

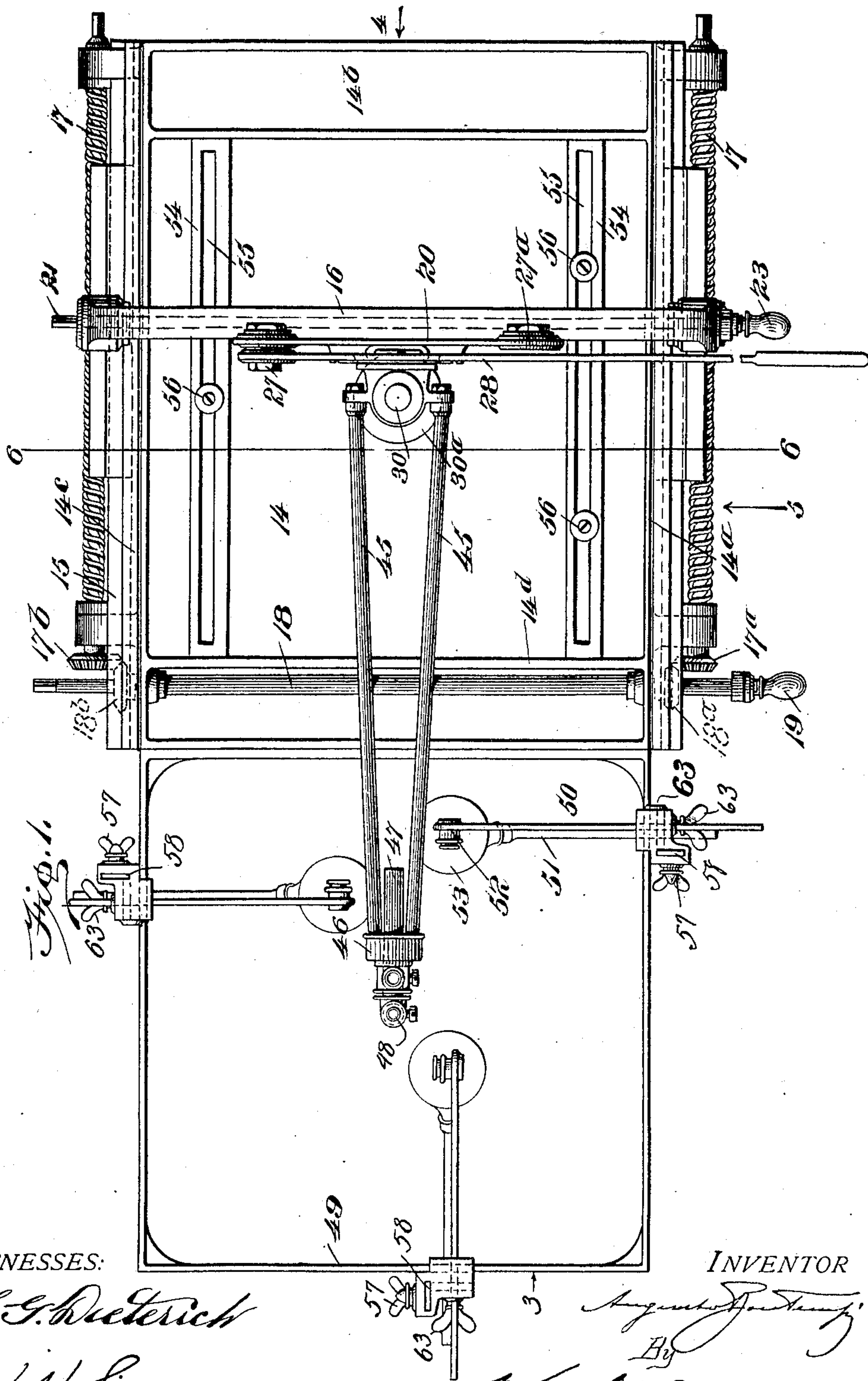
No. 871,668.

PATENTED NOV. 19, 1907.

A. BONTEMPI.
SCULPTURING MACHINE.

APPLICATION FILED NOV. 19, 1904.

7 SHEETS--SHEET 1.



WITNESSES:

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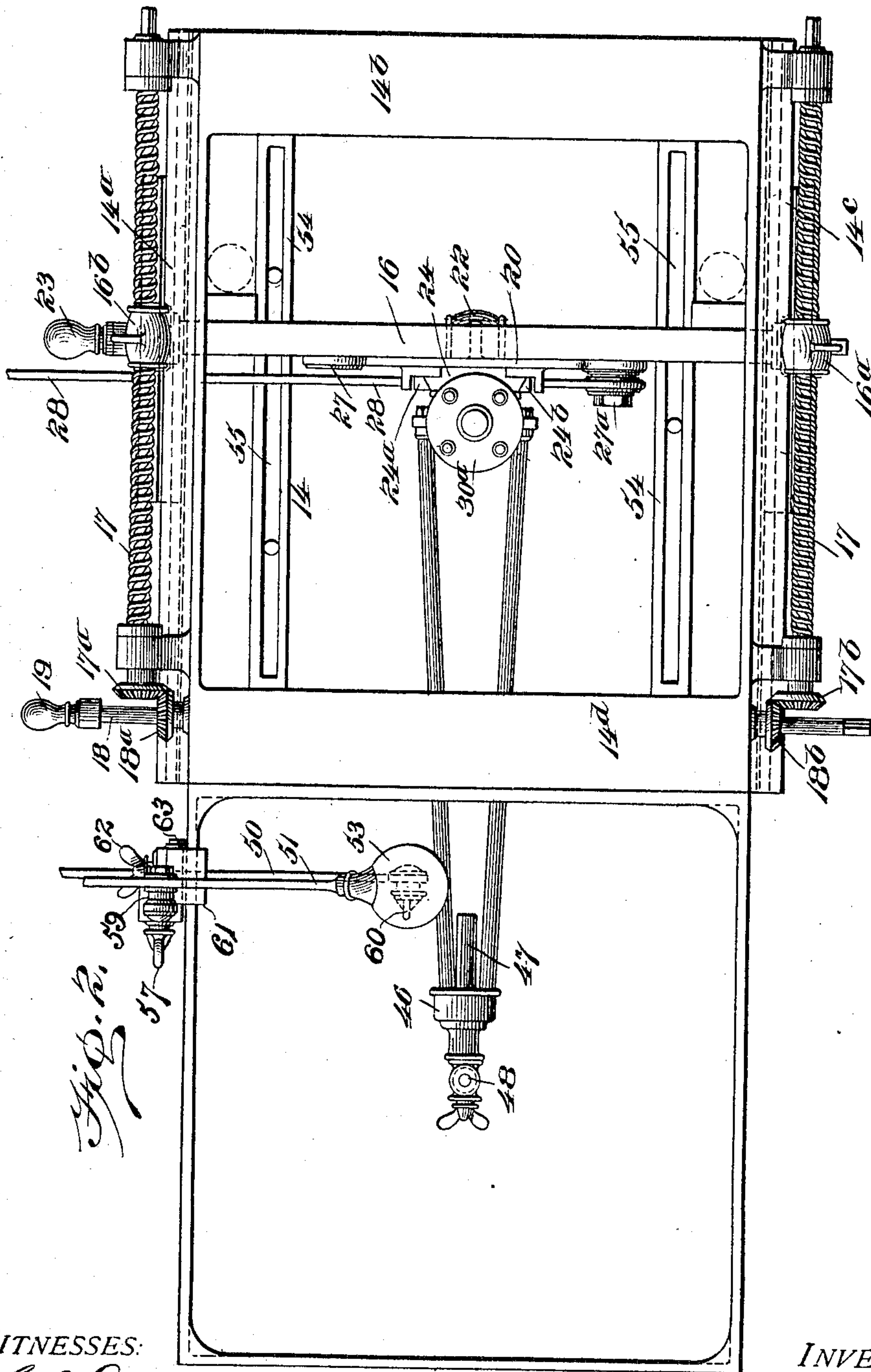
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7 SHEETS—SHEET 2.



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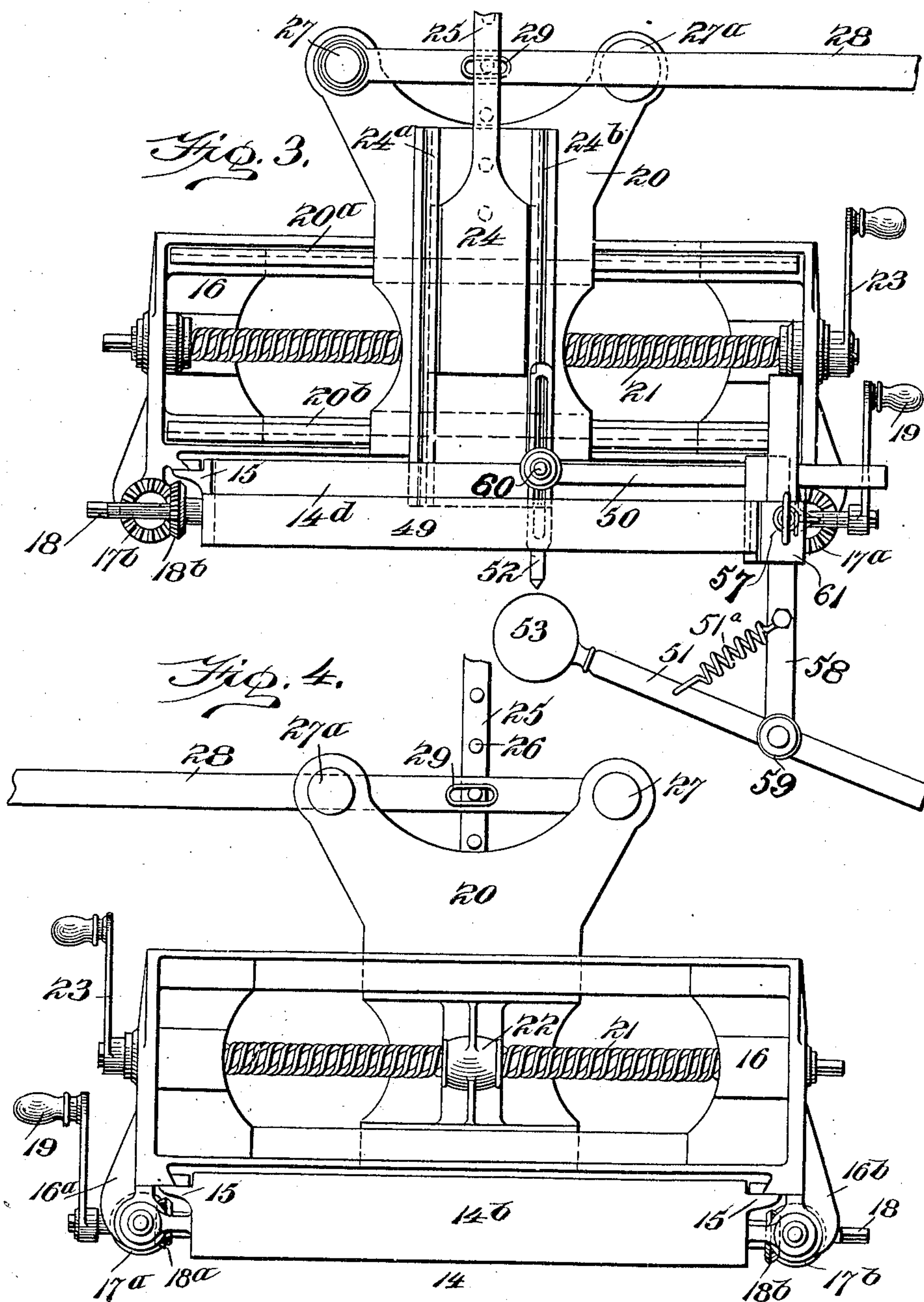
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7 SHEETS—SHEET 3.



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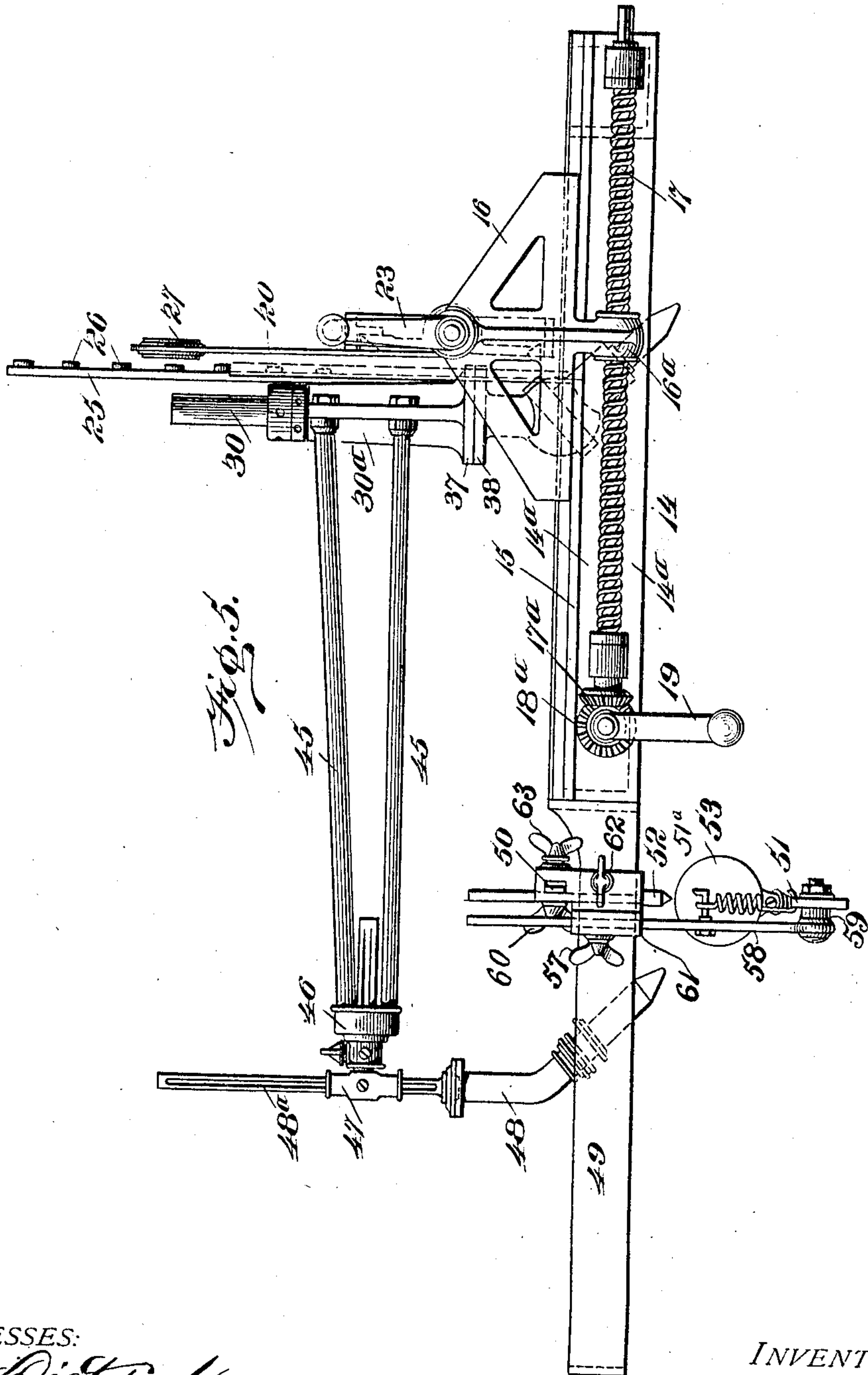
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7 SHEETS—SHEET 4.



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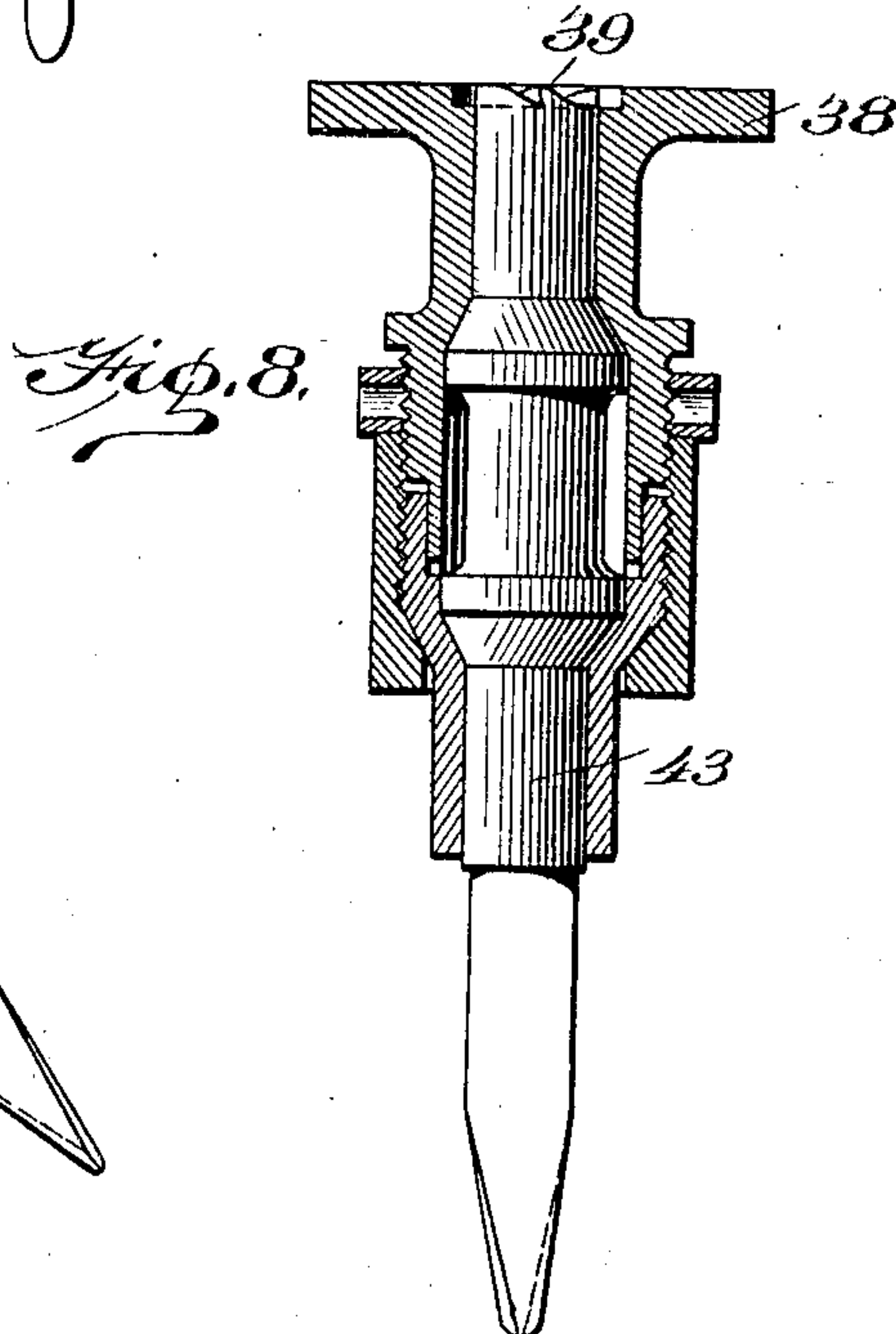
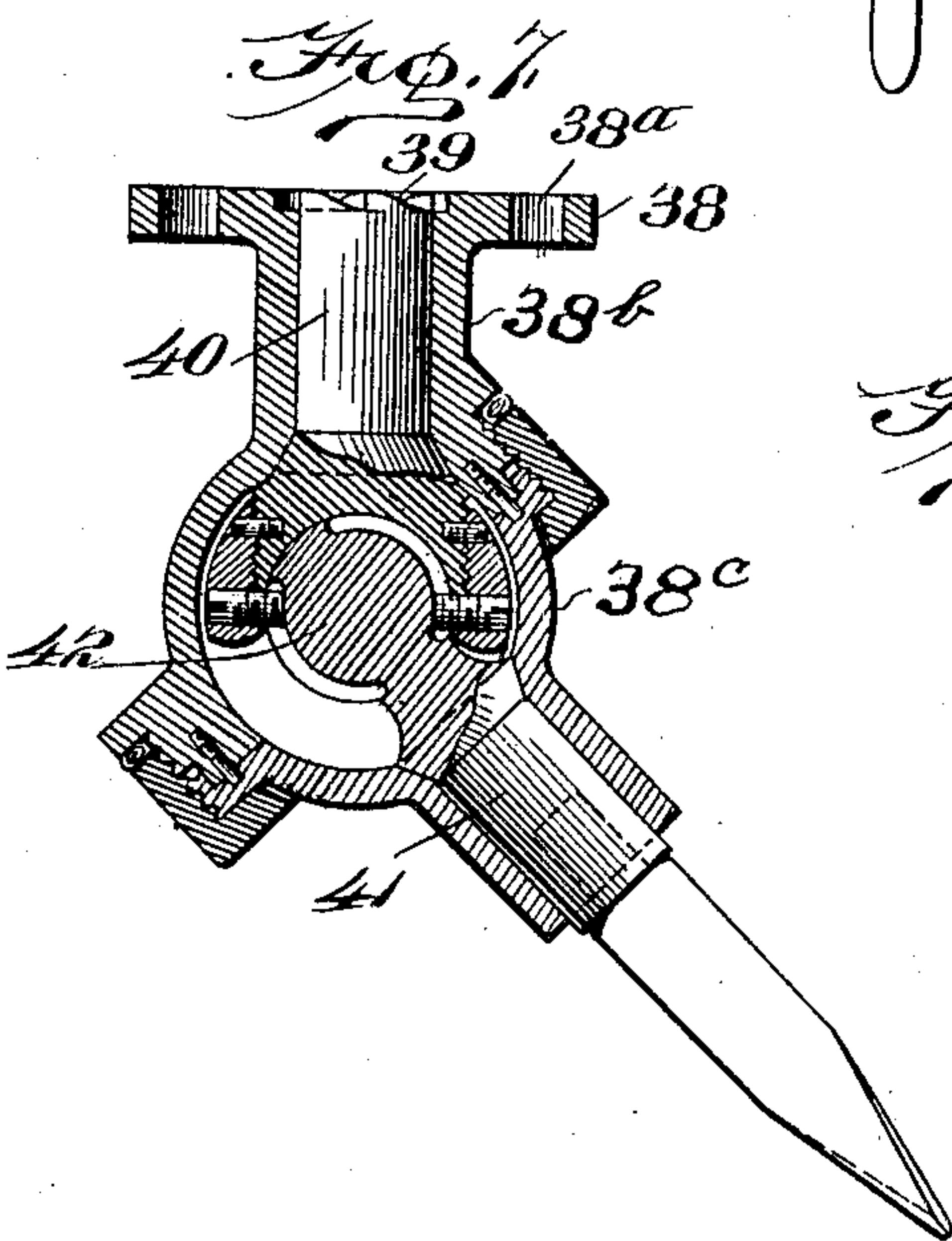
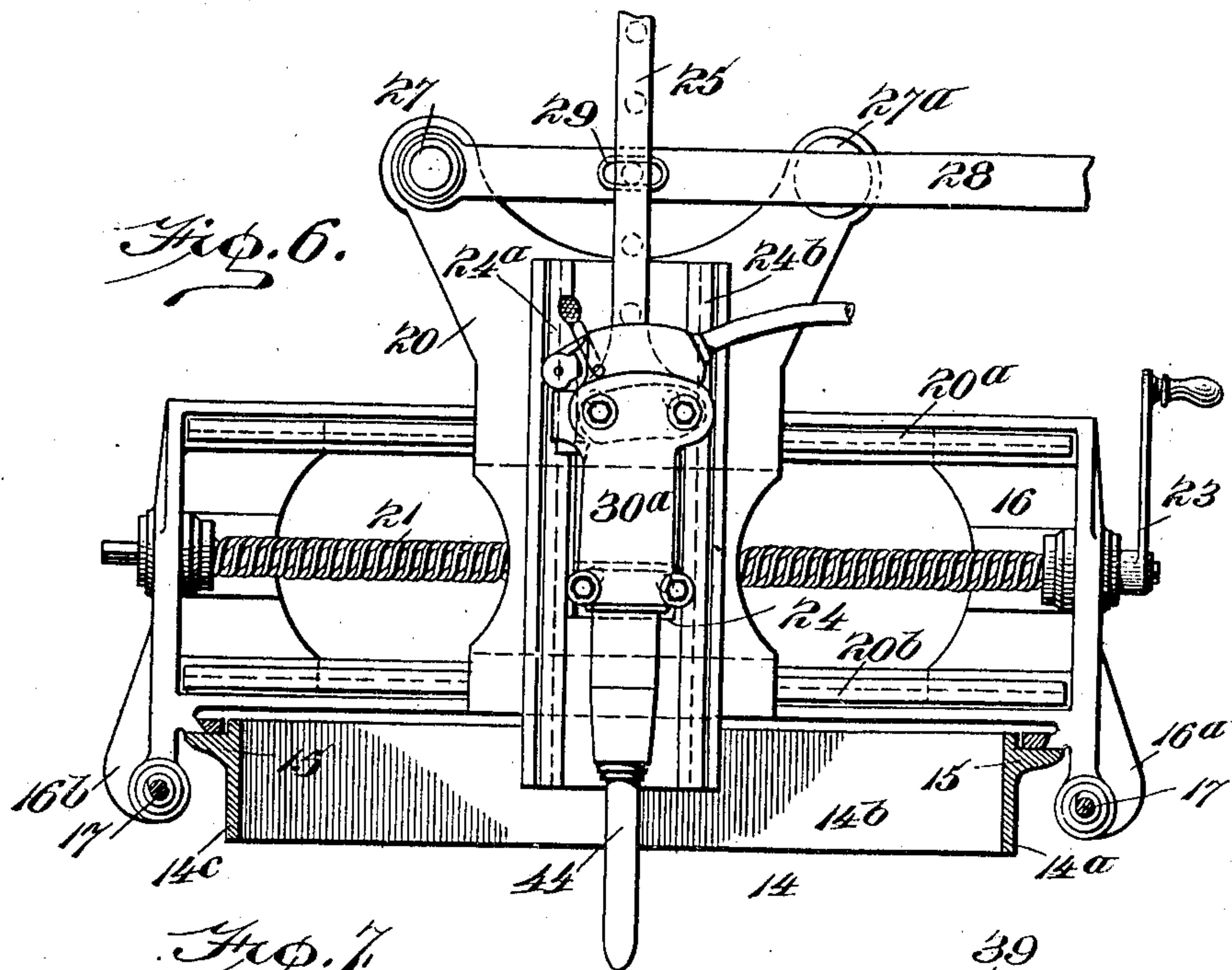
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7 SHEETS—SHEET 5.



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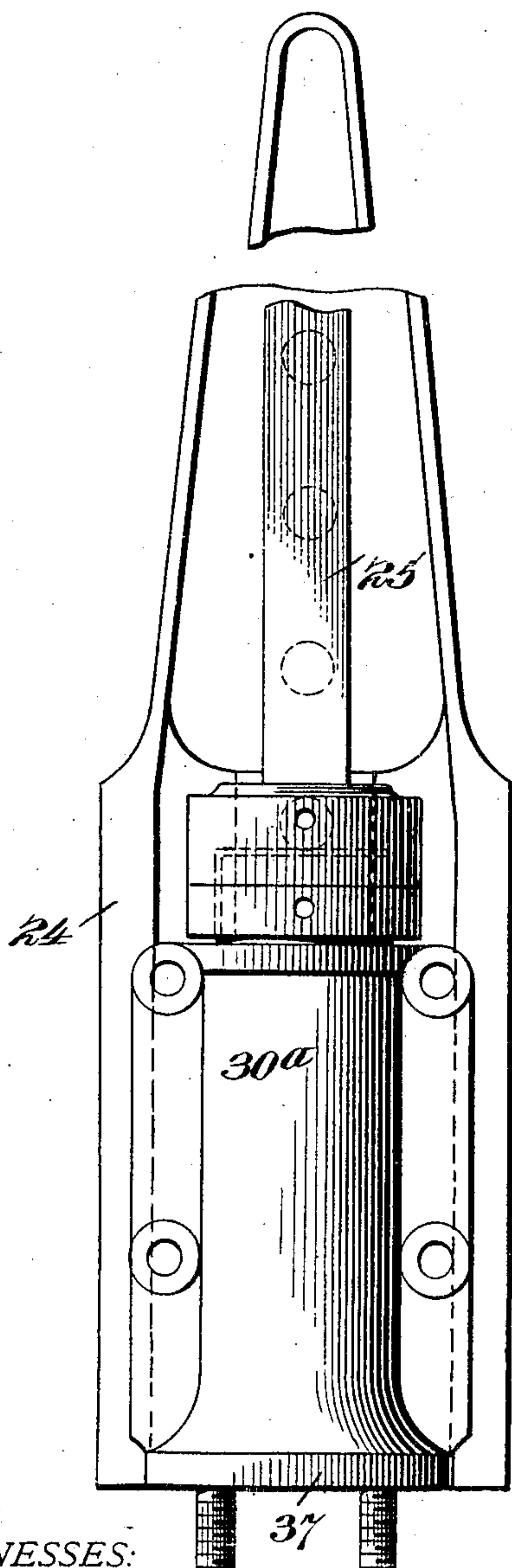
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7 SHEETS—SHEET 6.

Fig. 9.

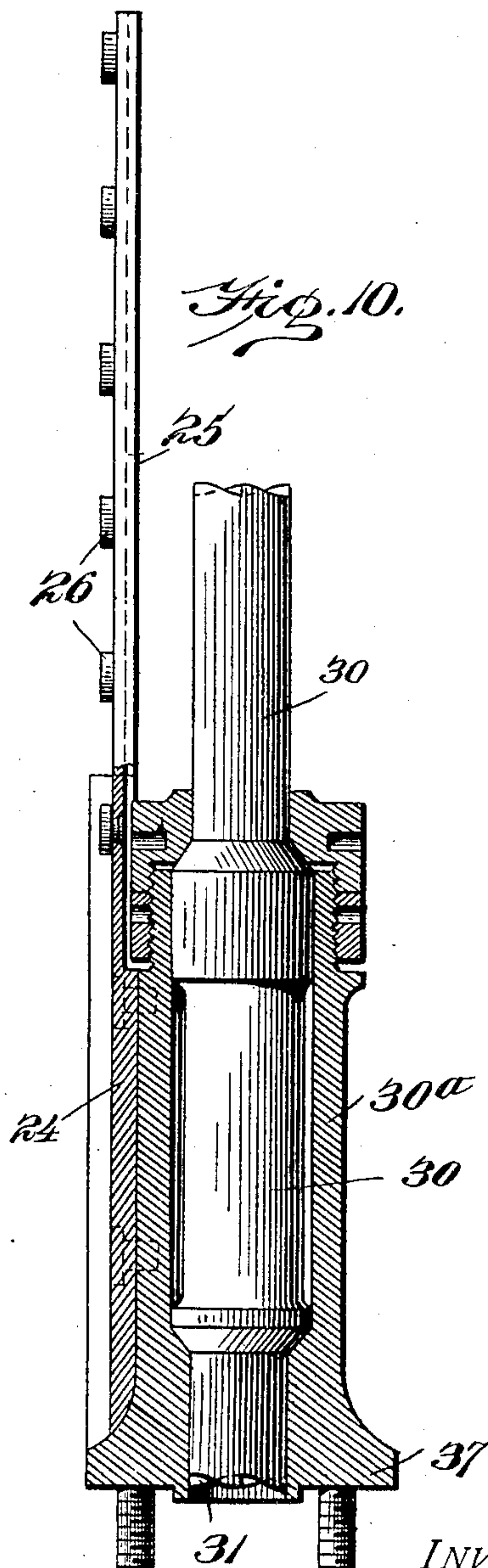


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Fig. 10.



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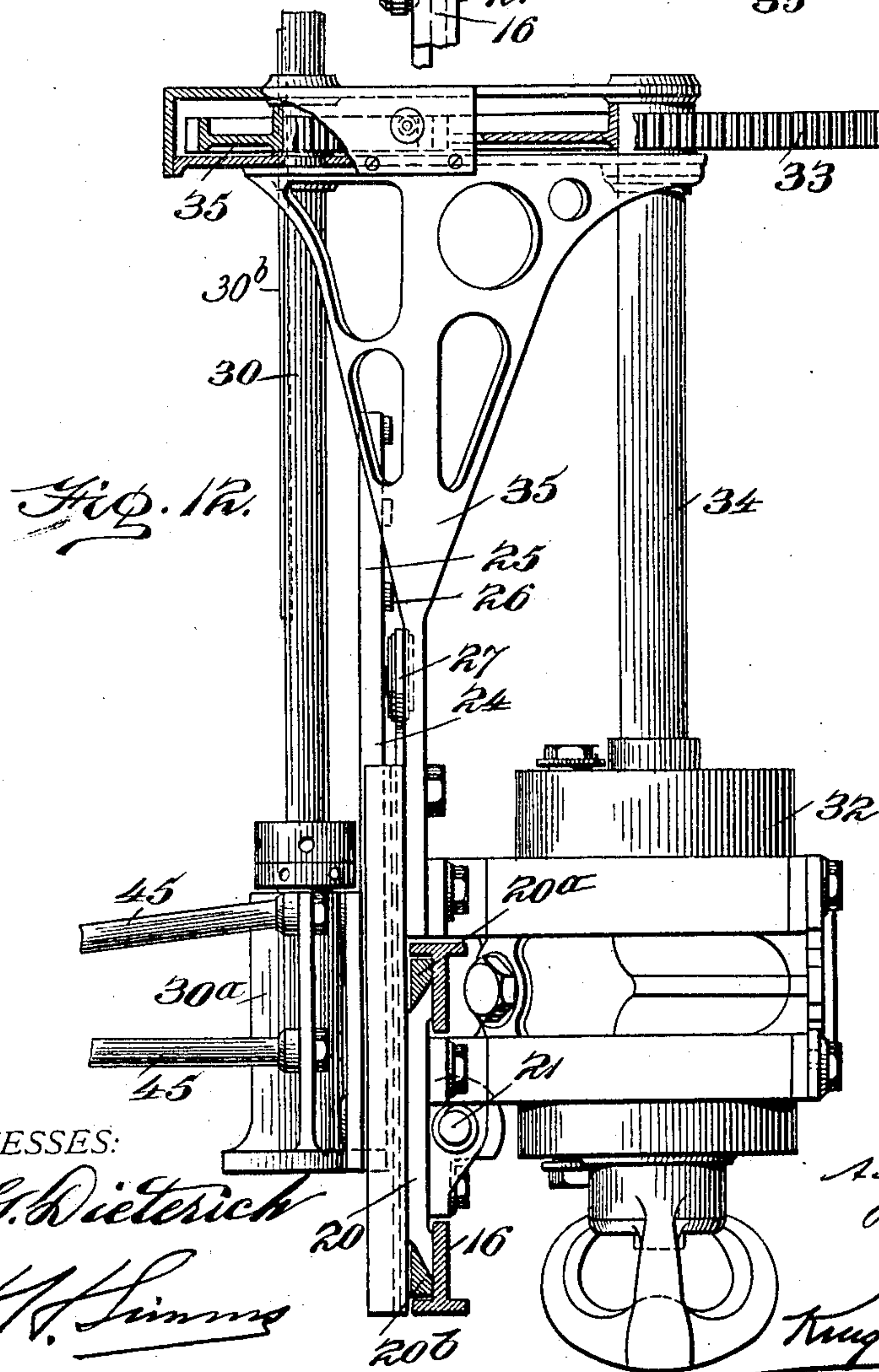
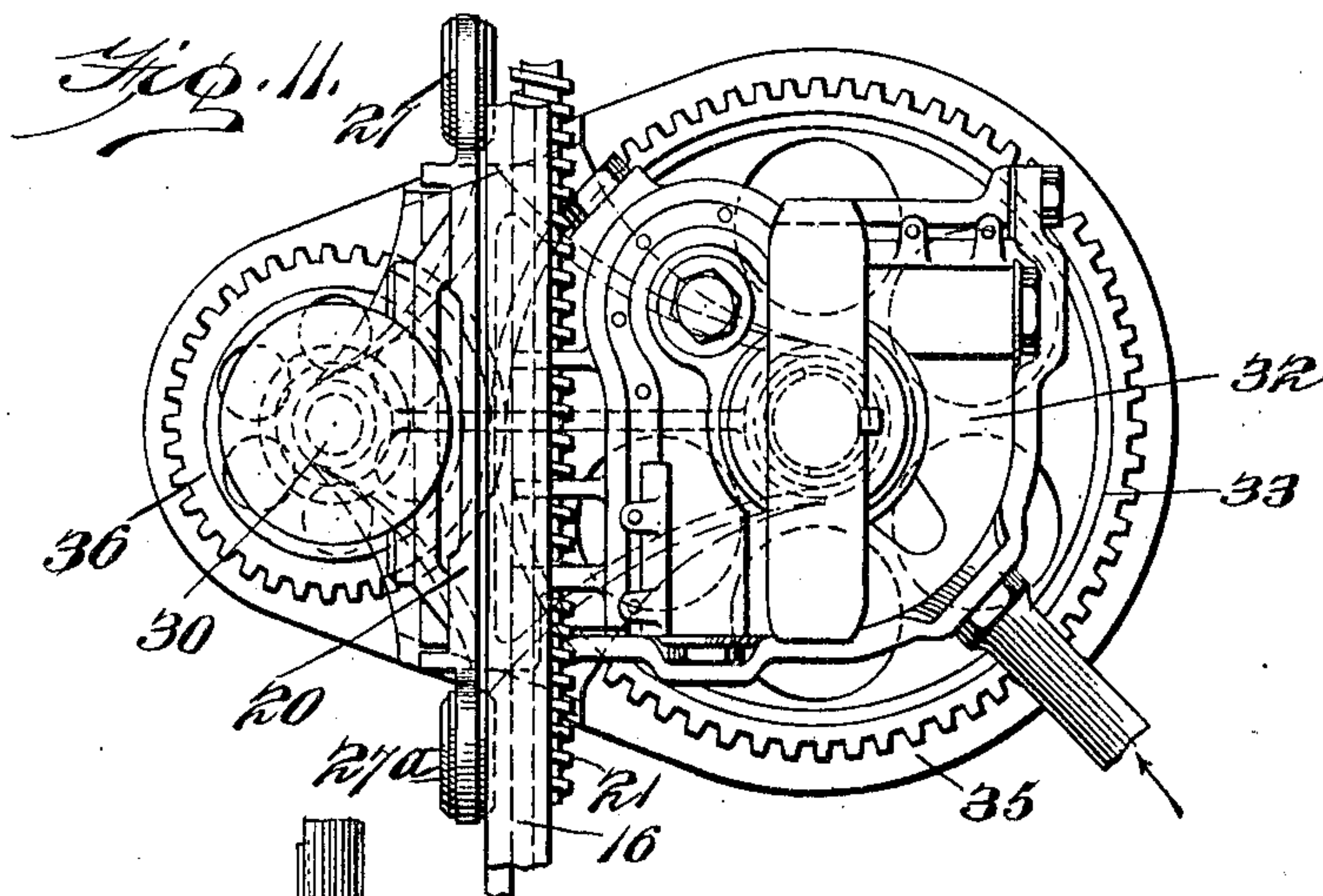
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7 SHEETS—SHEET 7.



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UNITED STATES PATENT OFFICE.

AUGUSTO BONTEMPI, OF NEW YORK, N. Y.

SCULPTURING-MACHINE.

No. 871,668.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed November 19, 1904. Serial No. 233,525.

To all whom it may concern:

Be it known that I, AUGUSTO BONTEMPI, a subject of the King of Italy, residing in New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sculpturing - Machines, of which the following is a specification.

This invention relates to sculpturing machines and it has for an object to provide a portable machine adapted to be supported by and attached to the material to be carved so that the machine partakes of the movement or vibrations of the material being carved, thereby preventing any variation of the relation between the material and the cutting tool.

Another object is to provide a machine which is adapted for architectural and decorative work on buildings.

Another object is to provide a machine adapted for use in any place in which the conveniences of the workshop are not available.

Another object is to provide a machine having a tool adapted for undercut work, the tool being adjustable to make an undercut in various directions.

Other objects and advantages will appear from the following description and will be more particularly pointed out in the appended claims.

In the drawings: Figure 1 is a top plan view of an embodiment of my invention; Fig. 2 is a bottom plan view of the embodiment shown in Fig. 1; Fig. 3 is an end view in the direction of the arrow 3, Fig. 1, the tool and tool operating shaft being removed; Fig. 4 is an end view in the direction of the arrow 4, Fig. 1; Fig. 5 is a side view in the direction of arrow 5, Fig. 1, another embodiment of the tool and tracer being shown; Fig. 6 is a vertical section on the line 6—6, Fig. 1, showing a pneumatic hammer as the tool; Figs. 7 and 8 are vertical sections of two forms of the drill tool for use with my machine; Figs. 9 and 10 are respectively an elevation and a vertical section of the carriage with a drill tool operating shaft mounted thereon; Figs. 11 and 12 are respectively a bottom plan and side elevation of the drill tool operating shaft connected to a compressed air motor.

Referring more particularly to the drawings, 14 indicates a rectangular marginal frame composed of members 14^a, 14^b, 14^c,

and 14^d, and adapted to be clamped to the block to be carved or to any other support preferably in an inclined or vertical position. On opposite sides of the frame 14 are provided tracks 15 on which travels a carriage 16. This carriage is propelled by a pair of oppositely threaded screw shafts 17 journaled on the members 14^a and 14^c of the work frame and working through nuts 16^a and 16^b on opposite ends of the carriage 16.

These screw shafts 17 have the same pitch and are simultaneously rotated in opposite directions by means of a shaft 18 which is rotated by a removable crank handle 19 adapted for connection with either end thereof, and communicates motion to the shaft 17, through bevel gears 18^a, 18^b, on the shaft 18 and bevel gears 17^a and 17^b on the shafts 17, thereby moving the carriage 16 longitudinally of the frame 14. The longitudinally movable carriage 16 is provided with tracks 20^a and 20^b, near its top and near its bottom respectively, on which a carriage 20 is adapted to move transversely of the frame 14. This carriage 20 is likewise propelled by a screw shaft 21 which is journaled in the carriage 16, works through a nut 22 on the carriage 20 and is rotated by a removable crank handle 23 adapted for connection with either end thereof. On the transversely moving carriage 20, are provided tracks 24^a and 24^b on which move perpendicularly of the frame 14, a tool carriage 24. This tool carriage 24 is provided with an extension 25 carrying a plurality of studs 26, while on the carriage is pivoted at 27 a controlling lever 28 which is provided with a slot 29 into which any one of the studs 26 is adapted to fit, and thereby control the tool carriage through the medium of the lever 28. The fulcrum of the lever 28 may be changed to 27^a.

The tool carriage 24 in Figs. 1, 2, 5, 9, 10, 11 and 12, has removably secured thereto a casing 30^a in which is journaled a shaft 30 which has a clutch face 31 at one end thereof and is rotated by any suitable means. In Figs. 11 and 12, I have shown one means for rotating the shaft 30, which means comprises a compressed air motor 32 of any suitable type carried by the transversely moving carriage 20 and having a gear 33 keyed to its shaft 34 that is supported in a frame 35. In the frame 35 is also journaled a gear 36 in mesh with the gear 33 and surrounding the shaft 30 which has a longitudinal movement therethrough but is compelled to turn there-

with by means of the spline 30^b carried by the shaft 30.

Secured to the casing 30^a is a tool of any suitable form, the two forms shown in Figs. 7 and 8 being respectively adapted for undercut work and straight work. Either tool may be secured to the casing 30^a by means of a flange 37 on the casing and a flange 38 on the coupling casing. Further, each tool is provided with a rotary drill carrying at its upper end a clutch face 39 to inter-engage with the clutch face 31 on the shaft 30. The drill shown in Fig. 7 is formed of two members 40 and 41 connected together by a universal joint 42, incased in upper casing member 38^b and lower casing member 38^c at an angle thereto, while the drill shown in Fig. 8 is composed of one member 43 held against axial movement within the tool casing. As shown in Fig. 7, the flange 38 is provided with a plurality of bolt holes by means of which the coupling casing may be secured to the casing 30^a by means of flange 37. By this means, the lower member 41 of the tool, while being held at a given angle to the upper member 40, can be caused to extend out of line in any one of a plurality of directions. In Fig. 6, the casing 30^a contains a pneumatic hammer 44 of any known construction. Extending from the tool carriage 24 is a tracer arm which comprises a number of converging rods 45 connected together at their free ends by a head 46 in which is adjustably mounted a T-shaped adjusting member 47 on which is mounted an adjustable tracer member 48^a carrying a tracer 48 which may be straight as shown in Fig. 2 or bent for undercut work as shown in Fig. 5. A rectangular frame 49 extends from one side of the main marginal frame 14 and serves as a frame for the model or a part of it. Mounted upon the several sides of the frame 49, are a number of clamps (one only being shown) for supporting the model in the same relative position to the frame 49 that the finished image thereof is to occupy relative to the frame 14.

Mounted upon one side of the frame 49 (see Figs. 2, 3 and 5) and in sliding relation therewith is a clamping bracket 61 which may be securely held at any desired position to the side member of the frame by the winged set screw 62. Sliding in bracket 61 are the bars 50 and 58 (see Figs. 2 and 3) which may be held against sliding by means of the winged set screws 63 and 57. Carried in a clamping device upon the outer end of bar 50, is the contact gage 52 which may be secured in rigid connection with the bar by means of a winged nut 60. From the bar 58 at its extremity, is suspended an arm 51 through the medium of an adjustable clamp 59 (seen best in Figs. 3 and 5). Upon the outer end of the arm 51 is an elastic ball 53. These bar arms 51 support the model in any

desired position by means of a gage-support 52 acting in conjunction with the elastic ball 53 which is pressed against the model by a spring 51^a acting on the arm 51.

Having cut out a block of marble or other material into a rough mass of sufficient size to get the desired figure or figures, three cardinal points upon the surface of the model which is to be copied are arbitrarily chosen and similar points located beneath the surface of the rough block to correspond exactly therewith. Each of the points so located will be the vertex of a hollow cone and will lie in the surface of the work when finished. It is by means of these points that the frame 14 of the sculpturing machine is connected to the block to be shaped and for this purpose the said frame carries a pair of transversely shiftable bars 54 provided with slots 55 in which move conical feet 56. These feet are made longer or shorter according to the requirements of the work. When they have been adjusted to agree with the three conical holes into which they are to set, the frame 14 is bound to the block or slab by ropes, chains or other similar means. The model having been correctly positioned within the frame 49, tracer 48 and the cutting tool are set in register with each other so that as the tracer passes from point to point within the working area of the model, the tool is traveling over a similar area of the working area of the block.

The workman standing in front of the machine controls the longitudinally movable carriage 16, through the shaft 18, the transversely movable carriage through the shaft 21, and the drill carriage 24 through the lever 28. The rotary drill is used for soft material while the pneumatic hammer is employed when the material is very hard and flinty. When the work of one working area is completed, the carriage is passed to another area, this being easily done by reason of the well balanced distribution of the weight in the carriage.

In undercut work, the cutter shown in Fig. 7 is employed, the position shown in Fig. 7 securing a cut of 45° to the right, but if cuts in other directions are desired, the flange 38 is turned relative to the flange 37, the openings 38^a being of a sufficient number to permit these various adjustments.

The machine is adapted for large or small work. Where employed for large work, the balls 53 are dispensed with and the model frame is secured to the model by any suitable means.

The embodiment herein shown is for the purpose of illustration only and therefore I desire it to be understood that, within the scope of the appended claims, I may make various changes without departing from the spirit or sacrificing any of the advantages of the invention.

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

1. In a sculpturing machine, the combination of the main marginal frame, a tool-carriage slidable on said frame in straight lines longitudinally, transversely and perpendicularly to the main frame, a tool-holder carried by the tool-carriage, a tracer-arm extending therefrom and a tracer mounted in the outer end of the tracer arm in such manner as to be constrained in its movements to an exact reproduction of the movements of the tool-holder.

2. In a sculpturing machine, the combination of a frame, a tool holder adjustable on the frame, a tracer connected with the tool-holder so as to move in exact parallelism therewith, a means for feeding the said tool-holder in the plane of and perpendicular to the frame and a plurality of feet also on the frame whereby the frame is supported on the work.

3. In a sculpturing machine, the combination of a frame, a sculpturing tool adjustable on the frame, a tracer also on the frame to reproduce in outline the movements of the tool-holder, and screw operated means for feeding the said tool on the machine and a plurality of feet for supporting the frame on the work.

4. In a sculpturing machine, the combination of a frame, a tool holder, mechanically operated means for feeding the tool holder on the machine and a three pointed supporting device for supporting the machine on the work in a certain definite relation with the surface of the finished sculpture.

5. In a sculpturing machine, the combination of a frame, a tool holder having screw feed thereon, and a plurality of conical feet shiftable in straight lines on the frame whereby the frame may be supported on the work in such a manner as to have the said conical feet in contact with the finished sculpture.

6. In a machine of the class described, the combination with the main frame, of a pair of slotted parallel bars shiftable thereon, a plurality of conical feet shiftable in the slots of the bars, and a sculpturing tool adjustable on said frame.

7. In a sculpturing machine, the combination with the marginal frame, of means for supporting the frame on the work over a working area, a tool holder and a tracer movable on the marginal frame and means for causing the tool holder to travel through an exact reproduction of the path traveled by the tracer.

8. In a sculpturing machine, the combination with the marginal frame, of shiftable feet carried by the frame to support the machine on the work, a tool-holder, a tracer and means for causing the tool holder and the tracer to move through parallel courses.

9. In a sculpturing machine, the combination with the main frame, of means for supporting the frame on the work, a sculpturing tool movable on the main frame, a model frame supported by the main frame, and a tracer for the model movable with the sculpturing tool.

10. In a sculpturing machine, the combination with the main frame, of feet for supporting the frame on the work, a sculpturing tool movable on the work frame, a model frame supported by the main frame, and a tracer movable with the sculpturing tool.

11. In a sculpturing machine, the combination with the frame, of an angular tool holder, within which the tool can be actuated, a tracer attached to the angular tool-holder so as to be moved together therewith and means whereby the said angular tool-holder may be rotatably adjusted on the frame.

12. In a machine of the class described, the combination with the frame, of a tool comprising two members adjustable angularly each to each, supporting means therefor for holding the said members at a constant angle with each other and a further means for adjusting the said supporting means about one of the said tool-members as an axis.

13. In combination with a machine of the class described, a tool comprising two members, a universal coupling uniting said members and a hollow tool-supporting attachment adjustable on the machine, wherein the tool is rotated while one of said constituent members is maintained at a constant angle to the other in any desired direction therefrom during the operation of the machine.

14. In a machine of the class described, the combination with the main frame, of a model frame arranged at one end thereof and rigidly secured thereto, a sculpturing tool movable in straight lines longitudinally and transversely of and perpendicularly to the main frame, and a tracer carried with the tool and positioned over the model frame.

15. In a machine of the class described, the combination with the marginal frame and the sculpturing tool, of a tracer movable therewith, a model frame, and a gage support adjustably mounted on the model frame.

16. In a machine of the class described, the combination with the carving mechanism, of a tracer carried thereby, a model frame connected therewith, a plurality of model-engaging gage supports shiftable on the model frame, and an elastic ball support also shiftable on the model frame.

17. In a machine of the class described, the combination with the carving mechanism, of a tracer carried thereby, a model frame connected therewith, an adjustable clamp carried by said model frame, the said clamp comprising two arms having adjustable gage

supports on one arm and an elastic ball on the other.

18. In a sculpturing machine, a main frame carrying feet, a tool adjustable to any position within the working area, a tracer moving in parallelism with the tool, and a model frame carrying the model supporting gage supports.

19. In a sculpturing machine, a main frame, having mechanism for supporting it upon the material to be carved, a model frame, a tool carried by the main frame and movable thereon, and a tracer moving over a path parallel to that of the tool.

20. In a sculpturing machine, a frame, means carried by the frame, for supporting it on a work piece in known relation to the surface of the finished form thereof, a tool movable on the frame to act upon the work piece upon which the frame is supported and a tracer moving with the tool.

21. In a sculpturing machine, a frame adapted for direct attachment to the material to be carved, a carving device carried by the frame, and having a tracer connected therewith to move in the same direction, and means for feeding the said carving device and tracer relatively to said frame through any path in space.

22. In a sculpturing machine, a marginal frame for bearing against the work, a tool-holder movable on and through the frame to

act upon a work piece upon which the frame is supported, an elongated frame support on the tool-holder, and a tracer attached to the end of the elongated frame.

23. In a sculpturing machine, a frame having a plurality of feet slidable thereon and adapted to bear against the material to be carved and to support the frame thereon, a sculpturing tool, a tracer, attached thereto to move in the same direction, and a screw feed mechanism carried by the frame whereby the sculpturing tool and the tracer may be moved on the frame to cover any desired part of the working areas of the work and model respectively.

24. In a sculpturing machine, a frame having a plurality of feet slidable thereon and adapted to bear against the material to be carved and to support the frame thereon, a sculpturing tool, a tracer attached thereto to move in the same direction, and means carried by the frame, whereby the sculpturing tool and the tracer may be guided on the frame to cover any desired part of the working areas of the work and model respectively.

The foregoing specification signed at the city of New York this sixteenth day of November, 1904.

AUGUSTO BONTEMPI.

In presence of—

DAVID THORNTON,
WILLIAM R. RUST.