

No. 638,927.

Patented Dec. 12, 1899.

J. HOPE & J. HOPE, JR.

GROUNDING ATTACHMENT FOR PANTOGRAPH ENGRAVING MACHINES.

(Application filed June 13, 1898.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.

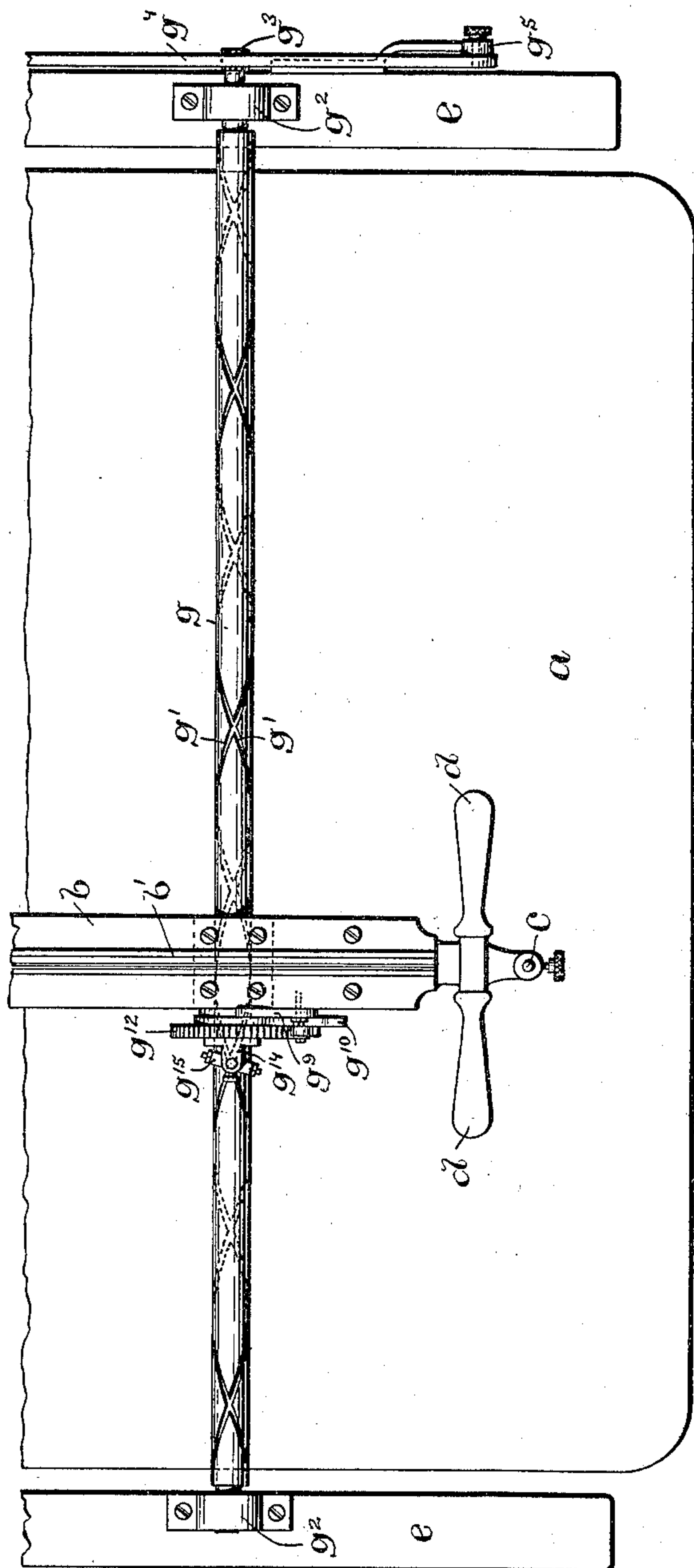
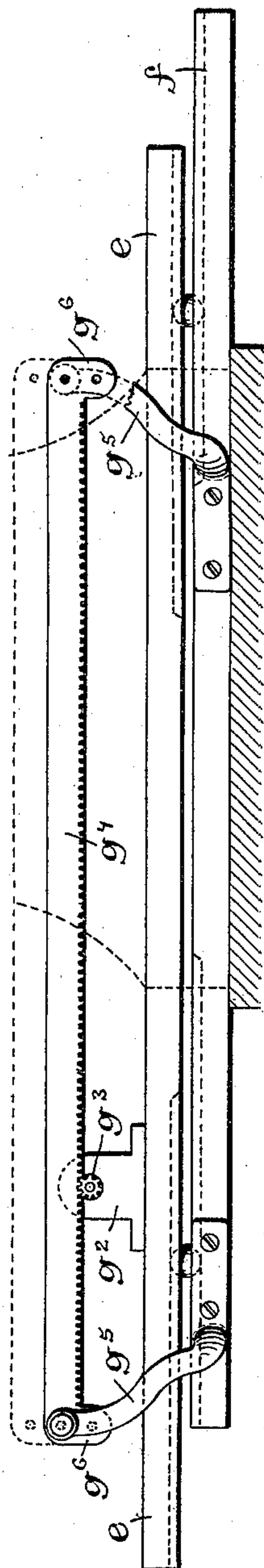


Fig. 2.



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Fig. 3.

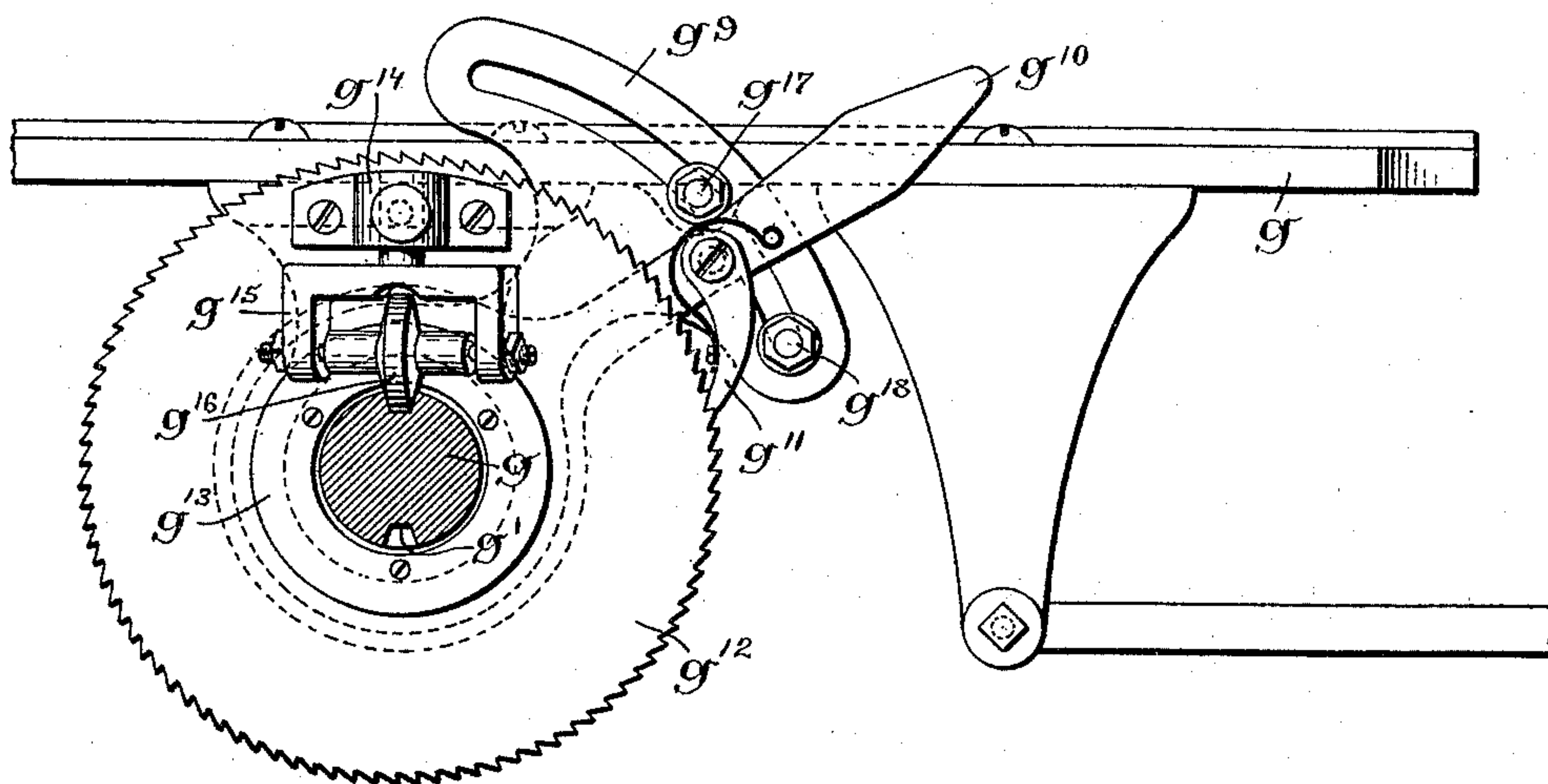
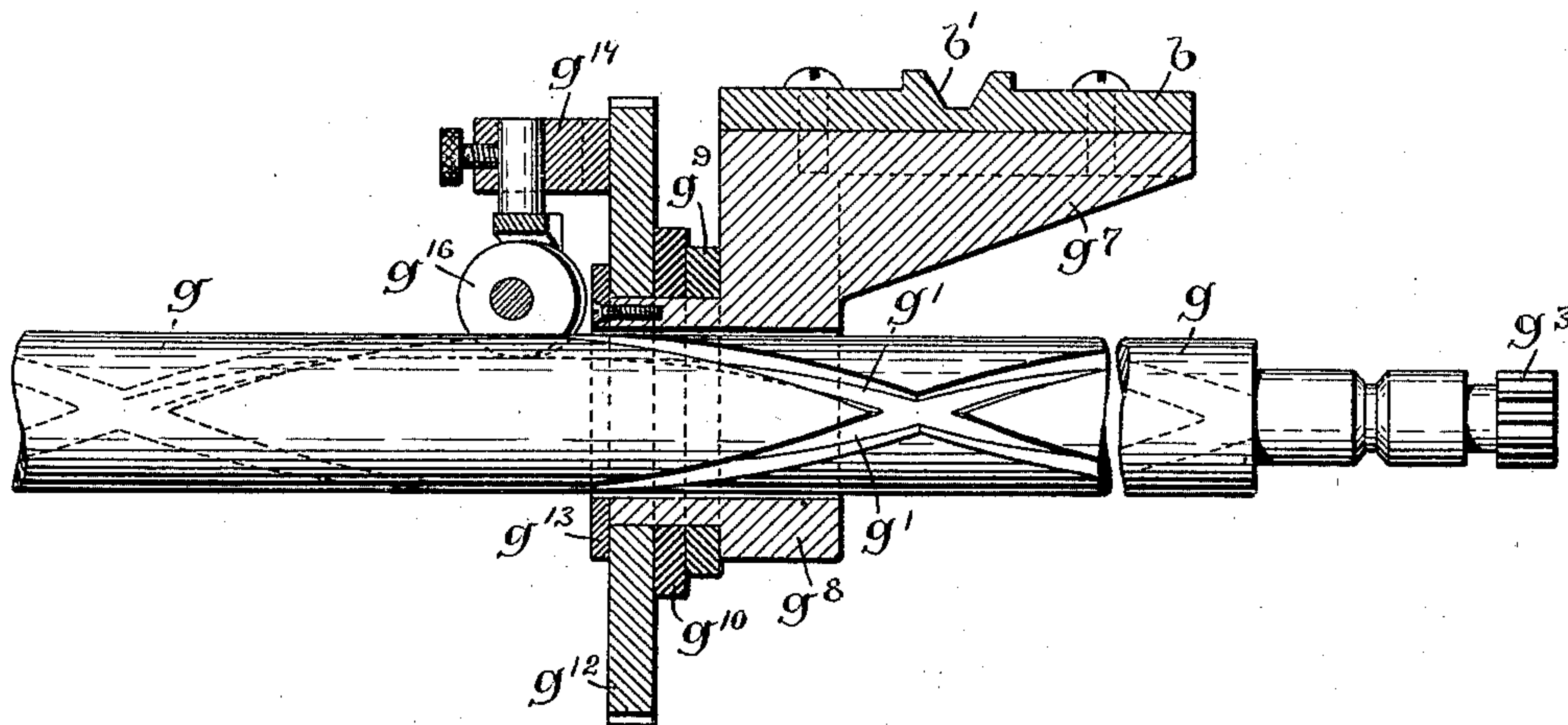


Fig. 4.



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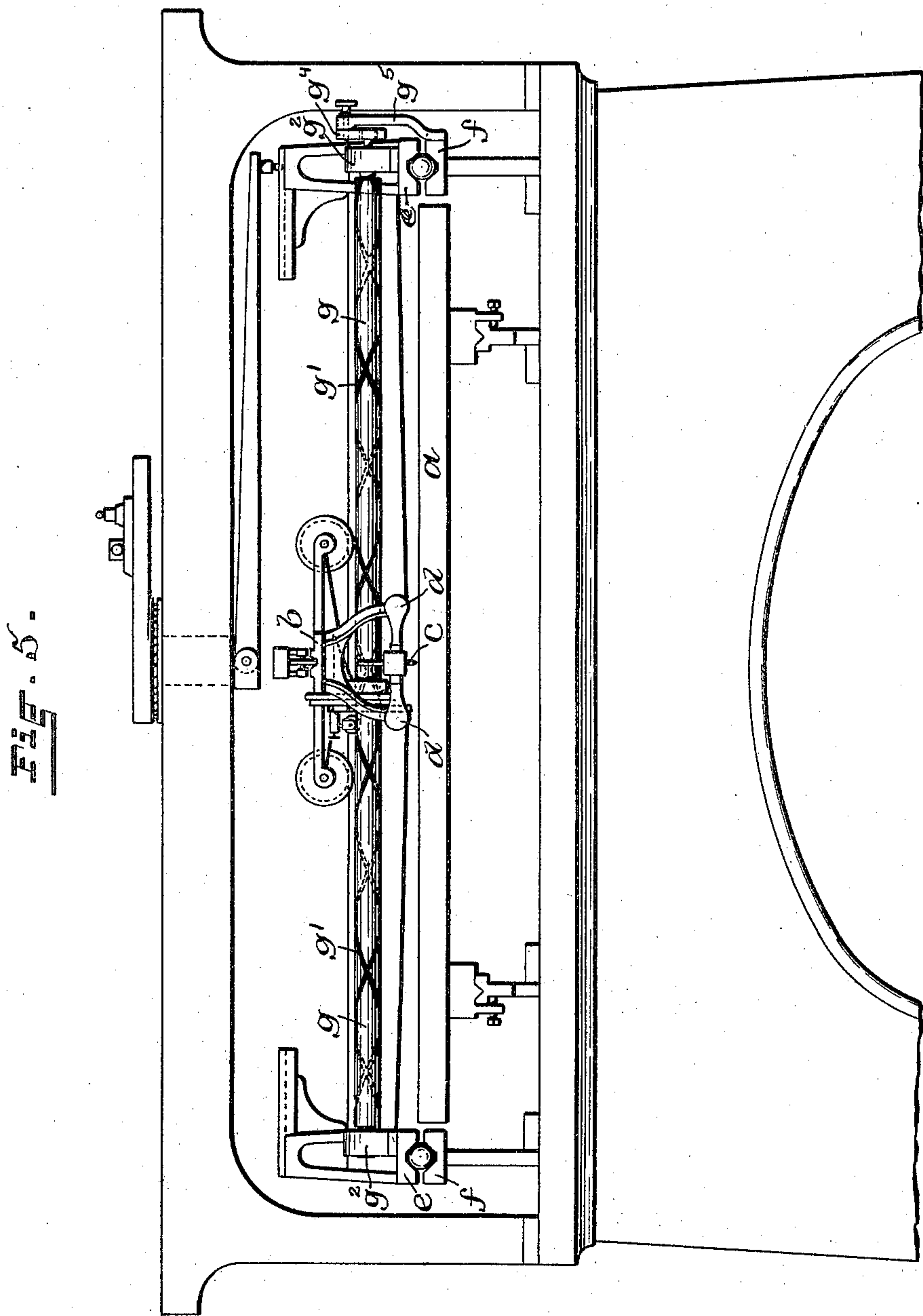
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

JOHN HOPE AND JOHN HOPE, JR., OF PROVIDENCE, RHODE ISLAND, ASSIGN-
ORS TO THE JOHN HOPE & SON'S ENGRAVING COMPANY, OF SAME PLACE.

GROUNDING ATTACHMENT FOR PANTOGRAPH ENGRAVING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 638,927, dated December 12, 1899.

Application filed June 13, 1898. Serial No. 683,254. (No model.)

To all whom it may concern:

Be it known that we, JOHN HOPE and JOHN HOPE, Jr., of Providence, in the county of Providence and State of Rhode Island, have
5 invented a new and useful Improvement in Grounding Attachments for Pantograph Engraving-Machines; and we hereby declare that the following is a full, clear, and exact description of the same, reference being had to
10 the accompanying drawings, forming part of this specification.

This invention has reference to an attachment for pantograph engraving-machines in which the cylindrical surface of calico-print-
15 ers' rolls is engraved. In this class of engraving-machines a series of gravers are supported on carriages which are operated to move longitudinally parallel with the roll or cylinder to be engraved, while the said roll or cylinder
20 is rotatably moved, so as to reproduce a series of patterns. The carriages are controlled in their longitudinal movement by what is termed the "stylus-carriage" and the roll by what is usually termed the "stylus-frame."
25 The movement of the stylus-frame is transverse to the roll or cylinder to be engraved, and the movement of the stylus-carriage is longitudinal to and parallel with the roll or cylinder. The stylus or tracer is pivotally
30 secured to the stylus-carriage. In following the lines of a pattern the operator moves the stylus-carriage and the stylus-frame and through them and the connecting actuating mechanism moves the gravers longitudinally,
35 while also partially rotating the roll or cylinder, thereby reproducing the usually enlarged pattern traced by the stylus on the roll or cylinder, generally on a reduced scale. When
40 the outlines of the pattern have been reproduced on the cylinder, the spaces inclosed by the outlines require to be grounded—that is, filled with lines parallel to each other and usually oblique to the axis of the cylinder. If the enlarged pattern were ruled with these
45 grounding-lines, this grounding or ruling could be done by the same mechanism which produces the pattern; but to so rule the enlarged pattern makes it difficult for the operator to follow the lines of the pattern with
50 the stylus. Therefore a separate machine is used, by which the oblique lines of the ground are produced.

The invention consists in the peculiar and

novel construction of the grounding attachment by which the longitudinal movement of
55 the stylus-carriage acts to rotate a bar journaled in bearings on the stylus-frame and provided with a pinion in engagement with a rack which moves the stylus-frame to partially rotate the roll or cylinder being en-
60 graved, to give to the lines the desired oblique direction, as will be more fully set forth hereinafter.

Figure 1 is a top view showing the attachment in connection with the stylus-carriage,
65 the stylus-frame, and the pattern-table of a pantograph engraving-machine. Fig. 2 is a view of the rack-bar and the pinion engaged therewith supported on the stylus-frame. Fig. 3 is a side view, on an enlarged scale, of
70 the stylus-carriage, showing the connection with the spiral bar. Fig. 4 is a longitudinal sectional view of the stylus-carriage, showing the connections with the spiral bar. Fig. 5 is
75 a front view of a portion of a pantograph engraving-machine, showing the attachment in connection with the stylus-carriage, the stylus-frame, and the pattern-table.

Similar marks of reference indicate corresponding parts in all the figures.

In the drawings, *a* indicates the table on
80 which the usually-enlarged pattern is supported; *b*, the stylus-carriage; *c*, the stylus; *d d*, the handles grasped by the operator, by which the movement of the stylus-carriage is
85 controlled, and *ee* the stylus-frame, which is supported on the ways *f*, secured to the frame of the machine.

The parts so far described, while they vary in construction in different pantograph en-
90 graving-machines, form the essential elements of all machines of this class. The bar *g*, having two continuous spiral grooves *g' g'*, is journaled in the bearings *g² g²*, secured to the stylus-frame *ee* at the opposite ends, and
95 is provided at one end with the pinion *g³*, which in the operative position engages with the rack-bar *g⁴*, connected with the brackets *g⁵ g⁵*, secured to the ways *f* or any fixed part of the machine. The ends *g⁶ g⁶* of the rack-
100 bar *g⁴* are provided with two holes, so that the rack-bar may be raised and secured in the disconnected position shown in broken lines in Fig. 2. To the stylus-carriage *b* is
105 secured by suitable screws the bracket *g⁷*, having the sleeve *g⁸* inclosing the spirally-

grooved bar g . On the sleeve g^8 is supported, next to the bracket, the adjustable stop-plate g^9 ; next to this the operating-handle g^{10} , on which the spring-pressed ratchet-pawl g^{11} is pivotally secured. The ratchet-wheel g^{12} is also supported on the sleeve g^8 and held in place by the washer g^{13} , secured to the end of the sleeve g^8 . The bracket g^{14} is secured to the outer surface of the ratchet-wheel g^{12} and forms the support of the frame g^{15} , an upwardly-extending pin of which is secured in the bracket by a clamp-screw. The roller or guide g^{16} is journaled in the frame g^{15} and engages with the grooves in the spirally-grooved bar g . The stop-plate g^9 is provided with a segmental slot and is secured to the bracket g^7 by the stop g^{17} , consisting of a bolt projecting from the bracket and provided with a nut forming a stop. The stop g^{18} is secured in the segmental slot, and the two stops g^{17} and g^{18} are adjusted to give the handle g^{10} and the pawl g^{11} the movement required to regulate the distance between the lines of the grounding.

To enable others skilled in the art to use our invention, we will now more fully describe the operation of the same. The spirally-grooved bar g being by its pinion in engagement with the rack secured to a fixed part of the machine, and the sleeve g^8 of the bracket g^7 being secured to the stylus-carriage b , in the groove b' of which the post connected with the lever operating the graver-carriages rests, the stylus as it moves the stylus-carriage longitudinally on the spirally-grooved bar g rotates the same by means of the roller or guide g^{16} , thereby moving the stylus-frame, the spirally-grooved bar journaled in bearings on the stylus-frame, and the stylus-carriage inwardly or outwardly and gives to the stylus an oblique direction, which is reproduced by the gravers. The operator moves the stylus from one edge of the pattern to be grounded to the other, tracing a line on the pattern, and at the end of each stroke the operator moves the handle g^{10} from the stop g^{17} to the stop g^{18} and back against the stop g^{17} for the next line, and again moving the stylus from one edge to the other, thereby moving the stylus through a succession of oblique lines parallel to and at equal distances from each other, which lines are reproduced by the gravers in the grounding of the pattern and traced by the stylus on the pattern.

We do not wish to confine ourselves to the exact construction of the pawl-and-ratchet movement for the spacing of the lines herein described, as the same may be varied or any one of the usual feeding movements used in similar machines be substituted.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a grounding attachment for pantograph engraving-machines, the combination with the stylus-carriage and the stylus-frame, of a spirally-grooved bar journaled in bearings secured to the stylus-frame, a pinion on the bar, a rack engaging with the pinion and secured to a fixed part of the machine, and an adjustable guide connected with the stylus-carriage and engaging with the spiral of the bar; whereby the longitudinal movement of the stylus-carriage on the spirally-grooved bar operates the stylus-frame, as described.

2. In a pantograph engraving-machine, the combination with the operative elements of the machine of the following instrumentalities: a rotatable spiral track, a rack and pinion operated by the rotation of the spiral track, a guide controlled by the stylus-carriage and engaging with the spiral track, and mechanism, substantially as described, intermediate with the guide and the stylus-carriage; whereby a succession of parallel lines may be traced, as described.

3. In a pantograph engraving-machine, the combination with the pattern-table, the stylus-carriage and the stylus-frame, of a rack secured to a fixed part of the machine, a spirally-grooved bar, journal-bearings for the bar secured to the stylus-carriage, a pinion on the spirally-grooved bar engaging with the rack, a bracket secured to the stylus-carriage, a sleeve on the bracket inclosing the spirally-grooved bar, a ratchet-wheel journaled on the sleeve, a guide supported on the ratchet-wheel and engaging with the spiral groove of the bar, a pawl and handle engaging with the ratchet-wheel, and adjustable stops; whereby oblique parallel lines may be traced on the pattern and engraved on the rolls, as described.

4. In a pantograph engraving-machine, the combination with the table a , the stylus-carriage b , the stylus-frame c and the ways f , of the rack g^4 adjustably supported on the brackets g^5 g^5 , the bar g having the spiral tracks g' g' , the journal-bearings g^2 , the pinion g^3 on the bar g and engaging with the rack g^4 , the bracket g^7 secured to the stylus-carriage, the stop-plate g^9 , the handle g^{10} having the pawl g^{11} , the ratchet-wheel g^{12} , the bracket g^{14} secured to the ratchet-wheel, the frame g^{15} adjustably secured in the bracket g^{14} and the roller or guide g^{16} journaled in the frame g^{15} ; whereby the longitudinal movement of the stylus-carriage on the bar g is changed to a diagonal direction and parallel lines may be engraved in the patterns, as described.

In witness whereof we have hereunto set our hands.

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JOHN HOPE, JR.

Witnesses:

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B. M. SIMMS.