure.

2 is the platform of the binder which is constructed after any well known manner.

Hinged at 3 to the bracket 4 which is suitably bolted to the master-wheel end of said platform is a standard 5 over which operates the sleeve 6. According to my preferred form of construction shown, said sleeve is provided with a wing 7 to which is secured or formed a part thereof the bracket 8 in which has bearing at one end the reel-shaft 9. This reel-shaft extends to the grain-wheel end of the binder and has keyed thereto at this end a pinion 10 which operates in the gear toothed rack 11 with which the standard 12 (to be hereinafter particularly described) is provided, which standard is hinged at 13 to any suitable support 14 at the grain-wheel end of the binder.

13¹ is a bracket operating over the rack-provided portion 103 of the standard 12 and in which has bearing the portion of the reel-shaft 9 passing therethrough.

Loosely mounted on the reel-shaft 9 is the reel 16 which may be of any suitable construction, and provided with the usual sails or fans. According to the construction shown of this reel, same comprises a sleeve 17 provided at each end with spiders 18 to which is suitably bolted the arms 19 which carry the fans or sails 20.

21 is a gear-wheel secured to one of the spiders 18 and meshing with the pinion 22 keyed to the shaft 23 (which has bearing in the bracket 24) and which shaft is provided with a bevel pinion 24 which meshes with the front face 25 of the double bevel gear wheel 26 which is mounted on the stub-shaft 27 secured to or formed a part of the front portion 28 of the bracket 6.

Meshing with the front face 25 of the double bevel gear-wheel 26 is a bevel pinion 29 through which passes a shaft 30 which rotates said bevel pinion 29. This bevel pinion is held in mesh with the front face 25 of the double bevel gear-wheel 26 by any suitable means. According to the construction shown, I show a bracket 31 for this purpose secured to or formed a part of the bracket 6. Where the shaft 30 passes through said bracket 31, same is provided with holes 32 larger than said shaft so that same will not come in contact therewith. It will be understood that when the bracket 6 is raised and lowered on the standard 5 (by means hereinafter described) that the parts above described will move therewith and will be held in a constant position in relation to each other. The shaft 30 is coupled by a universal joint 33 to the stub-shaft 35 held in the portion 36 of the bracket 4. The construction just described for connecting the shaft 30 with the stub-shaft 35 is of course well known. This stub-shaft carries a bevel gear-wheel 37 which meshes with a bevel pinion 38 keyed to

a shaft 39 journaled in said bracket 4. By means of a sprocket-wheel 40 suitably supported on said shaft 39 and the sprocket-chain 41 cooperating therewith (which is shown dotted) energy is transmitted (by suitable means not shown) from any suitable source of supply, to the sprocket-wheel 42 journaled at the upper portion of the member 43 and near the binder deck, so as to rotate the reel 16. In order to raise and lower said reel so as to enable same to handle all kinds of crop, I provide the following means: Keyed to the reel-shaft 9 is a pinion 44 which meshes with the gear toothed rack 45 with which the standard 5 is provided. Upon referring to Fig. 5 it will be seen that this pinion 44 is preferably housed by the front portion 28 of the bracket 6. Feathered on the reel-shaft 9 is a toothed clutch 46. 47 is a bracket secured to or formed a part of the wing 48, secured to or formed a part of the bracket 6, in which has bearing the master-wheel end of the reel-shaft 9. Loosely mounted on this reel-shaft is a bevel pinion 49 which is held constantly in mesh with the back face 50 of the double bevel-gear-wheel 26. The bevel pinion 49 is constructed after any of the well known manners in order that the toothed clutch 46 may cooperate therewith. Extending adjacent to the driver's seat (the post 51 of which only is shown) is a lever 52 of any suitable construction. In order that this lever may cooperate with the bracket 6, same is constructed with a forked end 53 which is pivoted at 54 to the ears 55 secured to or formed part of the wings 7 and 48. By pulling the lever 68 connected by the rod 69 to the clutch lever 58 (which is pivoted by the lugs 59 to the bracket 6) the clutch 46 is moved so as to be coupled to the bevel pinion 49 thus rotating the reel-shaft 9 and the pinions 44 and 10 and raising up the sleeve 6 and said reel. The bevel-pinion 29 it will of course be understood has union with the shaft 30 in such a manner as to permit of its longitudinal movement thereon, as will be understood by one skilled in this art. As soon as the reel has been raised to the proper height, the clutch 46 is thrown out of gear as will be understood.

From the construction and operation of the parts before described, it will be understood that the reel 16 is continuously revolved. As before described, through the movement of the clutch lever 58 the mechanism for raising the reel is thrown into gear. During the throwing of this mechanism into gear, the nose 60 of the clutch lever 58 presses against the lower end of the lever 61 (pivoted by the ears 62 to the bracket 6) and moves the end of the nose 63 of said lever out of the notch 64. But this movement does not move said nose far enough to escape the teeth 65, thus still locking the bracket 6 and its connected parts to the standard 5. When the mechanism for raising said bracket and the reel is actually in operation, then the nose 63 is moved upward out of locking engagement with the rack 66. By thus positively throwing into gear the mechanism for raising the reel prior to the unlocking of the bracket 6 and parts carried thereby from the standard 5, it will be understood that there is no possible chance of said reel and bracket 6 and connected parts from falling. From the foregoing, it will be understood that the nose 63 of the lever 61 is always in position to engage with one of the teeth 65 immediately upon the throwing out of gear of the reel-raising mechanism and thus lock the bracket 6 and its connected

parts to the standard 5. The notches 64 and teeth 65 constitute the toothed rack 66 secured to or formed part of the standard 5. It will be noticed that the teeth 65 are sloped inward so that the nose 63 will slip thereby and not lock the bracket 6 to the standard 5 during the operation of the reel-raising mechanism. By means of the spring 67 held between the lower end of the lever 61 and the bracket 6, it will be understood that the lever 61 will be positively held in normal position. Upon release of the pull of the rod 69 against the clutch lever 58 it will be understood that by reason of the position of said clutch lever the spring 67 will move said clutch lever into the position shown in Fig. 4, thus throwing the clutch 46 out of contact with the bevel-pinion 49 thus stopping the rotation of the pinion 44. In order to lower the reel, the grip 56 (pivoted to the lever 52) is pulled so that by means of the rod 57 connecting same to the lever 70 (pivoted by the ears 71 to the bracket 6) said lever 70 is moved so that its nose 72 will depress the lower end of the lever 61 and move its nose 63 out of one of the notches 64 and far enough to escape the teeth 65. These parts are held in this position while the lever 52 (which is connected as before described to the bracket 6) is tilted around its support 73 which is pivoted to the seat-board 75. Upon release of the grip 56 it will be understood upon inspecting Figs. 4 and 5 that the spring 67 will move the levers 61 and 70 back to normal position.

In order to provide for the necessary movement of the standards 5 and 12, the support 73 is pivoted as shown at 76 to the seat-board 75 and is adjustably held in different positions by any suitable means, with which means cooperates means for locking and unlocking the standard 12, hereinafter particularly explained. For the purpose of adjustably holding the seat-board 75 in any set position, I pivot to the lower portion of said support a bell-crank lever 77 which controls a spring-controlled bolt 78 which engages with the toothed quadrant 79 suitably secured to the under side of the seat-board 75. In order to release the bolt 78 from the quadrant 79, I provide a foot-lever 80 pivoted at 81 to the seat-board, and connect the lower end of same by means of a rod 82 to the bell-crank lever 77. As this foot-lever is in close proximity to the driver's foot it will be understood that by moving same in the direction indicated by arrow, the support 73 will be unlocked and may then be moved into the required position. Upon release of pressure from the foot-lever 80, the mechanism connected therewith will of course lock the said support in position. Where the lever 80 and support 73 operate through the seat-board 75, I provide suitable longitudinal slots 83 and 84.

85 is any suitable brace for the lever 52.

It will of course be understood that the standard 5 may be braced or supported by any suitable means. According to the construction shown, I provide a stay-rod 85' hinged at its lower end 86 after any suitable construction to portion of the frame 87 of the binder. The upper end of said stay-rod is secured to the cap 86 with which the standard 5 is provided.

89 is any suitable rein-support secured to or formed a part of the cap 88.

In case the driver should be careless and leave the reel-raising mechanism in operation too long, and in order to prevent the damaging of the parts, I secure to

or form a part of said cap 88 a downwardly-depending arm 90, the lower end of which is in the path of movement of the outside of the clutch lever 58. Upon referring to the drawings it will be seen that when the bracket 6 is raised up high enough, the clutch lever 58 will be moved in contact with the arm 90 and same is constructed so that this lever is thrown into the position shown in Fig. 4, thus throwing the reel-raising mechanism out of gear and permitting the lever 61 to lock the sleeve 6 of the reel to the standard 5: Thus automatically throwing the reel-raising mechanism out of gear at certain times prevents the mechanism from being damaged.

Upon inspecting Figs. 5 and 7, it will be seen that the pinions 44 and 10 are of the same size. Now from the operation of the parts before described, it will be understood that when the pinion 44 is rotated to raise or lower the master-wheel end of the reel, the pinion 10 is likewise operated in the required direction and thus raises or lowers the grain-wheel end of said reel (through the medium of the reel-shaft 9) and the same distance that the master-wheel end of the reel has been raised or lowered, thus keeping the fans or sails 20 in such position that they will always operate parallel to the cutter-bar. The standard 12 will be preferably of the same height as the standard 5. By hinging these standards as before described, it will be understood that the backward and forward movement of the reel is provided for.

In order to prevent the jarring of the machine accidentally throwing the clutch 46 into gear with the bevel-pinion 49, I provide a spring 92 connected at one end to the bracket 6 and at the other end to the end of the clutch lever 58 engaging with the clutch 46. Upon referring to Fig. 4, it will be understood that the action of the spring 92 keeps the clutch 46 in the position shown so that the reel-raising mechanism will be out of gear. From the foregoing specification, it will be understood that the spring 92 assists the spring 67 in its action, at certain times, against the clutch lever 58. The spring 67 really exerts no pressure against the clutch lever 58 when the lever 61 is depressed by the lever 70, so therefore an additional spring for positively holding the clutch 46 out of gear, at certain times, with the bevel-pinion 49, would appear to be necessary.

In my before-mentioned application, the standard 12 was constructed perpendicular throughout its length, and I found that same was liable to cause the grain to clog therearound. Now in my improvement, the standard 12 is provided with a lower portion 100; a toothed portion 101; a horizontal portion 102, and a rack-provided portion 103. By constructing my standard as shown in Figs. 2 and 3 of the drawings, it will be understood that by reason of the gap or space between the portions 100 and 102, the grain will not clog against said standard. The toothed portion 101 is of course concentric to the pivotal point 13 of said standard.

104 is a suitable standard secured to the platform 2, as shown.

105 is a bracket by means of which the toothed portion 101 of the standard 12 is held in relationship to the standard 104. The bracket 105 is suitably secured to the standard 104.

106 is a dog pivoted at 107 to the standard 104, and is designed to engage with the teeth 108 of the toothed portion 101 of the standard 12.

109 is a spring which connects the dog 106 to the standard 104 and keeps said dog in engagement with the teeth 108.

When the driver operates the lever 80 in order to unlock the supports 73, I provide a means whereby the same movement of the lever will unlock the standard 12. In other words, the movement of the lever 80 will unlock the standards 5 and 12 at the same time and thus permit same to be moved in the required direction. When the lever 80 is moved in the direction indicated by arrow, this movement, besides operating the rod 82 so as to release the bolt 78 from the quadrant 79, operates the dog 106 so as to move same out of contact with the toothed portion 101 of the standard 12, through the means now to be described.

110 is a flexible connection passing over the pulley 111 supported in the seat-board 75, and connecting the lever 80 with a rod 112.

113 is a flexible connection passing under the pulley 114 suitably supported from the rear of the platform 2, and by means of which the rod 112 is connected with the rod 115 which preferably lies at the back of the platform 2.

Passing under the pulley 117 (which is likewise suitably supported at the rear of the platform 2, as is the pulley 113) is a flexible connection 116 by means of which the rod 115 is secured to the rod 118 which is connected to the dog 106.

By the means just described, it will be understood that one movement of the lever 80 will unlock the standards 5 and 12. The spring 109 will return the dog 106 of the means intermediate same and the lever 80 back to normal position so soon as pressure is relieved from the lever 80. The bracket 105 will prevent undue side motion of the standard 12.

If desired I may provide a brace 119 bracing together the portions 102 and 103 of the standard 12. In order to permit free movement of the bracket 105, the rear of same is cut away as shown at 120 so as not to interfere with the brace 119.

121 is a flat spring which is suitably secured as at 122 to the platform 2. When in its normal position, the portion 100 of the standard 12 will rest upon the spring 121. The said spring is so constructed that it exerts energy to assist the operator in moving the standard 12 around its pivotal point 13.

It will of course be understood that the lever 80 and mechanism controlled thereby is only operated when the standards 5 and 12 are moved around their pivotal points 3 and 13.

What I claim as my invention is:--

1. In a harvesting machine, the combination with the platform; a standard hinged at the inner end of same, and a bracket supported by said standard; of the reel-shaft having a bearing at one end in said bracket; a standard at the other end of said platform comprising a lower horizontal portion the forward end of which is suitably hinged to said platform; a lower upright intermediate portion; an upper horizontal intermediate portion, and an upper vertically-extending portion provided with a rack; a bearing piece movable on said upper vertically-extending portion and in which the outer end of said reel-shaft has its bearing; a toothed pinion secured to said reel-shaft and meshing in the rack of said upper vertically-extending portion of said standard; the reel loosely mounted on said reel-shaft; means for rotating said reel; means for raising and lowering same by rotating said reel-shaft; means for locking said standard hinged at the inner end of said

platform; means for locking said standard hinged at the outer end of said platform, and means for simultaneously unlocking said standards so as to permit of their forward and backward movements.

5 2. In a harvesting machine, the combination with the platform; a standard hinged at the inner end of same, and a bracket supported by said standard; of the reel-shaft having a bearing at one end in said bracket; a standard at the outer end of said platform comprising a lower horizontal portion the forward end of which is suitably hinged to said platform; a lower upright intermediate portion provided with teeth; an upper horizontal intermediate portion, and an upper vertically-extending portion provided with a rack; a bearing piece movable on said upper vertically-extending portion and in which the outer end of said reel-shaft has its bearing; a toothed pinion secured to said reel-shaft and meshing in the rack of said upper vertically-extending portion of said standard; the reel loosely mounted on said reel-shaft; means for rotating said reel; means for raising and lowering same by rotating said reel-shaft; means for locking said standard hinged at the inner end of said platform; a standard supported from said platform; means supported by said standard and designed to support said standard hinged at the outer end of said platform by cooperating with the lower tooth-provided intermediate portion thereof; a dog hinged to said standard and cooperating with the teeth of said tooth-provided intermediate portion of said standard; a lever connected to the means for locking and unlocking said standard hinged at the inner end of said platform, and means connecting said lever to said dog, and connections whereby the operation of said lever simultaneously unlocks said standards so as to permit of their forward and backward movements.

35 3. In a harvesting machine, the combination with the platform, a standard hinged at the inner end of same; a bearing piece supported by said standard; the reel supported at one end in said bracket, and means for operating said reel, of a standard at the other end of said platform and comprising a lower horizontal portion the forward end of which is suitably hinged at said platform; a lower upright intermediate portion; an upper horizontal intermediate portion, and an upper vertically-extending portion; means carried by said upper vertically-extending portion whereby the outer end of said reel is supported by said standard in such a manner as to keep the reel parallel to said platform; means for locking said standard hinged at the inner end of said platform; means for locking said standard hinged at the outer end of said platform, and means for simultaneously unlocking the locking means for said standards so that said standards may be moved forward or backward on their hinged points.

4. In a harvesting machine, the combination with the platform, a standard hinged at the inner end of same; a bearing piece supported by said standard; the reel supported at one end in said bracket, and means for operating said reel, of a standard at the other end of said platform and comprising a lower horizontal portion the forward end of which is suitably hinged at said platform; a lower upright intermediate portion provided with teeth; an upper horizontal intermediate portion, and an upper vertically-extending portion; means carried by said upper vertically-extending portion whereby the outer end of said

reel is supported by said standards in such a manner as to keep the reel parallel to said platform; means for locking said standard hinged at the inner end of said platform; means for locking said standard hinged at the outer end of said platform cooperating with the tooth-provided intermediate portion of said standard, and means for simultaneously unlocking the locking means for said standards so that said standards may be moved forward or backward on their hinged points.

5. In a harvesting machine, the combination with the platform, of a standard at the outer end of said platform comprising a lower portion the forward end of which is suitably hinged on said platform; said lower portion normally occupying a substantially horizontal position; a lower upright intermediate portion constructed concentric to the hinged point of said standard; an upper intermediate portion normally occupying substantially a horizontal position, and an upper vertically-extending portion; a standard supported from said platform and designed to give additional support to said first-named standard, and means supported by said second-mentioned standard so as to lock said first-mentioned standard in the desired position.

6. In a harvesting machine, the combination with the platform, of a standard at the outer end of said platform comprising a lower portion, the forward end of which is suitably hinged on said platform; said lower portion normally occupying a substantially horizontal position; a lower upright intermediate portion constructed concentric to the hinged point of said standard; an upper intermediate portion normally occupying substantially a horizontal position; an upper vertically-extending portion; a standard supported from said platform and designed to give additional support to said first-named standard; means supported by said second-mentioned standard so as to lock said first-mentioned standard in the desired position, and a spring so placed as to assist the movements of said first-mentioned standard around its pivotal point.

7. In a harvesting machine, the combination with the platform, of a standard at the outer end of said platform comprising a lower portion, the forward end of which is suitably hinged on said platform; said lower portion normally occupying a substantially horizontal position; a lower upright intermediate portion provided with teeth constructed concentric to the hinged point of said standard; an upper intermediate portion normally occupying substantially a horizontal position, and an upper vertically-extending portion; another standard supported from said platform; a bearing-piece secured to said standard and through which passes the lower tooth-provided intermediate portion of said first-mentioned standard so as to support same; a dog hinged to said second-mentioned standard and cooperating with the teeth in said lower upright intermediate portion so that said first-mentioned standard may be locked in the desired position.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

THOMAS LAIT.

Witnesses:

L. G. SHARPE,
F. McDERMOTT.