

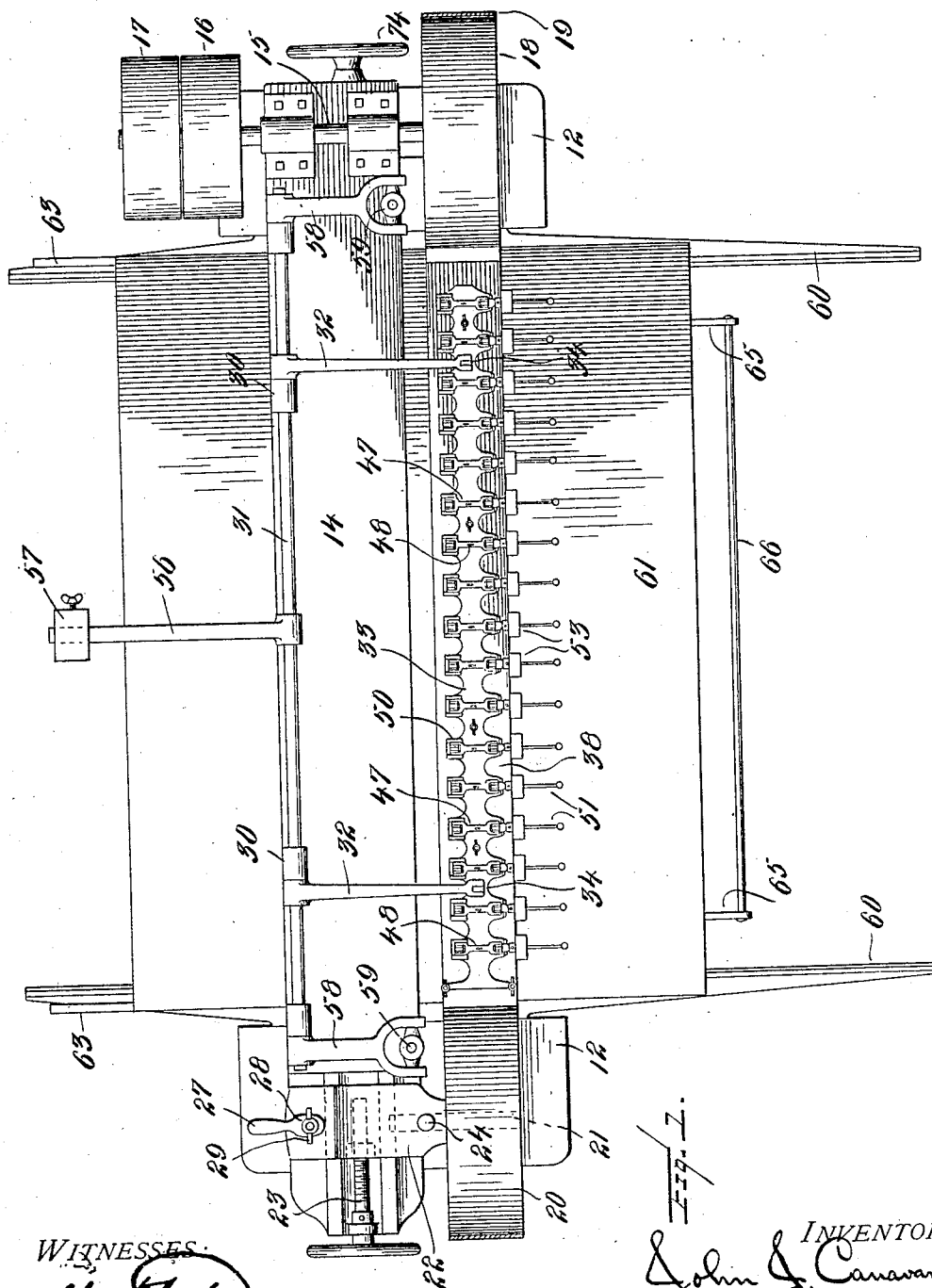
No. 882,665.

PATENTED MAR. 24, 1908.

J. J. CANAVAN.
ABRADING OR POLISHING MACHINE.

APPLICATION FILED MAY 22, 1907.

5 SHEETS—SHEET 1.



WITNESSES

H. F. Roy & Co.
W. H. Sweeney

BY

John J. Canavan
Calvert Calvert

Attorneys

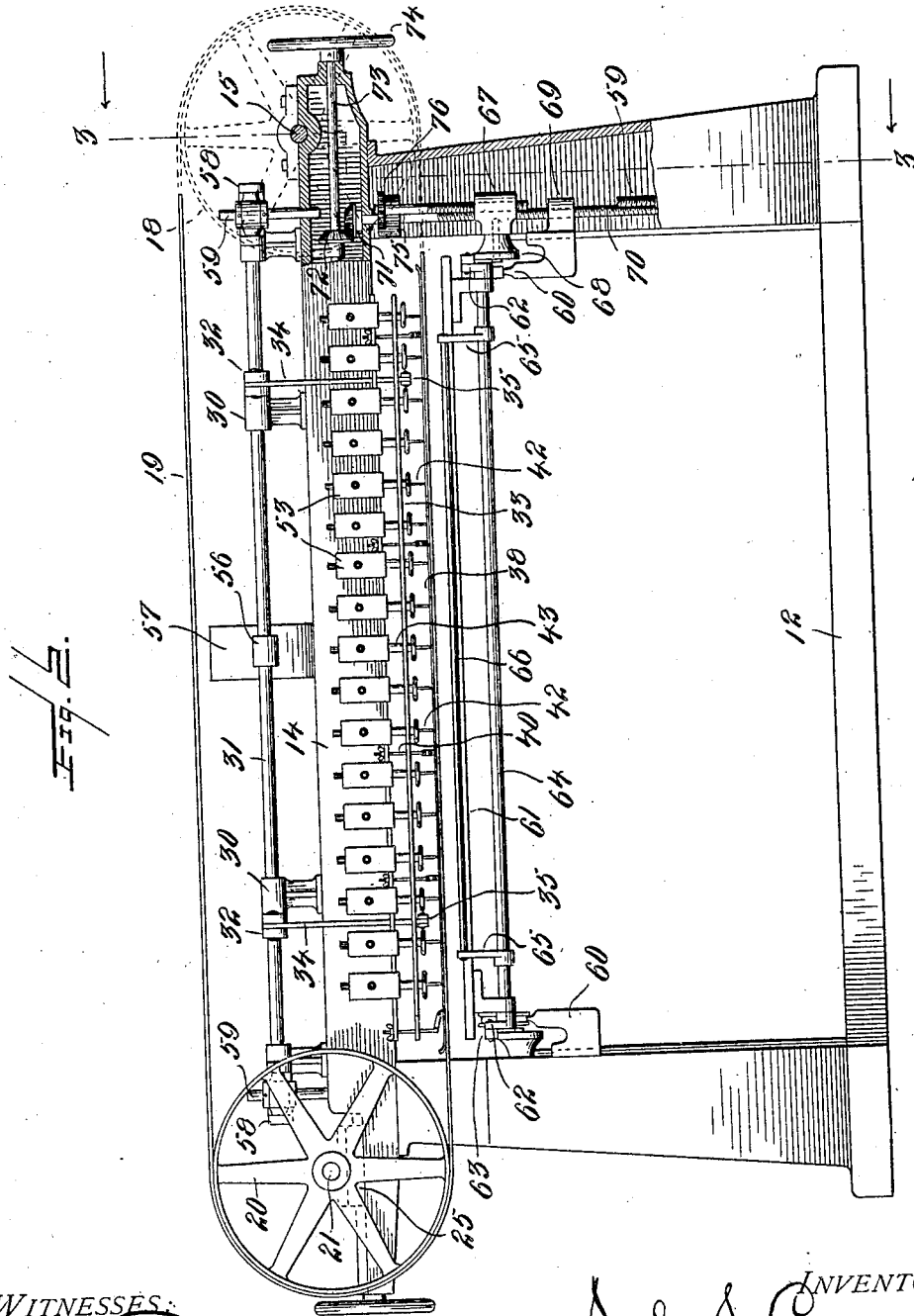
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WITNESSES:

H. F. Roy
C. M. Sweeney

BY

INVENTOR
John J. Canavan
Calvin Calvert

Attorney's

No. 882,665.

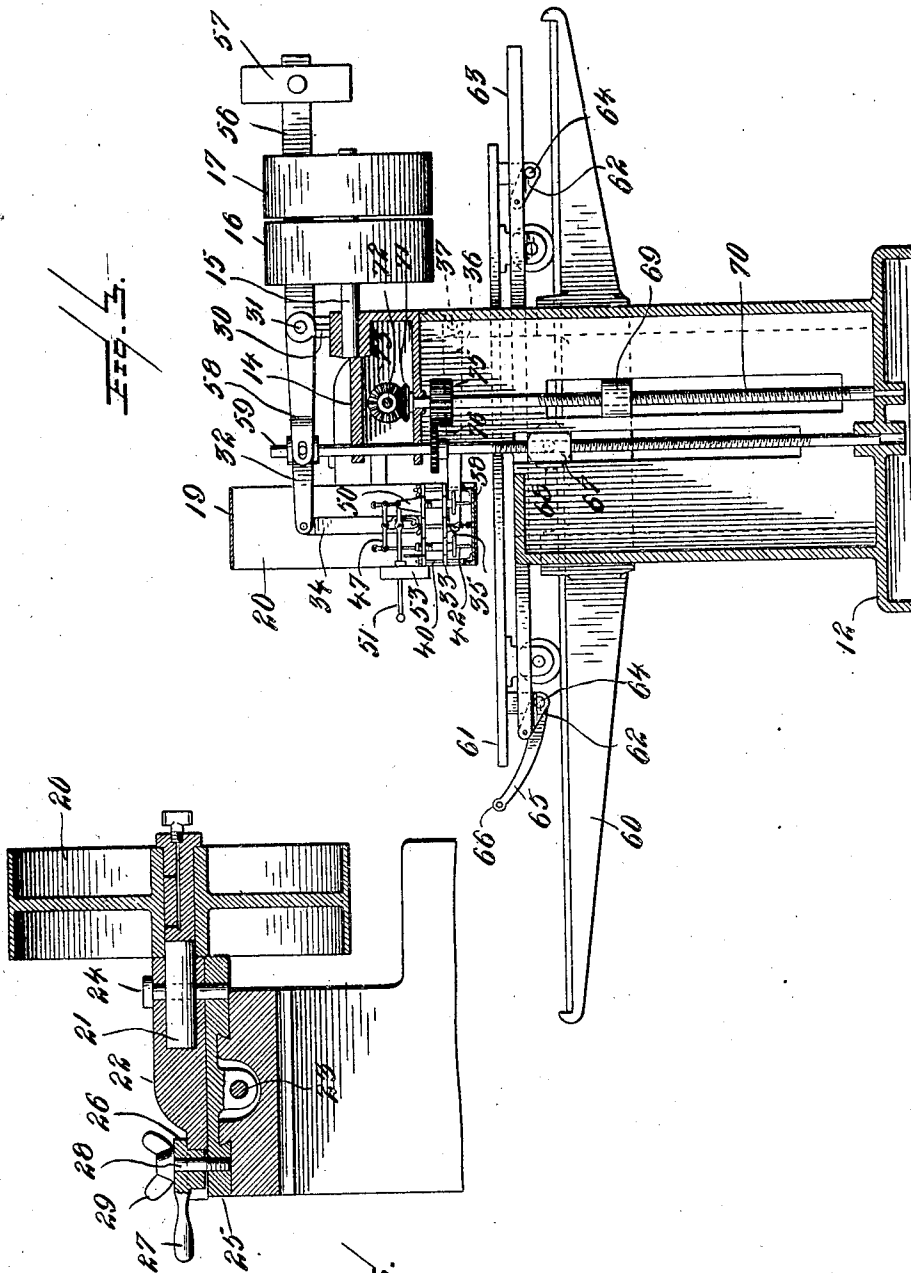
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WITNESSES:

H. F. Roy & Co.
C. M. Sweeney

BY

INVENTOR
John J. Canavan
Calvin Calvert

Attorneys.

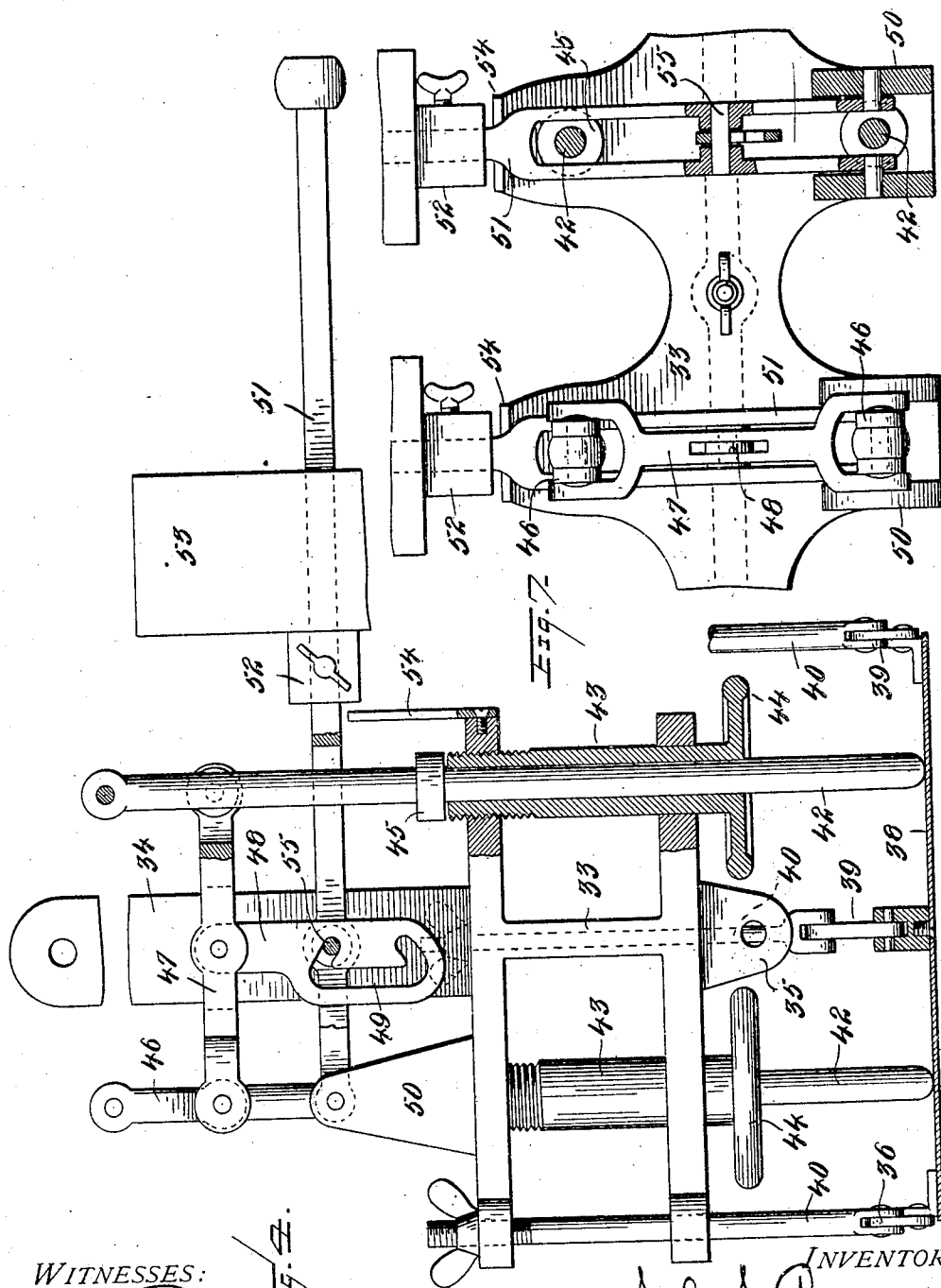
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WITNESSES:

Wm. F. Roy
C. M. Sweeney

BY

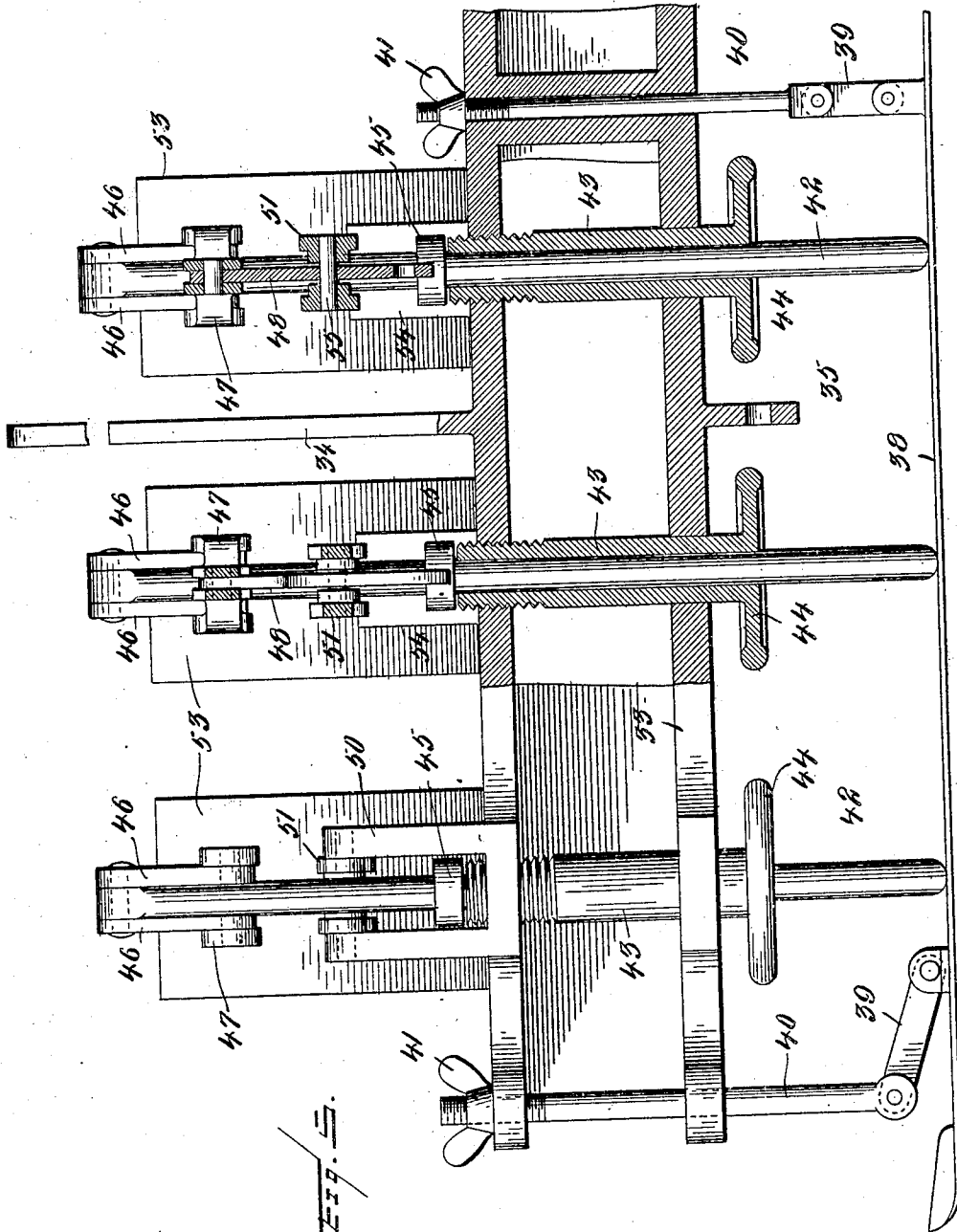
John J. Canavan
Calvin Calvert

Attorneys

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5 SHEETS-SHEET 5.



WITNESSES:

Wm. F. Roy & Co.
Wm. F. Roy

BY

INVENTOR
John J. Canavan
Calvin Calvert

Attorneys

UNITED STATES PATENT OFFICE.

JOHN J. CANAVAN, OF BROOKLYN, NEW YORK.

ABRADING OR POLISHING MACHINE.

No. 882,665.

Specification of Letters Patent.

Patented March 24, 1908.

Application filed May 22, 1907. Serial No. 375,019.

To all whom it may concern:

Be it known that I, JOHN J. CANAVAN, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented or discovered certain new and useful Improvements in Abrading or Polishing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

The present invention relates to belt sanding machines of the type shown in the patent to De Laski T. Clemons, No. 818,518, dated April 24, 1906, in which an endless sand belt is given a rapid continuous movement over the work to dress and finish the same, suitable belt guide and pressure appliances being provided to bring the belt into contact with the work. In machines of this type means are provided for bringing the sand belt or belts into contact with the work so as to maintain either a uniform pressure of the sand belt upon the work to be finished or to vary the pressure along the belt at the will of the operative in order that any low places in the work may be effectively reached by the belt and properly finished. In the machine shown by the patent above referred to these pressure devices are independently operated by fluid pressure under the control of the workman, whereby the results above referred to are effected.

One object of my invention is to improve the belt-guide pressure-devices in machines of the type above referred to, to simplify the operating means for the said devices, and to make the same reliable in operation, to the end that effective and uniform pressure of the belt upon the work may be secured and that a satisfactory variation in pressure on the belt may be quickly and conveniently effected. In the construction herewith shown I have provided gravity-controlled means for operating the pressure devices, said means preferably comprising a series of weighted levers, the pressures of which are independently transmitted to different points along the belt guide and the amounts of which pressures are readily adjustable.

Another object of my invention is to provide improved means for supporting and adjusting the work support relative to the sand belts and for preserving a proper relative position of the table, belts, and pressure mechanism.

Further objects of my invention are to

improve certain details of construction in machines of the character referred to, as will hereinafter appear.

While I shall hereinafter describe and have illustrated in the drawings a single belt sander it will be apparent that the invention is equally applicable in many respects to a sander having a plurality of belts, such, for example, as that shown in the patent above referred to, and such use and application of the novel features of construction will be understood as within the range of my invention.

It will furthermore be obvious that many features of my invention are useful not only in sanding machines, but would be equally applicable to machines designed for rubbing and polishing metal and other materials, in which are employed belts of felt or other fabric having applied thereto pumice stone or other polishing medium, and I therefore wish it to be understood that by the term "sand belt" hereinafter employed I intend to include any suitable polishing or abrading belt.

Referring to the drawings, accompanying and forming part of this specification, in which I have illustrated a preferred form of machine in which my invention may be embodied, Figure 1 is a plan view of the machine, the upper portion of the sand belt being broken away to show the pressure mechanism which is located between the upper and lower portions of said belt. Fig. 2 is a view in side elevation of the machine, parts of the supporting frame being broken away to illustrate the supports and the adjusting mechanism for the work-table and the pressure devices. Fig. 3 is a vertical transverse section of the machine, taken substantially on the line 3—3, Fig. 2. Fig. 4 is an end elevation, partly in section, on an enlarged scale, of the pressure mechanism. Fig. 5 is a side elevation, partly in section, of a portion of the same. Fig. 6 is a detail view of the adjusting device for alining the belt pulleys. Fig. 7 is a detail plan view, partly in section, of a portion of the pressure mechanism.

The machine herein shown is, in many respects, similar in its construction to the machine illustrated in Patent No. 818,518, above referred to, to which reference may be had for a more complete description of parts not herein fully described.

The frame of the machine is constructed with a suitable base 12 supporting two wide,

hollow pedestals in which the work-table elevating-screws and other adjusting devices are housed. To the top of each pedestal is bolted or otherwise secured a preferably hollow beam 14, upon one end of which is mounted, in suitable bearings, the main driving shaft 15, provided at one end with the usual fast and loose pulleys 16, 17, which are adapted to receive power from any suitable source. Mounted on said shaft 15 is the pulley 18 which drives the sand belt 19. At the opposite end of the machine is mounted a pulley 20, adapted to cooperate with the pulley 18 in supporting and driving the sand belt 19, said pulley 20 being carried by a stud shaft 21, attached to a plate 22, pivoted at 24 to a block 25 suitably mounted for movement longitudinally of the machine and provided with an adjusting device herein shown as a screw 23 for adjusting the tension of the belt 19.

In order to adjust the plate 22 about the pivot 24, for the purpose of alining the pulley 20 with respect to the pulley 18, I have provided an eccentric 26 (see Figs. 1 and 6) having an operating handle 27 and mounted upon a screw stud 28, tapped into the plate 25 and provided with a thumb nut 29 whereby said eccentric 26, and consequently the plate 22, may be locked in adjusted position.

Upon the top of the beam 14 are provided suitable bearing lugs 30 in which is journaled a rock-shaft 31, having fixed thereto forwardly extended arms 32, from the forward end of which arms 32 the belt guide and its cooperating pressure devices are supported. As above suggested this belt guide, with its pressure devices, will be herein described and illustrated in connection with a single belt sander, although it will be distinctly understood that this feature as well as the other novel features herein shown are equally applicable to a double belt sander.

The belt guide frame 33 is provided with suitable upwardly extending arms or members 34 by which it is supported from the arms 32, and with lugs 35 at the lower side thereof to which are connected pivoted arms 36 loosely mounted on a shaft 37, suitably secured in the frame of the machine. The arms 36 cooperate with the arms 32 to constitute a form of parallel motion device which serves to maintain the frame 33 in its proper upright position, whatever vertical position it may assume. The belt-guide proper 38 consists of a suitable strip of flexible and elastic material, preferably spring steel, secured to the frame 22 by suitable links 39 and rods 40, said rods 40 extending loosely through openings in the frame 33, whereby free upward movement of the guide 38 is permitted, and being provided with screw-threaded ends carrying nuts 41, for limiting the downward movement of the belt guide 38, whereby the normal position of said belt-

guide relative to the frame 33 may be adjusted. As shown in Fig. 5, the rods 40 and links 39 at the end of the belt guide 38 are so arranged as to permit the said belt guide to yield upwardly at these points in order to take up the pull of the belt, and to allow the matter to move up and down freely, whereby undue injury to the belt at its point of initial engagement with the belt guide is prevented.

The adjustable pressure devices for holding the belt guide in close engagement with the work will now be described.

Mounted in the frame 33 are pressure pins 42 slidably mounted in sleeves 43 tapped into said frame 33. The sleeves 43 are provided with suitable hand wheels 44, while the pins 42 are provided with collars or shoulders 45 adapted to engage the upper ends of the sleeves 43. It will thus be seen that by turning the hand wheels 44 the lower limits of movements of the pins 42 may be adjusted. The pressure pins 42 are arranged in pairs and are provided at their upper ends with links 46, and said links 46 of each pair are connected by bars 47. Pivotally connected to the center of each bar 47 is a link or latch 48 provided with the slot 49 of substantially the form shown in Fig. 4. On the frame 33 are provided a series of lugs 50 in which are pivotally mounted a series of arms or levers 51, equal in number to the number of pairs of pressure pins 42. Each arm 51 has slidably mounted thereon a weight 53 and is provided with a pin or stud 55 cooperating with the slot 49 in the latch 48, whereby each pair of pressure pins 42 may be connected with or disengaged from its corresponding weighted lever 51. It will be seen that the weights 53 tend to move the arms or levers 51 downwardly about their points of pivotal connection with the frame 33, thereby producing a downward pressure which may be transmitted through the latches 48 to the pressure pins 42 and thence to the belt guide 38, the amount of pressure thus transmitted to any pair of pins 42 being capable of adjustment according to the position of the weight 53 upon the corresponding arm 51. Movement of the weights 53 inwardly, or toward the fulcrum of the levers 51, may be limited, if desired, by adjustable collars 52, mounted on said levers 51, these collars being adapted to be set in any desired positions to thereby serve as guides to indicate the proper positions of the weights 53. Downward movement of the levers or arms 51 is limited by suitable stops 54 carried by the frame 33. It will be observed that the shape of the slot 49 is such that the latch 48, when disengaged from the pin 55, may be moved upwardly and supported upon the top of said pin thereby to hold the pressure pins 42 of any pair out of contact with the belt-guide 38.

From the construction above described it

will be seen that any desired pressure may be given to any particular pair of pins by the adjustment of the corresponding weight 53, and that the pressure imparted by both pins of any particular pair will be equalized by the pivoted bar or equalizing device 47 and links 46. Moreover any desired pair of pins may be disengaged from its weighted lever, and thereby thrown out of operation, by the disengagement of the corresponding latch 48 from its pin 55. In this manner the pressures imparted to the various points along the belt guide may be adjusted or arranged in any desired combination, thereby adapting the belt guide to any form or design of work to be operated upon.

The rock-shaft 31 is provided with an arm 56 keyed or otherwise rigidly secured thereto, said arm being provided with a counterweight 57 tending normally to raise the belt guide and its pressure devices away from the belt. In order to bring these parts into operative position against the weight 57, arms 58 are rigidly secured to the shaft 31, said arms carrying at their outer ends downwardly extending rods 59, guided at their lower ends in the machine frame. Mounted to move transversely of the machine upon tracks 60 is a carriage 61, carrying at its lower side pivoted links 62 connected at their lower ends by bars 63. One of the shafts 64, upon which the links 62 are rigidly mounted, is provided with a pair of arms 65 rigidly connected thereto and carrying at their outer ends a handle 66. The rods 59 are screw-threaded for a portion of their lengths to engage sleeves 67, suitably held against rotation in the machine frame, but free to move vertically therein, said sleeves carrying rollers 68, arranged below the bars 63. It will now be seen that downward motion imparted to the handle 66 will be transmitted through the bars 63, rollers 68, and rods 59 to the arms 58, thereby carrying the frame 33 into operative position.

For the purpose of adjusting the vertical position of the carriage 61 to correspond with different thicknesses of work to be operated upon, the tracks 60 are supported by lugs 69, carried by vertical adjusting screws 70, journaled in the machine frame and carrying at their upper ends gears 71, coöperating with gears 72 on a shaft 73, provided with a suitable hand wheel 74. Rotation of the hand wheel 74, it will be seen, will operate to raise or lower the tracks 60 and consequently the carriage 61.

In order that the normal operative position of the frame 33 and belt guide 38 may not be changed when the position of the carriage is varied the following means are provided. The threaded rods 70 are provided near their upper ends with gears 75 intermeshing with gears 76 on the threaded rods 59. It will now be seen that when the rods

70 are turned to adjust the vertical position of the track, rods 59 will be correspondingly turned resulting in a vertical movement of the sleeves 67, thereby maintaining the rollers 68 and bars 63 in substantially the same relative position irrespective of the position of vertical adjustment of the track 60.

From the foregoing description the operation of my improved machine will be clearly apparent without further explanation thereof.

While I, in order that my invention may be more fully understood, have chosen to illustrate and describe the same as embodied in a particular machine, I wish it to be distinctly understood that I do not limit myself to the precise construction shown and described, it being obvious that many changes might be made therein without departing from the spirit and scope of my invention.

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

1. In a machine of the character described, the combination with an abrading or polishing belt, of a flexible belt guide, and gravity controlled means for causing said belt guide to conform to the configuration of the work being operated upon.

2. In a machine of the character described, the combination with an abrading or polishing belt, of a flexible belt guide, and gravity controlled means for causing said belt guide to conform to the configuration of the work being operated upon, and for pressing said belt guide toward said work.

3. In a machine of the character described, the combination with an abrading or polishing belt, of a flexible belt guide, and gravity controlled means for causing said belt guide to conform to the longitudinal and lateral configuration of the work being operated upon.

4. In a machine of the character described, the combination with an abrading or polishing belt, of a flexible belt guide, and gravity controlled means for causing said belt guide to conform to the longitudinal and lateral configuration of the work being operated upon, and for pressing said belt - guide toward said work.

5. In a machine of the character described, the combination with an abrading or polishing belt, of a belt-guide, and a plurality of independently adjustable gravity - controlled devices for pressing said belt guide toward the work.

6. In a machine of the character described, the combination with an abrading or polishing belt, of a belt guide, and a plurality of gravity-controlled devices for pressing said belt guide toward the work, said devices being adapted to be thrown out of operation independently of one another.

7. In a machine of the character described, the combination with an abrading or polishing belt, of a belt-guide, means for pressing

said belt guide toward the work, gravity-controlled means for operating said pressing means, and means for detachably connecting said pressing means and said gravity controlled means.

8. In a machine of the character described, the combination with an abrading or polishing belt, of a belt guide, a plurality of devices for pressing said belt guide toward the work at a plurality of points, a gravity-controlled device for operating each of said pressing devices, and means for detachably connecting each of said pressing devices with its corresponding gravity controlled device.

9. In a machine of the character described, the combination with an abrading or polishing belt, of a belt guide, a pressure pin for pressing said belt guide toward the work, and gravity controlled means for operating said pressure pin.

10. In a machine of the character described, the combination with an abrading or polishing belt, of a belt guide, a pressure pin for pressing said belt guide toward the work, means for adjusting the limit of movement of said pressure pin, and gravity-controlled means for operating said pressure pin.

11. In a machine of the character described, the combination with an abrading or polishing belt, of a belt guide, a pressure pin for pressing said belt guide toward the work, and a weighted lever for operating said pin.

12. In a machine of the character described, the combination with an abrading or polishing belt, of a belt guide, means for pressing said belt guide toward the work, and a weighted lever for operating said pressing means.

13. In a machine of the character described, the combination with an abrading or polishing belt, of a belt-guide a pair of pressure pins for pressing said belt guide toward the work, and a single gravity controlled device for operating both of said pins.

14. In a machine of the character described, the combination with an abrading or polishing belt, of a belt guide, a plurality of pressure pins for pressing said belt guide toward the work, said pins being arranged in pairs, and an independently adjustable gravity controlled device for operating each of said pairs of pins.

15. In a machine of the character described, the combination with an abrading or polishing belt, of a belt guide, a plurality of pressure pins for pressing said belt guide toward the work, said pins being arranged in pairs, a gravity controlled device for operating each of said pairs of pins, and devices for independently and detachably connecting each of said pairs of pins with the corresponding gravity controlled device.

16. In a machine of the character described, the combination with an abrading or

polishing belt, of a belt guide, a plurality of pressure pins for pressing said belt guide toward the work, said pins being arranged in pairs, an equalizing device connecting the pins of each pair, and a gravity controlled device for operating each of said pairs of pins.

17. In a machine of the character described, the combination with an abrading or polishing belt, of a belt guide, a plurality of pressure pins for pressing said belt guide toward the work, said pins being arranged in pairs, an equalizing device connecting the pins of each pair, a gravity controlled device for operating each of said pairs of pins, and devices for detachably connecting said equalizing devices with said gravity-controlled devices.

18. In a machine of the character described, the combination with an abrading or polishing belt, of a belt guide, a pair of pressure pins for pressing said belt guide toward the work, an equalizing device connecting said pins, a weighted lever for operating said pins, a pin or stud on said lever, and a slotted link or latch attached to said equalizing device and adapted to cooperate with said pin or stud for operatively connecting said pressure pins with said weighted lever.

19. In a machine of the character described, the combination with an abrading or polishing belt, of a pair of pulleys for supporting said belt, a pivoted support for one of said pulleys, and an eccentric for adjusting said pivoted support to bring said pulleys into alinement with one another.

20. In a machine of the character described, the combination with an abrading or polishing belt, of a pair of pulleys for supporting said belt, a pivoted support for one of said pulleys, an eccentric for adjusting said pivoted support to bring said pulleys into alinement with one another, and means for securing said support in adjusted position.

21. In a machine of the character described, the combination with a vertically movable work-support, and a screw for adjusting said work-support, of an abrading or polishing belt, a belt guide, a rod for moving said belt guide into and out of operative position, a sleeve in screw-threaded engagement with said rod, means on said work support and cooperating with said sleeve for operating said rod, and cooperating gears on said rod and said screw.

22. In a machine of the character described, the combination with an abrading or polishing belt, of a belt guide, means for pressing said belt guide toward the work, a lever for operating said pressing means, and a weight slidably mounted on said lever.

23. In a machine of the character described, the combination with an abrading or polishing belt, of a belt guide, means for pressing said belt guide toward the work, a

lever for operating said pressing means, a weight slidably mounted on said lever and an adjustable stop for said weight.

24. In a machine of the character described, the combination with an abrading or polishing belt, of a belt guide, means for pressing said belt guide toward the work, a weighted lever for operating said pressing means, and a stop for limiting the movement of said lever.

25. In a machine of the character described, the combination with an abrading or polishing belt, of a belt guide, a frame from which said belt guide is supported, rods loosely mounted in said frame, links connecting said rods and belt guide, and means for

limiting the movement of said rods relatively to said frame.

26. In a machine of the character described, the combination with an abrading or polishing belt, of a belt guide, a frame from which said belt guide is supported, rods loosely mounted in said frame, links connecting said rods and belt guide, and adjustable means for limiting the movement of said rods relatively to said frame.

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

JOHN J. CANAVAN.

Witnesses:

HENRY CATHCART,
JESSIE CASPER.