No. 754,009. PATENTED MAR. 8, 1904.

R. L. PARSONS.

GRAIN BINDING HARVESTER.

APPLICATION FILED OCT. 1, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

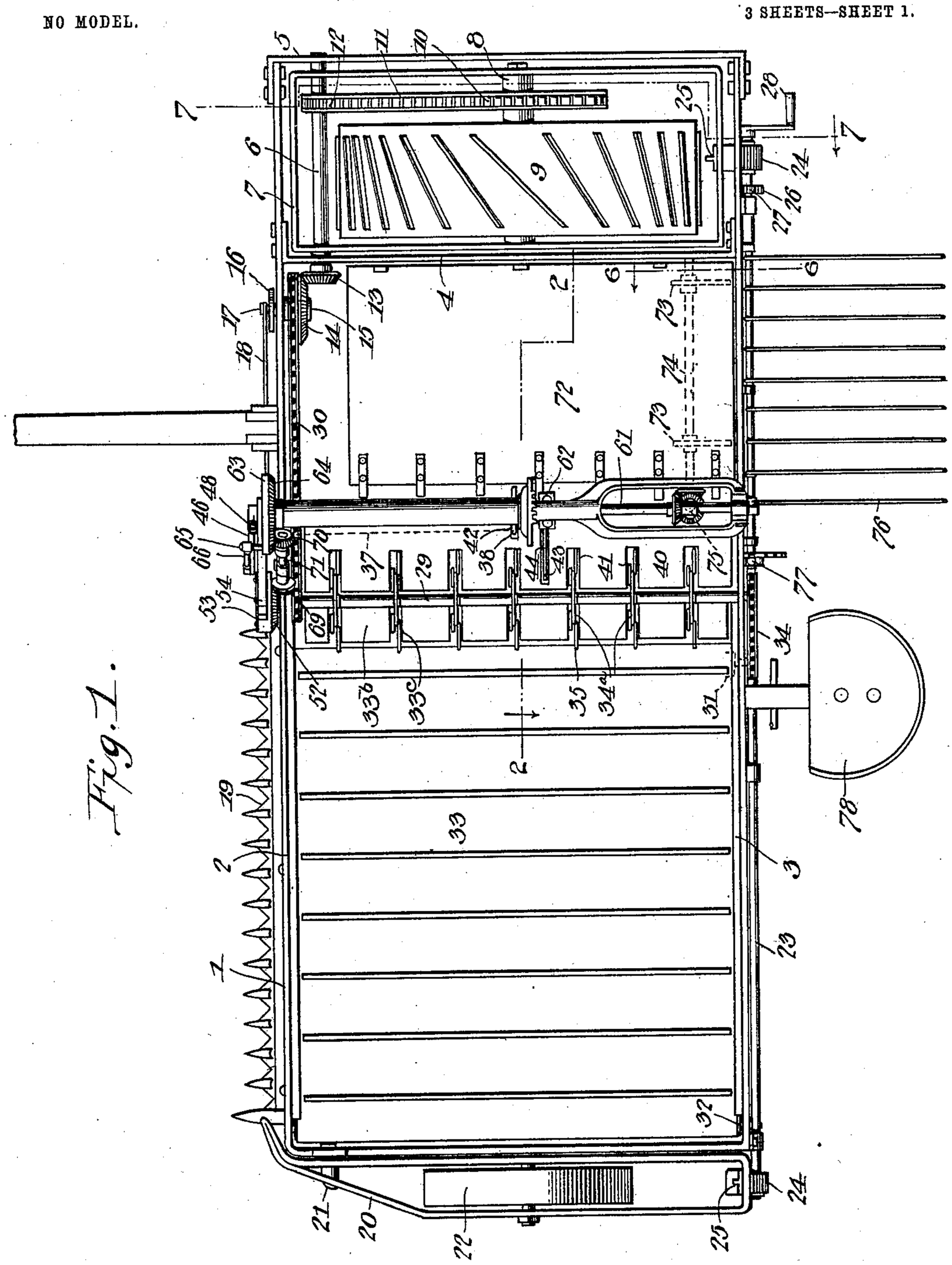

Fig. 1.

Witnesses

E. F. Stewart

Wm. Bagger

Robert L. Parsons, Inventor.

by Church & Co.

Attorneys

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 3.

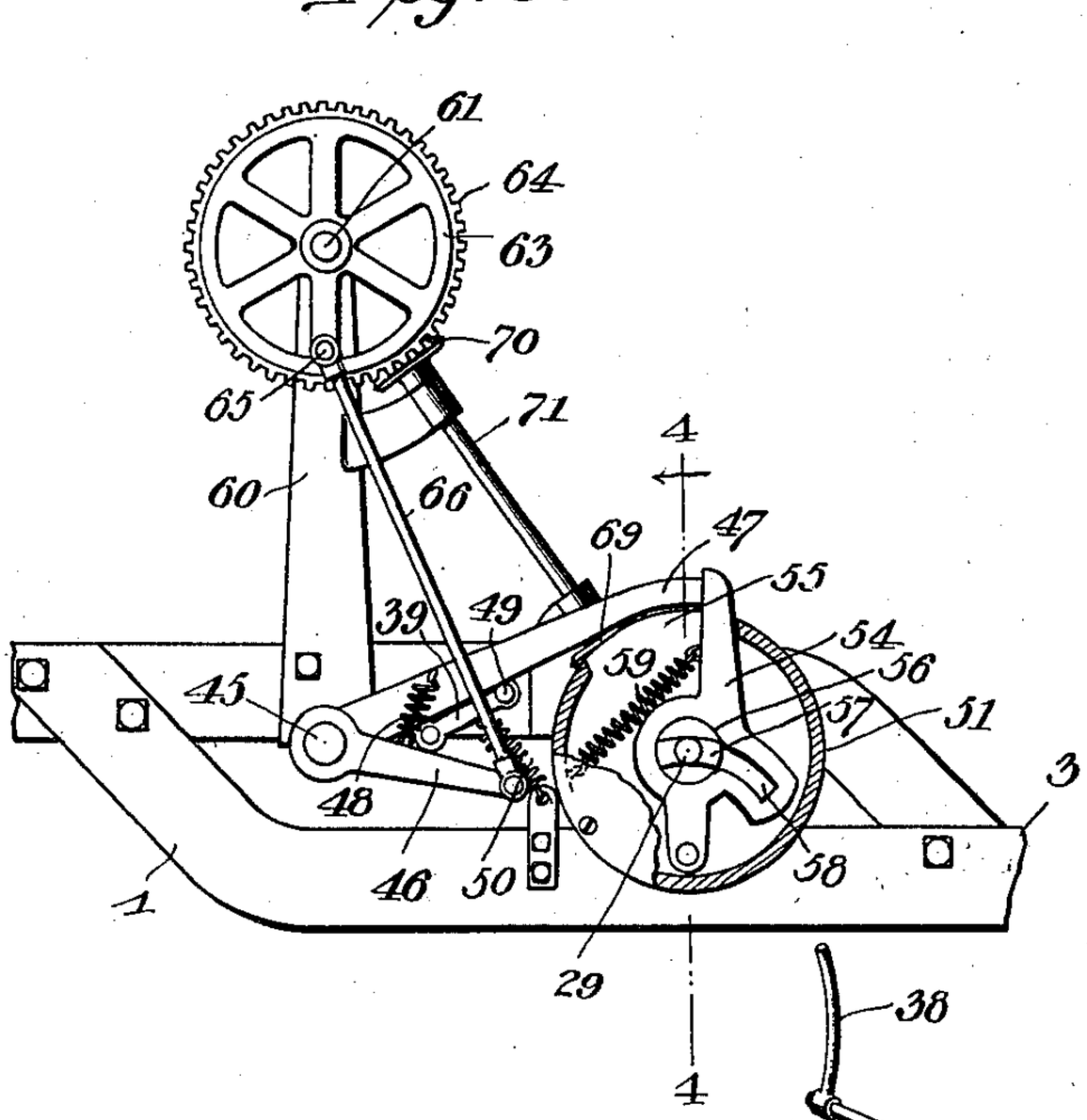


Fig. 4.

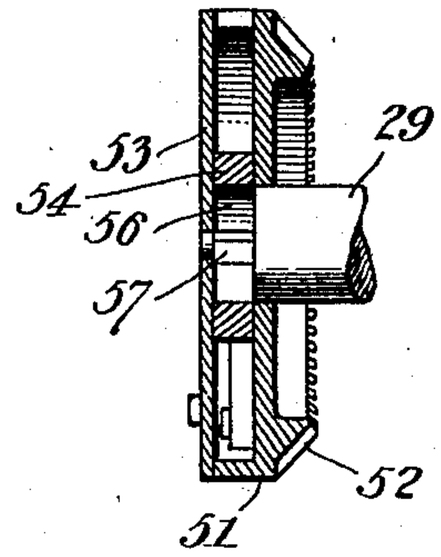


Fig. 5.

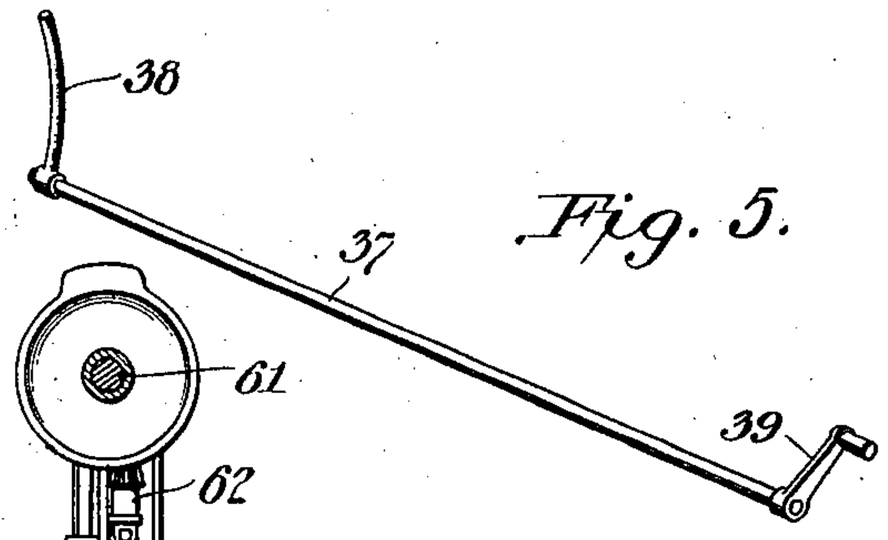
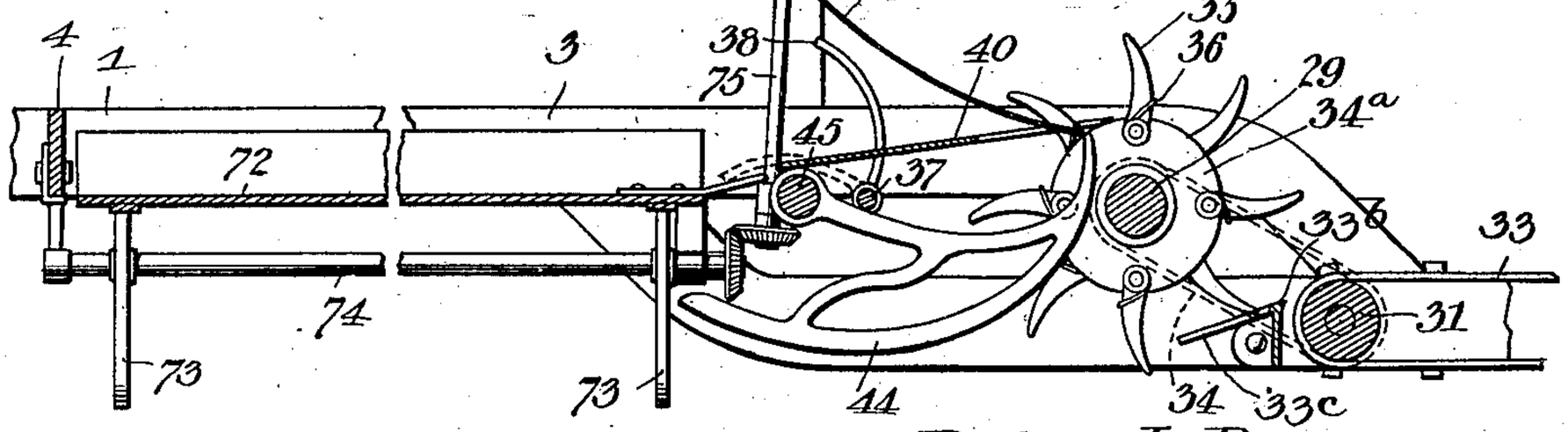


Fig. 2.



Witnesses
E. F. Stewart
Wm. Bagger

Robert L. Parsons,
Inventor.
by C. A. Snow & Co.
Attorneys

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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 6.

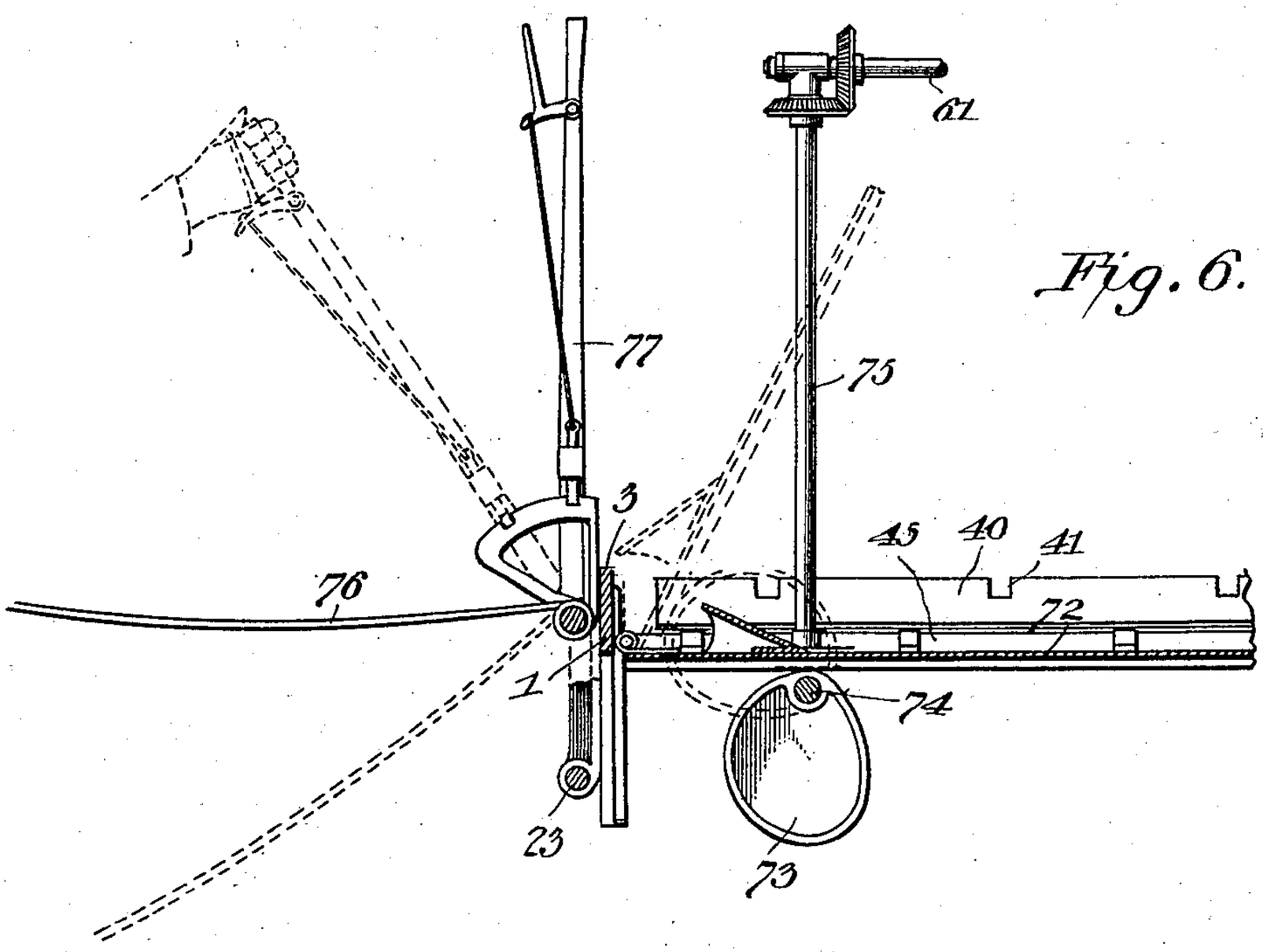
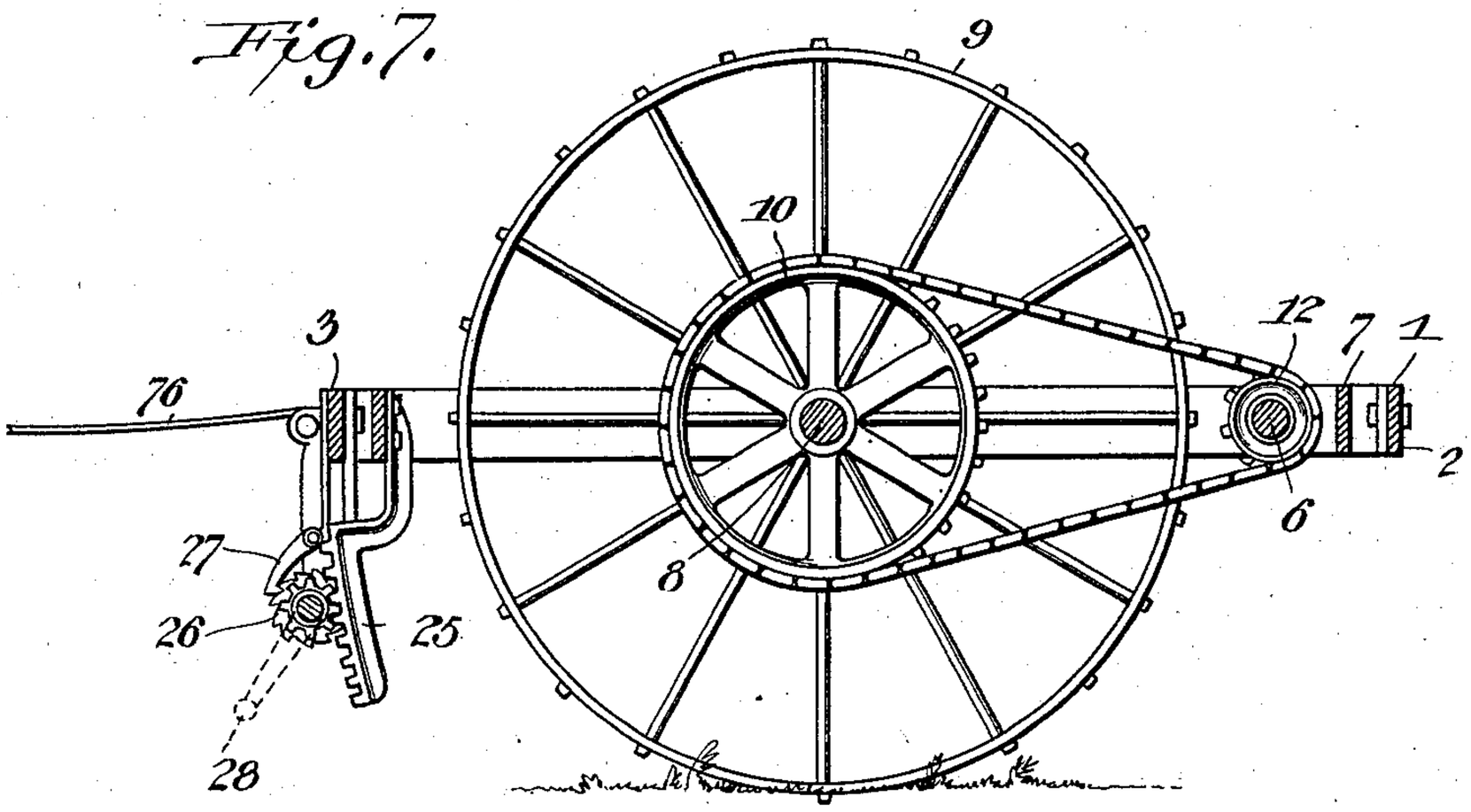


Fig. 7.



Witnesses
E. F. Stewart
Wm. Bagger

Robert L. Parsons,
Inventor,
by C. A. Snow & Co.
Attorneys

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UNITED STATES PATENT OFFICE.

ROBERT L. PARSONS, OF OLMSTEAD, KENTUCKY, ASSIGNOR OF ONE-HALF TO THOMAS M. TRAUGHBER AND BEVERLY C. CRUMBAUGH, OF OLMSTEAD, KENTUCKY.

GRAIN-BINDING HARVESTER.

SPECIFICATION forming part of Letters Patent No. 754,009, dated March 8, 1904.

Application filed October 1, 1903. Serial No. 175,346. (No model.)

To all whom it may concern:

Be it known that I, ROBERT L. PARSONS, a citizen of the United States, residing at Olmstead, in the county of Logan and State of Kentucky, have invented a new and useful Grain-Binding Harvester, of which the following is a specification.

This invention relates to grain-binding harvesters; and it has for its object to provide a device of this class which shall possess superior advantages in point of simplicity, durability, and general efficiency.

My present invention relates more particularly to the means for carrying the grain and forming the gavel without necessity for elevating the grain to any considerable extent, thereby effecting a considerable saving in the power required to operate the machine.

The invention further consists in certain improved means for actuating the bundle-tying mechanism, which latter by itself may be of any well-known form which may be suitably used in connection with my invention.

My invention further consists in certain improvements in the construction, arrangement, and combination of parts of the device, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a top plan view of a harvester constructed in accordance with the principles of my invention. Fig. 2 is a sectional detail view taken on the line 2 2 in Fig. 1. Fig. 3 is a detail front elevation of a portion of the machine, parts having been removed for the purpose of exposing the subjacent construction. Fig. 4 is a sectional detail view taken on the line 4 4 in Fig. 3. Fig. 5 is a perspective detail view of the trip-shaft. Fig. 6 is a sectional view taken on the line 6 6 in Fig. 1. Fig. 7 is a sectional view taken on the line 7 7 in Fig. 1.

Corresponding parts in the several figures are indicated by similar numerals of reference.

The frame of my improved grain-binding harvester, which is preferably constructed of metal, is designated 1, and said frame is preferably approximately rectangular in shape. The front and rear sides of the side bars 2 and 3 of said frame are connected by a cross-bar 4 near one end thereof, and said cross-bar and the adjacent end piece 5 afford bearings for a shaft 6, upon which is pivotally mounted a frame 7, the sides of which afford bearings for an axle 8, upon which a supporting-wheel 9 is securely mounted. The axle 8 also carries a sprocket-wheel 10, which is connected, by means of a chain 11, with a sprocket-wheel 12 upon the shaft 6, which carries the pivoted frame and to which a rotary motion is thus imparted when the machine is in operation. The inner end of the shaft 6 has a pinion 13, meshing with a bevel-gear 14 upon the rear end of a shaft 15, the front end of which has an eccentric disk 16, provided with a wrist 17, connected by a pitman 18 with the reciprocating cutter-bar 19. This method of operating the cutter-bar is old and well known and is not claimed as a part of my invention. To the end of the frame opposite to that which carries the pivoted frame 7 is pivotally connected another frame 20. The latter is mounted pivotally upon a stud 21, extending laterally from the main frame, and the front end of said frame 20 is made angular, as shown, so that it will serve to sweep the grain aside or apart from the cutting apparatus, acting not merely as a shoe, but as a divider which will separate the swath from the uncut grain. The pivoted frame 20 carries a supporting-wheel 22, which in conjunction with the bull-wheel 9 serves to support the machine. It may here be stated that the frames 7 and 20 are mounted pivotally for the purpose of enabling the main frame to be raised and lowered with relation to the supporting-wheels, the necessary adjustment being effected by means of a shaft 23, journaled in suitable bearings upon the rear part of the frame and provided with pinions which engage ratchets 25, depending from the pivoted frames 7 and 20. For the purpose of securing the latter at the proper adjustment the shaft 23 is provided with a ratchet-wheel 26, engaged by a pawl 27, which is pivotally connected with the main frame. Said shaft is also provided with a crank 28, by means of which it may be con-

veniently manipulated for the purpose of raising or lowering the frame, the latter operation being effected only when the pawl 27 is out of engagement with the ratchet, as will be readily understood.

The main frame of the machine is provided with bearings for the packer-shaft 29, which receives motion from the shaft 15 by means of a band or chain 30.

31 and 32 designate a pair of rollers over which moves the endless carrier or apron 33, which is disposed in rear of the cutting apparatus and which serves to carry the cut grain to the packing and tying devices. The roller 31 has connection by means of a chain 34 with a shaft 29, whereby motion is thus imparted to the grain-carrying apron. It will be observed that this grain-carrying apron usually and normally occupies an approximately horizontal position and that the grain which is carried by said apron in the direction of the packing mechanism will not be liable to displacement by sliding in any direction upon the said apron, as is oftentimes the case when the carrier is disposed in a more or less inclined position. Adjacent to the inner or discharge end of the apron 33 is placed an inclined plane 33^b, having a plurality of slots 33^c.

The packing mechanism of my improved binder comprises a plurality of disks 34^a, mounted upon the shaft 29 and each having a plurality of radially-extending packer-arms 35 engaging the slots 33^c in the inclined plane 33^b, which latter is disposed between the apron-carrying roller 31 and the shaft 29. These arms are actuated by suitably-disposed springs 36, which normally retain the said packer-arms in a radial position with relation to the axis of the shaft 29. The packer-arms 35, however, are capable of yielding against the tension of the springs 36, so as to fold down and out of the way when a gavel of the desired dimensions has been formed, this folding action of the arms being necessary in order to permit the latter to pass under the gavel while the latter is being operated upon by the tying mechanism.

Suitably disposed at a short distance from the shaft 29 and parallel thereto is arranged the trip-shaft 37, having one or more arms 38 and provided at its outer end with a trip or crank 39. This shaft, with its normally upstanding arm 38, is located in the path of the grain, which is conveyed from the endless apron 33 to the grain-board 40 by the action of the packer-arms 35, the grain-board being provided with a plurality of slots 41 for the passage of said packer-arms, which latter, as will be readily understood, will yield to the pressure of the grain and fold backward against the tension of the springs 36, so as to place the grain smoothly and evenly upon the grain-board. The latter is also provided with a slot 42 for the passage of the arm 38 (of which only one has been shown in the drawings) and with an additional slot 43 for the passage of the needle 44, which is mounted upon the needle-shaft 45. The needle, so far as its construction and operation is concerned, does not form a subject of my present invention, and a conventional form of said needle, as well as of the knot-tying mechanism, to be presently referred to, has been shown. The needle-shaft 45 carries at its front end a crank 46 and a pivotally-mounted arm 47, which latter is connected with the crank 46 by means of a spring 48, the tension of which is exerted to draw the said arm and crank in the direction of each other.

The trip 39 of the shaft 37 is disposed between the crank 46 and the arm 47 upon the needle-shaft, and the wrist 49 of the trip 39 may be said to normally rest against the under side of the arm 37. The trip 39 is normally drawn in a downward direction by means of a spring 50, which connects said trip with a suitable part of the frame of the machine.

The packer-shaft carries at its front end a disk or casing 51, the rear edge of which forms a bevel-gear, (indicated at 52 in Fig. 1 of the drawings.) The front side of the disk is recessed to form a casing, which is usually provided with a front lid or cover, (shown at 53 in Fig. 4 of the drawings.) In Fig. 3 only a small portion of said cover appears, the larger portion having been removed for the purpose of exposing the interior construction. The disk 51 is mounted loosely upon the packer-shaft 29, and within the cavity of said disk is mounted a lever 54, one end of which projects through a recess or opening 55 in the edge of the disk or casing. The lever 54 is provided with an eye or opening 56, which is normally in alinement with the end of the shaft 29, and the latter is provided with an arc-shaped lug 57, which projects through the eye 56. The lever 54 is provided with a lateral extension having an arc-shaped slot 58, which when it comes into alinement with the arc-shaped lug 57 may engage the latter. The lever 54 is connected, by means of a spring 59, with a fixed point of the disk or casing. It follows from the construction set forth that when during the rotation of the shaft 29 the lug 57 comes into alinement with the slot 58 the lever 54, if not otherwise obstructed, will be actuated by the spring 59 so as to cause the slot 58 to pass into engagement with the lug 57, thereby locking the lever, and with it the disk or casing, upon the shaft 29 and causing it to rotate therewith until by means provided for the purpose the lever 54 is moved against the tension of the spring 59 until the lug 57 passes out of engagement with the slot 58 and into the central eye or opening of the lever, within which it may freely rotate.

Uprights 60, suitably mounted upon the frame of the machine, serve to support the knotter-shaft 61 and also the various brackets

and other means whereby the knot-tying and band-severing mechanism (generally indicated by 62) is supported. The front end of the shaft 61 carries a disk or wheel 63, the rear side of which constitutes a bevel-gear 64 and the front side of which is provided with a wrist-pin 65, connected, by means of a pitman 66, with the end of the crank 46 upon the knotter-shaft.

When in operation the grain is conveyed by the arms 35 of the disks 34ª from the endless carrier to the grain-board, the said grain will gradually become packed upon the latter against the arm or arms 38 of the shaft 37. The binding-twine, which is indicated at 67 and which has been threaded through the eye of the needle 44, is also disposed in the path of the grain which accumulates upon the grain-board, the free end of said twine being held in the usual manner by the tying mechanism. As the gavel is being formed upon the grain-board the arm or arms 38 are depressed, thus gradually turning the shaft 37 and raising or lifting the trip 39 at the end of said shaft, which, as previously described, is provided with a pin 49, extending under the arm 47. Now it will be seen by reference to Fig. 3 that the end of the arm 47 normally abuts against the projecting end of the lever 54, which latter is thus retained in a stationary position, as well as the disk or casing 51, in which it is mounted. As soon, however, as the shaft 37 has been tilted sufficiently for the trip-arm 39 to elevate the arm 47 out of engagement with the lever 54 the latter will at the first available opportunity be actuated by the spring 59 so as to cause the slot 58 of the lever 54 to engage the arc-shaped lug 57 of the shaft 29, upon which the disk and lever thus become locked to rotate therewith. As soon as the disk begins to rotate motion is transmitted therefrom to the wheel 63 by means of a pair of pinions 69 and 70 upon a suitably-disposed shaft 71. By the time this movement takes place the arm 38 will have become depressed to the position shown in dotted lines in Fig. 2 and the wheel 63, through the pitman 66, imparts an oscillating motion to the needle-shaft 45, whereby the needle is swung into engagement with the tying mechanism, where the knot is tied and the needle is presently restored to its normal position. While the needle is elevated the continued operation of the grain cutting, carrying, and packing mechanism will cause grain to accumulate upon the grain-board in rear of the said needle. The grain thus accumulated as soon as the needle swings to normal position passes forward and into engagement with the arm or arms 38, which as soon as the bound sheaf rolls off the same are instantly raised to normal position by the action of the spring 50, connecting the trip 39 with a fixed point. As the crank 46 of the needle-shaft is restored to its normal position by the completed revolution of the wheel 63, which actuates the pitman 66, the spring 48, connecting said crank with the arm 47, will draw the latter back into the path of the projecting end of the lever 54, which when thus encountered is thrown back against the tension of the spring 39, thereby disengaging the slotted part of said lever from the arc-shaped lug 57 and disconnecting the disk from the shaft 29. As the shaft leaves the tying mechanism it drops upon the dumping-platform 72. The latter is operated intermittently by means of cams 73 upon a shaft 74, which receives motion from the knotter-shaft 61 by means of a vertically-disposed shaft 75 and intermediate gearing. The dumping-board 72 in turn discharges the sheaves upon the bundle-carrier 76, which is manipulated whenever a sufficient number of bundles have accumulated thereon by means of a hand-lever 77, disposed within convenient reach of the operator, whose seat 78 is supported upon the frame of the machine in a position convenient to said lever.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of my invention will be readily understood by those skilled in the art to which it appertains.

The construction of my improved machine is extremely simple, and it will be seen that it at no time is necessary to elevate the grain to a considerable height, as is necessary in almost every grain-binder that has heretofore been successfully used. It is accordingly evident that my improved machine may be operated with less expenditure of power than other machines of its class. It will be further understood that the entire machine is compact, simple, and not liable to get out of order.

I desire it to be understood that while I have in the foregoing described a construction which I consider simple and preferable, I do not necessarily limit myself to the structural details herein set forth, but reserve the right to any changes, alterations, and modifications which may be resorted to within the scope of my invention and without departing from the spirit or sacrificing the utility of the same.

Having thus described my invention, I claim—

1. In a grain-binding harvester, an endless apron forming a carrier, a packer-shaft disposed adjacent to and transmitting motion to said carrier, a plurality of disks upon said packer-shaft, having pivoted, radially-extending, spring-actuated arms, and means for transmitting motion to the packer-shaft from a rotary supporting member of the machine.

2. In a grain-binding harvester, an endless grain-carrying apron, a packer-shaft disposed adjacent to the inner end of said apron and transmitting motion to the latter, a plurality of disks mounted upon the packer-shaft, radially-extending spring-actuated arms connected pivotally with said disks, a grain-board hav-

ing slots for the passage of said disks and arms, a shaft mounted below the grain-board and having an arm extending through a slot in the latter to form a resistance to the grain packed upon the grain-board, a needle-shaft, a needle upon the latter, knotting mechanism coöperating with the needle, and means for releasing the operating mechanism at the proper time when a gavel has been formed and the resistance-arm has been thereby depressed.

3. In a machine of the class described, the combination with grain-binding mechanism, of a resistance-arm located in the path of the gavel, a shaft carrying a series of disks, each provided with a plurality of radially-extending, pivoted, spring-actuated packer-arms, a grain-board having slots for the passage of said packer-arms and for said resistance-arm, a trip upon the end of the resistance-arm, and means, released by said trip when the resistance-arm is depressed by the accumulated gavel, for conveying motion to the needle-carrying shaft, the knot-tying mechanism and the dumping mechanism.

4. In a machine of the class described, a continuously-rotating packer-shaft, a casing mounted loosely upon said shaft, a lever mounted pivotally in said casing and having a centrally-disposed eye and a slot extending laterally from the latter, a lug upon the end of the shaft adapted to engage said slot, a spring connecting the lever with the casing and actuating the lever to cause the slotted portion thereof to engage the lug upon the end of the shaft, a needle-carrying shaft, an arm mounted loosely upon the latter and normally engaging the protruding end of the lever, a shaft having a resistance-arm normally disposed in the path of the grain, a trip upon the end of said shaft having an arm bearing against the under side of the arm upon the needle-shaft to release said arm from contact with the lever when the resistance-arm is depressed, a knotter-shaft, means for transmitting motion to the latter from the casing upon the packer-shaft, a disk upon the knotter-shaft, a crank upon the needle-shaft, a pitman connecting said crank with said disk, and a spring connecting said crank with the arm which is mounted pivotally upon the needle-shaft.

5. In a machine of the class described, a clutch mechanism comprising a disk mounted loosely upon a continuously-operated shaft and having a cavity therein, a slotted lever mounted pivotally in the cavity of said disk and adapted to engage an arc-shaped lug upon the end of the latter and to be thus locked upon the shaft, a spring disposed to urge the lever in the direction of its locked position, a spring-actuated arm normally engaging the protruding end of the lever and holding it disconnected from the shaft, intermittently-operated means for tripping the said arm, and means for restoring said arm into the path of the lever.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ROBERT L. PARSONS.

Witnesses:
V. M. Cooper,
Henry L. Ferguson.