

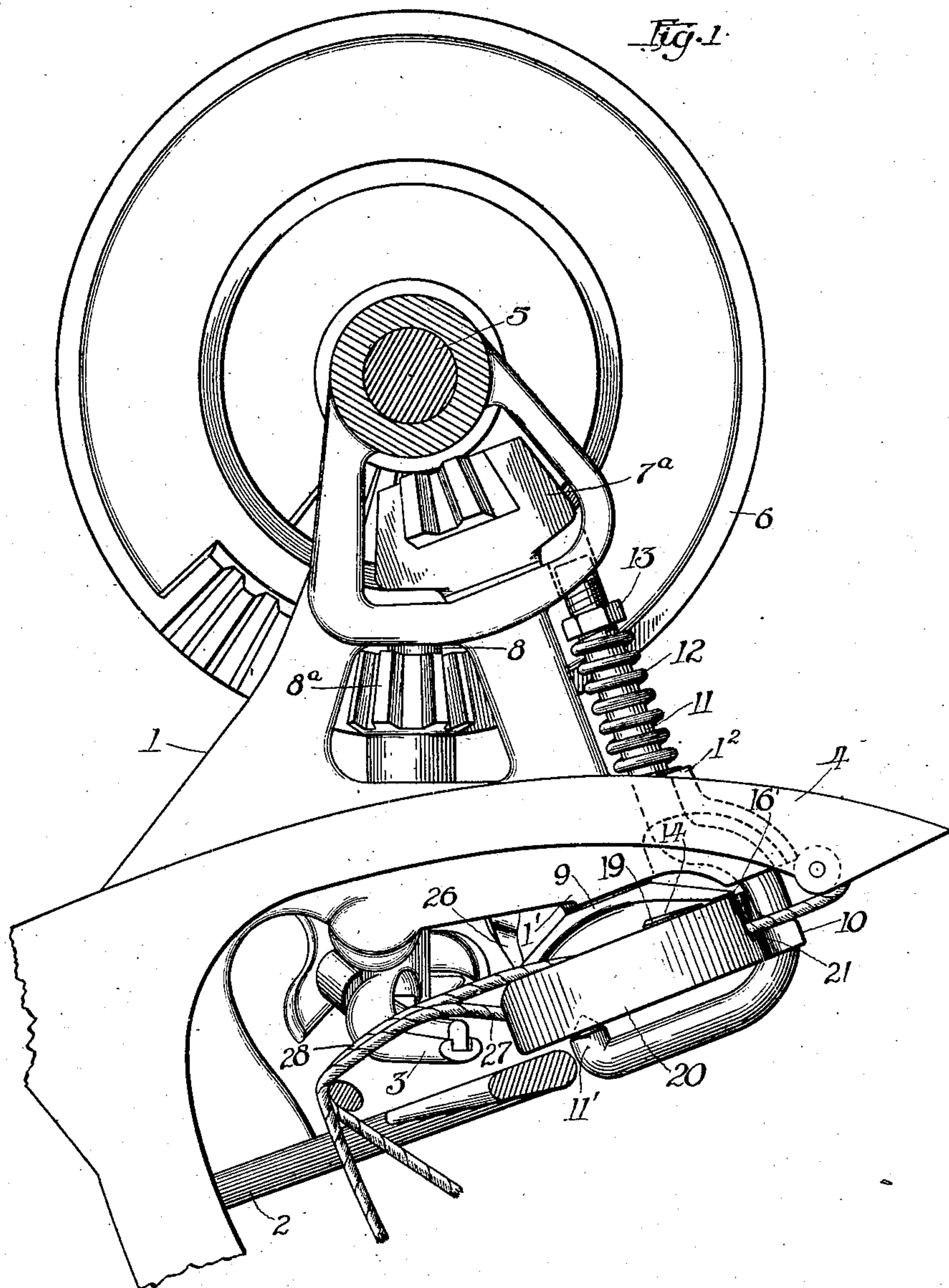
No. 865,754.

PATENTED SEPT. 10, 1907.

B. R. BENJAMIN.
CORD HOLDER FOR SELF BINDERS.

APPLICATION FILED APR. 8, 1907.

3 SHEETS—SHEET 1.



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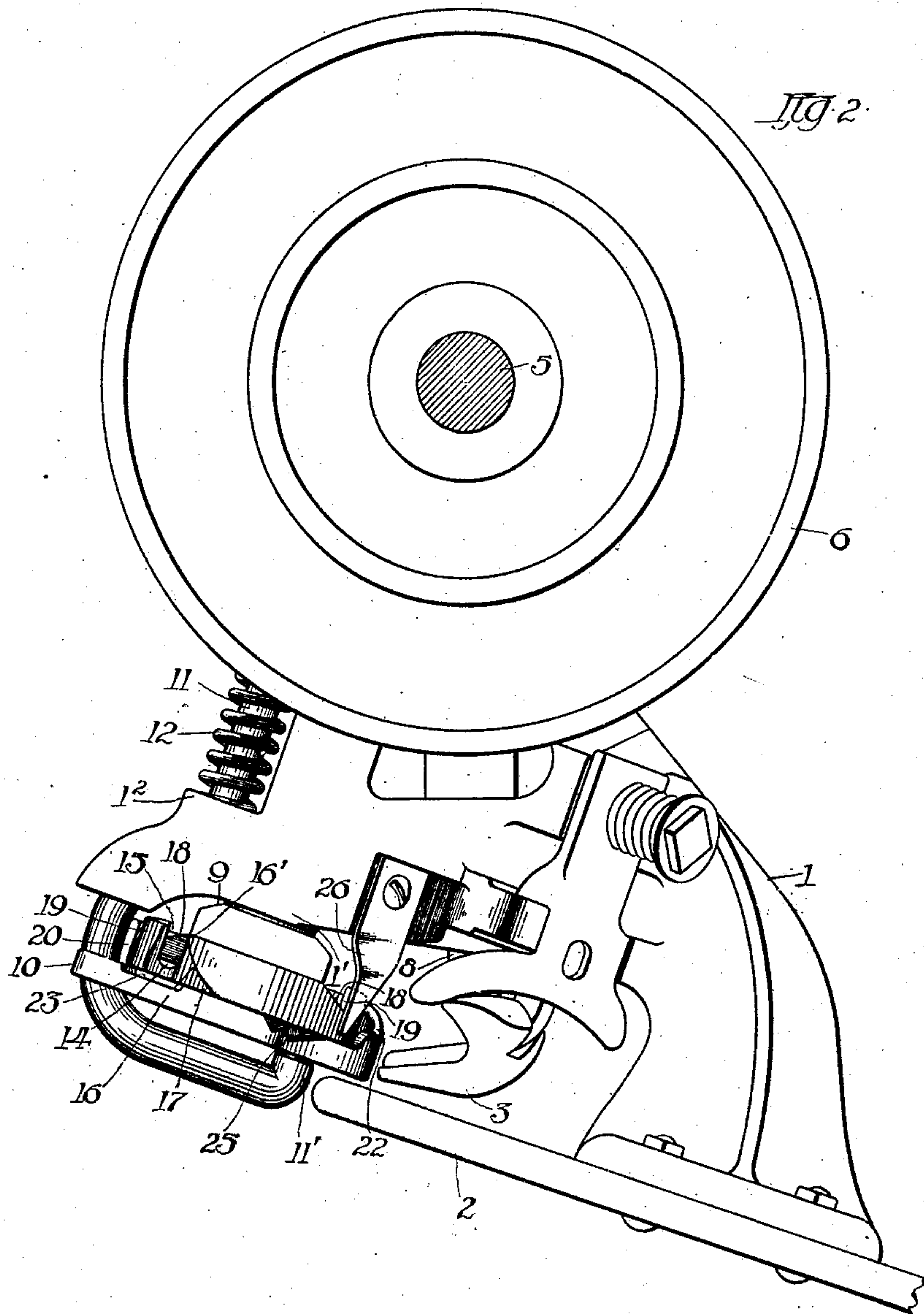
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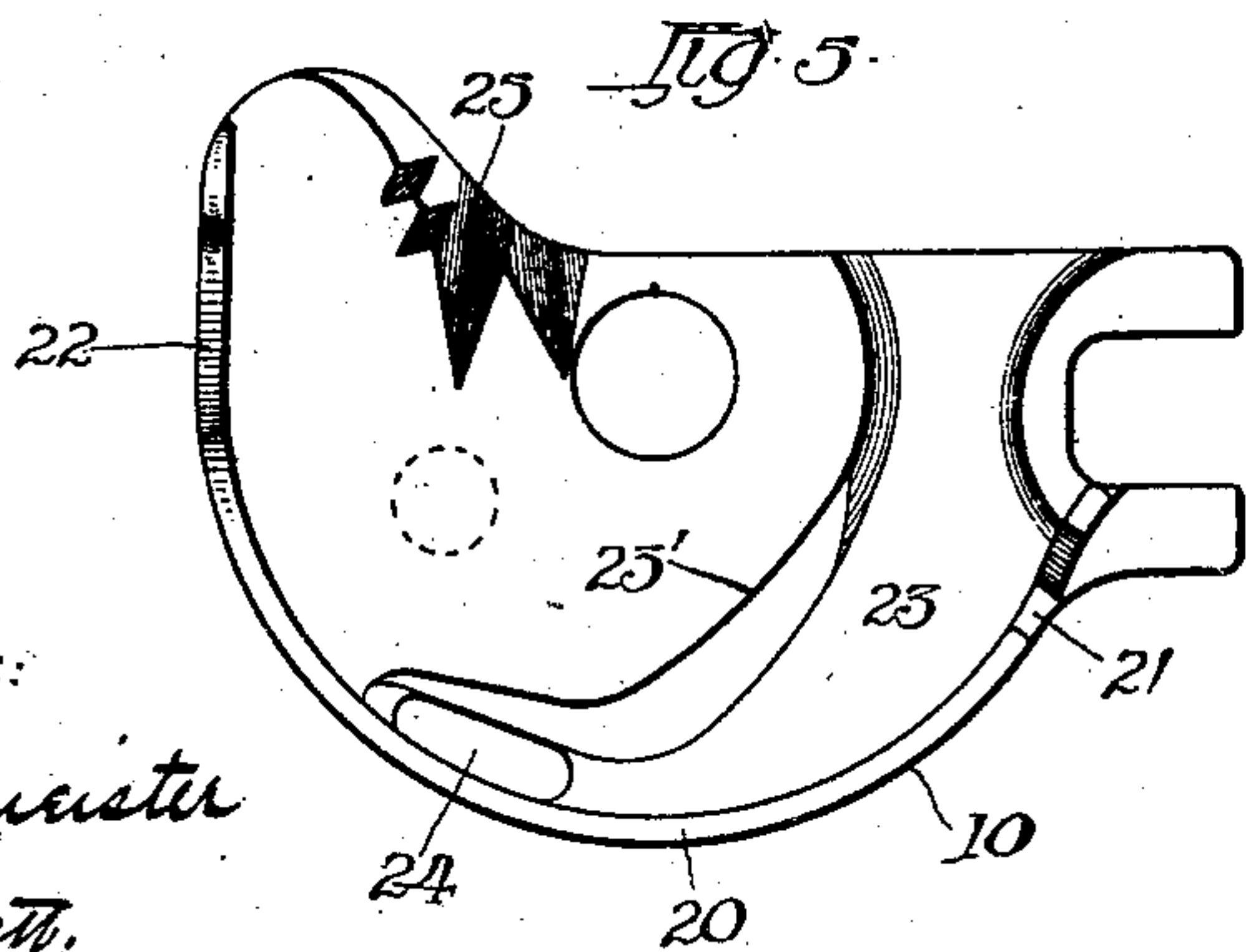
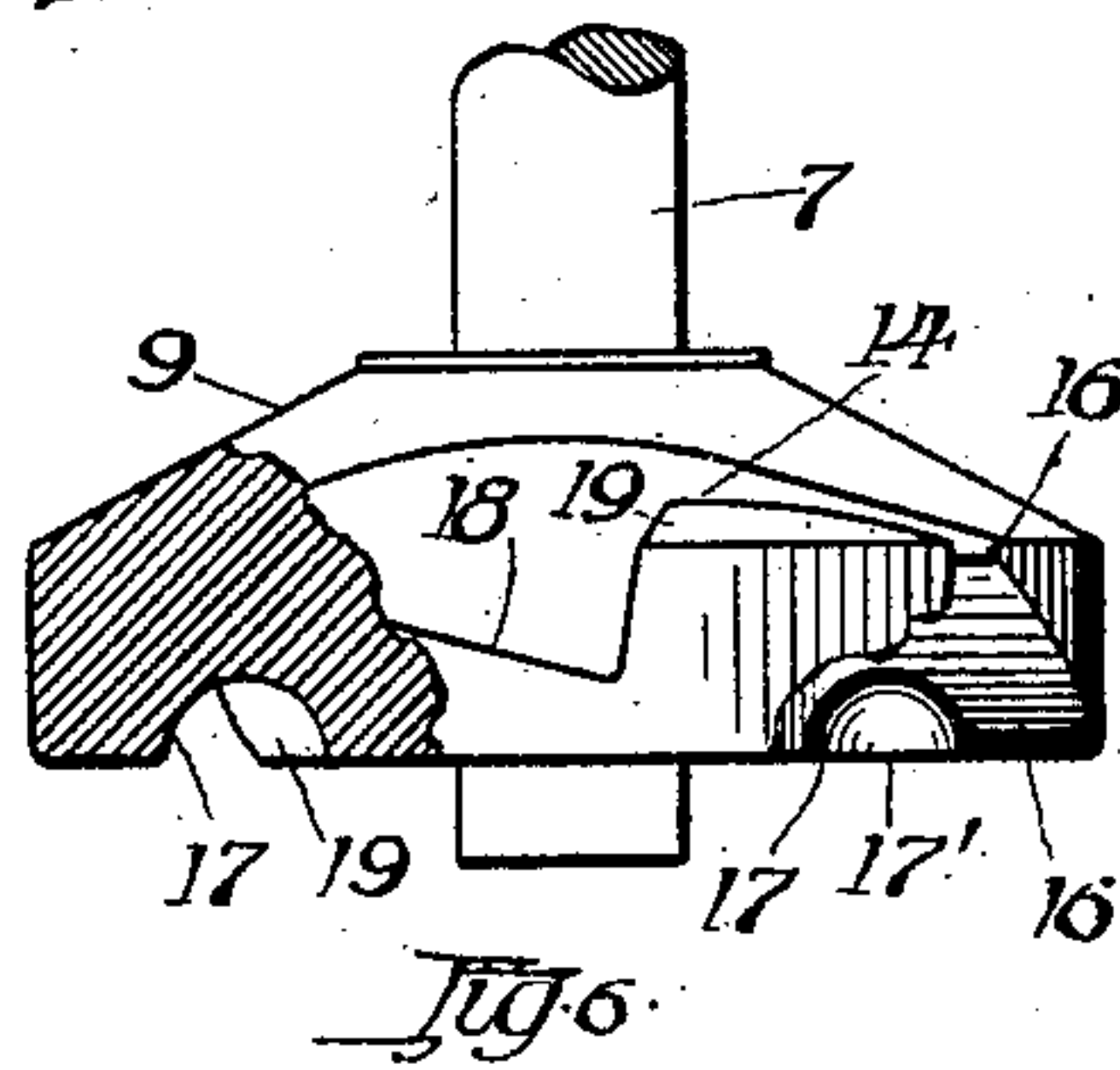
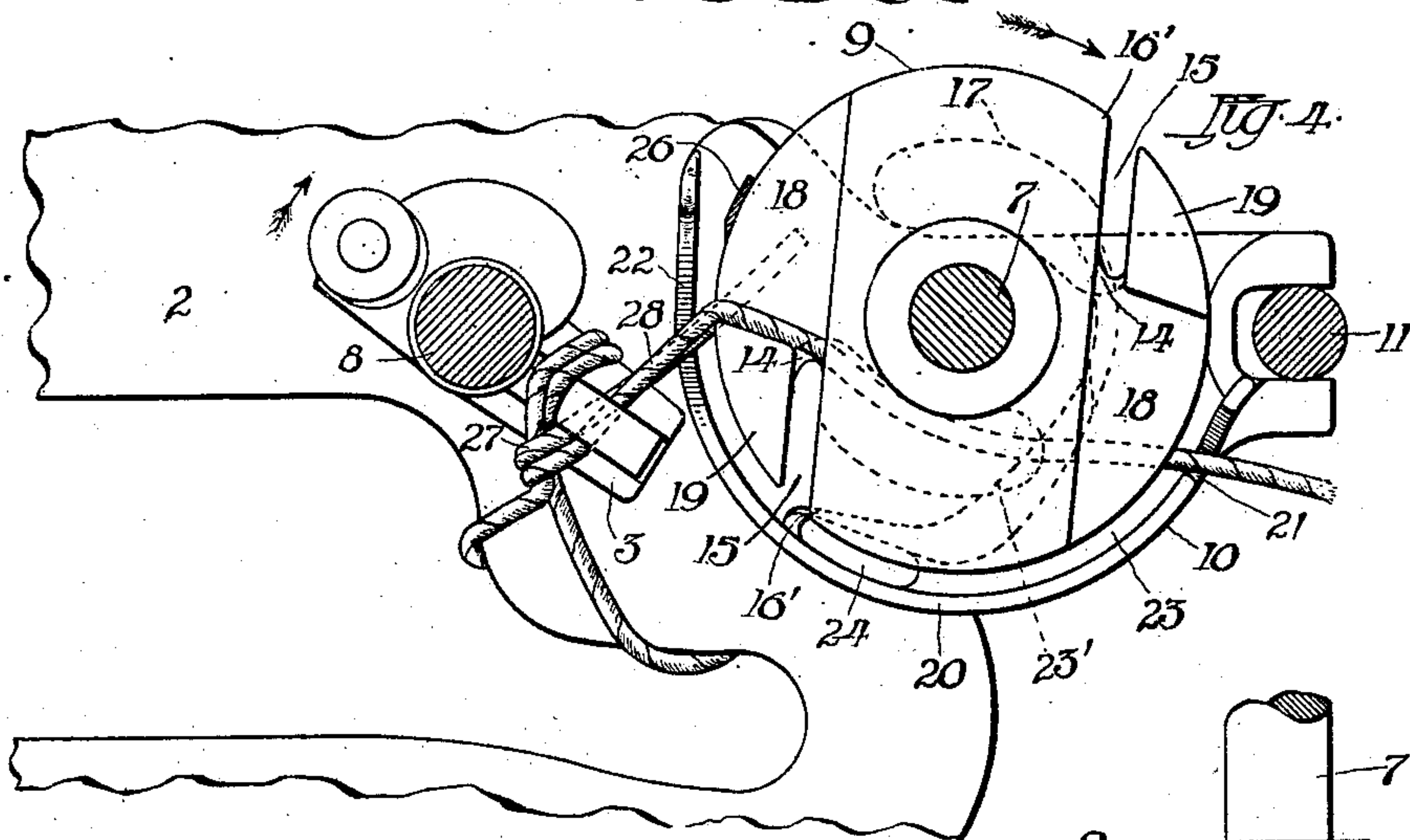
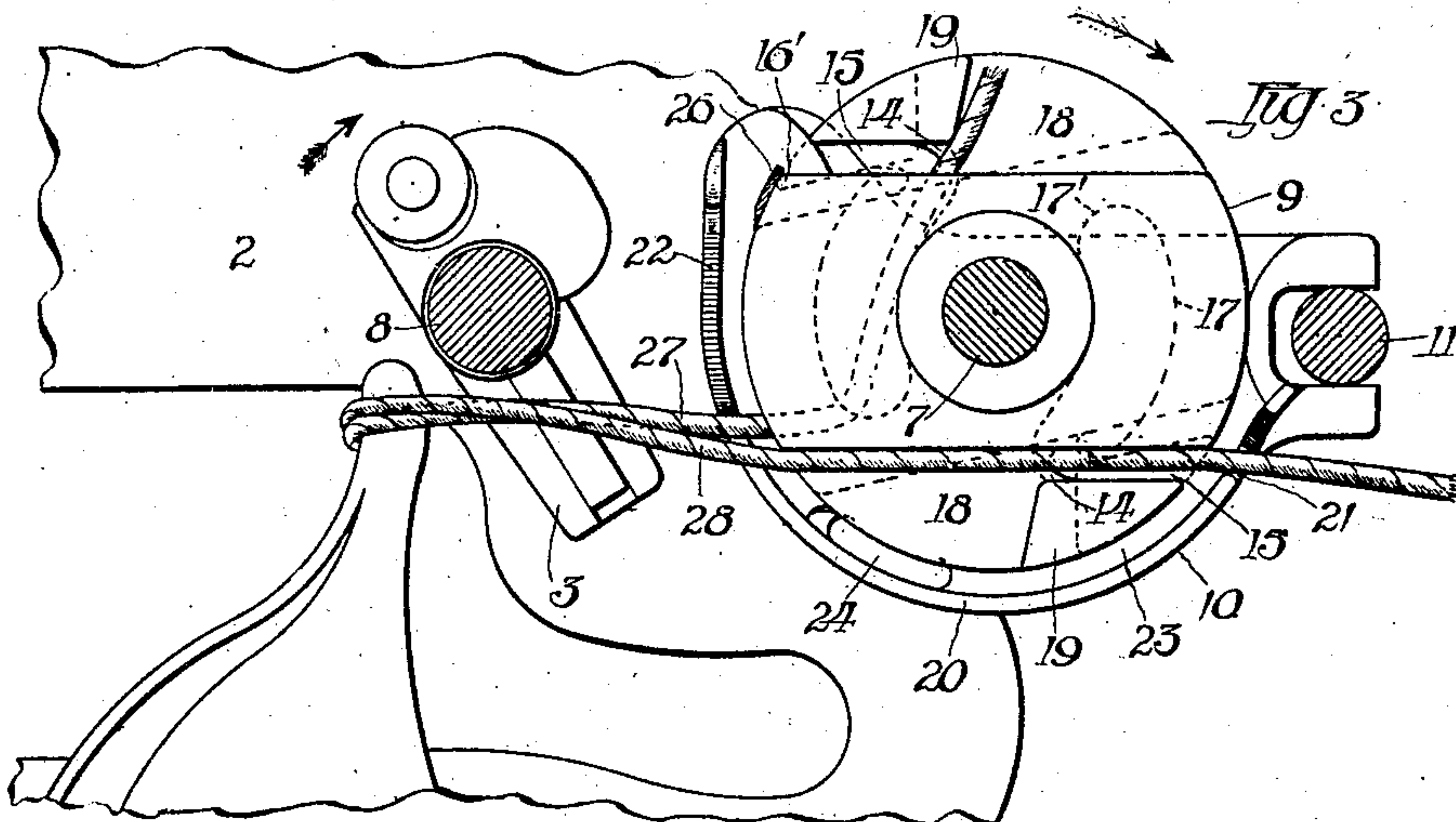
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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CORD-HOLDER FOR SELF-BINDERS.

No. 865,754.

Specification of Letters Patent.

Patented Sept. 10, 1907.

Application filed April 8, 1907. Serial No. 366,888.

To all whom it may concern:

Be it known that I, BERT R. BENJAMIN, a citizen of the United States, residing at Oak Park, in the county of Cook and State of Illinois, have invented a new and
5 useful Improvement in Cord-Holders for Self-Binders, of which the following is a complete specification.

This invention relates to certain improvements in cord-holders for grain binders, and is more particularly directed to improving certain features of cord-holders
10 of the type shown in my former patent, No. 741,296, October 13, 1903.

The object in view is to insure greater accuracy in the operation of the cord-holding and knotting mechanism by providing means to protect the cord-receiving
15 groove against the accidental lodgment of straws therein, and to so construct the parts that the cord will be held in proper relation with respect to the knotter-hook and that the objectionable accumulation of dirt or foreign matter in a place that would obstruct the free
20 operation of the cord-holding members will be prevented.

These and other improvements in various details of construction will be hereinafter described, set forth in the appended claims and illustrated in the accompanying
25 drawings, in which—

Figure 1 is a rear side elevation of a knotting mechanism for grain binders, disclosing a cord-holder, in which is embodied my invention, the needle appearing in the operation of laying the cord in the groove of the
30 cord-holder. Fig. 2 represents a front side elevation similar to that shown in Fig. 1, except that the knotter has just completed the knot and the needle is ready to recede. This view is designed to show the construction of the cord-holding disk and the relation of the knife
35 thereto. Fig. 3 is a sectional plan of the knotter and holder, with the parts shown in the same relative position as in Fig. 1. Fig. 4 is a similar plan of the same parts with the positions corresponding to those of Fig. 2. Fig. 5 is a detail plan of the cord-holding plate
40 detached; and Fig. 6 is a detail side elevation of the cord-holding disk.

Referring to the drawings, 1 designates the frame of the knotter, 2 the breastplate, 3 the knotter bill and 4 the end of the needle. On the cam-gear shaft 5 is
45 mounted the cam-gear 6, which is arranged to mesh with and actuate the cord-holder disk shaft 7 and the knotter-hook shaft 8 through the pinions 7^a and 8^a, respectively, the arrangement being such that the disk shaft will be rotated one half revolution and the knotter
50 hook one complete revolution for each revolution of the cam-gear shaft.

Fixed on the lower end of the disk shaft 7, and abutting the boss portion 1¹ of the knotter frame 1, is the cord-holding disk 9, and underlying this disk is the

cord-holding plate 10, which is held yieldingly against
55 said disk by means of the hook bolt 11. A coil spring 12 surrounds the upper end of the hook bolt 11 and reacts between the nut 13 on the upper end of said bolt and the shoulder 1² on the knotter frame. The lower transversely extending portion of the hook bolt is
60 provided with an upturned end 11¹ which engages a corresponding depression in the bottom of the cord-holding plate 10, the point of contact being directly beneath that portion of the plate where the greatest pressure is required between it and the disk to hold the
65 cord.

The principal novel features of this invention relate to the modified construction of the plate and disk above mentioned, and for a description of the general construction and operation of these parts, as well as a
70 more complete detail description of the other associated members, reference is made to my former patent already cited.

The cord-holding disk 9, which rotates in the direction indicated by arrows in Figs. 3 and 4, is provided
75 with a conical top; and in each side thereof is formed the oppositely disposed, transversely extending cord-receiving grooves 14. These grooves terminate at the periphery of the disk, and on their cord-receiving ends in the notches 15, in which the twine is laid by the
80 needle, and each notch is cut away on its advancing side, as at 16, to form a cord-engaging hook 16¹. On the lower or engaging face of the disk, and extending rearwardly relative to the rotation thereof from the inner end of each of said notches, is a relieved surface
85 17, the function of which is to grasp the twine between the cooperating surfaces of the disk and plate, to properly place it therebetween and to enable the twine to be rendered to the knotter hook at the right time. The groove 14 is also cut away, as at 18, on its outer side
90 flush with its bottom and made tapering toward the cord-receiving end; but the cut-away part does not extend to said end, so there is left the cord-cutting lug 19. The retreating side of the notch 15 is also cut away slightly on its under side in order to insure the
95 end of the holder twine being readily released as the twine is stripped from the knotter hook.

Owing to the unprotected nature of the rotating disk, when constructed as set forth in my former patent, a tendency of straws to occasionally lodge in
100 the cord-receiving groove of the disk holder was sometimes encountered, and especially in large and tangled grain. With a view to overcoming this difficulty the construction of the cord-holding plate has been changed by providing an upwardly projecting shielding flange
105 20 thereon, the said flange extending from the knotter side of the plate on the needle side to the cord-receiving side thereof. The said flange extends substan-

tially flush with the top of said disk and a slight distance therefrom, so that the top of the flange, in connection with the conical top of the disk, presents a comparatively unbroken outline to the straw, and thus the chance of straws becoming inadvertently lodged in the cord-receiving groove 14 is made remote. A notch 21 is formed in the flange 20 in a position to register with the notch 15 in the periphery of the disk 9 when the groove 14 in the latter is in position to receive the twine from the needle. This notch enables the strand of needle twine to be placed low enough in the groove 14 to insure its being engaged by the hook 16¹. On the knotter end of the flange 20 is a depression 22, the lowest point of the depression being so located that it will hold the cord in a proper relation with respect to the knotter hook, and guides the twine and permits it to be drawn down to position to be grasped by the knotter hook. The slightly raised portion of the flange 20, which forms one side of the depression 22, is made somewhat lower than the normal height of said flange in order to provide greater clearance.

The relieved surface 23 is formed in the twine-engaging side of the holder, and the initial grasping of the twine is accomplished by the edge 23¹ on the plate holder and the rear edges 17¹ of the relieved surfaces 17. An aperture 24 is formed in said plate at the forward end of the relieved surface 23, through which may escape the grain, dirt or other foreign substance gathered by the rotation of the disk. A groove, or cut-away portion 25 of the holder plate is provided, into which the holder end of the cord is carried by the disk during the formation of the knot, thereby reducing the effective holding surface and allowing the cord to be drawn therefrom by the knotter as it requires slack. The normal position, or position of rest, of the cord-holding disk 9 is shown in dotted lines in Fig. 3, and is such that the groove 14 in the cord-holding disk 9 will not register with the notch 21 in the flange 20 of the plate 10. The disk stops at the end of its movement and just before the registering position of the groove and notch is reached. The lug 19 will thus be made to occupy a position immediately in front of the notch 21 and thereby effectually prevent straws lodging in the groove and notch. When the twine is first laid across the disk by the needle it will rest upon the knotter side of the disk and extend over the top of the lug 19; but as soon as the disk begins to rotate the twine will drop into the groove and notch, crowding any straws out of the way. With this novel construction and arrangement the only opportunity the straw will have to lodge in the groove is the instant the notch and groove register after the disk starts, so the chances of straw lodging therein and choking are reduced to a minimum.

A depending knife 26 is fixed to the knotter frame, its blade portion lying tangentially to and close against the cord-holder disk 9, this knife cooperating with the lug 19 in severing the twine. In order to enable the knife blade to yield laterally to the pressure of the disk and also to yield slightly in the direction of the plane of the blade when cutting the twine, the shank portion of the said knife is twisted or inclined with respect to the blade portion. The shank portion is secured to the knotter frame on a surface inclined with respect to the cutting plane of the knife.

The operation of the device is as follows: Assuming

that the cord-holder strand 27 of the twine is in place and a bundle completed, the needle will advance to its forward position, as shown in Fig. 1, laying the needle strand 28 across the disk and over the top of the lug 19 and in position to drop into the notch 21 when the disk rotates sufficiently to cause the notch 15 to register with said notch 21. When the cord has been thus laid the holder-disk 9 continues to move and the hook 16¹ passes above the needle strand. The knotter hook 3 starts at about the same time and the lug 19, at the side of which the needle twine has been laid, deflects it over toward the shank of the bill into the position shown in Fig. 4, so as to prevent the cord from escaping the bill and also so as to carry it around to meet the open jaws. While the disk is thus moving the needle strand is free to draw out slack over the hook, but just before the lug 19 reaches the knife 26 the rear edge 17¹ of the recess 17 passes over the forward edge 23¹ of the relieved surface 23 on the plate 10, as indicated by dotted lines in Fig. 4, and the needle twine is at once gripped between the cooperating contacting surfaces of the disk and holder. It is apparent that continued rotation from the position shown in Fig. 4 will soon carry the cord by the knife 26 and sever same. The needle strand 28, as just explained, will have been gripped before the knife is reached. The needle strand now becomes the cord-holder strand, and the needle 4 in the meantime begins to return, lifting the twine out of the notch 21, so that the twine which extends from the cord-holder to the needle will pass up between the edge of the disk and the flange 20 on the plate during the movement of the parts from the position shown in Fig. 4 to that shown in Fig. 3. It will be observed that in the rotation of the knotter hook the cord 27 will be rendered to said hook until its length between the surfaces of the holder is reduced from that shown in Fig. 3 to approximately the short end shown in Fig. 4.

In the operation above described the flange 20 effectually prevents straws lodging in the cord-receiving groove of the holder, the notch 21 permits the needle to lay the twine sufficiently low to insure the hook 16¹ engaging it, the depression 22 guides the twine properly with respect to the knotter hook, and the aperture 24 in the plate enables the grain or dirt lodging between the flange and disk to be discharged.

What I claim as my invention, and desire to secure by Letters Patent, is:

1. In a cord-holder for the knotters of self-binders, in combination, a cord-holding disk provided with a cord-receiving groove, and an underlying cord-holding plate, said plate having formed thereon an upwardly extending shielding flange adjacent to and substantially flush with the top of the cord-holding disk, said flange having formed therein, on its cord-receiving side, a twine-receiving notch.

2. In a cord-holder for the knotters of self-binders, in combination, a cord-holding disk provided with a cord-receiving groove in the upper surface thereof, and an underlying cord-holding plate, said plate having formed thereon an upwardly extending notched flange adjacent to and substantially flush with the top of the cord-holding disk, the cord-receiving groove occupying a position out of alinement with the notch in the flange when the said disk is at rest.

3. In a cord-holder for the knotters of self-binders, in combination, a cord-holding disk provided with a cord-receiving groove in the upper surface thereof, and an underlying cord-holding plate, said plate having formed thereon an upwardly extending notched flange adjacent to and substantially flush with the top of the cord-holding

disk, the arrangement being such that initial movement of the said disk will cause the groove therein to register with the notch in said flange.

4. In a cord-holder for the knotter of self-binders, in combination, a cord-holding disk provided with a cord-receiving groove, and an underlying cord-holding plate, said plate having formed thereon an upwardly extending shielding flange adjacent to and substantially flush with the top of the cord-holding disk, said flange having a depression formed therein on the knotter side thereof for permitting the twine to draw down to position to be grasped by the knotter hook, and also having formed therein, on the cord-receiving side of the said disk, a notch which registers with the cord-receiving groove in the cord-holding disk at a predetermined point in the rotation of said disk.

5. In a cord-holder for the knotter of self-binders, in combination, a cylindrical conical-topped cord-holding disk having oppositely disposed recesses formed in the bottom thereof and provided also with a cord-receiving groove, which terminates at one end in a notch in the periphery of said disk, the side of this notch being cut away below on its advancing side to form a hook, and an underlying cord-holding plate, said plate having formed thereon an upwardly extending flange adjacent to and substantially flush with the top of the cord-holding disk, said flange having a depression formed therein, on the knotter side thereof, for permitting the twine to draw down to position to be grasped by the knotter hook, and also having formed thereon, in the cord-receiving side of the said disk, a notch which registers with the cord-receiving groove in the cord-holding disk at a predetermined point in the rotation of said disk.

6. In a cord-holder for the knotter of self-binders, in combination, a conical-topped, horizontally disposed cord-holding disk provided on its upper surface with two opposite transversely extending cord-receiving grooves, cut-away notches in the periphery of said disk at the end of said grooves and relieved surfaces in the bottom of said disks, an underlying cord-holding plate, and an upwardly projecting flange on said plate substantially flush with the top of said disk and adjacent thereto, the said flange extending from the knotter side to the cord-receiving side of said disk and on the needle side thereof.

7. In a cord-holder for the knotters of self-binders, in combination, a conical-topped cord-holding disk provided on its upper surface with two opposite transversely extending cord-receiving grooves, the upper portion of the

disk outside the groove being cut away to form cutting lugs adjacent to the cord-receiving end of said grooves, cut-away notches in the periphery of said disk at the ends of the grooves, and relieved surfaces in the bottom of said disks, and an underlying cord-holding plate cooperating with said disk.

8. In a cord-holder for the knotters of self-binders, in combination, a cord-holding disk provided with cord-receiving grooves and relieved surfaces on its under side, an underlying cord-holding plate, the said plate being provided with an aperture therein for the discharge of accumulated grain or dirt, and an upwardly extending notched flange formed on said plate adjacent to the said disk and substantially flush with the top thereof.

9. In a cord-holder for the knotters of self-binders, in combination, a knotter frame, a cord-holding disk provided on its upper surface with a cord-receiving groove and a cutting lug, an underlying cord-holding plate, and a knife having a blade and a shank portion inclined with respect to each other, the blade portion being arranged tangentially to the periphery of said disk in a manner to cooperate with said cutting lug on the disk, the shank portion being secured to the knotter frame on a plane inclined with respect to the cutting plane of the knife.

10. In a grain binding mechanism for harvesters, in combination, a needle, a movable cord holding member, means for imparting intermittent rotation thereto, a cooperating cord holding member fixed against rotation, each of said cord holding members being provided with a groove or notch, the said notches occupying non-registering positions with respect to each other when the two members are at rest but registering momentarily at a predetermined point in the travel of the said cord holding member and thereby forming a continuous notch for the reception and initial grasp of the twine from the needle.

11. In a grain binding mechanism for harvesters, in combination, a needle, a movable cord holding member, means for imparting intermittent rotation thereto, a cooperating cord holding member fixed against rotation, each of said members being provided with a notch, the two notches momentarily registering with each other at a predetermined point in the path of travel of the said movable member, thereby forming a groove in which the twine is initially received and grasped from the needle.

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