

F. H. KOERNER.

APPARATUS OR MACHINE FOR GRINDING AND POLISHING SKATE RUNNERS.

APPLICATION FILED OCT. 5, 1909.

951,401.

Patented Mar. 8, 1910.

4 SHEETS—SHEET 1.

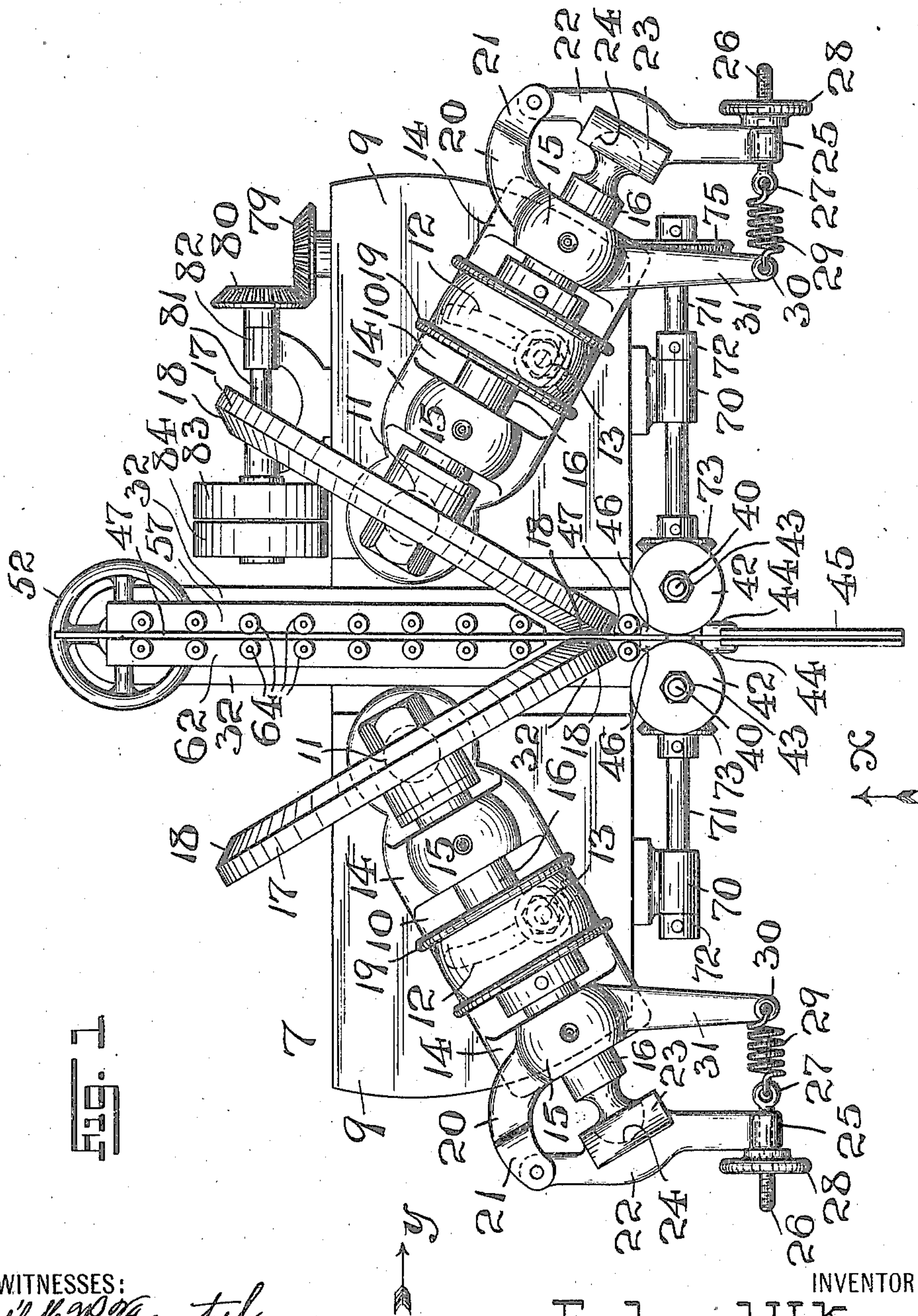


Fig. 1

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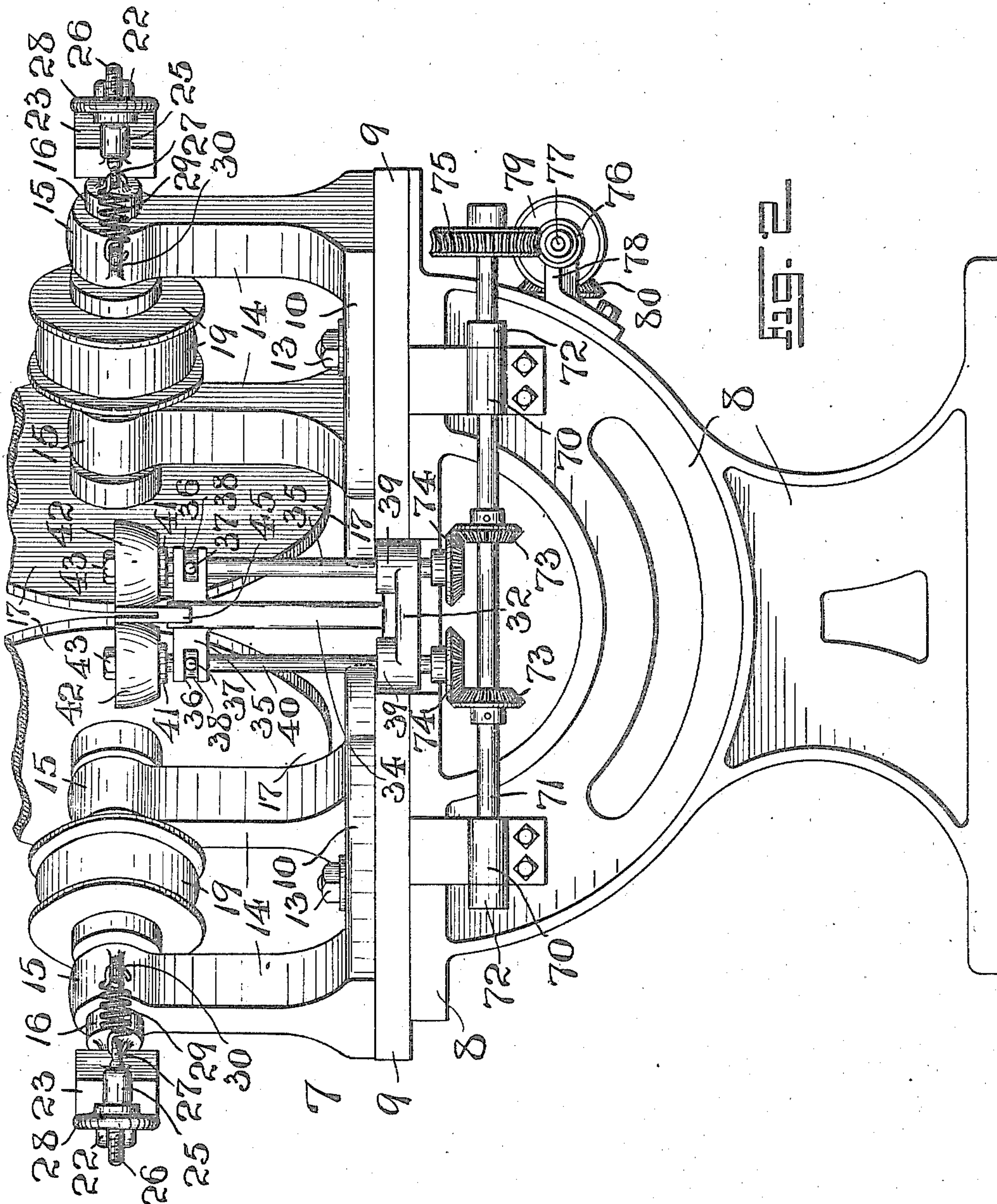
Fraentzel and Richards,
ATTORNEYS.

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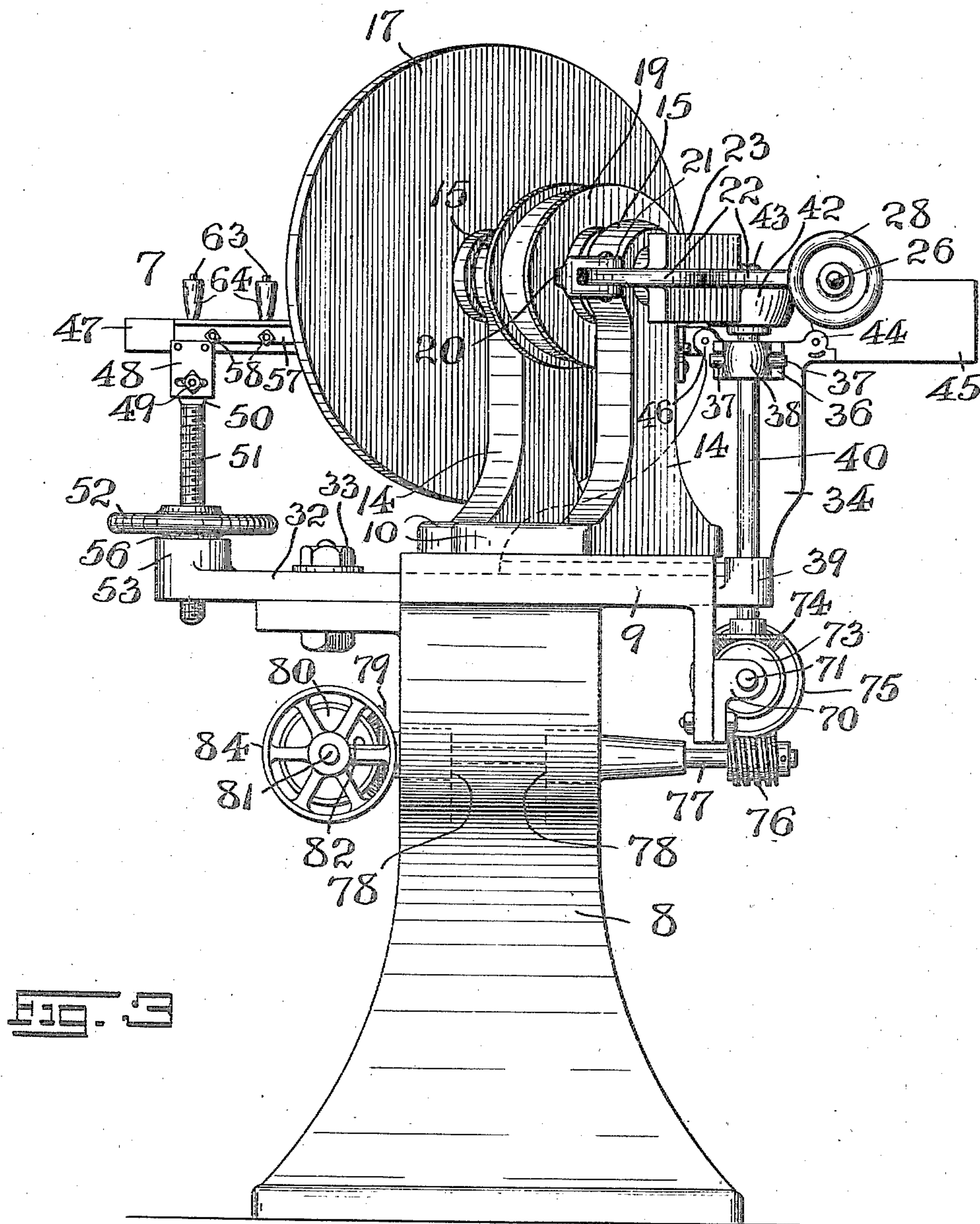


Fig. 3

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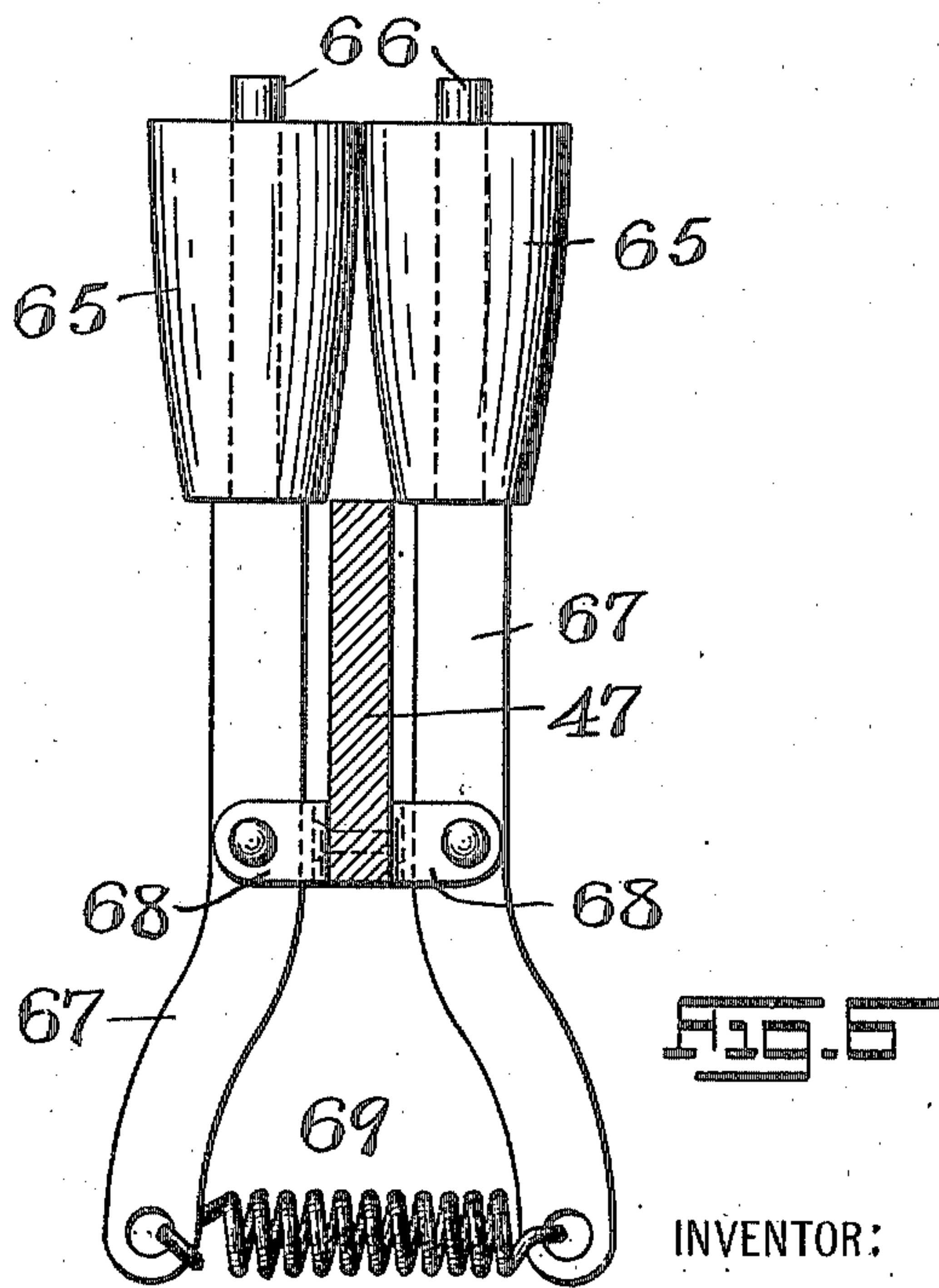
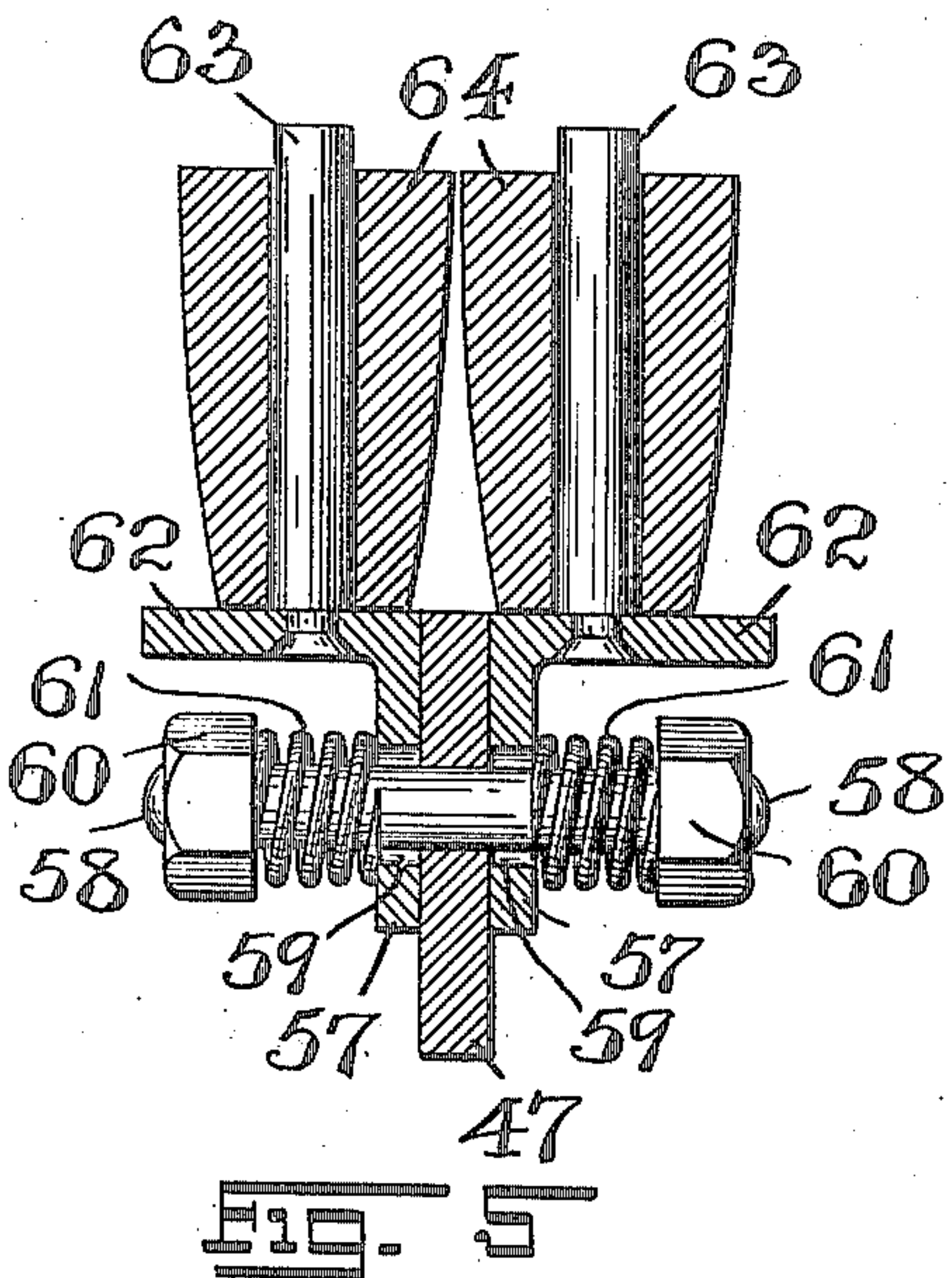
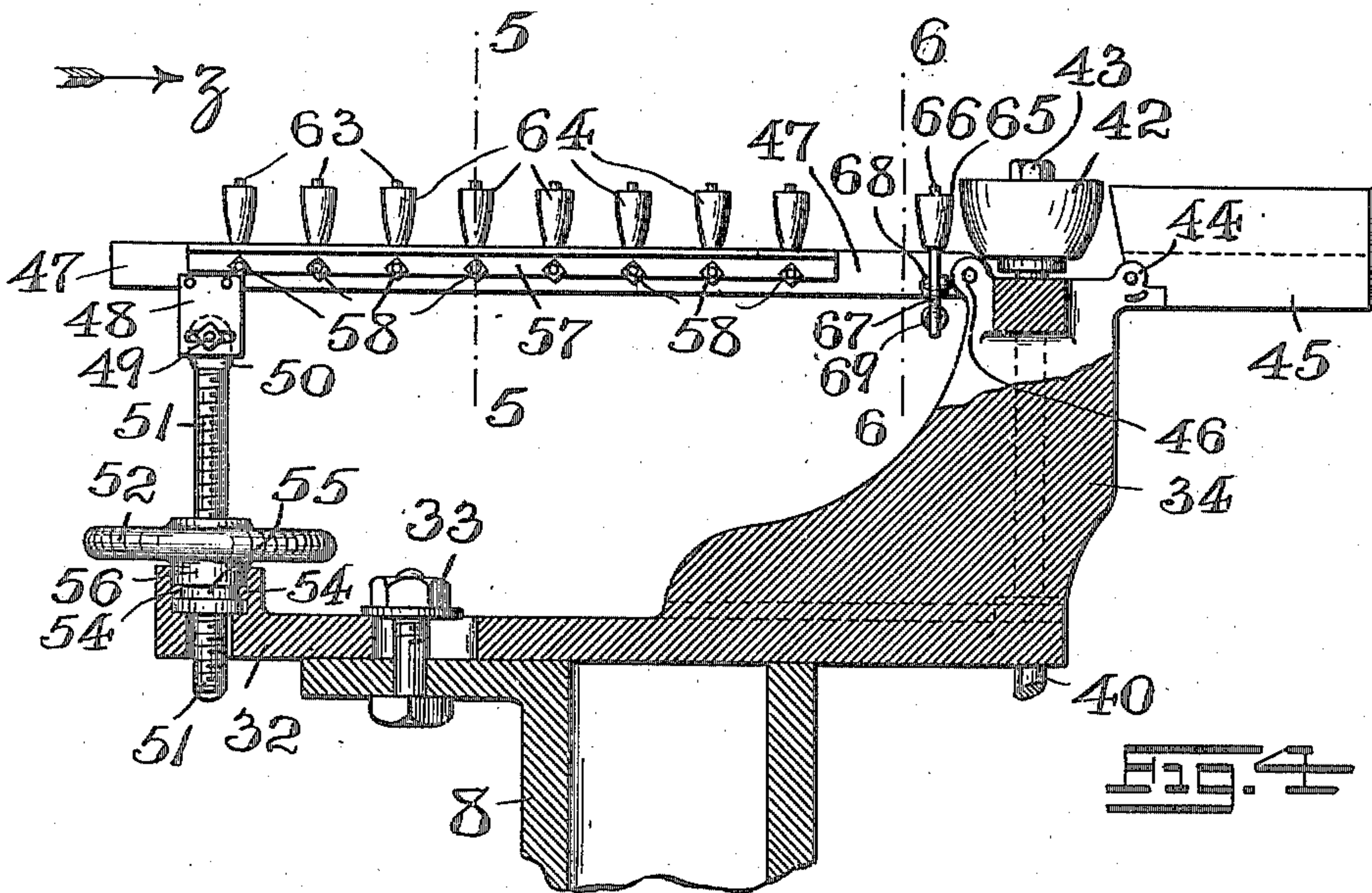
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

FERDINAND H. KOERNER, OF IRVINGTON, NEW JERSEY, ASSIGNOR OF ONE-HALF TO ANNA LOWENTRAUT.

APPARATUS OR MACHINE FOR GRINDING AND POLISHING SKATE-RUNNERS.

951,401.

Specification of Letters Patent.

Patented Mar. 8, 1910.

Application filed October 5, 1909. Serial No. 521,151.

To all whom it may concern:

Be it known that I, FERDINAND H. KOERNER, a citizen of the United States, residing at Irvington, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Apparatus or Machines for Grinding and Polishing Skate-Runners; and I do hereby 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 characters of reference marked thereon, which form a part of this specification.

The present invention has reference, generally, to improvements in grinding and polishing machinery; and the present invention refers, more particularly, to a novel construction of machine which is particularly adapted for the grinding, polishing and finishing of skate-runners, and all similar classes of work.

The invention has for its principal object to provide a simple and easily adjusted arrangement of grinding elements provided with means for regulating and controlling the bearing-pressure of said grinding elements upon the work operated upon, so that the work, such as skate-runners and the like, may be properly ground, polished and finished without danger of "burning" or otherwise injuring the same during the performance of said operation.

The invention has for its further object the provision of a novel and simple means for receiving and conveying the work, in a proper position to be operated upon, to and past the grinding elements of the machine, so that the latter may perform their functions upon the work as it is fed through the machine.

Other objects of the present invention not at this time more particularly enumerated will be clearly understood from the following detailed description of my present invention.

With these various objects of my present invention in view, the said invention consists, primarily, in the novel construction of machine for grinding, polishing and finishing skate-runners, and similar classes of work, hereinafter set forth; and, furthermore, this invention consists in the several

novel arrangements and combinations of various devices and parts, as well as in the details of the construction thereof, all of which will be hereinafter more fully described and then finally embodied in the clauses of the claims which are appended to and which form an essential part of this specification.

The invention is clearly illustrated in the accompanying drawings, in which:—

Figure 1 is a plan view of the novel construction of grinding and polishing machine embodying the principles of my present invention. Fig. 2 is a side elevation of the same, looking in the direction of the arrow *x* in said Fig. 1; and Fig. 3 is an end elevation of the same, looking in the direction of the arrow *y* in said Fig. 1. Fig. 4 is a detail view, partly in section and partly in elevation, of the conveying and feeding mechanism adapted to carry the work to be operated upon between the grinding elements; Fig. 5 is a detail cross section, taken on line 5—5 in said Fig. 4; and Fig. 6 is another detail cross section, taken on line 6—6 also in said Fig. 4, both of said cross sections being viewed in the direction of the arrow *z* in said Fig. 4.

Similar characters of reference are employed in all of the hereinabove described views, to indicate corresponding parts.

Referring now to the several figures of the accompanying drawings, the reference-character 7 indicates the complete machine for grinding and polishing, showing one embodiment of the principles of my present invention, the same comprising a suitably designed base or standard 8 provided at each end with bed-plates 9. Pivotaly mounted upon each bed-plate 9 is a carrier-plate 10 the same being provided with a downwardly projecting stud 11 which is adapted to project into a suitable opening therefor in said bed-plate 9. The said carrier-plate 10 swings in a horizontal plane upon said bed-plate 9 with its stud 11 as a fulcrum. The means for securing said carrier-plate 10 in any adjusted position upon said bed-plate 9 comprises a curved slot 12 with which said bed-plate 9 is provided, and a nut and bolt 13 which is adapted to pass through said slot 12 and said carrier-plate 10, whereby the latter may be clamped in its adjusted position. Extending upwardly from each of said carrier-plates 10 are a pair of vertical standards 14, the upper ends

of which are provided with bearing-blocks 15, and journaled in the bearing-blocks 15 of said standards 14 is a shaft 16. Secured to the inner end of said shaft 16, in any suitable manner, is a grinding-wheel 17, the same being made of any desirable abrasive material. Said grinding-wheel 17 may be provided with a chamfered periphery 18, as shown; or, the periphery thereof may be rounded or otherwise formed to suit the character of work to be performed thereby. It will also be clearly evident, that any well known type of polishing wheel may be substituted for the grinding-wheel which is usually made of emery, carborundum, or similar material. Secured upon said shaft 16, preferably at a point midway between the standards 14, is a driving-pulley 19, by means of which power may be transmitted to said shaft 16, that the same and its grinding-wheel 17 may be rotated. Extending outwardly from and preferably forming an integral part of said bearing-block 15 of the rear or outer of the two standards 14 is an arm 20 which is provided at its free end with a suitably forked member 21. Pivotal-ly secured within this forked member 21 is one end of a lever or arm 22 the horizontal plane which presses through the longitudinal axis of said lever or arm coinciding with the horizontal plane which passes through the longitudinal axis of the said shaft 16. The said lever or arm 22 is also provided at a point between its fulcrum and its free end with a thrust-bearing or block 23, the same being provided with a bearing or seat adapted to receive a semi-spherical or other suitable pivot-member 24 with which the outer end of said shaft 16 is provided. The free end of said lever or arm 22 is provided with an eye-member 25 in which is slidably arranged the screw-threaded shank 26 of an eye-bolt 27, and arranged upon said shank 26 is an adjusting nut 28, by means of which the eye-bolt is moved through said eye-member 25. A coiled spring 29, of the pull type, is secured at one of its ends to the eye of said eye-bolt 27 and by means of its other end to an eyelet 30 formed in a stationary arm 31 which projects from and preferably forms an integral part of said bearing-block 15 of the rear or outer one of the two standards 14. The tension of the said spring 29 may be increased or diminished, by means of said screw 26 and nut 28, whereby the pressure of the thrust-bearing or block 23 upon the end of the shaft 16 will determine the pressure of the grinding wheel 17 upon the work to be performed.

This arrangement assures the proper abrasive pressure of the said grinding-wheels 17 upon the work to be ground, polished or finished and eliminates the danger of "burning" or otherwise injuring said

work. The angle of approach of said grinding-wheels 17 to the work to be performed is readily adjustable and regulated to the needs of the work in hand by swinging said carrier-plates 10 upon their studs or fulcrums 11, as will be clearly evident from an inspection of Fig. 1 of the accompanying drawings. Secured in a centrally located position upon said base or standard 8, and adapted to extend transversely across the machine is a supporting-member 32, the same being held or secured in its proper position by means of a nut and bolt 33, and extending upwardly from said supporting member 32 is a bracket or member 34. The upper end of said supporting member is provided with a pair of outwardly projecting bearing-supports 35, said bearing-supports being formed with cutaway or slotted portions 36. Arranged within said cutaway or slotted portions 36 are the journals or studs 37 of a bearing block 38. The said supporting-member 32 is furthermore provided with bearing-portions 39, and mounted in said bearing-portions 39 and extending upwardly through said bearing-blocks 38 are a pair of vertical shafts 40, said shafts being provided at their upper ends with shoulders 41. Secured upon the upper ends of said shafts, so as to rest upon said shoulders 41, are gripping rollers 42, the same being rigidly secured upon said shafts 40 by means of the nuts 43, so as to rotate with said shafts. The said bracket or member 34 is furthermore provided at its upper and outer end with suitable ears or lugs 44 to which is pivotally secured a receiving-member 45. In like manner, said bracket-member 34 is provided at its upper and inner end with ears or lugs 46 to which is pivotally secured one end of a supporting-bar 47. The other or outer end of said supporting bar 47 is provided with a pair of slotted link-plates 48 which are rigidly secured to said plates. Pivotal-ly secured between said link-plates 48, by means of a bolt and nut 49, is the tongue-like end 50 of an adjusting screw 51. The said adjusting-screw 51 is operated to raise and lower said supporting-bar 47 and bring the same into proper operative relation with the grinding elements of the machine. To accomplish this, there is arranged upon this adjusting screw 51 a hand-wheel or nut 52 which, when revolved, is adapted to cause either an ascension or descension of the said adjusting screw, as will be clearly evident. The said hand-wheel or nut 52 is retained in a fixed or stationary position, with relation to the machine, by means of a bearing-member 53 with which said supporting member 32 is provided, said bearing-member being formed with an inner annular rib 54 which properly engages a correspondingly formed and placed channel or groove 55 which is formed

in the hub 56 of said hand-wheel or nut 52. The said supporting bar 47 previously mentioned is provided with means for retaining a skate-runner in proper position to be operated upon by the grinding elements of the machine, as the said skate-runner is pushed forward upon said supporting-bar 47 toward said grinding elements. This retaining means comprises a pair of longitudinally extending angle-irons or brackets 57 which project from the outer end of said supporting-bar 47 toward the grinding elements of said machine, one upon each side of said supporting-bar, substantially as shown. The said angle-irons or brackets 57 are retained in place by means of bolts 58 which pass transversely through said supporting bar 47 and through suitable slots 59 in said angle-irons or brackets 57. Nuts 60 are secured upon the free ends of said bolts 58 and a coiled spring 61 is arranged between each nut 60 and the side of a bracket or angle-iron 57. The horizontal flanges 62 of said brackets or angle irons 57 are provided with a plurality of upwardly extending studs 63, spaced at suitable intervals and so arranged, that the studs 63 of one angle-iron or bracket 57 are in transverse alinement with the stud 63 of the opposite angle-iron or bracket.

Rotatably mounted upon each stud 63 is a roller or member 64, the same being preferably made so as to taper slightly from top to bottom. The means of securing said angle-irons or brackets 57 upon said supporting-bar 47, above described, permits of a proper retention of the said rollers 64 in upright positions with their top edges practically tangent with their transverse neighbor, but when a skate-runner is introduced between the roller-members of the respective angle-irons or brackets 57, then the same are pushed apart against the tension of the coiled springs 61. This serves to create a proper holding engagement of said roller-members with the sides of the skate-runner, whereby the same is retained upright and in a proper position to be operated upon by the grinding elements of the machine.

After a skate-runner, or the like, has been operated upon by the grinding elements of the machine, it passes between a pair of guide-rollers 65 to and in contact with the gripping rollers 42 which pull the ground skate-runner forward and forces the same into the runner-receiver 45, whence the runner drops into a receptacle beneath or upon a belt-conveyer whereby it is removed or carried away, as desired. The said guide-rollers 65 are mounted upon the stud-members 66 of a pair of levers or arms 67 pivotally secured between ears or lugs 68 upon opposite sides of said skate-runner supporting-bar 47. Secured to and between the lower ends of said levers or arms 67 is a

coiled spring 69, said spring being arranged under tension between the said levers or arms, so as to push the lower ends thereof apart and consequently the rollers upon the upper end together until forced apart by the passing skate-runner. The said gripping-rollers 42 are revolved by means of their shafts 40, and the bearing-blocks 38 of which by means of their studs or journals being slidably arranged in the cutaway or slotted portions 36 of the bearing supports 35, provide a means for permitting a slight outward "spring" of the said vertical shafts 40 as the skate-runner passes between the gripping-rollers 42, thereby assuring a proper gripping engagement of the skate-runner by said gripping rollers 42, as will be clearly evident. The shafts 40 are driven by the following means:—Mounted in suitable bearing-brackets 70 is a longitudinally extending shaft 71, the same being retained in proper position by means of the collars 72. Suitably arranged and secured upon said shaft 71 are a pair of bevel-gears 73 respectively in mesh with bevel-gears 74 which are secured upon the lower end-portions of the respective shafts 40. Secured upon one end of said shaft 71 is a worm-wheel 75, the same meshing with a worm 76 suitably secured upon a transverse shaft 77 which is mounted in suitable bearing-brackets 78 secured upon one end of the standard or base 8. Secured upon the other end of said shaft 77 is a bevel-gear 79 which meshes with another bevel-gear 80 secured upon one end-portion of a shaft 81 rotatably mounted in a bracket-bearing 82, also secured to said standard or base 8, and suitably secured upon said shaft 81 is a fast or driving pulley 83 and a loose pulley 84, for driving and operating the various shafts and the gears herein-above mentioned.

The operation of the machine, the construction of which has thus been specifically set forth, will be clearly apparent from an inspection of the several figures of the accompanying drawings.

I am aware that changes may be made in the various arrangements and combinations of the several devices and parts, as well as in the details of construction thereof without departing from the scope of my present invention, as described in the foregoing specification and as defined in the claims which are appended thereto. Hence I do not limit my invention to the exact arrangements and combinations of the devices and parts as described in the said specification, nor do I confine myself to the exact details of the construction of the said parts, as illustrated in the accompanying drawings.

I claim:—

1. In a grinding and polishing machine, the combination with a base or standard, of a pair of carrier-plates pivotally mounted

thereupon so as to be swung in a horizontal plane, means for securing said carrier-plates in their adjusted positions, bearing-blocks supported upon said carrier-plates, shafts in said bearing-blocks, driving-pulleys secured, respectively, upon said shafts, a pair of oppositely facing grinding-wheels secured, respectively, upon the inner ends of said shafts, and means operating in connection with each of said shafts for regulating and adjusting the abrasive pressure of said grinding-wheels upon the work to be performed, comprising means for pivotally supporting a lever, a thrust-bearing carried by said lever, adapted to engage with the outer end of said shaft, and an adjustable tension device for controlling and regulating the pressure of said thrust-bearing upon said shaft, substantially as and for the purposes set forth.

2. In a grinding and polishing machine, the combination with a base or standard, of a pair of carrier-plates pivotally mounted thereupon so as to be swung in a horizontal plane, means for securing said carrier-plates in their adjusted positions, bearing-blocks supported upon said carrier-plates, shafts in said bearing-blocks, driving-pulleys secured, respectively, upon said shafts, a pair of oppositely facing grinding wheels secured, respectively, upon the inner ends of said shafts, and means operating in connection with each of said shafts for regulating and adjusting the abrasive pressure of said grinding-wheels upon the work to be performed, comprising an arm connected with one of said bearing-blocks, a lever pivotally secured to said arm, a thrust-bearing carried by said lever adapted to engage with the outer end of said shaft, a second outwardly extending arm connected with said bearing-block, a coiled spring connected with the free end thereof, and an adjustable means for connecting the other end of said spring with the free end of said lever to regulate and control the tension of said spring upon said lever and said thrust-bearing carried thereby, substantially as and for the purposes set forth.

3. In a grinding and polishing machine, the combination with a base or standard, of a pair of carrier-plates pivotally mounted thereupon so as to be swung in a horizontal plane, means for securing said carrier-plates in their adjusted positions, bearing-blocks supported upon said carrier-plates, shafts in said bearing-blocks, driving-pulleys secured, respectively, upon said shafts, a pair of oppositely facing grinding wheels secured, respectively, upon the inner ends of said shafts, and means operating in connection with each of said shafts for regulating and adjusting the abrasive pressure of said grinding-wheels upon the work to be performed, comprising an arm connected with

one of said bearing-blocks, a lever pivotally secured to said arm, a thrust-bearing carried by said lever adapted to engage with the outer end of said shaft, a second outwardly extending arm connected with said bearing-block, a coiled spring connected with the free end thereof, and an adjustable means for connecting the other end of said spring with the free end of said lever to regulate and control the tension of said spring upon said lever and said thrust bearing carried thereby, comprising a screw-shank connected with said spring and slidably connected with the free end of said lever, and an adjusting-nut upon said screw-shank, said nut bearing against the end of said lever, substantially as and for the purposes set forth.

4. In a grinding and polishing machine, the combination with a base or standard, of rotatably mounted grinding elements, means for conveying and guiding the work in proper position to said grinding elements, comprising a supporting member secured upon said base or standard, a bracket-member extending upwardly therefrom, a supporting bar pivotally connected with said bracket-member and extending outwardly between said grinding elements, a plurality of retaining roller-members, and means for operatively supporting the same in connection with said supporting-bar, substantially as and for the purposes set forth.

5. In a grinding and polishing machine, the combination with a base or standard, of rotatably mounted grinding elements, means for conveying and guiding the work in proper position to said grinding elements, comprising a supporting member secured upon said base or standard, a bracket-member extending upwardly therefrom, a supporting bar pivotally connected with said bracket-member and extending outwardly between said grinding elements, a plurality of retaining roller-members, means for operatively supporting the same in connection with said supporting-bar, and means for adjusting said supporting-bar with relation to said grinding element, substantially as and for the purposes set forth.

6. In a grinding and polishing machine, the combination with a base or standard, of rotatably mounted grinding elements, means for conveying and guiding the work in proper position to said grinding elements, comprising a supporting member secured upon said base-standard, a bracket-member extending upwardly therefrom, a supporting bar pivotally connected with said bracket-member and extending outwardly between said grinding elements, angle-irons upon each side of said supporting bar, a plurality of bolts extending through said supporting bar and the respective angle-irons, nuts on the free ends of said bolts, coiled

springs arranged between said nuts and said angle-irons, a plurality of vertical studs connected with the flange of said angle-irons, and rollers arranged upon said studs, substantially as and for the purposes set forth.

7. In a grinding and polishing machine, the combination with a base or standard, of rotatably mounted grinding elements, means for conveying and guiding the work in proper position to said grinding elements, comprising a supporting member secured upon said base-standard, a bracket-member extending upwardly therefrom, a supporting bar pivotally connected with said bracket-member and extending outwardly between said grinding elements, angle-irons upon each side of said supporting-bar, a plurality of bolts extending through said supporting bar and the respective angle-irons, nuts on the free ends of said bolts, coiled springs arranged between said nuts and said angle-irons, a plurality of vertical studs connected with the flange of said angle-irons, rollers arranged upon said studs, and means for adjusting said supporting bar with relation to said grinding elements, substantially as and for the purposes set forth.

8. In a grinding and polishing machine, the combination with a base or standard, of rotatably mounted grinding elements, means for conveying and guiding the work in proper position to said grinding elements, comprising a supporting member secured upon said base or standard, a bracket-member extending upwardly therefrom, a supporting bar pivotally connected with said bracket-member and extending outwardly between said grinding elements, angle-irons upon each side of said supporting bar, a plurality of bolts extending through said supporting bar and the respective angle-irons, nuts on the free ends of said bolts, coiled springs arranged between said nuts and said angle-irons, a plurality of vertical studs connected with the flanges of said angle-irons, rollers arranged upon said studs, and means for adjusting said supporting bar with relation to said grinding elements, comprising a screw-shank pivotally connected with the free end of said supporting-bar, a hand-wheel arranged upon said screw-shank, and means connected with said

supporting-member for retaining said hand-wheel in a stationary position with relation to said supporting-member, substantially as and for the purposes set forth.

9. In a grinding and polishing machine, the combination with a base or standard, of rotatably mounted grinding elements, means for conveying and guiding the work in proper position to said grinding elements, means for carrying the work away from said grinding elements when the same has been operated upon, said means comprising a pair of gripping rollers mounted on vertical shafts, a transmission means for rotating said vertical shafts, and a receiving-member, substantially as and for the purposes set forth.

10. In a grinding and polishing machine, the combination with a base or standard, of rotatably mounted grinding elements, means for conveying and guiding the work in proper position to said grinding elements, means for carrying the work away from said grinding elements when the same has been operated upon, said means comprising a supporting-member secured upon said base or standard, a bracket-member extending upwardly therefrom, bearing-supports extending outwardly from said bracket-member, said bearing-supports being provided with cutaway portions, bearing-blocks slidably arranged in said cutaway portions, bearings connected with said supporting-member, a pair of vertical shafts rotatably mounted in said bearing-blocks and said bearings connected with said supporting member, gripping rollers secured upon the upper end-portions of said vertical shafts, a system of shafting and gearing connected with said base or standard for rotating said vertical shafts and said gripping-rollers, and a receiving member pivotally connected with said bracket-member adjacent to said gripping-rollers, substantially as and for the purposes set forth.

In testimony, that I claim the invention set forth above I have hereunto set my hand this 30th day of September, 1909.

FERDINAND H. KOERNER.

Witnesses:

FREDK. C. FRAENTZEL,

FREDK. H. W. FRAENTZEL.