W. UTT, JR.

KNOTTER FOR GRAIN BINDERS.

APPLICATION FILED MAY 5, 1909.

970,359. Patented Sept. 13, 1910.

Fig. 1.

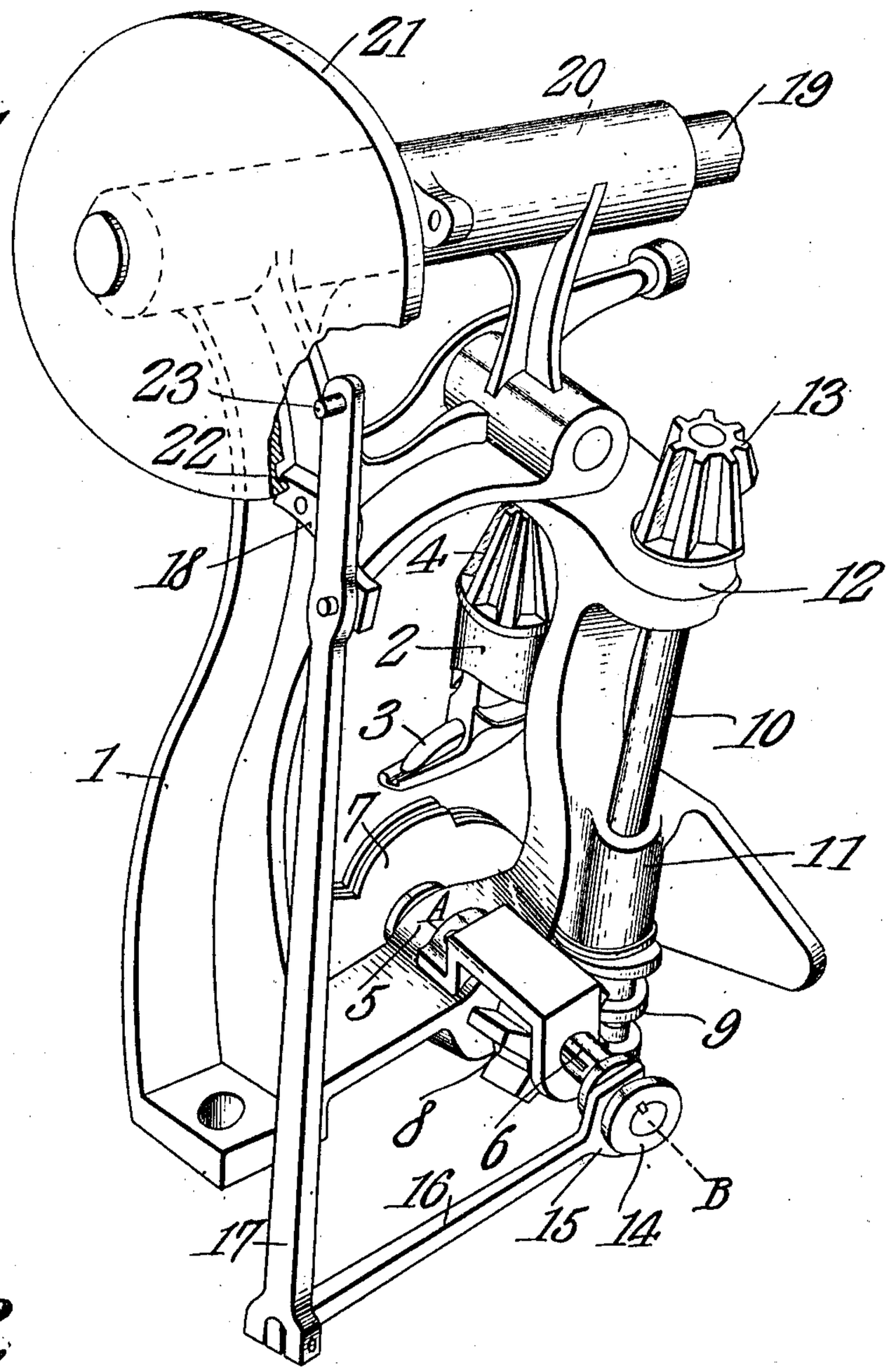

Fig. 2.

Witnesses

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KNOTTER FOR GRAIN-BINDERS.

970,359. Specification of Letters Patent. **Patented Sept. 13, 1910.**

Application filed May 5, 1909. Serial No. 494,021.

To all whom it may concern:

Be it known that I, WILL UTT, Jr., a citizen of the United States, residing at Bruceville, in the county of Knox and State of Indiana, have invented a new and useful Knotter for Grain-Binders, of which the following is a specification.

This invention has reference to improvements in knotters for grain binders and is designed more particularly to relieve the strain upon the cord during the operation of tying the knot so that the breaking of the cord which often occurs during the knot tying operation is prevented. The tying bill takes up a certain amount of cord in forming the knot and as the cord is then under considerable longitudinal strain, the extra strain due to the taking up of the cord about the tying bill often becomes too great for the strength of the cord and the result is that the cord is broken thereby missing the tying of some bundles and the readjustment of the cord to the knotter causes vexatious delay.

The invention will be best understood from a consideration of the following detail description taken in connection with the accompanying drawings forming a part of this specification, in which drawings,

Figure 1 is a perspective view of a known form of knotter with the invention applied thereto. Fig. 2 is a view on the line A—B of Fig. 1.

The invention is shown in connection with a known form of knotter for grain binding machines and will be described with reference thereto, with the understanding however that with or without slight changes in the proportions of the parts the invention may be applied to other types of knotting mechanisms.

There is shown a casting 1 of appropriate shape to carry the several parts of the knotter. The casting 1 is formed with a bearing 2 for a tying bill 3 on the end of the shaft of which is a bevel gear 4 by means of which the tying bill 3 is given rotative movement at the proper intervals by the engagement of the bevel gear 4 with a suitable drive gear, not shown, but common to the type of knotter illustrated in the drawings.

Mounted in suitable bearings 5 in the casting 1 is a shaft 6 capable of longitudinal movement through the bearings 5 as well as rotative movement therein. On the end of the shaft adjacent to the tying bill 3 the said shaft carries a disk 7 which coacts with the tying bill and is common to knotters of the type shown in the drawings. Mounted on the shaft 6 and splined thereto so as to rotate the shaft but through which the shaft is capable of moving longitudinally is a pinion 8 and this pinion is driven by a worm 9 on another shaft 10 having journal bearings 11—12 in the casting 1. The shaft 10 on the end remote from the worm 9 carries a bevel pinion 13 receiving motion from a suitable driving gear common to knotters of the type shown in the drawings but which bevel gear is not illustrated. The shaft 10 and consequently the disk 7 as well as the tying bill 3 receive motion in respective timed relation, the disk 7 holding the cord to be knotted while the tying bill 3 is acting thereon in the usual manner. Because of the wrapping of the cord about the tying bill during the operation of tying the knot the end of the cord is often pulled loose from its lodgment in the disk 7, or if it fails to pull loose, then the strain on the cord is sometimes sufficient to break the cord. When the cord is pulled away from the disk 7 or is broken then the knotter fails to work and the result is an untied bundle and the machine must be stopped and the cord readjusted thus causing delay. This is due to the fact that in the knotters like that shown in the drawing but as ordinarily constructed the shaft 6 has no longitudinal movement and aside from the axial rotation the disk 7 and tying bill 3 maintain a constant relation. By making the shaft 6 movable in the direction of its length as well as rotative the disk 7 will move toward the tying bill 3 and thus relieve the cord from strain so that during the act of winding the cord on the tying bill the cord is not put under such strain as to be pulled loose from the disk 7 or be caused to break.

In order to move the shaft 6 in the direction of its longitudinal axis in proper timed relation to the rotative movement of the shaft and the rotation of the tying bill 3, the end of the shaft remote from the disk 7 is provided with a circumferentially grooved collar 14, made fast to the shaft and engaged by a fork 15 formed on one end of an arm 16 carried by the longer end of a lever 17 pivoted to a bracket 18 made fast on the casting 1, or of course the bracket 18 may be made an integral part of the casting 1 when the invention is applied

to a machine in the course of construction, but when applied to a machine already built then the bracket 18 is made fast to the casting 1 in any suitable manner.

The driving gear for the pinions 4 and 13 is mounted on a shaft 19 having a suitable journal bearing 20 formed on the casting 1. This shaft 19 carries a grooved disk 21 having a groove 22 formed in one face thereof and in this groove engages a pin 23 on the shorter end of the lever 17. The disk 21 is mounted eccentrically on the shaft 19 so that the groove 22 becomes in effect a cam groove. It is of course evident that the disk 21 may be mounted concentrically on the shaft 19 and the groove 22 may be appropriately displaced to act as a cam groove. Because of the eccentricity of the groove 22 with relation to the axis of the shaft 19 the lever 17 is caused to rock about its pivot support on the bracket 18 and the shaft 6 will participate in this movement in a direction longitudinal to said shaft. The parts are so timed in operation that the shaft 6 will move longitudinally in proper relation to the action of the tying bill 3 in order that when the cord is being wound upon the tying bill the disk 7 will approach the latter and so relieve the cord from undue strain and when the tying bill is moving toward the disk 7 then the latter will be moved out of the way by the reverse action of the shaft 6 in the direction of its length.

The invention is adapted to be applied with minimum change to existing machines requiring practically only the replacing of the shaft ordinarily carrying the disk 7 by a longer shaft such as shown at 6 in the drawings so that the shaft is capable of moving longitudinally. Aside from the shaft 6 with its collar the invention comprises the arm 16 together with the lever 17 and disk 21.

What is claimed is:—

In a knotting mechanism, a suitable frame, a tying bill rotatably mounted in said frame, a cord holding disk, a shaft mounted in said frame and carrying said disk and capable of movement in the direction of its longitudinal axis to carry the disk to and from the tying bill, a pinion on said shaft and connected to the latter for imparting rotative movement thereto, said pinion being held in the frame against movement in the direction of its axis of rotation, another shaft mounted in the frame and carrying a cam disk, a lever mounted on the frame and engaged at one end by the cam disk, and connections between the other end of the lever and the shaft carrying the cord holding disk for imparting reciprocatory movement to the said shaft on the rotation of the cam disk.

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

WILL UTT, JR.

Witnesses:
G. M. HILL,
JAMES UTT.