

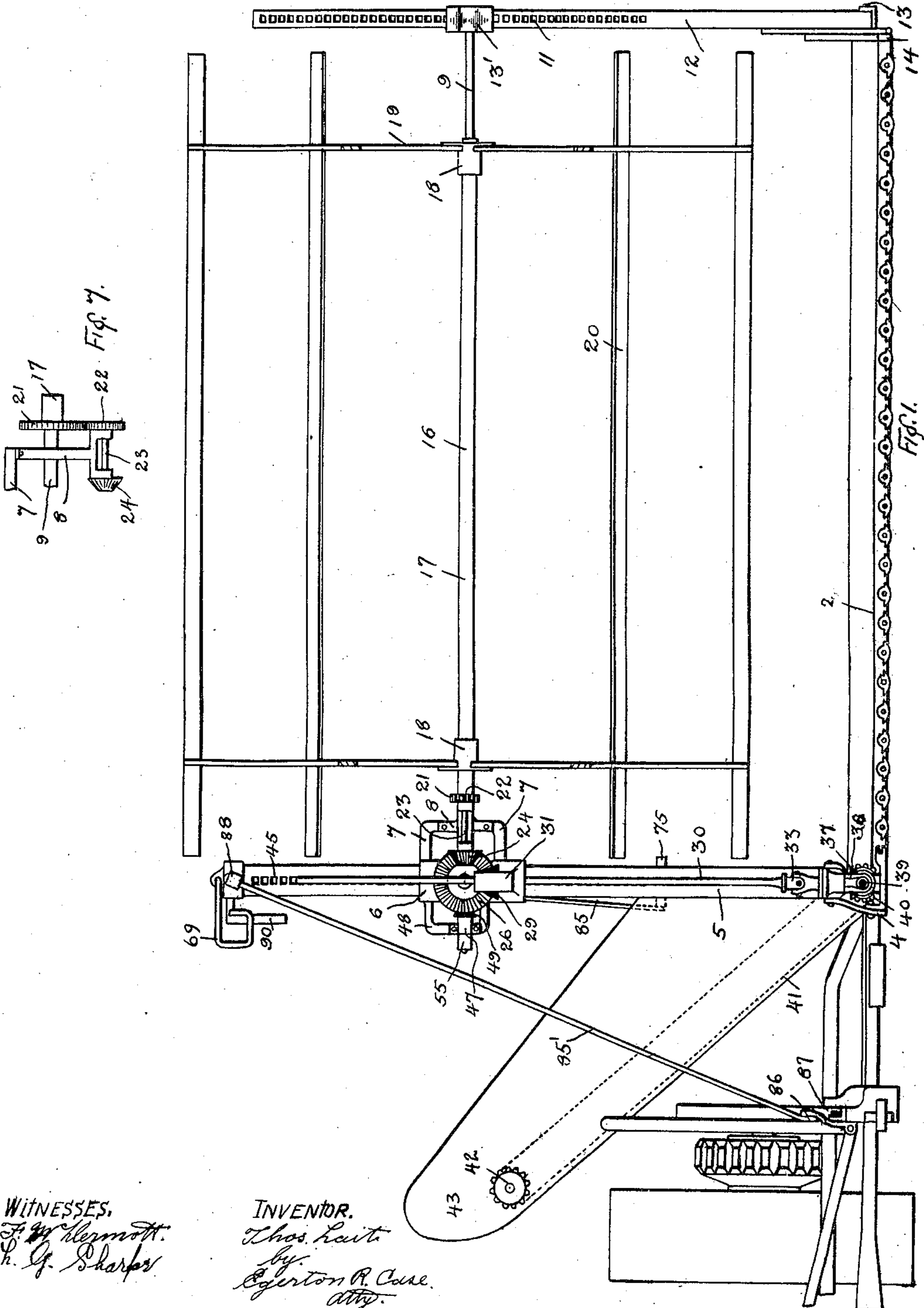
No. 862,258.

PATENTED AUG. 6, 1907.

T. LAIT.  
OPERATING MECHANISM FOR BINDER SAILS OR FANS.

APPLICATION FILED MAY 31, 1906.

3 SHEETS—SHEET 1.



WITNESSES,  
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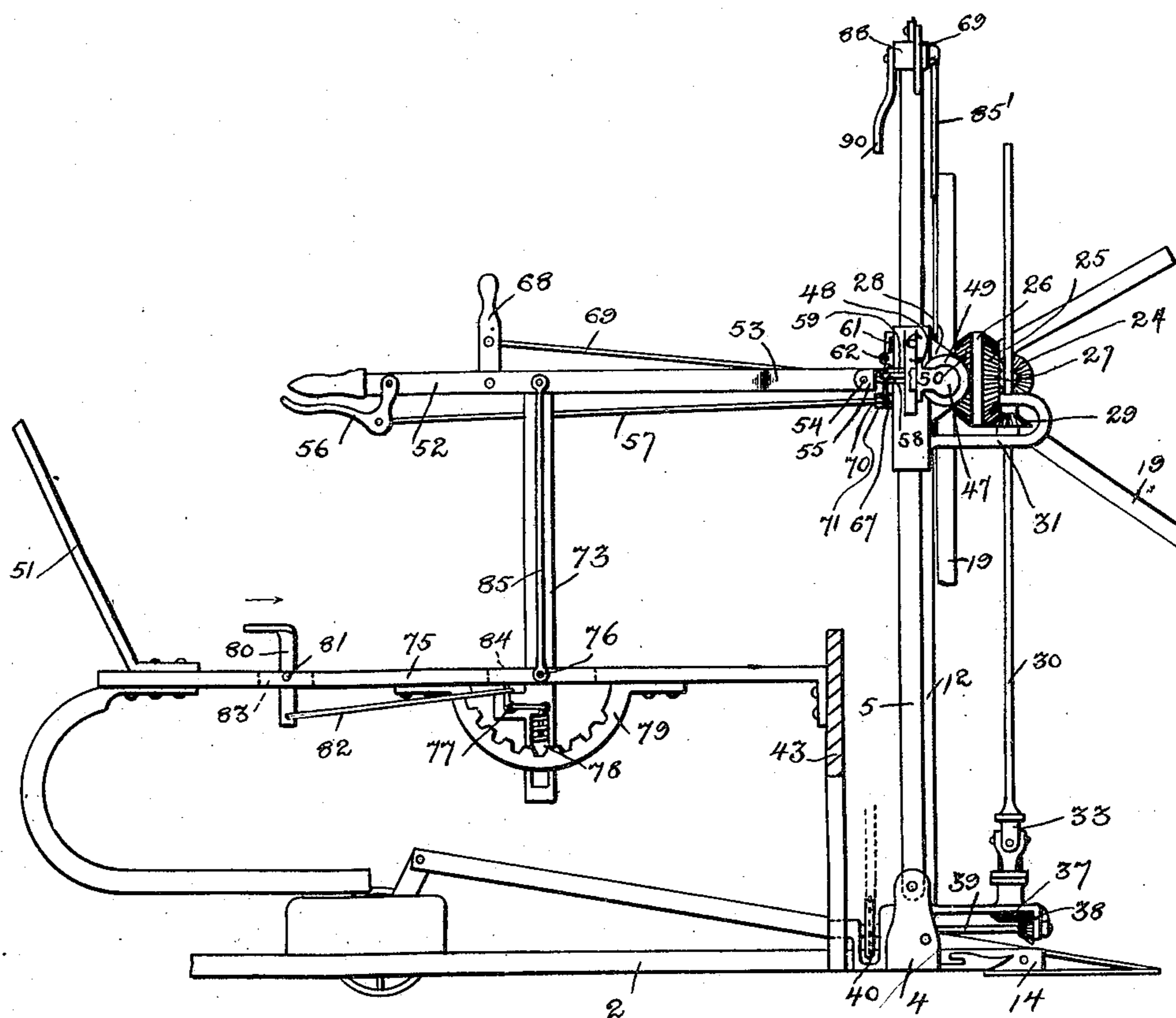


Fig. 2.

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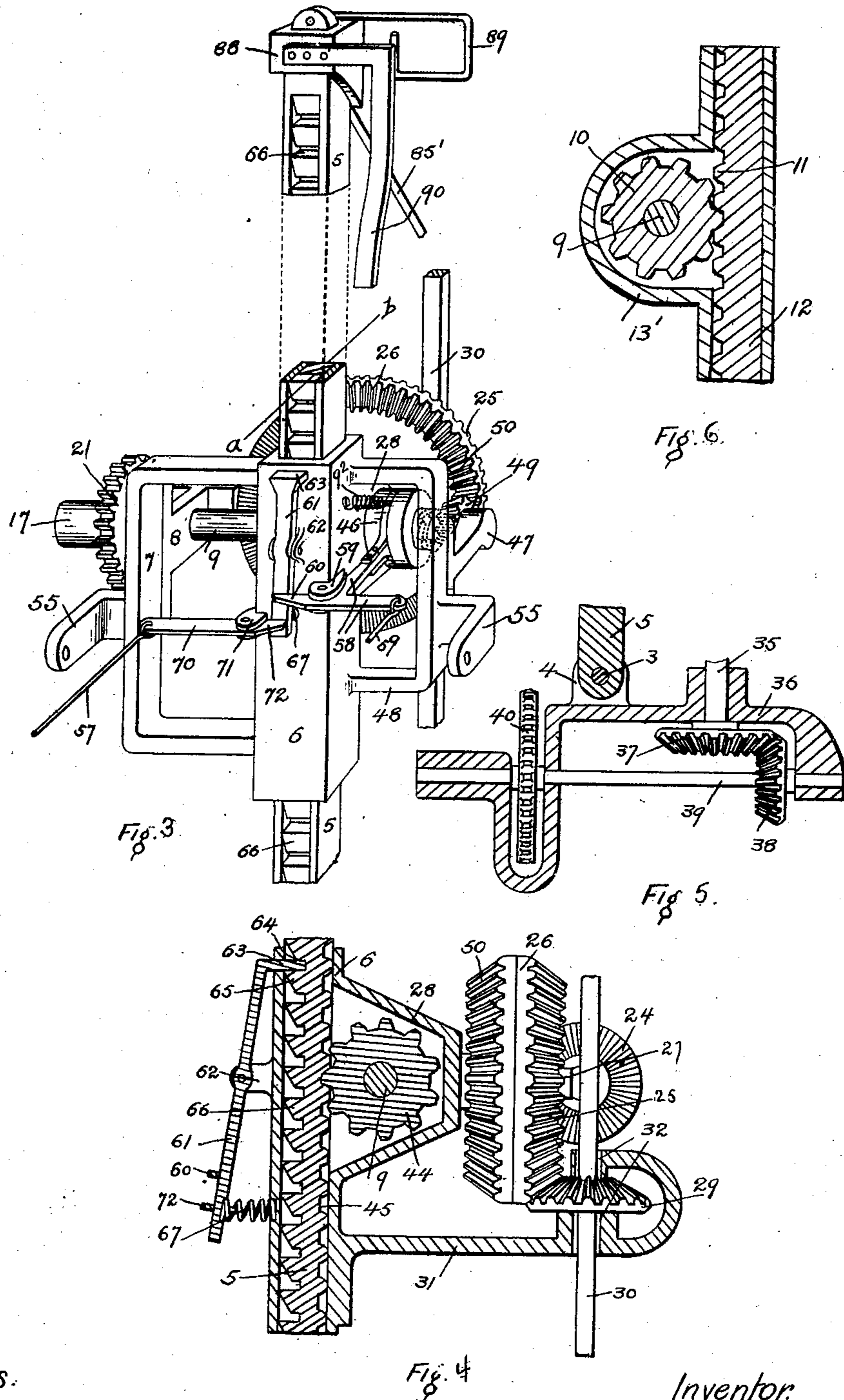
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

THOMAS LAIT, OF MEDICINE HAT, ALBERTA, CANADA.

## OPERATING MECHANISM FOR BINDER SAILS OR FANS.

No. 862,258.

Specification of Letters Patent.

Patented Aug. 6, 1907.

Application filed May 31, 1906. Serial No. 319,475.

*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 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 support the sails or fans of the binder at both ends so as to permit same to safely operate to within half an inch or so of the cutter-bar and thus enable it to carry satisfactorily to the knife all kinds of crop, whether short, long, light, heavy, down or tangled; secondly, to properly distribute the weight of the reel by supporting it after the manner before mentioned and so absolutely prevent any tendency of the fans or sails to droop towards the grain-wheel end of the binder. When the fans or sails droop at all it is impossible to do good work with the binder. By preventing the drooping of the fans or sails, it will be understood that they will operate a constant distance at all points from the cutter-bar; thirdly to automatically throw the heel-raising mechanism out of gear at certain times to prevent damage; fourthly, to provide improved means for raising and lowering the reel, and fifthly to place the mechanism controlling the raising and lowering of the reel in convenient position relative to the driver's seat, and it consists essentially of a toothed standard hinged to the master-wheel end of the binder platform; another standard hinged to the grain-wheel end of the binder; a bracket operating upon the first-mentioned standard; a reel having bearing at one end on said bracket and supported at its other end by the standard supported from the grain-wheel end of the binder, and means for operating said reel.

My invention further consists in providing particular mechanism for raising and lowering said reel and operating same, as hereinafter more particularly explained.

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 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. 4 is an enlarged section on the vertical plane passing through the line *a-b*, Fig. 3, showing portion of the driving means for the reel and showing means for raising and lowering same. Fig. 5 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. 6 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. 7 is an enlarged plan view of the gearing for rotating the reel.

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 bracket 6. According to my preferred form of construction shown said bracket 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 is provided, which standard is hinged at 13 to any suitable support 14 at the grain-wheel end of the binder.

13<sup>1</sup> is a bracket operating over 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 made 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 8) 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 the means hereinafter described) that the parts above described will move therewith and will be held in a constant po-

sition 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 coöperating therewith (which is shown dotted) energy is transmitted (by suitable means not shown) from any suitable source of supply, sprocket-wheel 42 journaled at the upper portion of the member 43 and near the binder deck so as to rotate the wheel 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. 3 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 coöperate 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 coöperate 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 toothed-clutch lever 58 (which is pivoted by the lugs 59 to the bracket 6) the toothed-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 bracket 46 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 toothed-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 toothed-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 toothed-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 toothed-clutch lever 58 it will be understood that by reason of the position of said toothed-clutch lever the spring 67 will move said toothed-clutch lever into the position shown in Fig. 3, thus throwing the toothed-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. 3 and 4 that the springs 67 will move the levers 61 and 70 back to normal position.

In order to provide for the necessary movement of the standard 5 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. According to the construction shown for this purpose, 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<sup>1</sup> 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 88 with which the standard 5 is provided.

5 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 toothed-clutch lever 58. Upon referring to Fig. 3 it will be seen that when the bracket 6 is raised up high enough the toothed-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. 3, thus throwing the reel-raising mechanism out of gear and permitting the lever 61 to lock the bracket 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. 4 and 6 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 toothed-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 toothed-clutch lever 58 engaging with the toothed-clutch 46. Upon referring to Fig. 3 it will be understood that the action of the spring 92 keeps the toothed-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 toothed-clutch lever 58. The spring 67 really exerts no pressure against the toothed-clutch lever 58 when the lever 61 is compressed by the lever 70, so therefore an additional spring for positively holding the toothed-clutch 46 out of gear, at certain times, with the bevel-pinion 49, would appear to be necessary.

Many changes or alterations in the construction of the different parts entering into my invention may be made by one skilled in this art, and consequently I do not confine myself to the construction herein shown and described, but may deviate or change therefrom in any manner within the scope of the appended claims.

60 What I claim as my invention is:

1. In a harvesting machine, the combination with the platform; a standard hinged at inner end of same, and a bracket supported by said standard, of the reel-shaft having bearing at one end in said bracket; a rack-provided standard hinged to the outer end of said platform; a

bracket movable thereon 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 standard; the reel loosely mounted on said reel-shaft; means for rotating said reel, and means for raising and lowering same by rotating said reel-shaft. 70

2. In a harvesting machine, the combination with the platform; a rack-provided standard hinged at the inner end of the same, and a bracket normally locked to said standard, of the reel-shaft having bearing at one end in said bracket; a bevel-pinion loosely mounted thereon; a bevel gear wheel having bearing in said bracket and with which said bevel-pinion is in mesh; a toothed pinion keyed to said reel-shaft and meshing with the rack in said standard; a clutch on said reel-shaft designed to engage with said bevel-pinion in order to rotate said reel-shaft to raise and lower same and said bracket; means for unlocking said bracket from said standard; means for operating said clutch; means for operating said bevel gear-wheel; a rack-provided standard hinged to the outer end of said platform; a bracket movable thereon 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 standard; the reel loosely mounted on said reel-shaft, and means for rotating said reel interposed between same and said bevel gear-wheel. 75 80 85 90

3. In a harvesting machine, the combination with the platform; a rack-provided standard hinged at the inner end of the same, and a bracket normally locked to said standard, of the reel-shaft having bearing at one end in said bracket; a bevel-pinion loosely mounted thereon; a double bevel gear wheel having bearing in said bracket and with which said bevel pinion is in mesh; a toothed pinion keyed to said reel-shaft and meshing with the rack in said standard; a clutch on said reel-shaft designed to engage with said bevel-pinion in order to rotate said reel-shaft to raise and lower same and said bracket; means for unlocking said bracket from said standard; means for operating said clutch; a rack-provided standard hinged to the outer end of said platform; a bracket movable thereon 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 standard; the reel loosely mounted on said reel-shaft; a gear-wheel secured to said reel; a pinion meshing with said gear-wheel; a shaft having bearing in said bracket and carrying said pinion; a bevel-pinion secured to said shaft and in mesh with the outer face of said double-bevel gear-wheel, and means for operating said double-bevel gear-wheel. 95 100 105 110

4. In a harvesting machine, the combination with the platform; a rack-provided standard hinged at inner end of same, and a bracket normally locked to said standard, of the reel-shaft having bearing at one end in said bracket; a bevel-pinion loosely mounted thereon; a double bevel gear-wheel having bearing in said bracket and with which said bevel-pinion is in mesh; a toothed pinion keyed to said reel-shaft and meshing with the rack in said standard; a clutch on said reel-shaft designed to engage with said bevel-pinion in order to rotate said reel-shaft to raise and lower same and said bracket; means for unlocking said bracket from said standard; means for operating said clutch; a rack-provided standard hinged to the outer end of said platform; a bracket movable thereon 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 standard; a reel loosely mounted on said reel-shaft; a gear-wheel secured to said reel; a pinion meshing with said gear-wheel; a shaft having bearing in said bracket and carrying said pinion; a bevel pinion secured to said shaft and in mesh with the outer face of said double bevel gear-wheel; a bevel-pinion held constantly in mesh with the outer face of said double bevel gear-wheel; a shaft on which said bevel-pinion has longitudinal movement; the said shaft being mounted so as to permit of the movement of said first-mentioned pivoted standard, and means for operating said shaft. 115 120 125 130 135 140

5. In a harvesting machine, the combination with the platform; a toothed standard hinged at the inner end thereof; a bracket movable on said toothed standard; the reel-shaft supported in said bracket; and means for oper- 145

ating said reel-shaft, of a gear-wheel secured to said reel-shaft and in mesh with the toothed rack in said standard; means for clutching and unclutching said reel-shaft from its operating-means; a locking rack secured to or formed  
 5 a part of said standard; a bolt carried by said bracket and designed to engage with said locking rack in order to lock said bracket and said reel-shaft to said standard when said reel-shaft is not rotating, and means for unlocking  
 10 said bolt from said rack in order to permit of the raising of said bracket by the rotation of said reel-shaft.

6. In a harvesting machine, the combination with the platform; a toothed standard hinged at the inner end thereof; a bracket movable on said toothed standard, and the reel-shaft supported in said bracket; and means for  
 15 operating said reel-shaft, of a gear-wheel secured to said reel-shaft and in mesh with the toothed rack in said standard; means for clutching and unclutching said reel-shaft from its operating-means; a locking rack secured to or  
 20 formed a part of said standard; a bolt carried by said bracket and designed to engage with said locking rack in order to lock said bracket and said reel-shaft to said standard when said reel-shaft is not rotating; a support; a  
 25 lever hinged to said support and hinged to said bracket on said toothed standard, and means carried by said lever and said bracket in order to unlock said bolt from said locking-rack during the rotation of said reel-shaft in order to permit said bracket being raised up.

7. In a harvesting machine, the combination with the platform; a rack-provided standard hinged to the inner  
 30 end of same, and a carrying bracket supported upon said rack-provided standard, of a supporting member; a lever; a standard to which said lever is hinged said standard being hinged to said support; means for locking and unlock-

ing said standard to and from said support, and means carried by said lever and said bracket in order to lock and  
 35 unlock said bracket to and from said rack-provided standard.

8. In a harvesting machine, the combination with the platform; a rack-provided standard supported at the inner  
 40 end of same, and a bracket supported on said standard, of the reel-shaft having bearing in said bracket; a gear-wheel secured thereto and in mesh with the toothed rack of said standard; a clutch for throwing said reel-shaft  
 45 into and out of gear with a source of power; a clutch lever pivoted to said bracket, and an arm depending from said standard and into the path of movement of said clutch lever so that when same is moved into contact with said  
 50 arm, the clutch will be operated out of gear with said source of power so as to prevent the rotation of said reel-shaft.

9. In a harvesting machine, the combination with a platform; a standard hinged at the inner end of same; a  
 55 bracket supported on said standard and the reel-shaft supported by said bracket, of a bevel-gear-wheel journaled in said bracket; a bevel-pinion in mesh therewith; a shaft supported in said bracket to which said bevel pinion is secured; a pinion secured to said shaft; a reel mounted on  
 60 said reel-shaft; a gear-wheel secured to said reel and meshing with said pinion, and means for operating said bevel-gear-wheel.

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

Witnesses:

FRED. S. PINGLE,  
 FRED. ALLINGHAM.