(Model.) 2 Sheets—Sheet 1.

J. GARDAM.

Proportional Parallel Ruler.

No. 242,625. Patented June 7, 1881.

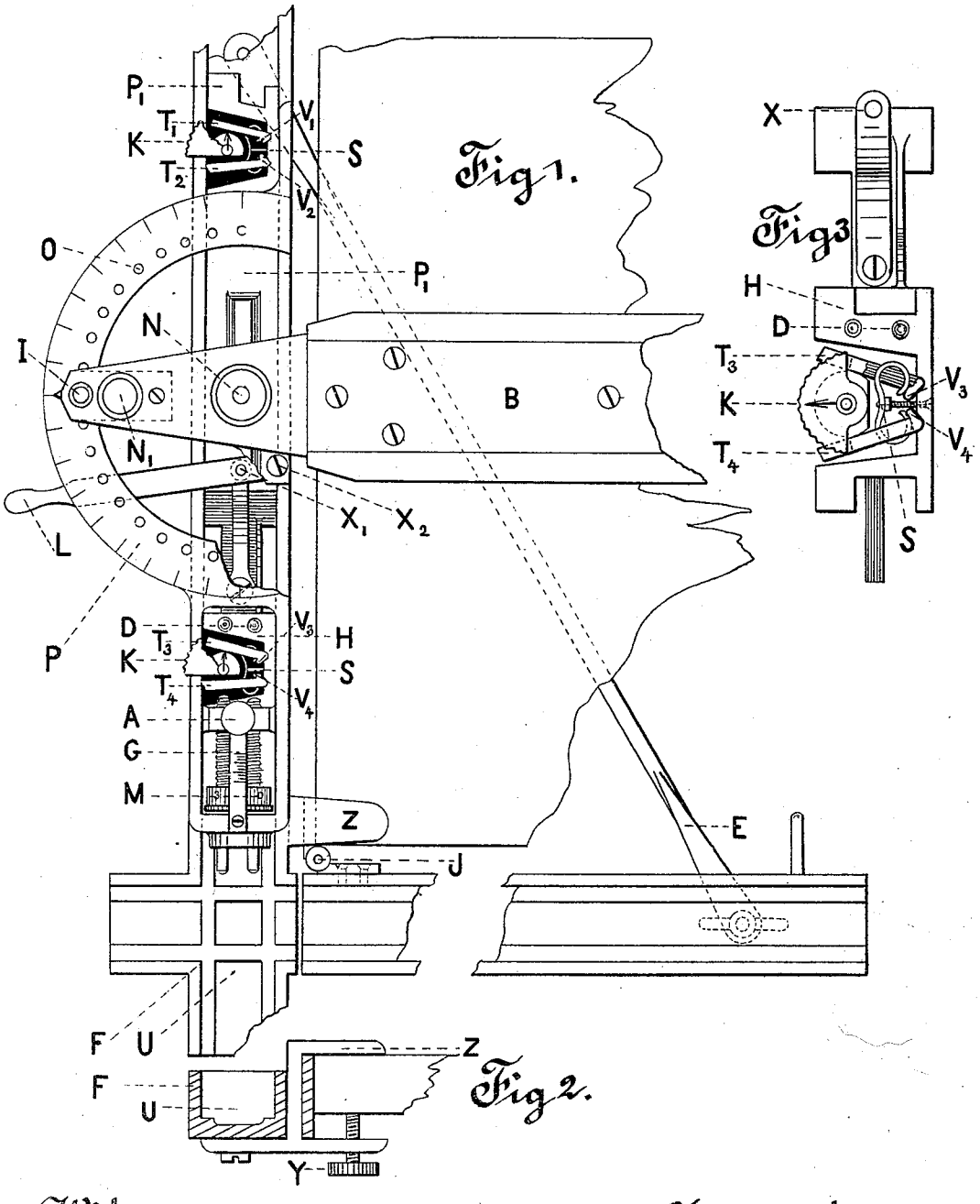


Fig 1.

Fig 3

Fig 2.

Witnesses:
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Inventor:
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N. PETERS. Photo-Lithographer, Washington, D. C.

(Model.) 2 Sheets—Sheet 2.

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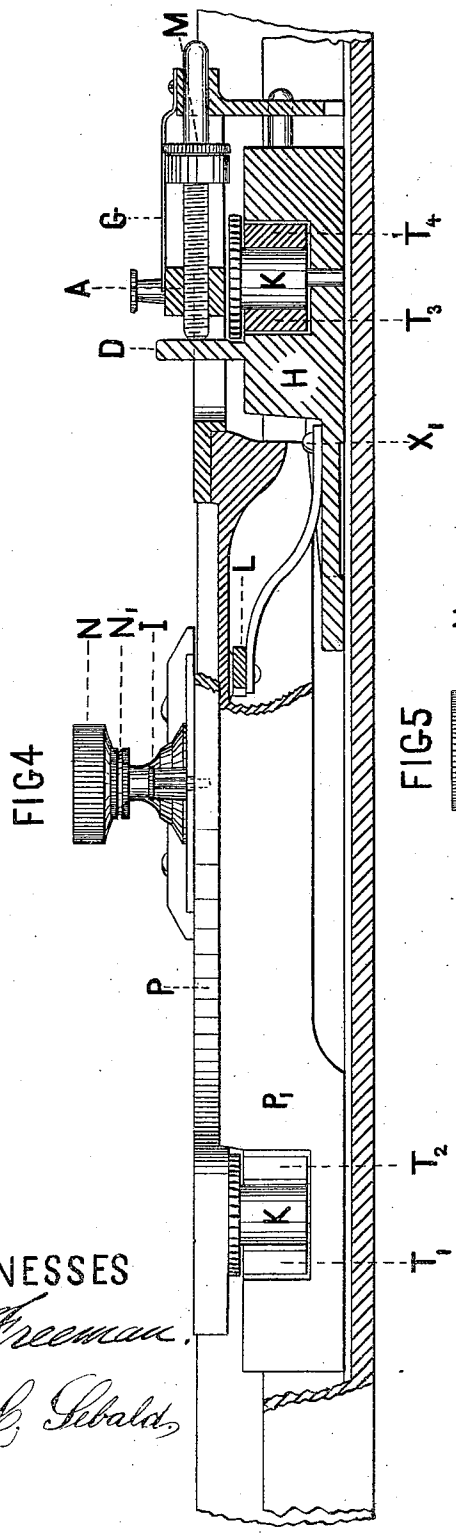


FIG4

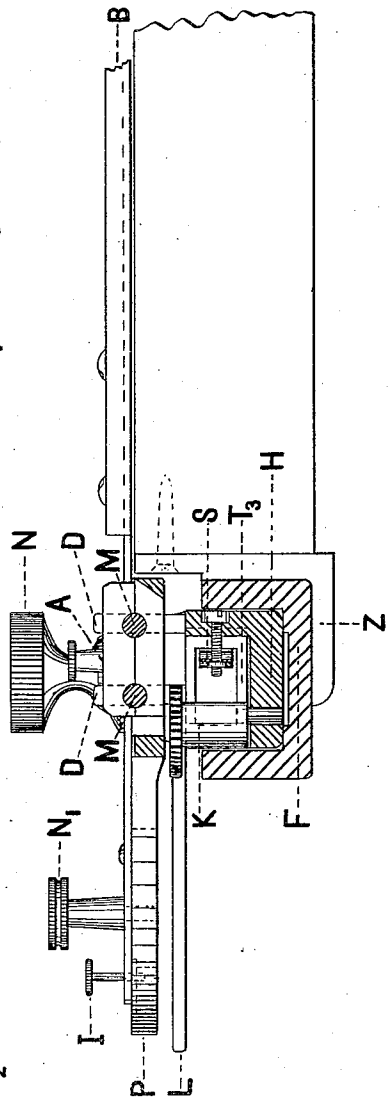


FIG5

WITNESSES

J. H. Freeman.

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UNITED STATES PATENT OFFICE.

JOSEPH GARDAM, OF BROOKLYN, NEW YORK, ASSIGNOR OF TWO-THIRDS TO WILLIAM GARDAM AND FREDERICK W. GARDAM, OF SAME PLACE.

PROPORTIONAL PARALLEL RULER.

SPECIFICATION forming part of Letters Patent No. 242,625, dated June 7, 1881.

Application filed August 17, 1880. (Model.)

To all whom it may concern:

Be it known that I, JOSEPH GARDAM, of Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in a Proportional Parallel Rule, which improvements are fully set forth in the following specification and accompanying drawings, in which—

Figures 1 and 2 illustrate, respectively, the plan and end elevation of said instrument; Fig. 3, an enlarged plan of slide H; Fig. 4, an enlarged longitudinal section through the center of slide H and frame F; Fig. 5, a transverse section through the center of slide H.

My object is to provide for economy in the manufacture of said instrument and its perfection.

My proportional parallel rule, as in the past, consists of a protractor, P, attached to a guide-piece or slide, P′, and the auxiliary guide-piece or slide H traveling in a recessed frame, F, held to the drawing-board by lugs Z and screws Y, said protractor P having a limb or blade, B, turning on its center, N, and clamped to the graduations of the protractor P by means of a Vernier clamp, N′.

The present modifications of the instrument are principally embodied in the introduction of a right-angled frame, F, having a rectangular or trapezoidal groove, U, and the improved toggles $T' T^2$ and $T^3 T^4$ of the guide-pieces or slides P′ and H. The right-angled frame F is to facilitate the drawing of perpendicular as well as horizontal lines, and is to insure their being at right angles to each other.

In using the instrument for horizontal lines or for lines within the limits of the protractor P, place the T-square head in that portion of the frame running perpendicularly to the base of the drawing-board and to the left of the latter. Perpendicular lines or lines to be drawn at right angles to any line emanating from the edge of the blade B (attached to the protractor P while in frame F and to the left of the board) are to be drawn by placing the T-square head in that portion of the frame situated at the base of the board or its lower side.

It is obvious that the T-square may be propelled with equal facility in either the horizontal or perpendicular groove of the right-angled frame F.

The slide H, as shown in Figs. 3, 4, and 5, is placed in frame F, and connected to the linked lever L by the pivot X′, the fulcrum of the lever L existing in the pivot X^2 of the slide P′. In both guide-pieces or slides P′ and H are cavities, into each of which are introduced a pair of toggles, $T' T^2$ and $T^3 T^4$, which are held in requisite perpendicular grooves through contact with a suitably-curved spring, S, at the eccentric points $V' V^2$ and $V^3 V^4$ of said toggles $T' T^2$ and $T^3 T^4$. The tendency of said spring S is further to cause contact with each other of the thereby self-acting toggles in their entire length, and to prevent which a circular cam, K, with flattened surface on one side and milled head on top is inserted. On the upper surface of the milled head a line or arrow is engaged, whose direction is perpendicular to the above flattened surface of the cam K. For any position of this arrow the length of said self-acting toggles $T' T^2$ and $T^3 T^4$ is now such as to allow at most but one toggle at a time to come in contact with the inner face of frame F, though in the event of the arrow being at right angles to the face of said frame it prevents either toggle from so doing, as shown in Fig. 3. The slide H is further provided with a pair of fixed vertical pins or stops, D, which, when traveling with slide H, come in contact with the extremities of the horizontal micrometer-screws M, these latter being efficiently guided and readily fixed by a clamp-nut and screw, A. The proportional adjustment of the instrument is to be achieved by increasing or diminishing the distance between the extremities of the micrometers M and their respective stops D, and is effected by means of turning the graduated milled micrometer-heads until the latter shall have traveled the requisite distance indicated by the horizontally-attached scale G in conjunction with the graduated micrometer-heads.

The object in having two micrometer-screws is to furnish either decimal or duodecimal proportions, as occasion may require.

In using the instrument apply the left-hand thumb and forefinger to the lever L, the stroke

length of which will be governed by either one or the other of the micrometer-screws M and stops D. It will now be evident that if the arrows of the cams K are placed in the position indicated in Fig. 1, thus permitting toggles T^2 and T^4 to come in contact with the inner face of frame F, a pressure on the lever L in the same direction will cause slide H to travel with it; but by the retrogression of lever L the toggle T^4 is caused to jam on the inner face of frame F, thereby holding slide H in position, and subsequently causing a movement on the part of slide P′, protractor P, and blade B in the direction of the arrows, Fig. 1. The eventual amount of movement of blade B produced by a full action of the lever L is therefore an amount equal to that indicated by the scale G and the selected graduated micrometer M. A successive number of movements on the part of lever L will therefore give any desired number of lines separated by equal distances. By reversing the direction of the arrows a movement of the blade B in the opposite direction is effected, and by placing them in opposite directions the instrument becomes fixed.

The right-angled frame F may be in one casting, or may be furnished with a joint at J, to render the instrument more portable, in the latter case a bar, E, being attached, as indicated, whereby the right angle of the frame is insured. The said bar E is rendered detachable at its extremities, and clamped to the arms of the right-angled frame F by thumb-screws or any other suitable device for readily attaching or removing the same.

To render the frame F portable it is but necessary to detach bar E and cause the arms of frame F to come in contact by agency of the joint J.

To provide for the ready and more efficient adjustment of the blade B relative to the protractor P, I introduce in the extremity of the former a hole, which, when connected with any of the series of holes O of the protractor P by means of the pin I, positively fixes said blade opposite the graduation corresponding to said hole, the pin I further obviating the necessity of a tangent screw for precisely adjusting the limb or blade B to any graduation governed by its respective hole O of the protractor P.

In using the instrument as an ordinary T-square it is but necessary to place the arrows of the cams K at right angles to the face of frame F, when the T-square may be removed or shifted, as in ordinary cases. It is further obvious that if an instrument should be required having a progressive movement in but one direction it would be necessary to provide but two toggles, T' and T^3 or T^2 and T^4, at the option of the draftsman.

The instrument can be made to operate in one direction with but one toggle, though not so efficiently.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a proportional parallel rule or guided T-square head with fixed or movable blade, a self-acting toggle, in combination with the requisite cam K, for relieving or engaging said toggle at will, substantially as shown and described.

2. In a proportional parallel rule or guided T-square head with fixed or movable blade, a pair or more of self-acting toggles T' T^2 T^3 T^4, in combination with the requisite cam or cams K, for relieving or engaging either toggle or toggles at will, substantially as shown and described.

3. In combination with a proportional parallel rule or guided T-square head with fixed or movable blade, one or more graduated micrometer-screws, M, acting upon a suitable stop or stops, D, as required, for the purpose set forth.

4. In combination with a proportional parallel rule or guided T-square head having a fixed or movable blade, a right-angled frame, F, with a rectangular or trapezoidal groove, U, substantially as shown and described.

5. In a proportional parallel rule or guided T-square head with fixed or movable blade, the right-angled frame F, provided with a joint, J, and a truss or bar, E, substantially as shown, and for the purpose set forth.

JOSEPH GARDAM.

Witnesses:
JAMES A. HUDSON,
WALTER LARGE.