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PATENTED FEB. 26, 1907.

C. F. ADAMS.  
KNOTTER FOR GRAIN BINDERS.  
APPLICATION FILED MAR. 1, 1906.

FIG. 1.

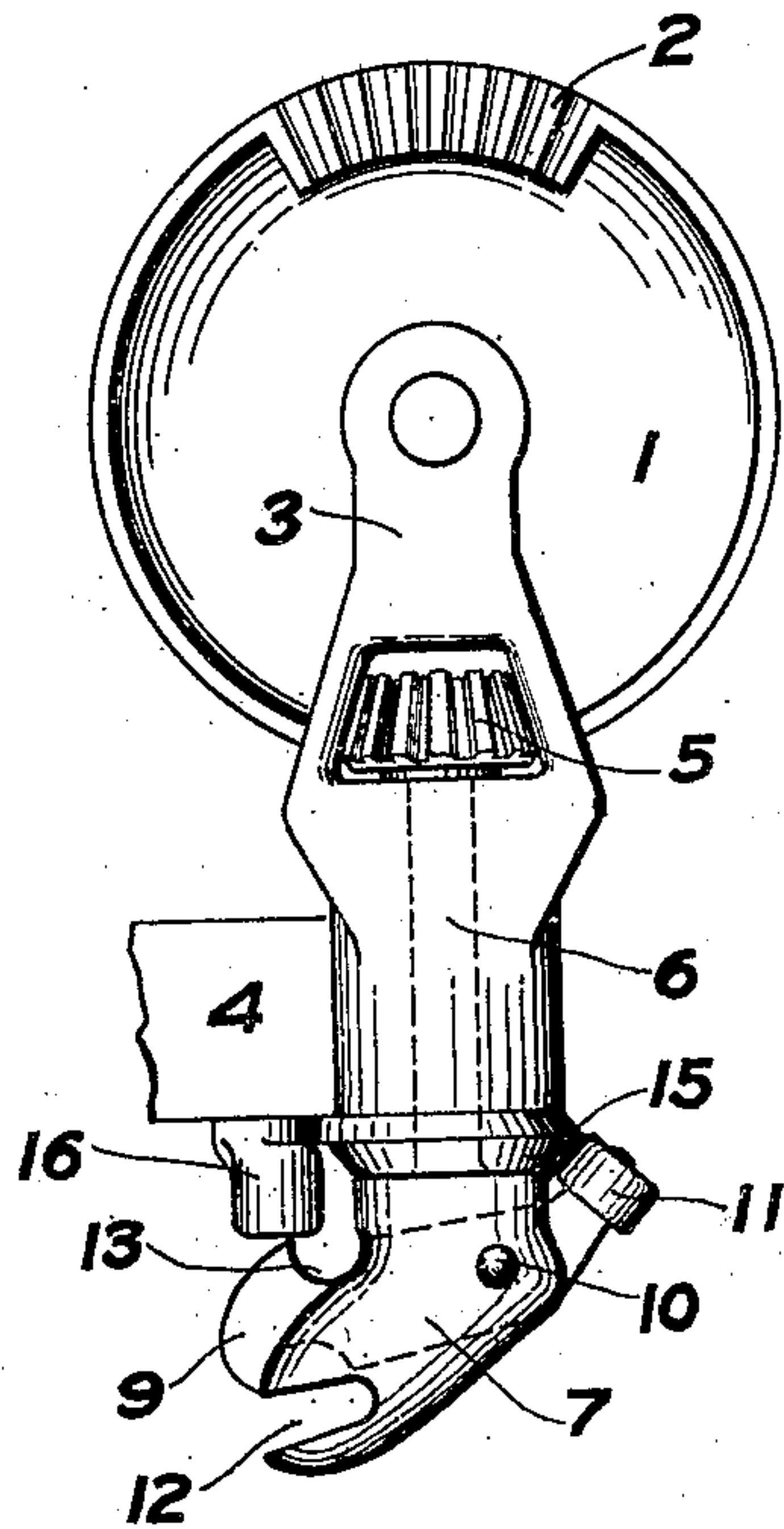


FIG. 2.

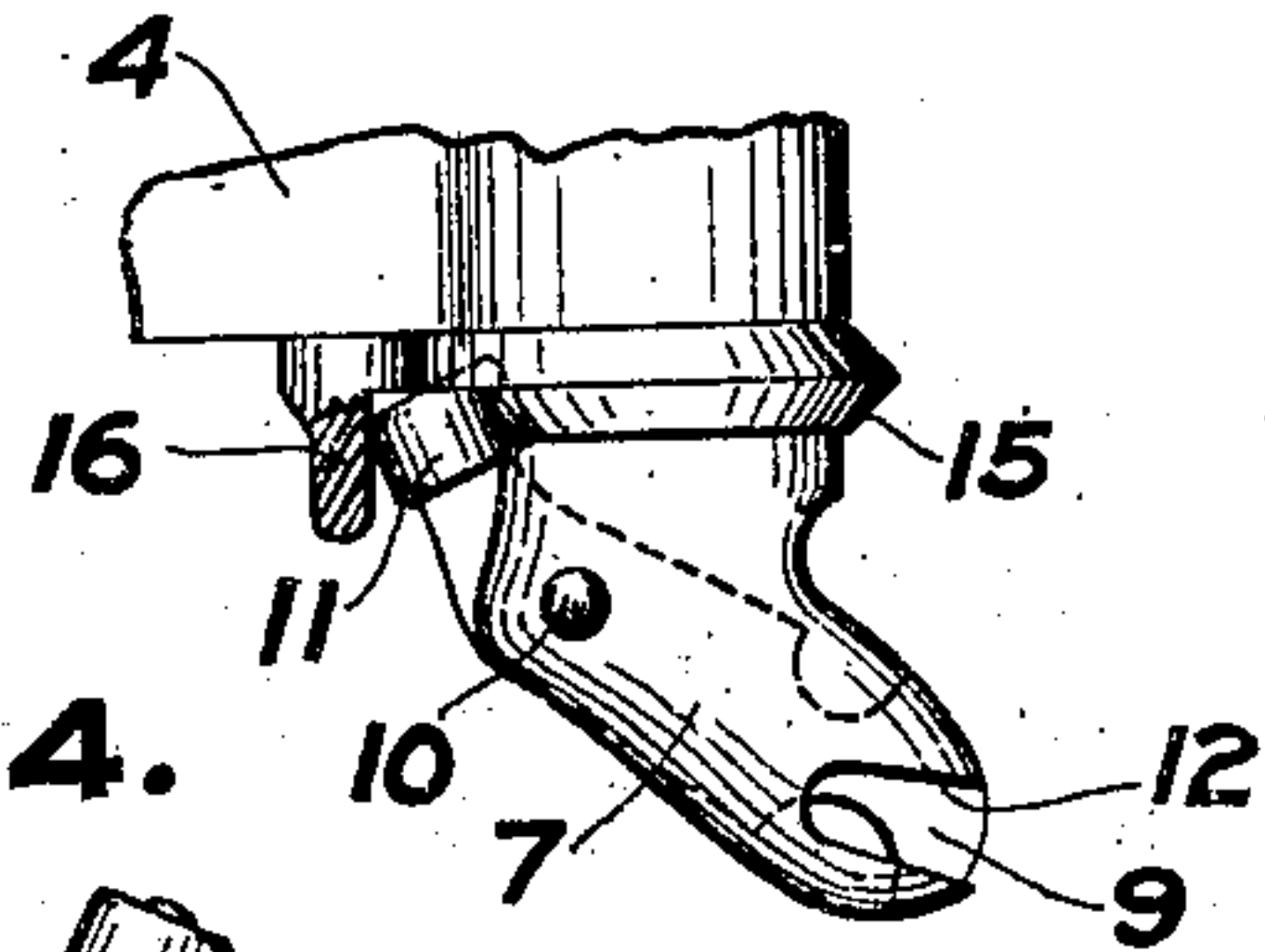


FIG. 4.

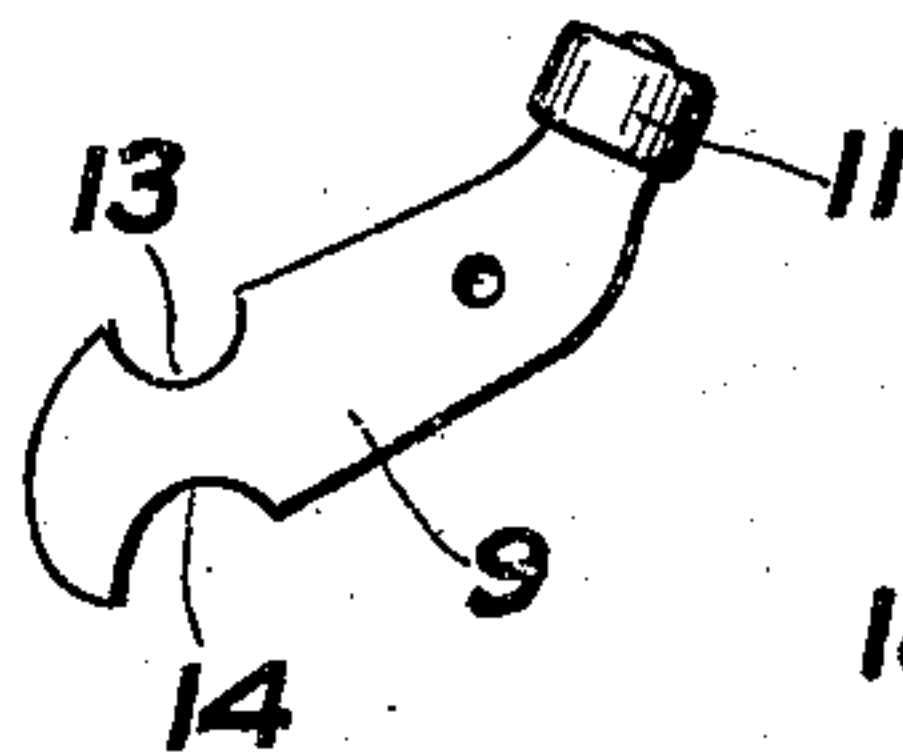


FIG. 3.

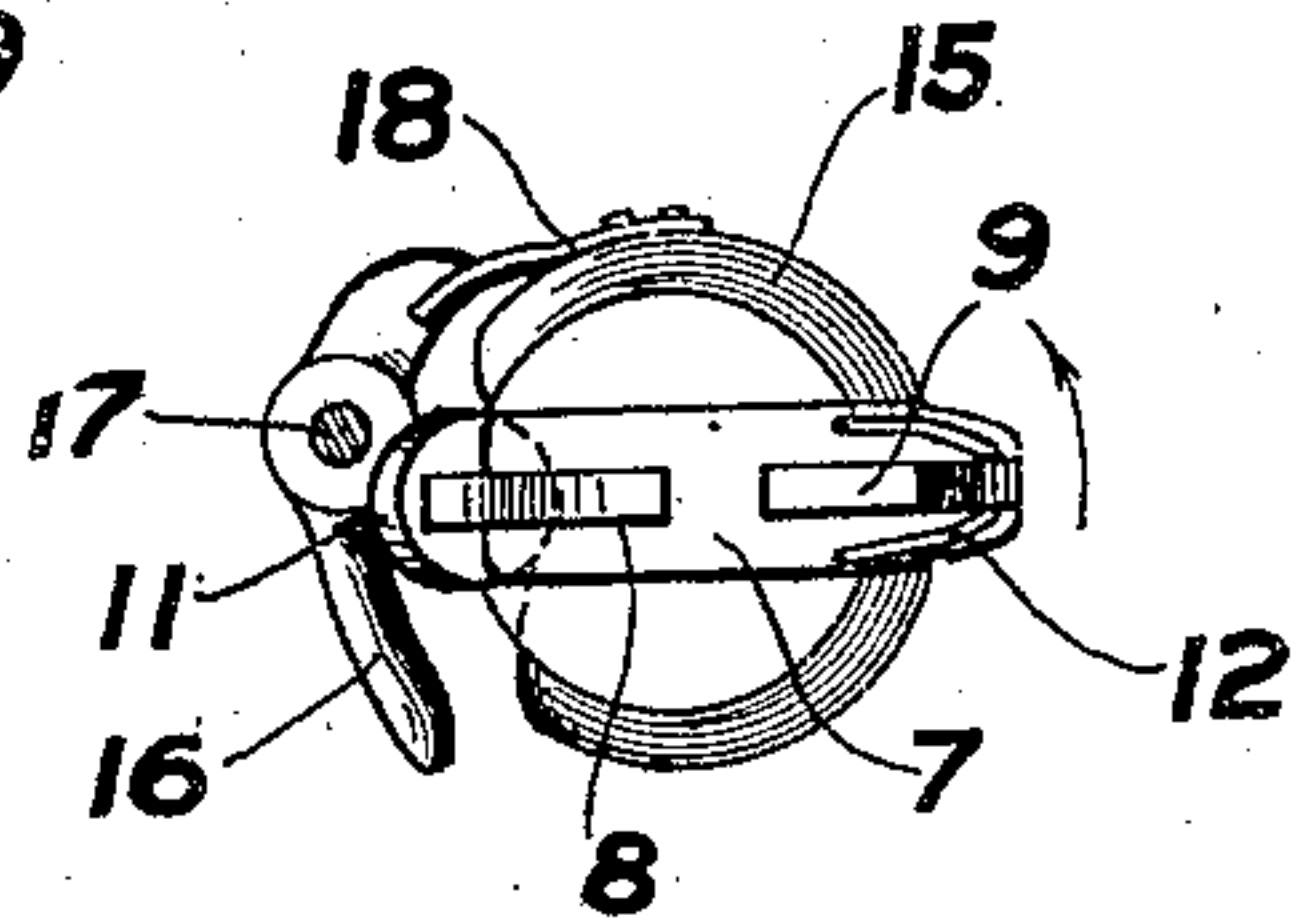


FIG. 7.

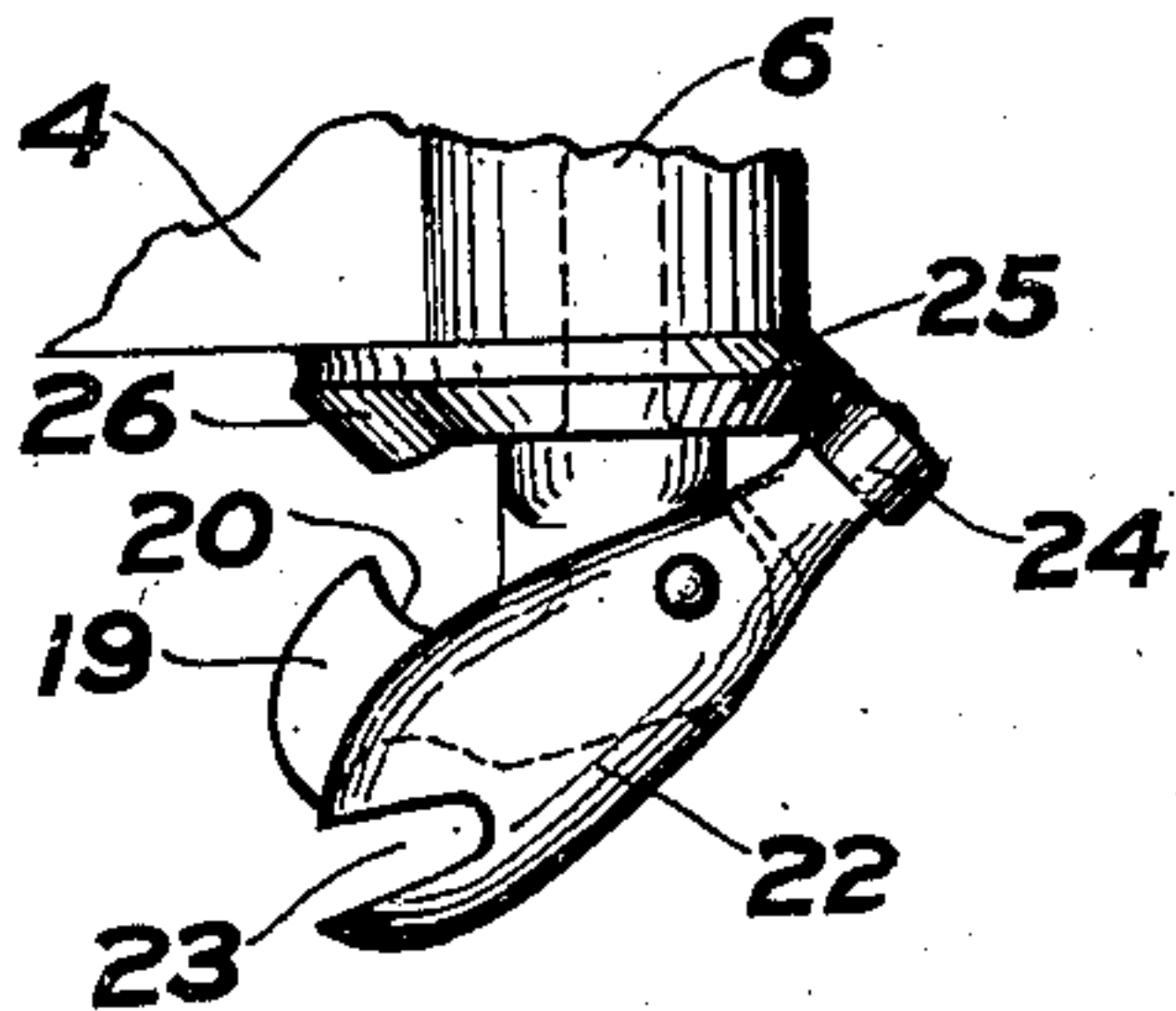


FIG. 5.

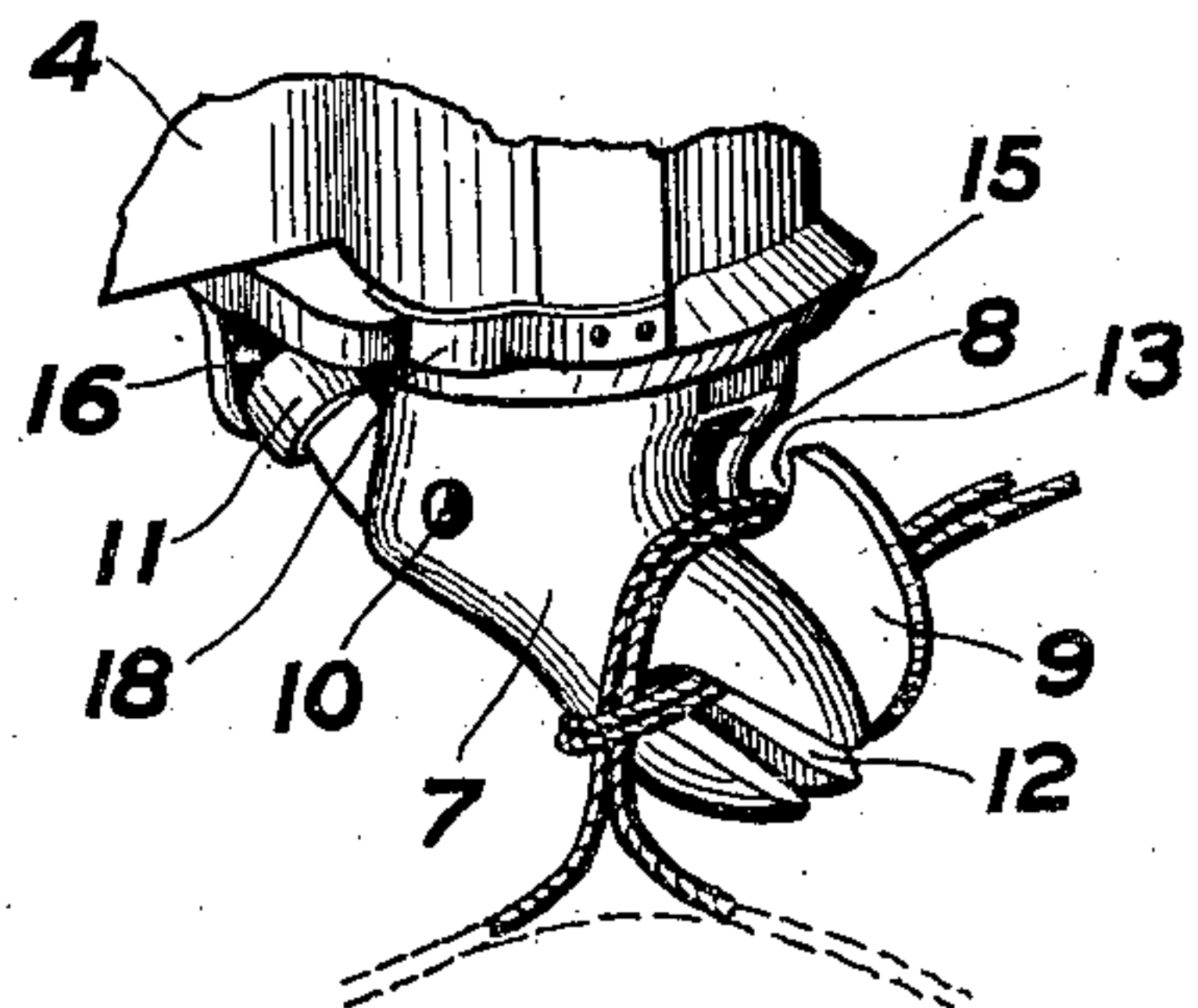
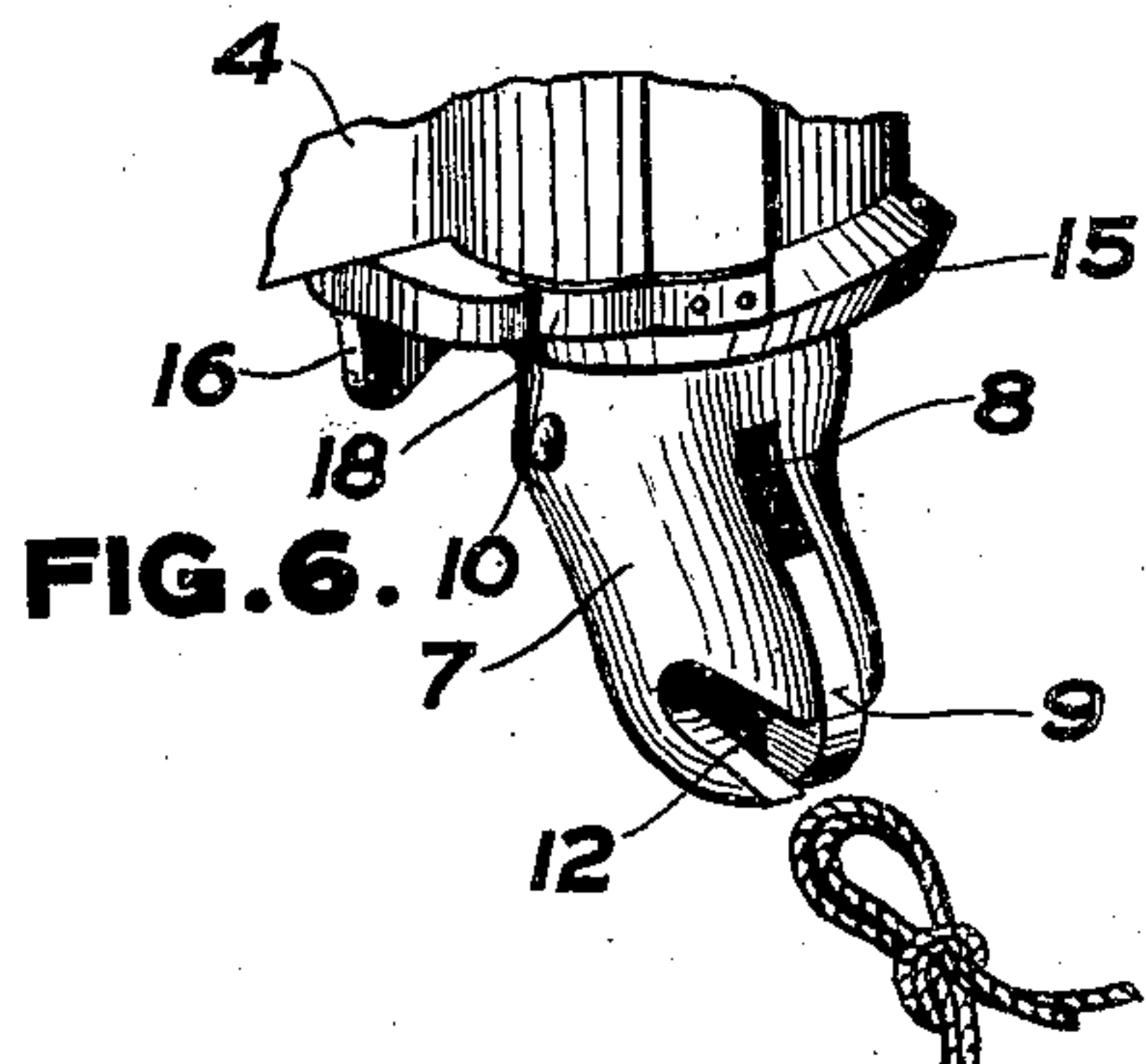
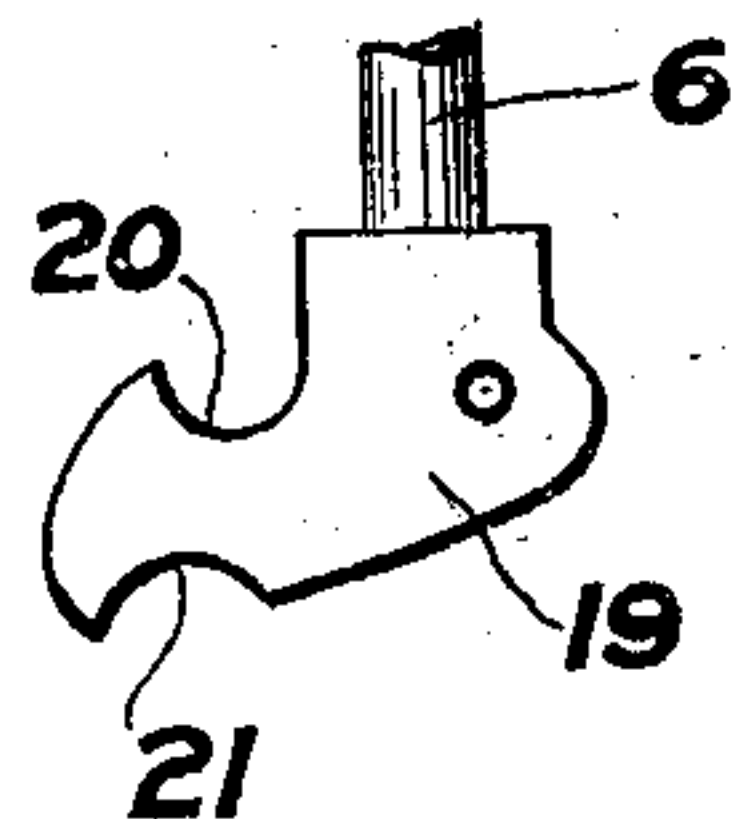


FIG. 8.



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# UNITED STATES PATENT OFFICE.

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## KNOTTER FOR GRAIN-BINDERS.

No. 845,158.

Specification of Letters Patent.

Patented Feb. 26, 1907.

Application filed March 1, 1906. Serial No. 303,704.

*To all whom it may concern:*

Be it known that I, CHARLES FRANCIS ADAMS, a citizen of the United States, and a resident of the township of Riga, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Knotters for Grain-Binders, of which the following is a specification.

This invention relates to knotters for grain-binders, and consists in the apparatus hereinafter described and claimed.

The object of the invention is to provide a knotter having a more certain positive action than those heretofore generally in use.

In the drawings, Figure 1 is an elevation of a portion of a knotter mechanism embodying this invention. Fig. 2 is an elevation of the tier-bill of this knotter and certain related parts. Fig. 3 is a bottom plan view of the same structure. Fig. 4 is an elevation of the tier-bill tongue. Fig. 5 is a view of the same parts shown in Fig. 2, showing the cord in place just prior to the knot being tied. Fig. 6 is an elevation of the same parts after the knot has slipped off the tier-bill. Fig. 7 is an elevation of the tier-bill and tongue of a modified form, and Fig. 8 is a view of the tongue of the same device shown in Fig. 7.

This invention relates solely to the construction of the tier-bill, its tongue, and the mechanism for operating the same, and in the drawings the parts of a grain-binder are omitted which would be understood to be used in connection with the knotting device.

In Fig. 1, 1 is the tier-wheel provided with its segmental gear 2. 3 is a support carried by a portion 4 of the frame of the machine, which support carries the tier-bill pinion 5 on the tier-bill stem 6. To the lower part of the support 3 is attached a tier-bill 7, having a longitudinal slot 8, (shown in Fig. 3,) in which is pivoted the tier-bill tongue 9 on the pivot 10 and carrying on the rear extension thereof the antifriction-roller 11. The tier-bill has the transverse slot 12 across its extremity, which intersects the slot 8, so that the tongue 9 is adapted to move in the slot 8 and across the slot 12. The tongue 9 has a notch 13 in its upper edge and the notch 14 in its lower edge. The upper notch 13 forms a hook in the tier-bill tongue, and the notch 14 is adapted to grasp and hold the cord in the slot 12.

On the support 3 is the stationary cam 15 for engagement with the roller 11 for actuating the tongue 9. As shown in Fig. 3, the cam 15 is interrupted or cut away for a portion of its length, so as to permit the tongue 9 to descend into the position shown in Figs. 2 and 6 when it is desired to release the cord from the tier-bill and after the knot is made. While the roller 11 is running on the cam 15 the tongue is raised into the position shown in Figs. 1 and 5. Opposite to the depression or mutilated part of the cam 15 just described is an arm 16, pivoted, as at 17, to the frame 4 and pressed inward toward the axis of movement of the tier-bill by means of a spring 18. This arm 16 is in such position and is of such shape as to make contact with the roller 11 when the latter is opposite the depression or mutilation of the cam 15 in order to raise said roller into said depression or mutilation.

The operation of the device is as follows: While the tongue 9 is tilted by contact with the roller 11, with the cam 15, into the position shown in Figs. 1 and 5 the cord is carried over the tongue 9, so as to lie in the notch 13, and the cord passes around the tier-bill and back through the notch 12 under the tongue 9. The hooked form of tongue holds the cord firmly in place to make the knot. The parts are then in the position shown in Fig. 5. As the bundle with the cord around it is ejected from the machine, the tier-bill is turned so that the roller 11 comes in contact with the arm 16, which depresses the tongue 9 and grasps that portion of the cord which lies in the slot 12; but the tongue 9 is so far depressed that the outer contour of the tier-bill and tongue are sufficiently smooth to permit the turn of the cord to slide off the tier-bill, while the cord in the slot 12 is held in place. This makes the knot in the usual way, and it is pulled off the tier-bill, as stated, by the ejection of the bundle from the binder. Fig. 6 shows the parts in their positions just as the knot has been made and has slipped off the tier-bill.

In Figs. 7 and 8 is shown a modified form of this device in which the tongue 19 has the upper notch 20 and the lower notch 21 in the same relative positions as in the tongue 9; but in this case the tongue 19 is stationary, being fixed upon the tier-bill stem 6. The



tongue 19 is flat, and on the side of it lie the rounded halves 22, having the transverse terminal slot 23, corresponding to the slot 12 above mentioned. The movable tier-bill 22 carries an antifriction-roller 24, adapted to run on a stationary cam 25, having in this case the projecting portion 26. It will be obvious from Fig. 7 that when the roller 24 is running on the main portion 25 of the cam the parts will take the position shown in Fig. 7, corresponding to the positions of the other form of device shown in Figs. 1 and 5, and with the tongue forming a hook for catching and holding the cord; but when the roller 24 meets the projection 26 of the cam the movable tier-bill 22 will rise, so as to cover the notch 20 and push the cord out of said notch, at the same time grasping, by means of the notch 21, the portion of the cord that passes through the slot 23 in the movable tier-bill 22. The modes of operation of these two modifications are identical.

What I claim is—

1. In a knotter for grain-binders, a tier-bill having a vertical slot, and also a transverse slot in its end for the cord, a tongue lying in the vertical slot in said tier-bill and having a notch in its upper surface forming a hook to retain the cord when the tongue is above the top of the tier-bill, and means for producing relative movement of said tier-bill and tongue to expose the hook above the tier-bill and to cover it within the tier-bill, whereby the said hook is operative in one position and is inoperative in another, and the cord is held between the tier-bill and the tongue in said transverse slot and is released.

2. In a knotter for grain-binders, a tier-bill having a vertical slot, and also a transverse slot in its end for the cord, a tongue lying in said vertical slot of said tier-bill and having a notch in its upper surface, and means for producing relative movement of said tier-bill and said tongue, whereby the

notch is exposed above the tier-bill and the cord lies ungripped in said transverse slot when the parts are in one position, and the notch is covered by the tier-bill and the cord is gripped in said transverse slot when the parts are in another position.

3. In a knotter for grain-binders, a tier-bill having a vertical slot, and also a transverse slot in its end for the cord, a support, a cam on said support, a tongue lying in the vertical slot in the tier-bill and having a notch in its upper surface, pivotal connections between said tier-bill and said tongue, a roller running on said cam and connected with one of said pivotally-connected parts, the other of said pivotally-connected parts being fastened to said support, whereby when the roller runs on the cam the notch is exposed above the tier-bill, and when the roller is not running on the cam the notch is covered by the tier-bill and a cord may be gripped between the tongue and the tier-bill.

4. In a knotter for grain-binders, a tier-bill having a vertical slot, and also a transverse slot in its end for the cord, a support, an interrupted cam on said support, a tongue lying in the vertical slot in the tier-bill and having a notch in its upper surface, pivotal connections between said tier-bill and said tongue, a roller running on said cam and connected with one of said pivotally-connected parts, the other of said pivotally-connected parts being fastened to said support, whereby when the roller runs on the cam the notch is exposed above the tier-bill, and when the roller is not running on the cam the notch is covered by the tier-bill, and a stationary guide for acting on said roller to hold the same and its connected part in place when the roller is off the cam.

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