W. F. MEYERS.

STONEWORKING LATHE.

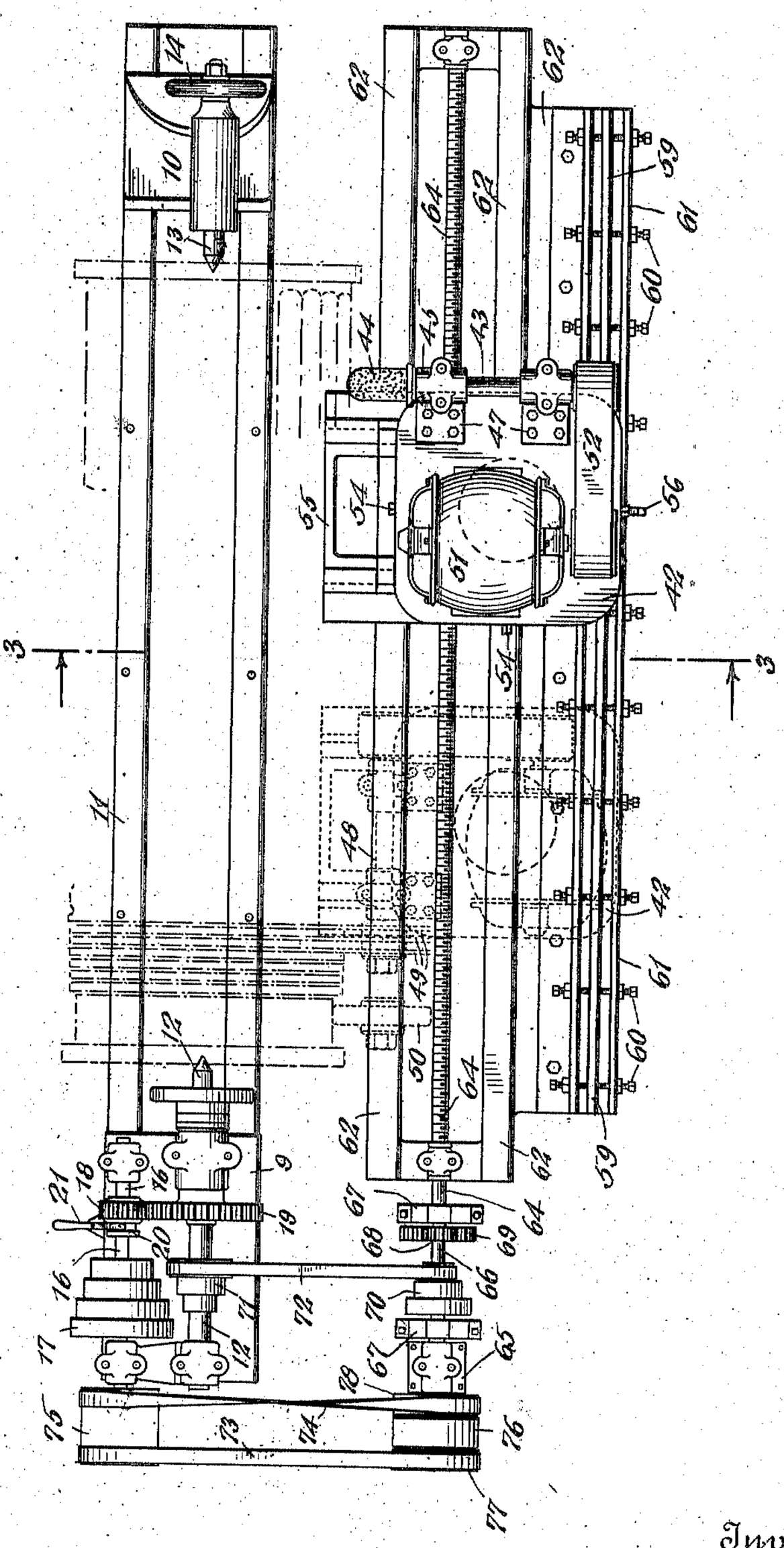
APPLICATION FILED JAN. 22, 1909.

957,978.

Patented May 17, 1910.

4 SHEETS—SHEET 1.

Fig. 1.



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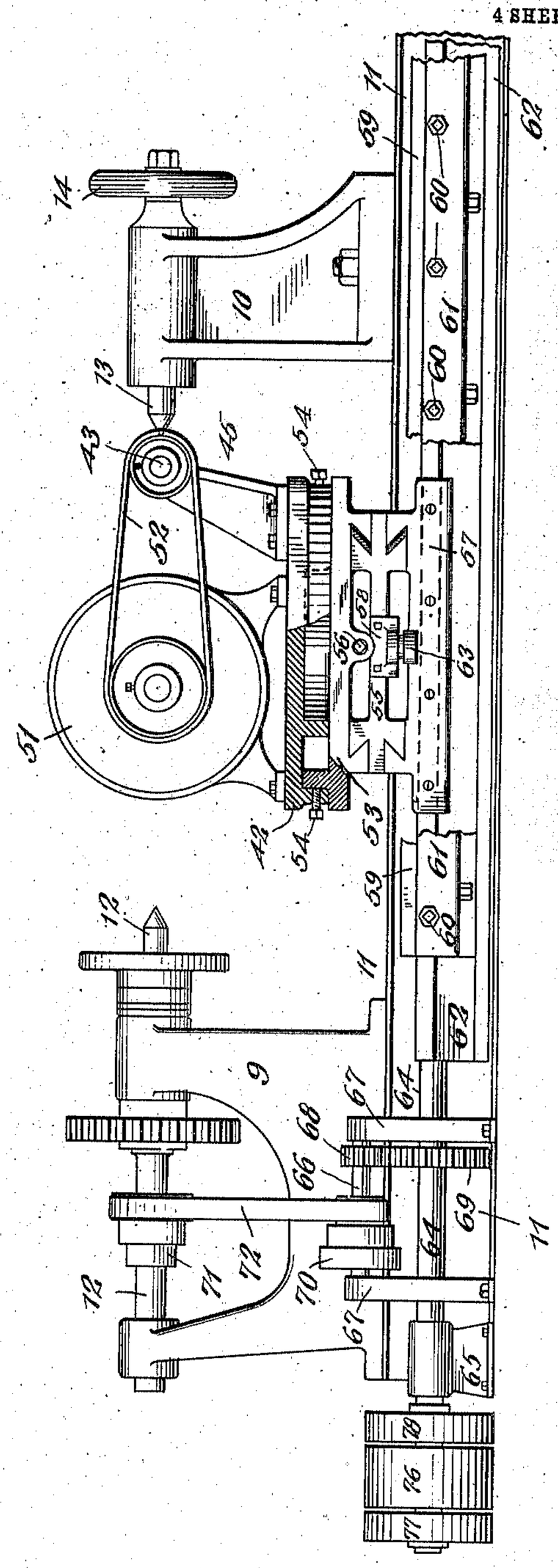
4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 4.

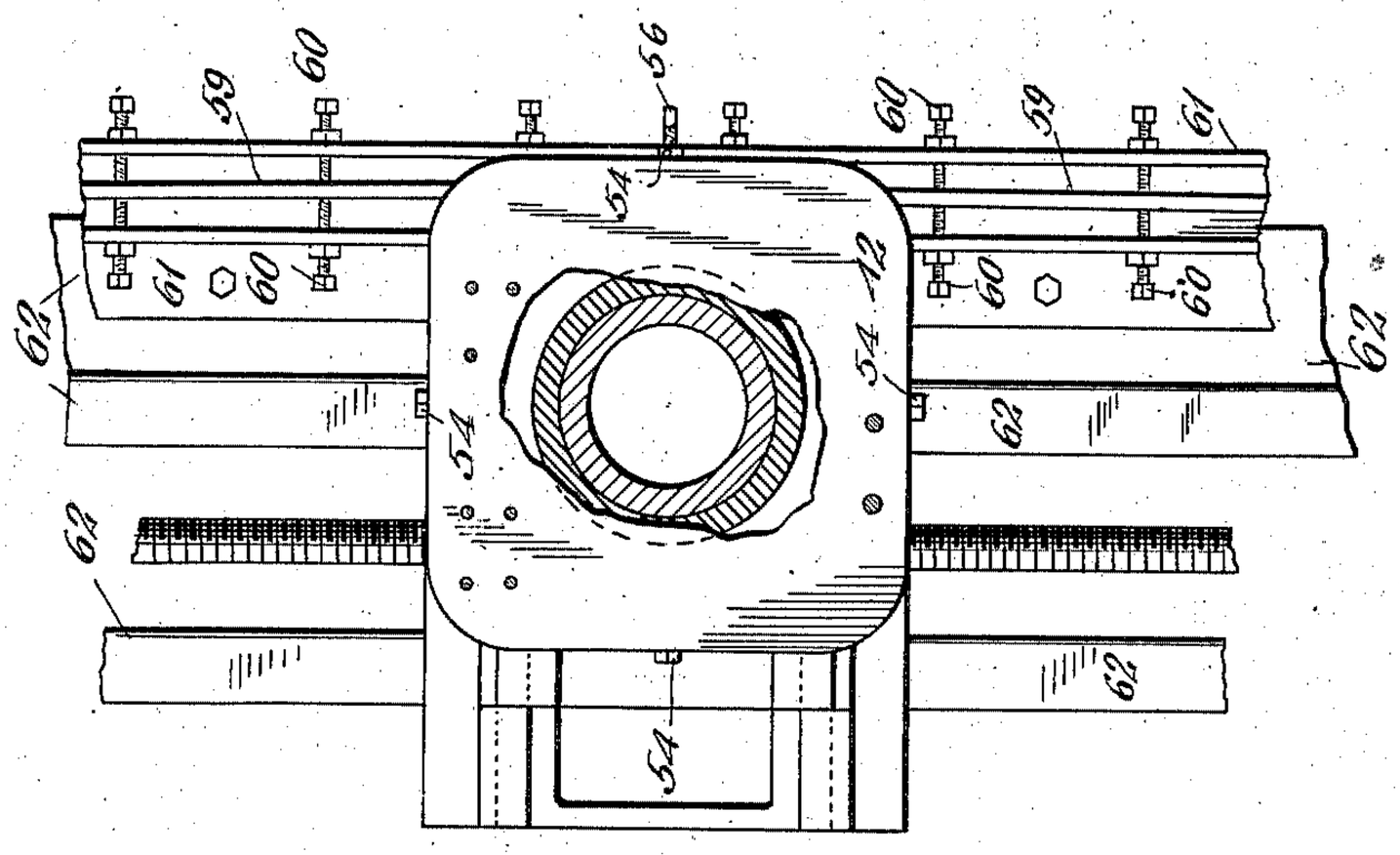

Fig. 3.

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4 SHEETS—SHEET 4.

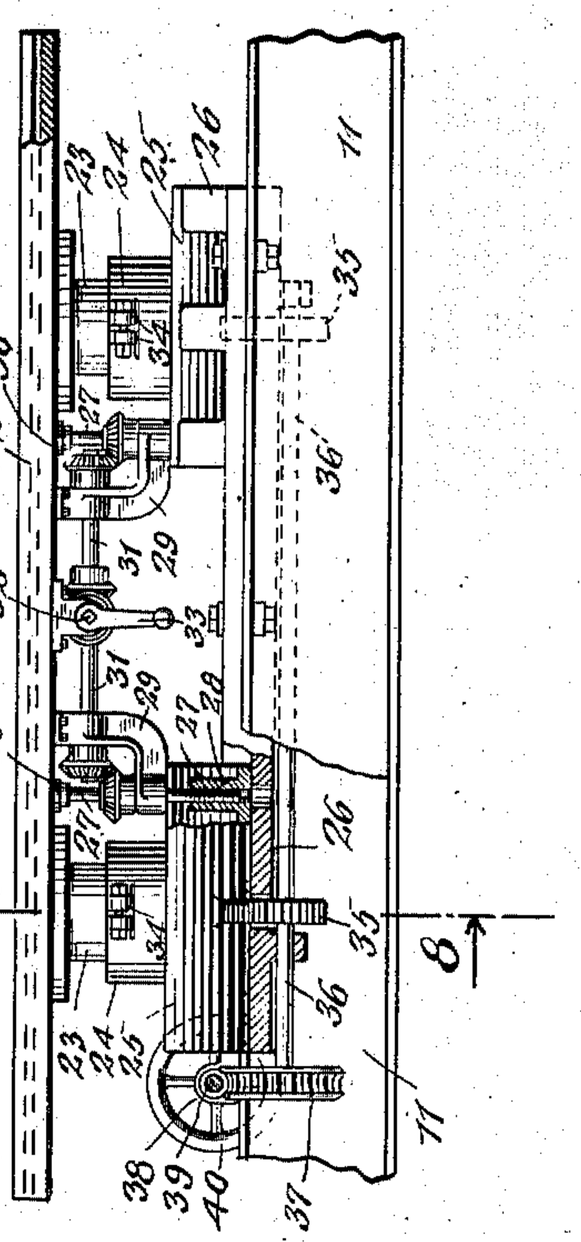

Fig. 5.

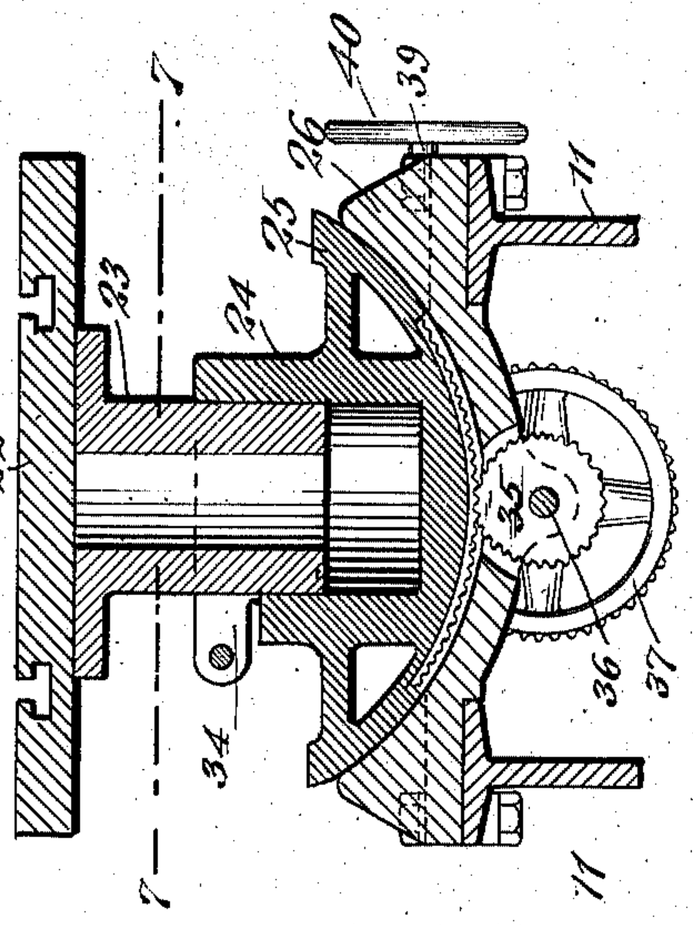

Fig. 6.

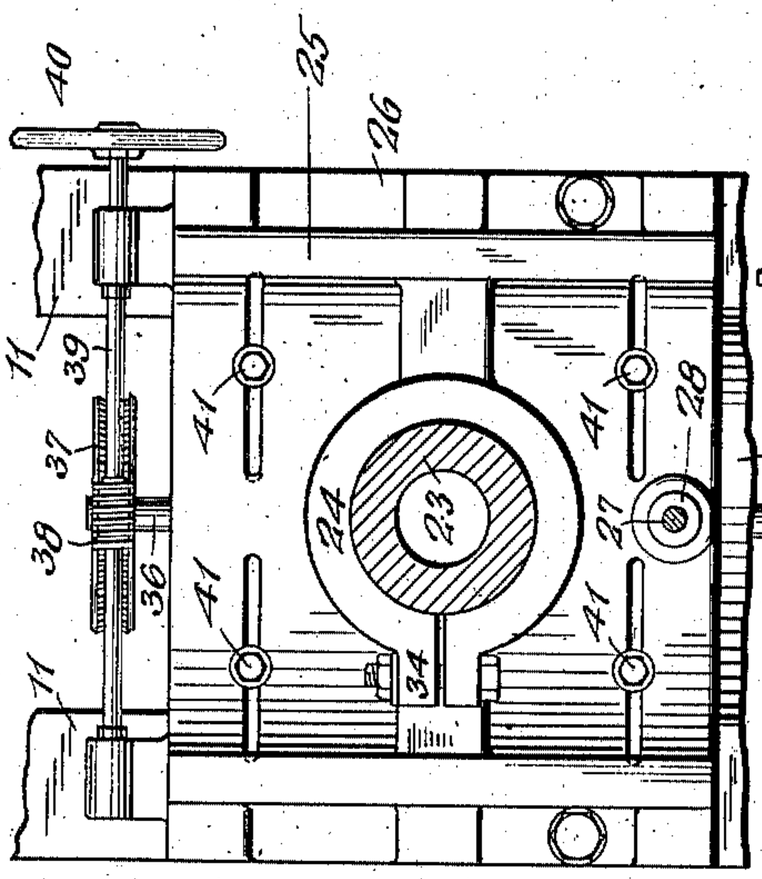

Fig. 7.

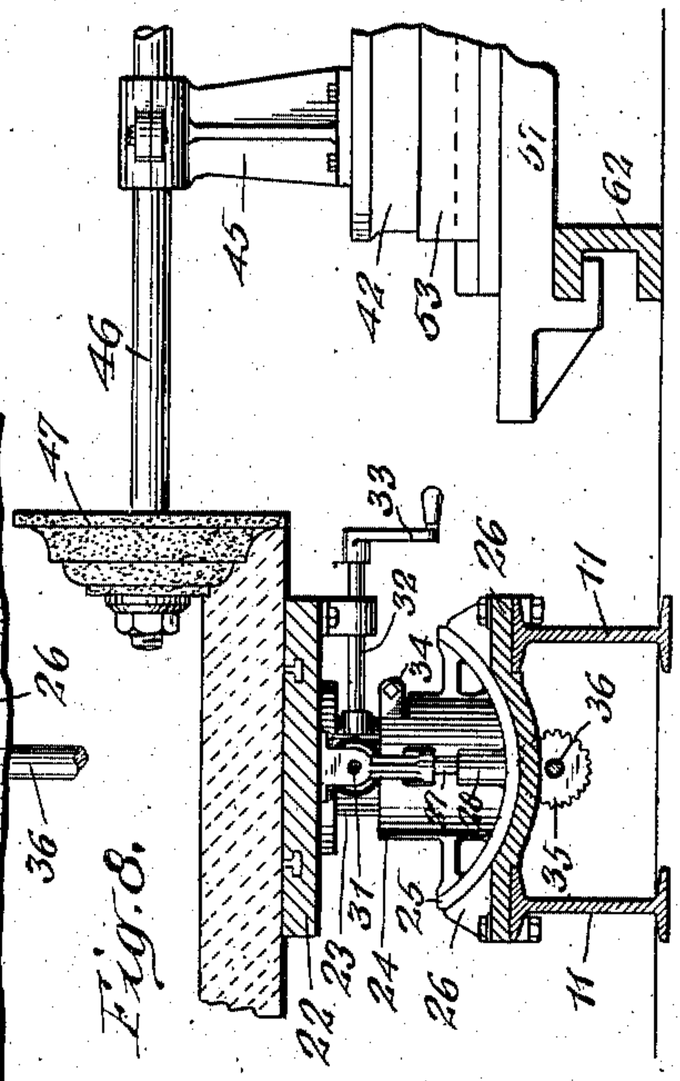

Fig. 8.

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UNITED STATES PATENT OFFICE.

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STONEWORKING-LATHE.

957,978. Specification of Letters Patent. Patented May 17, 1910.

Application filed January 22, 1909. Serial No. 473,699.

To all whom it may concern:

Be it known that I, WILLARD F. MEYERS, a citizen of the United States, residing at Long Island City, borough of Queens, city of New York, in the county of Queens and State of New York, have invented a certain new and useful Improvement in Stoneworking-Lathes, of which the following is a specification, reference being had therein to the accompanying drawings, forming part thereof.

My invention relates to lathes for operating on stone and the general object of my invention is to combine in a single machine means for doing a greater variety of work than has hitherto been possible. For instance, a lathe constructed in accordance with the present invention is adapted for turning, fluting and facing the work and for forming moldings; and more particular objects of my invention are to provide means for tilting certain kinds of work and to hold the work at a desired angle and height, and a further object of my invention is to provide a tool-supporting carriage which is rotatively adjustable.

My invention includes means for tilting and adjusting the height of a work-supporting table and means for adjusting the tool carriage, the work-supporting table being detachably secured to the bed of the lathe.

My invention also includes several details of construction and combinations of parts as will hereinafter appear.

I shall now describe my invention with reference to the accompanying drawings and shall thereafter point out my invention in claims.

Figure 1 is a plan view of my improved lathe as equipped for handling work of circular cross-section. Fig. 2 is an elevation on a slightly enlarged scale of what is shown in Fig. 1 with certain parts omitted. Fig. 3 is an enlarged section on a plane indicated by line of section 3—3 of Fig. 1 as viewed from the left. Fig. 4 is an enlarged plan view of the tool carriage and its adjuncts with the motor and tool-carrying arbor removed and portions broken away. Fig. 5 is an elevation of the work-supporting table and its adjuncts shown as applied to the construction illustrated in the above named figures and is for handling flat or non-rotating work. Fig. 6 is an enlarged cross-section on a plane indicated by line of section 6—8 of Fig. 5 as viewed from the right. Fig. 7 is a plan view in section on a plane indicated by line of section 7—7 of Fig. 6 with parts omitted at the ends to save space. Fig. 8 is a cross-section on a plane indicated by line of section 6—8 in Fig. 5 as viewed from the left and includes also a portion of the tool carrier and its adjuncts and a piece of flat work supported on the table.

In the embodiment of my invention illustrated in the drawings, the usual head stock 9 and tail stock 10 are supported on a frame or bed formed intermediate of its ends of I-beams 11. The head stock 9 has journaled therein a work-rotating spindle or "live center" 12, and the tail stock 10 carries a work-supporting spindle or "dead center" 13 adjustable by a hand wheel 14. The tail stock 10 is adjustable along the bed pieces 11 to and from the head stock 9 and is shown as held in place by a screw-retained clamping plate 15. When the work is to be rotated, it is held between the two spindles or "centers" 12 and 13 and is made to rotate by the rotating spindle or "live center" 12. The live spindle 12 is driven by the main shaft 16 journaled on the head stock 9 and carrying a cone pulley 17 for taking power from any convenient source and has thereon a spur pinion 18 meshing with a spur gear 19 fixed on the live spindle 12, the pinion 18 being arranged to be connected with the main shaft 16 by an ordinary clutch 20 actuated by a hand lever 21.

For handling flat or non-rotatable work, a work-supporting table 22 (Figs. 5, 6, 7 and 8) is provided and is arranged to be both tilted or rocked transversely, and raised and lowered, so as to hold the work at the proper height and angle to be operated on by a tool carried by the tool carriage. The table 22 is supported on columns 23, shown as two in number, telescoping into sockets 24, shown as formed integral with arcuate bottom pieces or rockers 25. The rockers 25 rest in a correspondingly formed base piece 26, which, in turn, is supported on the bed pieces 11 and is shown as detachably secured thereto by bolts passing through the flanges of the bed pieces 11. When the work-supporting table is used, the tail stock 10 is run back toward the outer end of the bed 11 so as to be out of the way.

The means for raising and lowering the table 22 comprise lifting screws 27, one adjacent to each column 23, engaging nuts 28 on the rockers 25 and journaled in supporting brackets 29 depending from the table 22

and in bearings 30 also carried on the table 22. The lifting screws 27 are arranged to be rotated by a connecting shaft 31 journaled in the brackets 29 and geared to the screws 27 as shown in the drawings, the pitch and direction of screw-threads being such as to vertically adjust the table 22 with a uniform and parallel movement. The connecting shaft 31 is arranged to be actuated by a transverse shaft 32 geared to the connecting shaft 31 and supported in bearings carried by the table 22 as shown and may be rotated to vertically adjust the table 22 by a crank 33. When the table 22 has been adjusted to the proper height, it may be fixed or set at that position by clamps 34 at the upper end of the sockets 24 and adapted to be drawn together by bolts as shown.

The means for transversely rocking or tilting the table 22 comprise spur pinions 35 fixed on a longitudinal shaft 36 and engaging arcuate racks shown as formed on the under sides of the rockers 26. The longitudinal shaft 36 is supported in bearings on the base 26 and carries at one end a worm wheel 37, which is actuated by a worm 38 carried by a cross-shaft 39 journaled in bearings on the base 26 and provided with a hand wheel 40. It is evident that when the hand wheel 40 is rotated, the curvilinear surfaces of the rockers 25 will be made to travel along the corresponding curvilinear surface of the base 26 so as to tilt the rockers 25 laterally and thereby tilt the work-supporting table 22 transversely at a corresponding angle. When the work table 22 has in this manner been adjusted to the proper angle, it may be firmly secured in position by bolts 41 passing through transverse slots in the rockers 25 into the base 26 as shown in Fig. 7.

A tool carriage 42 is provided and has supported thereon a rotary tool-carrying spindle or tool arbor 43 shown as carrying a rotary grinding tool 44, which may be of suitable abrasive material. The tool spindle or arbor 43 is journaled in bearings 45, shown as bolted to the carriage 42, and the grinding tool 44 is of a kind adapted to produce flutings on a column as indicated in dotted lines in Fig. 3 and in Fig. 1 at the right. It should be noted that different shafts or tool spindles may be substituted for the shaft 43, these different shafts being adapted for carrying different kinds of tools according to the different kinds of work to be done. For example, in Fig. 8 a longer shaft 46 is shown as journaled in the bearings 45 on the tool carriage 42 and carrying a grinder or molding wheel 47 adapted for forming a molding as indicated. At the left of Fig. 1 is indicated in dotted lines another arbor or spindle 48 carrying grooving wheels 49, shown as a gang of three, for roughing out the work as indicated, the ridges between the grooves being conveniently removable by knocking off with a hammer or other suitable manual tool. The arbor 48 is supported on the carriage 42, also shown in dotted lines, and as rotatively adjusted through an angle of 90° from the position shown at the right of Fig. 1, so as to bring the grooving wheels 49 into proper position relatively to the work as indicated. A facing wheel 50, indicated in dotted lines at the left of the grooving wheels 49, may be substituted for the grooving wheels 49 to give a smooth surface to the work, which is indicated as a column and is adapted to be rotated by the live spindle 12. The tools carried by the tool carriage 42 may be rotated by an electric motor 51 supported on the carriage 42 and shown as geared to the tool spindle 43 by a belt 52.

The means for permitting rotative adjustment of the tool carriage 42 include a carriage support 53, on which the carriage 42 is rotatively mounted, the support 53 being provided with a boss, over which fits a circular flange on the carriage 42, as shown in the drawings, and the tool carriage 42 may be retained in any desired angular position by set screws 54 passing through the flange of the tool carriage and impinging against the boss of the carriage support 53.

Means are provided for adjusting the tool carriage 42 transversely so as to adjust the tool to and from the work and the means shown comprise a slide 55 on which is journaled an adjusting screw 56 having screw-threaded engagement with the carriage support 53 and shown as squared at its outer end to receive a key or crank to rotate the screw. The carriage support 53 is provided with dovetail gibs adapted to engage and slide in dovetail ways on the slide 55, as best seen in Fig. 2.

Means are provided for feeding the tool carriage 42 together with the tool carried thereby transversely, independently of the adjusting means just described. The slide 55 is provided with dovetail gibs engaging and sliding in corresponding dovetail ways formed on a base 57. The slide 55 is provided with a bracket 58 shown as carrying rollers 63 which engage opposite sides of a stationary feed rail 59 shown as adjustably held between oppositely directed adjusting screws 60 in a trough 61 secured on a bed 62. The feed rail 59 is slightly flexible and by manipulating the screws 60 may be bent so as to give different curves and with portions lying at different angles so that the tool carriage 42 is fed transversely by the rollers 63, guiding the slide 55, as the base 57 together with the parts carried thereby is fed longitudinally of the work, and the transverse feed of the tool therefore being subject to the longitudinal feed movement. By this transverse feed the work may be given the

desired configuration in a longitudinal direction; for example, a column may be given a curved taper.

The base 57 rests on the bed 62, which is provided with flanges engaged by corresponding toes on the base 57, as most clearly seen in Fig. 3, the base 57 being adapted to be fed along the bed 62 to feed the tool longitudinally of the work and to actuate the transverse feeding means as above described. The means for imparting the longitudinal feed movement to the tool carriage 42 and its adjuncts comprise a longitudinal feed screw 64 journaled in the bed 62 and also journaled in an independent bearing 65. The feed screw 64 is actuated from a short parallel shaft 66 journaled at its ends in posts 67 and carrying a spur pinion 68 which engages with a spur gear 69 fixed on the feed screw 64. The short shaft 66 has fixed thereon a cone pulley 70, which is connected by a belt 72 with a reversely arranged cone pulley 71 carried by the live spindle 12. If it is desired to actuate the live spindle 12 without actuating the feed screw 64, as, for example, in cutting the annular grooves indicated at the left of Fig. 1, the belt 72 may be shipped from the pulleys 70 and 71. When it is desired to actuate the feed screw 64 without continuously actuating the live spindle 12, as, for example, in forming the flutings indicated at the right of Fig. 1, then the feed screw 64 is driven directly from the main shaft 16 by belts 73 and 74, passing over a long pulley 75 carried by the main shaft 16 and adapted to engage a screw-actuating pulley 76 fixed on the corresponding end of the screw 64. The belt 74 is crossed for driving the screw 64 in an opposite direction to the belt 73 and either of these belts may be engaged with the screw-actuating pulley 76 at will, and when it is not desired to drive the feed screw 64 directly from the main shaft 16 by means of the belts 73 and 74, these belts are both shipped respectively upon loose pulleys 77 and 78, as seen in Fig. 1. It is understood, of course, that when the carriage 42 is to be fed longitudinally of the work without rotating the work, the clutch 20 is actuated to disconnect the main shaft 16 from the live spindle 12.

It is evident from the above description that in the lathe of this invention facilities are provided for doing a much greater variety of work than can be accomplished with the stone working lathes commonly used.

It is obvious that various modifications may be made in the construction shown and above particularly described within the principle and scope of my invention.

I claim:

1. A stone-working lathe comprising a removable tilting work-suporting table detachably secured to the bed of the lathe, a tool-supporting carriage, means for feeding the carriage relatively to the table, and means for adjusting the carriage relatively to the table.

2. A stone-working lathe comprising a removable tilting work-supporting table detachably secured to the bed of the lathe, a tool-supporting carriage, and means for feeding the carriage relatively to the table.

In testimony whereof I have affixed my signature in presence of two witnesses.

WILLARD F. MEYERS.

Witnesses:

BERNARD COWEN,

J. M. WALSH.