No. 713,264. Patented Nov. 11, 1902.

W. N. WHITELY.

GRAIN BINDING HARVESTER.

(Application filed Sept. 13, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

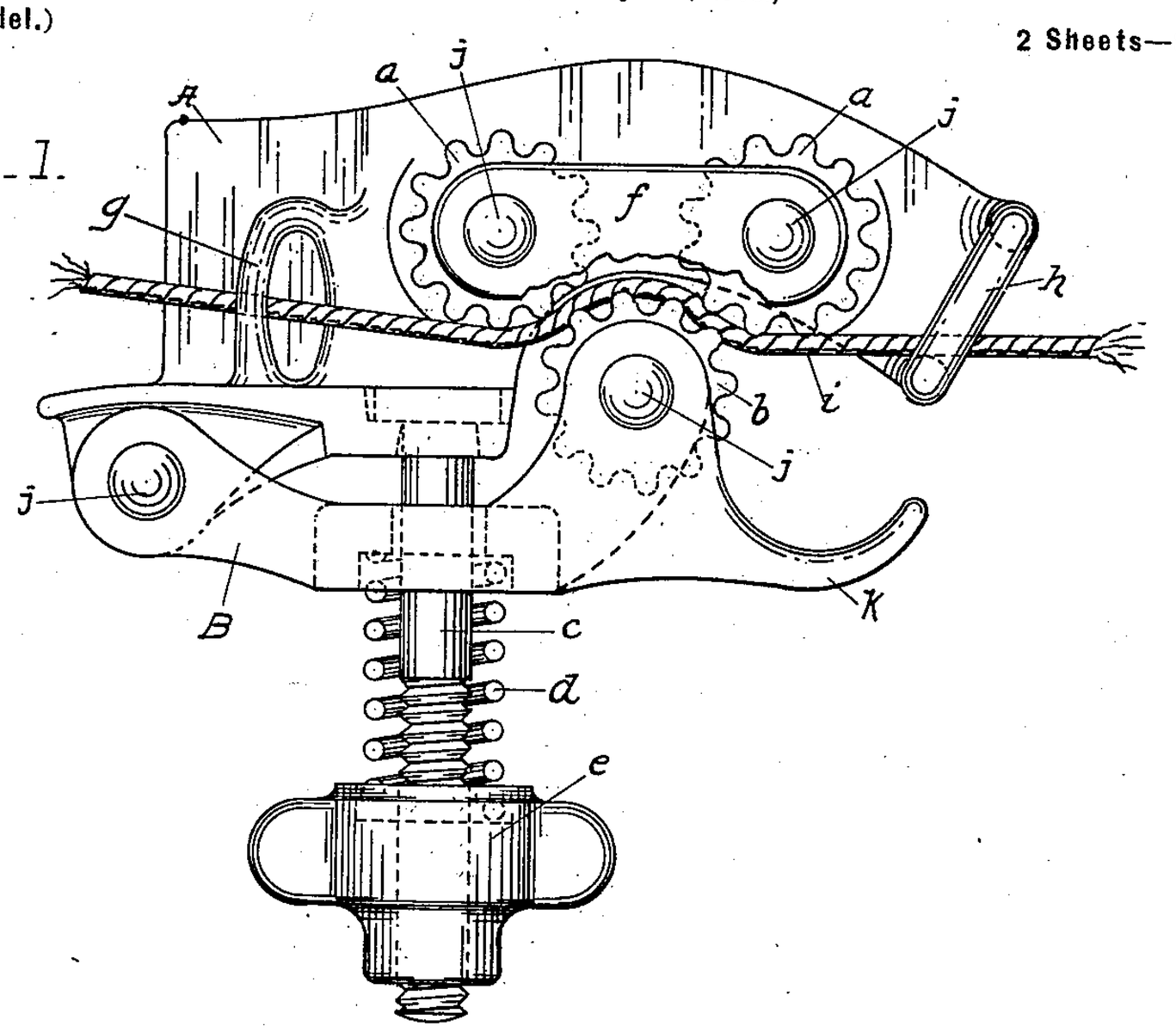

Fig. 2.

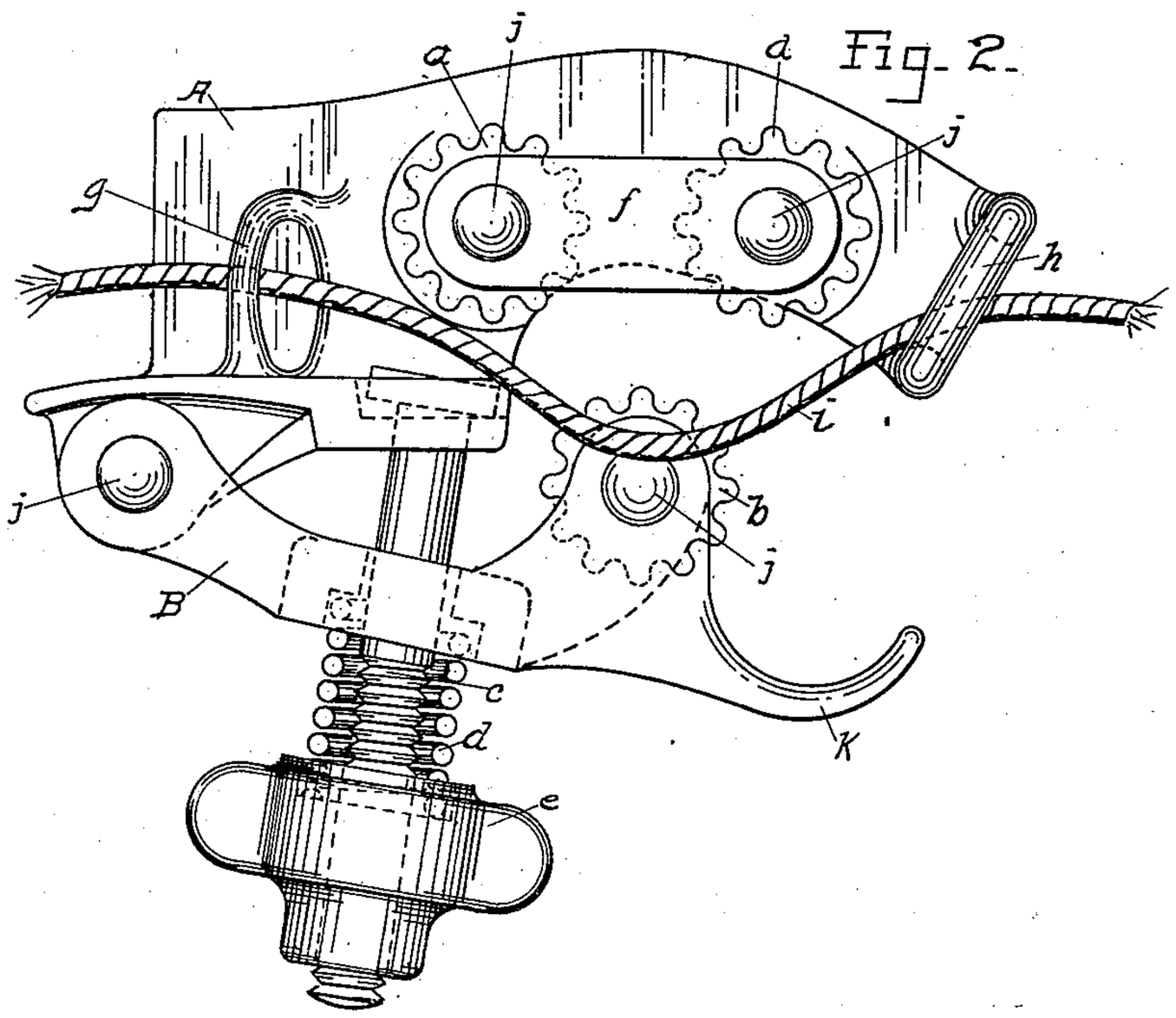

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Fig. 2.

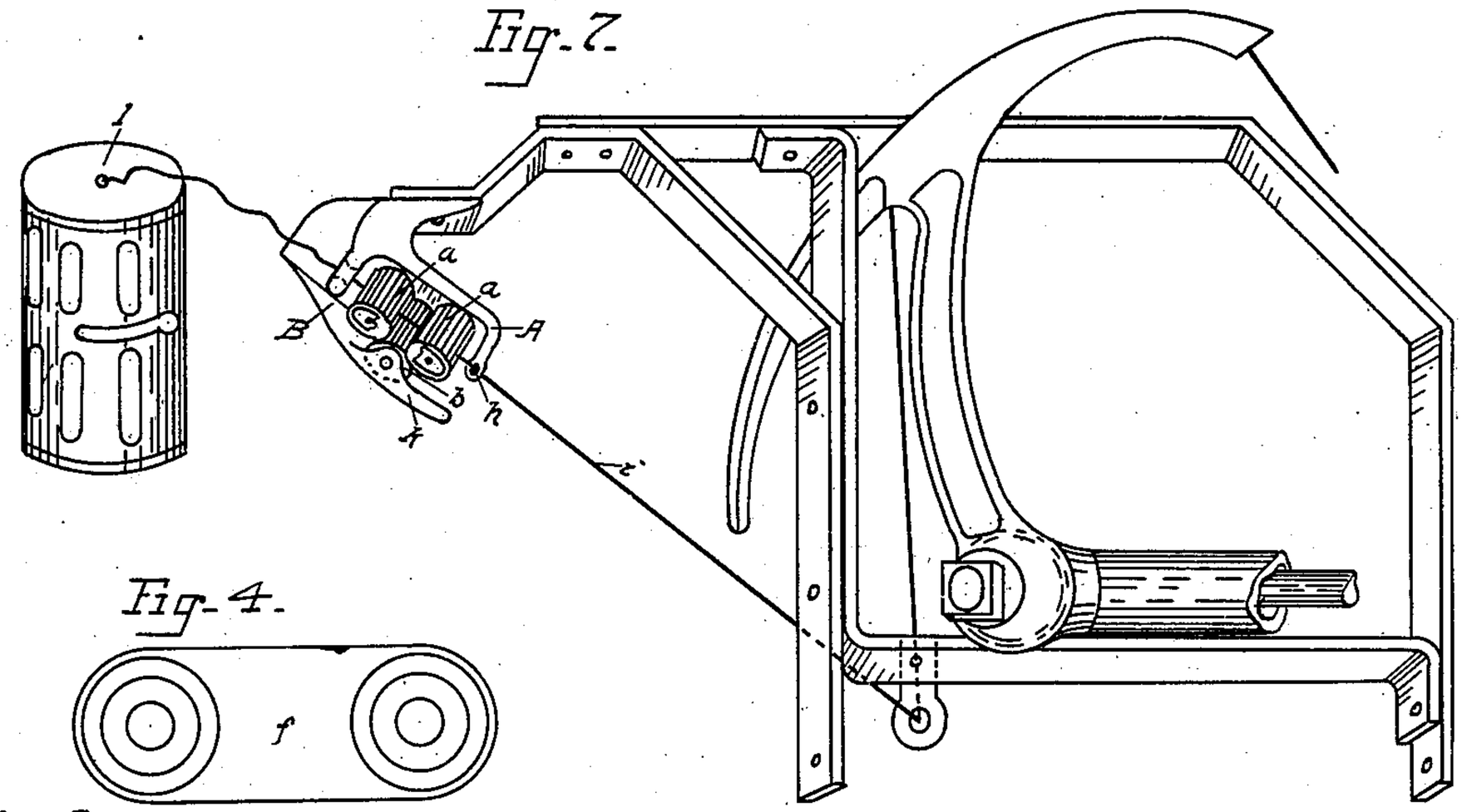


Fig. 4.

Fig. 5.

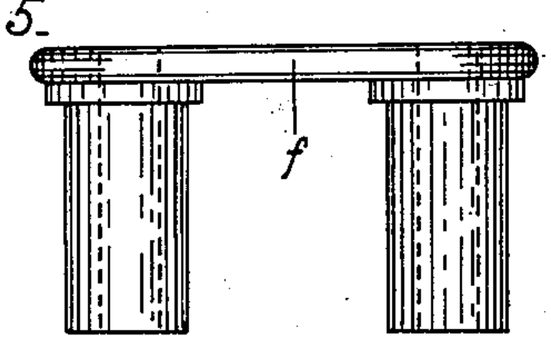


Fig. 6.

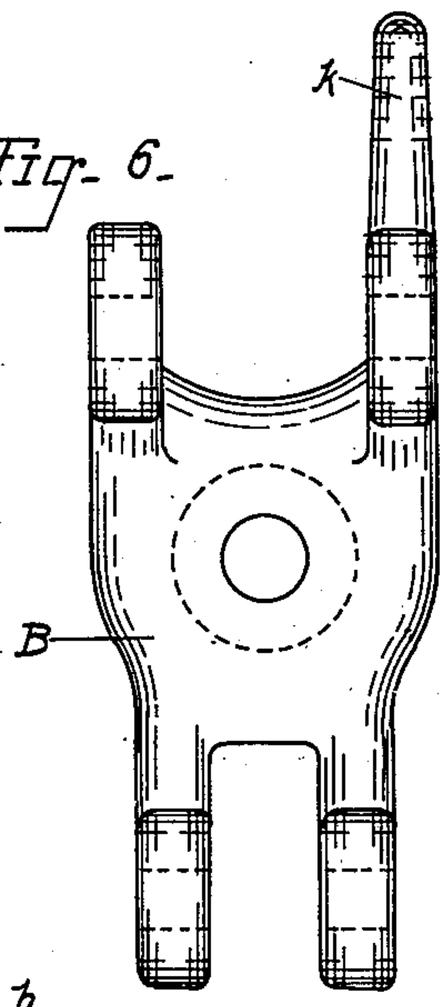
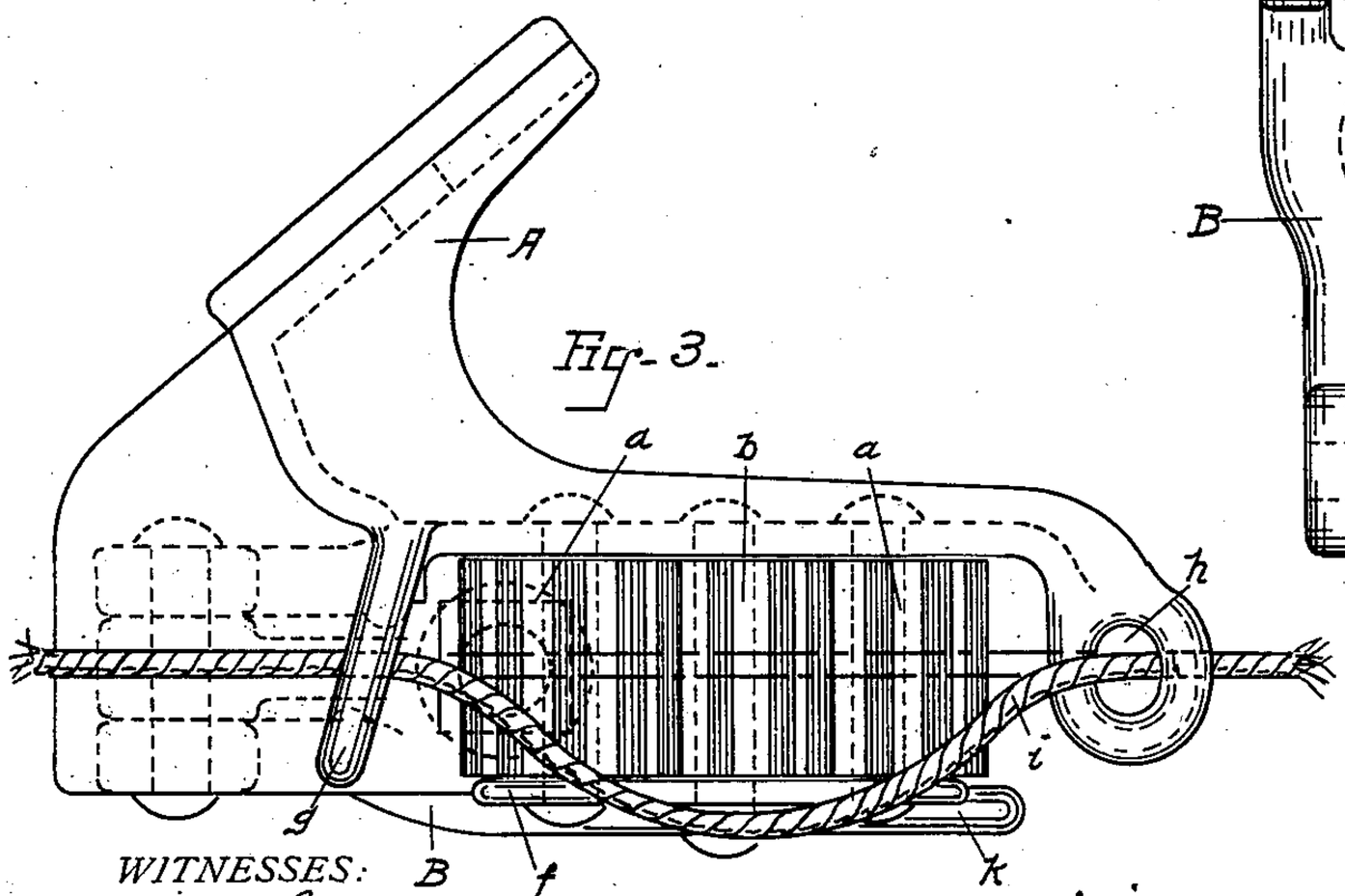


Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM N. WHITELY, OF SPRINGFIELD, OHIO.

GRAIN-BINDING HARVESTER.

SPECIFICATION forming part of Letters Patent No. 713,264, dated November 11, 1902.

Application filed September 13, 1901. Serial No. 75,293. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM N. WHITELY, a citizen of the United States, residing at No. 153 East High street, Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Grain-Binding Harvesters; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to an improved cord-tension device for grain-binding harvesters.

It is important in the operation of grain-binders that the tension upon the cord be uniform at all times and that irregular-size cord as well as cord of regular size may receive a uniform tension and that knots, snarls, kinks, and lumps in the cord may pass readily through the tension without stoppage or breakage of the cord. The ordinary friction-plate tension heretofore used has been found defective and is not satisfactory, as it did not exert a uniform tension on the cord on account of irregularities in the size of the cord and cord of varying sizes could not pass through with equal facility and effectiveness.

Another trouble experienced with the friction-plate tensions of the kind now in use is that, the cord being drawn through between two plates, in a short time grooves are worn in the plates by the action of the cord passing between them, and when small places in the cord are drawn through little or no tension is exerted upon the cord, the result being that the cord between the knot-tying mechanism and the tension would become slackened, kinked, twisted, or broken. To overcome these defects and to fit the grain-binder for good work by providing a cord-tension device that will at all times exert a uniform tension on the cord regardless of its condition is one object of my invention.

Another object of my invention is to provide a cord-tension that is easily threaded, as trouble of this kind has been experienced with the tensions heretofore in use. In my construction I leave one end of each roller exposed, so that in threading the tension the cord is first passed through the guides, then over and around the exposed ends of the two inseparable rollers, and afterward between said two inseparable rollers and the yielding roller.

To effect these objects, I employ what I term a "three-roller cord-tension device," consisting of two grooved rollers inseparably connected and revolving upon suitable bearings mounted upon a supporting-frame and a yielding roller of the same construction as the two inseparable rollers and revolving upon a bearing mounted upon a separate supporting-frame, the two supporting-frames pivotally connected together longitudinal of said rollers, the yielding roller preferably adjustable to the two inseparable rollers and parallel to same, said two inseparable rollers being located a sufficient distance apart to admit about one-fourth of the diameter of the yielding roller to come between them, so that the cord in its passage through the tension may be bent around the yielding roller and between it and the two inseparable rollers, which produces sufficient friction upon the rollers to rotate them, and it is not necessary to bend the cord into the grooves of the rollers, or but little.

In this construction cord of varying sizes from the same source of supply may be used with equal efficiency, and as the rollers run on trunnions or bearings of medium size and fit loosely upon said bearings or in bearings sufficient friction is attained to retard the movement of the cord between the rollers without the intervention of a brake mechanism, large bearings, or heavy spring-pressure to force said rollers together. This is an important desideratum, as the cord is drawn through between the rollers evenly and smoothly under all circumstances. I also employ a cord-guide located on each side of said rollers so as to keep the cord passing between said rollers central of their length and to prevent it from working out past the ends of said rollers. These guides may be located on either supporting-frame for the rollers or independently of said frame, but preferably on the roller-frame. When three rollers are employed, foreign matter in the

cord will pass freely through the tension and between the rollers without winding around the rollers or their bearings.

In the accompanying drawings, which form a part of this specification, Figure 1 is a side elevation of my improved cord-tension, showing the position of the cord in the guides and between the rollers when the tension is in operation. Fig. 2 is a side elevation of my improved cord-tension, showing the cord in the guides, the cord drawn over the exposed ends of the two inseparable rollers, the frame supporting the yielding roller drawn down out of its regular working position to admit the cord between the rollers. Fig. 3 is a plan view of my improved cord-tension, showing the cord passing through the cord-guides and drawn out over the exposed ends of the two inseparable rollers for insertion between the two inseparable rollers and the yielding roller, the dotted lines indicating the position of the cord between the rollers when the tension device is threaded. Fig. 4 is a detail side elevation of the two-bearing bracket-support for the two inseparable rollers. Fig. 5 is a detail plan view of the same. Fig. 6 is a detail top view of the supporting-frame for the yielding roller. Fig. 7 is a perspective view of a binder-frame, showing the position of my improved cord-tension device located thereon, also the cord-supply and the passage of the cord from the cord-supply through the cord-tension to the needle.

Like parts are represented by similar reference-letters in the several views.

In the said drawings, A represents the supporting-frame for the two inseparable grooved rollers *a a*.

B is the supporting-frame for the yielding grooved roller *b*.

c is the screw-threaded bolt passing through the supporting-frames A and B. *d* is the tension-spring mounted on said bolt. *e* is the nut on the end of said bolt.

f is the two-bearing bracket-support for the two inseparable longitudinally-grooved rollers *a a*.

g is the cord-guide on the supporting-frame A through which the cord passes from the cord-supply to the cord-tension.

h is the cord-guide on the supporting-frame A through which the cord passes from the cord-tension to the needle.

i is the cord.

j j j j are screw-threaded bolts which pass through the bracket-support *f* for the two inseparable rollers connecting same to the frame A and also through the yielding roller *b*, connecting same to its supporting-frame B, and also through the supporting-frame A for the two inseparable rollers and the yielding frame B, pivotally connecting same together longitudinal of said rollers.

k is the thumb-latch located on the supporting-frame B for the yielding roller.

l is the cord-supply.

By means of the pivotal connection between the two supporting-frames A and B, screw-threaded bolt *c*, and spring *d*, mounted on said bolt and the nut *e*, the three rollers are forced together into frictional contact, as shown in Fig. 1. I employ a thumb-nut *e* on said bolt *c* to increase or relax the frictional contact with said rollers, the spring *d*, mounted on said bolt *c* intermediate the frame B, and nut *e*.

It will be observed that where three friction-rollers are employed, as in my present application, that however loose the fittings may be the two inseparable rollers *a a*, mounted on the supporting-frame A, will partially surround the yielding roller *b*, supported on the yielding frame B, or the yielding roller *b* will fit in between the two inseparable rollers *a a*, thereby making a perfect and uniform bearing upon the cord *i* and no disposition or tendency to twist one end of the cord up or down in its passage between the rollers, the three rollers coöperating and working together in perfect harmony with each other.

Much difficulty has been experienced in threading the cord-tensions heretofore used by reason of the tension and cord-guides being inconveniently located and difficult to reach; but I provide an easy and comfortable means for that operation by so locating the cord-tension and cord-guides where they can be easily reached and threaded quickly. This I accomplish by having one side of my three-roller cord-tension device open, as shown in Figs. 1, 2, and 3, leaving one end of said rollers exposed. The operation being as the cord is taken from the cord-supply to first pass the cord through the cord-guide *g*, then through the cord-guide *h*, then around the exposed ends of the rollers *a a* in the manner shown in Figs. 2 and 3, then by drawing down the yielding frame B, supporting the yielding roller *b*, by means of the thumb-latch *k*, located on said supporting-frame B, an opening will be effected between the two inseparable rollers *a a*, mounted on the frame A, and the yielding roller *b*, mounted on the frame B, to admit the cord between said rollers. Then by releasing the frame B the rollers *a a* by the action of the spring *d* on the bolt *c* and the nut *e* are brought into frictional contact with each other and the cord *i* is held in its proper place central of said rollers. This means for threading the tension is very important, as it is necessary to repeat the operation many times in the use of the machine and the easier and more comfortably it is done, the more desirable.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a cord-tension for grain-binding harvesters, in combination, three friction-rollers, each having longitudinal grooves, a supporting-frame, two of said rollers mounted inseparably on said frame, a separate supporting-frame for the third roller, said frames connected together by a pivot extending par-

allel to said rollers, a screw-threaded bolt passing through said frames between said pivotal joint and said third roller, an adjusting-nut and spring mounted on said bolt to force the yielding roller between said two inseparably-supported rollers, a thumb-latch on said yielding supporting-frame to hold said rollers apart for the purpose of laying the cord between said rollers.

2. In a cord-tension for grain-binding harvesters, in combination, three friction-rollers having longitudinal grooves, a supporting-frame, two of said rollers mounted inseparably on said frame, a separate yielding frame to support the third roller, said frames connected by a pivot extending parallel to said rollers to maintain the parallelism of said rollers at all points of adjustment, flexible means to force one of said rollers between the other two, a cord-guide located upon either side of said rollers, the end of one or more of said rollers exposed that the cord may be passed around same, the cord being first passed through said guides and afterward laid between said rollers where it is held by flexible means to any degree of tension desired.

3. In a cord-tension for grain-binding harvesters, in combination, three friction-rollers having longitudinal grooves, a supporting-frame, two of said rollers mounted inseparably on said frame and located near each other, a yielding supporting-frame for the third roller, said frames connected together by a pivot extending parallel to said roller, a screw-threaded bolt passing through both of said frames between said pivotal connection for said frames and the third roller, an adjusting-nut on said bolt, a spring mounted on said bolt intermediate said nut and said yielding frame to force said rollers together, the adjustable roller located farther from the pivotal connection for said frames than said adjusting-bolt to give said third roller a greater movement than said spring.

4. In a cord-tension for grain-binding harvesters, in combination, three friction-rollers having longitudinal grooves, said rollers arranged and maintained with their axes parallel to each other at all times, a supporting-frame, two of said rollers mounted inseparably on said frame, a separate yielding supporting-frame for the third roller, said frames pivotally connected together to maintain the parallelism of said rollers in their varying adjustments, a screw-threaded bolt passing through both of said frames between the pivotal joint of said frames and said third roller, an adjusting-nut and spring mounted on said bolt to flexibly adjust said rollers and hold said rollers in frictional contact.

5. In a cord-tension for grain-binding harvesters, in combination, three friction-rollers having longitudinal grooves, said rollers turning in the same direction the cord is moving, a supporting-frame, two of said rollers mounted inseparably on said frame, a separate yielding supporting-frame for the third roller, said frames connected to each other by a pivot extending parallel to said rollers to always maintain the parallelism of said rollers, cord-guides located on either side of said rollers and arranged to admit the cord without passing the cord through between said rollers, after which one of said rollers may be separated from the other two for the free admission of the cord between them.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM N. WHITELY.

Witnesses:
JOHN L. GILLIGAN,
J. W. CLARK.