

No. 681,015.

Patented Aug. 20, 1901.

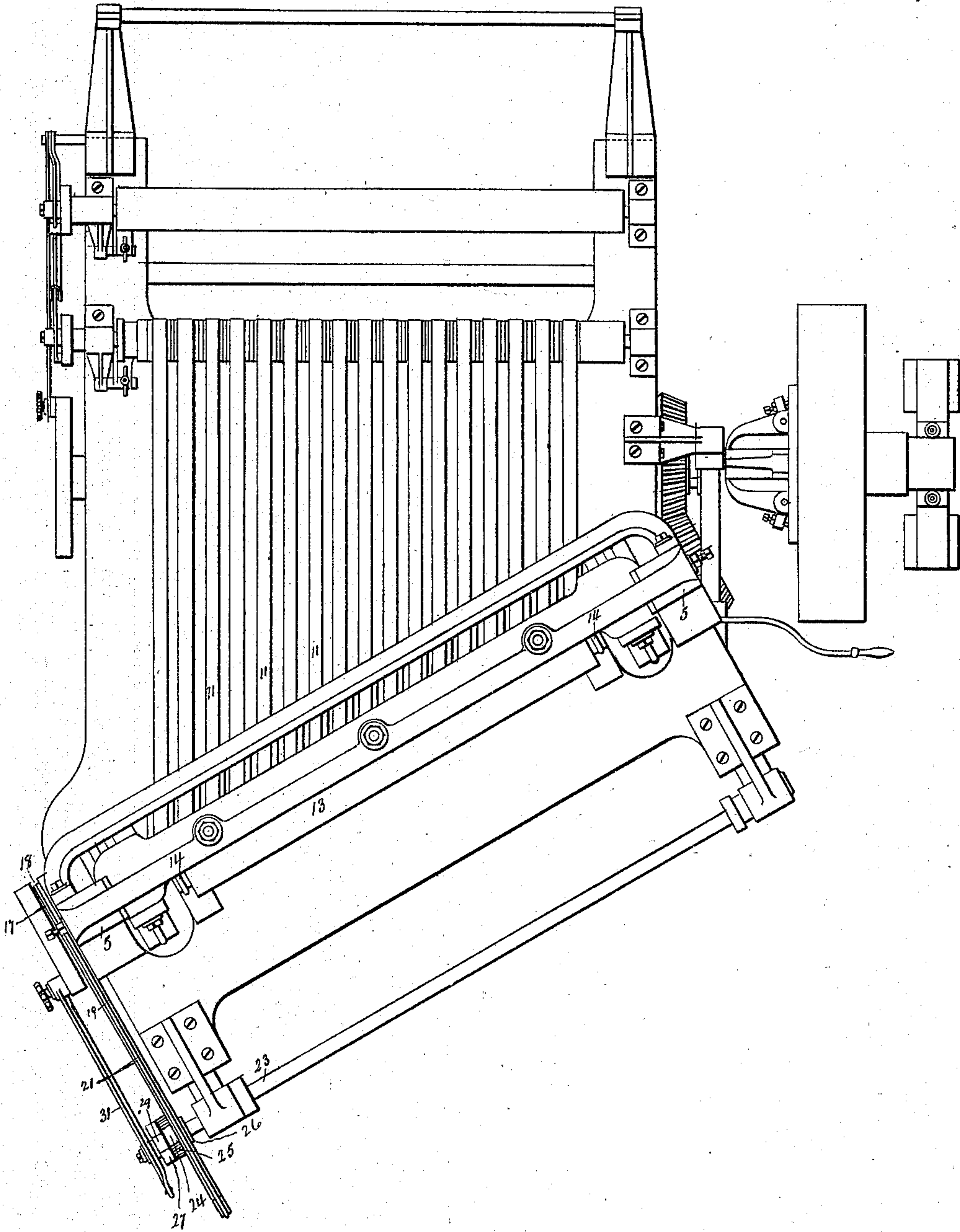
F. H. BREWSTER.  
BIAS CUTTING MACHINE.

(Application filed Mar. 5, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



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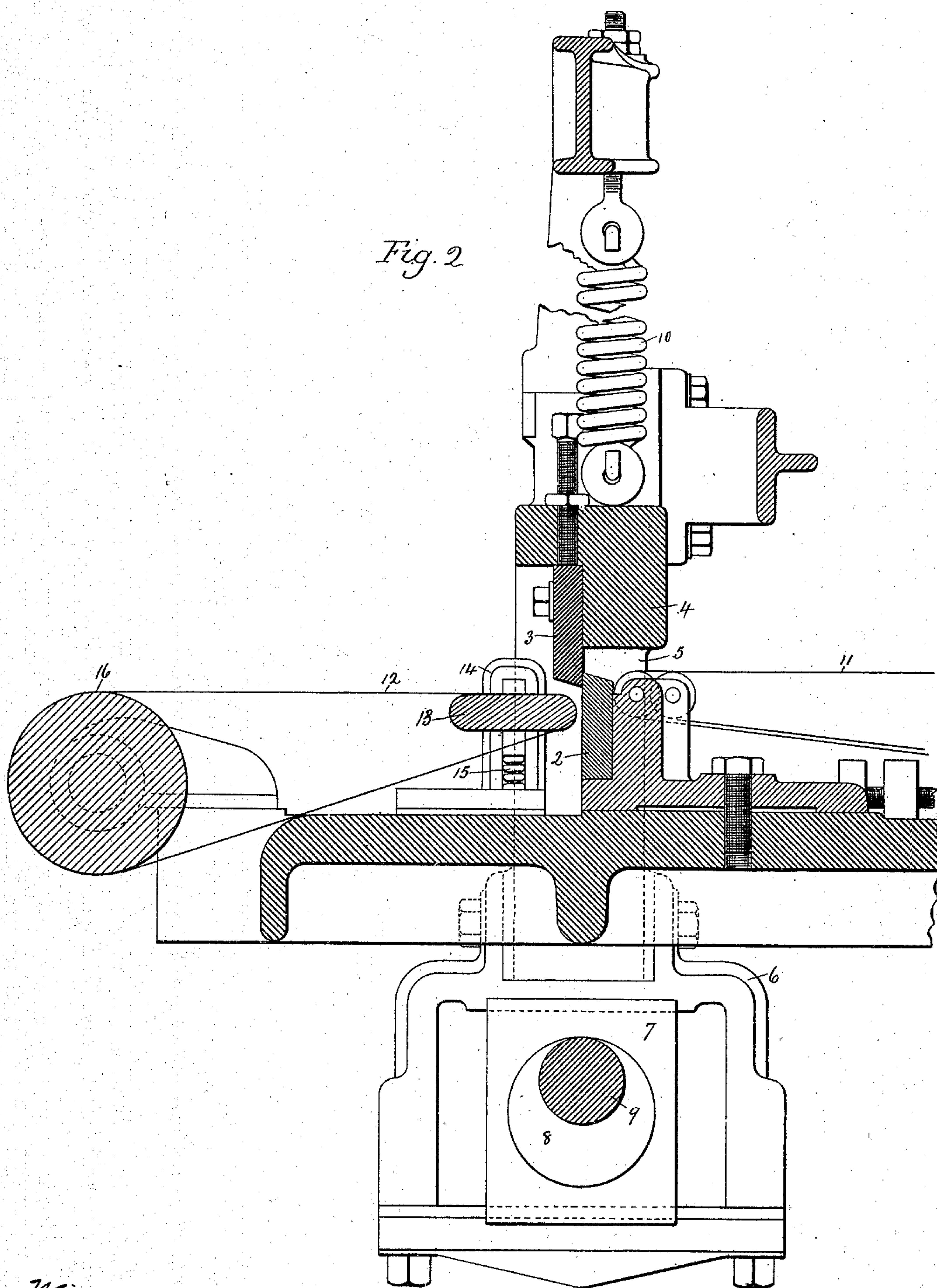
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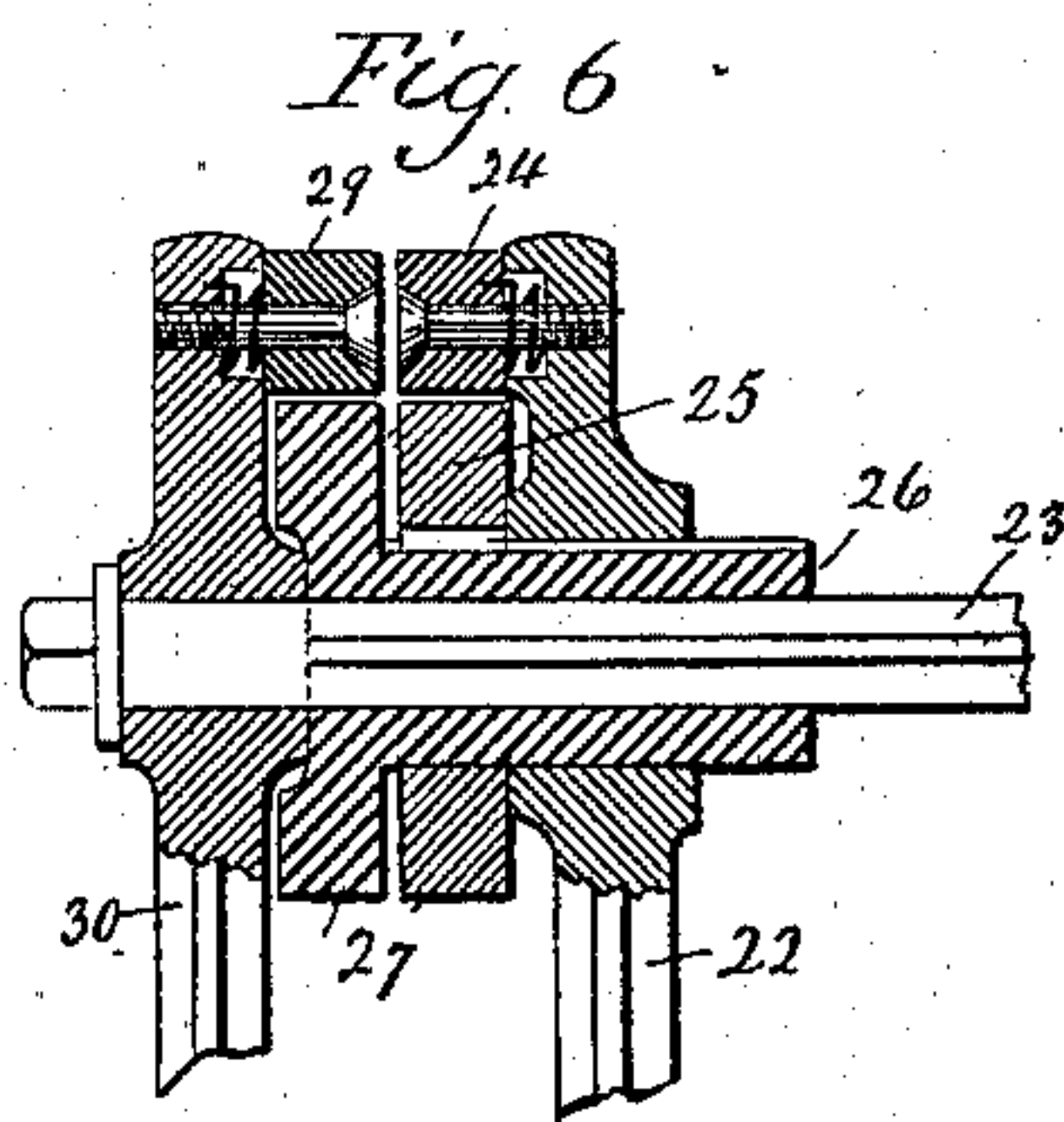
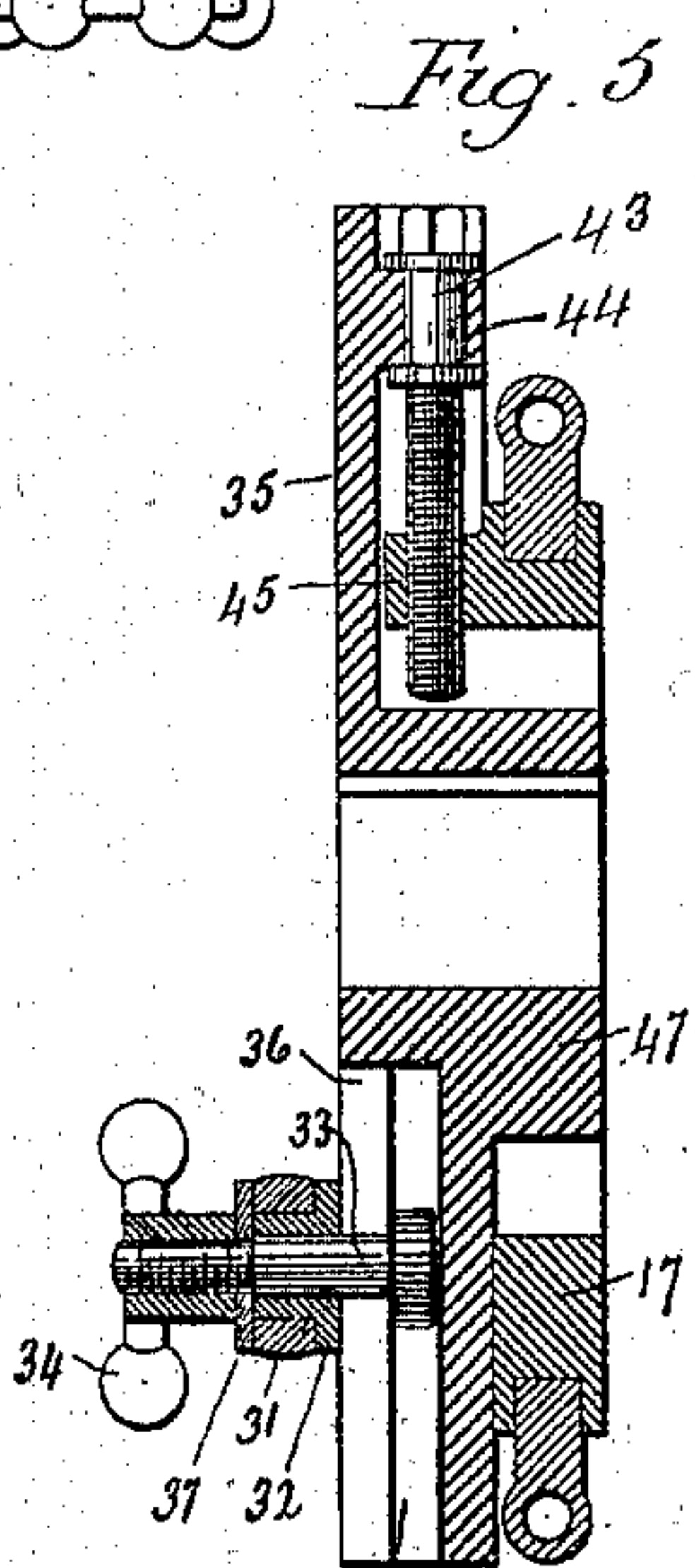
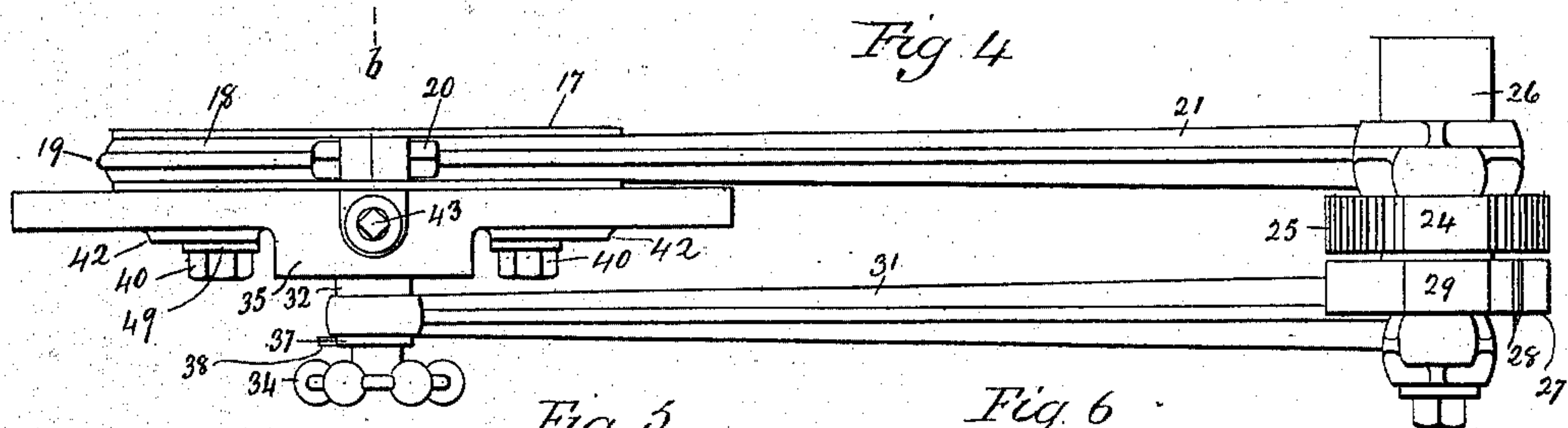
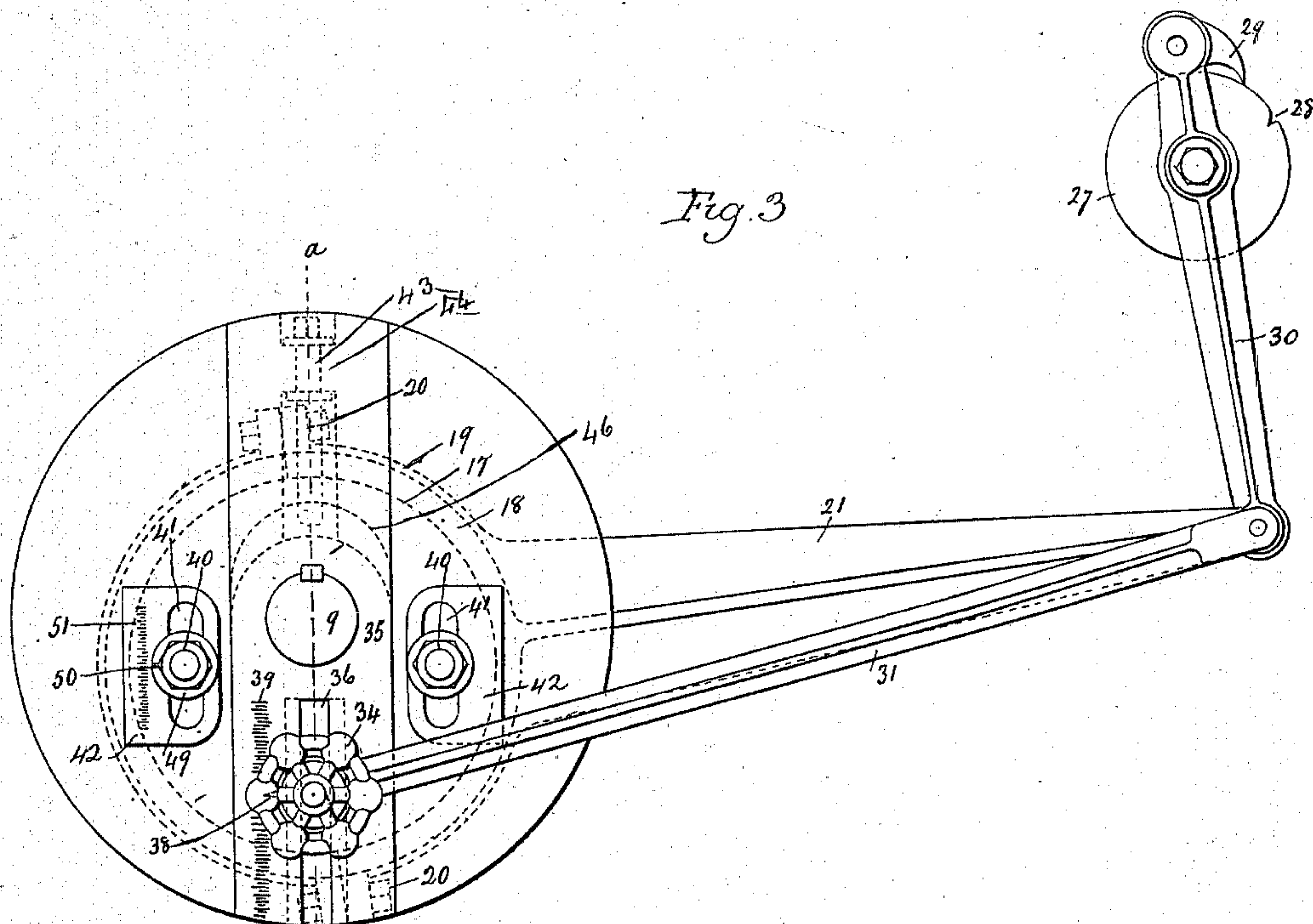
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3 Sheets—Sheet 3.



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# UNITED STATES PATENT OFFICE.

FRANK H. BREWSTER, OF DERBY, CONNECTICUT, ASSIGNOR TO  
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## BIAS-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 681,015, dated August 20, 1901.

Application filed March 5, 1901. Serial No. 49,917. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK H. BREWSTER, of Derby, in the county of New Haven and State of Connecticut, have invented a new Improvement in Bias-Cutting Machines; and I do hereby declare the following, when taken in connection with the accompanying drawings and the figures of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a plan view of one form which a machine constructed in accordance with my invention may assume; Fig. 2, a broken view, in vertical section, through the shearing-knives of the machine and showing also the delivery-apron thereof; Fig. 3, a view in side elevation showing the combined step-by-step and spacing mechanisms; Fig. 4, a plan view thereof; Fig. 5, a view in vertical section on the line *a b* of Fig. 3; Fig. 6, a broken view, in vertical section, through the step-by-step ratchet and its pawl and the spacing-disk and its pawl.

My invention relates to an improvement in bias-cutting machines which are employed for cutting the bias strips of "piping" used in the manufacture of boots and shoes and other articles of rubber, the object of the invention being to provide these machines with simple, conveniently-adjusted, and reliable spacing mechanism by means of which and a table or schedule furnished with the machine the same may be set to count the strips in groups of any desired number in each group within a range wide enough for all practical purposes.

With these ends in view my invention consists in a bias-cutting machine provided with a spacing attachment and having certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In carrying out my invention I employ a bias-cutting machine of ordinary construction and not therefore calling for detailed description. It is provided with a stationary shearing-knife 2, coacting with a reciprocating shearing-knife 3, secured to a head or gate 4, the ends of which are connected with upright arms 5, terminating at their lower

ends in open frames 6, containing horizontally-movable heads 7, bored out to receive eccentrics 8, mounted upon the main shaft 9, which through the medium of the said eccentrics depresses the gate 4, and hence the knife 3, against the tension of the spring 10, which assists the eccentric in lifting the knife.

The piping, which consists of a long sheet of fabric treated with rubber, is fed to the action of the knives by means of delivery-strips 11, to which the knives are set at the required angle for producing the right bias in the strips. As the strips are sheared from the sheet they fall upon the extreme inner end of the upper reach of an endless apron 12, the inner end of which rides over the rounded inner edge of a platform 13, consisting of a board the ends of which are yieldingly supported in frames 14, containing springs 15. This apron is driven by an apron-driving drum 16, over which it passes and which is actuated in step-by-step movement by step-by-step mechanism nearly through one complete rotation, when spacing mechanism "cuts in," so to speak, and completes the revolution of the drum by a long quick movement, so that the apron is moved by a series of regular steps separated by one long quick step. The said step-by-step mechanism comprises an eccentric 17, encircled by an eccentric-strap 18, having a rib 19 and formed in two sections united by adjusting-screws 20. (Shown by broken lines in Fig. 3.) The forward section of this strap merges into a step-by-step pitman 21, the outer end of which is connected with a step-by-step lever 22, carrying at its upper end a step-by-step pawl 24, which coacts with the step-by-step ratchet-wheel 25, which is keyed to the long hub 26 of the notched spacing-disk 27, having a single notch 28, as best shown in Fig. 3. The lever 22 swings upon the said hub 26, through which the shaft 23 passes and to which the shaft is keyed. The notched spacing-disk 27 is engaged by a spacing-pawl 29, carried by the upper end of a spacing-lever 30, suspended directly from the shaft 23, upon which it swings as upon a center. The lower end of this lever is connected with the forward or outer end of a connecting-rod 31, the inner end of which is passed over a non-rotatable



bushing 32, receiving a T-bolt 33, furnished at its outer end with a clamping hand-wheel 34, which is employed to clamp the bushing 33 upon the outer face of a disk 35 at any point within the range of a radial T-slot 36, formed in the said disk, which is secured to the main shaft 9, as will be described. A non-rotatable washer 37 rests upon the outer end of the bushing 32, against which it is held by the hub of a hand-wheel 34. The said bushing is furnished with an index-mark 38, which is used in conjunction with a vertically-arranged scale 39, located upon the outer face of the disk 35 for setting the hub 32 at the right position in the T-slot 36. This adjustment is employed to vary the throw of the spacing-pawl 29. For the purpose of varying the throw of the step-by-step pawl 24 with respect to the step-by-step ratchet 25 the eccentric 17 is adjusted with respect to the slotted disk 35, with which the eccentric is connected by means of bolts 40, passing into the eccentric through slots 41, located in bosses 42, formed upon the outer face of the slotted disk 35. An adjusting-screw 43, passing freely through a lug 44, formed upon the inner face of the disk 35, enters a threaded lug 45, formed upon the outer face of the eccentric, which may thus be adjusted by the screw 43 when the bolts 40 are loosened. To provide clearance for this adjustment, the eccentric is formed with a large clearance-opening 46, which, as shown, is square at one end and rounded at the other and receives a head 47, formed integral with and upon the inner face of the disk 35 and receiving the main shaft 9, which is keyed to it. This head has straight side walls, which engage with the side walls of the clearance-opening 46, and a rounded and square end to conform to the rounded and square ends of the said opening, than which, however, the head is much shorter. Of course the clearance-opening may be rounded at both ends or square at both ends or of any other convenient form. Under the nut 48 of one of the bolts 40 I locate a non-rotatable washer 49, formed with an index-mark 50, used in conjunction with a scale 51 for determining the adjustment of the eccentric 17 with respect to the disk 35.

The step-by-step mechanism and the spacing mechanism are set to operate in the desired concert by adjusting the eccentric 17 with regard to the slotted disk 35 by the aid of the scale 51 and by adjusting the connection of the rod 31 with the said disk 35 by the aid of the scale 38. These adjustments are facilitated by means of a table furnished with the machine and compiled with reference to the circumference of the apron-driving drum.

It may now be said that in the ordinary action of the machine the movement of the shearing-knife 3 and the delivery-apron 12 is such that as the bias strips are cut from the sheet they will be laid one upon the other so that their edges will slightly overlap and form

a continuous overlapping series of strips upon the apron. The principle upon which my invention is based is to compel the apron to take one long quick step during each revolution of its driving-drum, so as to break the continuous piling of the strips and arrange them in uniform groups. The number of strips in each group being known, the counting of the strips becomes a simple matter. For illustration, let it be supposed that it is desired to count the bias strips in groups of twenty-five and that the ratchet-wheel has one hundred and forty teeth. With this end in view the eccentric 17 will be adjusted with respect to the slotted disk 35 by means of the adjusting-screw 43 and the scale 51, so that every throw of the eccentric will cause the step-by-step pawl 24 to engage with every fifth tooth of the step-by-step ratchet-wheel 25 and to adjust the bushing 32 in the slot 36 of the disk 35 by means of the scale 38, so that the throw of the spacing-pawl 29 will be equal to twenty teeth of the step-by-step ratchet. Now when the machine begins to operate the pawl 24 by engaging with every fifth tooth of the ratchet-wheel 25 will utilize one hundred and twenty of the one hundred and forty teeth thereof in imparting twenty-four separate step-by-step impulses to the apron-driving drum 16, and hence to the apron 12, but the ratchet-wheel 25 will lack twenty teeth of one complete revolution. During this time the spacing-pawl has ridden idly upon the surface of the spacing-disk 28, which, however, has been rotated synchronously with the ratchet-wheel 25, with which it is rigidly connected, through its long hub. The spacing-disk will therefore have had twenty-four separate impulses imparted to it, and at the end of the last impulse its notch 28 will be brought under the pawl 29, which will drop into it. The spacing-pawl being now entered into the notch in the spacing-disk, its next throw is an effective throw and being a much longer throw than the throw of the step-by-step pawl 24 moves the spacing-disk, and hence the ratchet-wheel 25, through an arc representing twenty teeth of the ratchet-wheel 25, which thus completes one rotation. During this long movement of the spacing-disk the drum takes a long step and causes the apron to take a correspondingly long step, and the step-by-step ratchet is rapidly rotated under the step-by-step pawl, which will be unaffected. Just before this long movement occurs the twenty-fifth strip has been delivered to the apron, which is then moved, as described, through a comparatively long step, so that the said strip will be separated from the next strip laid upon the apron and forming the first strip of the next group of twenty-five, and so on. In this way the strips laid upon the apron will be grouped in groups of twenty-five, with spaces between each group, enabling them to be rapidly counted. It will be readily understood that by changing the adjustment of the step-by-step and spacing



mechanisms and providing the spacing-disk 27 with several instead of one notch the long quick movement of the spacing-apron may be timed as desired, so that the number of 5 strips in the groups may be varied. The spacing attachment may of course be applied to any machine to which it is applicable without respect to the character of the machine or to the character of the material being 10 handled.

It is apparent that in carrying out my invention some changes from the construction herein shown and described may be made, and I would therefore have it understood that 15 I do not limit myself to the precise details herein shown, but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

20 Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a bias-cutting machine, the combination with an endless apron, of a step-by-step 25 mechanism for moving the said apron step by step, and spacing mechanism combined with the step-by-step mechanism to impart a long movement to the apron at regular intervals, the said long movement of the apron 30 being longer than its step-by-step movement, and virtually effecting the counting of the bias strips upon the apron in groups of predetermined numbers, whereby the strips are counted in groups kept distinct from each 35 other and each containing the same number of strips.

2. In a bias-cutting machine, the combination with an endless apron, of an apron-driving drum, a step-by-step mechanism for driving 40 the said drum in step-by-step rotation, and a spacing mechanism operating before the completion of every revolution of the drum to move the same through a longer arc than its step-by-step movement for the purpose of finishing the revolution of the drum 45 and imparting a long movement to the apron whereby the bias strips upon the apron are virtually counted in groups of predetermined numbers.

50 3. In a bias-cutting machine, the combination with an endless apron, of an apron-driving drum, a step-by-step mechanism for driving the drum including an eccentric, and a spacing mechanism for finishing the move-

ment of the drum with a long step, including 55 a disk, the said eccentric being adjustably connected with the disk for changing the step-by-step movement of the drum.

4. In a bias-cutting machine, the combination with an endless apron, of an apron-driving drum, a ratchet-wheel for imparting step- 60 by-step movement to the drum, a pawl for the said wheel, a swinging lever carrying the said pawl, a spacing-disk provided with a hub to which the ratchet-wheel is secured, 65 and mounted upon the shaft of the said drum, a pawl coacting with the said disk, a lever carrying the said pawl, and means for operating the said levers.

5. In a bias-cutting machine, the combination with an endless apron, of an apron-driving drum, a slotted disk connected with the 70 main shaft of the machine, an eccentric adjustably connected with the said disk, a step-by-step ratchet connected with the said drum, 75 which it actuates in step-by-step rotation, a pawl coacting with the said ratchet, and connected with the said eccentric by which it is operated, a spacing-disk rigidly connected 80 with the said step-by-step ratchet, a spacing-pawl coacting with the said spacing-disk and adjustable connection between the said spacing-pawl and the said slotted disk.

6. In a bias-cutting machine, the combination with an endless delivery-apron, of an 85 apron-driving drum, a spacing-disk having a long hub, and mounted upon the shaft of the said drum, a spacing-pawl for coaction with the said spacing-disk, a lever by which the said pawl is carried, a ratchet-wheel mounted 90 upon the hub of the spacing-disk, a pawl coacting therewith, a lever carrying the said pawl, a slotted disk mounted upon the main shaft of the machine, a connecting-rod adjustably connected with the said disk through 95 its slot and connected with the lever carrying the spacing-pawl, and an eccentric adjustably connected with the said slotted disk and connected with the lever carrying the pawl of the ratchet-disk. 100

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FRANK H. BREWSTER.

Witnesses:

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LILLIAN D. KELSEY.