

No. 720,512.

PATENTED FEB. 10, 1903.

J. M. BROWN.
SPOKE AUGER.

APPLICATION FILED SEPT. 16, 1901.

NO MODEL.

3 SHEETS—SHEET 1.

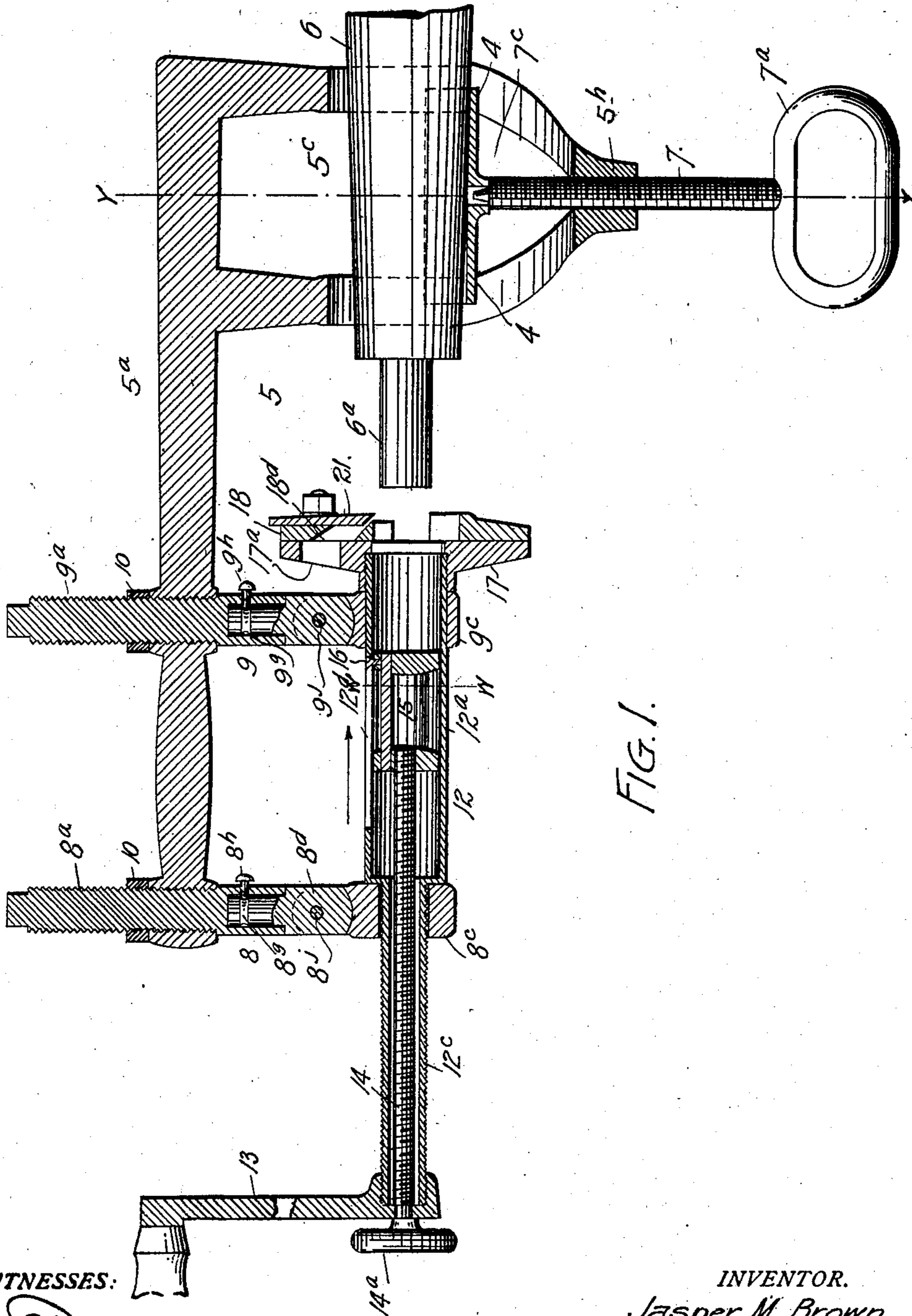


FIG. 1.

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3 SHEETS—SHEET 2.

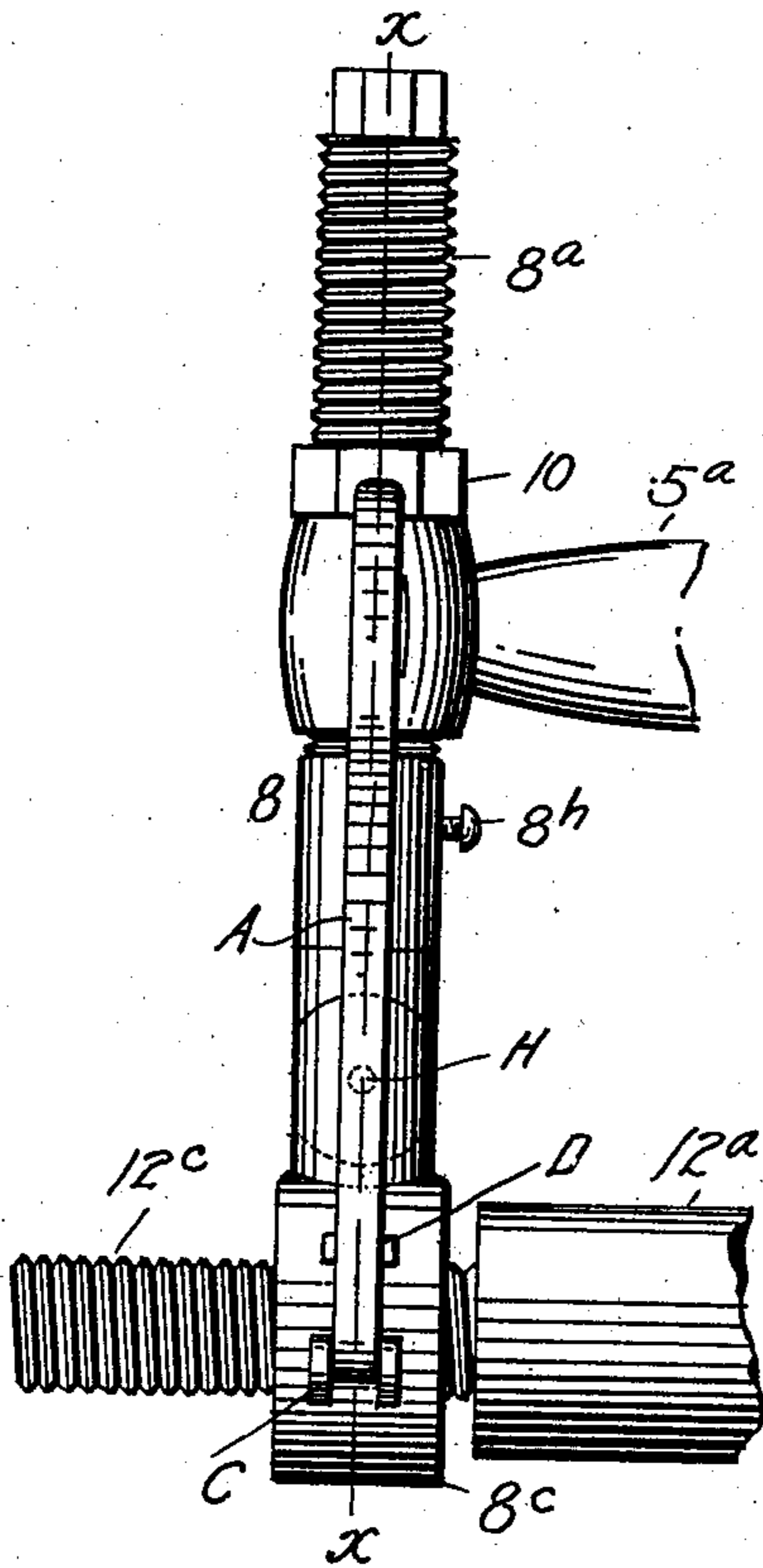


FIG. 2

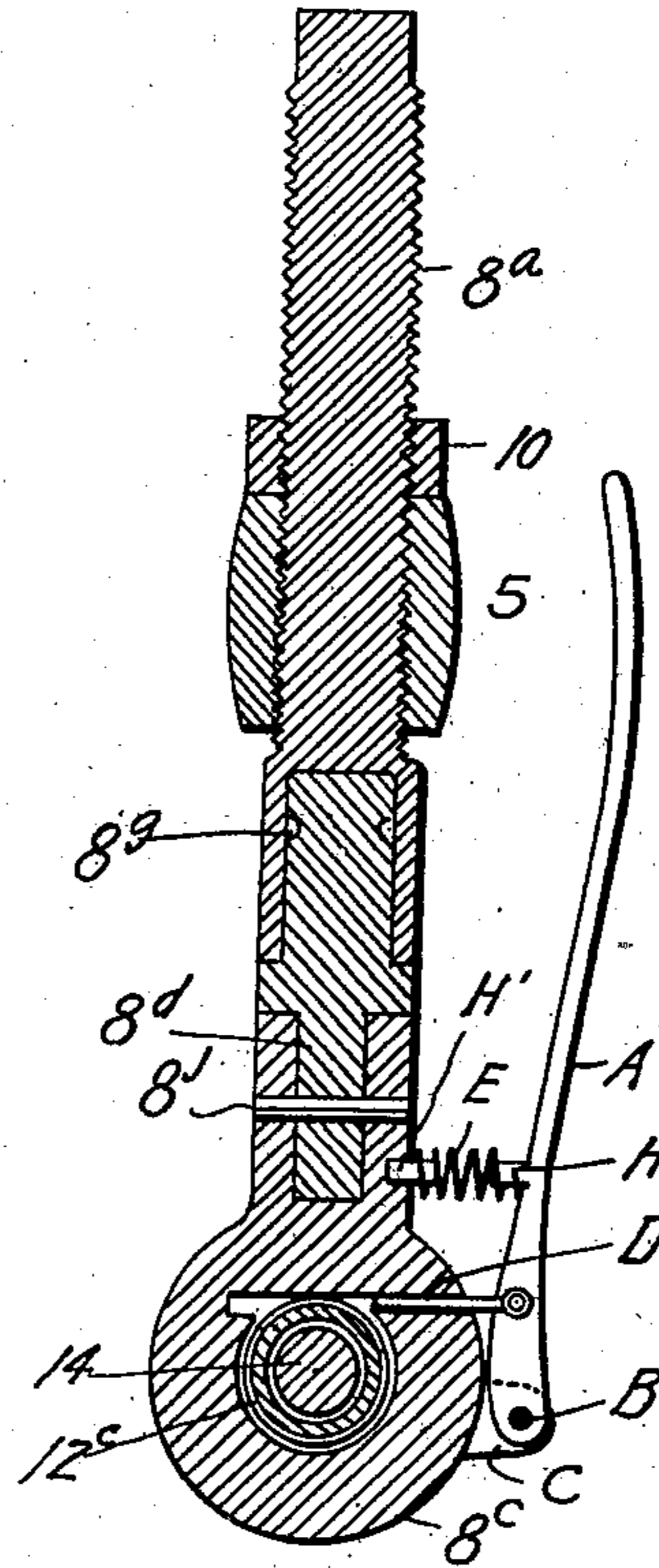


FIG. 3

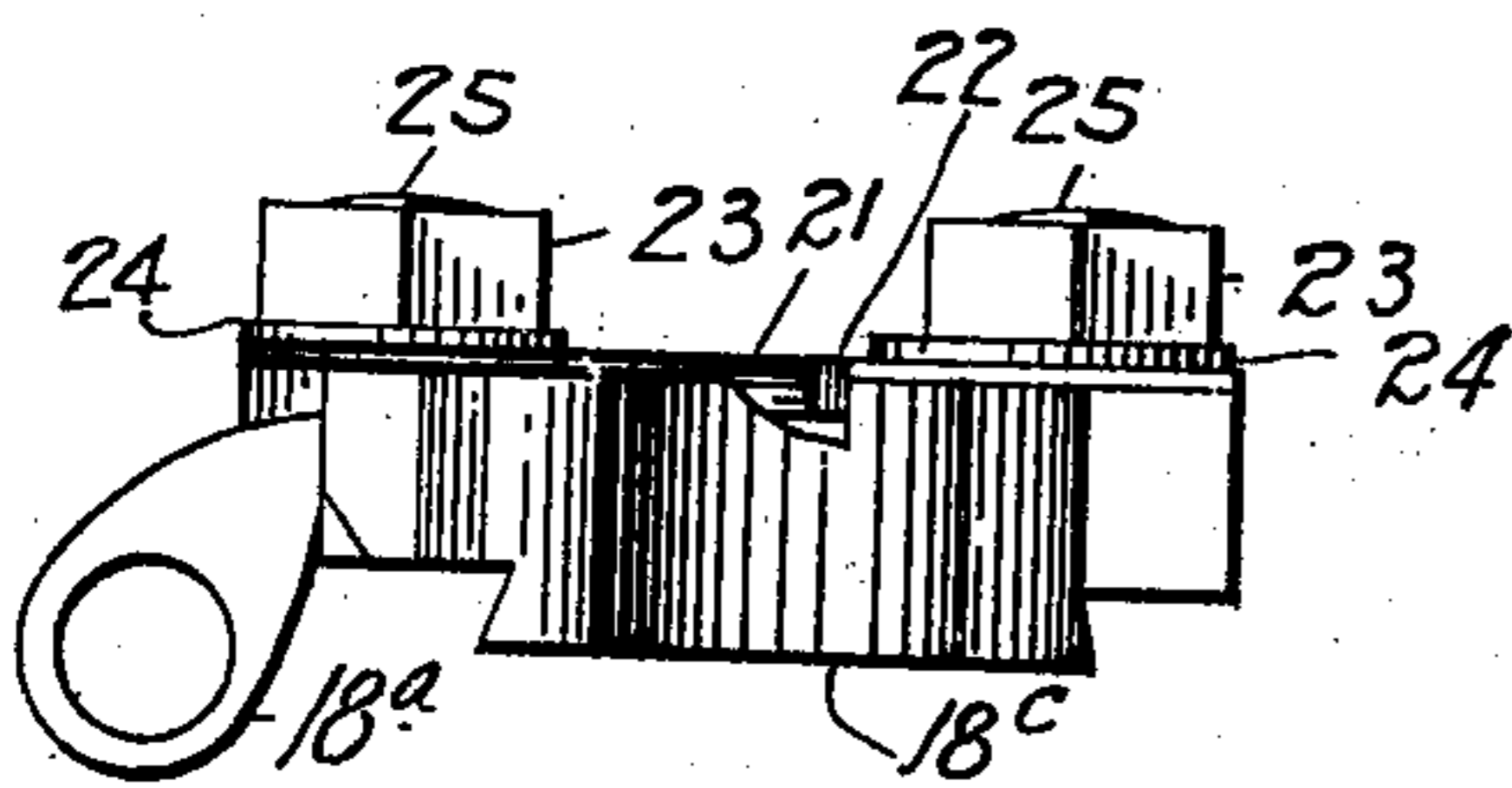


FIG. 10.

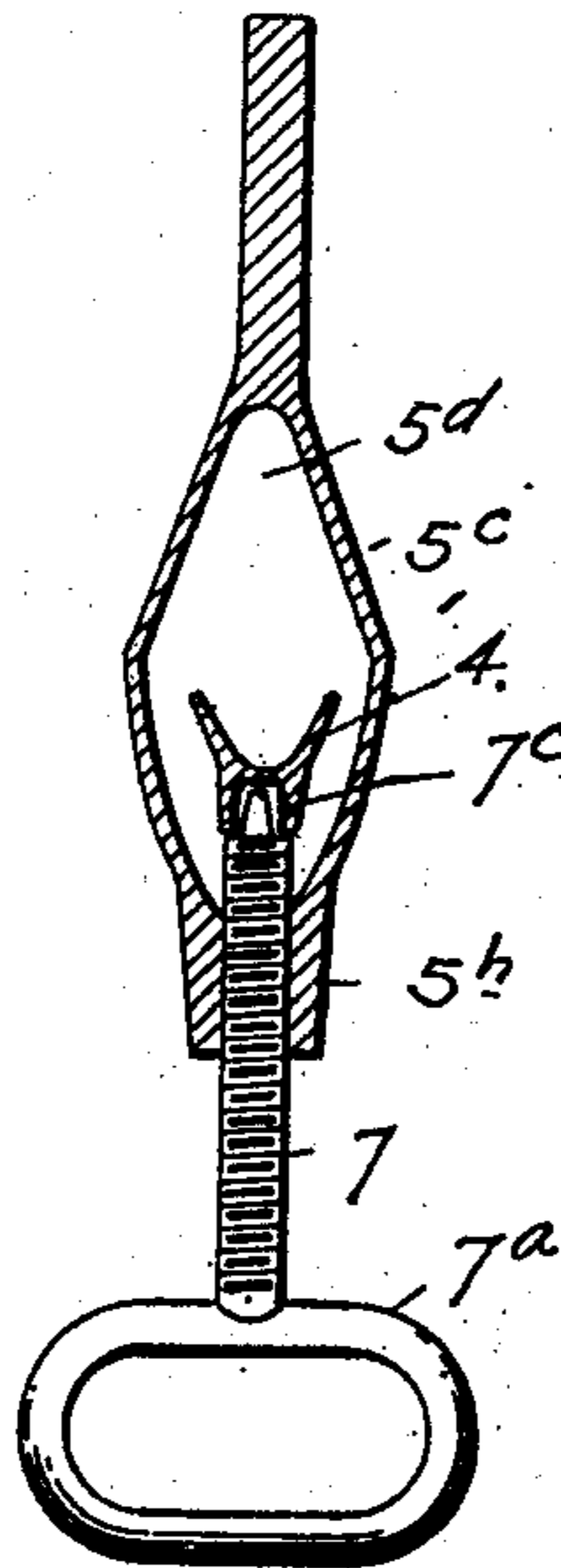


FIG. 4.

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3 SHEETS—SHEET 3.

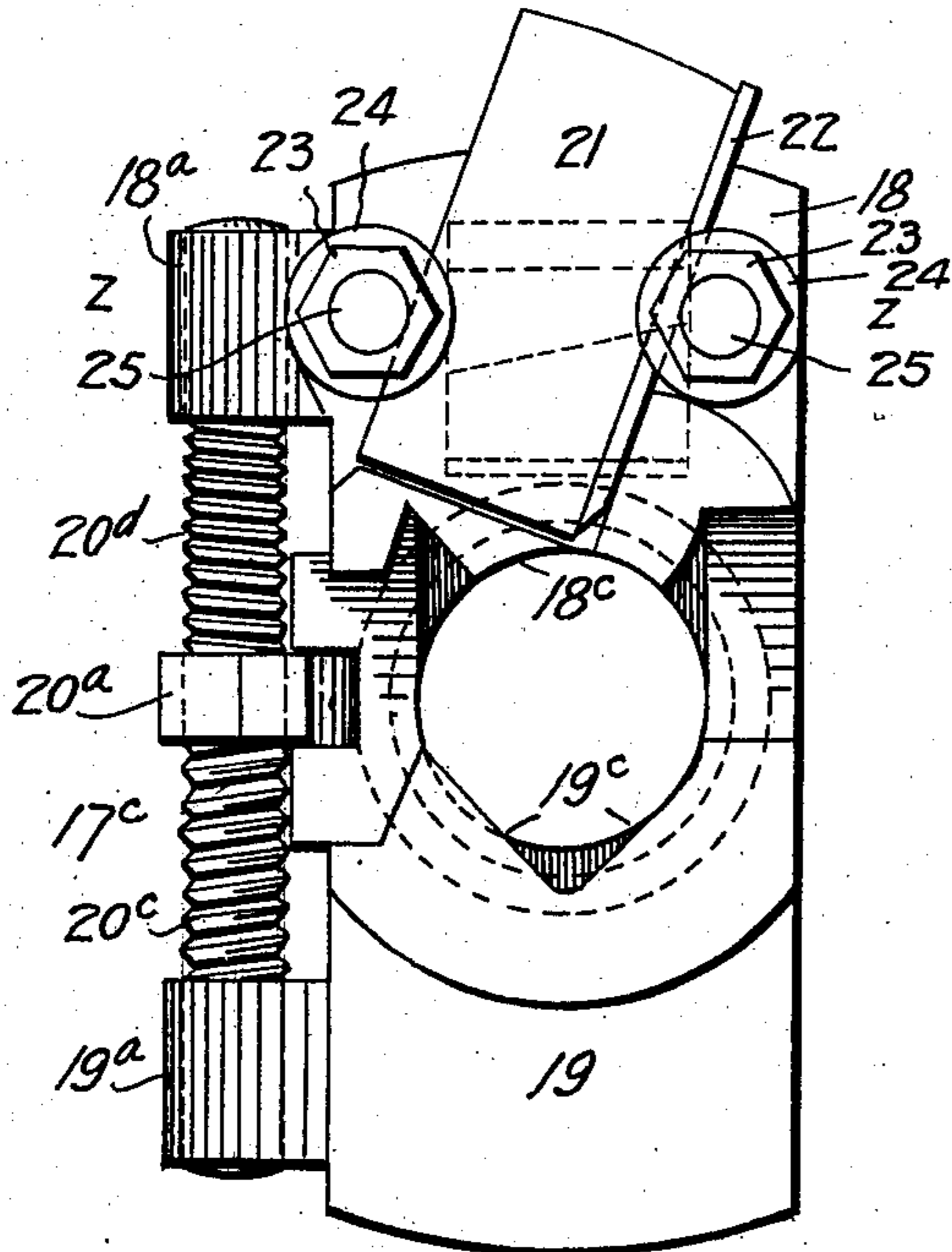


FIG. 5

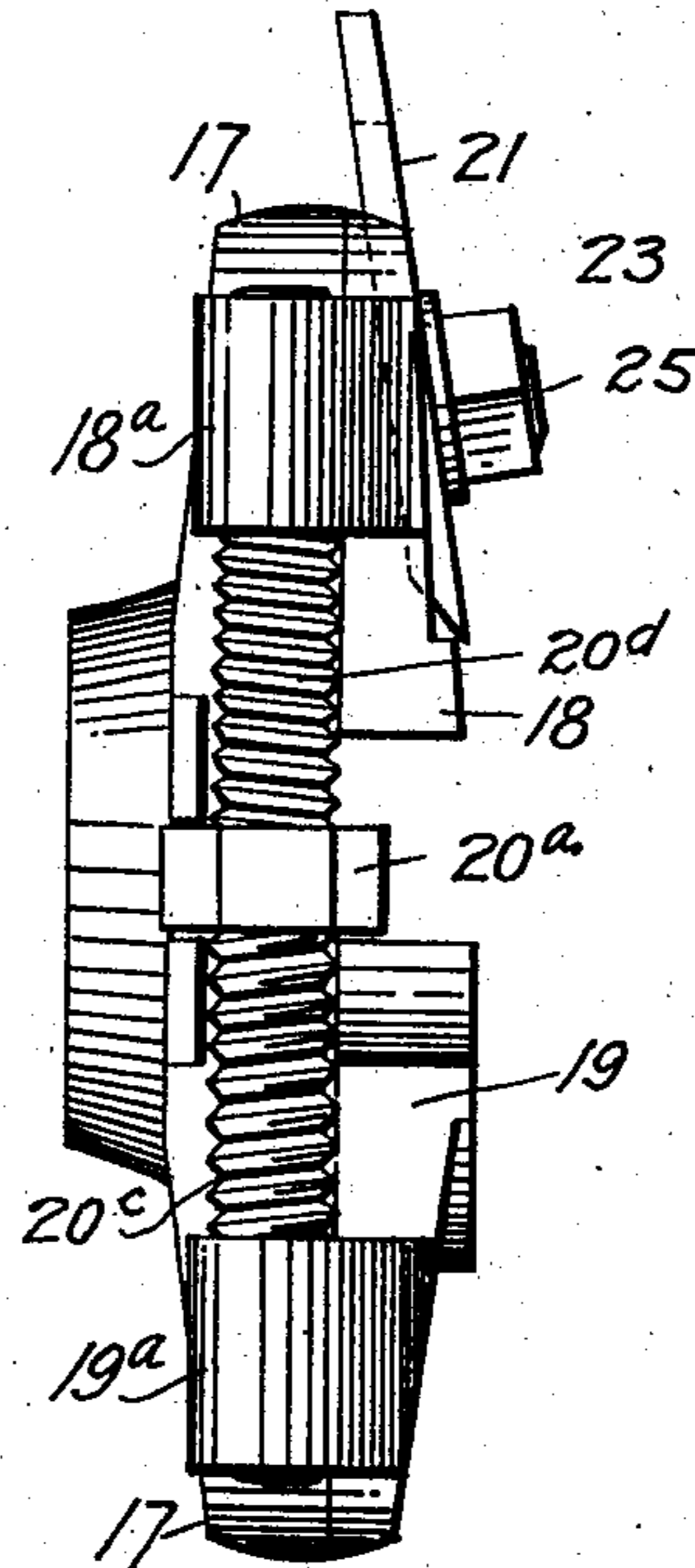


FIG. 6

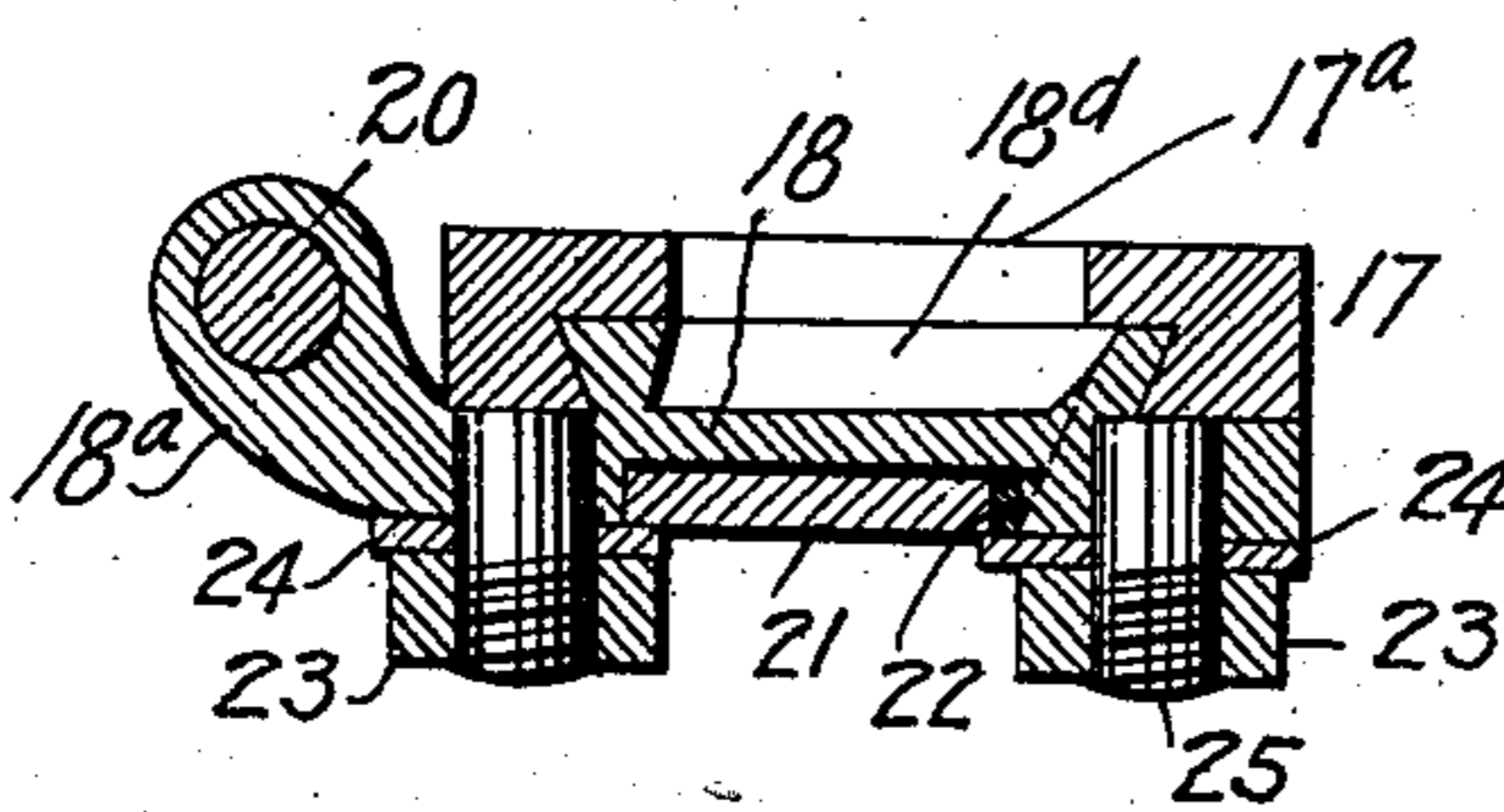


FIG. 8

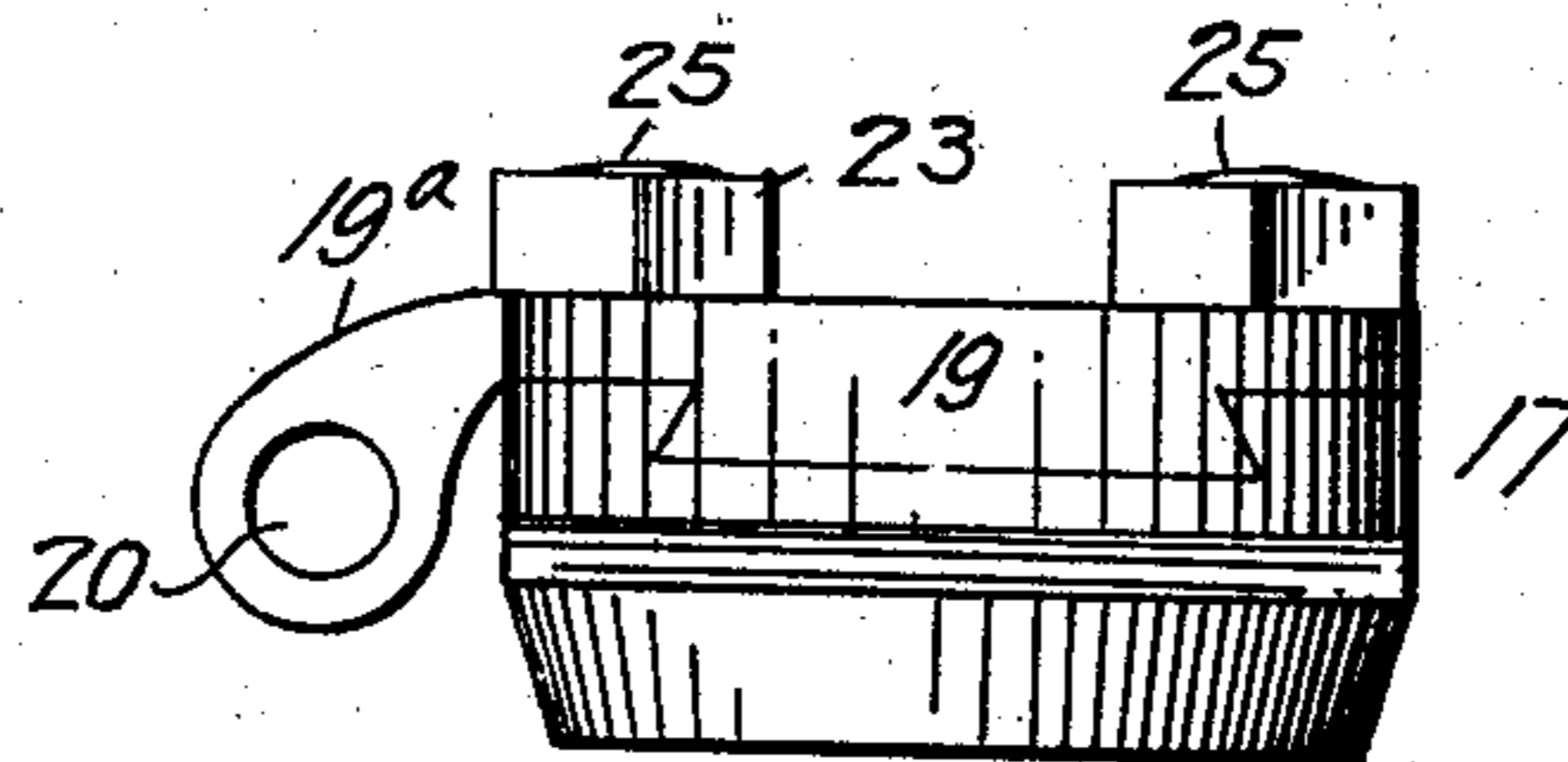


FIG. 7

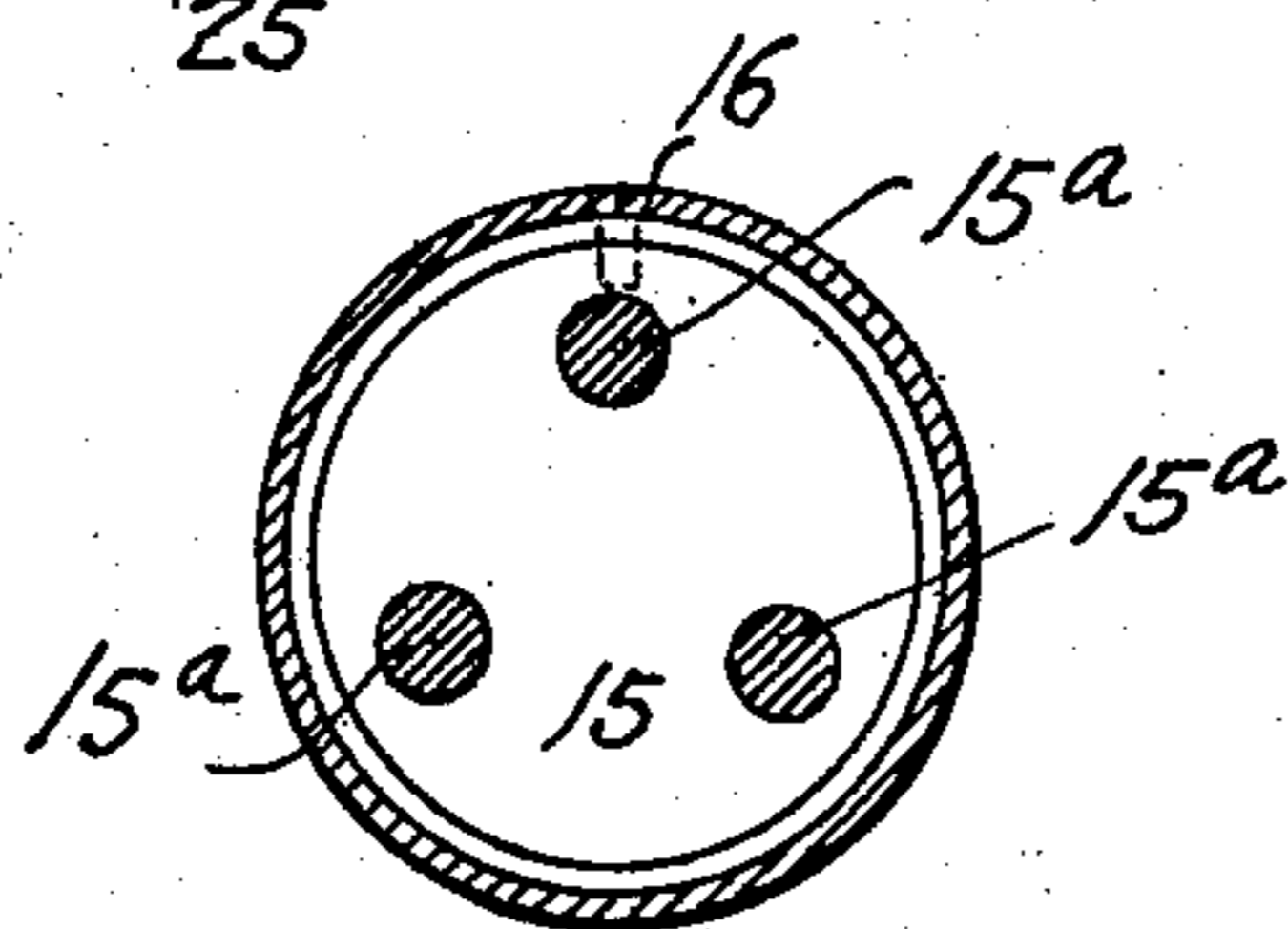


FIG. 9

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UNITED STATES PATENT OFFICE.

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SPOKE-AUGER.

SPECIFICATION forming part of Letters Patent No. 720,512, dated February 10, 1903.

Application filed September 16, 1901. Serial No. 75,635. (No model.)

To all whom it may concern:

Be it known that I, JASPER M. BROWN, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Spoke-Augers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in spoke-augers or devices for cutting or forming the cylindrical tenons on the outer extremities of wheel-spokes, my object being to provide a machine or device adapted to perform this work more rapidly than can be done by the devices heretofore employed; and to this end the invention consists of the features, arrangements, and combinations hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a vertically-longitudinal section taken through the device, showing the spoke in position. Fig. 2 is a fragmentary side elevation illustrating the lever for controlling the auger-feed, the parts being shown on a larger scale than in Fig. 1. Fig. 3 is a section taken through the same on the line *x x*, Fig. 2. Fig. 4 is a section taken through the spoke holding and adjusting part of the machine. This section is indicated by the line *y y*, Fig. 1, the scale being somewhat reduced. Figs. 5, 6, and 7 are front, side, and end elevations, respectively, of the cutting-head of my improved spoke-auger, the parts being shown on a larger scale than in Fig. 1. Fig. 8 is a section taken on the line *z z*, Fig. 5, the device being turned over or inverted as compared with Fig. 7. Fig. 9 is a section taken on the line *w w*, Fig. 1, the parts being shown on a larger scale. Fig. 10 is an elevation of the member 18, carrying the knives, looking in the direction of the knife-edges.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a framework composed of a bar 5^a, having a depending part 5^c, provided with an opening 5^d, adapted to receive the spoke 6 upon which the tenon 6^a is to be formed. The part 5^c is bifurcated, and the two members unite at their lower extremities, as shown at 5^h. In this part 5^h is formed a threaded opening in which is screwed a threaded stem 7, provided at its lower extremity with a hand-piece 7^a and at its upper extremity with a shoulder, above which projects a reduced tapering part 7^c, adapted to loosely engage a central opening formed in a shoe 4, which forms a support for the spoke 6 from below. The tapered shape of the upper extremity of the stem is necessary in order to allow the shoe to occupy an inclined position with reference to the stem, since the spoke exteriorly tapers, and for the further reason that the spoke generally occupies an inclined position on account of the dish of the wheel. The bar 5^a is provided with two vertical interiorly-threaded openings into which are respectively screwed two adjustable hangers 8 and 9, each of which is composed of three parts. The hanger 8 is composed of an upper threaded stem 8^a, a lower interiorly-threaded collar 8^c, and an intermediate part 8^d, hinged to the part 8^c and connected with the part 8^a by a set-screw 8^h, threaded in the part 8^a, its inner extremity engaging a circumferential groove 8^g, formed in the reduced upper extremity of the part 8^d, thus permitting the stem 8^a to be turned on the part 8^d for the purpose of adjusting the hanger vertically. A hinge-pin 8^j passes through registering openings formed in a tongue with which part 8^d is provided and the bifurcated upper portion of the part 8^c. This hinged joint is required to permit the axis of the collar 8^c to occupy a position forming oblique angles with the axis of the stem 8^a for a reason which will be apparent as this specification proceeds. The hanger 9 is substantially of the same construction as the hanger 8, and the corresponding parts are designated 9^a, 9^c, 9^d, 9^g, 9^h, and 9^j, respectively. The threaded part of each hanger-stem is provided

with a lock-nut 10 to prevent further downward movement when the hanger is properly adjusted.

The hangers 8 and 9 form the support for the auger proper of the device. This auger is provided with a hollow revoluble shaft 12, composed of a part 12^a and the reduced exteriorly-threaded part 12^c. The part 12^c fits the opening of the collar 8^c, while the part 12^a fits in the collar 9^c. Normally the shaft is adapted to slide freely in both collars. When the device is in use, however, and it is desired that it should travel forward or in the direction of the arrow shown in Fig. 1 or when in the act of forming a spoke-tenon, a suitable device mounted on the hanger 8 is employed to engage the threads of the part 12^c of the shaft, whereby the latter is automatically fed to keep pace with the cutting action of the head, as hereinafter described. This device, as shown in the drawings, (see Figs. 2 and 3,) consists of a lever A, fulcrumed at B on a lug C, formed in the collar 8^c. A pin D is pivotally connected with the lever and passes through an opening in the collar, the arrangement being such that as the lever is actuated or pressed inwardly toward the hanger the pin is made to engage the threads of the shaft part 12^c, thereby causing the auger-shaft to move forward automatically as it is rotated. The lever A is normally held by a spring E in a position whereby the pin D is disengaged from the threads of the shaft. Hence as soon as the lever is released from pressure the spring E will throw the parts to the position shown in Fig. 3. The spring E is held in place by short pins H and H', which are attached to the lever and hanger, respectively.

To one extremity of the shaft 12 is applied a hand-crank 13. In this same end of the shaft is journaled an exteriorly-threaded rod 14, provided at its outer or exposed extremity with a hand-wheel 14^a. This rod 14 protrudes into the hollow shaft, and its inner extremity engages a threaded opening formed in one extremity of a follower 15, which, as shown in the drawings, is composed of two separated heads connected by rods 15^a. This follower forms a stop within the hollow shaft to limit and determine the length of the spoke-tenon. The portion of the follower within the part 12^a of the shaft is observed exteriorly through a longitudinal slot 12^d, through which a set-screw 16 is passed. This screw enters a threaded opening formed in the forward head of the follower. By loosening the screw the follower may be adjusted at will. The shaft adjacent the slot should be provided with a graduated scale to guide the user in adjusting the follower. The extremity of the shaft remote from the crank 13 and adjacent the follower 15 is exteriorly threaded to receive the cutting-head, which is provided with an interiorly-threaded counterpart socket for the purpose. This head is provided with a plate 17, in which is formed an opening register-

ing with the socket-opening and the opening in the adjacent extremity of the hollow shaft. The front face of this plate is provided with dovetail grooves located on the opposite sides of the central opening. In these grooves are respectively located two movable cooperating members 18 and 19, provided with integral lugs 18^a and 19^a, respectively. These lugs are provided with threaded openings, which are engaged by a bolt 20, whose central portion is provided with a part 20^a, adapted to receive a wrench for convenience of adjustment. This bolt is provided with right and left threads on opposite sides of the part 20^a, so that as the bolt is turned the two members 18 and 19 may be made simultaneously to approach each other or recede from each other, as may be desired. These members are adjusted according to the size of the tenon that is to be formed on the spoke. The members 18 and 19 are provided with oppositely-located cooperating faces adapted to engage and support the spoke-tenon during the cutting operation. The operating-face of the member 19 is V-shaped, as shown at 19^c, so that the spoke-tenon, regardless of its size, will always engage this member at two points. The face 18^c of the member 18 is curved and adapted to engage the tenon on the side opposite the member 19. The member 18 is provided with an opening 18^d, which registers with an opening 17^a in the plate 17. Forward of the opening 18^d and normally closing the same in front is the main knife 21, which occupies a diagonal position, engaging a groove formed in the face of the member 18. This knife, as well as the narrow auxiliary knife 22, is held in place by nuts 23 and washers 24, applied to threaded studs 25, fast on the member 18 and projecting forwardly from its front, facing on opposite sides of the groove in which the knives are located. The cutting extremity of the knife 21 is interiorly beveled, and this cutting edge occupies a plane slightly forward of the plane of the front face of the member 18. The distance between these planes determines the forward depth of the knife-cut during the tenon-forming operation. The knife 21 cuts the wood from the outer surface of the spoke inwardly toward the tenon, the depth of the cut in the direction of the axis of the spoke depending upon the position of the members 18 and 19. The auxiliary knife 22 is narrow and occupies a position along the inner edge of the knife 21, and its cutting edge extends substantially at right angles to the edge of the knife 21. In other words, the edge of the knife 22 cuts in a line parallel with the axis of the spoke or at right angles to the knife 21, so that the shavings cut from the vertical shoulder of the spoke around the base of the tenon are removed or freed by the narrow knife 22. The curved face of the member 18 is notched to make room for the cutting edge of the knife 22. The part 20^a of the bolt 20 projects into a recess 17^c, formed in the plate

17, whereby the bolt is prevented from traveling in either direction as it is rotated. The threads of the threaded portion 20^c of the bolt or the part connected with the member 19 are coarser or of greater pitch than the threads of the part 20^d, connected with the member 18, so that as the bolt is turned the member 19 will travel faster than the member 18. The object of this is to keep the axis or longitudinal center of the tenon in line with the auger-shaft, since the smaller the tenon the farther it will pass into the V-shaped groove 19^c, and vice versa. When the device is in use, the wheel-hub (not shown) in which this spoke is secured is supported in any suitable manner. The device is then placed in position to cause the spoke 6 (see Figs. 1 and 4) to pass through the opening 5^d of the part 5^c. The screw-stem 7 is then adjusted to press the shoe 8 against the spoke from below until the latter is clamped securely in place. The spokes of a wheel usually occupy a position more or less inclined, forming what is usually termed the "dish" of the wheel. The hangers 8 and 9 must then be adjusted to cause the auger-shaft to occupy a position bringing its axis into line with the axis of the spoke. In other words, the auger-shaft must be inclined to conform to the inclination of the spoke. It is evident that the auger-shaft-supporting collars 8^c and 9^c may be raised and lowered at pleasure by turning the threaded stems 8^a and 9^a, which are suitably fashioned at their upper extremities to receive a wrench. The hinged joints heretofore described permit the auger-shaft to occupy a position forming oblique angles to the stems 8^a and 9^a. The stop 15 is adjusted in the part 12^a of the hollow shaft to regulate the length of the tenon. The auger-head is then moved against the end of the spoke, and the shaft 12 is then turned by the hand-crank or otherwise, as may be desired. At the same time the lever A is adjusted to cause the auger to feed automatically to keep pace with the cut of the knives. The shavings or wood cut away in forming the tenon pass through the openings 18^d and 17^a, heretofore described.

Having thus described my invention, what I claim is—

1. In a spoke-auger, the combination with a suitable frame, of hangers mounted thereon, a hollow auger supported by the hangers in which the auger-shaft is adapted to slide, a portion of the shaft being threaded, a lever fulcrumed on one of the hangers, and a pin connected with the lever and passing through an opening formed in the hanger-collar whereby the pin may be made to engage the threaded part of the auger-shaft, substantially as described and for the purpose set forth.

2. In a spoke-auger, the combination with a frame, of means for clamping the spoke in the frame, a hollow auger mounted on the frame, a stop located in the hollow of the auger-shaft which is provided with a longitudinal slot adjacent the stop, a screw passed through said

slot and threaded in the stop, and a screw-stem journaled in the hollow auger-shaft and threaded in the stop, substantially as described.

3. The combination with a suitable, relatively stationary frame, of a hollow exteriorly-threaded auger revolubly mounted thereon, a lever fulcrumed on the frame, and a pin carried by the lever and arranged to be thrust to engagement with the threads of the hollow auger, substantially as described.

4. In a spoke-auger, the combination with a suitable frame, of hangers mounted thereon, a hollow auger supported by the hangers in which the auger-shaft is adapted to slide, a portion of the shaft being threaded, a lever fulcrumed on one of the hangers, a pin connected with the lever and passing through an opening formed in the hanger-collar, whereby the pin may be made to engage the threaded part of the auger-shaft, and a spring normally holding the lever in position to disengage the pin from the threads of the shaft, substantially as described.

5. The combination with a suitable, relatively, stationary frame, of a hollow exteriorly-threaded auger revolubly mounted thereon, a lever fulcrumed on the frame, a pin carried by the lever and arranged to be thrust to engagement with the threads of the hollow auger, and a spring normally holding the lever in position to disengage the pin from the screw-threads of the auger.

6. The combination with a suitable, relatively, stationary frame, of a hollow auger revolubly mounted in the frame, a stop adjustable in the opening of the auger to determine the length of the spoke-tenon, a rod journaled in the hollow auger and threaded in the stop, the auger being provided with a slot, and a set-screw passed through said slot and threaded in the stop.

7. The combination with a suitable, relatively, stationary frame, of a hollow auger revolubly mounted in the frame, a stop adjustable in the opening of the auger to determine the length of the spoke-tenon, and composed of two separated heads suitably connected, a rod journaled in the hollow auger and threaded in one of the heads of the stop, the hollow auger being provided with a longitudinal slot, and a set-screw passed through said slot and threaded in the other head of the stop, substantially as described.

8. In a spoke-auger, the combination with a suitable frame, of hangers threaded in the frame and vertically adjustable, a hollow auger carried by the hangers, a stop located in the tenon-opening of the auger-shaft and composed of two separated heads, the auger-shaft being provided with a longitudinal slot, a set-screw passed through the slot and threaded in one of the heads of the stop, and a threaded rod journaled in the auger-shaft and engaging a threaded opening in the stop for adjusting the latter, substantially as described.

9. In a spoke-auger, the combination with a

frame and a hollow auger, of two hangers
each composed of three parts, namely a stem
threaded in the opening of the frame, a collar
through which the auger-shaft passes, and an
5 intermediate part hinged to the collar part
and connected with the threaded part to allow
the latter to turn therein, a plate applied to
the auger-shaft and provided with a central
opening, two coöperating members movably
10 mounted on the plate, cutting means mount-
ed on one member, a bolt threaded in lugs
formed in the two members and provided
with right and left threads, a suitable con-
nection between the bolt and the plate where-
15 by the bolt is prevented from traveling lon-

gitudinally as it is rotated, a stop located in
the tenon-opening of the auger-shaft, a
threaded rod journaled in the auger-shaft and
threaded in the stop, the latter being com-
posed of two heads suitably connected, the 20
auger-shaft being provided with a longitudi-
nal slot, and a set-screw passed through said
slot and threaded in one head of the stop,
substantially as described.

In testimony whereof I affix my signature 25
in presence of two witnesses.

JASPER M. BROWN.

Witnesses:

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A. J. O'BRIEN.