

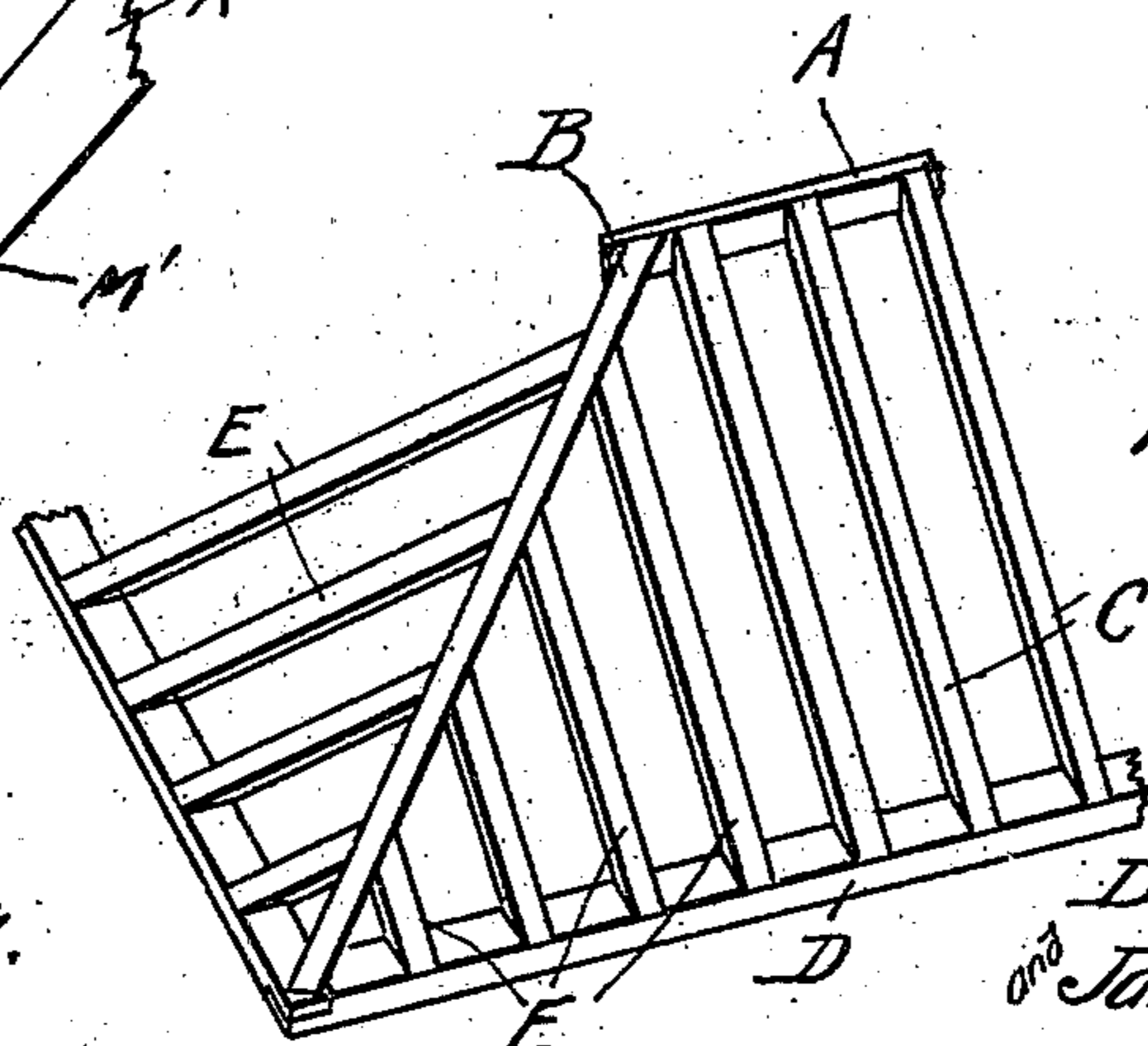
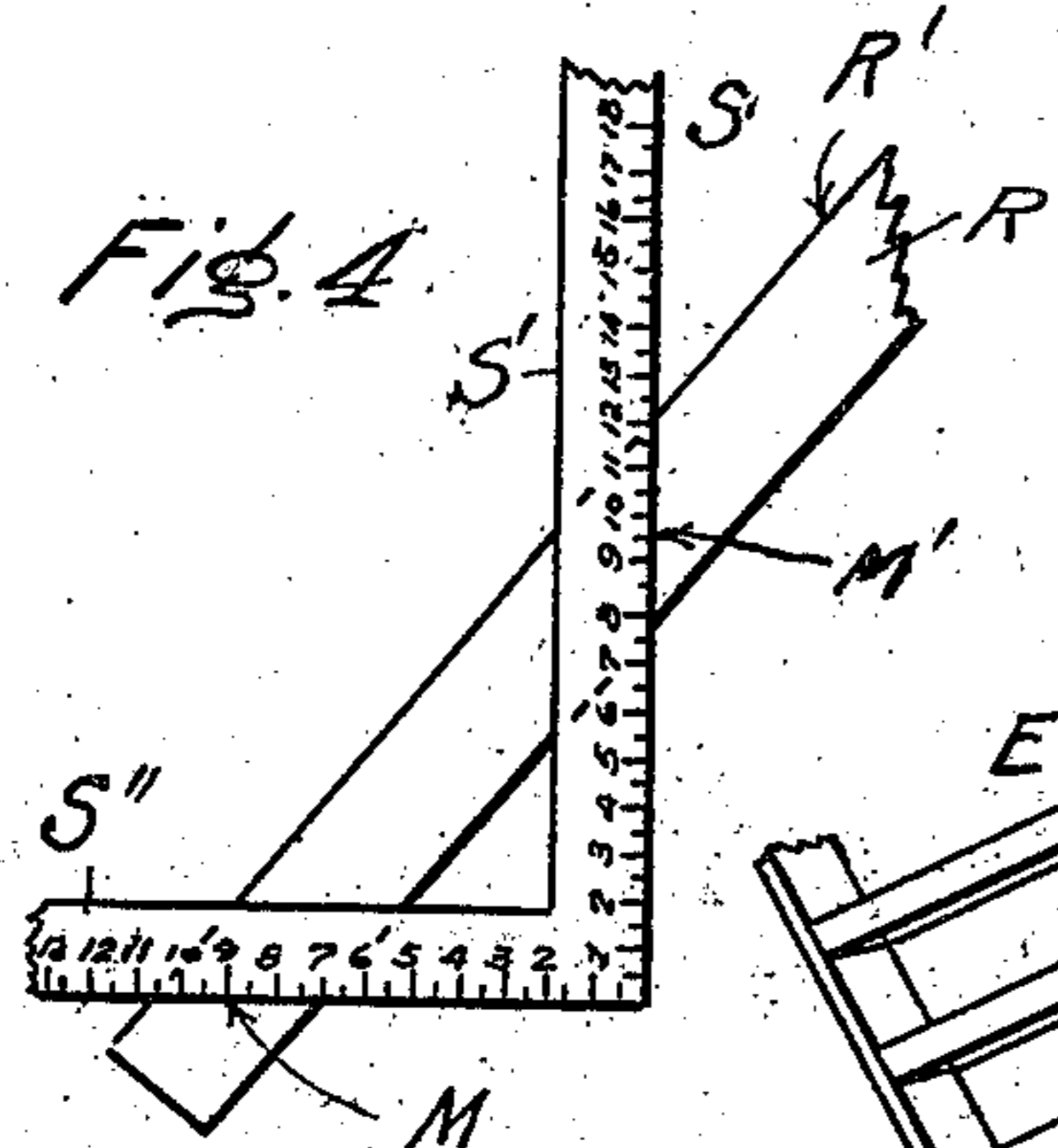
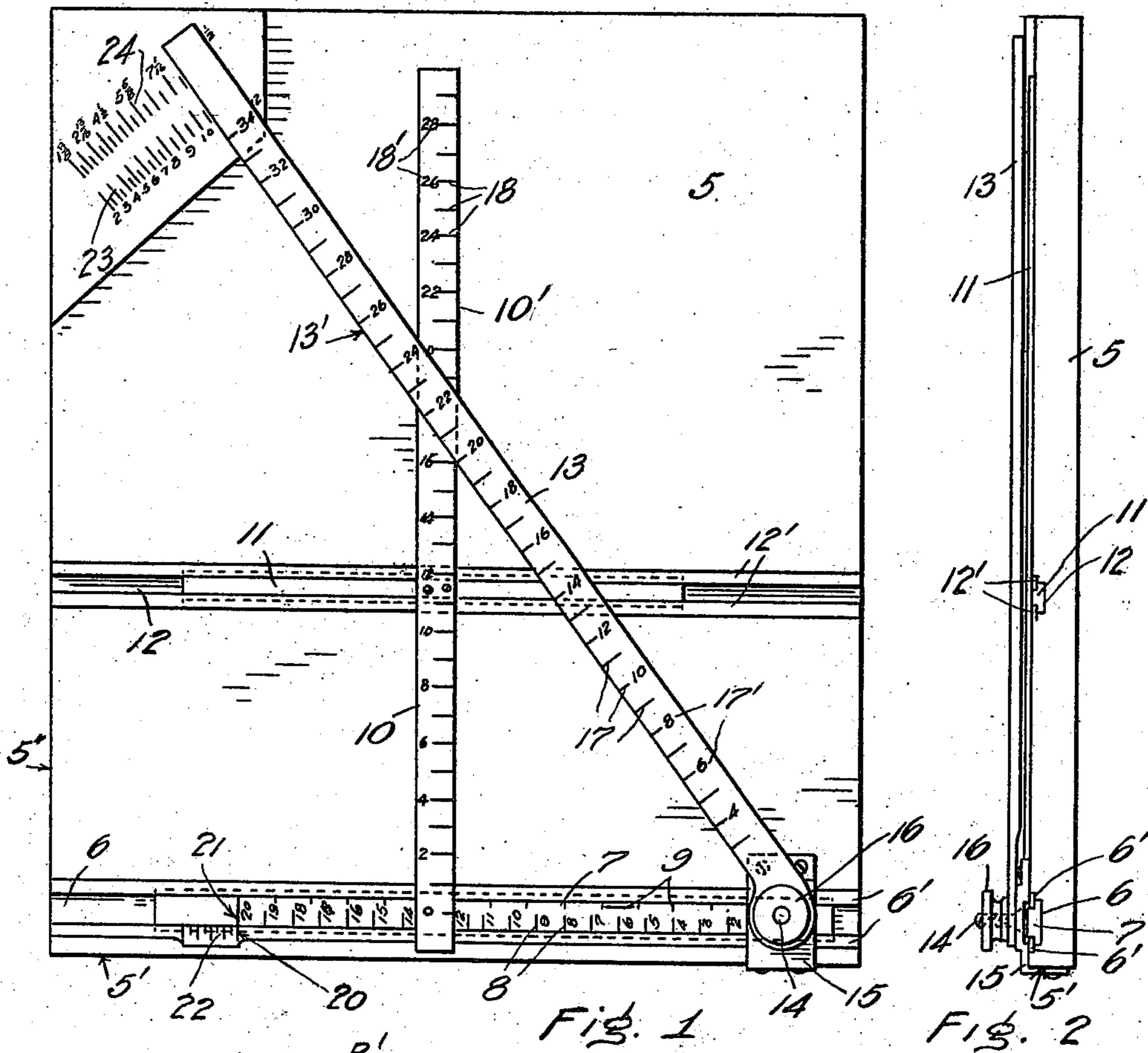
D. ROBERTSON & J. A. ATKINSON.

ROOF RAFTER CALCULATING DEVICE.

APPLICATION FILED FEB. 23, 1910.

989,806.

Patented Apr. 18, 1911.



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# UNITED STATES PATENT OFFICE.

DONALD ROBERTSON, OF NEW WESTMINSTER, AND JAMES A. ATKINSON, OF CENTRAL PARK, BRITISH COLUMBIA, CANADA.

## ROOF-RAFTER-CALCULATING DEVICE.

989,806.

Specification of Letters Patent.

Patented Apr. 18, 1911.

Application filed February 23, 1910. Serial No. 545,433.

*To all whom it may concern:*

Be it known that we, DONALD ROBERTSON and JAMES A. ATKINSON, subjects of the King of England, and respectively residing at New Westminster and Central Park, in the Province of British Columbia, Canada, have invented certain new and useful Improvements in Roof-Rafter-Calculating Devices, of which the following is a specification.

This invention relates to carpenter's calculating apparatus and its object is the provision of inexpensively constructed and simple operable means whereby the marking of house-rafter cuts is facilitated.

The invention consists in the novel construction and combination of devices, as will be hereinafter described and claimed with reference to the accompanying drawing, wherein—

Figure 1 is a plan view and Fig. 2 an end elevation of an embodiment of our invention. Fig. 3 is a fragmentary perspective view of a roof frame. Fig. 4 is a plan view of a carpenter's square as applied to a scantling in transferring the measurements derived from the calculating appliances illustrated in Figs. 1 and 2.

According to our invention, there is provided a frame 5, herein shown as a flat rectangular body, having in proximity to its front edge 5' a transversely arranged groove 6. Within the groove is placed for lengthwise movement a rod 7 having along one edge marks 8 graduated according to a convenient foot scale as, for example, one-half inch to the foot and is correspondingly numbered. Along the other edge of the rod is another scale 9 whereof the marks are spaced at distances to represent, say sixteen inches, or corresponding to the usual spacing for the rafters of dwelling houses or similarly constructed roof framing. Upon said frame is a superposed blade 10 which is arranged to be maintained perpendicular with respect to the aforesaid rod and is connected to the frame for transverse movement. Desirably, such connection is had through the medium of a transversely arranged bar 11 which is rigidly secured to said blade and is slidably fitted within a transverse groove 12 provided in the frame.

For retaining the rod 7 and the bar 11 in their respective grooves, strips 6' and 12' are secured to the frame and overlap the ad-

jacent edges of the rod and bar; and, advantageously, as shown in Fig. 2, the frame and the movable members 7 and 11 may be recessed to accommodate the strips so that the upper surfaces of the latter will be in a plane with or flush with the face of the frame.

13 is a blade which is pivotally connected near one of its ends by a pin 14 with an attachment 15 which is rigidly secured to the frame in proximity to one of the corners thereof, desirably that formed by the front and right-hand edges. Said pin is desirably screwthreaded for engagement with the threads of a clamping nut 16 which is superposed upon the blade 13. The blade 13 is provided with graduations, as 17, which are spaced and denoted by numbers 17', according to scale, from the axis of the pin 14 and along an edge 13' which, if prolonged, would pass through such axis. The blade 10 is divided by spaced marks 18 which are numbered as at 18' to indicate by scale distances from a line extended through the axis of said pin and at right angles to the blade 10.

Upon the frame and in juxtaposition with said rod 7 is an index mark 20 which is located to coincide with a predetermined mark, as 21, upon the rod when the initial or zero mark of the latter is in alinement with the axis of the pin. 22 represents a scale beginning at said index mark and extending therefrom toward the side edge 5'' of the frame which is most remote from the pin 14. This scale may be in feet, as two, and fractional parts thereof, the function of which will be hereinafter explained.

Upon the frame and in proximity to the corner which is diagonally opposite that at which the blade 13 is pivotally connected are two scales 23 and 24 disposed in arcuate arrangement and concentric to the axis of the pivotal pin 14. The scale 23 indicates the rise in inches to the foot run of the common rafters, and the scale 24 indicates the rise in inches to the foot run of the hip rafters, the scales being so arranged on the frame that one setting of the blade 13 indicates the rise in inches on the respective scales 23 and 24 to the foot run of the common and hip rafters respectively for the same roof.

For a better understanding of the following description of the operation, we illustrate in Fig. 3 a portion of a roof frame including a ridge board A, a hip-rafter B,

main-rafters C extending from the plate D to the ridge-board, and jack-rafters E extending from said plate to the hip-rafter. Assuming that the frame of a roof is to be made having a slope afforded by a rise, of ten and a half feet in a horizontal distance of twelve feet. The blade 13 is accordingly first set to have its edge 13' register with the mark of scale 23 which designates ten and one-half and is secured to this adjustment by manipulating the clamp nut 16. The rod 7 is then positioned to have its mark 21 coincide with the index mark 20; and the blade 10 is shifted laterally until its measuring edge 10' is brought into register with the proper one of marks 8 of the scale on rod 7 which corresponds with the span, measured horizontally, of the main rafters C. With the two blades thus regulated the intersections of the scales thereof will designate the length of the main rafters, C, on blade 13; and the rise of the main rafters C on the blade 10. These lengths are laid off to their true measurements by rule on appropriate scantlings for roof timbers. The bevels at which the ends of a main-rafter R (Fig. 4) are to be cut, are found by laying a carpenter's square S so that the square-tongue S' will have the inch mark twelve thereon at the intersection of one of the end marks previously made with the scantling edge R' and the  $10\frac{1}{2}$  inch mark of the square-stock S'' coincide with the same edge R' of the scantling. A scratch or pencil mark is then made upon the scantling along the edge M' of the square-tongue S' to indicate the proper cutting line for the heel of a main-rafter. The top or ridge cut is similarly found except that the cutting line is made along the edge M of the square tongue when the same is held against the other of the length marks. The jack rafters E are similarly marked by the square to lengths ascertained from the scale 17 at the intersection of the blades 13 and 10 when the latter is successively shifted distances equal to the spacing of these rafters; as sixteen inches, through the instrumentality of the scale 9. The marks for a cut upon a hip rafter B are obtained by employing the graduation on the scale 24, as  $7\frac{7}{16}$  inches, which is indicated by the crossing of the blade edge 13' with this scale for the positioning of the square-tongue S'' against an edge of the scantling when the square stock

S'' is set to have the 12-inch mark of the latter coincide with the corresponding edge of the timber. A scratch or pencil mark is then made upon the scantling along the edge M' of the square-stock S' to indicate the proper cutting line for the heel of a hip-rafter. The top or ridge cut is similarly found except that the cutting line is made along the edge M of the square tongue when the same is held against the other of the length marks.

When the rafters extend beyond the plate the rod 7 is adjusted to have the mark 21 register with the mark of scale 22 which designates the distance, measured horizontally, which the rafters protrude outside of the plate and whereupon the measurements of the various rafters are obtained in the manner as above explained.

The invention is valuable in that there is no possibility of mistakes and a roof frame may have its several members cut to proper lengths without the exercise of any computation and simply through the utilization of the various measurements as indicated from the scales.

What we claim as our invention, is—

1. An instrument of the class described, comprising a flat base frame formed with a transverse groove, a scale arranged upon said frame in spaced parallel relation to said groove, a scale arranged upon said frame at right angles to the first scale and having a bar rigidly secured to its inner face, said bar fitting slidably in said groove, and a third scale pivotally connected to said frame for angular adjustment with respect to the second scale.

2. An instrument of the class described, comprising a flat base frame formed with a pair of spaced parallel transverse grooves, a scale slidably fitted in one of said grooves, a bar slidably fitted in the other groove, a scale arranged upon said bar at right angles to the first scale, and having said bar rigidly secured to its inner face, and a third scale pivotally connected to said frame for angular adjustment with respect to the second scale.

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