

F. MILDE.
PANTOGRAPH.
APPLICATION FILED JUNE 19, 1912.

1,059,893.

Patented Apr. 22, 1913.

5 SHEETS-SHEET 1.

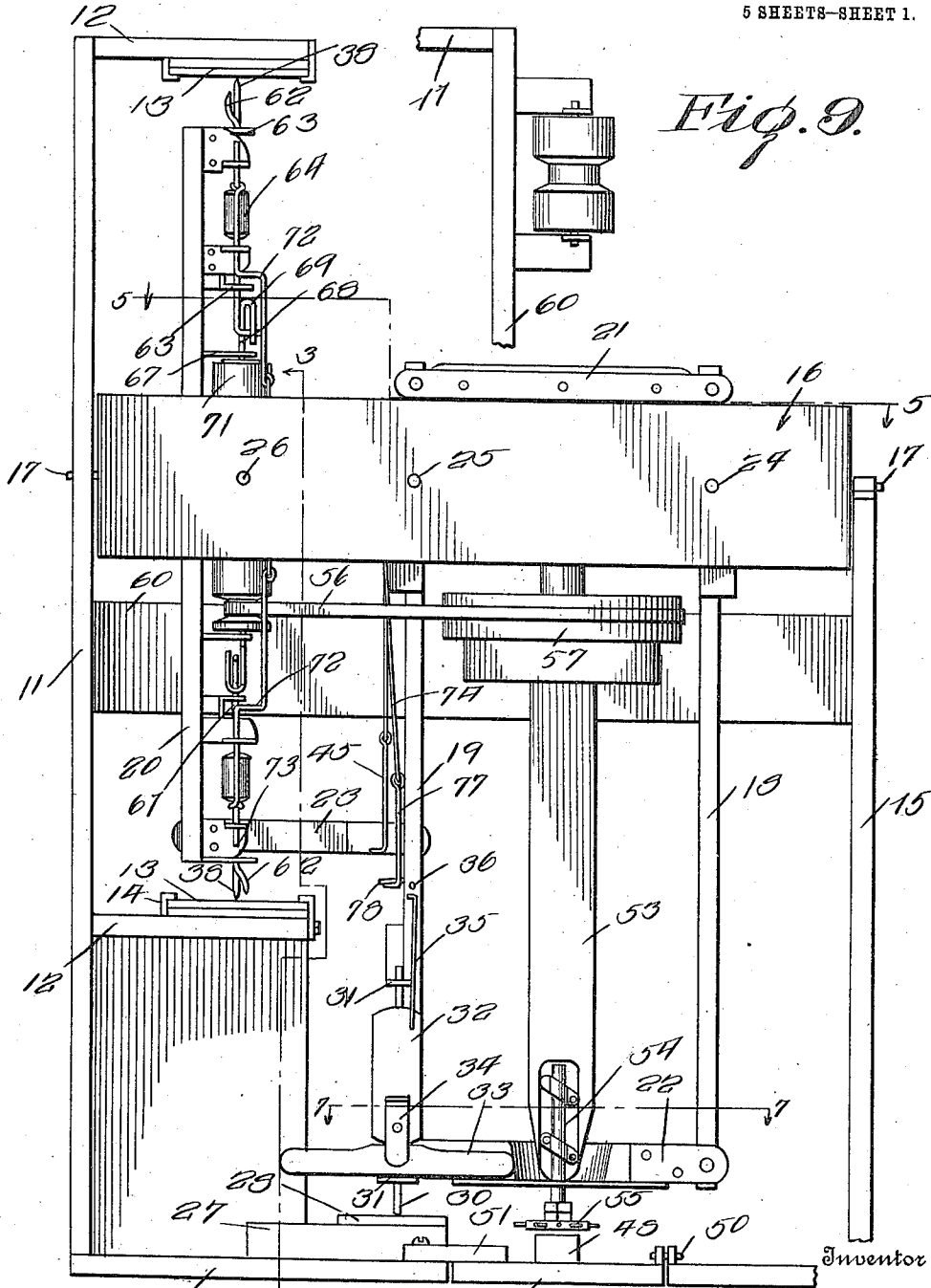


Fig. 1.

Witnesses
138
Francis Boyle

Fig. 1.

By

F. Milde

Charles Charles

Attorney

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5 SHEETS—SHEET 2.

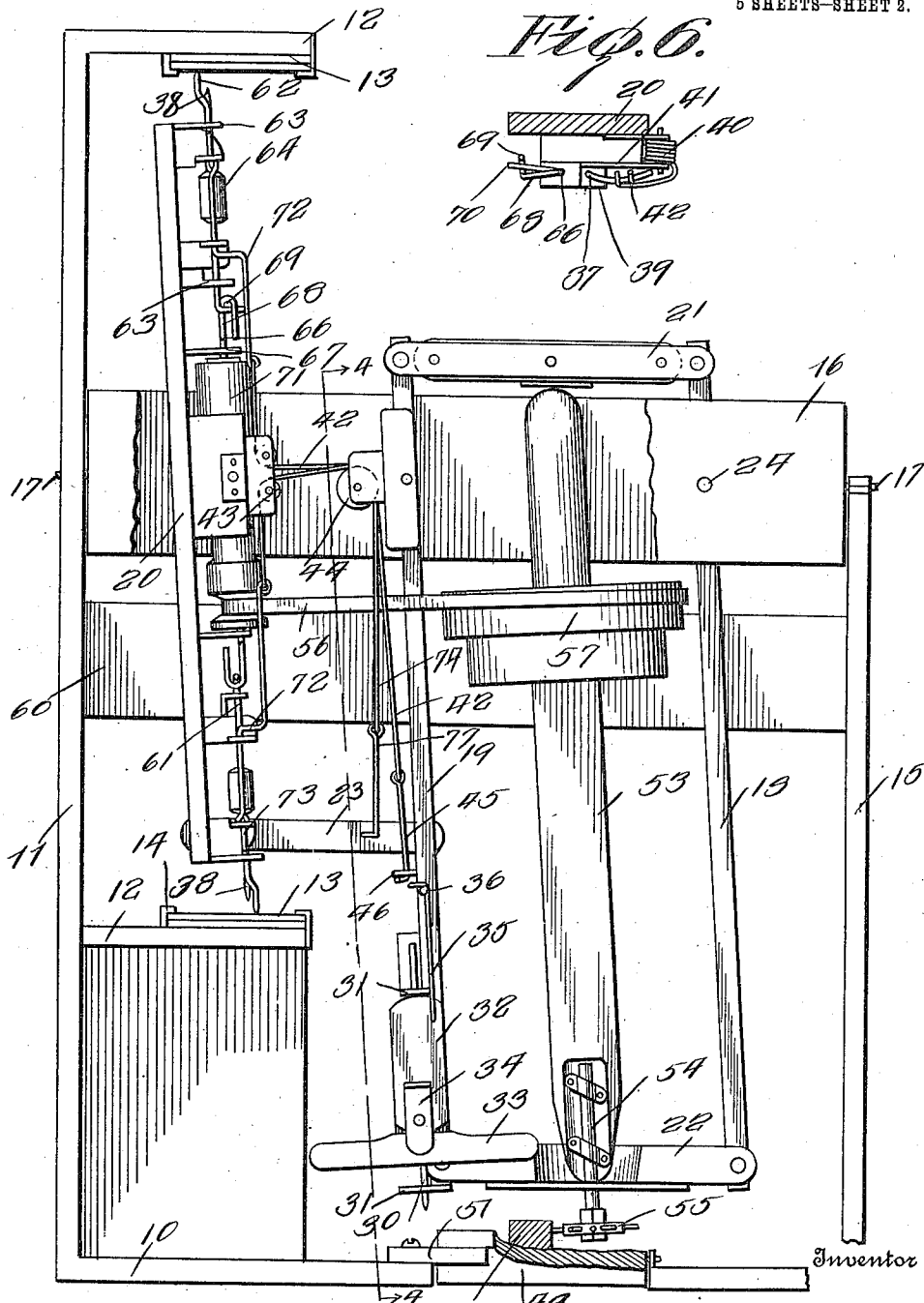


Fig. 6.

Witnesses
B. J. Brown

Francis Boyle

Fig. 2.

F. Milde

By Charles Hawley

Attorney

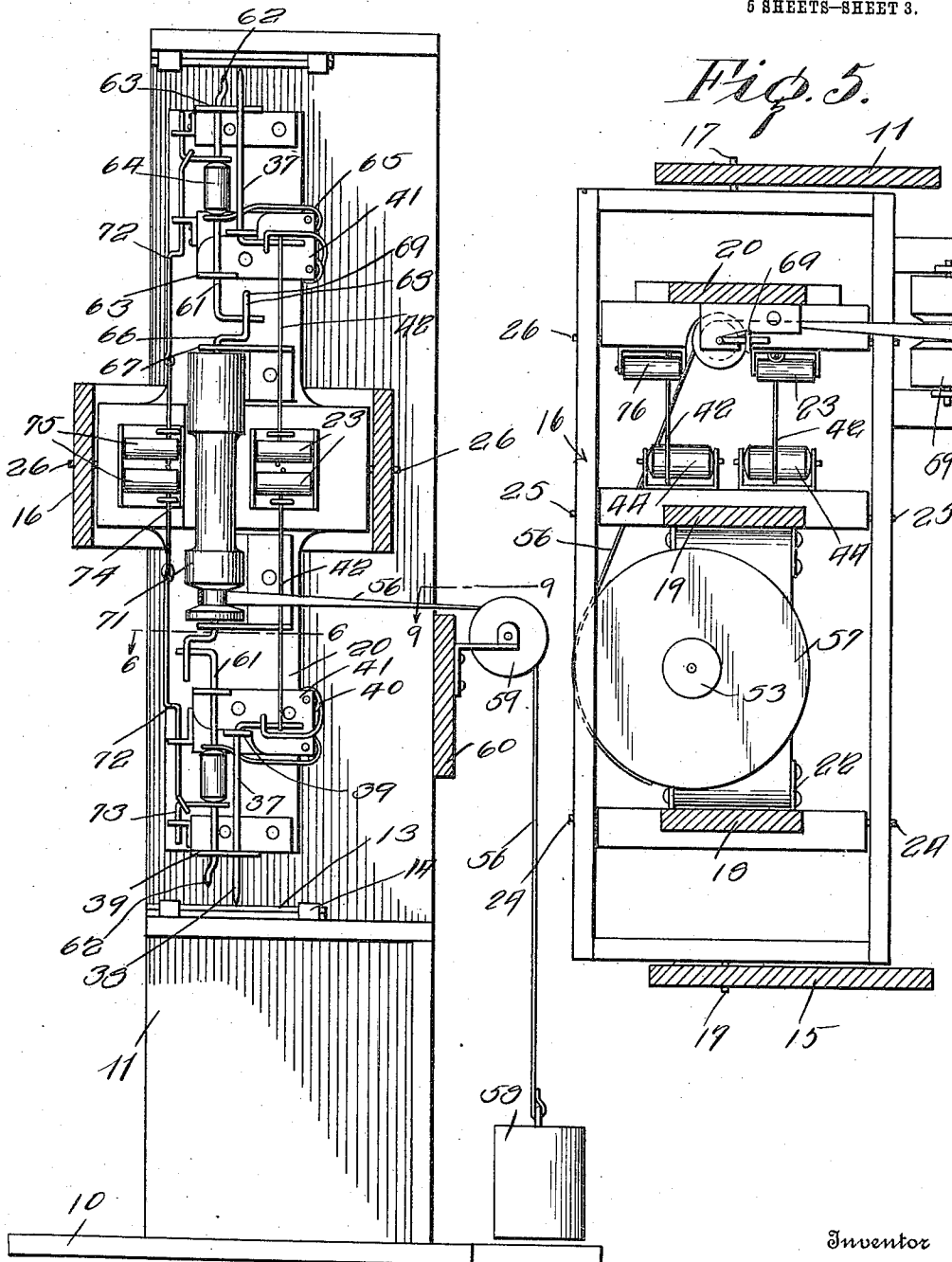
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5 SHEETS—SHEET 3.



Witnesses
R. J. Baum
Francis Boyle

Fig. 3.

F. Milde
By *Charles Charles*

Attorney

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5 SHEETS—SHEET 4.

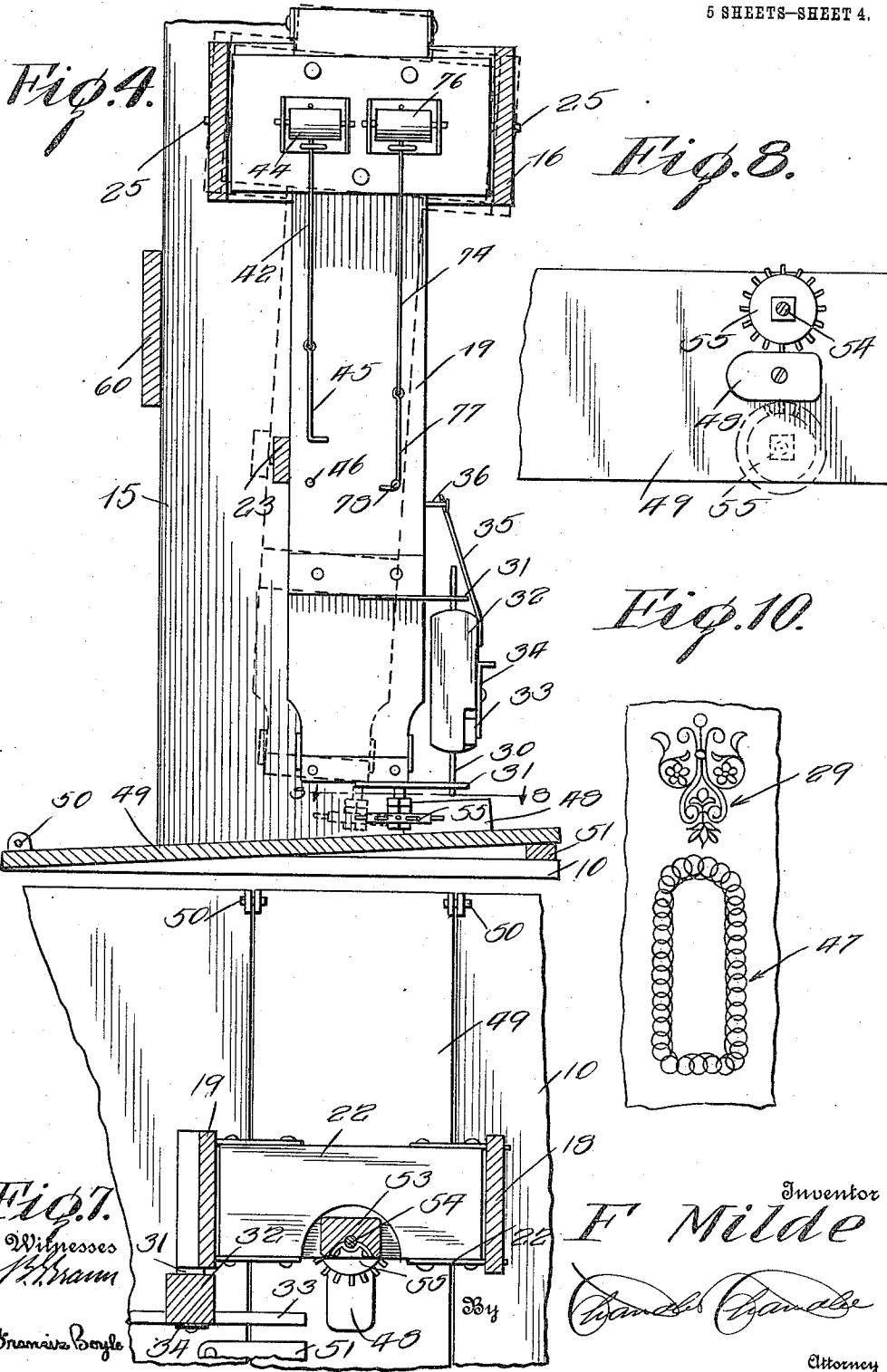


Fig. 7.

Witnesses
J. H. Ham

Ernest B. Boyle

Inventor

F. Milde

Charles C. Ham

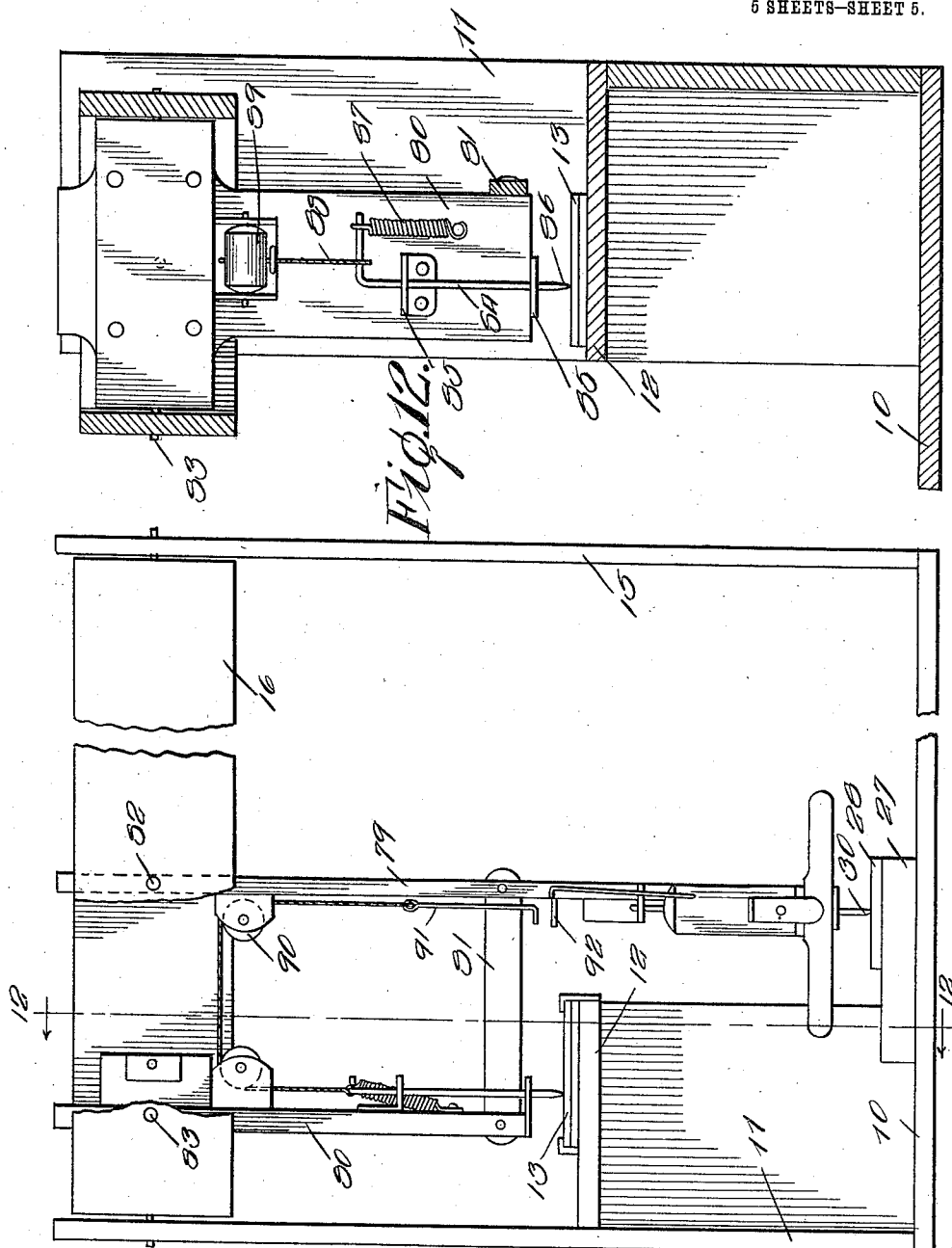
Attorney

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6 SHEETS-SHEET 5.



Witnesses
186, Brown
Francis Boyle

Fig. 11.

F. Milde

By *Charles C. ...*

Attorney

UNITED STATES PATENT OFFICE.

FRANZ MILDE, OF SEELYVILLE, PENNSYLVANIA.

PANTOGRAPH.

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Specification of Letters Patent.

Patented Apr. 22, 1913.

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To all whom it may concern:

Be it known that I, FRANZ MILDE, a subject of the Emperor of Austria-Hungary, residing at Seelyville, in the county of Wayne, State of Pennsylvania, have invented certain new and useful Improvements in Pantographs; 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.

This invention relates to pantograph engraving machines, and has for an object to generally simplify and improve the construction of this class of machines by the provision of a novel linkage for operatively connecting the tracing tool to the working tool.

A further object of the invention is to provide a novel spring pressed revoluble working tool and novel means for directing the tool to form various designs on the work, the rotation of the tool serving to trace the various lines of the design in scroll form.

A further object of the invention is to provide a machine having two independently operable spring controlled tools for tracing two different designs on the work, there being novel means employed to hold either tool released while the other is in operation.

With the above objects in view the invention consists of certain novel details of construction and combination of parts herein-after fully described and claimed, it being understood that various modifications may be made within the scope of the appended claims.

In the accompanying drawings forming part of this specification:—Figure 1 is a front elevation of the machine showing the simple design working tool in operative position. Fig. 2 is a front elevation of the machine showing the linkage in a different position than shown in Fig. 1 and showing the scroll design working tool in operative position. Fig. 3 is a vertical sectional view taken on the line 3—3 Fig. 1. Fig. 4 is a vertical sectional view taken on the line 4—4 Fig. 2. Fig. 5 is a cross sectional view taken on the line 5—5 Fig. 1. Fig. 6 is a cross sectional view taken on the line 6—6 Fig. 3. Fig. 7 is a cross sectional view taken on the

line 7—7 Fig. 1. Fig. 8 is a cross sectional view taken on the line 8—8 Fig. 4. Fig. 9 is a cross sectional view taken on the line 9—9 Fig. 3. Fig. 10 is a view illustrating the two types of designs capable of being formed on the work by this machine. Fig. 11 is a front elevation of a modified form of the machine. Fig. 12 is a vertical sectional view taken on the line 12—12 Fig. 11.

Referring now to the drawings in which like characters of reference designate similar parts, 10 designates a bed plate which carries an upright 11 the latter having two spaced work tables 12 to which the work 13 is fixed by clips 14, the work being supported on the underneath face of the upper table and on the top face of the lower table. A standard 15 rises from the bed plate, and coacts with the standard 11 in supporting a tilting oblong frame 16, the latter being equipped at the ends with gudgeons 17 which are journaled in suitable openings formed in both standards.

The linkage consists of three parallel swinging bars 18, 19 and 20, the latter supporting the working tools, and the bars 18 and 19 supporting the tracing tools, both of the bars 18 and 19 being connected together at their upper and lower ends by cross heads 21 and 22 respectively, and the bar 19 being connected to the bar 20 by a cross link 23 parallel to the cross heads, the cross heads and link being pivotally connected at the ends to their respective bars. The bars are connected respectively to the sides of the oblong tilting frame by gudgeons 24, 25 and 26 which are in alinement in the plane of the tilting frame gudgeons 17.

The linkage may be swung laterally in the tilting frame to the position shown in Fig. 2, for instance, and may be swung to other positions on either side of the vertical, this movement taking place simultaneously with the tilting movement of the frame as shown in Fig. 4 to accommodate the machine to deal with a plain surface in both pattern and work requiring length and breadth only. As will hereinafter appear the working tools are spring pressed to accommodate the machine to work in which the tools must have vertical movement such as is required in working on water tumblers and the like having cylindrical surfaces.

A pattern table 27 is carried by the bed

plate and supports a pattern 28 in the form of a flat plate having a design such as for instance, as is shown at 29 in Fig. 10, cut in the top face. The tracing tool 30 is mounted to slide vertically in guide lugs 31 carried by the linkage bar 19, and is equipped between the lugs with a sleeve 32 to which a transverse handle 33 is removably secured by means of a button 34. A hook 35 forms means for lifting the tracing tool out of engagement with the pattern, the hook being secured over a lug 36 on the bar 19 to hold the tracing tool released.

The working tools for inscribing the design of the pattern 29 on the work 13 are best shown in Fig. 3 wherein it will be noted that two working tools 37, corresponding to the two work tables, are mounted on the bar 20. Each tool is in the form of an L-shaped needle the long leg of which is sharpened to a working point 38 and is furthermore mounted for vertical movement in guide lugs 39. The short leg of the needle is pressed by a helical spring 40 which is supported upon the edge of the bar 20, by means of a plate 41, as best shown in Fig. 6. The springs serve to hold the tools in engagement with the work when dealing with either flat surface work or cylindrical surface work.

When the operator manually manipulates the tracing tool 30 over the lines of the pattern 28, the pantograph linkage heretofore described transfers the lateral or two dimension motions of the tracing tool to the working tools 37. The controlling springs 40 of the tools communicate vertical motion to the tools in the meantime such as is necessary in engraving the cylindrical walls of water tumblers and the like. As best shown in Figs. 2 and 5, the short legs of both tools are connected by a releasing cord 42 which is looped upon itself and trained between guide pulleys 43 carried on the bar 20, and thence trained over a guide pulley 44 carried on the bar 19, the bight of the loop extending down along the bar 19 and being equipped with a hook 45 which is hooked over a pin 46 on the bar 19 to hold both tools raised from the work.

For engraving on the work a design such as is shown at 47 in Fig. 10, a substantially oblong pattern block 48 is supported on the top face of a pattern table 49 which is pivoted at the rear end to the bed plate as shown at 50. For holding the table raised to operative position as best shown in Figs. 2 and 4, a button 51 is pivoted on the bed plate as shown at 52 and is turnable to engage the bottom face of the table, this button being also turnable over the top face of the table to hold the table dropped to released position.

A revoluble stand shaft 53 is journaled in the cross heads 21 and 22 and is equipped

with a fixed extension 54 which projects below the lower cross head and is terminally equipped with an integral pin wheel 55 designed to be manually run around the edge of the pattern block by manipulation of the bars 18 and 19 as best shown in Figs. 2 and 8. The unwinding of a cord 56 from a fixed pulley 57 on the shaft serves to rotate the shaft, such rotation being governed by the frictional engagement of the pin wheel with the pattern block 48. The cord is terminally equipped with a weight 58 the gravitation of which serves to unwind the cord, the cord being trained over a guide pulley 59 carried on a cross brace 60 which connects both of the standards 11 and 15, and being also trained over and serving to simultaneously rotate a working tool at a higher rate of speed than the shaft, during gravitation of the weight as will presently be described.

By now referring to Fig. 3 it will be seen that two working tools 61, corresponding to the two work tables, are mounted on the bar 20. Each tool is in the form of an L-shaped needle having the long leg terminally offset and sharpened to a working point 62, the long leg being furthermore journaled for rotation in bearing lugs 63 on the bar 20. An integral enlargement 64 formed on the long leg forms an abutment for the end of a helical pressure spring 65 which is supported upon the edge of the bar 20 by means of the above mentioned plate 41. These springs serve to hold both needles in engagement with the work. A revoluble shaft 66 is journaled in bearings 67 on the bar 20 and is provided at the ends with cranks 68 the extremities of which are directed to form guide loops 69 which straddle the short legs of both working tools as best shown in Figs. 3 and 6. A grooved pulley 71 is fixed to the shaft 66 and receives the above mentioned cord 56. Both working tools are simultaneously rotated by this cord rotating the shaft, and by virtue of the tools being rotated at a higher rate of speed than the pin wheel 55, the offset working points 62 of the tools will inscribe a continuous spiral or scroll on the work.

The pantograph linkage heretofore described transfers the lateral or two dimension motions of the pin wheel tracing tool 55 to the working tools 61 with a resultant inscription of the design shown at 47 in Fig. 10 upon the work, the controlling springs 65 of the tools in the meantime communicating vertical motion to the tools such as is necessary in engraving the cylindrical walls of water tumblers and the like. For holding both of the working tools 61 released when the other set of working tools 37 are in operation, draw links 72 are slidably fitted on the bar 20 as best shown in Fig. 3, and are indirectly connected to the tools 61 through the instrumentality of slides

73 which bear upon the enlargements 64. The confronting ends of the draw links are connected by a cord 74 which is looped upon itself and trained between pulleys 75 carried on the bar 20, and thence being trained over a guide pulley 76 carried by the bar 19 as best shown in Fig. 4, the bight of the cord extending down along the bar 19 and being terminally equipped with a hook 77 which is hooked over a pin 78 on the bar to hold the tool released.

The modified form shown in Figs. 11 and 12 is designed primarily for use in inscribing upon the work the design shown at 29 in Fig. 10 or other similar single line design, and includes the bed plate 10, standards 11 and 15, horizontally disposed tilting frame 16, work table 12, work 13, pattern table 27, pattern 28, and tracing tool 30 of the preferred form of the invention above described. The pantograph linkage comprises a bar 79 which supports the tracing tool, a bar 80 which supports the working tool, and a link 81 which is terminally pivotally connected to both bars, both bars being mounted for lateral swinging movement in the tilting frame through the instrumentality of gudgeons 82 and 83.

The working tool 84 is in the nature of an L-shaped needle the long leg of which is mounted for vertical movement in guide lugs 85 on the bar 80 and is terminally sharpened to a working point 86. The tool is held pressed against the work through the instrumentality of a helical spring 87 terminally connected to the short leg of the tool and to the bar 80. For releasing the tool a cord 88 is secured to the short leg of the tool and is trained over a pulley 89 carried on the bar 80, and is thence carried toward and trained over a pulley 90 carried on the bar 79, being thence directed downwardly along the latter bar and terminally equipped with a hook 91 which may be engaged over a pin 92 carried by the said bar to hold the tool released.

To operate the device, suppose it is desired to trace the design shown at 47 in Fig. 10 on the work. The pattern table is raised to the position shown in Fig. 2 and the working tool 62 is lowered into engagement with the work 13 which has been previously coated with paraffin or the like. The operator then rocks the pantograph linkage bar 19 so that the pin wheel 55 travels around the edge of the pattern block 48 as shown in Fig. 8. The pin wheel and the working tool are simultaneously rotated during such movement by means of the weight 58 gravitating, the rotation of the tool being governed by the frictional engagement of the pin wheel with the pattern block and the tool being rotated at a higher rate of speed than the pin wheel with a resultant tracing of the design 47 in the paraffin, the surface

of the work being exposed by such tracing, whereupon acid may be poured into the traced lines to etch the design on the work, supposing the latter is glass or like material. To trace the design shown at 29 on the work, the tracing tool 30 is lowered into engagement with a pattern 28 having countersunk lines corresponding to the design. The tool 38 is also lowered, and now upon actuation of the pantograph linkage in such a manner that the tracing tool traces the design, the tool 38 will simultaneously trace the same design upon the work.

What is claimed, is:—

1. In a pantograph machine, a frame adapted to rock upon its longitudinal axis, a pantograph linkage including a plurality of parallel bars pivoted on said frame and adapted to rock with and in the plane of the axis of said frame, a tracing tool on one of said bars, and a spring pressed working tool on another of said bars.

2. In a pantograph machine, a frame adapted to rock upon its longitudinal axis, a pantograph linkage including a plurality of parallel bars pivoted on said frame and adapted to rock with and in the plane of the axis of said frame, a tracing tool on one of said bars, and a spring pressed revoluble tool on another of said bars.

3. In a pantograph machine, a frame adapted to rock upon its longitudinal axis, a pantograph linkage including a plurality of parallel bars pivoted on said frame and adapted to rock with and in the plane of the axis of said frame, a revoluble tracing tool on one of said bars, a revoluble working tool on another of said bars, and means for simultaneously actuating said tracing tool and said working tool at different speeds.

4. In a pantograph machine, a frame adapted to rock upon its longitudinal axis, a pantograph linkage including a plurality of parallel bars pivoted on said frame and adapted to rock with and in the plane of the axis of said frame, a pattern block, a revoluble tracing tool on one of said bars having terminal means adapted to travel upon and frictionally engage said block whereby to govern the speed of said tracing tool, a revoluble working tool on another of said bars, and means for simultaneously actuating said tracing tool and said working tool.

5. In a pantograph machine, a frame adapted to rock upon its longitudinal axis, a pantograph linkage including a plurality of parallel bars pivoted on said frame and adapted to rock with and in the plane of the axis of said frame, a tilting pattern table, means for locking said table in raised operative position and lowered released position, a pattern block on said table, a revoluble tracing tool adapted to engage with said pattern block when said table is in operative

position, a vertically movable revoluble
working tool on another of said bars adapted
to be lowered to operative position and
raised to released position, means for simul-
5 taneously rotating both of said tools, and
means for locking said working tool in re-
leased position.

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

FRANZ MILDE.

Witnesses:

H. M. POPHAM,
FRANCIS BOYLE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
