(No Model.) 2 Sheets—Sheet 2.

H. G. GRIER.

PANTOGRAPH MACHINE.

No. 538,776. Patented May 7, 1895.

FIG. 3.

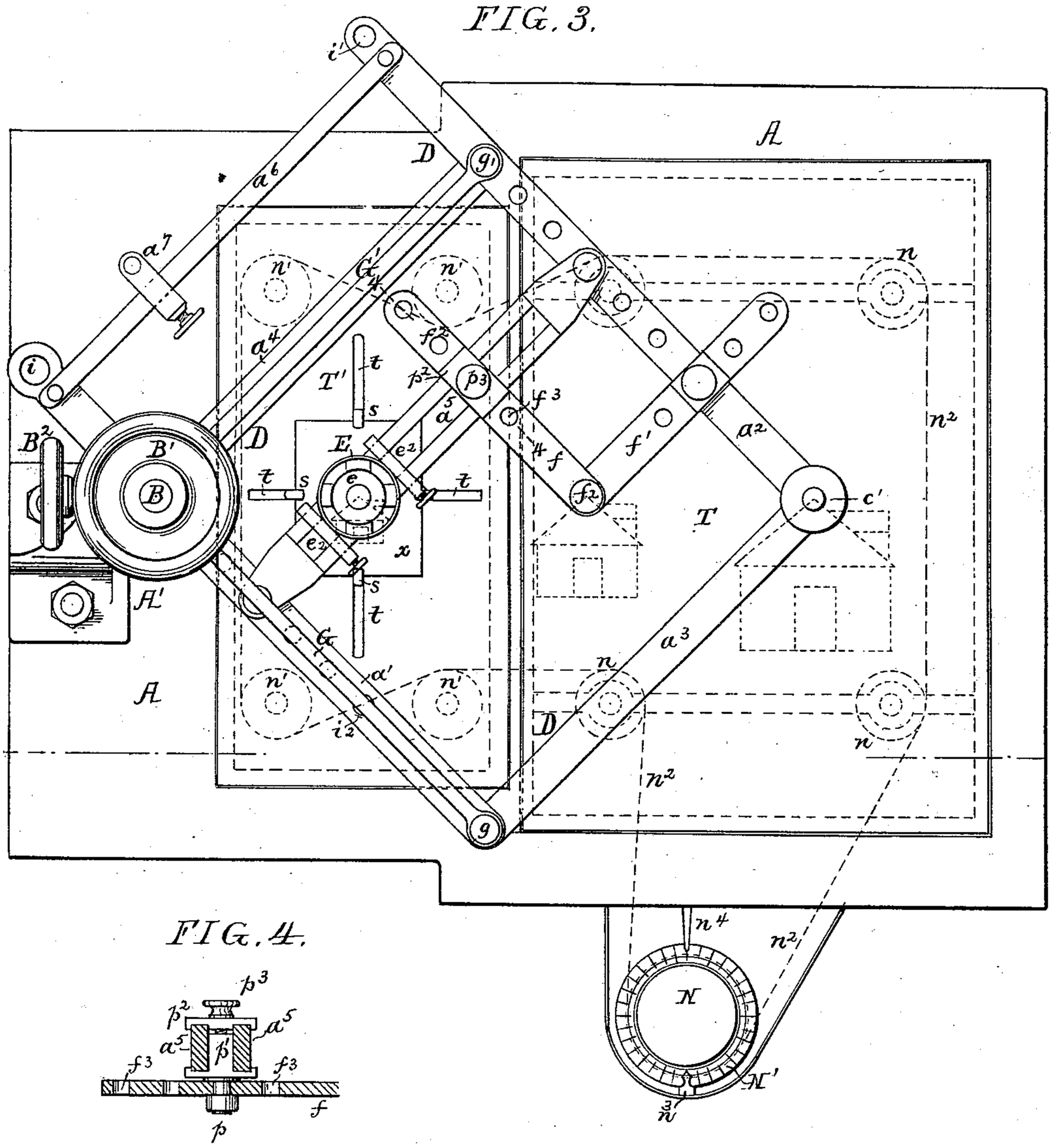

FIG. 4.

Witnesses:
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Inventor:
Harry G. Grier
by his Attorneys
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UNITED STATES PATENT OFFICE.

HARRY GRAHAM GRIER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO ALBERT G. GRIER AND ALFRED S. HOTTLE, OF SAME PLACE.

PANTOGRAPH-MACHINE.

SPECIFICATION forming part of Letters Patent No. 538,776, dated May 7, 1895.

Application filed April 25, 1894. Serial No. 509,021. (No model.)

To all whom it may concern:

Be it known that I, HARRY GRAHAM GRIER, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Pantograph-Machines, of which the following is a specification.

The object of my invention is to construct a pantograph machine by which a stone or metal plate can be engraved simultaneously with the tracing of the outline of the drawing, dispensing with the usual intermediate step of drawing upon the stone and engraving by hand or by a separate machine.

My invention also further relates to the arrangement by which a reduced or enlarged drawing can be made simultaneously with the engraving.

With these objects in view, my invention consists in novel combinations of parts and details thereof, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a sectional elevation of my improved pantograph-machine. Fig. 2 is a front view of the table. Fig. 3 is a plan view. Fig. 4 is a section on the line 4 4, Fig. 3.

In Figs. 1 and 3, A is the base of the machine and projecting from this base is a standard A′ having bearings a a' for the shaft B to which is hung the pantograph frame D. This frame consists of the bar a', which is mounted on and capable of swinging around the shaft B, a bar a^2 secured to the bar a' and parallel to it, and end bars a^3, a^4 which are parallel with each other. A bar a^5 is secured to the bars a', a^2 and is parallel with the bars a^3, a^4. This bar a^5 is suitably shaped to carry an electric motor E. This electric motor is constructed in the ordinary manner and has the usual armature shaft e provided, at its lower end, with a chuck e' in which is secured the cutting tool c. The motor is held securely in place on the bar a^5 by means of clamps e^2. Secured to the bar a^5 is a bar f. This bar is hinged at f^2 to a bar f' which is secured to the bar a^2. The bar f is mounted on a pin p projecting from a block p' which rests in the slot in the bar a^5, as shown clearly in Fig. 4 and resting on the bar a^5 is a plate p^2 through which passes a clamp screw p^3 which clamps the block to the bar a^5. The bar f can be adjusted by inserting the pin p in any one of the openings f^3 in the bar and the bar f' can also be adjusted on the bar a^2.

Extending from the upper portion of the vertical shaft B to the points g g' are supporting rods G G′. These supporting rods and the main bars carry the combined weight of the several parts that constitute the pantograph together with the engraving motor pens or tracing pens.

On the upper end of the shaft B is a hand wheel B′. The lower end of the shaft B is screw threaded and adapted to pass through a screw threaded lug a' on the upright A′.

A collar b and a collar b' on the shaft B support the pantograph frame so that by turning the hand wheel B′ the pantograph may be raised or lowered to adjust it in respect to the table. This shaft B can be locked in its adjusted position by a set screw B^2, Fig. 1.

The main parallel bars a', a^2 extend rearwardly as shown, and in the ends of these bars are holes i, i' so that the pantograph can be extended by removing the vertical shaft B and releasing the supporting bars G G′ and moving the frame forward, so that the shaft will pass through the hole i and the pin g' can be secured in the hole i' and the pin g secured in the hole i^2 in the bar a'. Thus by this arrangement the pantograph can be enlarged considerably.

The cross bar a^6 is secured by pins to the main parallel bars a', a^2 and serves to stiffen the frame. A tracing point a^7 may be secured to this bar, as shown in Fig. 3, if necessary.

In the base A are two tables T T′, and adapted to screw threaded openings in the base are adjusting screws n n' so that the table T′ may be raised or lowered to adjust it in respect to the pantograph. The table T′ is provided with radial slots t t', through which clamps s may extend. Thus by this means any stone or metal plate can be clamped to

able parallel with the front edge of the base, and provided with a plurality of thumb screws for clamping the drawing at two or more points on the table, with a pantograph frame pivotally supported above the table, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HARRY GRAHAM GRIER.

Witnesses:
R. T. FRAZIER,
HARRY Y. DAVIS.

(No Model.) 5 Sheets—Sheet 1.

O. E. HAUSBURG.

ELECTRIC WATCHMAN'S CLOCK.

No. 538,777. Patented May 7, 1895.

FIG. 2.

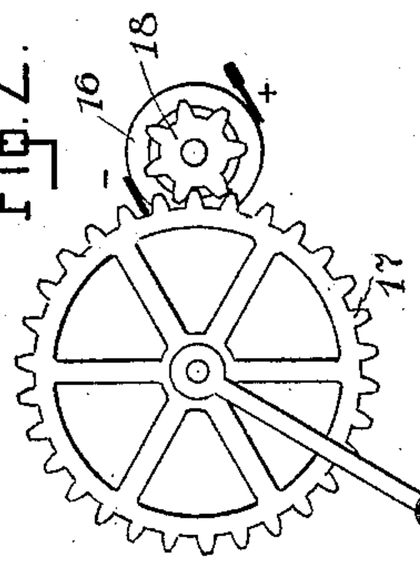

FIG. 1.

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