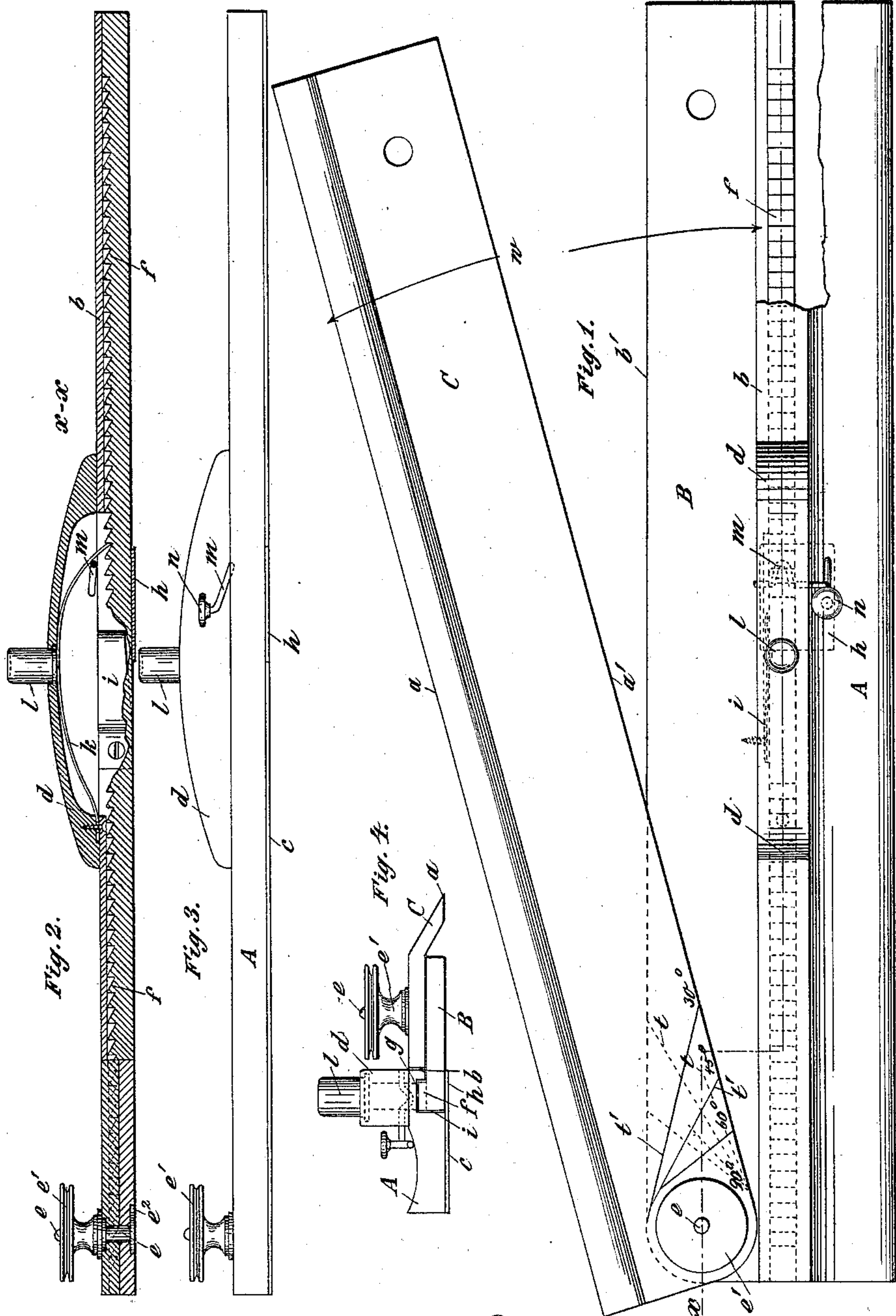


(No Model.)

F. BARDELLI & K. DANIELOVSKY.  
PARALLEL RULER.

No. 561,474.

Patented June 2, 1896.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

FRANCO BARDELLI AND KARL DANIELOVSKY, OF BUDA-PESTH, AUSTRIA-HUNGARY.

## PARALLEL-RULER.

SPECIFICATION forming part of Letters Patent No. 561,474, dated June 2, 1896.

Application filed December 10, 1894. Serial No. 531,325. (No model.)

*To all whom it may concern:*

Be it known that we, FRANCO BARDELLI and KARL DANIELOVSKY, engineers, of Buda-Pesth, Austria-Hungary, have invented new and useful Improvements in Parallel-Ruling Apparatus, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to apparatus or instruments for parallel ruling or drawing parallel lines; and it consists in an improved arrangement or construction of said apparatus or instrument which has the advantage of great simplicity, exact working, and especially that it allows any desired variations in the distance between the parallel lines up to a maximum limit determined by the construction of the apparatus, to be made in a convenient manner.

On the drawings appended hereunto, Figure 1 shows the apparatus as seen from above; Fig. 2, a vertical section along line  $xx$  of Fig. 1; Fig. 3, a front view, and Fig. 4 an end view.

The construction of the improved apparatus is based upon the application of the most usual method of parallel ruling or section-lining, which consists in shifting one side of a triangular set-square along a straight-edge or ruler and to draw the lines along one of the other sides of the set-square, the distance of the lines depending on the distance by which the set-square is shifted. In the improved apparatus the shifting is effected by depressing a pawl, which engages in a rack, while the distance of the parallel lines can be varied by altering the angle  $w$ , formed by the edge  $a$ , Figs. 1 and 4, of the triangular set-square, along which the line is drawn, and the edge  $b$ , on which the same is shifted.

It will be readily seen that if the angle  $w$  equals ninety degrees the width of the ruling equals the distance by which the set-square is shifted, while when  $w=0$  the width also becomes 0. It follows that the widths of the ruling are in the ratio of the sines of the angles  $w$ , or the less the angle  $w$  is the closer the ruling will be. In the apparatus represented on the drawings appended hereunto the straight-edge consists of a flat bar A, which, in order to lie firmly upon the paper, is provided on its under side with a strip of cloth

or leather  $c$  and carries a small casing  $d$ , containing the mechanism for shifting the set-square. The latter is formed by two flat rulers or bars B and C, which are joined movably together at one end by means of a screw-bolt  $e$  and button-nut  $e'$ , and can be fixed at any angle to each other. The bolt is made with a steadying-nib  $e^2$ , or of a square shape, and let into the ruler B, whereby the bolt is prevented from turning when the nut  $e'$  is tightened. One edge of the ruler B is fitted with a rack  $f$ , which slides in a groove  $g$  of the straight-edge A and serves to guide the ruler B on A. For the same purpose a small plate  $h$  is screwed to the straight-edge A, projecting underneath B, and in a vertical side of the groove  $g$  a spring-blade  $i$  is fixed, which presses the rack against the opposite side of the groove.

The mechanism for shifting the triangular set-square or the rulers B and C consists of a spring-blade  $k$ , one end of which is fixed to the case  $d$ . It acts as a pawl and for working it is provided with a button or push  $l$ , protruding from the case  $d$ . The spring  $k$  is bent, as shown, so that it is free and presses upon the rack and ordinarily remains engaged therewith. Below this end a small bent wire crank  $m$  is mounted in bearings, which crank, by depressing the button  $n$ , can be so turned that the end of the spring is lifted out of the teeth of the rack.

The manipulation and action of the apparatus are as follows: The angular set-square formed by the rulers B and C is pushed with the rack  $f$  into the groove  $g$  from the left until the spring  $k$  engages with the first tooth on the right-hand side of the rack. The angle  $w$  is then adjusted according to the desired width of ruling and the edge  $a$ , Fig. 1, placed into the direction of the lines to be drawn. The button  $l$  is now depressed by the first finger of the left hand, while the other fingers of this hand firmly press the straight-edge A upon the paper. The stroke of the button  $l$  is limited by the height of the case  $d$  and the length of the spring  $k$ , so that by a complete depression of the button the spring moves the rack  $f$ , and with it the entire angular set-square, to the right by one tooth. When the button is now released, the pawl or free spring end moves back by a tooth, and a line



is drawn with the right hand. The button is then depressed again. Band C are thereby moved to the right by a tooth and another line is drawn, and so on.

5 The length of the surface which can be ruled or section-lined with this apparatus without shifting the straight-edge A depends on the length of the rack. When the spring  $f$  has shifted the last tooth of the rack  $f$  to  
10 the right, the ruler B is drawn out of the groove  $g$  on the right-hand side and pushed in again at the other, or by depressing the button  $n$  the spring  $k$  is lifted up and the ruler B pushed back until the first tooth at  
15 the right-hand end of the rack is engaged with the spring.

Obviously the spring-pawl  $k$  may be replaced by a pawl hinged to a lever under spring action or their equivalents.

20 Near to the screw  $e$  division-lines  $t$  are drawn upon the ruler B by empirical method, indicating the distance between the parallel lines drawn when the edge  $a'$  of C coincides with these division-lines. On the ruler C  
25 other division-lines  $t'$  are drawn, indicating the size of the angle  $w$  when one of these lines

coincides with the projection of the edge  $b'$  of ruler B.

What we claim, and desire to secure by Letters Patent of the United States, is— 30

In a parallel-ruler the combination of a straight-edge and two rulers, the latter hinged together at one end, the straight-edge and one ruler being secured together so as to permit longitudinal motion, one of the rulers 35 being provided with a ratchet on its side next the straight-edge and the straight-edge carrying a spring-pawl adapted to engage the ratchet, and having a protecting thumb-button by which the rulers may be stepped forward a desired distance, and a lever suitably 40 pivoted to lift and hold the pawl out of engagement with the ratchet when adjusting the ruler, substantially as described.

In witness whereof we have hereunto set our 45 hands in presence of two witnesses.

FRANCO BARDELLI.  
KARL DANIELOVSKY.

Witnesses:

JOHANN WEIST,  
KARL FRANZE.