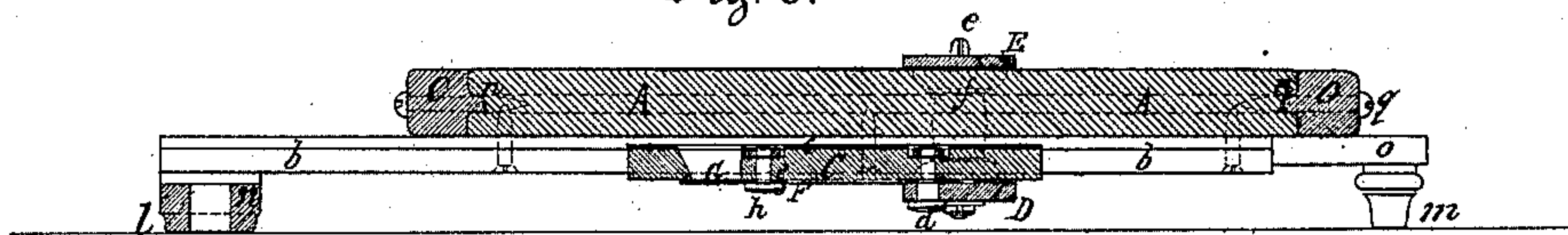


T. BERGNER.
RULER ATTACHMENT FOR DRAWING BOARDS.

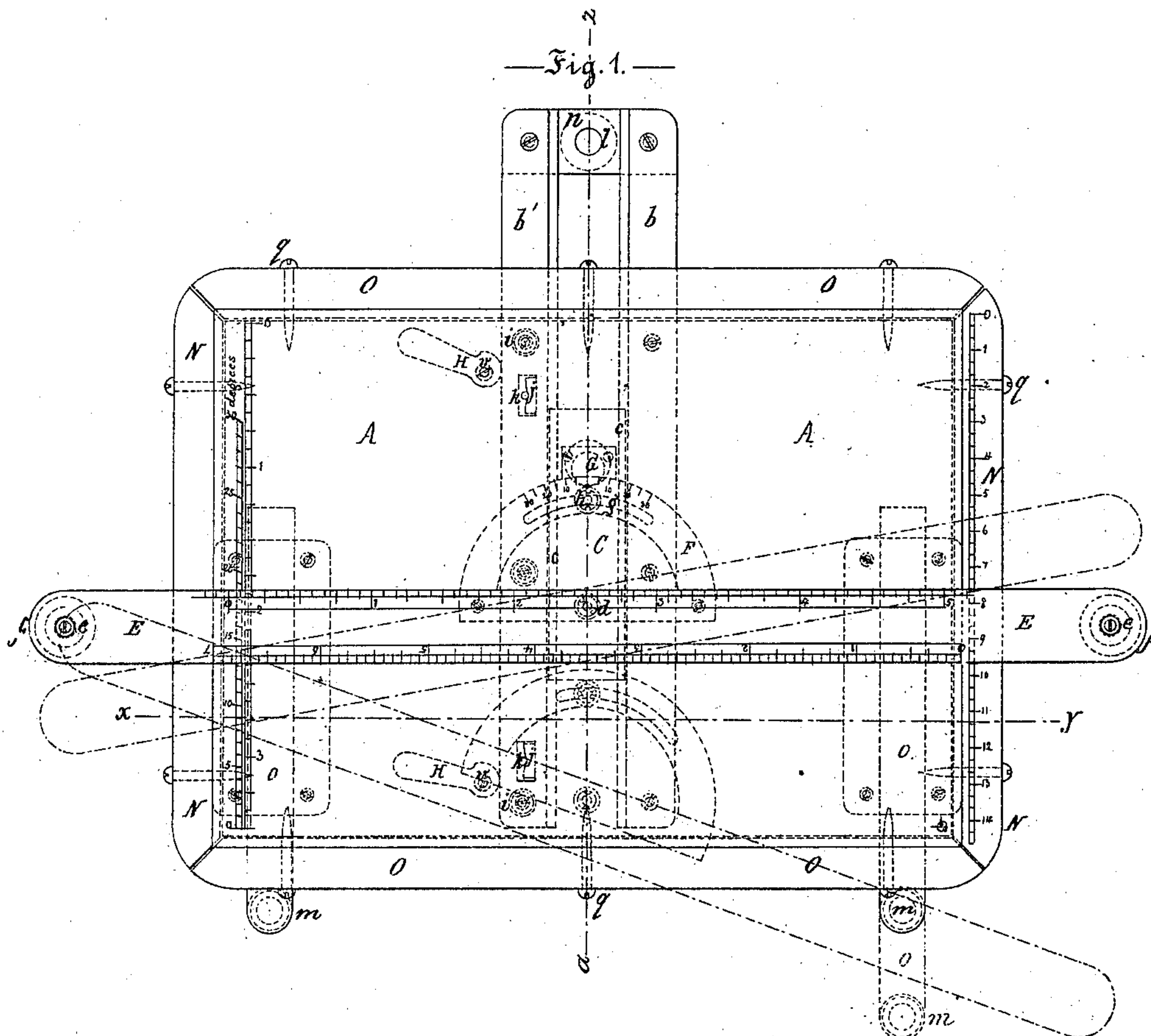
No. 113,726.

Patented Apr. 18, 1871.

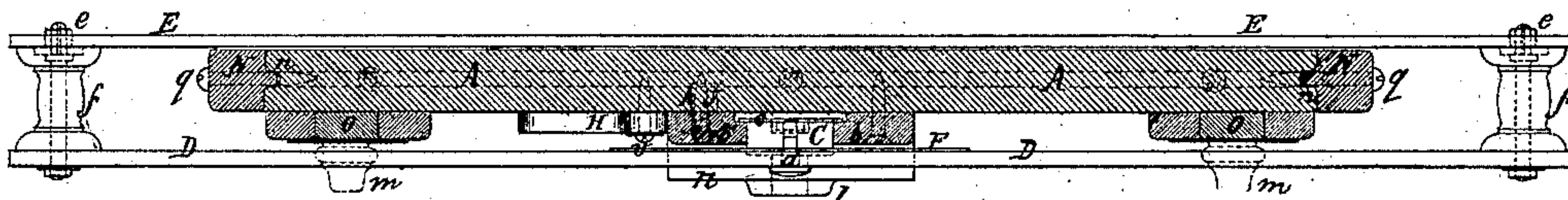
— Fig. 3. —



— Fig. 1. —



— Fig. 2. —



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THEODORE BERGNER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
JAMES W. QUEEN & CO., OF SAME PLACE.

Letters Patent No. 113,726, dated April 18, 1871.

IMPROVEMENT IN RULER ATTACHMENTS FOR DRAWING-BOARDS.

The Schedule referred to in these Letters Patent and making part of the same.

I, THEODORE BERGNER, of the city of Philadelphia and State of Pennsylvania, have invented certain Improvements in Drawing-Boards, of which the following is a specification.

The first part of my invention relates to the combination, with a drawing-board, of a system of guides for the head or cross-piece of a parallel ruler in such a manner that the true parallelism of the lines shall be more positively maintained, and not be dependent on the edges of the drawing-board, as is the case with the ordinary T-square. This part of my invention also comprises a means of setting the parallel-ruler at different angles to the head, and the means of securing the head or cross-piece in any position in the direction of its motion on the board, and relative to the angular adjustment of the ruler.

The second part of my invention relates to the combination, with a drawing-board and the improved parallel-ruler, of a system of graduation or scales, whereby the vertical, horizontal, and angular measurements or divisions may be defined on the drawing without the use of compasses and detached scales.

In the annexed drawing forming part of this specification—

Figure 1 is a plan of my improved drawing-board.

Figure 2 is a section on the line xy , fig. 1.

Figure 3 is a transverse section through the line az , fig. 1.

A is a plain rectangular board, of uniform thickness, which may be of any required dimensions, and when large should be made up of pieces framed together so as to prevent warping.

This board is, on the under side, provided with two bars or straight-edges, b and b' , placed parallel to and equidistant from the vertical center-line of the board, and acting as guides for the sliding head C, which is confined between their opposite inner edges.

D is a supplementary ruler, jointed to this head at d , and carrying the drawing-blade or ruler E, which is fitted at each end to pins $e e$, and rests on intermediate blocks $f f$, of the required height for keeping the two rulers level when the upper one, E, rests on the top of the board.

The weight of head C and blade D is supported by the laterally-projecting edges of a thin plate of metal, c , on the top of D.

F is a semicircular protractor, so fastened to the supplementary ruler D that its axis coincides with the axis of vibration d on head C.

The circular part of F has a curved slot, g , through which passes a clamping-screw, h , by means of which the rulers D E are held in any required position relative to head C.

G is a vernier, by means of which the deflection of

the rulers in either direction from a rectangle may be correctly measured upon the degree-scale of F.

One of the straight-edges, b , is permanently secured to the board A, while the other, b' , is so held against the board by clamping-screws and washers $i i$ that it may have a limited sliding motion on its bearing surface, for the purpose of adjusting the guiding surfaces relative to head C.

$j j$ are springs resting in suitable cavities under the bar b' , and bearing against pins $k k$ on bar b' with a tendency of pushing the guiding surface of this bar away from the opposite guiding surface on bar b .

H H are small cams, secured to board A by screws $v v$, acting as fulcrums for their vibration. The bar b' being held against the eccentric surfaces of these cams by the elastic pressure of springs $j j$, and capable of movement under the washers of clamping-screws $i i$, may, therefore, be nicely adjusted by the use of cams H H. This adjustment of the straight-edge b' serves on the one hand to compensate for shrinkage or swelling of the several parts, or for wear of the sliding surfaces, to preserve their parallelism, while on the other hand it also provides the means of clamping the head C securely between its guiding surfaces at any point in the direction of its motion. The object and importance of this arrangement will be readily apparent: being thus enabled to secure the ruler E rigidly in any desired place on the board, the drawing or inking of vertical shading lines, or the drawing of equidistant lines for shading or sections, can be accomplished with ease and accuracy, it being only necessary to slide the triangle along the fixed edge of the ruler without attention to the position of the latter, whereas with the use of an ordinary T-square, or without this means of securing my improved ruler, a more diversified attention and greater skill are required to do such work accurately and with dispatch.

The improved mode of guiding the parallel-ruler has important advantages over the T-square in other respects: To draw parallel lines with the latter requires a constant effort to press it against the edge of the board; and when the extreme end of its rule is used, or when lines are to be drawn near the top or bottom edge of the board, its use becomes very inconvenient and unreliable; whereas my improved drawing-ruler is so guided as to require no effort to maintain its parallelism, and remains uniformly correct and convenient in any position over the whole field of the board.

In order to provide a clear space underneath the drawing-board for the free motion of head C and lower ruler D, the board has three feet or supports, $l m m$.

l is fixed at the top on a cross-piece, n , beneath the upper end of bars $b b'$.

The two lower supports, $m m$, are carried on slides $o o$.

Ordinarily, these movable feet may occupy the position shown in full lines in fig. 1; but, when the rulers D E are to be used with any considerable degree of obliquity near the lower edge of the board, the one of the feet *m* which would, if permanent, check the required downward motion of the roller, need only be drawn out, as shown in dotted lines in fig. 1, to give the desired clearance.

The combination of a system of scales with the above-described mode of maintaining parallel guiding surfaces will be fully understood on reference to fig. 1 in the drawing, and the convenience and practical importance of this improvement will at once be evident.

The ruler E, being easily reversible on pins *e e*, may have several edges graduated, and thus contain a variety of scales for horizontal distances and vertical lines.

Graduations of conforming values are provided at the right and left-hand sides of the board for the vertical distances and horizontal lines.

The scales on the right-hand side are shown on the clamping-strip N, (hereafter fully described,) and those on the left-hand side are represented as being printed on the margin of the drawing-paper.

The degree-scale may be either on the protractor

E, or it may be provided alongside of each of the vertical scales, as shown to the left hand of fig. 1.

The saving of much tedious labor, and the accuracy of workmanship resulting from the use of this system of scales, is very important: To draw a screw or rack, for instance, requiring a long series of correctly-spaced equidistant lines, it is necessary with the ordinary drawing implements to first divide and mark the spaces carefully with the compasses, then to draw the lines in pencil, and finally in ink, while by the use of my improvement such spaces can be directly and accurately defined from one of the graduations and at once drawn in ink, without the tedious preparation otherwise required.

Having thus described the nature and objects of my invention,

I claim—

The rulers D E, head C, and guides *b b'*, when combined with and arranged in relation to a drawing-board, in the manner and for the purpose specified.

THEODORE BERGNER.

Witnesses:

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