

V. BENEDEK.
SHEET METAL BRAKE.
APPLICATION FILED MAR. 29, 1909.

929,818.

Patented Aug. 3, 1909.
6 SHEETS—SHEET 1.

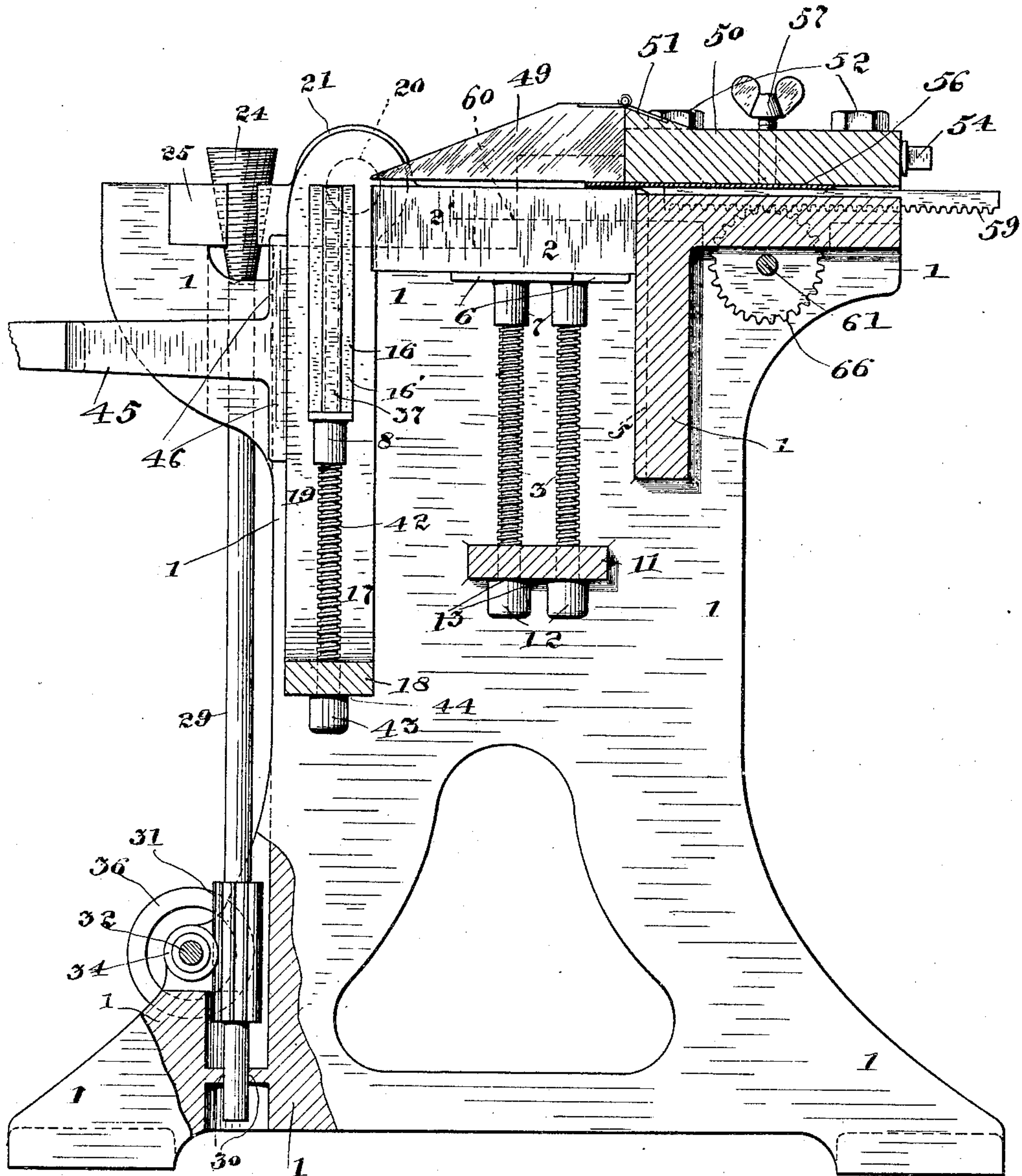


Fig. 1.

Witnesses:
R. C. Bretcher
W. E. Smith

Inventor:
Victor Benedek
by Joshua R. Horne
his Attorney.

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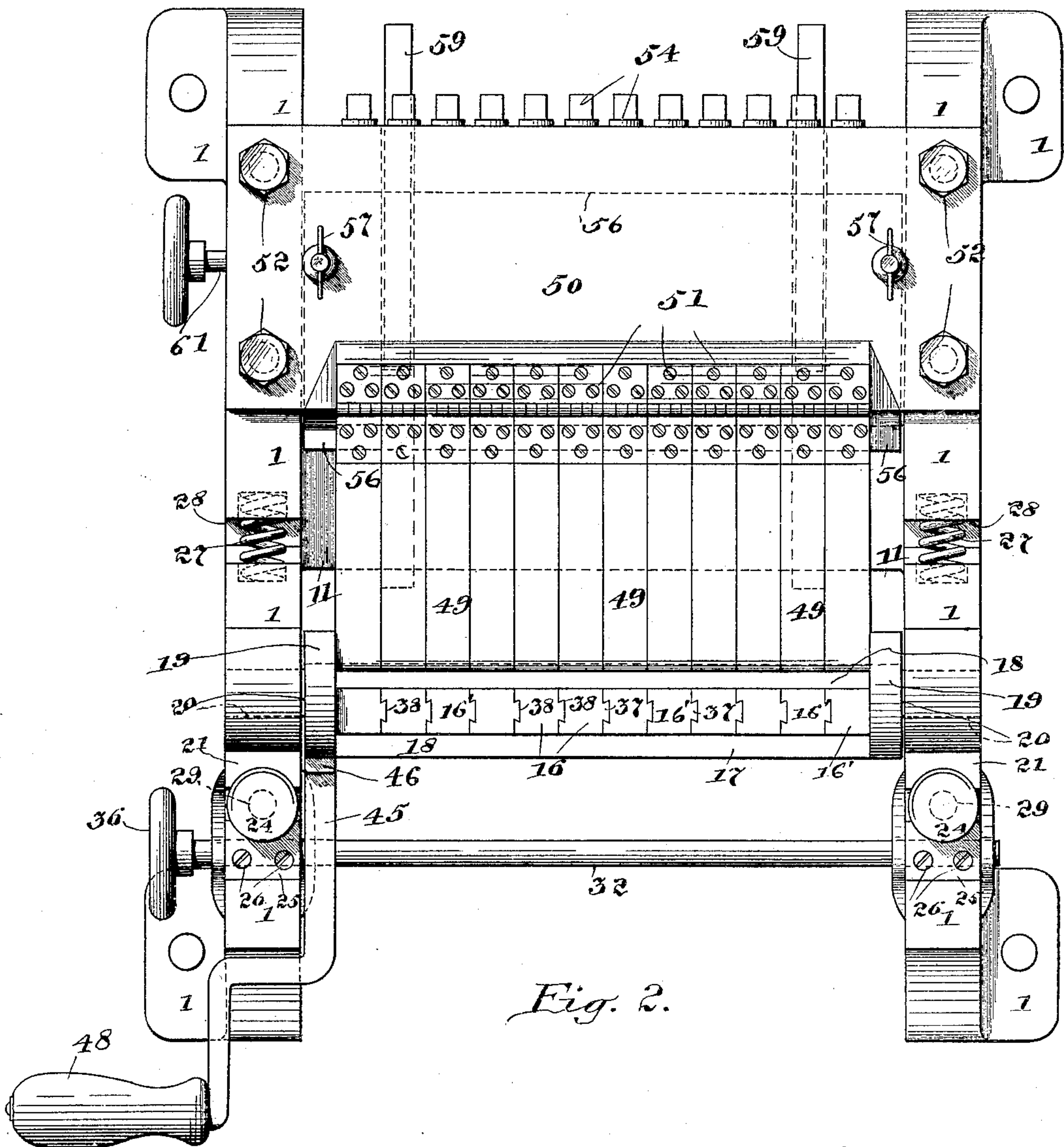


Fig. 2.

Witnesses:
R. C. Bretcher
W. B. Smith

Inventor:
Victor Benedek
by Joshua R. Horn
his Attorney.

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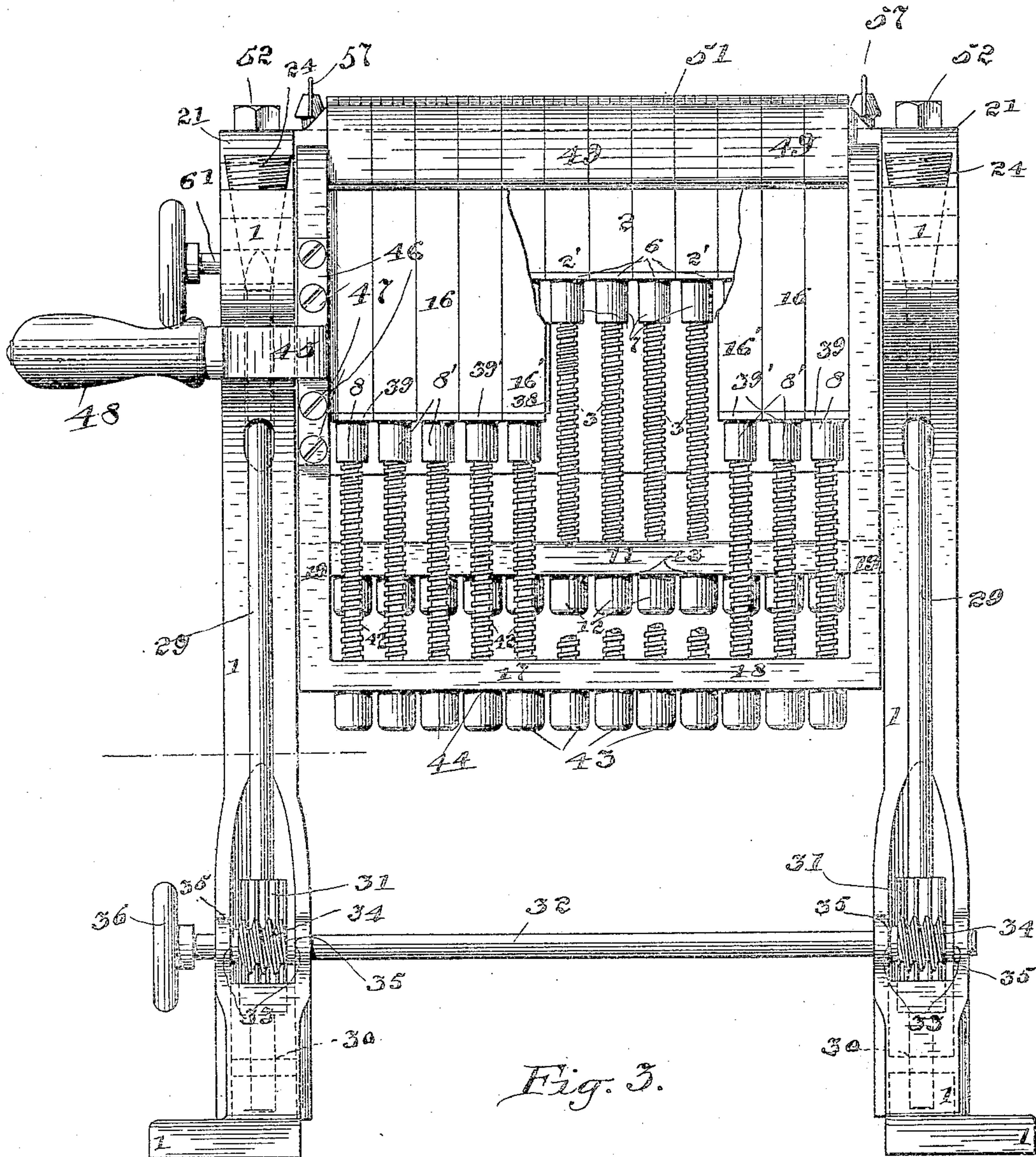


Fig. 3.

Witnesses:
R. C. Butcher
W. C. Smith

Inventor:
Victor Benedek
by *James R. Storer*
his Attorney.

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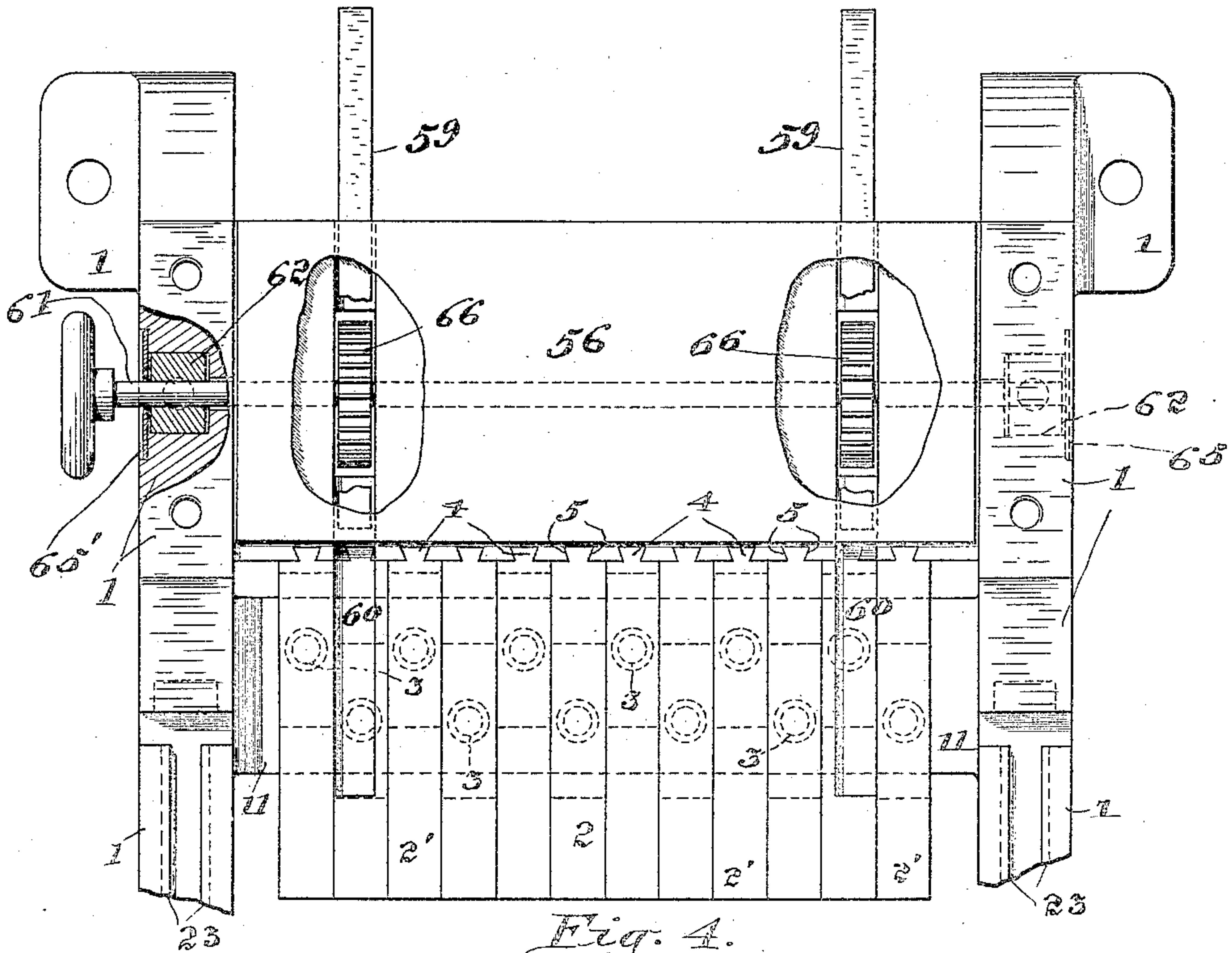


Fig. 4.

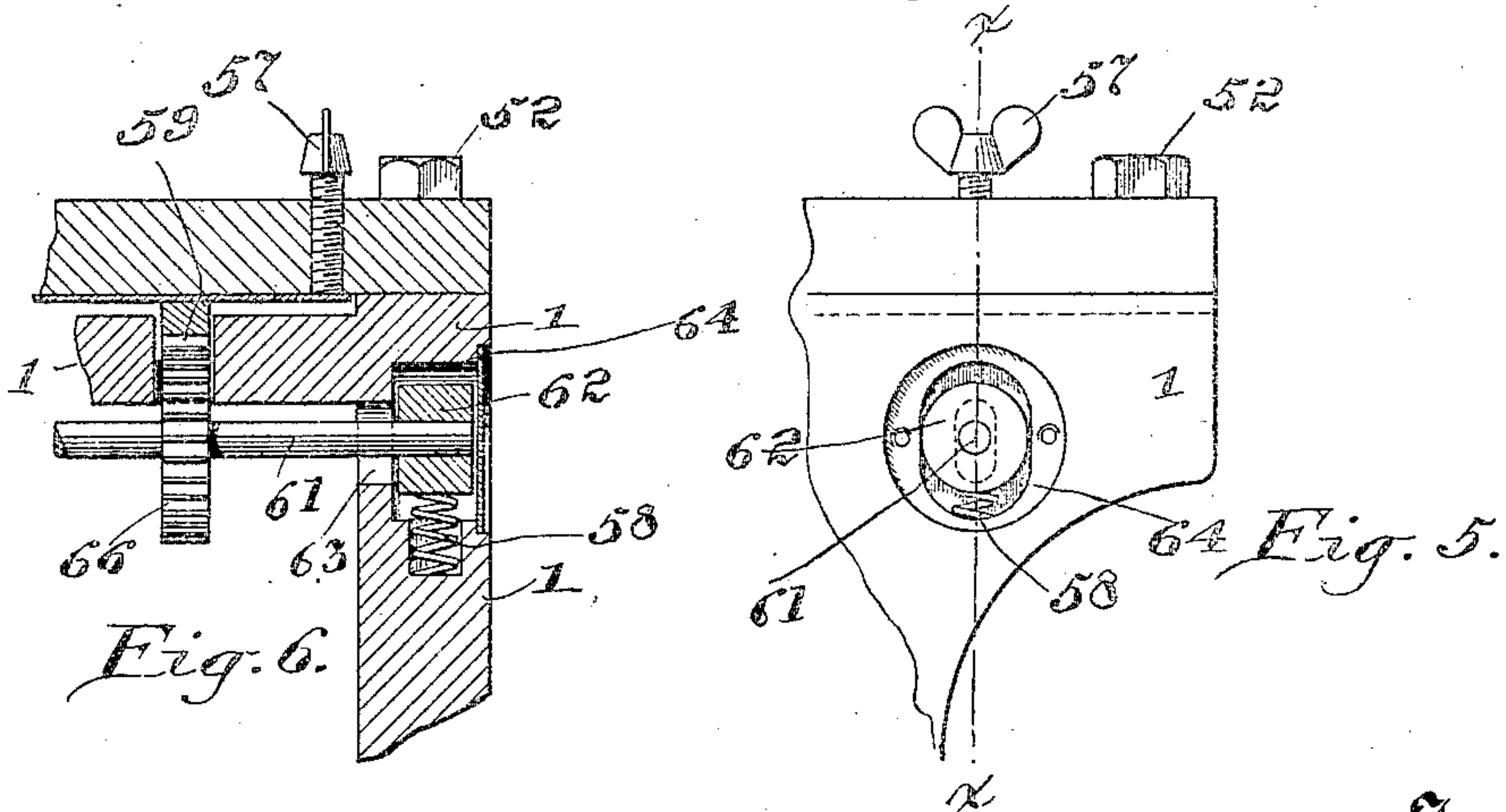


Fig. 6.

Fig. 5.

Witnesses:
R. C. Bletcher
W. B. Smith

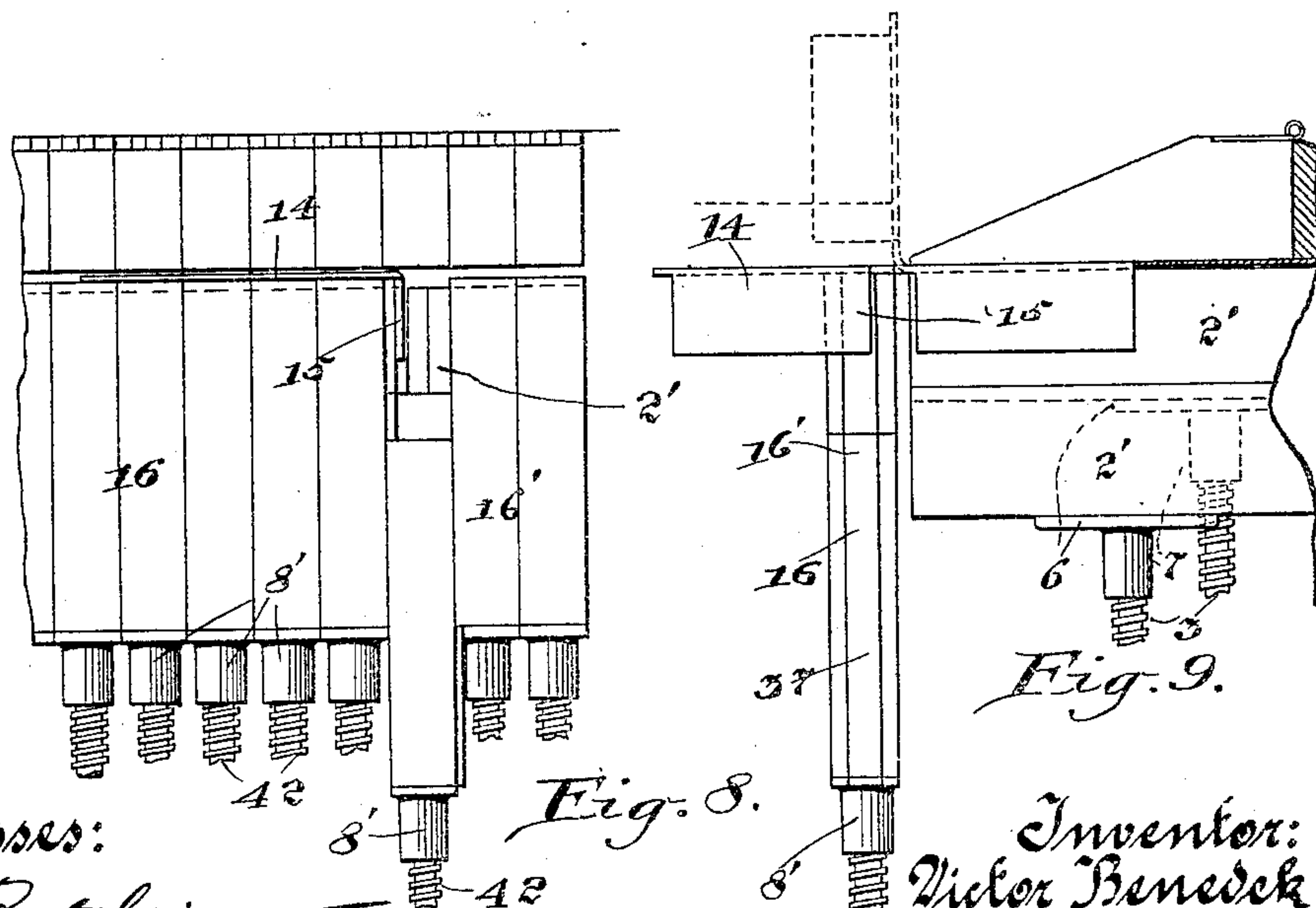
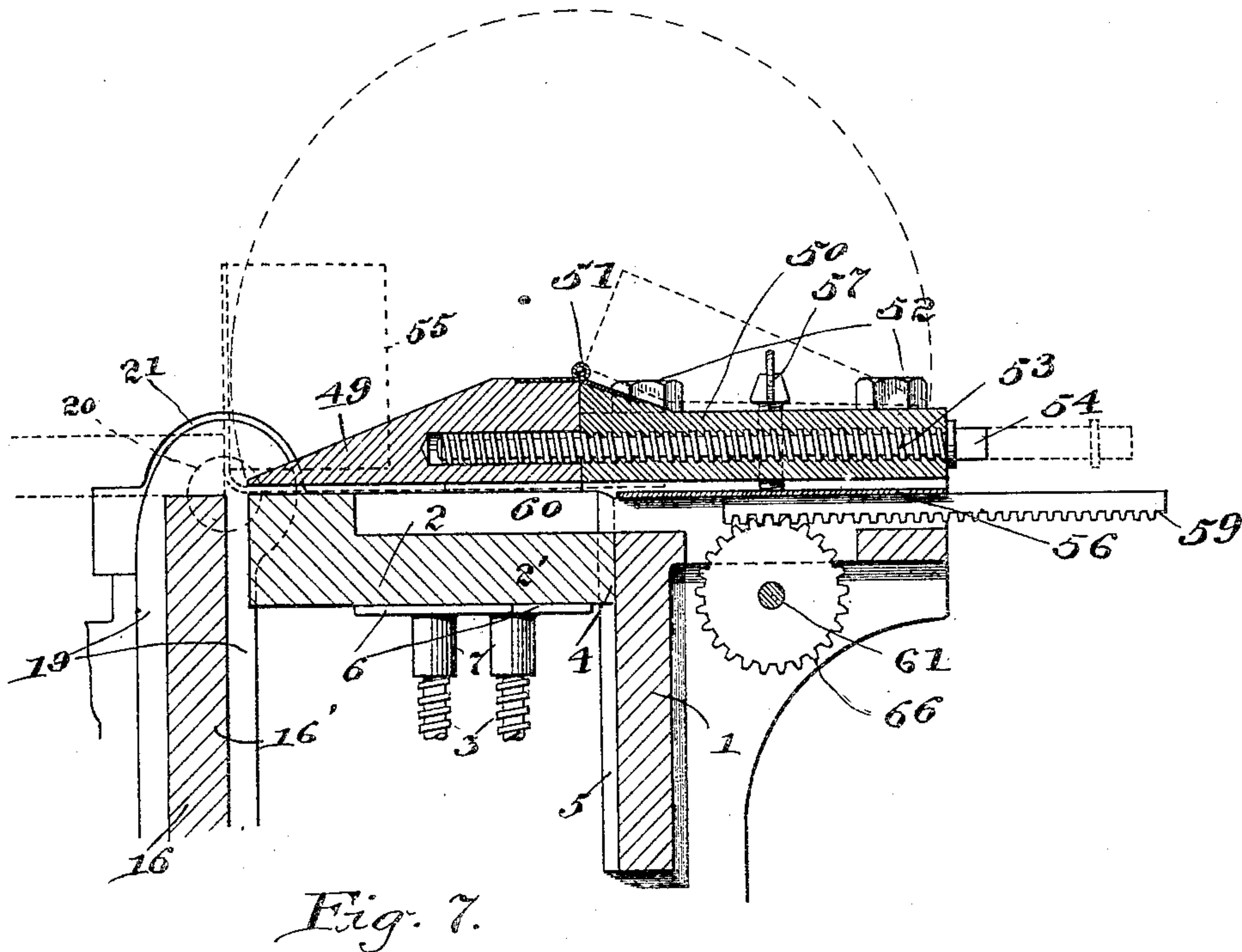
Inventor:
Victor Benedek
by Joshua R. Horn
his Attorney.

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6 SHEETS—SHEET 5.



Witnesses:

P. C. Bletcher

W. L. Smith

Inventor:

Victor Benedek

by
J. H. R. R. R.
his Attorney.

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6 SHEETS—SHEET 6.

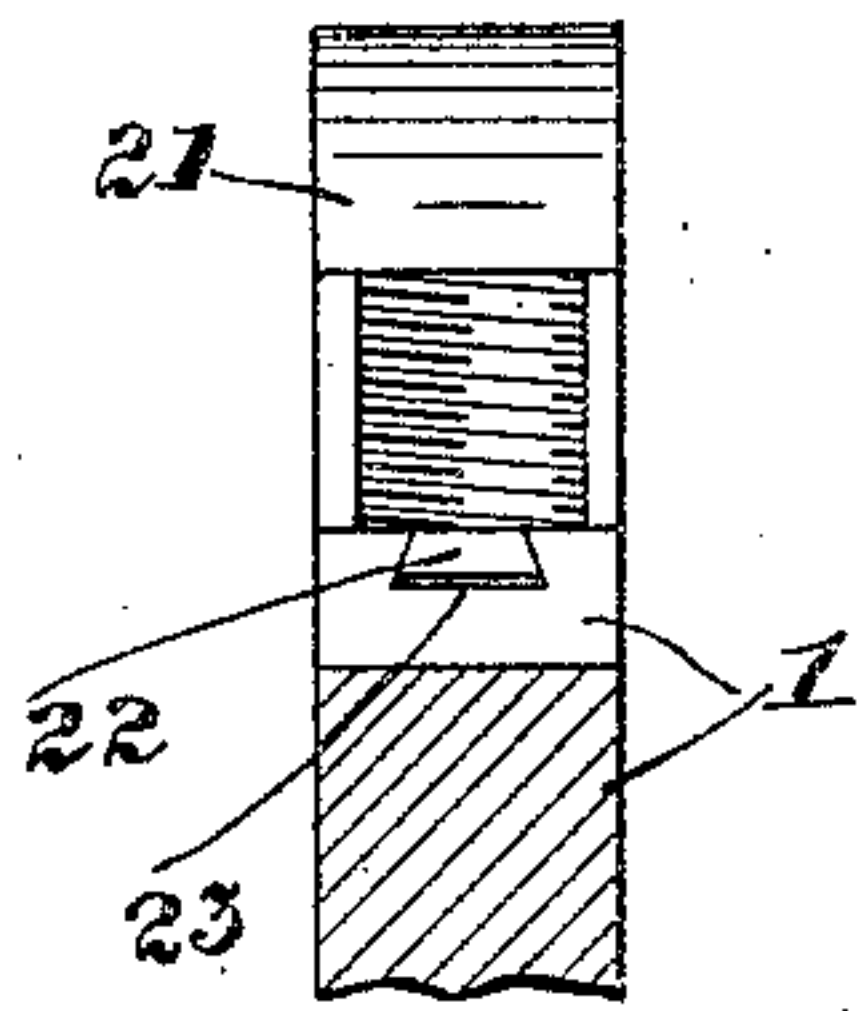


Fig. 10.

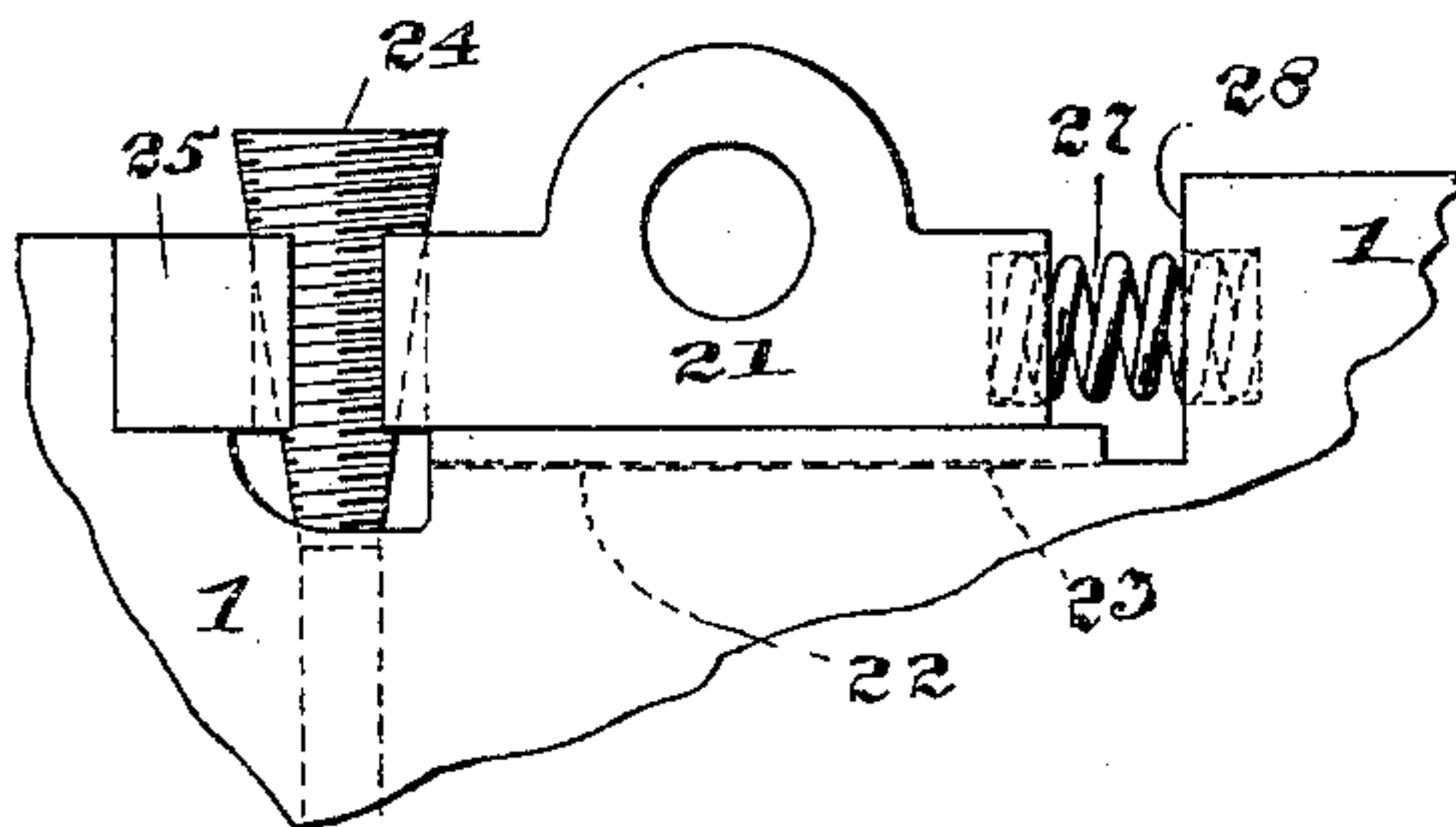


Fig. 11.

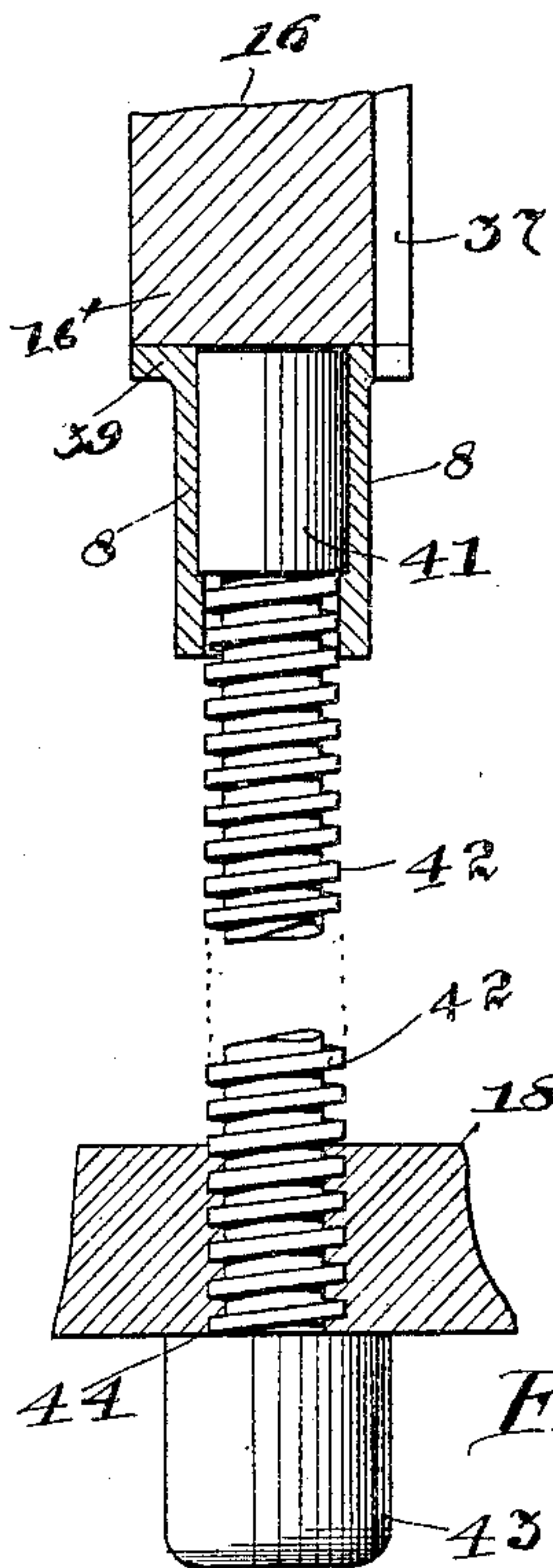


Fig. 14.

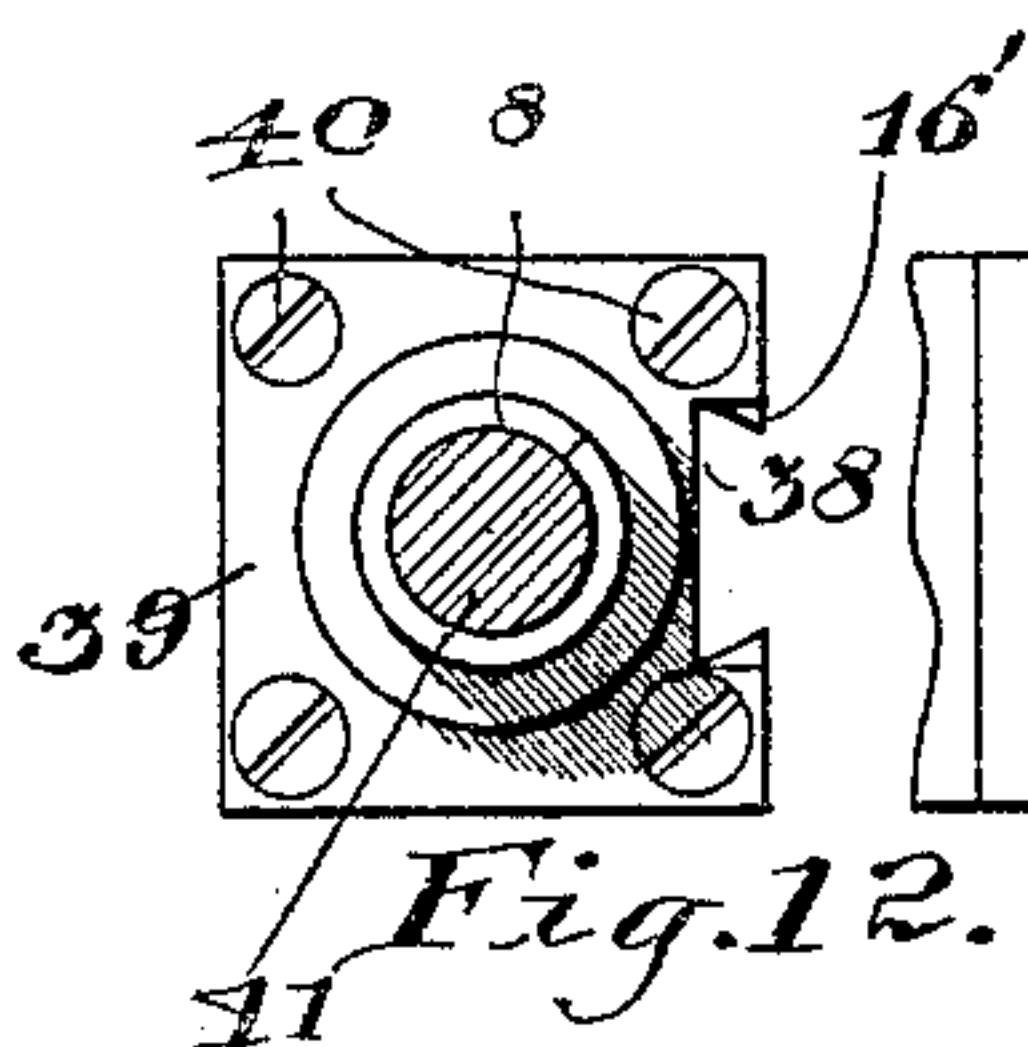


Fig. 12.

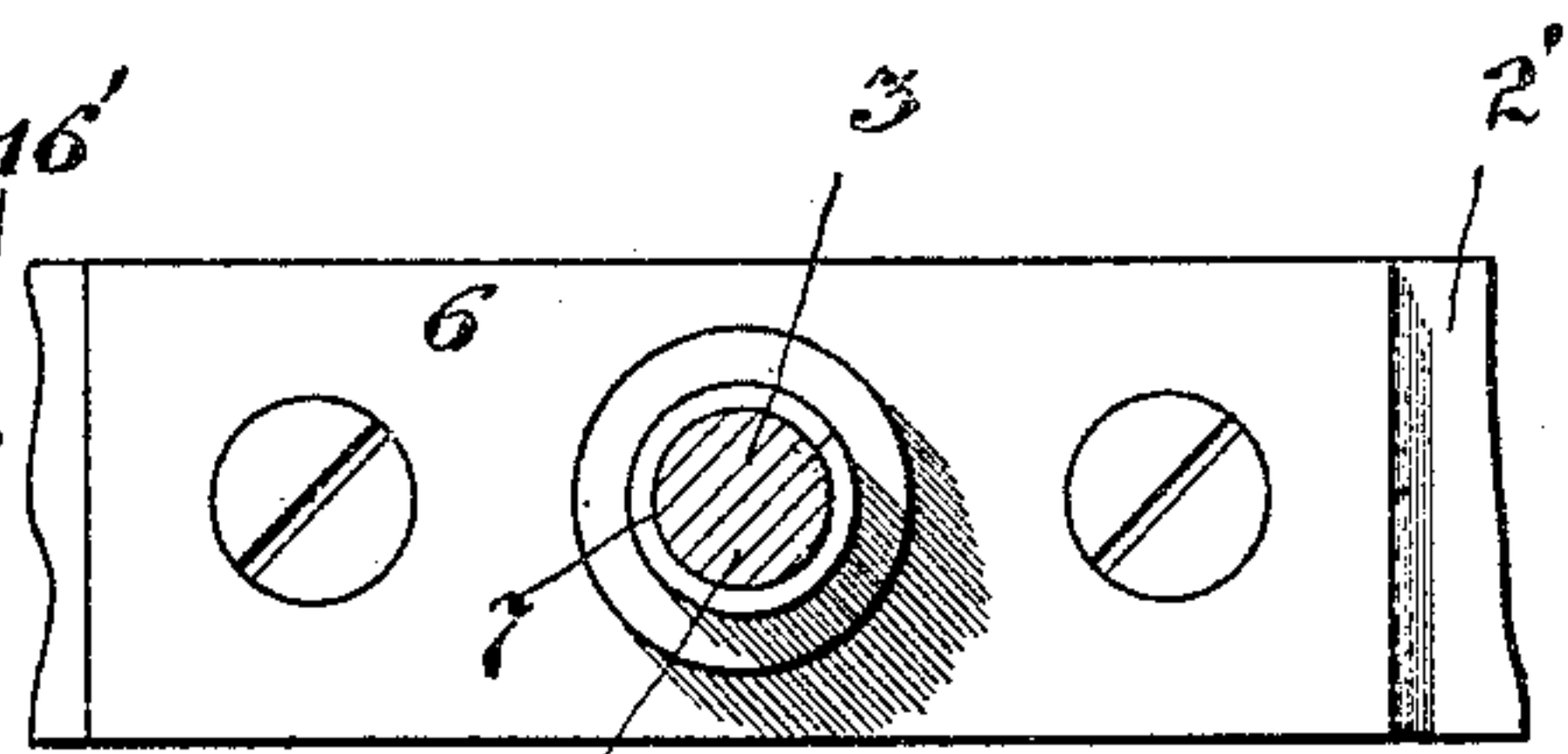


Fig. 13.

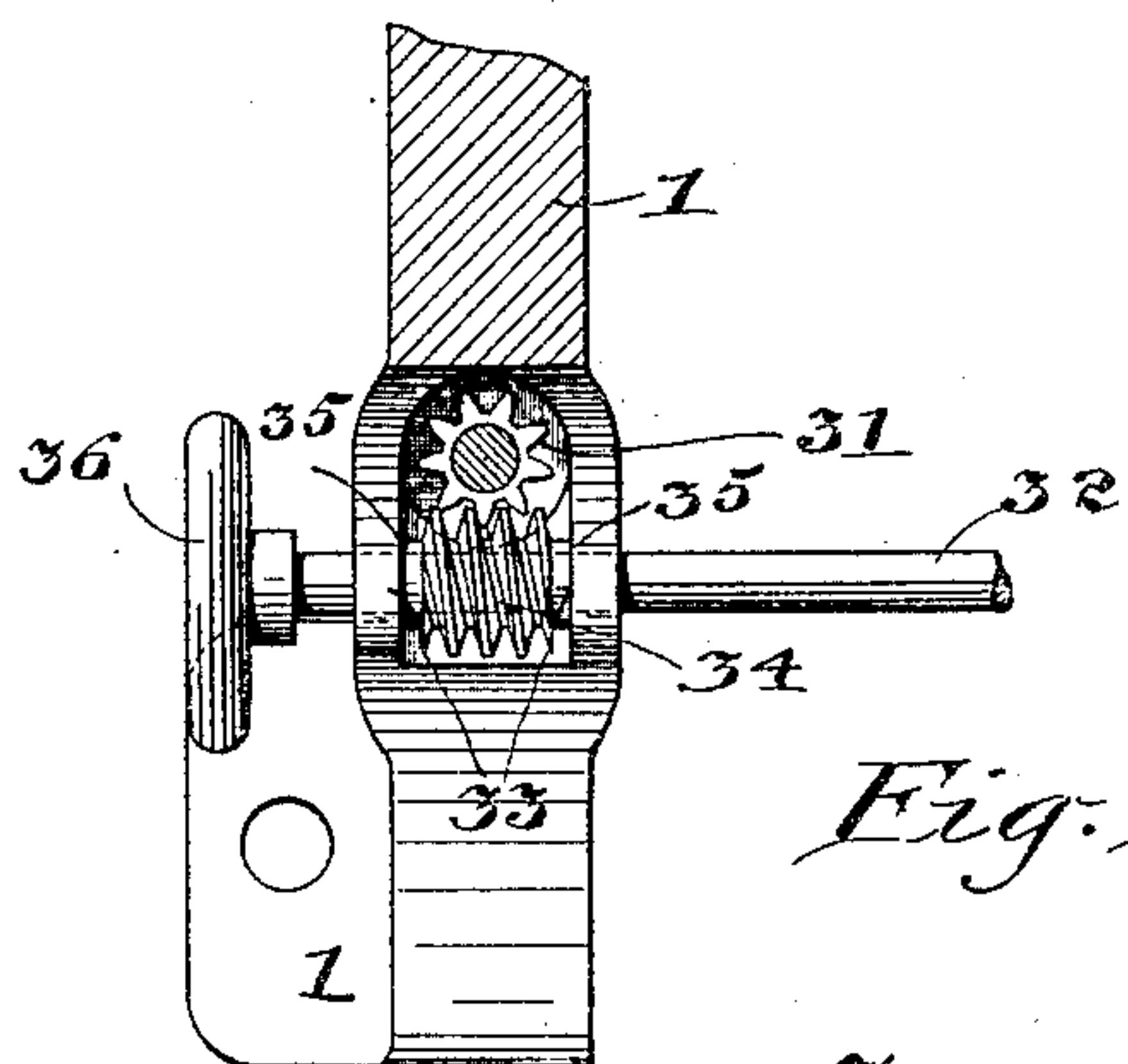


Fig. 15.

Witnesses:
R. C. Bretcher
W. T. Smith

Inventor:
Victor Benedek
by Joshua A. Torne
his Attorney.

UNITED STATES PATENT OFFICE.

VICTOR BENEDEK, OF CHICAGO, ILLINOIS.

SHEET-METAL BRAKE.

No. 929,818.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed March 29, 1909. Serial No. 486,323.

To all whom it may concern:

Be it known that I, VICTOR BENEDEK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sheet-Metal Brakes, of which the following is a specification.

My invention relates to improvements in sheet metal bending machines or brakes and has for its object to provide a manually operated machine of this character that shall be adapted to bend sheet metal into a greater variety of forms than is possible with brakes in ordinary use, it being well known that certain forms of sheet metal articles have to be produced partially by hand owing to the limitations of machines usually employed.

A further object of my invention is to construct the normally stationary horizontal table of the brake of a plurality of vertically adjustable members, any one of which may be depressed independent of the others to provide clearance for the sides or ends of an article which have been previously formed.

A further object of my invention is to provide a series of independently adjustable members in the crank operated hinged leaf of the brake for a similar purpose as the vertically adjustable members in the table, and a further object is to provide a plurality of hinged fingers disposed above the table and adjacent thereto, said fingers being adapted to be held in position independently by removable horizontally disposed screws.

Other objects will appear hereinafter.

With these objects in view my invention consists in the novel construction and arrangement of parts all as will be hereinafter fully described and particularly pointed out in the appended claims.

My invention will be more readily understood by reference to the accompanying drawings forming a part of this specification, in which,

Figure 1 is a vertical section showing my improved brake in its preferred form, Fig. 2 is a top elevation, Fig. 3 is a front elevation, Fig. 4 is a detail top elevation showing the table with the fingers removed, Fig. 5 is a detail side elevation showing the vertical adjustability of a horizontally disposed shaft in connection with the table gage plate, Fig. 6 is a detail section taken on line *a a* of Fig. 5, Fig. 7 is a detail vertical sec-

tion showing the manner of holding the fingers by the removable horizontally disposed screws, Figs. 8 and 9 are detail front and side elevations respectively illustrating the clearance which may be provided when bending a sheet of metal by properly adjusting the members of the table and hinged leaf of the brake, Figs. 10 and 11 are respectively detail end and side elevations of a journal block employed in the machine, Figs. 12 and 13 are detail bottom elevations of sleeve plates; Fig. 14 is a detail side elevation of one of a plurality of screws employed in the machine, and Fig. 15 is a detail top elevation.

Referring now to the drawings 1 indicates the brake frame and 2 the table mounted thereon, the latter comprising a plurality of elongated rectangular members 2' adapted to be independently vertically adjustable by means of the screws 3. These members are arranged closely together as shown in Figs. 3 and 4, and the rear end 4 of each one of which is dove-tailed to fit into a vertical dove-tailed guide groove 5 formed in the frame 1. A plate 6 having a perforated sleeve 7 integral therewith is screwed securely to the lower side of each member 2' as shown in detail in Fig. 13, the sleeve 7 being formed similar to the sleeve 8 shown in transverse section in Fig. 14. The end 9 of each screw 3 is cylindrically formed similar to the screw shown in Fig. 14, said end being journaled in the sleeve 7. A horizontally disposed bar 11 integral with the frame 1 is tapped to receive the screws 3, each one of which is provided with a head 12 serving as a stop to limit the upward movement of a member 2'. The heads 12 may be knurled if so desired in order that the same may be readily turned by the fingers. Thus it is clear that the top of the table 2 is level when the shoulders 13 of the heads 12 all abut the lower side of the bar 11, and that each member 2' may be lowered independent of the others. The advantage of this construction may be seen by reference to Figs. 8 and 9 which show a piece of sheet metal 14 having a downwardly extending flange 15. In order to bend this piece as indicated by dotted lines in Fig. 9, the same is laid on the table 2 and the member 2' lowered to provide clearance for the flange 15, when the bending operation may be easily performed.

The crank operated hinged leaf 16 com-

prises a substantially U-shaped member 17 having a horizontally disposed portion 18 and portions 19 extending perpendicular thereto. Two journals 20 integral with the member 17 are in alinement with each other and extend outwardly from the ends of said member, the journal bearing blocks 21 being provided with dove-tails 22 formed in the lower side thereof. Horizontally disposed dove-tailed grooves 23 are formed in the frame 1 in which the dove-tails 22 of the blocks 21 are adapted to slide, this provision being made in order that the distance between the leaf 16 and the table 2 may be varied according to the requirements of the work in hand. The means for sliding the blocks 21 in their respective grooves 23 comprises vertically disposed tapered screws 24, one end of the blocks 21 conforming to and threaded to fit said screws on one side thereof, blocks 25 screwed to the frame 1 by means of the screws 26 being threaded to fit the other side of said tapered screws. Suitably seated helical springs 27 are interposed between the blocks 21 and shoulders 28 formed in the frame 1, in order to maintain said blocks in constant engagement with the screws 24. Vertically disposed shafts 29 integral and in alinement with the screws 24 are journaled adjacent their lower extremities in the bearings 30 formed in the frame 1, and elongated worm wheels 31 are formed on said shafts above said bearings.

A horizontally and transversely disposed shaft 32 is arranged in front of the shafts 29 and journaled in the bearings 33. Worms 34 adapted to mesh with and drive the worm wheels 31 are securely pressed on the shaft 32, the shoulders 35 being provided to abut the sides of the bearings 33 to prevent longitudinal movement of said shaft. A hand wheel 36 is secured to the shaft 32 for operating the same, and it is clear that when the same is turned that the shafts 29 will rotate and cause the leaf 16 to either approach the table 2 or to recede therefrom. The leaf 16 comprises a series of independently adjustable members 16' connected together and slidably mounted on each other by means of dove-tailed tongues and grooves 37 and 38, respectively, formed in the edges of all of said members except the outermost of the series. The members 16' are substantially rectangular in form and constitute the principal portion of the leaf 16. Metallic sleeves 8 and 8' are integral with the plates 39 and 39' respectively the latter being secured to the lower ends of the members 16' by means of screws 40. Journaled in these sleeves are cylindrical portions 41 of the screws 42 provided to adjust the members 16' in order to make clearance for a flange as shown in Fig. 8. The screws 42 are provided with heads 43 having shoulders or stops 44 to limit the upward movement of

the members 16'. The horizontal portion 18 of the U-shaped member 17 is tapped to receive the screws 42, and when the stops 44 abut said member the upper ends of the members 16' register and form substantially a straight edge as shown in Fig. 3. The operating crank 45 is provided with a T end 46 which is secured by means of the screw 47 to a portion 19 of the U-shaped member 17, the crank extending forwardly and provided with a handle 48.

The fingers 49 are hinged by means of the hinges 51 to the top piece 50 which is secured to the frame 1 by means of the bolts 52. The fingers 49 are preferably tapered as shown and the same are tapped longitudinally to receive the horizontally disposed screws 53 which are provided with square heads 54 and adapted to hold the fingers firmly in position.

When it is desired to bend a piece of sheet metal having a flange 55 as shown in Fig. 7, a screw 53 may be removed and the finger which interferes with the flange turned into the dotted line position, the remaining fingers serving to hold the piece of sheet metal sufficiently rigid.

The gage-plate 56 is movable forwardly and rearwardly by means of a gearing to be described hereinafter, and the same is adapted for use in all ordinary bending operations, but when a sheet of metal to be bent is so large that the gage-plate cannot serve its function, it may be depressed by thumb-screws 57 mounted in the ends of the top piece 50, said gage-plate being adapted to return to its normal position automatically by means of the helical springs 58 acting through the gage-plate actuating gearing.

The gage-plate gearing comprises toothed racks 59 secured on the lower side of the plate and extending rearwardly therefrom, grooves 60 in the table being provided to make clearance for said racks. A shaft 61 parallel with the shaft 32 is journaled in vertically slidable blocks 62 resting on the springs 58, the guide slots 63 and 64 being provided in the frame 1 to make clearance for the shaft 61 and the blocks 62, respectively. Circular cover plates 65 and 65' are provided and secured in position as shown in Figs. 4 and 6. Spur gears 66 are rigidly secured to the shaft 61 and the same are arranged to mesh with and reciprocate the racks 59, a hand operating wheel being secured to said shaft at the end thereof which projects through the plate 65'. The gage plate 56 is thus adapted to be reciprocated when in operative position, or it may be depressed below the level of the table 2 as aforesaid.

While I have shown what I deem to be the preferable form of my improved bending machine, I do not wish to be limited thereto, as there might be slight modifica-

tions thereof which would be comprehended within the scope of my invention.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. In a device of the class described, a table and a supporting frame therefor, a superimposed top-piece bolted to said frame to which a plurality of fingers are hinged, a series of rectangular members forming said table each having an independent vertical adjusting means, and a leaf hinged to said frame and actuating means therefor, one edge of said leaf being adapted to cooperate with said table and fingers for bending sheet metal, substantially as and for the purpose specified.

2. In a device of the class described, a frame and a table consisting of a plurality of rectangular members mounted thereon, the top surface of said members being normally in a horizontal plane, means for independently depressing each of said members, a top-piece coextensive with the length of said frame and bolted thereto on the top thereof, the front edge of said top-piece being adjacent the rear ends of said members, a series of tapered fingers hinged to the front edge of said top-piece, each finger being co-extensive in width with each of said members and disposed above and adjacent thereto, and a crank operated leaf hinged to said frame in front of said table and adapted to cooperate therewith when a sheet of metal is being formed, substantially as and for the purposes specified.

3. In a device of the class described, a frame having a horizontal member integral therewith in which a plurality of vertically movable screws are mounted, the upward movement of said screws being limited by heads integral therewith adapted to contact the lower side of said member, a plate having a sleeve integral therewith mounted on the upper end of each of said screws, a series of horizontally disposed substantially rectangular members superimposed on the plates which are screwed thereto, one end of each of said members being dove-tailed and adapted to slide in dove-tailed grooves provided in said frame, a plurality of fingers disposed above said members and normally secured adjacent thereto, and a crank operated hinged leaf composed of a series of adjustable members hinged to said frame, substantially as and for the purposes specified.

4. In a device of the class described, a frame having a table composed of a series of independently vertically adjustable members, a series of fingers disposed above said members and normally secured adjacent therewith, a substantially U-shaped member having journals extending outwardly and horizontally at the ends thereof, forwardly and

rearwardly adjustable blocks mounted on said frame in which said journals are mounted, a plurality of screws arranged parallel with the sides of said U-shaped member and screwed into the horizontal member thereof, heads on said screws adapted to contact with said horizontal member to limit the movement of the screws therein, and a plate having a sleeve integral therewith mounted on each of said screws and screwed to each of a series of dove-tailed tongued and grooved members adapted to slide relative to each other, substantially as and for the purposes specified.

5. In a device of the class described, a frame having a table mounted thereon comprising a series of vertically adjustable members, blocks mounted on said frame to which a leaf having a series of adjustable members is hinged, said leaf being arranged parallel with the front edge of said table, said blocks being forwardly and rearwardly adjustable and resting on a horizontal portion of said frame, helical springs interposed between said blocks and shoulders formed in said frame, vertically disposed tapered screws adapted to contact with said blocks at the ends thereof opposite said springs, and means for rotating said screws, substantially as and for the purposes specified.

6. In a device of the class described, a frame having a leaf hinged thereto comprising a series of adjustable members arranged in front of a table mounted on said frame, bearing blocks mounted on said frame to which said leaf is hinged, dove-tails formed on the lower side of each bearing block and dove-tailed grooves formed in said frame in which said dove-tails are slidably mounted, helical springs interposed between said blocks and shoulders formed in said frame, tapered screws mounted in said frame between threaded stationary blocks on one side thereof and threaded portions of said bearing blocks on the other, said screws being secured to vertically disposed shafts journaled in said frame and having worm wheels integral therewith, a horizontally disposed shaft journaled in said frame having worms formed thereon and adapted to mesh with and drive said worm wheels, and a hand wheel secured to said last named shaft, substantially as and for the purposes specified.

7. In a device of the class described, a frame having a table mounted thereon and a leaf hinged thereto each having a series of independently adjustable members, a top-piece bolted to the top of said frame to which a series of tapered fingers are hinged and adapted to swing in vertical planes, a plurality of horizontally disposed screws having squared heads mounted in said top-piece and adapted to screw into said fingers for maintaining the same in a normally horizontal position, each of said screws being

adapted to screw out of said fingers independent of the others in order that one or more fingers may swing while the others are in the horizontal position, substantially as
5 and for the purposes specified.

8. In a device of the class described, a frame having a table mounted thereon and a leaf hinged thereto each having a series of independently adjustable members, a top-
10 piece bolted to the top of said frame to which a series of tapered fingers are hinged, a gage-plate interposed between said top-piece and said frame, means for moving said
15 plate forwardly and rearwardly, and means for depressing said plate below the level of the table, substantially as and for the purposes specified.

9. In a device of the class described, a frame having a leaf hinged thereto and a
20 table mounted thereon each having a series of independently adjustable members, a top-piece screwed to the top of said frame to which a series of fingers are connected, a gage-plate interposed between said frame
25 and said top-piece, toothed racks secured to

said plate, grooves in said table forming clearance for said racks, said racks being disposed parallel to each other and adapted to move forwardly and rearwardly, a shaft
30 mounted in vertically movable blocks provided in said frame, gears secured to said shaft adapted to mesh with said racks, helical springs interposed between said blocks and the bottom of slotted portions in said
35 frame in which said blocks are adapted to reciprocate vertically, and thumb screws mounted in said top-piece adapted to depress said plate when the same are screwed down-
40 wardly, said springs being adapted to return said plate to its normal position when the thumb screws are screwed upwardly, substantially as and for the purposes specified.

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

VICTOR BENEDEK.

Witnesses:

JOSHUA R. H. POTTS,
HELEN F. LILLIS.