

(No Model.)

R. CHAMBERLAIN & J. AUSTIN.

KNOT TYING DEVICE FOR GRAIN BINDERS.

No. 253,002.

Patented Jan. 31, 1882.

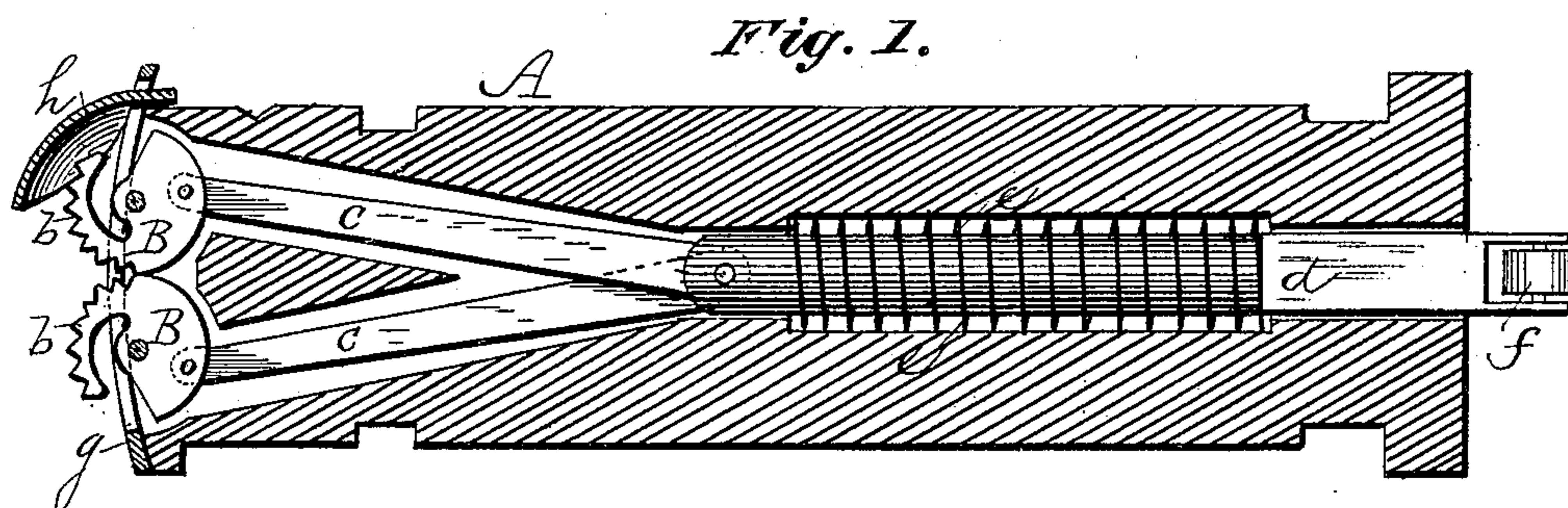


Fig. 2.

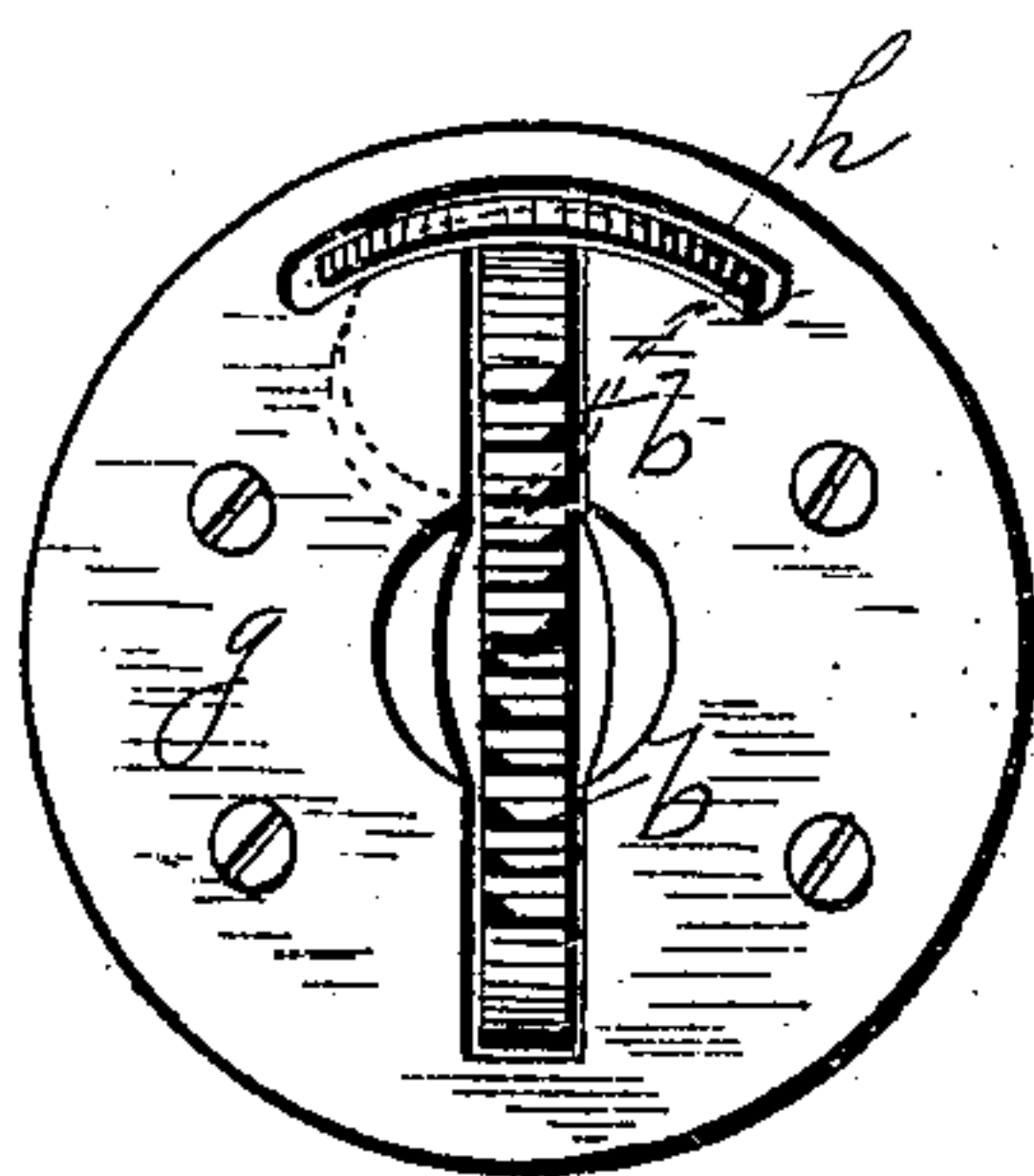


Fig. 3.

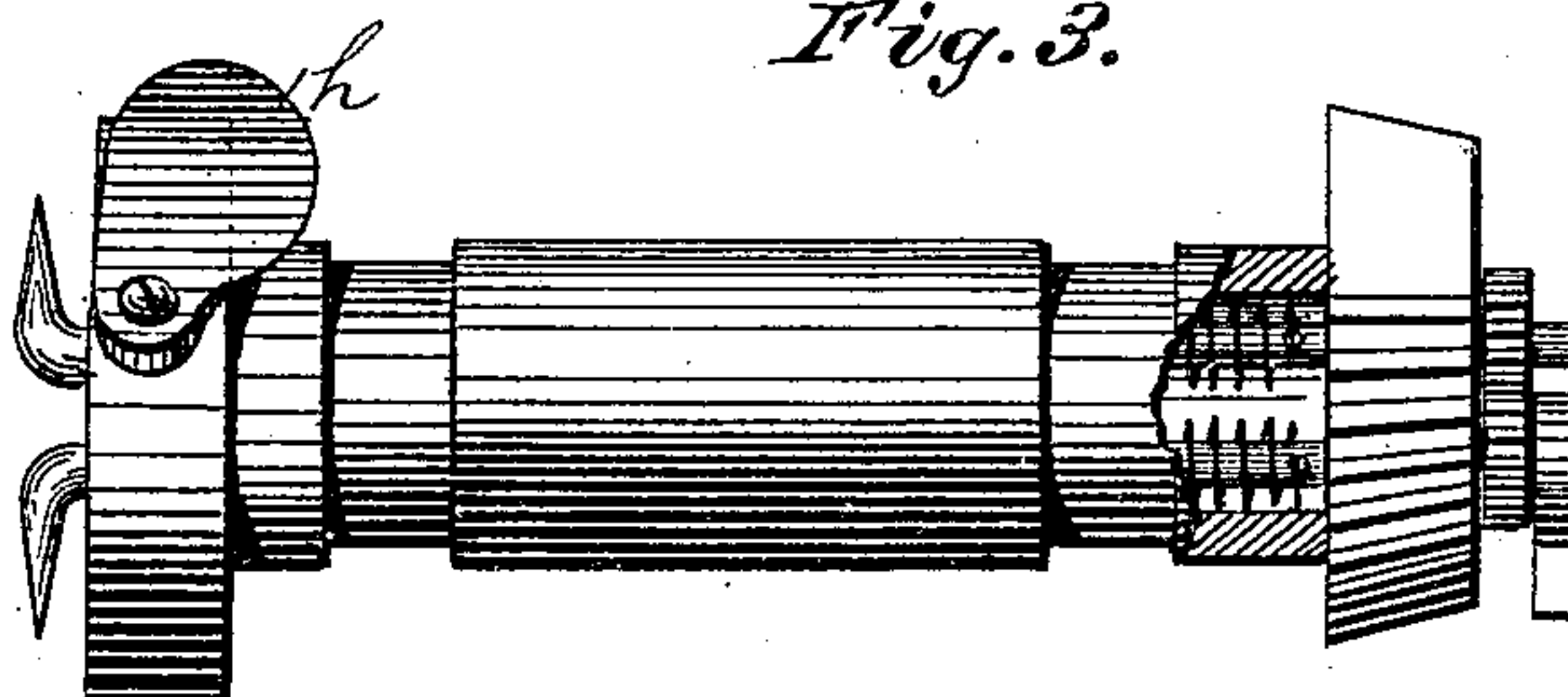


Fig. 4.

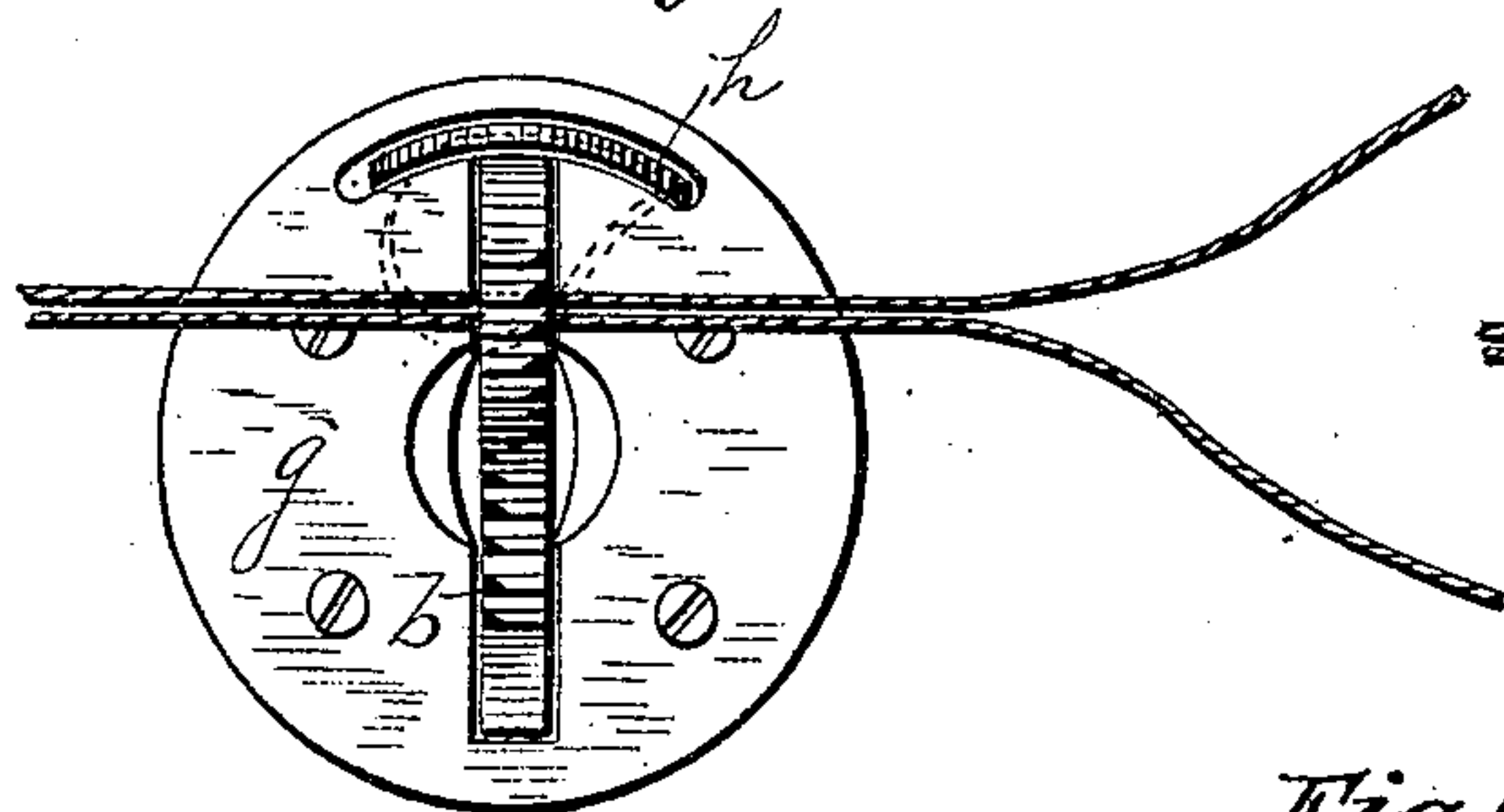


Fig. 5.

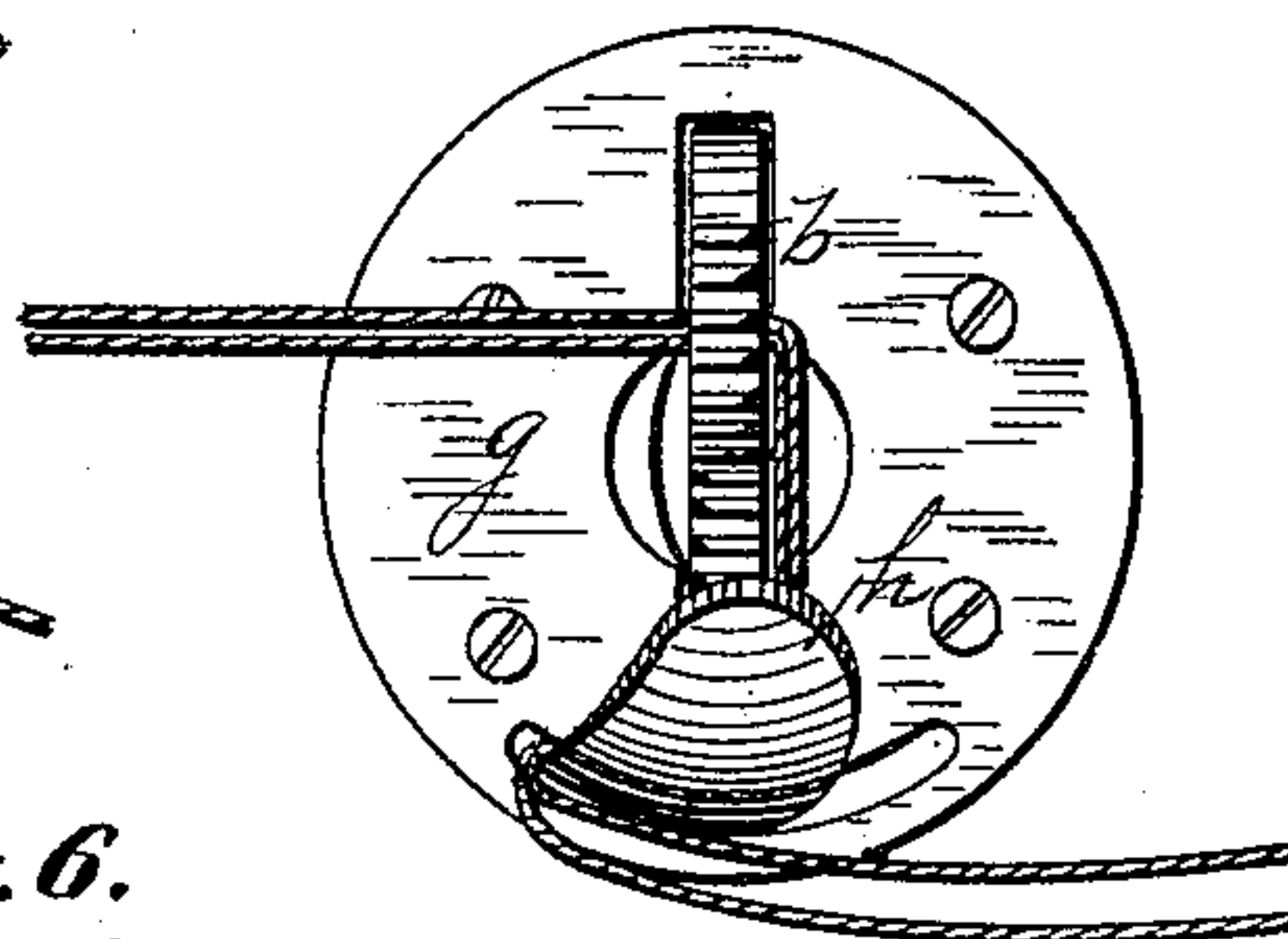
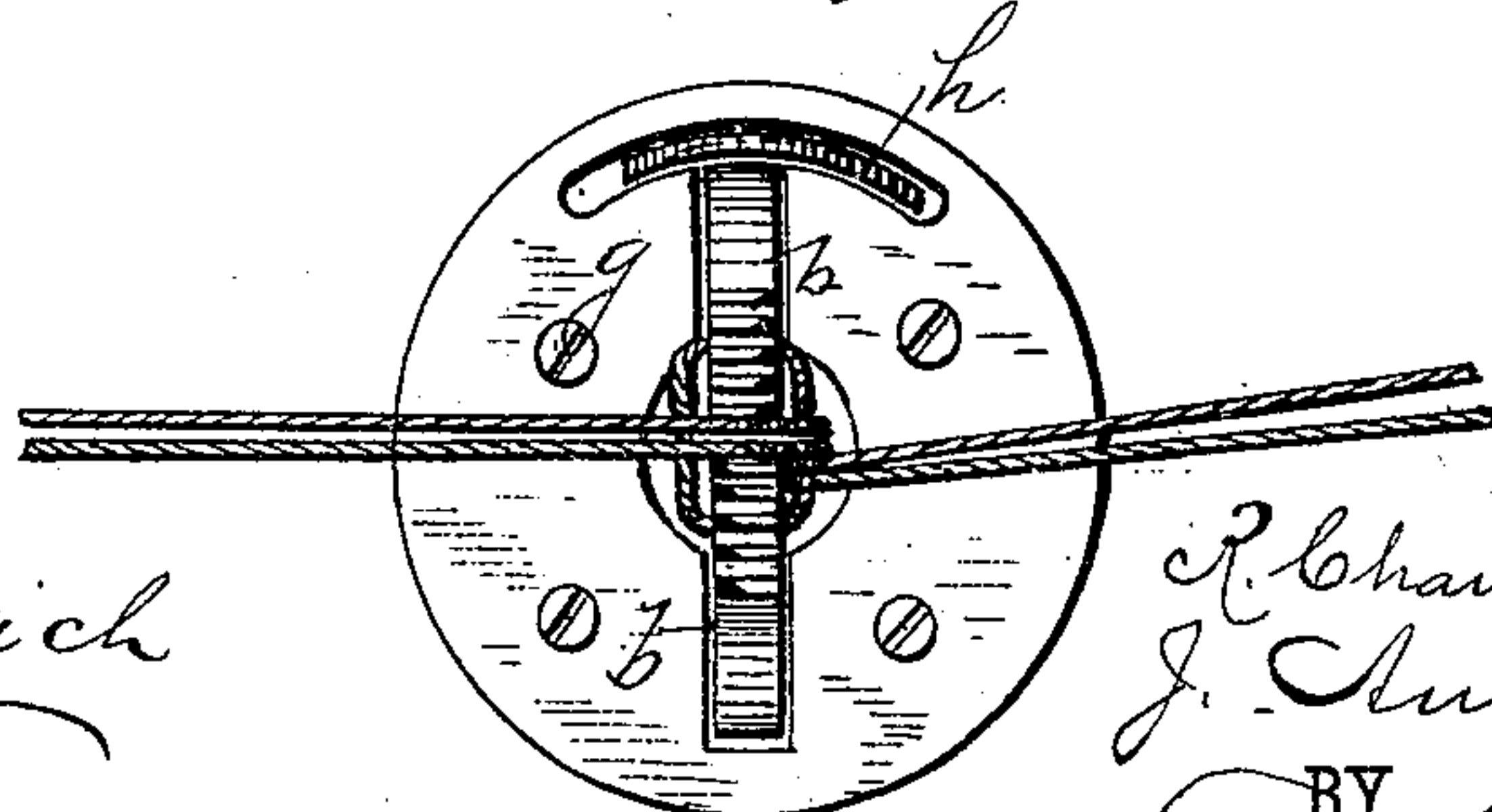


Fig. 6.



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KNOT-TYING DEVICE FOR GRAIN-BINDERS.

SPECIFICATION forming part of Letters Patent No. 253,002, dated January 31, 1882.

Application filed May 3, 1881. (No model.)

To all whom it may concern:

Be it known that we, ROSSCO CHAMBERLAIN and JOSIAH AUSTIN, of East Liberty, in the county of Logan and State of Ohio, have invented a new and useful Improvement in Knot-Tying Devices for Grain-Binders, of which the following is a full, clear, and exact description, reference being had to the drawings hereto annexed, in which—

Figure 1 is a longitudinal section of the invention; Fig. 2, an end view; Fig. 3, a modification, and the remaining figures perspective views, illustrating the different steps in the formation of the knot.

Our invention relates to knot-tying devices in which a rotary head is employed; and it consists in a hollow rotary head provided with a pair of oscillating armed segments and an oscillating guide-lever, as hereinafter described.

In the accompanying drawings, A represents a rotary head, having two segments, B B, pivoted in a suitable recess in one end. The said segments are provided with outwardly-curved arms *b b*, having teeth on their peripheral surfaces, which mesh together as the arms are drawn into the head by the oscillation of these segments. The segments are each provided with a radial slot, in which is pivoted one end of a bar, *c*, whose other end is pivoted in a longitudinal slot in the end of a rod, *d*, which projects from the other end of the rotary head A. The two inner ends of bars *c* are thus secured by the same pivot, and the recesses in which they are embedded are made slightly broader at the outer ends to allow for the converging and diverging of the bars while oscillating the segments. The rod *d* is provided with a spiral spring, *e*, which is coiled around its central portion, and held in position at one end by suitable shoulders upon the rod, and at the other by the shouldered recess in which it is confined. As thus arranged the spring tends to draw the bars *c* inward, thereby thrusting the arms *b* out from the head. The projecting end of rod *d* is provided with an anti-friction roller, *f*, with which a suitable cam is made to engage to operate the device. At the outer end of the rotary head is a concavo-convex guide-lever, *h*, pivoted at one end to the cylindrical surface of the head in such

manner that it may be made to oscillate through a curved slot in the end plate, *g*, and fall over the adjacent arm *b*. A bracket in contact with the end of the rotary head will cause the lever to oscillate inward within a suitable recess, which shall be so formed in the bearing which incloses and supports the head as to extend partly around the head, while the unrecessed portion of the bearing which shall lie in the same circle with the recess will cause the lever to reverse its oscillation when the latter comes in contact therewith, thus causing it to oscillate once in each direction at each revolution.

The operation of the device is as follows: Suitable mechanism communicates an intermittent motion to the rotary head, so that at the beginning of the operation the rotary head remains in its normal position with the curved arms in a vertical plane and the guide-lever at the top. A suitable clamp, arranged at the side of the rotary head opposite the pivoted end of the guide-lever, holds one end of the cord, while the arm that carries the cord around the sheaf in its opening movement places the cord in the crook of the upper arm of the rotary head. The free end of the cord is then passed around the sheaf and brought back and placed in the crook of the said upper arm, in which rests the opposite end of the cord, the rotary head of course remaining stationary. As soon as this stage of the operation is reached the rotary head, by means of suitable mechanism, begins to rotate, and the said unrecessed portion of the bearing of the rotary head causes the guide-lever to project over the nearest arm, where its curved edge serves as a guide for lifting the outer portion of the cords over the teeth of the arms until by the rotation of the head the cords are passed around and placed in the crook of the remaining arm. The passage of the cords over the teeth is facilitated by having said teeth beveled on opposite sides. The second stage of the operation then consists in engaging the two cords with the crooks of the curved arms so that the free ends can be brought by means of the guide-lever over said engaged portion. At this stage the free ends are in contact with the guide-lever, which, as the device rotates, carries said ends over between the teeth, where they are at once seized by the teeth and drawn into the head. This

movement is effected by a cam coming in contact with the projecting end of rod *d*, which also causes the two ends or points of the curved arms to come together and allow the knot to slip off, the two ends of the cord being held long enough to draw the knot tight. At the instant the engaged ends are drawn in by the teeth they are cut and the sheaf is swept from the table.

10 A modification of our invention consists in having the arms *b b* made without teeth, and so arranged that they shall oscillate from a vertical to a horizontal position, instead of being sprung in and out of the head, as above described. In this case two parallel rods hav-
15 ing pinions on their projecting ends and provided with spiral springs will cause the arms to oscillate, said rods being turned by means of a suitable lever on the projecting end of one
20 of the rods, said lever being operated by a suitable cam or other mechanism.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A knot-tying device consisting of a chambered rotary head having two oscillating segmental arms, which are crooked outwardly from each other, and an oscillating guide-lever, substantially as shown and described. 25

2. A knot-tying device, consisting in a chambered rotary head, *A*, having segments *B B*, provided with curved arms *b b*, having intermeshing teeth, bars *c c*, rod *d*, spring *e*, and friction-roller *f*, in combination with the curved oscillating guide-lever *h*, substantially as shown and described. 30 35

3. A knot-tying device consisting in rotary head *A*, having oscillating lever *h*, and toothed segmental arms *b b*, in combination with suitable mechanism for operating the same, substantially as shown and described. 40

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Witnesses:

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