

(No Model.)

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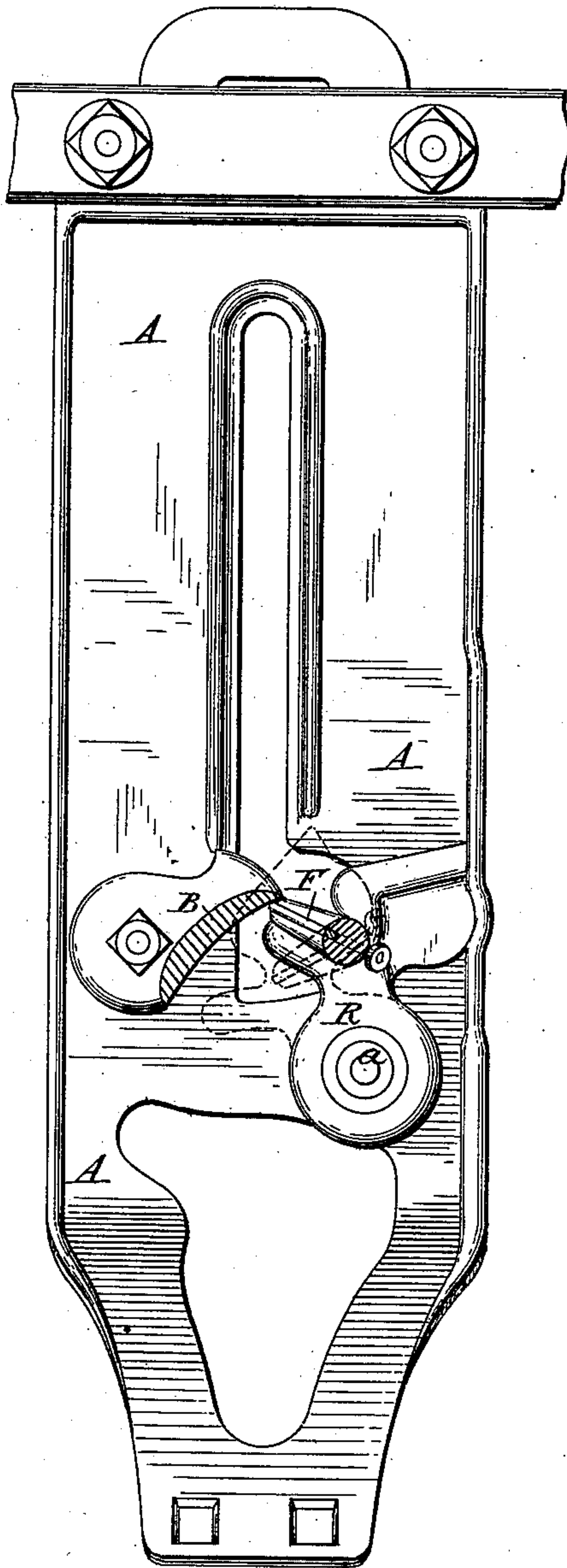
W. BUTTERFIELD.

CORD TYER FOR GRAIN BINDERS.

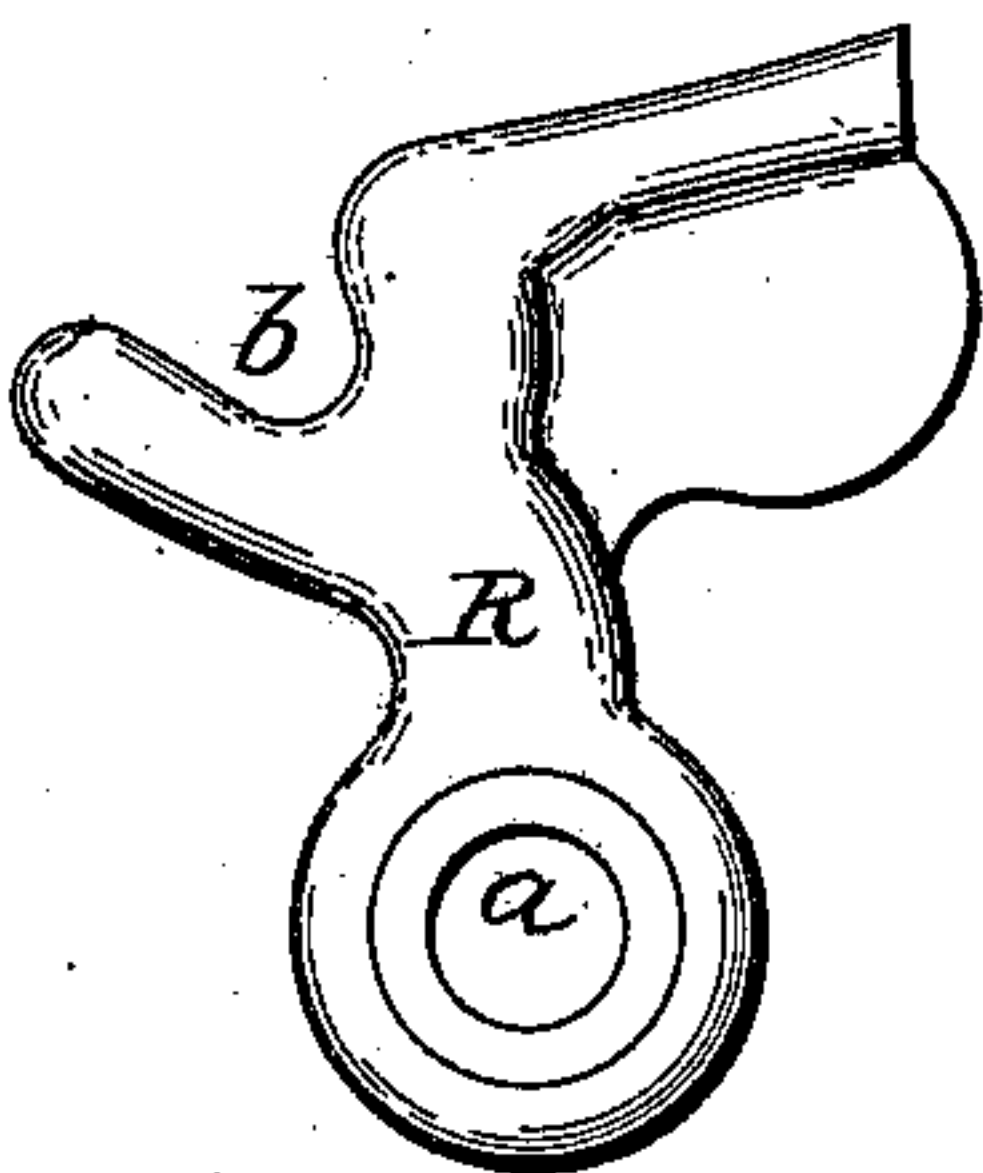
No. 373,220.

Patented Nov. 15, 1887.

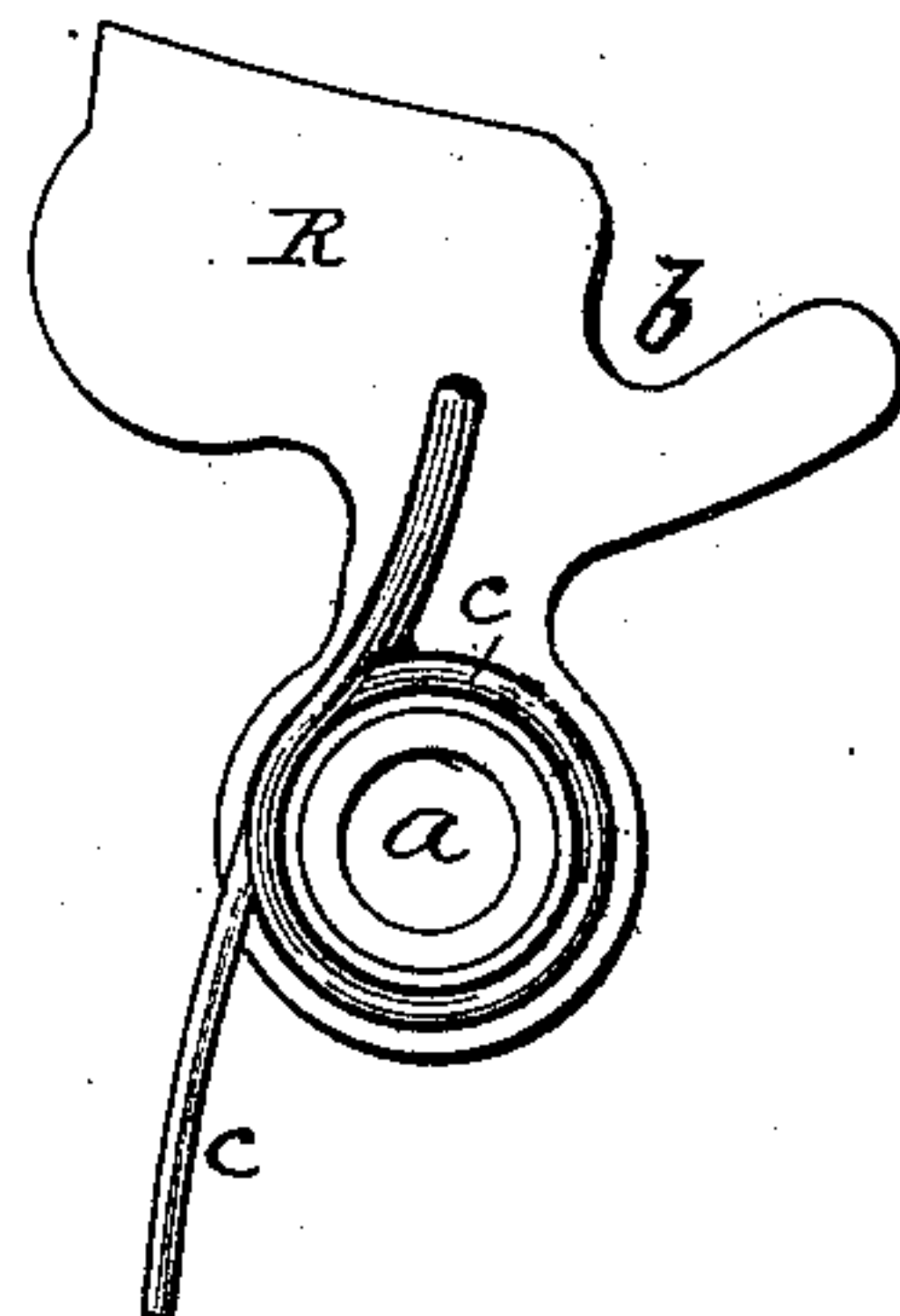
*Fig. 1*



*Fig. 2.*



*Fig. 3.*



*Attest:*

*Sidney P. Hollingsworth*  
*W. A. Kennedy*

*Inventor:*

*William Butterfield*  
*By his Atty*  
*P. T. Dodge*

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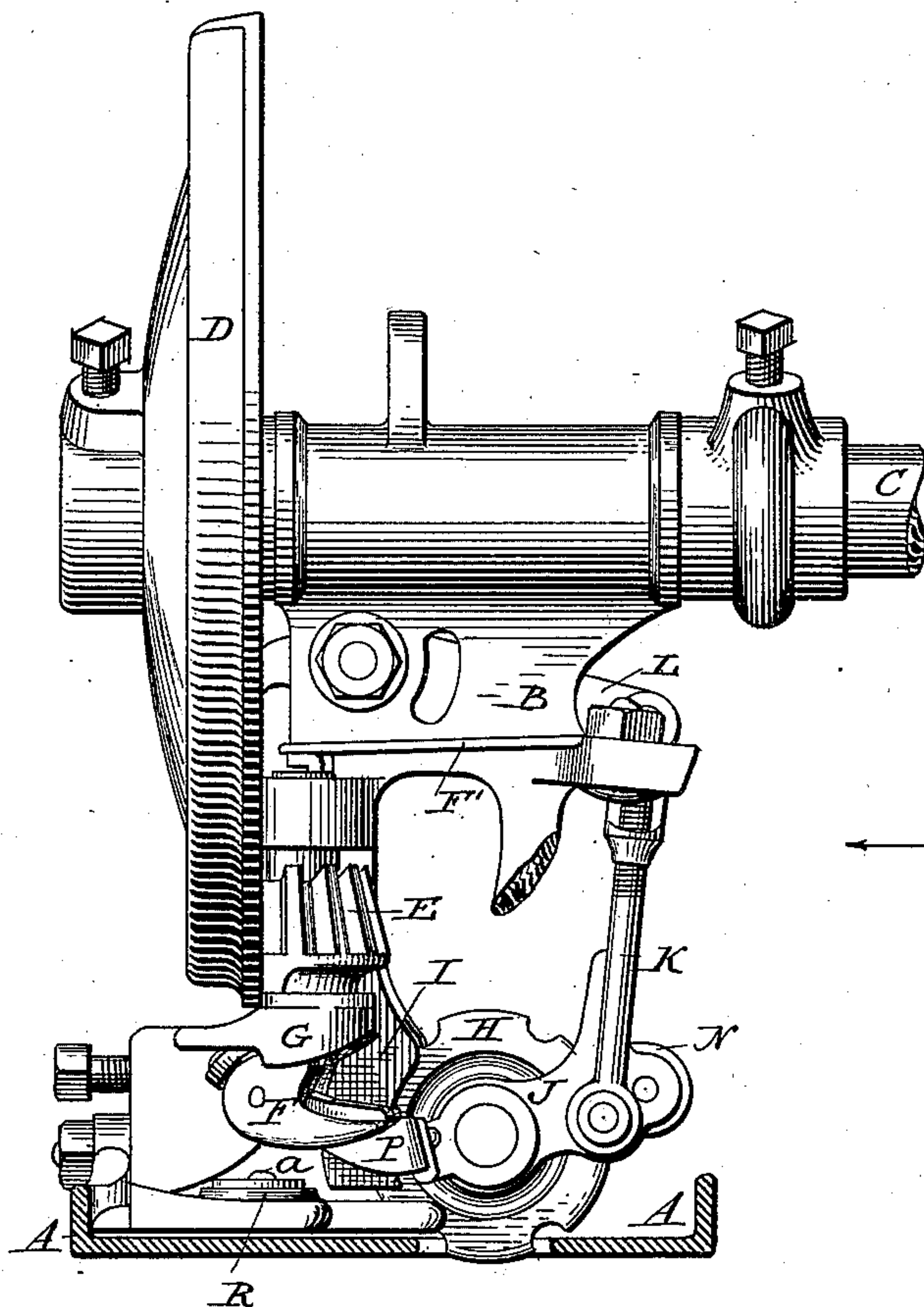
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*Fig. 4.*



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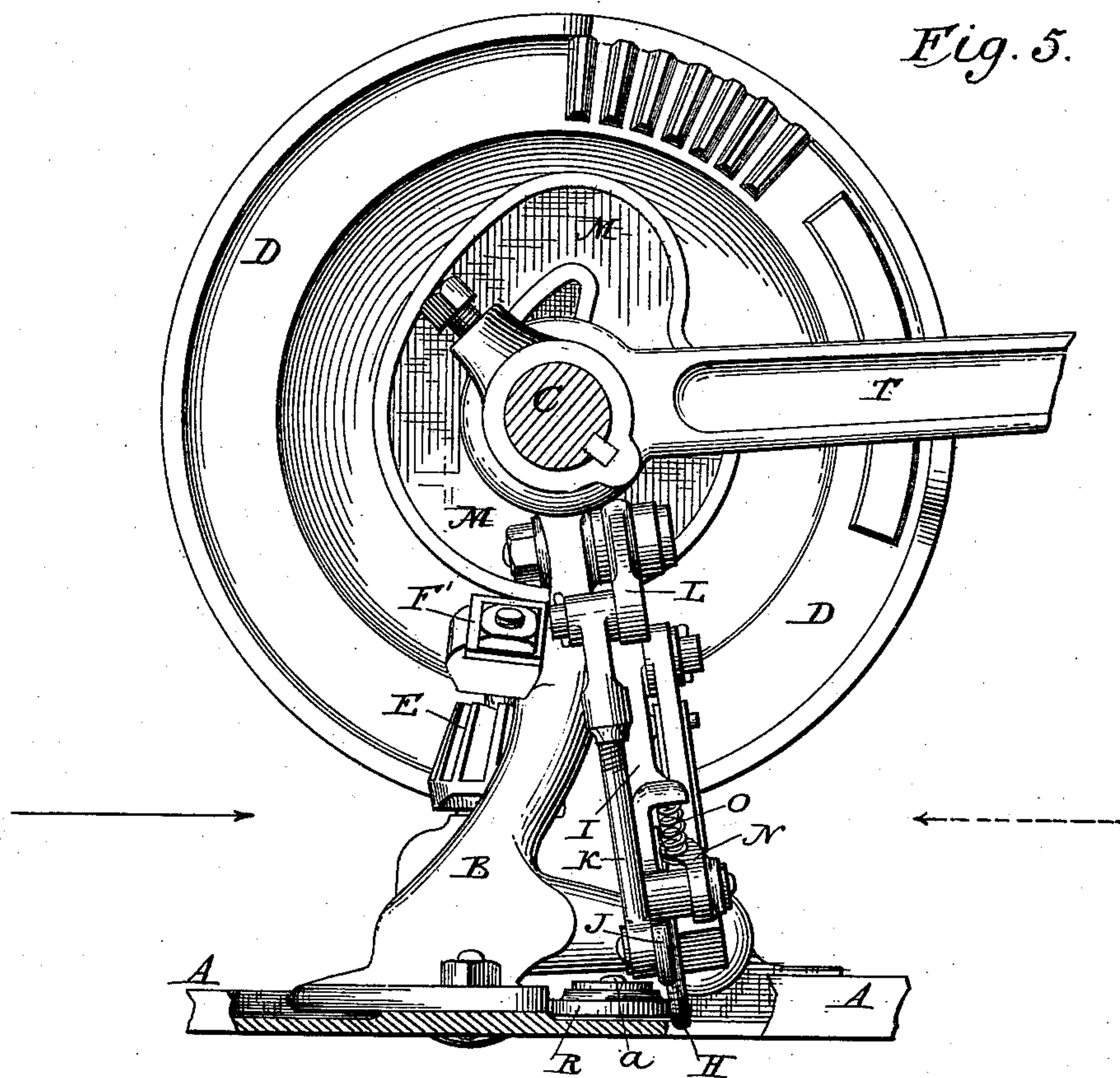


Fig. 5.

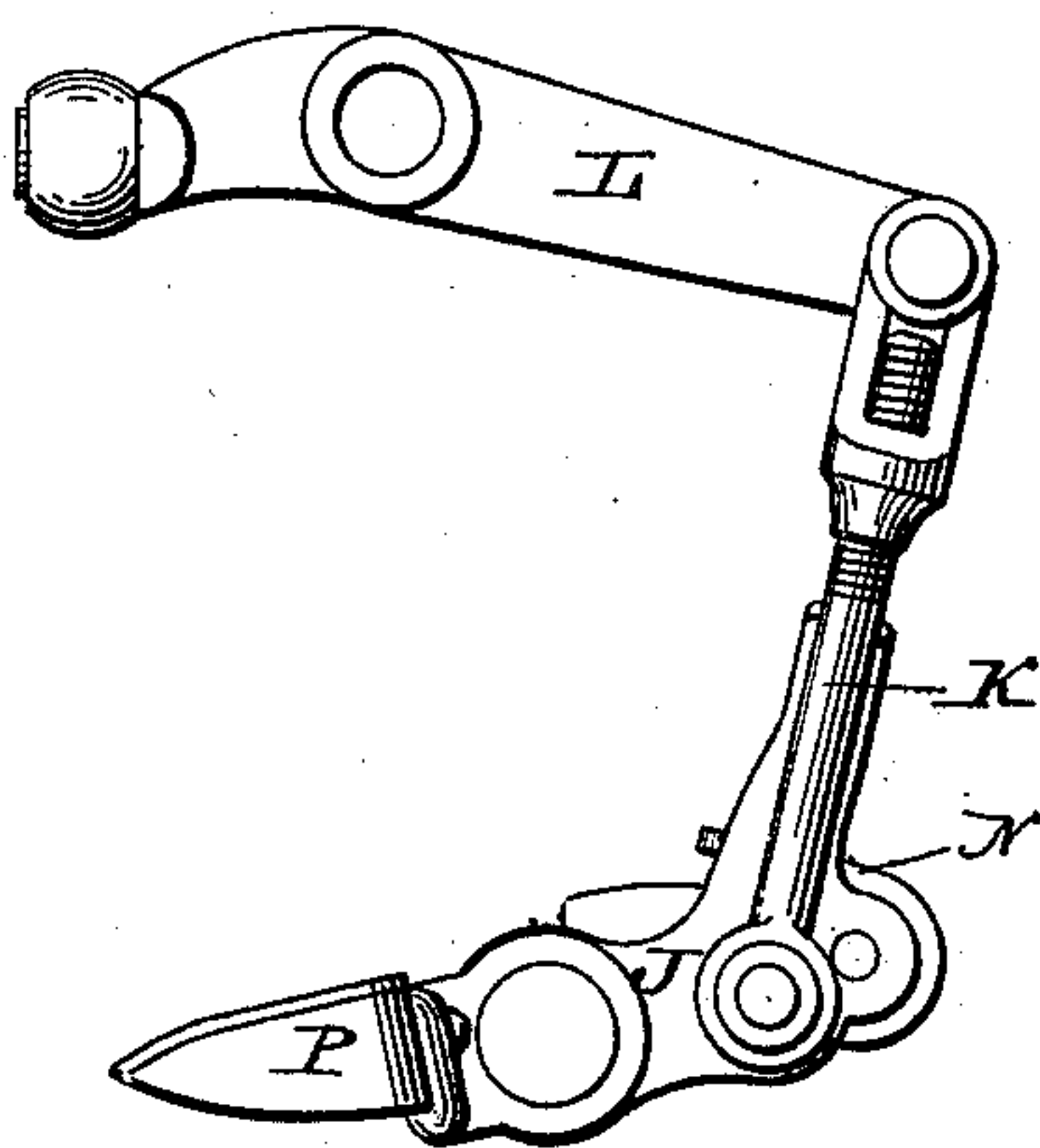


Fig. 6.

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Inventor:

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*Phil. T. Dodge*



(No Model.)

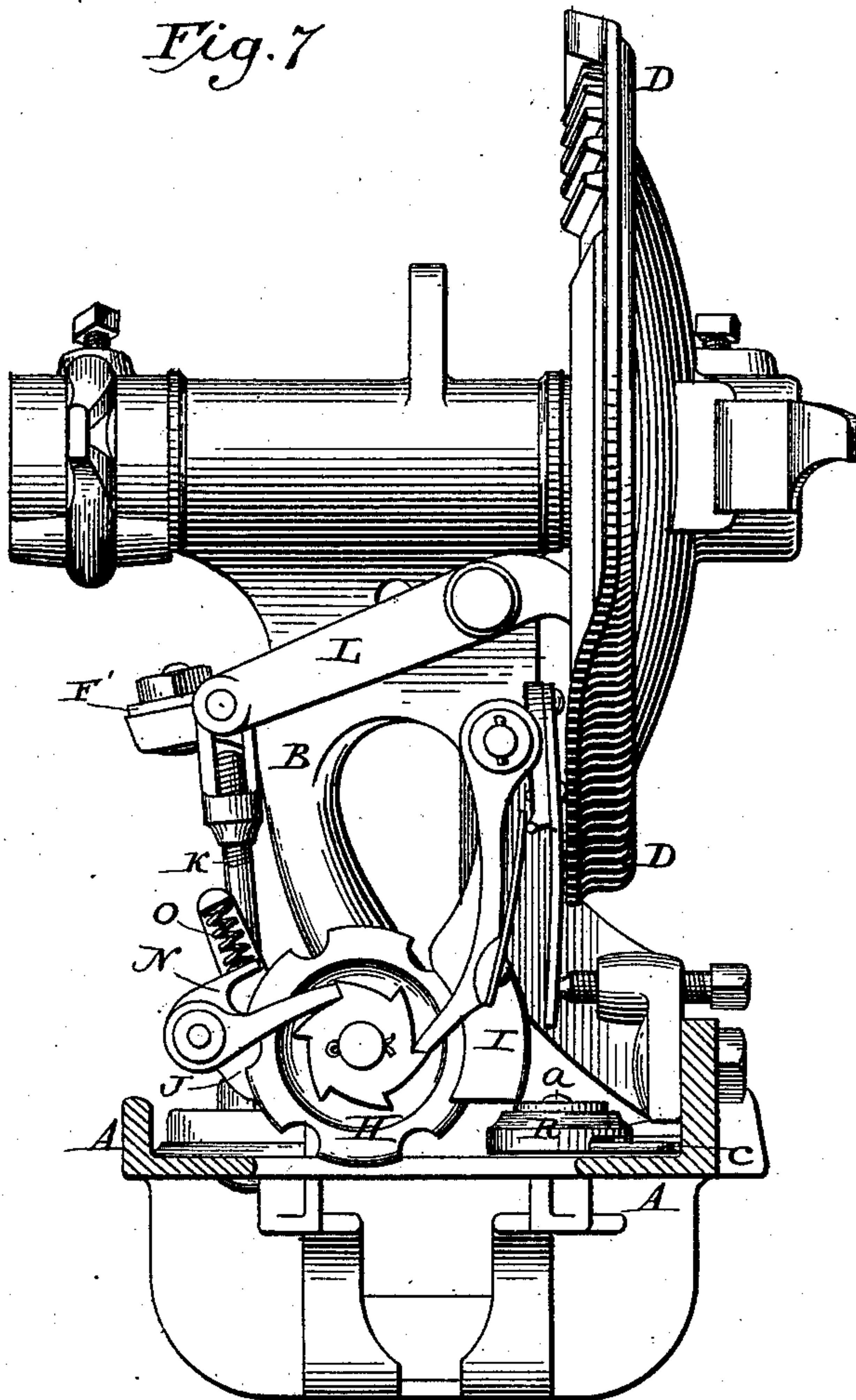
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*Fig. 7*



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# UNITED STATES PATENT OFFICE.

WILLIAM BUTTERFIELD, OF AUBURN, NEW YORK, ASSIGNOR TO D. M. OSBORNE & COMPANY, OF SAME PLACE.

## CORD-TYER FOR GRAIN-BINDERS.

SPECIFICATION forming part of Letters Patent No. 373,220, dated November 15, 1887.

Application filed February 4, 1887. Serial No. 226,555. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM BUTTERFIELD, of Auburn, in the county of Cayuga and State of New York, have invented certain Improvements in Cord-Tyers for Grain-Binders, of which the following is a specification.

This invention has reference to the band-fastening mechanism, and particularly to that class of machines in which the cord is laid by the binding-needle across the bill of a rotary tyer and across an intermediate cutting-blade to a clamping-disk by which the ends are retained.

The improvements consist in a movable stripper actuated by a strain of the cord thereon and serving to force the knot from the tying-bill, in combining the knife with a plate or arm which carries the dog for rotating the clamping-disk, and in other minor features, herein after explained.

For the purposes of illustration I have shown my invention incorporated in a binder of the familiar Appleby type; but it is to be understood that it may be applied to machines of other forms.

In the accompanying drawings, Figure 1 is a top plan view of the breast-plate, the lower end of the tyer, and the underlying stripper. Fig. 2 is a top plan view of the stripper. Fig. 3 is a bottom plan view of the same, together with its retracting-spring. Fig. 4 is a side elevation of the clamping, tying, and cutting mechanism and attendant parts, the underlying breast-plate being shown in cross-section. Fig. 5 is an elevation of the foregoing parts in the direction indicated by the arrow in Fig. 4. Fig. 6 is a side elevation of the arm through which the knife and the cord-clamp are operated, together with its actuating-lever. Fig. 7 is an elevation of the entire mechanism, looking in the direction indicated by the dotted arrow in Fig. 5.

Referring to the drawings, A represents the fixed breast-plate overlying the grain-passage, and provided with the usual slot to admit of the binding-needle rising therethrough to present the cord to the fastening devices.

B represents the usual standard rising rigidly from the breast-plate and formed at its upper end to support the main shaft C, commonly known as the "knotter-shaft," which

carries at one end the usual wheel, D, provided with teeth and delay-surfaces to actuate the stop-pinion E, secured on the upright spindle of the tyer-bill F, the spindle having its bearings, as usual, in the standard. The tying-bill is of the ordinary type, consisting of two laterally-projecting jaws pivoted one to the other, the movable jaw being closed by an action of the spring F' and opened by a stationary cam, G, which encounters its heel in the course of its revolution. The jaws revolve, as usual, immediately above the breast-plate and in a plane substantially parallel therewith in such position that the ascending needle will lay the end of the cord across the two jaws.

H represents the peripherally-notched clamping-disk, pivoted to the spindle in an upright position in rear of the tyer, so that the cord will be laid across its edge and into one of its notches by the needle. The edge of this disk travels through a spring-supported shoe, I, which confines the cord therein.

The foregoing parts are of familiar construction, and are not claimed as of my invention.

In order to give an intermitting rotation to the clamping-disk, I pivot on its axis an arm or lever, J, and connect the same at one end by a pitman, K, adjustable in length, to a lever, L, pivoted on the standard and seated at its opposite end, which is provided with an anti-friction roller, in a cam-groove, M, in the face of the main gear D. The arm or lever J carries a pivoted dog or bill, N, which, actuated by a spring, O, engages the ratchet-teeth on the side of the disk to give motion thereto.

On the lever J, which, it will be remembered, drives the disk, I secure a knife, P, arranged to vibrate between the disk and the tying-bill for the purpose of severing the applied band from the spool end of the cord. The parts are so formed and arranged that the knife retreats during the time that the disk is turning forward to clamp the cord and that it rises to sever the cord while the disk is at rest after the tyer has revolved to form the knot. As regards these parts, my invention resides in maintaining the knife and the device for operating the cord-clamp on the one lever, so that both may receive motion through one driving device.

For the purpose of stripping the knot from



the tyer I employ a movable stripper-plate, R, preferably made in the particular form represented in Figs. 2 and 3, but susceptible of reasonable modification in form. This plate  
 5 is pivoted at *a* to the top of the breast-plate and arranged to vibrate beneath and past the lower end of the tyer. It is provided in its forward end with a cord-receiving notch, *b*, and combined with a spring, *c*, by which it is  
 10 held normally in a forward position, as shown in Fig. 1, one of its arms extending across the cord passage or slot *d*, as shown in said figure. When in this position, the notch *b* lies immediately below the tyer, so that the cord car-  
 15 ried backward through the slot against the tying-bill enters the notch *b* of the stripper. As the tying operation is completed and the bill turned toward the rear, as indicated by dotted lines, to permit the escape of the knot,  
 2 the cord, moving rearward, acts to turn the stripper-plate rearward toward the position indicated in dotted lines. As the plate is piv-  
 25 oted eccentrically to the axis of the tyer, it acts during this rearward movement to force the knot outward toward and from the end of the bill, thus insuring its proper delivery. In this type of machines the bundle is discharged positively by means of a revolving arm, T, carrying the band with it, and thus it is that the  
 30 cord is turned sufficiently to insure the proper action of the stripper.

The essence of my invention resides in the construction of the stripper to be actuated by the cord, and it is manifest that it may be  
 35 modified in form and arrangement in many respects which will suggest themselves to the skilled mechanic without departing from the scope of my invention.

Having thus described my invention, what I  
 40 claim is—

1. In a grain-binding machine, and in combination with a tyer-bill, an adjacent movable stripper-plate, substantially as described, arranged in the path of and actuated by the ap-  
 45 plied band as the bundle is discharged.

2. The tyer-bill, in combination with a piv-  
 50 oted stripper-plate having the notched end located in the path of the band and arranged to swing lengthwise of the tyer-jaws, and the spring to return said stripper to its normal position, said parts organized, substantially as described and shown, so that the stripper is moved and caused to perform its function by the action of the applied band thereon.

3. In a grain-binder, the slotted breast-plate  
 55 through which the cord is passed, in combination with the rotary tying-bill above said plate, the intermediate vibratory stripper-plate having its arms arranged to span the slot or cord-passage and its pivot located as de-  
 60 scribed, so that the plate will swing forward under the strain of the binding-cord toward the end of the tyer-bill, and the spring for returning said plate to its normal position when released from the action of the cord. 65

4. In a grain-binder, the combination of a rotary tyer-bill, the vibratory stripper-plate located between the tyer and the place occu-  
 70 pied by the gavel and adapted and arranged, as described, to be moved by the action of the binding-cord thereon, and the bundle-ejector, whereby the delivery of the bundle is caused to strain the applied band across the stripper, and by thus moving the latter to force the knot from the tyer. 75

5. In combination with the tyer-bill, the rotary cord-clamping disk, the lever J, provided with the pivoted pawl to rotate the disk, and with the fixed knife, the pitman K, connected to the lever, the lever L, to actuate the pit-  
 80 man, and the cam-wheel to actuate said lever.

In testimony whereof I hereunto set my hand, this 14th day of January, 1887, in the presence of two attesting witnesses.

WILLIAM BUTTERFIELD.

Witnesses:

WM. A. KIRBY,  
 DAVID HERBERT.