(No Model.) 4 Sheets—Sheet 1.

W. N. WHITELEY, W. BAYLEY & S. DYER.

KNOTTING DEVICE FOR GRAIN BINDERS.

No. 333,907. Patented Jan. 5, 1886.

Fig. 1.

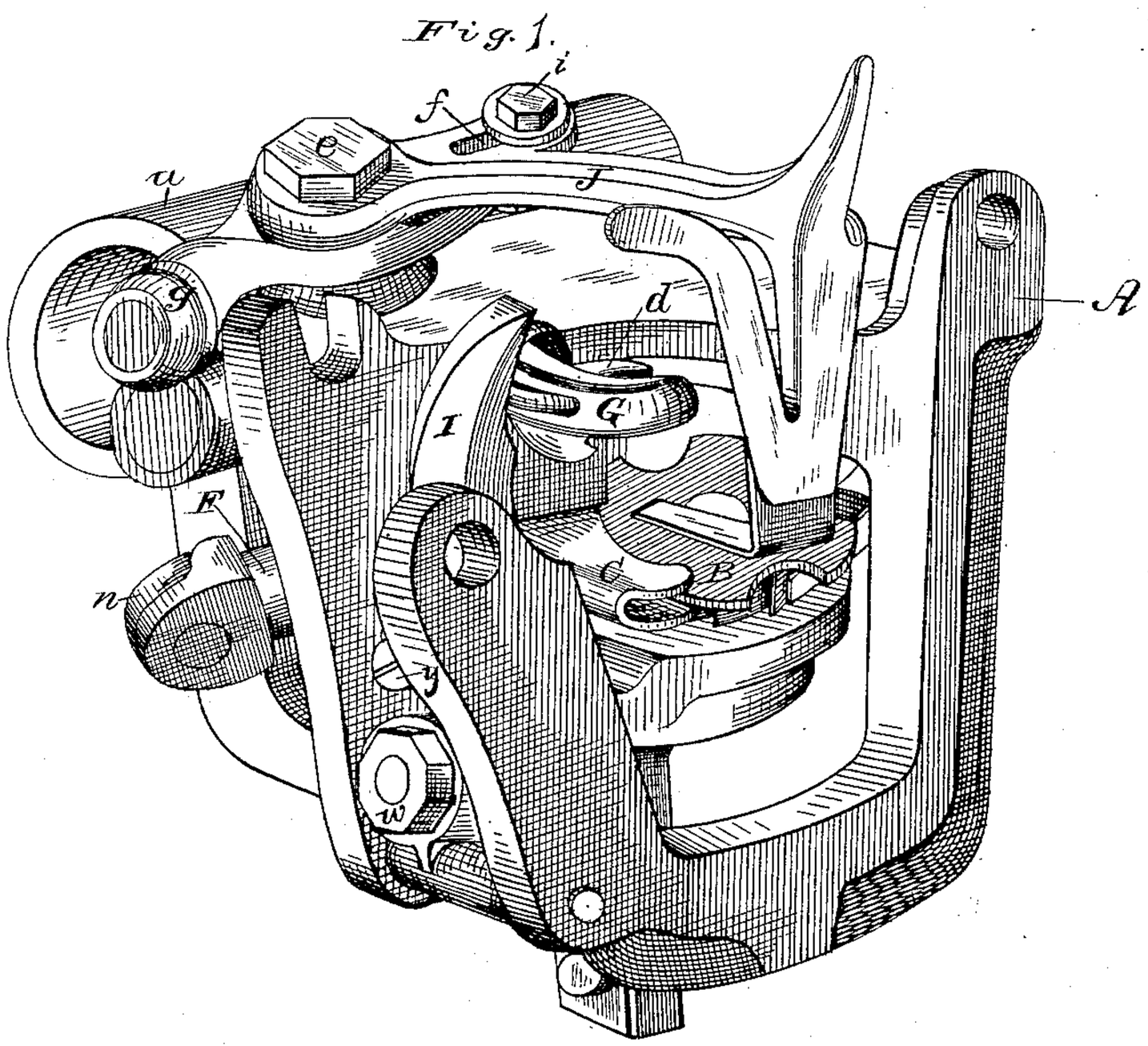
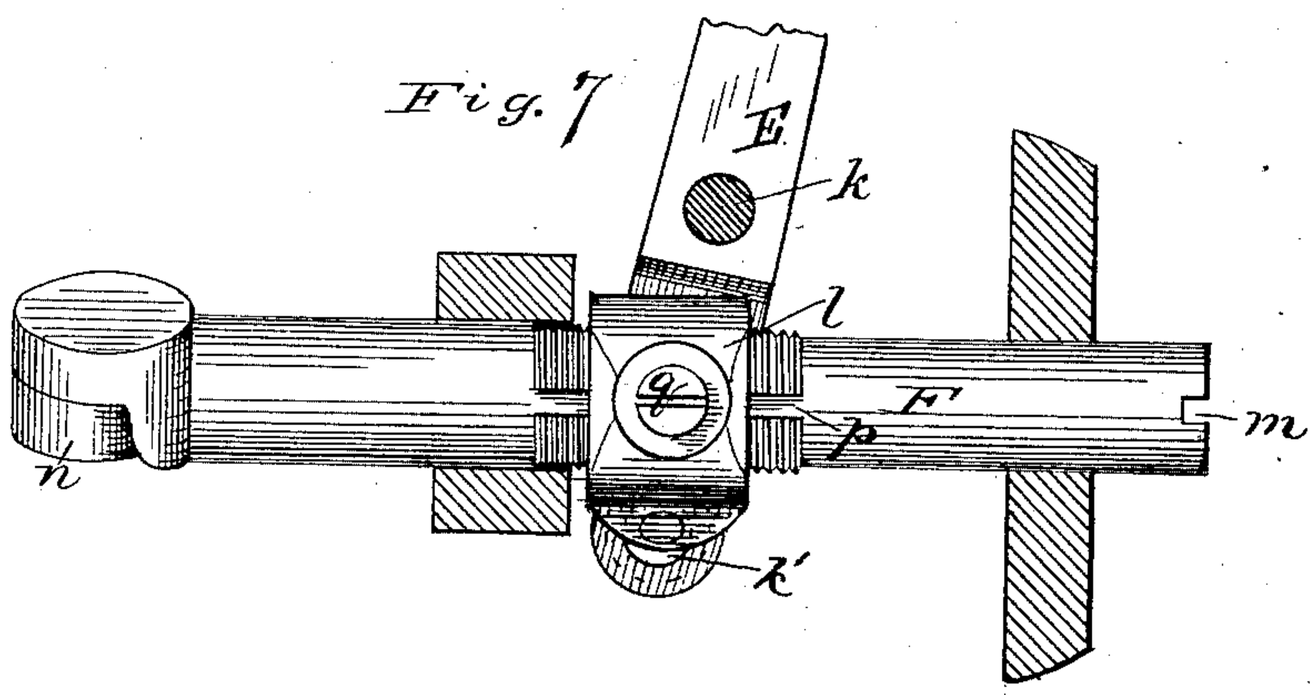


Fig. 7



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(No Model.)

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KNOTTING DEVICE FOR GRAIN BINDERS.

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Fig. 2.

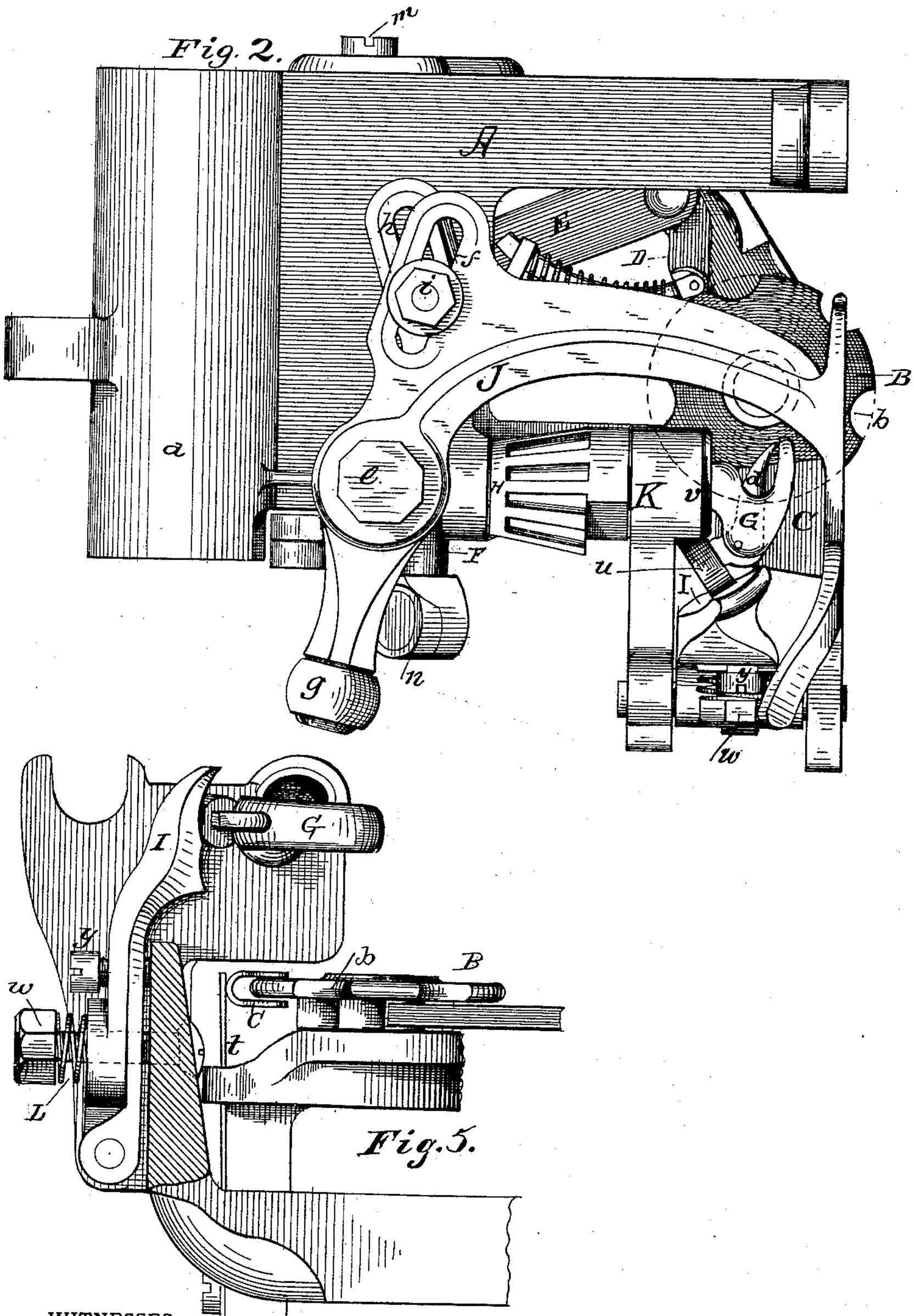

Fig. 5.

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4 Sheets—Sheet 3.

W. N. WHITELEY, W. BAYLEY & S. DYER.

KNOTTING DEVICE FOR GRAIN BINDERS.

No. 333,907. Patented Jan. 5, 1886.

Fig. 3.

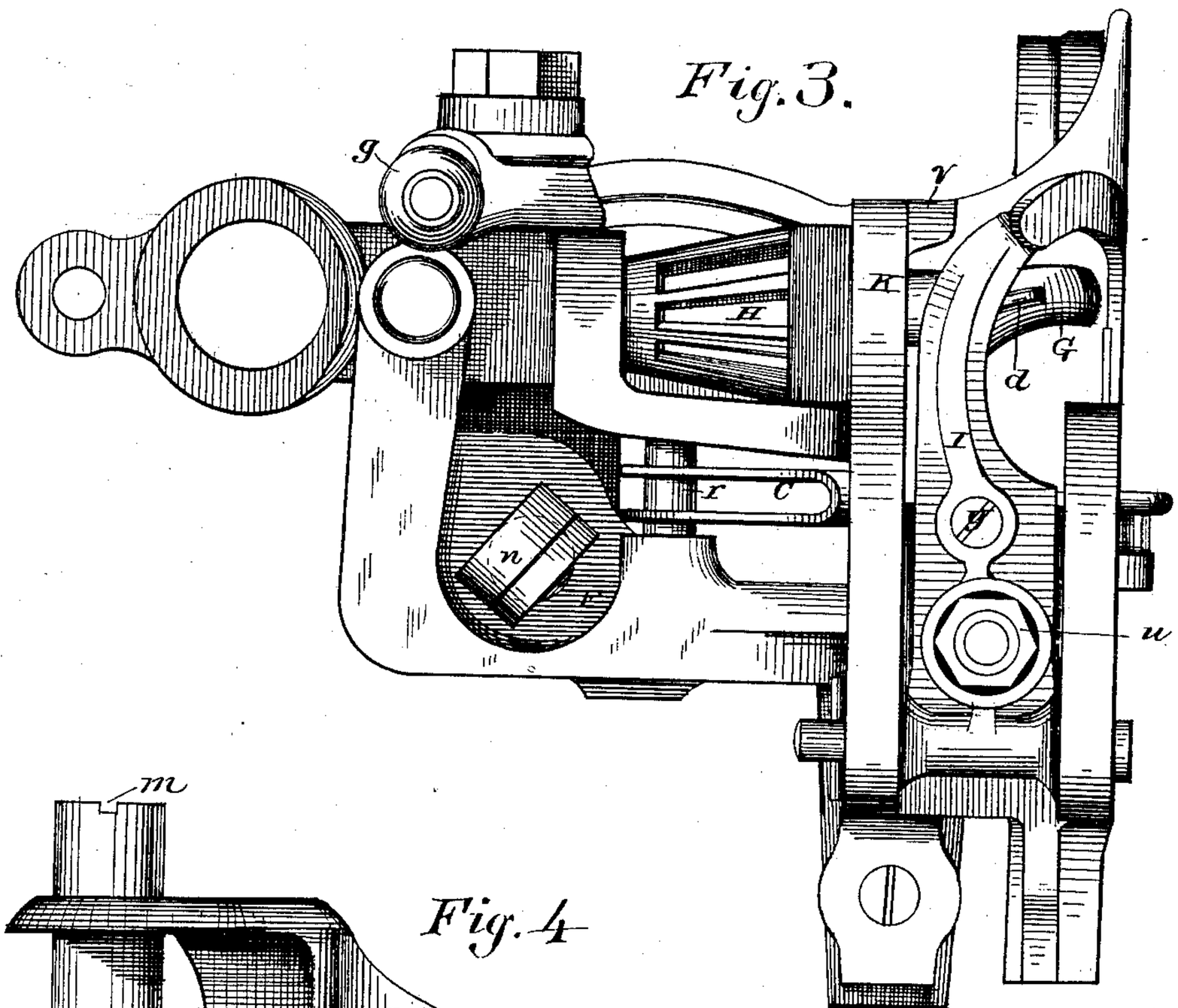
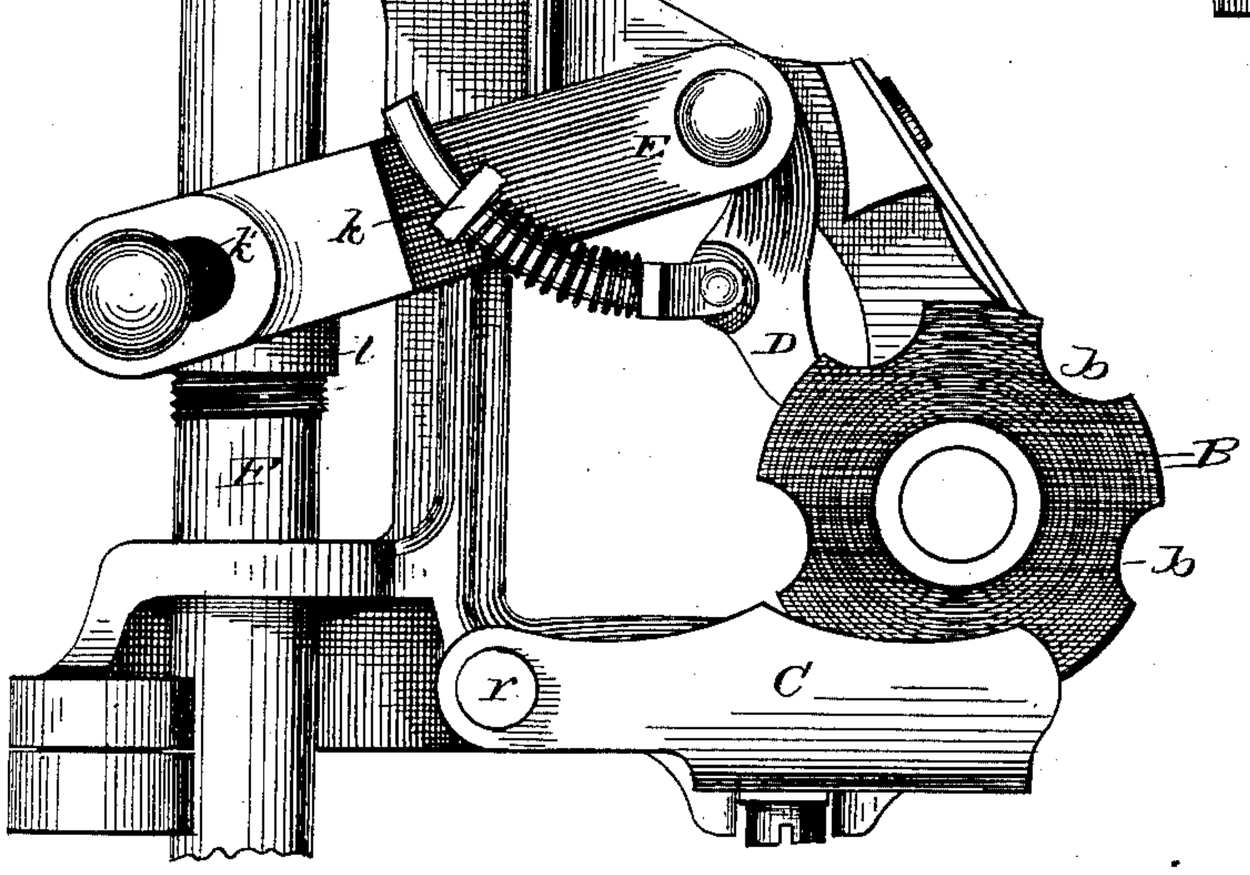


Fig. 4



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(No Model.) 4 Sheets—Sheet 4.

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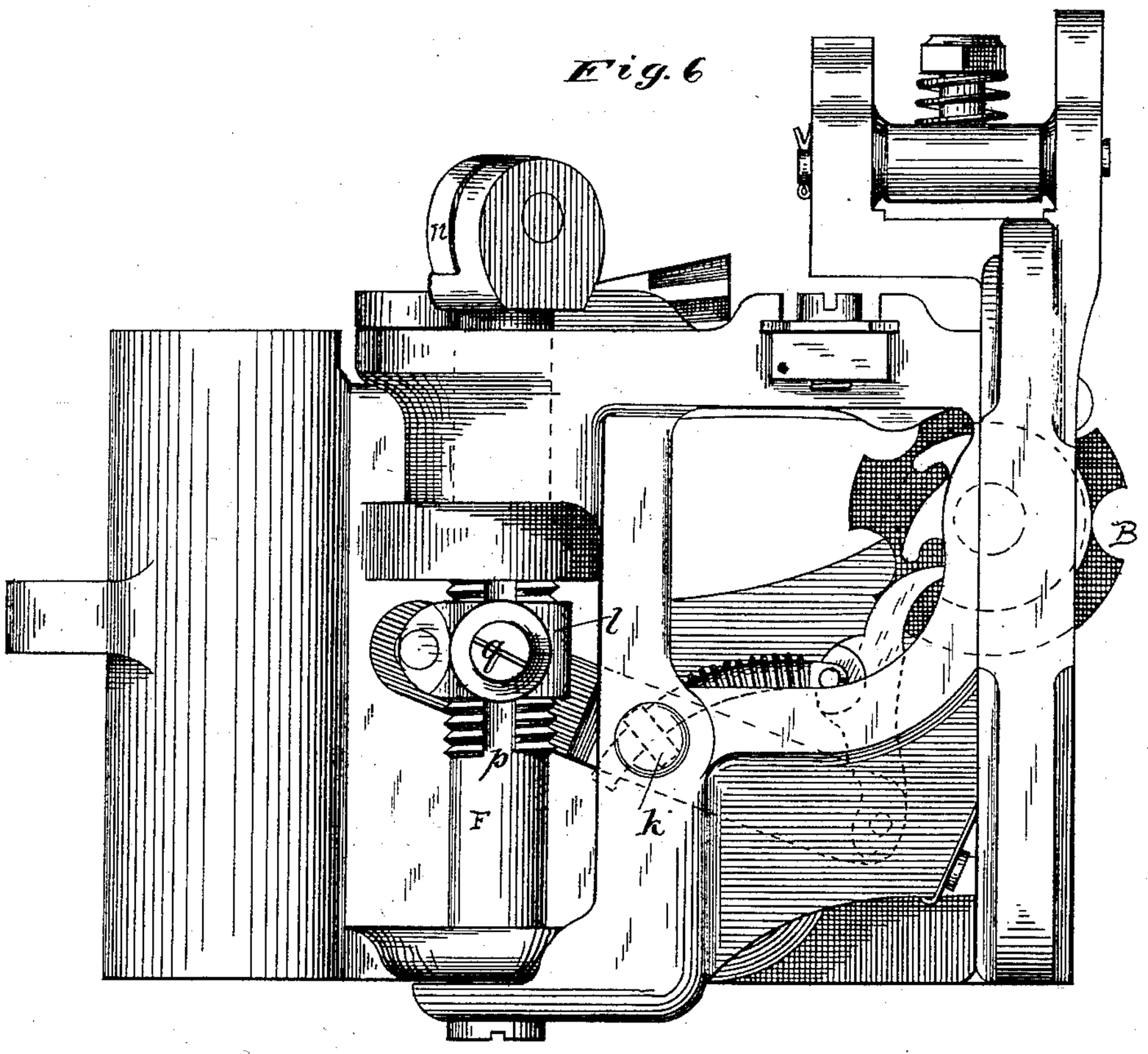
KNOTTING DEVICE FOR GRAIN BINDERS.

No. 333,907. Patented Jan. 5, 1886.

Fig. 6



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UNITED STATES PATENT OFFICE.

WILLIAM N. WHITELEY, WILLIAM BAYLEY, AND SAMUEL DYER, OF SPRINGFIELD, OHIO.

KNOTTING DEVICE FOR GRAIN-BINDERS.

SPECIFICATION forming part of Letters Patent No. 333,907, dated January 5, 1886.

Application filed January 28, 1884. Serial No. 118,898. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM N. WHITELEY, WILLIAM BAYLEY, and SAMUEL DYER, all of Springfield, Clark county, in the State of Ohio, have invented new and useful Improvements in Knotting Devices for Grain-Binders in the Automatic Binding of Sheaves of Grain; and we do hereby declare that the following is a full and accurate description of the same, reference being had to the accompanying drawings, wherein—

Figure 1 is a perspective view of that part of the knotter which contains our invention. Fig. 2 is a plan view of the same. Fig. 3 is a side elevation of the same. Fig. 4 is a plan showing the device for holding the end of the cord. Fig. 5 is a front elevation showing the knotter and cord-holder. Fig. 6 is a bottom plan of the knotter. Fig. 7 is a detached plan of the adjusting-bolt.

The general structure and mode of operation in handling the cord and forming the knot is not new with us, and we do not propose to claim more than the particular improvements hereinafter noted, to wit: Our improvements relate, first, to the stripper, which strips the cord off the jaws of the hook, made in two parts, so as to admit of an adjustment; second, to the plunger-bolt, whereby the holding-disk is operated, made with a screw-adjustment capable of operation at any time by means of a screw-driver; third, to the U-shaped holder, which surrounds the edge of the holding-disk, made in one piece and elastic; fourth, to the hinged spring-cam that closes the knotter-hook, pivoted in the rear with a spring-pressure and an adjustable stop.

A is the cast-iron frame which supports the operative mechanism of the knotter. The sleeve *a*, which is a part of the frame A, encircles the main drive-shaft of the binding-machine, and is thereby principally supported and held in place, though there are attachments to other parts of the frame-work of the binder.

B is the rotating disk, whereby the end of the binding-cord is held. The edge of said disk is notched, as at *b*, to make sure the proper seizure of the cord. The cord is gripped and held by being caught in one of the notches *b* and carried and jammed into the spring-shoe C, which folds over and incloses the edge of the disk B for that purpose. The disk B is caused to rotate automatically by the pawl D, operated by the lever E and push-rod F, which takes motion from the usual revolving cam and gear-wheel for operating the knotter, which is not shown.

G is the knotting-hook, with the pivoted jaw *d*. The knotter-hook G is actuated by the pinion H, and the jaw *d* is caused to close at the proper moment by the spring-cam I.

When the knot has been formed, the stripper J, swinging upon its pivot *e*, and actuated by engagement of its friction-roller *g* with a cam-groove in the knotter-operating wheel, which is not shown, strips the loop off the hook, and thereby releases the sheaf.

The particular improvements will now be more minutely described. The stripper J requires an adjustment at its free end to bring it to the exact point with reference to the knotter-hook G, where its action will be the most efficient, because a slight misadjustment will tend to cause a misformation of the knot, and a failure to perform the intended function of the machine. The stripper-lever is therefore made in two parts, both of which are pivoted upon the bolt *e*, and provided, respectively, with intersecting slots *f h* and a connecting-bolt, *i*, which may be adjusted to any point in said slots, and thereby correspondingly vary the relative position of the roller *g* and free end of the stripper. It is also necessary to adjust the pawl D as to the ratchet-teeth attached to the disk B so as to secure a movement of the said disk proper to carry the cord not only into the holder C, but also the exact position required. The pawl D is jointed to the lever E, and said lever is pivoted upon the frame A at *k*, and is actuated by its slotted connection *k'* with the screw-sleeve *l* upon the push-rod F. The screw-sleeve *l* may be moved back and forth by rotating said push-rod, and to enable the attendant to shift the adjustment of said sleeve with the lever E and pawl D, I make a nick, *m*, in the end of the push-rod for the ready and efficient application of a screw-driver for that purpose; but as it is necessary that the friction-roller *n* shall always maintain its plane of revolution a groove, *p*, is cut across the screw-threads on

the push-rod to receive the end of the set-screw *q*, and said groove and set-screw thereby determine the position of said roller and prevent any shifting of the same while the parts are in action. The disk B seizes the cord and folding it over its edge carries the part so folded between the sides of the U-shaped shoe C, where said cord is jammed between the surfaces of the disk and holder; but as the cord employed with grain-binders is liable to vary greatly in size and quality the action of this gripping and clamping device is liable to correspondingly vary unless a proper elasticity be provided in the shoe, and this elasticity we provide by making said shoe from a single piece of sheet metal, preferably steel, folded over, so as to present the required U shape in cross-section. The sides of the shoe may then yield and spread a little to accommodate cord of unusual size. The shoe is pivoted to the frame by the pin *r*, and is kept up to working position by the spring *t*.

The knotting-hook G is rotated by means of the pinion H, and its jaw *d* is extended through the back of said hook past its pivot, and is provided with a friction-roller, *u*. As the hook is rotated, this roller travels on the cam or track extension *v* of the housing or box K, in which the shaft of said hook revolves. This causes the jaw *d* to open and remain so until in its revolution the jaw has received the cord to be seized and held. The roller *u* then passes off the track *v* and under a cam, which causes said jaw to close upon the cord. As the cord is liable to vary in size, and also to present itself in an unfavorable position in said jaw, undue strains are encountered when the closing-cam is rigid. We have therefore placed the closing-cam upon the arm I, which is pivoted at its lower end to the frame, and is provided with a stiff spring, L, which will hold the closing-cam up with sufficient force to insure the gripping and holding of the cord, and yet will yield slightly when the cord is of greater than usual size. The tension of the holding-spring may be regulated by the screw-nut *w*, and the forward movement of the arm I may be limited by the stop-screw *y*.

Having now described our improvement, we claim as new—

1. The stripper J, made in two parts, capable of adjustment as to each other, whereby the position of the free or stripping end of said lever may be adjusted, substantially as set forth.

2. The stripper J, made in two parts, both pivoted upon the bolt *e* and provided with intersecting slots *f h*, and the connecting-bolt *i*.

3. The combination of the pivoted lever E, carrying the pawl D, whereby the disk is actuated, connected with the sleeve *l* by a slot, *k'*, in its end, said sleeve *l*, fitted upon the plunger-rod F, having a screw-thread thereon, and provided with a nick, *m*, at its outer end, whereby a tool may be applied to revolve said rod, and thereby change the position thereon of the sleeve *l*, for the purpose set forth.

4. The lever E, pivoted at *k* to the frame and jointed at its front end to the pawl D, and provided at its rear end with a sliding pivotal connection with the sleeve *l*, combined with said sleeve provided with the set-screw *q*, and the screw-threaded plunger-bolt provided with the groove *p* to receive the set-screw *q*, as set forth, whereby the lever E may be adjusted by rotating the plunger-rod, and the correct position for pause determined, as set forth.

5. The disk B, with the notches *b*, combined with an elastic U-shaped holder, C, which incloses the edge of said disk, as and for the purpose set forth.

6. The folded U-shaped holder C, constructed from a single piece of sheet metal, as and for the purpose set forth.

7. The elastic U-shaped holder C, constructed from a single piece of sheet metal, pivoted to the frame by pin *r*, combined with the spring *t* and the notched disk B.

8. The revolving knotting-hook G and its hinged jaw *d*, provided with the roller *u*, combined with an arm, I, pivoted at its lower end to the frame and at its upper end fashioned to act as a closing-cam for the jaw *d*, and the adjustable tension spring, substantially as set forth.

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