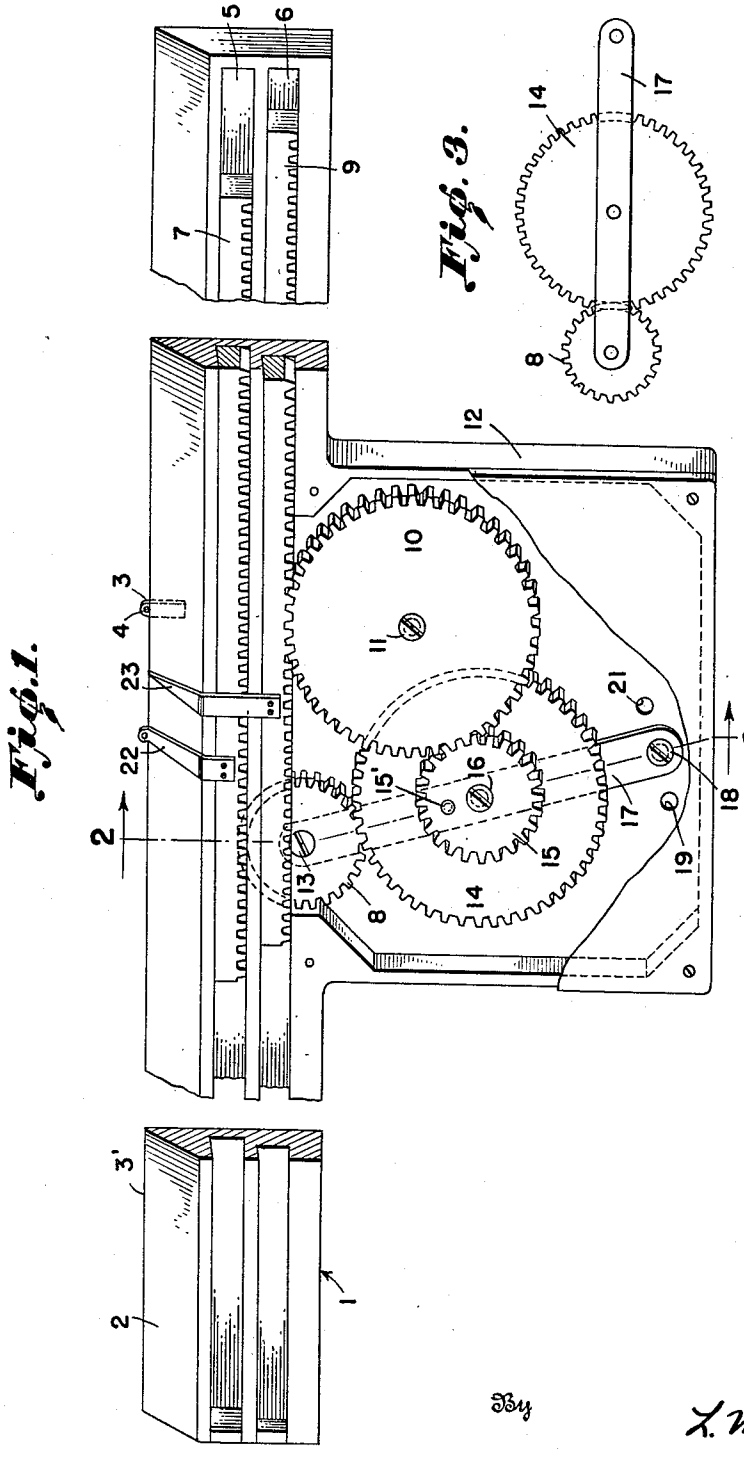
June 26, 1951 D. K. CROOK 2,557,944

RATIO SCALE

Filed Aug. 10, 1948 2 Sheets-Sheet 1



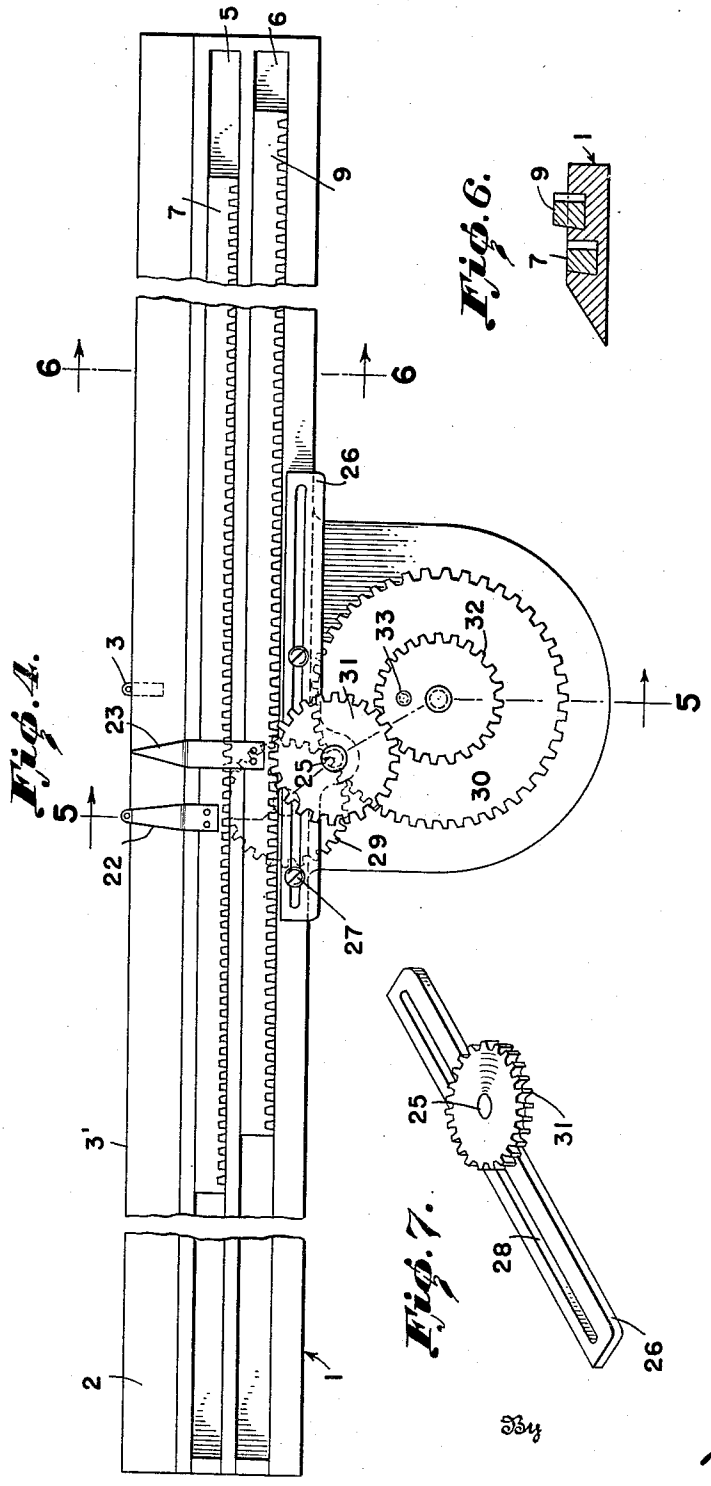
Inventor
D. K. CROOK

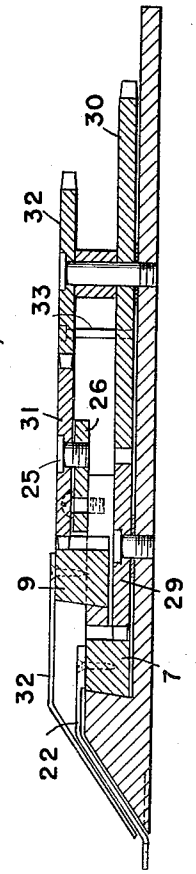
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RATIO SCALE

David K. Crook, Lincoln, Nebr.

Application August 10, 1948, Serial No. 43,502

4 Claims. (Cl. 33—75)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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This application is made under the act of March 3, 1883, as amended by the act of April 30, 1928, and the invention herein described, if patented in any country may be manufactured and used by or for the Government of the United States of America for governmental purposes throughout the world without the payment to me of any royalty thereon.

This invention relates to a device for use as a proportional divider, or in drafting enlargements or reductions of drawings, maps, or templates, to scale.

An object of this invention is a scaling device of this character having simplicity of design and ruggedness of construction, combined with accuracy and adjustability to vary the scale ratio.

Two modifications of the device are shown in the drawings, in which:

Figure 1 is a top three-dimensional view of one form;

Figure 2 is a section on line 2—2 of Figure 1;

Figure 3 is a detail view of gears of Figure 1;

Figure 4 is a top view of the second form;

Figure 5 is a section on line 5—5 of Figure 4;

Figure 6 is a section on line 6—6 of Figure 4;

Figure 7 is a detail view of a gear of Figure 4 and its mounting.

The device shown in Figure 1 comprises a base plate 1 having a bevelled straight-edged surface 2 which may be ruled if desired. Attached to plate 1 is a pointer 3 having a hole 4 through which a pin point may be projected. The instrument may be pivoted about this point on the map or drawing to be reduced or enlarged.

Base plate 1 is provided with two parallel slots, or grooves, 5 and 6. In slot 5 is slidably seated a gear-toothed rack 7 which meshes with a lower pinion gear 8. A second gear-toothed rack 9 is slidably seated in slot 6, and meshes with an upper gear 10. As shown in Figure 2, slot 5 is deeper than slot 6, to permit access of the gear 8 to rack 7.

Gear 10 is rotatably mounted upon shaft 11, which is fixed upon base plate extension 12. Gear 8 is mounted upon shaft 13 attached to base plate extension 12. Gears 14 and 15 rotate about shaft 16, which is mounted upon lever 17. A pin 15' on gear 15 fits into a hole in gear 14. Lever 17 pivots on shaft 13 at one end; at its other end is a screw 18 which may be fastened in place in any one of the three holes 19, 20, 21. Gear 15 may be replaced with a smaller or a larger gear having a different number of teeth. The gear ratio may thus be adjusted to obtain the desired enlargement or reduction.

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Pointer 22 is attached to and moves with rack bar 7. Pointer 23 is attached to rack bar 9.

To operate the device of Figure 1 it is placed over the center point of the map, or drawing, or over the picture center of a templet. A pin is then inserted through hole 4. Pointer 22 is moved along edge 3' to a selected point on the map. Pointer 23 will follow along edge 3' a proportional distance, dependent upon the over-all gear ratio.

The device shown in Figure 4 is similar in structure and operation. The mounting of the gears is modified. The gear 31 rotates about a shaft 25 which is fixed upon slide plate 26. The plate 26 slides upon the base plate 1, being held in position by screws 27 tightened in slot 28. By replacing gear 32 by a smaller or larger gear the ratio between the distances moved by pointers 22 and 23 can be altered. Lower pinion gear 29 meshes with lower rack 7 and with large gear 30. Gear 31 meshes with upper rack 9 and with gear 32. Gear 32 is fixed upon larger gear 30 by pin 33 fitting in a hole in gear 30.

Having thus described my invention, I claim:

1. In a proportional divider, a base member providing a ruling straight edge and two grooves parallel thereto, a straight rack slidably mounted in each groove, a pinion gear in mesh with each rack, both pinions being mounted upon the base member at the same side of the straight-edge, the gear teeth of the rack nearer the straight edge extending vertically below the path of the teeth of the other rack to permit access of one of the said pinions thereto, additional gears to transmit movement of one of the pinions to the other in the same direction, and a pointer mounted upon each rack and travelling along the straight edge, the pointer attached to the farther removed rack moving in a path adjacent to but outside the path of the other pointer, which latter is nearer the straight edge, the additional gears comprising a pair of rotary gears mounted for rotation together about a common pivot, a lever pivoted upon the shaft of one of the pinion gears, the said common pivot being carried by the lever.

2. In a proportional divider, a base member providing a ruling straight edge and two grooves parallel thereto, a straight rack slidably mounted in each groove, a pinion gear in mesh with each rack, both pinions being mounted upon the base member at the same side of the straight-edge, the gear teeth of the rack nearer the straight edge extending vertically below the path of the teeth of the other rack to permit access of one of the said pinions thereto, additional gears to transmit movement of one of the pinions to the other in

the same direction, and a pointer mounted upon each rack and travelling along the straight edge, the pointer attached to the farther removed rack moving in a path adjacent to but outside the path of the other pointer, which latter is nearer the straight edge, the additional gears comprising a pair of rotary gears mounted for rotation together about a common pivot, one of said four gears being mounted upon an axis adjustable in position with respect to the axis of another of said four gears with which it is in mesh in operation, whereby one of said gears may be replaced by another gear, for adjustment of over-all gear ratio.

3. The device of claim 2, one of the pinion gears being the gear mounted upon an axis adjustable as recited, said one pinion gear being mounted upon a shaft adjustable longitudinally of the racks.

4. A ratio scale comprising a base plate providing a longitudinally extending ruling straight edge having a fixed pivot point marker intermediate its ends; and providing two grooves parallel to and both on the same side of the straight edge; a first straight rack gear slidably mounted in the groove that is nearer the straight edge; a second straight rack gear slidably mounted in the other groove; the teeth of the gear of the first rack extending below the plane of the lower face of the second rack gear; a pinion gear mounted on the base plate in mesh with the second rack gear, another pinion gear mounted on the base plate beneath the second rack gear and in mesh with the first rack gear; a pair of gears, mounted for rotation about a common axis for transmitting proportionate motion of one rack gear to the other, these gears meshing with the pinion gears and moving the racks in the same direction on the same side of the fixed pivot point marker; a first pointer attached to the first rack and travelling along the straight edge; a second pointer attached to the second rack and mounted to travel along the straight edge above the path of the first pointer.

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