

(No Model.)

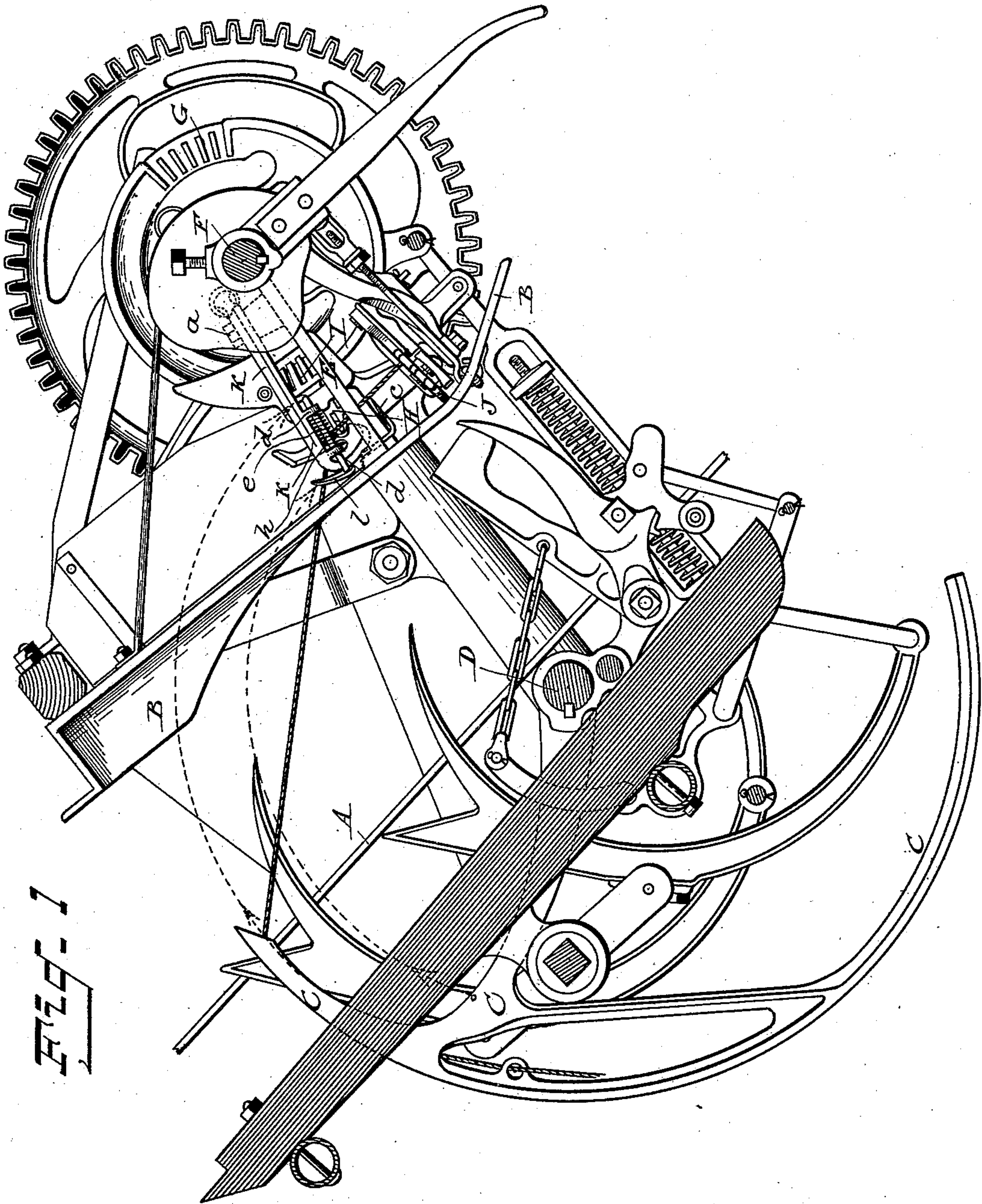
F. A. MURDOCK.

3 Sheets—Sheet 1.

GRAIN BINDER.

No. 378,845.

Patented Feb. 28, 1888.



Witnesses:  
W. A. Kennedy  
J. T. Chapman

Inventor:  
Frederick Ashlibald Murdock.  
By Attorney,  
Phil T. Dodge.



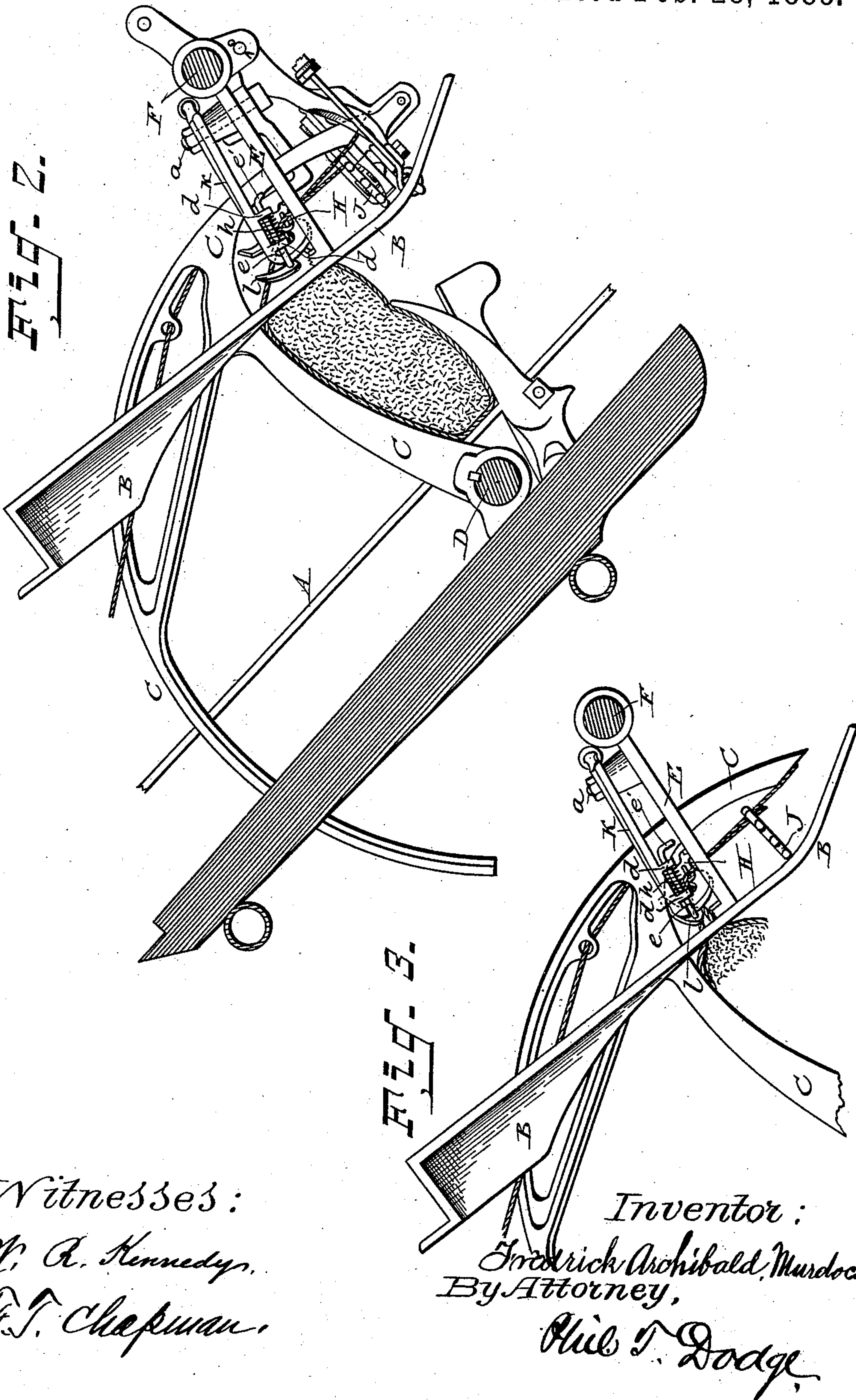
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F. A. MURDOCK.  
GRAIN BINDER.

3 Sheets—Sheet 2.

No. 378,845.

Patented Feb. 28, 1888.



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F. A. MURDOCK.  
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Fig. 4.

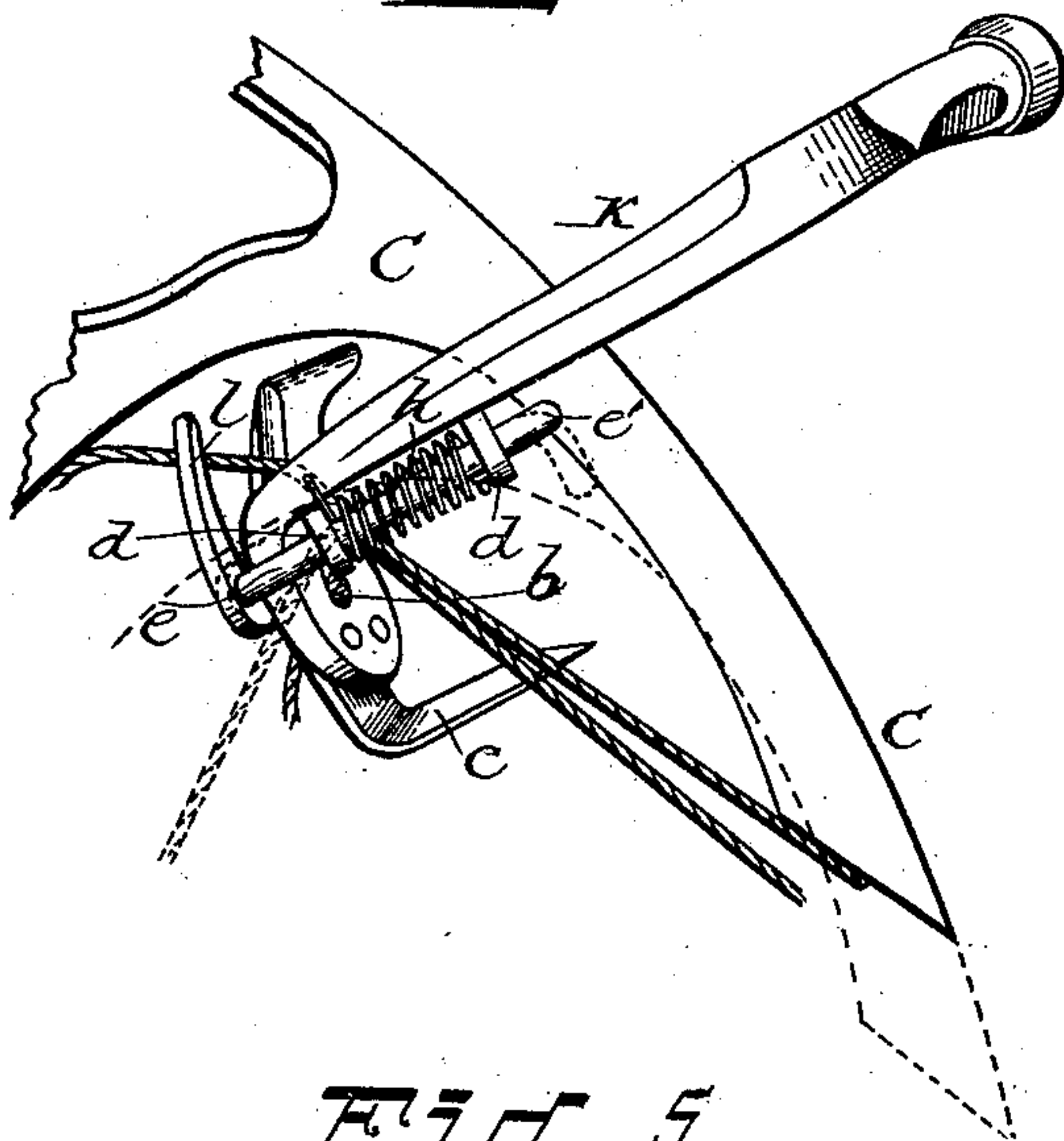


Fig. 5.

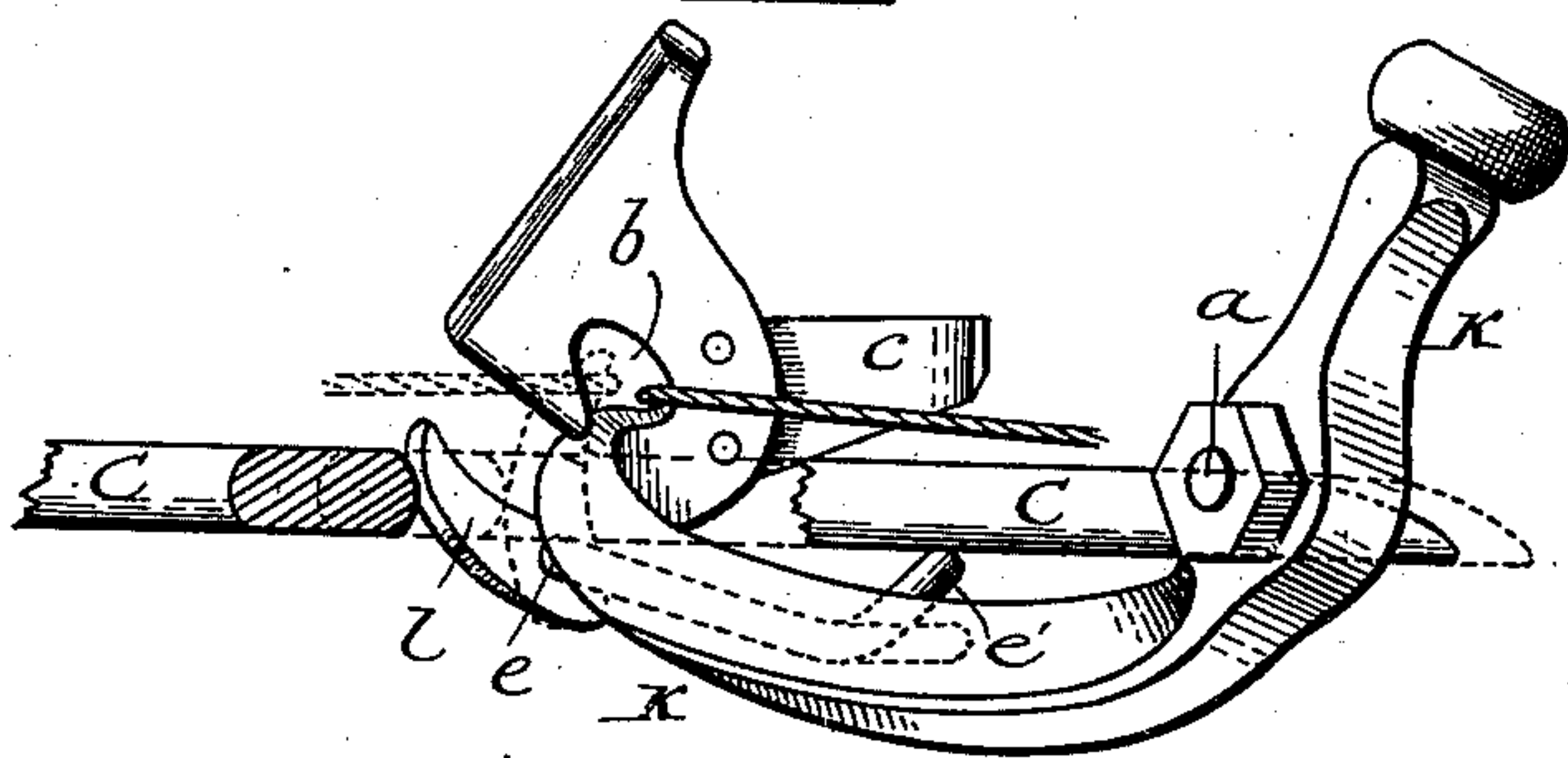
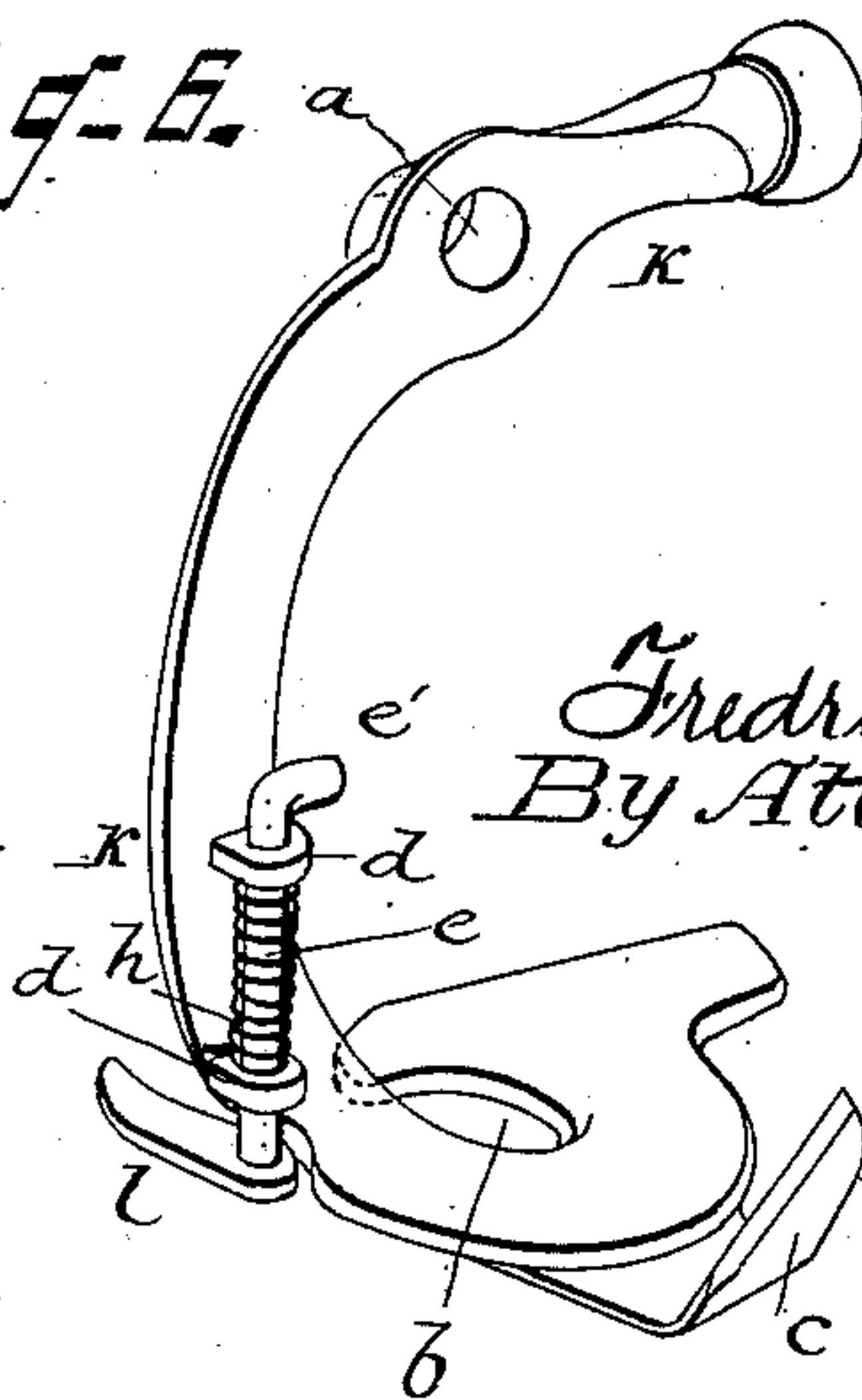


Fig. 6.



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# UNITED STATES PATENT OFFICE.

FREDRICK ARCHIBALD MURDOCK, OF AUBURN, ASSIGNOR TO THE D. M. OSBORNE & COMPANY, OF NEW YORK, N. Y.

## GRAIN-BINDER.

SPECIFICATION forming part of Letters Patent No. 378,845, dated February 28, 1888.

Application filed June 23, 1887. Serial No. 242,293. (No model.)

*To all whom it may concern:*

Be it known that I, FREDRICK ARCHIBALD MURDOCK, of Auburn, in the county of Cayuga and State of New York, have invented certain Improvements in Grain-Binders, of which the following is a specification.

Grain-binding machines of the form now most generally in use are provided with a tying-bill to secure the ends of the applied band, and with a vibratory arm which aids in guiding the cord to the tyer, and which also carries the knife to sever the band.

My improvement consists in mounting on the knife carrying or guiding arm a movable tucker-finger to assist in bringing and holding the cord in proper relation to the bill during the tying action, and in arranging the needle or cord-placing arm to actuate this tucker.

The parts are susceptible of modification in form and arrangement; but in the accompanying drawings I have represented them in their preferred forms, adapted for use in a binder of the familiar Appleby type.

Figure 1 represents a rear elevation of an Appleby binder provided with my improvement, the parts being in the position which they occupy at the moment the needle begins its ascent. Fig. 2 is an elevation of the upper parts of the binder in the position which they occupy at the commencement of the tying operation. Fig. 3 is an elevation of the tyer and adjacent parts at an intermediate stage of the tying operation. Fig. 4 is a side elevation on a larger scale showing the relation of the cord-guiding arm, the needle, and the tucker at the time the cord is first laid in position by the needle. Fig. 5 is a top plan view of the same parts, the needle being shown partially in section to illustrate more clearly its action on the tucker-finger. Fig. 6 is a perspective view of the knife-carrying and cord-guiding arm with the tucker thereon.

Referring to the drawings, A represents the deck or table on which the gavel is received and bound; B, the overlying breast-plate to confine the grain; C, the vibratory needle or cord-placing arm mounted on the rock-shaft D, beneath the table; E, the stationary knotter-frame; F, the knotter driving-shaft; G, the knotter-actuating gear-wheel carried by said shaft; H, the tyer having its spindle provided

with pinion I, driven by the gear-wheel G; J, the cord clamping disk; and K, the vibratory cord guiding and knife-carrying arm pivoted at *a*, and seated at its rear end in a cam-groove in the side face of the gear-wheel.

The foregoing parts, their driving mechanism, the grain delivering and compressing devices, and other customary parts of the machine are constructed and operated in the ordinary manner familiar to those skilled in the art.

The cord-placing arm is provided, as usual, with the notch *b*, in which the cord is laid by the needle between the gavel and the tyer, and is also provided with the usual knife, *c*, fixed thereon, to sever the cord between the tyer and the clamp J.

In applying my improvement I mount in suitable bearings, *d*, on the side of the knife-arm K, a rock-shaft, *e*, having its upper end bent laterally to form a crank, *e'*, and its lower end provided with a tucker-finger, *l*, fixed rigidly thereon. A spiral spring, *h*, is applied around the rock-shaft with one end connected thereto and the other end seated against the knife-arm, and acts to hold the finger normally in its outward position. (Represented in Figs. 5 and 6.) As the needle ascends to place the cord about the bundle and present its end across the tying-bill to the clamp, its side face acts, as shown in Fig. 5, against the crank-arm *e'*, and turning the shaft, carries the end of the tucker inward, so that its point crosses the path of the advancing needle, which, acting thereon, as shown in Fig. 5, closes the tucker inward over the cord and across the top of the notch in the arm, as shown in dotted lines in Fig. 5. The tucker thus actuated forces the cord positively to a position in which it will lie properly across the tying-bill and holds it securely in such a position. The knife-carrying arm receives the usual vibratory motion from its actuating-cam in a path transverse to the path of the needle. It will, of course, be understood that the cam presents the arm in the position shown in Figs. 4 and 5, prior to or during the advance of the needle, in order that the latter may act in the manner described upon the tucker.

The essence of my invention as regards the tucker lies, first, in mounting it movably upon



the knife-carrying arm, whereby the knife-arm is utilized as a support and the tucker caused to carry the same at the proper time to its operative position; and, second, in employing the needle as a means of actuating the tucker thus carried.

While it is preferred to employ a knife-arm notched in the peculiar manner shown to receive the cord, it is to be understood that the form of this notch is not of the essence of my invention, and that it may be modified at will, and that the form of the tucker may also be modified, provided only it is adapted to override the cord and bring the same to its proper position.

Instead of operating the tucker by means of the needle, it may be operated by other means without passing beyond the limits of my invention.

Having thus described my invention, what I claim is—

1. The rotary tyer, the vibratory cord-guiding arm, and the needle, in combination with the tucker mounted on the arm and adapted to be actuated by the needle, substantially as described.

2. In combination with the rotary tying-bill and the movable cord-guiding arm, a tucker or cord-confining finger movably mounted on the arm and adapted to engage over the cord from the outer side, as shown.

3. In a grain-binder, and in combination with suitable cord tying and clamping devices, a movable knife-carrier, and a cord-tucker movably attached to said carrier, substantially as described, to close over the cord.

4. The tucker-blade and its sustaining rock-shaft, having the crank-arm, in combination with the retracting-spring, and the binding-needle arranged to act first on the crank and thereafter on the tucker-blade, whereby the needle is enabled to operate the tucker without the employment of levers or other intermediate movable parts.

In testimony whereof I hereunto set my hand this 10th day of May, 1887, in the presence of two attesting witnesses.

FREDRICK ARCHIBALD MURDOCK.

Witnesses:

G. W. S. ALLEN,  
C. B. KASTERS.