

No. 689,302.

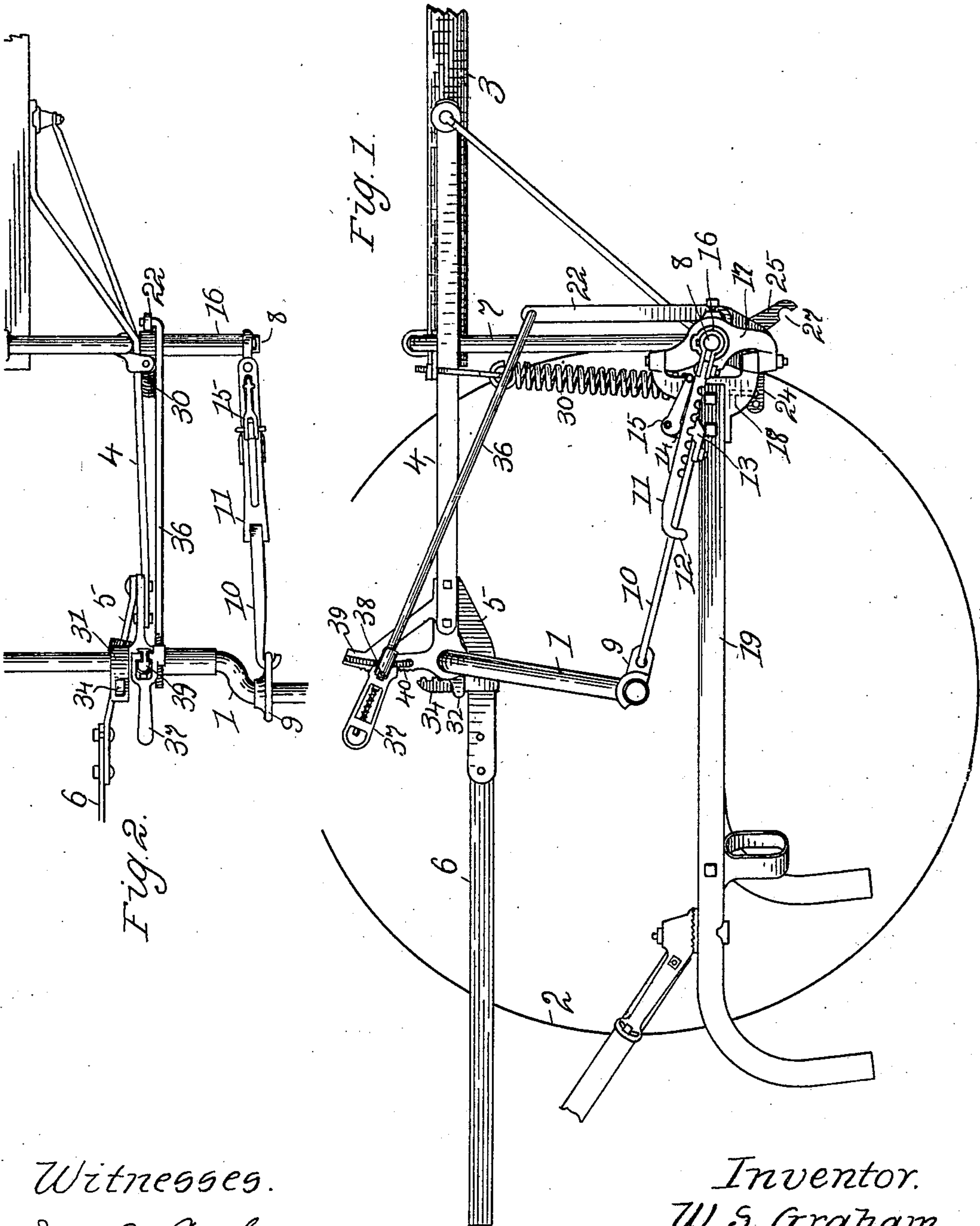
Patented Dec. 17, 1901.

W. S. GRAHAM.  
CULTIVATOR.

(Application filed Sept. 9, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses.  
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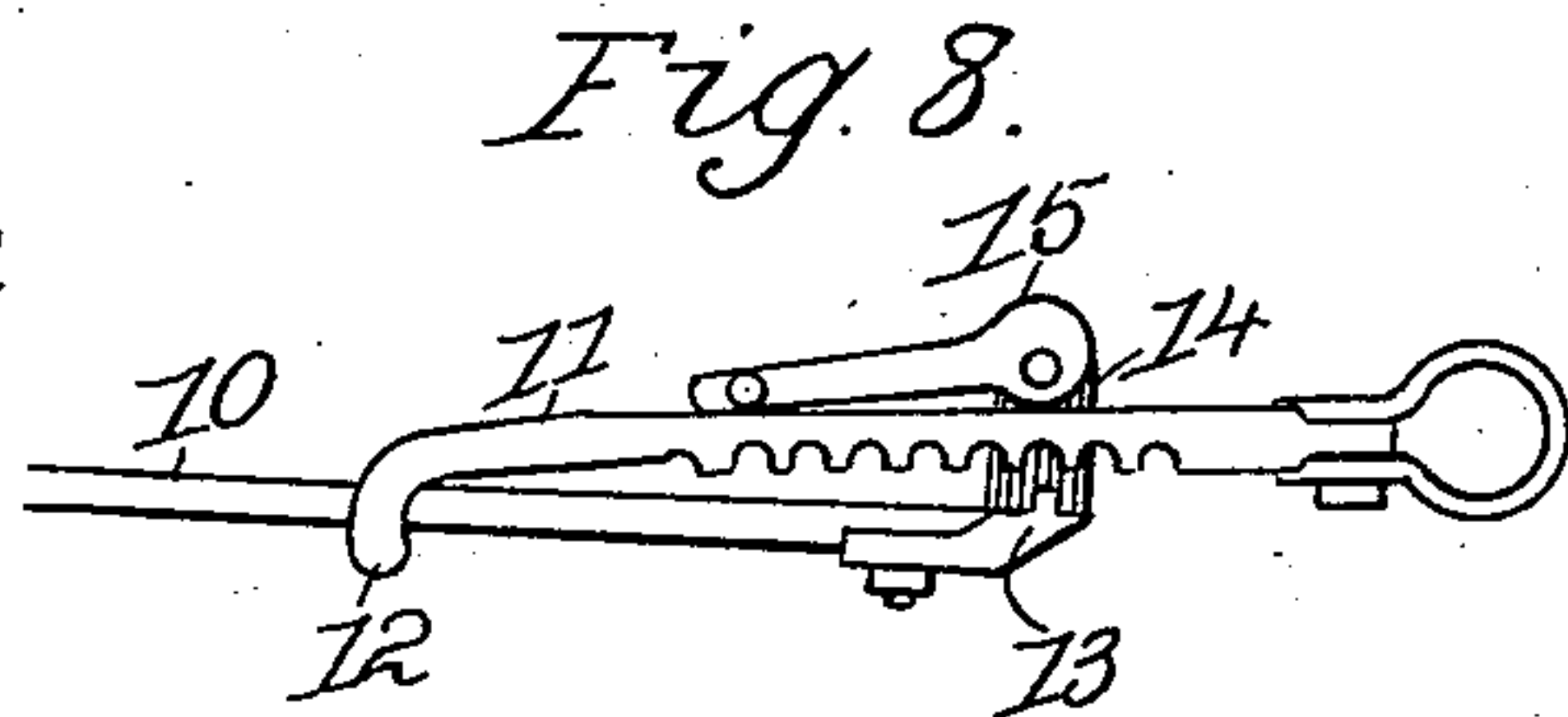
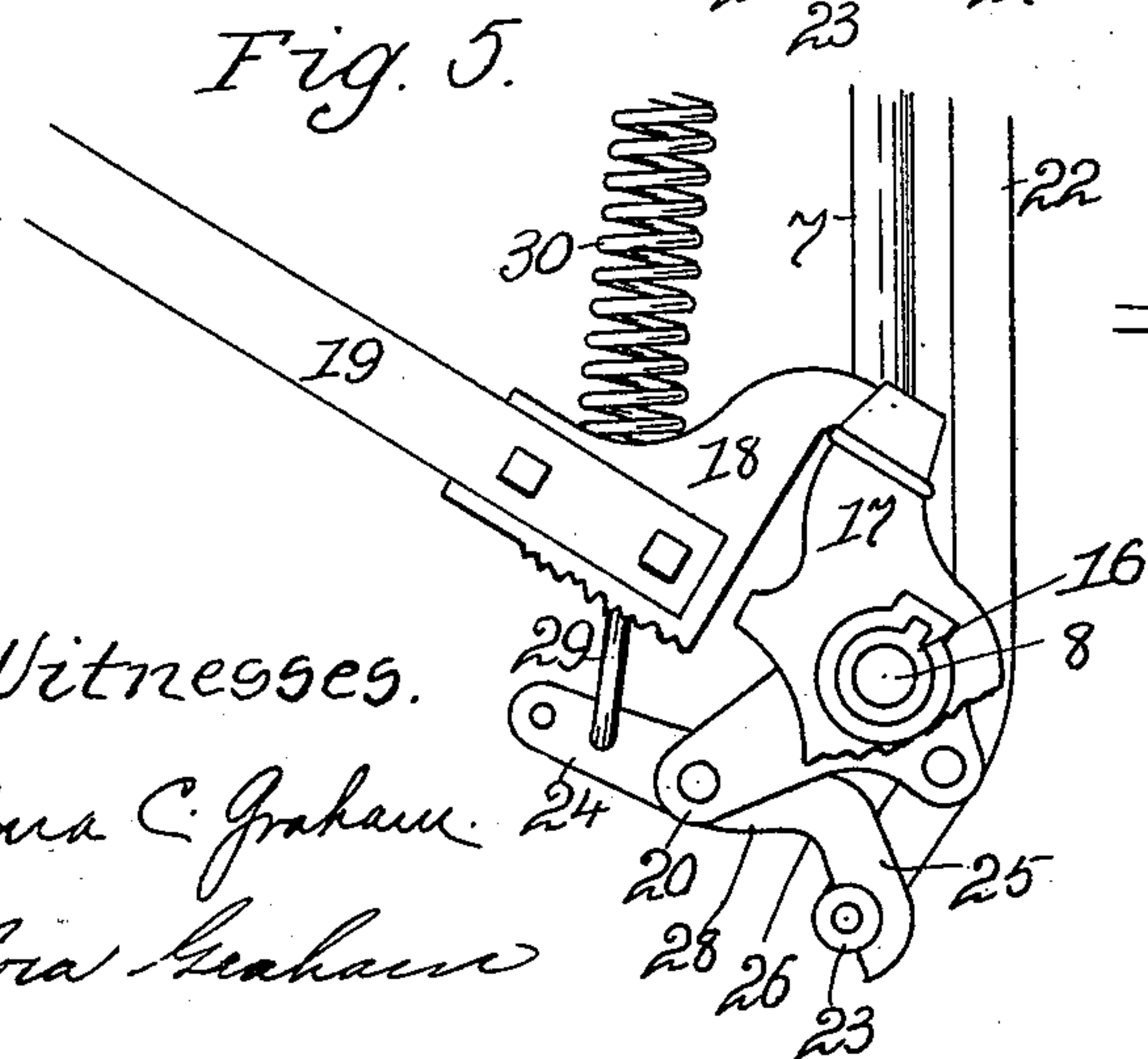
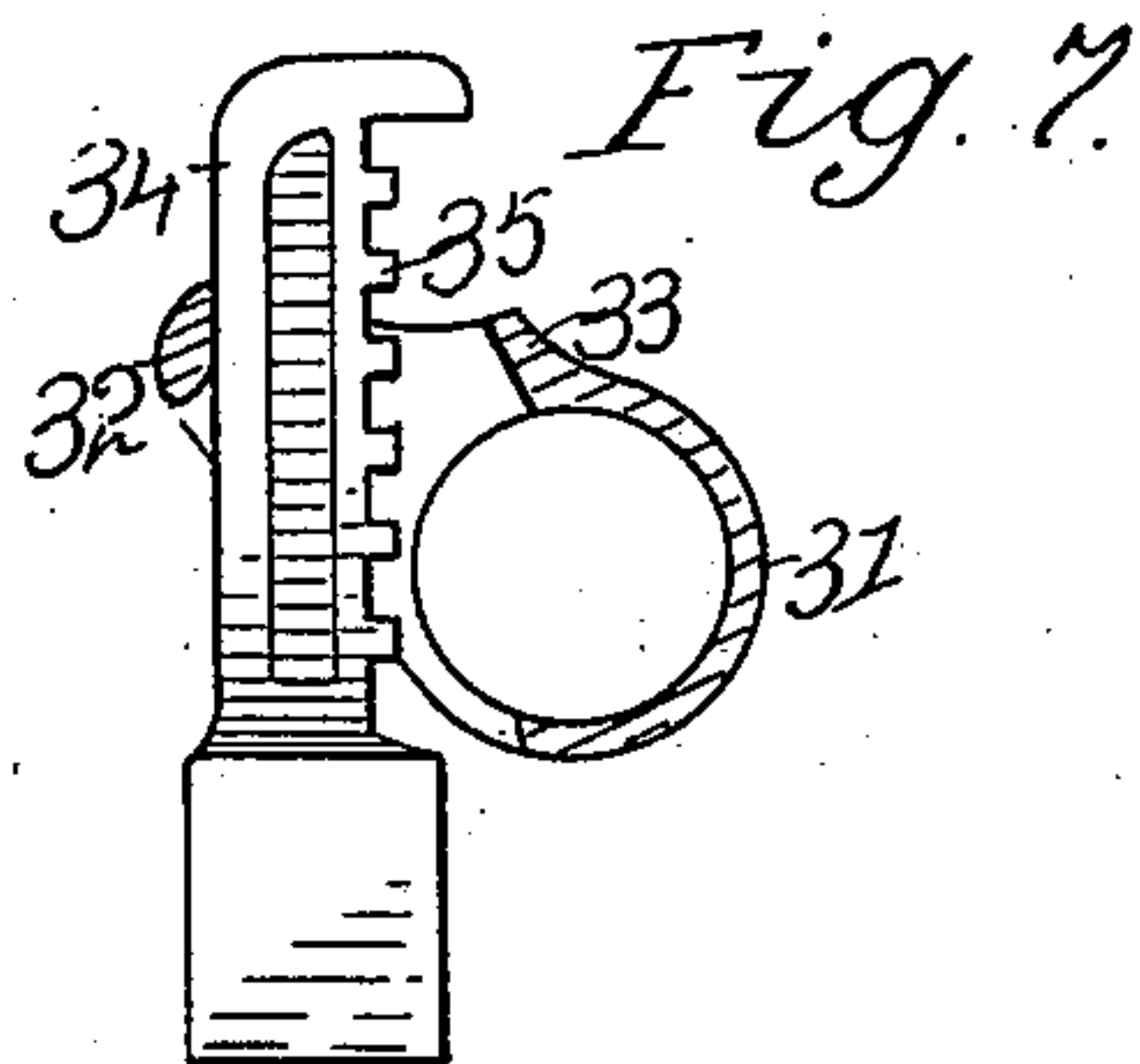
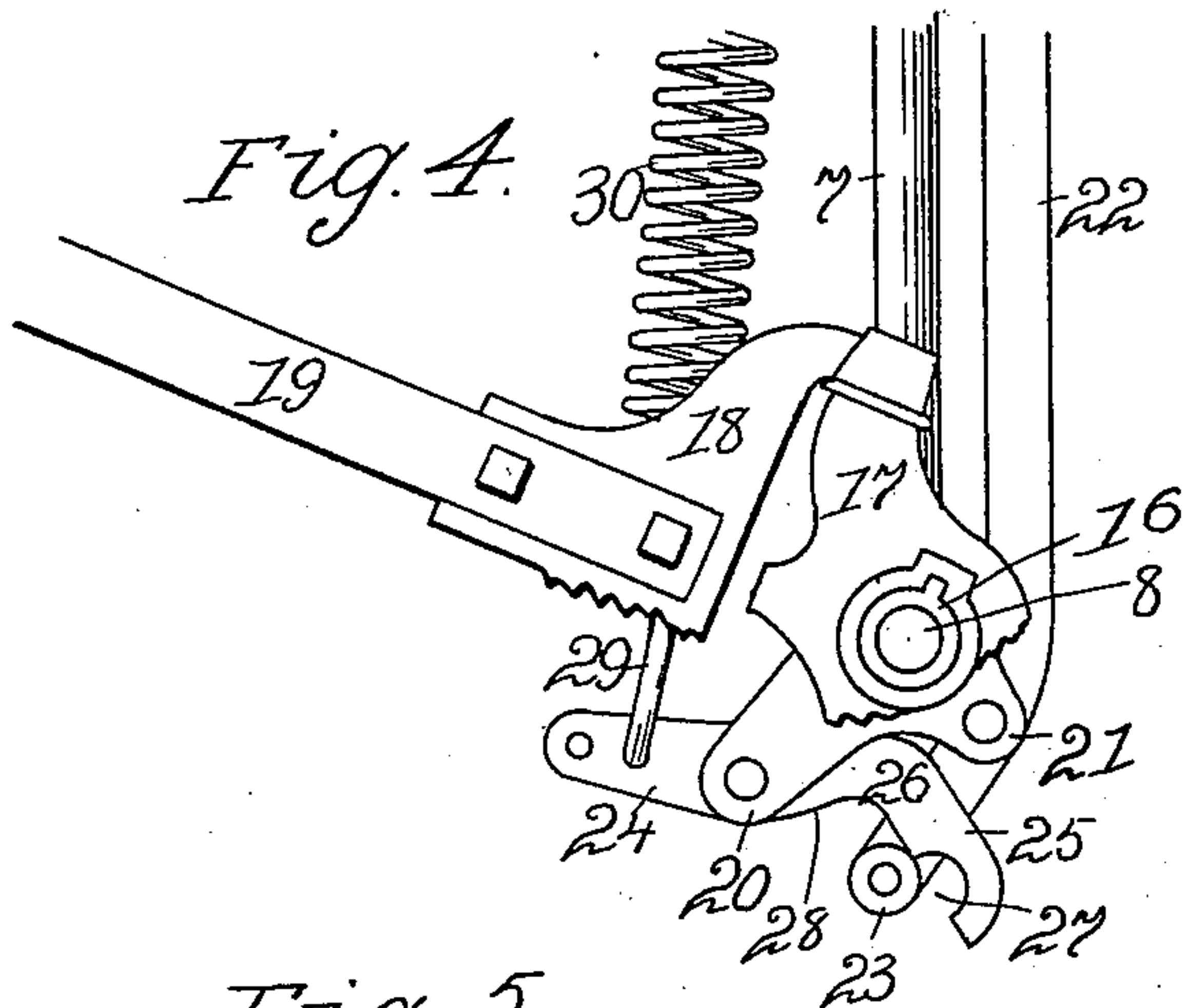
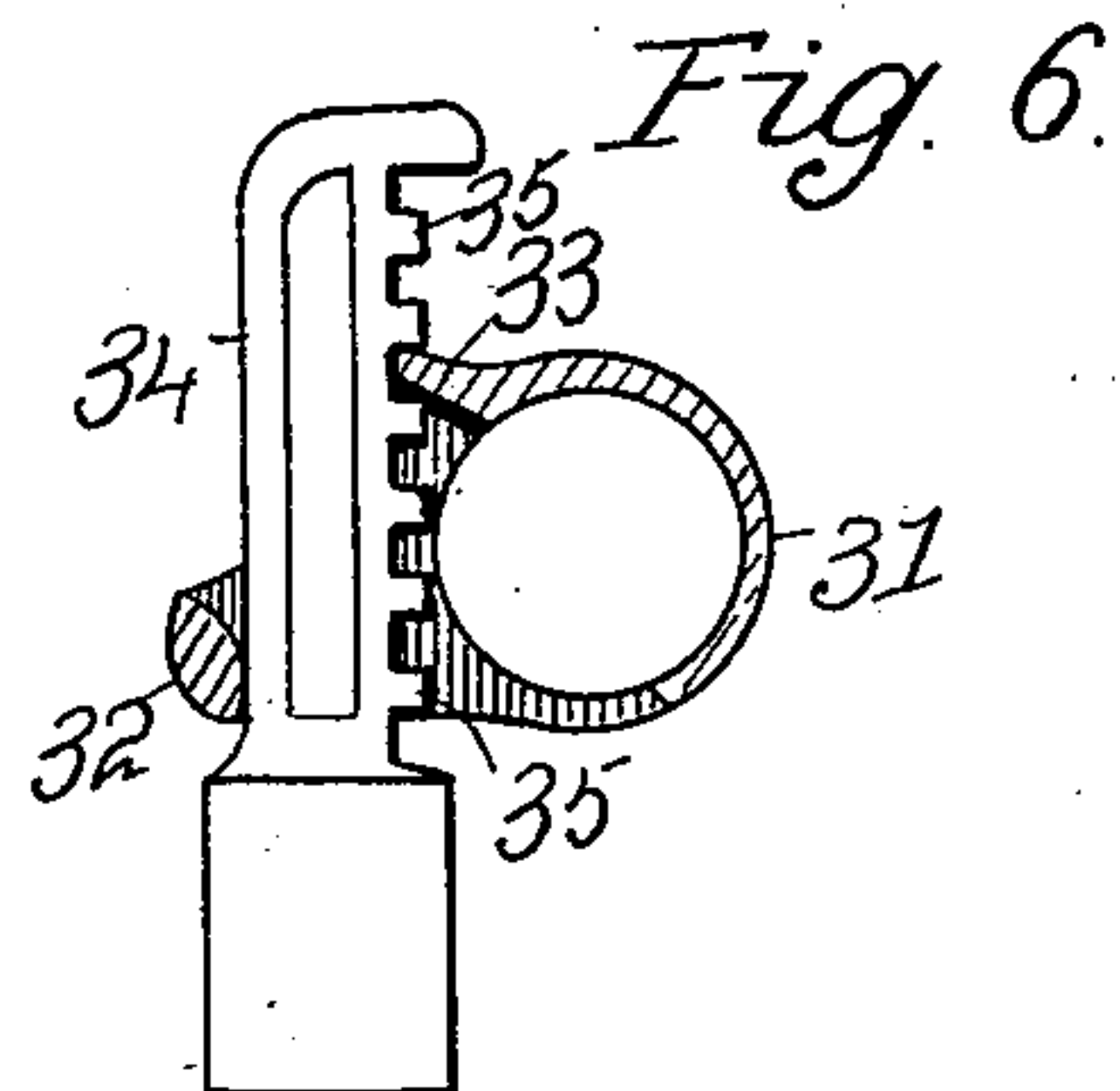
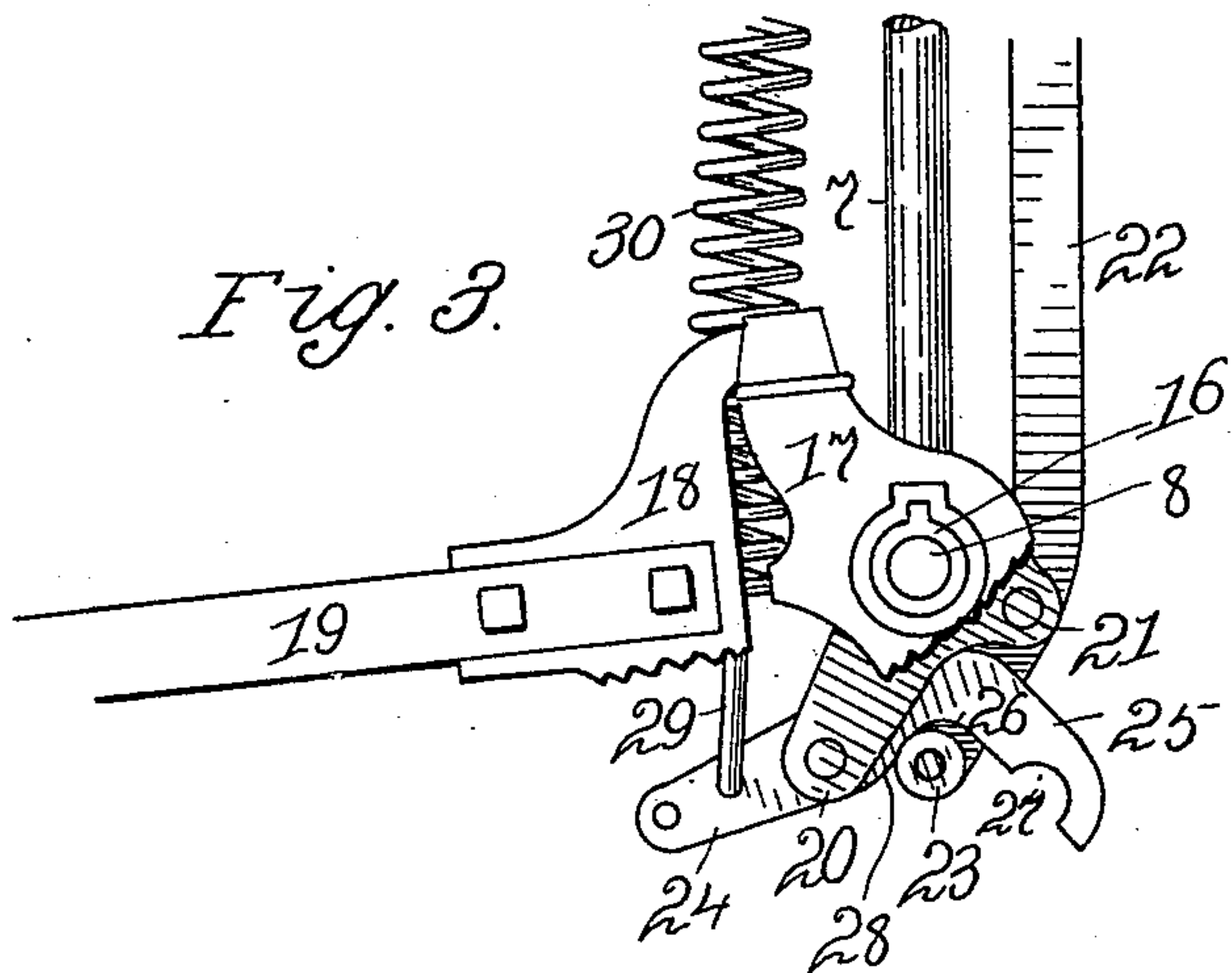
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2 Sheets—Sheet 2.



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# UNITED STATES PATENT OFFICE.

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## CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 689,302, dated December 17, 1901.

Application filed September 9, 1901. Serial No. 74,860. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM S. GRAHAM, of the city of Canton, in the county of Fulton and State of Illinois, have invented certain  
5 new and useful Improvements in Cultivators, of which the following is a specification.

This invention relates to riding-cultivators or to convertible riding and walking cultivators; and the object is to provide means for  
10 properly and readily adjusting and controlling the frame and the beams.

The invention is exemplified in the structure hereinafter described, and it is defined in the appended claims.

15 In the drawings forming part of this specification, Figure 1 is a side elevation of so much of a cultivator as is needed to explain my improvements. Fig. 2 is a detail plan of an embodiment of my invention. Figs. 3, 4,  
20 and 5 are details illustrative of the operation of the beam-controlling mechanism, Fig. 3 showing the beam depressed slightly below its normal or average operative position, Fig. 4 showing the beam raised nearly to its in-  
25 operative resting position, and Fig. 5 showing the beam hung up by the action of the raising mechanism. Figs. 6 and 7 are details, partly in section, of the improved hanger for the seat-frame, Fig. 6 showing the  
30 parts of the hanger in engagement, and Fig. 7 showing the parts detached preparatory to adjusting the height of the seat-frame. Fig. 8 is a detail in side elevation of the improved adjustable brace used to hold the carrying-  
35 wheels in different positions under the frame.

The arched axle of a cultivator is shown at 1, a carrying-wheel at 2, a tongue at 3, and a side bar of the frame at 4. At 5 is shown a bar hinged to the bar 4 in front of the arched  
40 axle and extended to the rear of the axle. The seat-bar 6 is hinged to bar 5, so as to fold upward thereon, but not downward. A hanger-arm 34 (shown in detail in Figs. 6 and 7) is attached to bar 5 at right angles therewith and  
45 is supplied with teeth, as 35, in one of its edges. A collar 31 fits loosely on the arch of axle 1, and it has an extension that is slotted vertically to receive arm 34. The outer bearing-surface 32 of the slot of the collar is be-  
50 low the inner bearing 33, and the inner

bearing is shaped to engage the notches between the teeth of the arm. When the collar engages the arm, as shown in Fig. 6, the weight of the seat-frame pulls down on bearing 33 and presses bearing 32 against the  
55 arm. When it is desired to raise or lower the seat-frame, the frame is raised slightly, the collar is turned into the position shown in Fig. 7, the arm 34 is adjusted to the desired height, and the collar is swung back into  
60 engagement with the teeth of the arm. The operation is the same when the arm is extended downward through the collar, and so the bar 5 may cross the axle either above or  
65 below it.

An arched bar or rod 7 crosses the front of the cultivator-frame, and its ends 8 extend horizontally outward. A clip 9 embraces a spindle extension of axle 1 and a rod 10 connects at one end with the clip. A notched  
70 bar 11 fits over a horizontal extension 8 of the arched bar 7, and the notched bar is diverted and looped at 12 to embrace the rod 10. The rod 10 extends along the notched side of bar 11, and it has a tooth 13, that is  
75 adapted to engage the notches of the bar. A lug 14 extends from rod 10 through a slot in bar 11, and a cam-arm 15 is pivoted to the lug above the notched bar. The length of the brace-bar, composed of rod 10 and bar 11,  
80 may be varied by swinging cam-arm 15 to the position shown in Fig. 8, shifting tooth 13 to the desired position with relation to the notches of bar 11, and then returning the cam-arm to the position shown in Fig. 1. By this  
85 adjustment the spindles of the axle are carried forward or back with relation to the frame to properly balance the weight of the driver and to properly balance the frame when the driver walks.

90 A sleeve 16 is mounted loosely on each of the horizontal extensions 8 of the arched bar 7. A bracket 17 is fastened onto sleeve 16, so as to rock vertically therewith, bracket 18 is hinged to bracket 17, so as to swing hori-  
95 zontally thereon, and the cultivator-beam 19 is fastened to bracket 18. An arm 20 is fastened to sleeve 16, so as to partake of the swing of the beam. A lever 24 is fulcrumed between its ends on the swinging end of arm  
100



20, it extends beneath the sleeve at right angles therewith, its rear end is approximately horizontal, and its front end extends in a generally horizontal direction for a short distance from the fulcrum and then turns downward, as shown at 25. The under surface of the forward extension of the lever constitutes a cam-bearing that varies the tension and leverage of the lift-spring in a manner to properly control the beam, and such cam-surface coacts with a relatively-fixed roller 23. The lift-spring 30 connects with the rearward extension of lever 24 through a link 29, and it exerts upward pull on the beam through the lever, the arm 20, and the sleeve 16. The cam-surface of the lever consists of the slightly convex extension 28, leading forward from the fulcrum, the concave surface 26 at the bend in the lever, the oblique extension of end 25, and the notch 27 in the deflected end. When the beam is lowered into an operative or cultivating position, the concave surface 26 of the lever bears against the roller 23 and the spring exerts tension upward approximately equal to the weight of the beam and its shovels. When the beam is pressed downward to follow occasional short depressions, the surface 28 rides along the roller, as shown in Fig. 3, carrying the forward end of the lever upward with considerable rapidity and materially increasing the tension of the spring. When the beam is raised from an operative to a resting position, the oblique surface of extension 25 rides along the roller, as shown in Fig. 4, increasing the tension of the spring a little as the beam rises, and when the beam is entirely raised the notch 27 engages the roller, as shown in Fig. 5, and gives the spring sufficient advantage to enable it to hold the beam raised. In lowering the beam the tension of the spring must be overcome by hand or foot pressure to an extent to carry the notch from contact with the roller, and after that the lowering is easily effected. While the cam-surface between the concavity 26 and the notch 27 is in contact with the roller, the spring acts to lift or counterbalance the weight of the beam. When the surface 28 is in contact with the roller, the spring acts as a cushion to resist downward foot or hand pressure, and when the notch engages the roller the spring and the notch act as a hanger to hold the beam raised.

The roller 23 should rest in the concavity 26 of the cam-surface of the lever when the shovels of the beam are at the desired depth in level ground, and as the depth of cultivation varies special provision is made to provide against such variation. This provision consists in making the roller adjustable, and the means preferably employed to effect the adjustment comprise the lever 22, a rod 36, and means accessible to the driver whereby the rod may be set forward or backward to change the angle of the lever. The roller is on the lower end of the lever 22. The lever is fulcrumed at 21, preferably on an exten-

sion from arm 20, and the rod 36 connects with the upper end of the lever 22. A rack-frame 39 is attached to the cultivator-frame at some convenient place. It extends upward eccentric with the swing of rod 36. It has grooves in its side, and its rear surface is supplied with notches, as 40. A handle 37 is secured to the rear end of rod 36. It has pins that extend into the grooves of the rack-frame, and it also has a spring-bolt 38, that engages the notches 40 of the rack. When the handle 37 is raised and lowered on the rack, the spring-bolt passes from one notch to another, and when the handle is stopped the spring-bolt engages a notch and holds it in position. When the handle is raised, the rod 36 is made to pull the upper end of lever 22 backward, thereby forcing roller 23 forward and providing for deeper cultivation. The reverse effect is produced by lowering the handle.

I claim—

1. In a cultivator, the combination of a vertically-swingable beam, a cam-lever fulcrumed on a pivot that partakes of the swing of the beam, a spring exerting upward pull on the beam through an arm of the lever and a relatively fixed bearing engaging the cam-surface of the lever; whereby the action of the spring on the beam is varied by the configuration of the cam-surface.

2. In a cultivator, the combination of a vertically-swingable beam, a lever fulcrumed between its ends on a pivot that partakes of the swing of the beam, a deflected cam formed of one end of the lever, a relatively fixed bearing for the cam-surface and a spring lifting upward on the beam through the other end of the lever.

3. In a cultivator, the combination of a vertically-swingable beam, a lever fulcrumed on a pivot that partakes of the swing of the beam, a deflected cam formed of an extension of the lever, such cam-surface having a lock-notch, a relatively stationary bearing adapted to bear against the cam-surface and engage the notch thereof and a spring lifting on the beam through the lever and forcing the cam-surface against the bearing.

4. In a cultivator, the combination of a vertically-swingable beam, an arm partaking of the swing of the beam, a lever fulcrumed on the swinging end of the arm and having one of its ends deflected vertically to form an internal angle at a distance from the fulcrum, a relatively fixed bearing in position to rest in the internal angle of the lever when the beam is in normal working position and a spring lifting on the beam through the lever and forcing the cam-surface of the lever against the relatively fixed bearing.

5. In a cultivator, the combination of a vertically-swingable beam, an arm partaking of the swing of the beam, a lever fulcrumed on the swinging end of the arm and having one of its ends deflected vertically to form an internal angle at some distance from the ful-



crum and a notch in the deflected end, a relatively fixed roller to bear against the cam-surface and engage the notch, and a spring lifting on the beam through the lever and forcing the cam-surface of the lever against the roller.

6. In a cultivator, the combination of the beam, the cam-lever fulcrumed on a pivot that partakes of the motion of the beam, the spring to lift the beam by force imparted through the lever, the roller to engage the cam-surface of the lever, the rock-arm carrying the roller and the rod connecting with the rock-arm and providing means for shifting the position of the roller.

7. In a cultivator, the combination of the beam, the cam-lever fulcrumed on a pivot that partakes of the swing of the beam, the spring to lift the beam by force imparted to an arm of the lever, the roller to engage the cam-surface of the lever, the rock-arm carrying the roller, the rod connecting with the rock-arm, the notched rack on the frame, the handle for the rod engaging the rack, and the spring-bolt in the handle engaging the notches of the rack.

8. A hanger for the seat-frames of cultivators, comprising a notched arm connected with the seat-frame, and a rockable collar mounted

pivotal on a relatively stationary part of the cultivator-frame and embracing the notched arm; the collar having an inner, upper bearing extension to engage the notches of the arm and also having an outer, lower bearing that is pressed against the outer surface of the arm by downward pull exerted through the teeth of the notches.

9. An extensible brace-bar for the arched axles of cultivators, comprising a bar having a set of notches in one of its sides, a rod having a tooth to engage the notches and a cam to force the tooth of the rod into engagement with the notched bar.

10. An extensible brace-bar for the arched axles of cultivators, comprising a longitudinally-slotted bar having notches in one of its sides, a rod having a tooth to engage the notches, a lug on the toothed rod extending through the slot of the notched bar and a cam-arm on the lug adapted to bear against the notched bar.

In testimony whereof I sign my name in the presence of two subscribing witnesses.

WM. S. GRAHAM.

Witnesses:

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CARL B. CHANDLER.