Sept. 16, 1930. B. McBRIDE 1,775,940

SHOCK BINDER

Filed Sept. 12, 1927

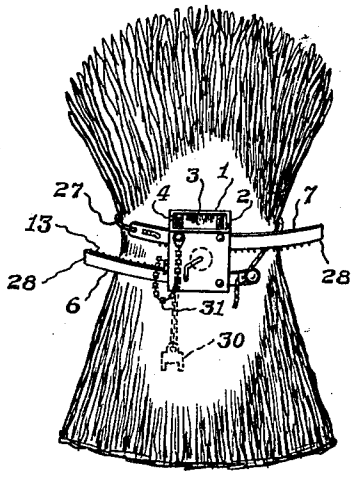



Fig. 1.

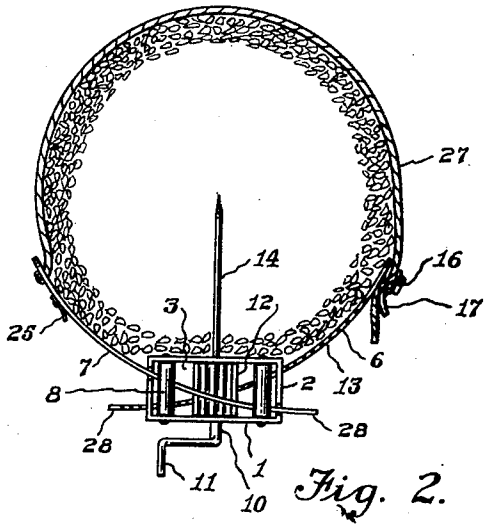



Fig. 2.

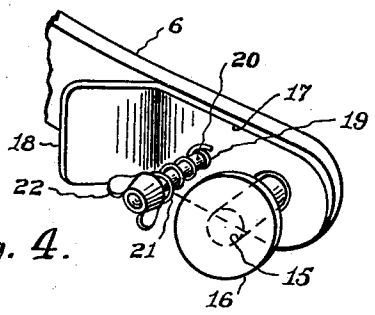



Fig. 4.

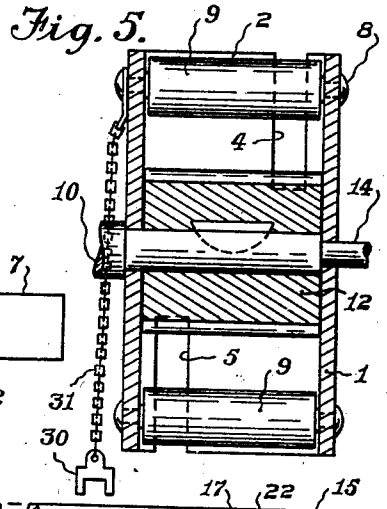



Fig. 5.

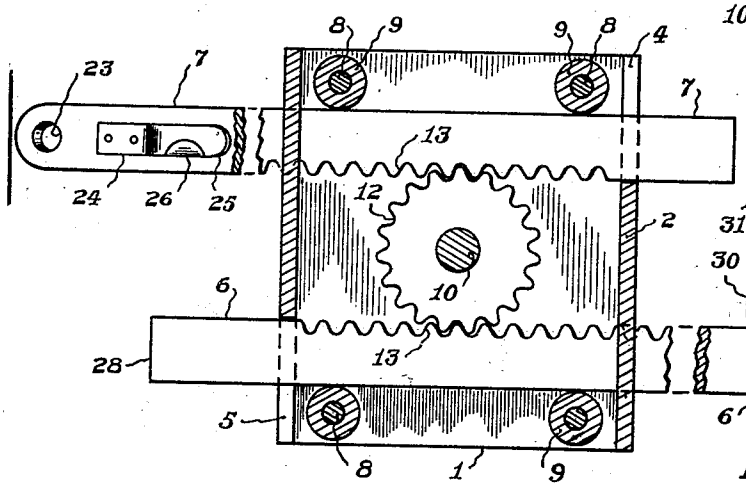
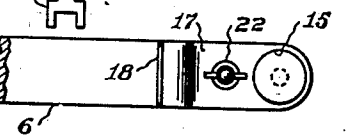



Fig. 3.




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# UNITED STATES PATENT OFFICE

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## SHOCK BINDER

Application filed September 12, 1927. Serial No. 219,159.

This invention relates to the art of binding sheaves of grain, fodder and analogous farm products, into bundles or shocks, and more particularly to a device which is adapted for binding or compressing sheaves of grain or the like, by means of a flexible binding element operatively associated therewith.

The invention has for its principal purpose, the provision of a binding device having a mechanism which is actuable in a manner similar to manually drawing the end portions of a flexible element such as a sash cord taut, after the major portion thereof has been placed about a sheaf or shock of grain subsequent to the binding thereof.

To accomplish this action, the present invention embodies a pair of toothed racks which are carried by and operatively disposed through a suitable housing or casing, and are formed to substantially follow the contour of a sheaf or shock of grain upon the binding thereof, in conjunction with a pinion housed within the casing and manually rotatable to move the racks in opposite directions, through the instrumentality of a pivoted shaft and crank handle formed therewith. The diagonally extended opposite ends of the racks have a stout cord connected thereto for passage around a sheaf or shock of grain to compress the same. Obviously, when a sheaf or shock has been suitably compressed, it may be readily and finally secured with suitable cord or a like agency for the purpose.

Another purpose is to provide a housing or casing in conjunction with a plurality of rollers which are positioned adjacent thereto, for guiding the protruding diagonally disposed racks, so that they may operate freely without binding the actuating pinion and whereby the outer free end thereof may be directed away from the shock or sheaf, when the racks are operated to draw the cord binding element taut about a shock or sheaf of grain.

A further purpose is to provide a novel locking means adapted to engage the teeth of one of the racks in conjunction with the side of the casing, to hold the racks and pinion therefor, against a reverse or releasing movement, after a sheaf or shock has been compressed thereby, so that the operator may be free to bind the same with suitable cord means in the well known manner.

A still further purpose of the invention, is the provision of a twine or cord holding and cutting means, which is attached to and adjacent the free end of one of said racks, to eliminate the requirement for a pocket knife or the like, for cutting the binding cord supply from the portion secured about the shock. A temporary cord securing means is further provided on the opposite end of the other of said racks, so that the binding element or cord may be securely connected to the rack during the compressing operation and at the same time readily removable from the securing means after the shock has been ultimately tied.

The invention comprises further features, arrangements, and combination of parts hereinafter set forth, illustrated in the accompanying sheet of drawing and defined in the appended claims.

In the drawing:

Fig. 1, is a perspective view illustrating the manner of applying the shock binder to a sheaf of grain, and wherein the same is fully compressed and with the binding mechanism shown fully actuated and locked against retrograde movement.

Fig. 2, is a top plan view of the shock binder as applied to a loose formation of grain stalks, and illustrating the position of the binding mechanism prior to a binding movement thereby.

Fig. 3, is a vertical section through the housing illustrating the manner of positioning the racks, rollers and pinion therein.

Fig. 4, is an enlarged perspective view of the temporary binding element anchoring means carried by one of the racks adjacent one end thereof.

Fig. 5, is a transverse sectional view through the casing, illustrating the diagonally and oppositely disposed rack openings and relative position of the rollers thereto.

Referring to the drawing in detail, 1 identifies a metal housing or casing which may be of any suitable size and configuration. The

sides of the said casing being closed as shown at 2, and with the upper and lower ends thereof open as indicated at 3.

The upper portion of the sides 2, are provided with guide slots 4, which extend inwardly from the upper free edge of the casing and disposed diagonally and oppositely with respect to a center line through the casing in the direction of its greatest width. The lower portions of the sides 2, are similarly provided with guide slots 5, which are also oppositely and diagonally disposed, but in a position just opposite to the position of the slots 4, so that the racks 6, and 7, hereinafter referred to and which are guided by the said slots, may move in diagonal directions.

Upon examination of Fig. 2, it will be readily apparent that the racks will move in directions crossing each other when the pinion is actuated. Since the said racks 6 and 7 are formed of flexible or spring steel sections, they will conform substantially to the curvature of the shock, and the diagonally opposite free ends of the racks will therefore move away from the shock when the racks are operated in opposite directions to draw a cord taut about the shock. Obviously, the said free ends of the racks will not interfere or engage with the body of the shock.

The outwardly extending ends of the slots 4 and 5 are open as shown, and journaled upon bolts 8, adjacent to said slots are rollers 9, which are disposed transversely of the casing or housing 1. These rollers as will be apparent, are positioned adjacent to and across the open ends of the casing, so that they will engage the upper smooth surface of the racks not confined by the said slots, during their movement therethrough.

Journalled centrally of the housing or casing 1, in suitable bearings therefor, is a shaft 10, having a crank 11, formed integral therewith and provided further with a pinion 12, which is located interiorly of the casing. The said pinion 12, being so positioned that the teeth of the racks may engage therewith, and the diameter of the pinion 12. is such as to hold the smooth edges of the racks against the rollers 8, so as to avoid any rocking movement of the racks during their travel through the casing. It is here to be noted that the racks 6 and 7 have their teeth 13 formed at an acute angle with respect to the curved side walls of the racks, so that the said teeth 13 will engage the teeth on the pinion 12 in its travel through the casing 1.

The shaft 10, has suitable means in the form of shoulders to prevent axial movement thereof, and the inner end 14, of said shaft is extended and tapered to a point so that it may pierce the shock of grain, fodder or the like, and thereby support the device when the racks are being actuated.

One end of the rack 6, is provided with a laterally projecting stud 15, which is provided at its outer end with a head in the form of a disc 16, for retaining the end portion of a cord when wound on the stud, as indicated in Figs. 1 and 2.

Attached to the rack 6, by means of the stud 15, is a clamping plate 17, which has an inclined extremity 18, with an opening 19, therein. A pin 20, also secured to the rack 6, adjacent to the stud 15, projects laterally therefrom in like manner for registration with the opening 19, in the clamping plate 17.

Mounted on the pin 20, outwardly of the said plate, is a coil spring 21, which is retained thereon by means of a suitable wing nut 22, adapted to be regulated for adjusting the tension of the said spring and thereby governing the pressure of the plate 17, against the side of the rack 6.

In a similar manner, the rack 7, is provided with a relatively large opening 23, for receiving and tying thereto one end of the binding cord element. Riveted or otherwise secured to the rack 7, adjacent the opening 23, is a plate 24, provided with an inclined end 25, and having its bottom edge sharpened as at 26, to serve as a cutting blade.

In bundling grain into shocks, the shock, after the stalks have been arranged in position, is then adapted for inserting the pointed end 14, of the shaft 10, therein, transversely of the center. A suitable cord 27, preferably a sash cord, with one end thereof secured in the opening 23, is passed about the body of the shock, and the free remaining end thereof is finally wrapped several times around the stud 15, with the end portion of said cord beyond this wrapping forced between the clamping plate 17, and the side of the rack 6; the racks having been previously arranged so that their unattached diagonally extended ends 28, are immediately adjacent the sides of the casing 1, but not within the casing.

The shaft 10, is then rotated by means of the crank 11, thereby imparting movement to the pinion 12, through which the racks 6, and 7, are operated in opposite directions, hence tensioning the cord 27, taut about the shock.

When the shock has been so formed and the grain held closely together, the operator may, by straddling the key or stop plate 30, over the toothed face of the rack 6, immediately adjacent the point of entrance into the casing 1, prevent retrograde movement of the racks and the pinion.

The operator is then free to tie the shock with any suitable cordage adapted for the purpose. After ultimately tying the shock, the binding device may be removed from the shock, by disengaging the stop plate 30, from the rack 6, and detaching one end of the cord 27, from the tension plate 17, and the stud 15. The said stop plate 30 is suitably suspended from the casing 1 by means of a chain

31, which is attached to one of the bolts 8, supporting the rollers 9.

The invention having been set forth, what I claim and desire to secure by Letters Patent is:

1. In a shock binder, the combination with a pair of racks adapted for opposite directional movement, of a flexible binding element operatively associated with said racks for binding a shock of grain, a housing for movably supporting said racks, unitary manually operable means carried by said housing for actuating the racks and binding element simultaneously and guiding means formed with said racks and housing for imparting a diagonal path of travel to said racks.

2. A device of the character described, comprising a pair of arcuately formed racks adapted for opposite diagonal movement, a flexible binding element operatively associated with said racks for compressing a shock of grain, a housing for movably supporting said racks, unitary manually operable means carried by said housing for actuating the racks and binding element simultaneously, rack guiding means formed with said housing, and rotatable means co-acting with said last named means for maintaining said racks in diagonal paths of travel.

3. A shock binder comprising a casing having a plurality of diagonally opposite openings therein, a pair of arcuate racks having their teeth formed at acute angles with respect to the curvature of said racks movably supported in said casing in spaced relation, a pinion journaled in said housing between said racks for operative engagement therewith, manually operable means connected with said pinion outwardly of said casing for actuating said racks and pinion, a plurality of rollers journalled in said casing adjacent said openings for maintaining said racks in constant contact with said pinion throughout their opposite paths of travel, means provided at certain ends of said racks for attaching a flexible binding element thereto, locking means carried by said casing for straddling one toothed face of said racks at a point adjacent said casing to prevent retrograde movement of said racks and pinion, and a cord cutting and supporting means secured to one of said racks adjacent the binding element connecting end thereof as and for the purpose set forth.

In testimony whereof I affix my signature.

BERT McBRIDE.