(No Model.) 3 Sheets—Sheet 1.

M. A. KELLER.

KNOT TYING MECHANISM FOR GRAIN BINDERS.

No. 422,798. Patented Mar. 4, 1890.

FIG. 1.

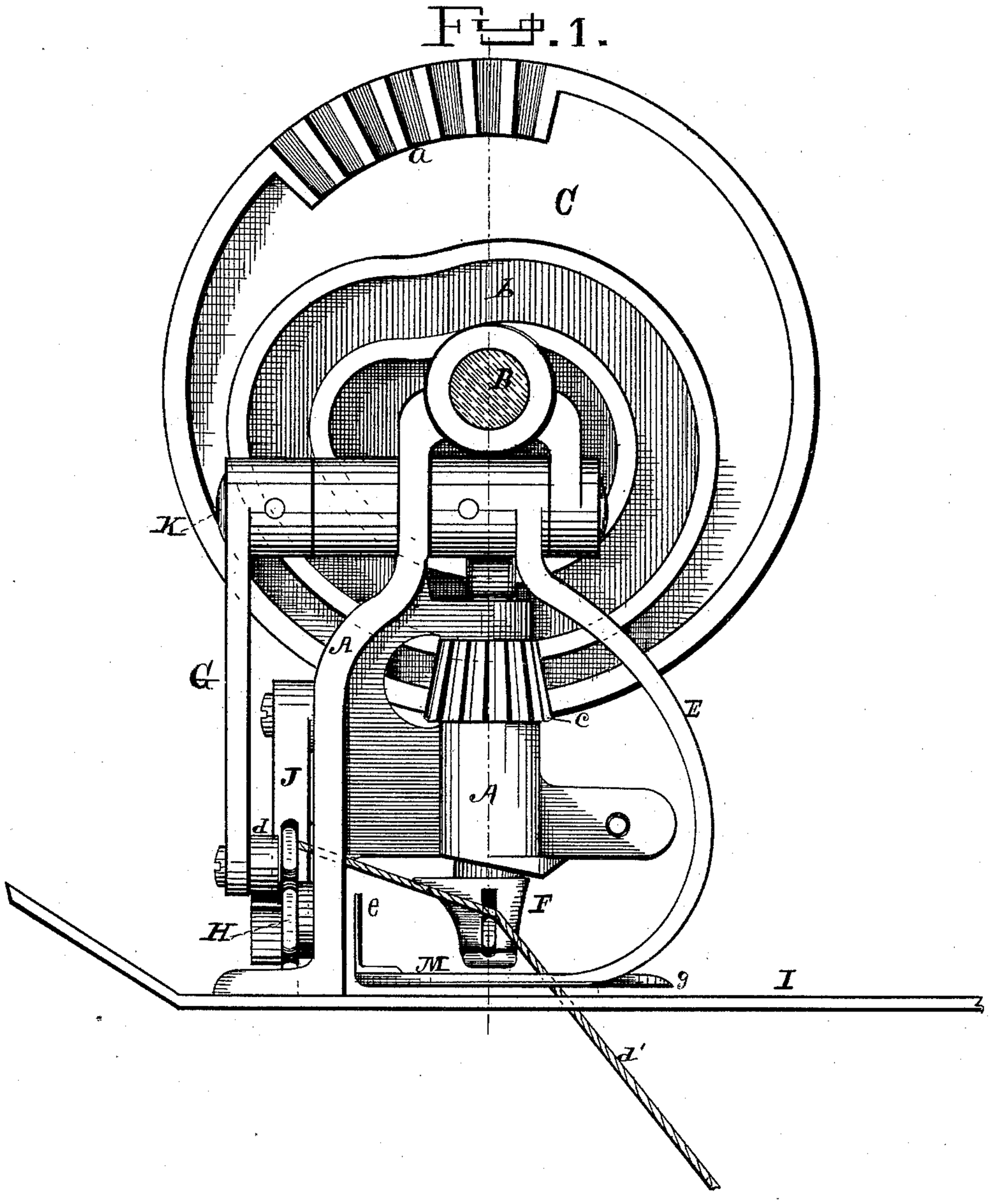

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Fig. 2.

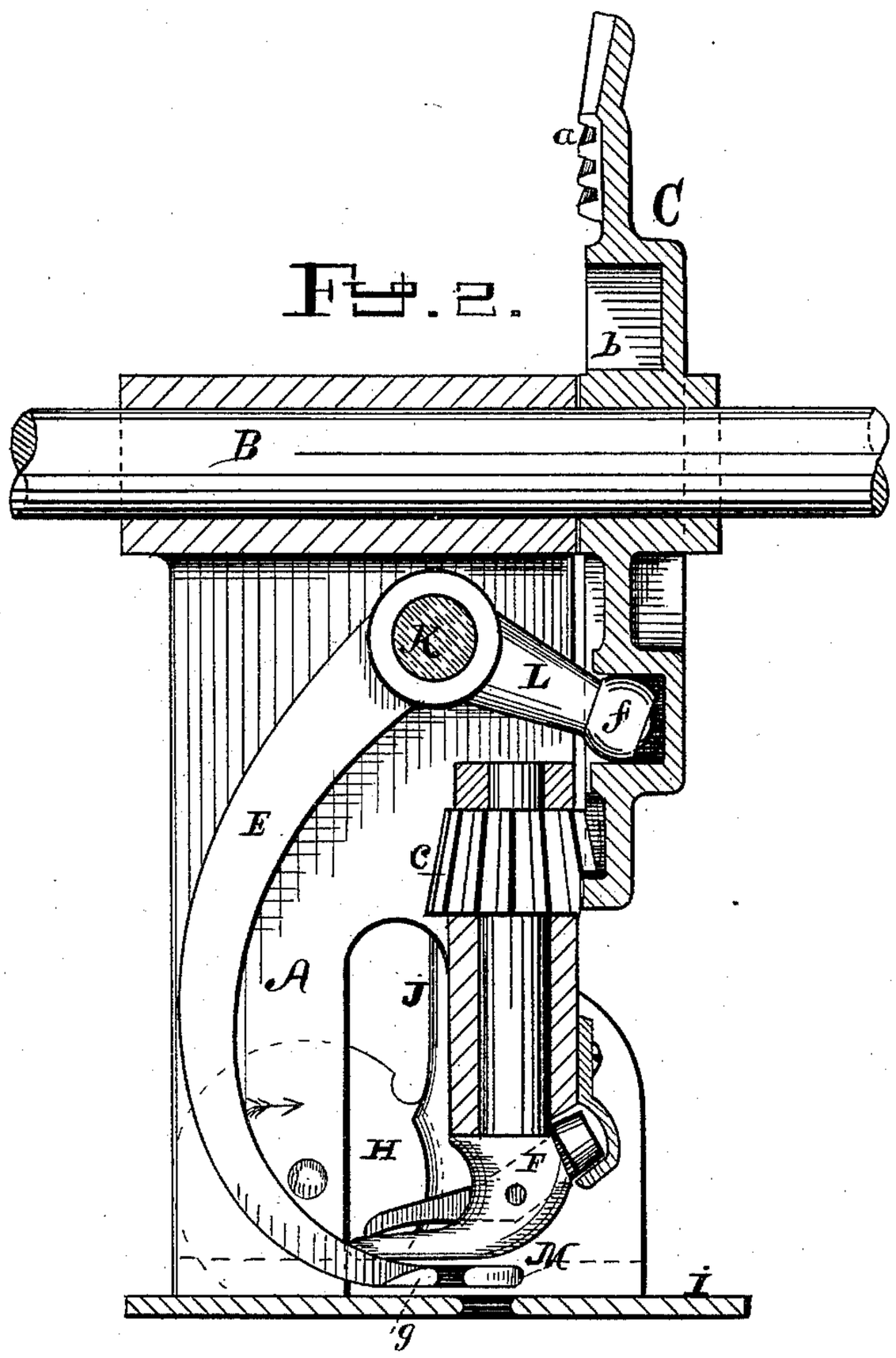

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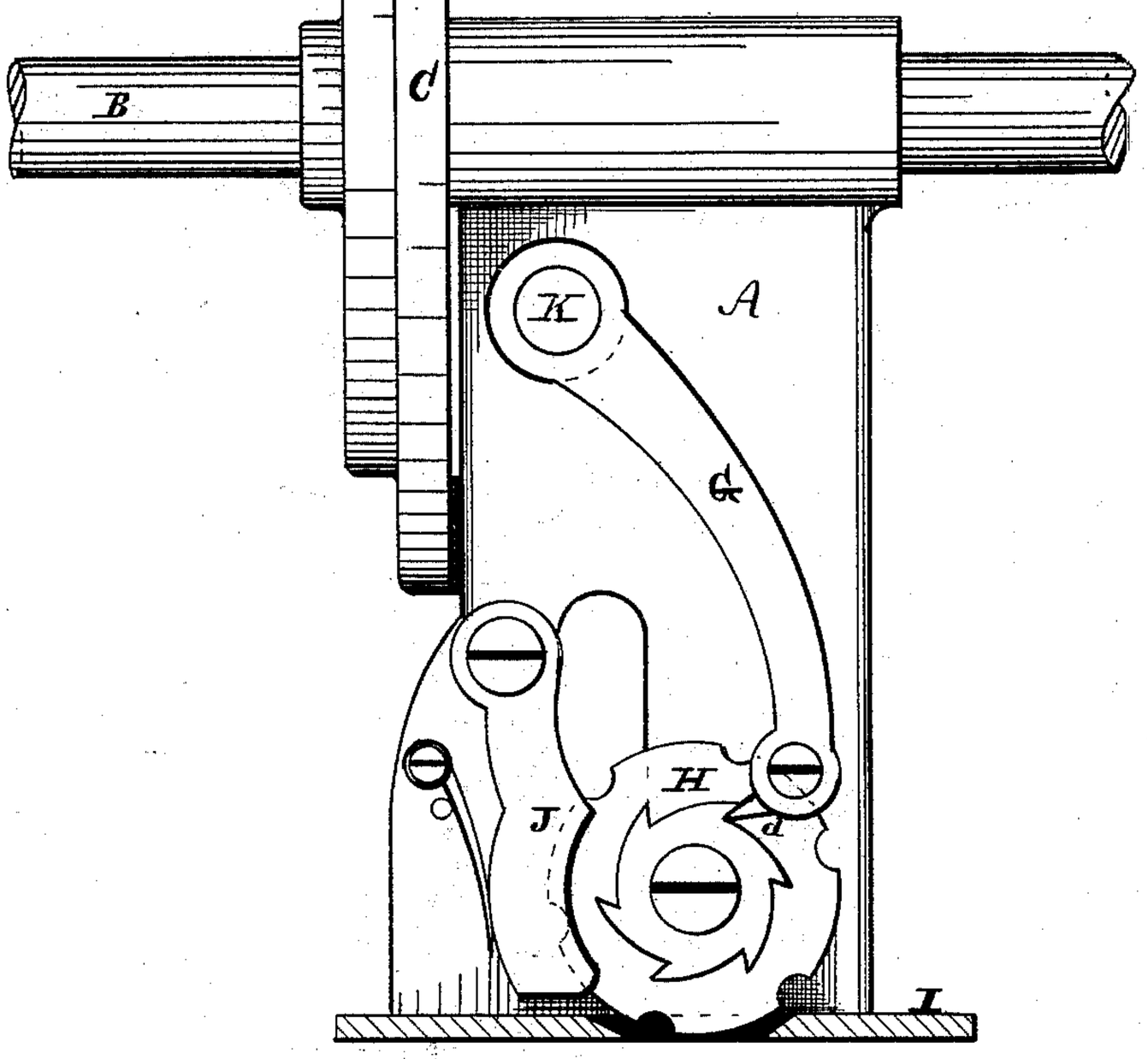
Fig. 3.



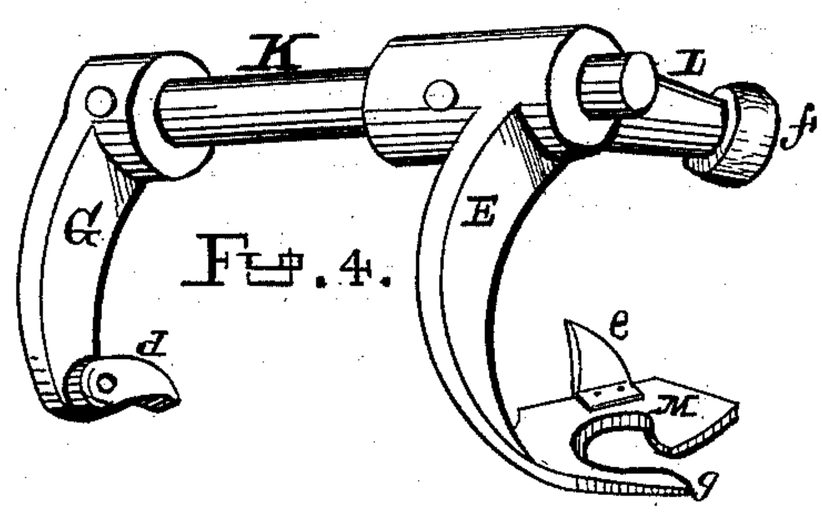


Fig. 4.

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UNITED STATES PATENT OFFICE.

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KNOT-TYING MECHANISM FOR GRAIN-BINDERS.

SPECIFICATION forming part of Letters Patent No. 422,798, dated March 4, 1890.

Application filed November 11, 1886. Serial No. 218,542. (No model.)

To all whom it may concern:

Be it known that I, MOSES A. KELLER, a citizen of the United States, residing at Batavia, in the county of Genesee and State of New York, have invented a new Improvement in Knot-Tying Mechanism for Grain-Binders, of which the following is a specification.

My invention relates to improvements in knot-tyers in which a bell-cranked lever and a supplemental lever are affixed to a shaft journaled in the main knotter-frame, forming the mechanism for actuating the cord-clamping mechanism and for tucking and stripping the binding-cord, in combination with a rotary knotter and a single knotter-operating wheel. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 represents a right-hand side elevation of the entire knotter completed. Fig. 2 is a front side elevation partially in section. Fig. 3 is a rear side elevation showing the oscillating arm for rotating the cord-clamping disk, and Fig. 4 is a perspective view of my improvement detached from the knotter-frame.

Similar letters of reference denote corresponding parts throughout the specification, in which—

A is the main knotter-frame, and B the main knotter-operating shaft, to which is affixed the knotter-operating wheel C. A knotter F is journaled in a stationary bearing in the main frame and has a segmental bevel-pinion *c* affixed to the upper end of its shaft, which is at the proper time engaged by the bevel-cogs *a* on the knotter-operating wheel C and caused to make one complete revolution.

A circular cord-clamping disk H, provided with a ratchet-wheel and journaled upon a stationary stud secured in the main knotter-frame and operating in conjunction with a grooved clamping-shoe J, forms the mechanism whereby the ends of the binding-cord are secured and held.

Journaled in the main knotter-frame A, below the main shaft B and crosswise to said shaft B, is a shaft K, to which are secured the lever or arm G and the L-shaped lever E, the former being provided at its lower end with a spring-pawl *d*, which operates in conjunction with the ratchet-teeth on the clamping-disk H and causes said disk to rotate intermittently, whereby the binding-cord is secured and held during the binding operation. The L-shaped arm or lever E is provided with a slotted foot M and tucking-finger *g*. A knife *e* for severing the binding-cord, is also affixed to said foot. On the end of the arm L is journaled a roller *f*, which engages the cam-groove *b* of cam or knotter operating wheel C.

Secured to the foot of the knotter-frame A is the usual slotted breast-plate I.

In the operation of tying a knot by this mechanism, the binding-cord being first passed into the knotter by the binding-needle in the usual way common in this class of knotters, the first movement of the L-shaped lever E is in the direction indicated by the arrow in Fig. 2, which moves the tucking-finger *g* across the slot of the breast-plate I and tucks the cord over the knotter-jaws. Simultaneously with this motion the arm G, with its pawl *d*, causes the clamping-disk H to rotate the distance of one notch, securing the cord and carrying it down until in line with the open knotter-jaws, which have in the meantime been rotated and formed the loop. The cord, now extending between the knotter and the clamping-disk, is passed between the knotter-jaws, which immediately close upon the cord, the knotter now coming to rest in its normal position. The cam *b* in the knotter-operating wheel C now causes the lever E to move in the opposite direction. The knife *e* severs the cord, and the notched foot M pulls the loop off the knotter-jaws and completes thereby the knot of the band, and the entire knotting mechanism now comes to rest and is in its normal position to begin the next operation, substantially as before.

Having thus fully described my improvement, what I desire to secure by Letters Patent is—

1. The combination, substantially as hereinbefore shown and described, of the main stationary frame A, slotted breast-plate I, secured to the foot of the frame A, the rotary knotter F, journaled in the frame A, knotter-operating wheel C, provided upon its face

with a cam and having said wheel affixed to the main knotter-operating shaft B, which is also journaled in the stationary frame A, the cord-clamping disk H, also journaled to the frame A and operating in conjunction with a grooved shoe J, the L-shaped lever E, affixed to a horizontal shaft K, journaled in the frame A crosswise to the shaft B and operating in conjunction with the cam-wheel C, and having said lever provided with a rigid foot for tucking and disengaging the binding-cord, and a knife on said foot for severing the cord, and the lever G, also affixed to the shaft K at the opposite side of the frame A, and provided with pawl mechanism for intermittently rotating the clamping-disk H, all arranged and adapted for operation substantially in the manner and for the purpose specified.

2. The combination, with the knotter-frame and knotter operating shaft, of two levers affixed to an oscillating shaft journaled in said frame, a short arm on said shaft for oscillating both levers, one of said levers being adapted to tuck and disengage the binding-cord in combination with the rotary knotter and the other lever adapted for actuating the cord-clamping mechanism, the rotary knotter and cord-clamping mechanism journaled in the knotter-frame on the same side as the levers, and the knotter-operating wheel having the segmental gear and cam on the same side of the wheel for operating both levers and knotter, substantially as described.

3. In a knotting mechanism for grain-binders, an oscillating lever affixed to a horizontal shaft journaled in main knotter-frame between the knotter and main knotter-operating shaft, and crosswise to both the knotter-shaft and said main knotter-operating shaft, and having said lever adapted for tucking and disengaging the binding-cord, in combination with a rotary knotter and a knife moving with said lever for severing the cord, and also a supplemental lever affixed to the opposite end of same shaft, to which is affixed the tucker-lever, and adapted to overhang and operate the cord-clamping mechanism, all arranged and adapted for operation in combination with a single knotter-operating wheel on main knotter-operating shaft.

4. The combination, with the knotter-frame and knotter-operating shaft, of the combined gear and cam wheel affixed to said shaft, the rotary knotter, intermittently-rotating cord-clamping mechanism, and two oscillating levers mounted upon a common journal in said knotter-frame, all on the same side of the wheel, one of said levers having a notched foot rigidly formed to its lower or free end, a cord-severing knife on said foot, and having said foot adapted to tuck and disengage the binding-cord in combination with the knotter, and the other lever provided at its free end with mechanism for actuating the cord-clamping mechanism, substantially as described.

5. The combination, with the knotter-frame and knotter-operating shaft, of the rotary knotter journaled in said frame, the rotary cord-clamping mechanism, two oscillating levers moving upon a common journal, also journaled to said frame, one of said levers being provided at its free end with pawl mechanism for intermittently rotating the cord-clamping mechanism and the other lever being provided at its free end with mechanism for controlling and disengaging the binding-cord in combination with the rotary knotter and the single wheel upon said shaft, provided with a cam and segment-gear upon the same side of the wheel for directly and positively operating both knotter and levers.

6. The combination, with the rotary knotter, rotary cord-holder, and main knotter-operating shaft, of the notched stripper-foot and the separate pawl-actuating lever rigidly mounted upon a common oscillating axis, and means, substantially as described, connecting said foot and lever with and operating them positively from a cam upon said main knotter-operating shaft.

7. The combination, with the rotary knotter, rotary cord-holder, and main knotter-operating shaft, of the notched stripper-foot and cutter and the separate pawl-actuating lever of the cord-holder, both rigidly mounted upon a common oscillating axis, and means, substantially as described, connecting said foot-lever and cutter with and operating them positively from a cam upon said main knotter-operating shaft.

8. The combination, with the stationary frame and main knotter-operating shaft, of the rotary knotter, rotary cord-holder. journaled in said frame, the separate notched stripper-foot rigidly mounted upon the same oscillating axis as the pawl-actuating lever, and the single segmental gear and cam wheel upon said main knotter-operating shaft, and means, substantially as shown, connecting said wheel with and operating all of said parts positively, as described.

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