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Patented Aug. 16, 1898.

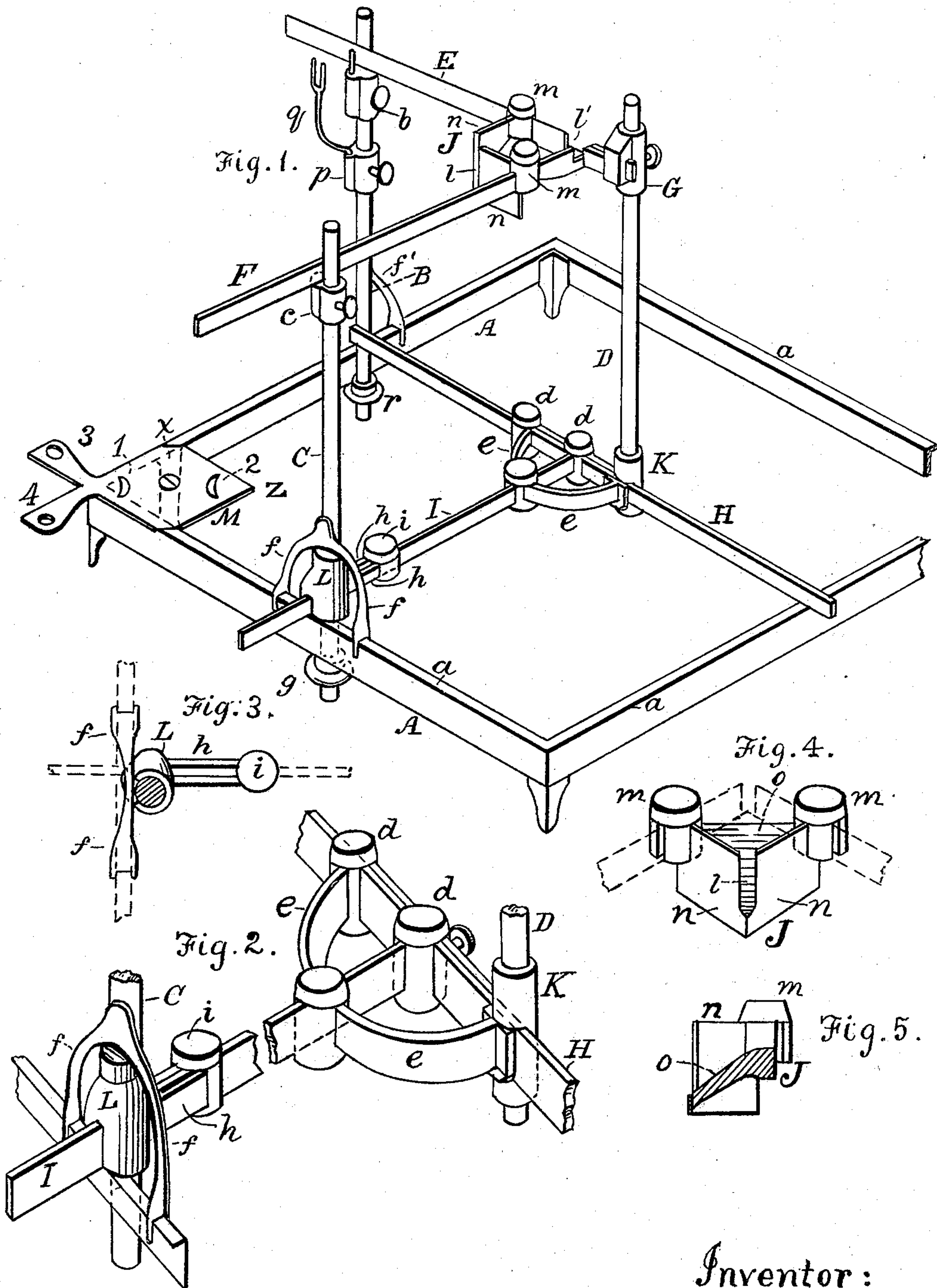
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APPARATUS FOR ASCERTAINING LENGTH AND BEVEL OF RAFTERS.

(Application filed July 9, 1897.)

(No Model.)

2 Sheets—Sheet 1.



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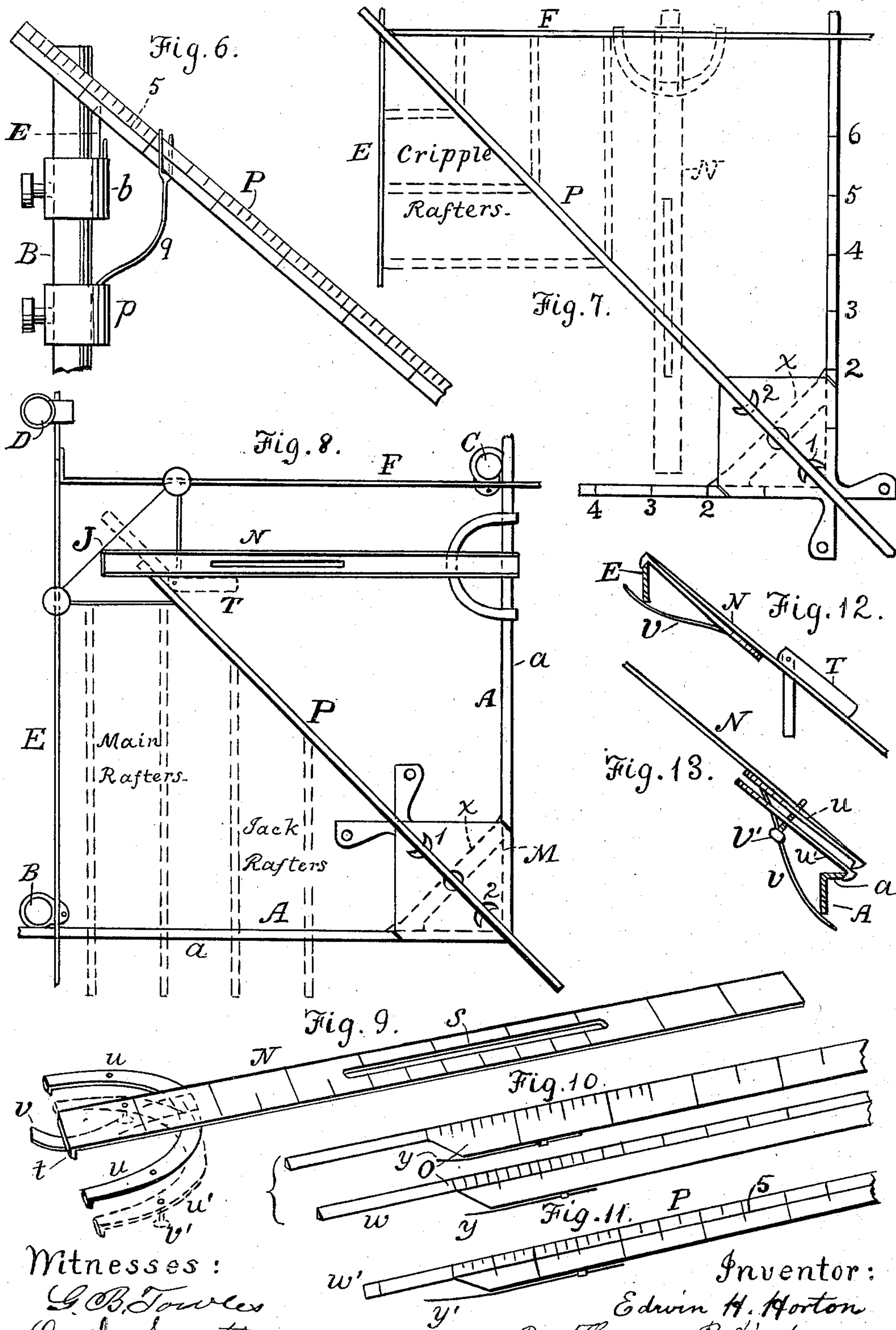
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UNITED STATES PATENT OFFICE.

EDWIN H. HORTON, OF ELKTON, MICHIGAN.

APPARATUS FOR ASCERTAINING LENGTH AND BEVEL OF RAFTERS.

SPECIFICATION forming part of Letters Patent No. 609,391, dated August 16, 1898.

Application filed July 9, 1897. Serial No. 644,029. (No model.)

To all whom it may concern:

Be it known that I, EDWIN H. HORTON, a citizen of the United States, residing at Elkton, in the county of Huron and State of Michigan, have invented certain new and useful Improvements in Apparatus for Measuring and Fixing the Bevels of Rafters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to apparatus for measuring the length and laying out the bevels of rafters; and it consists in certain improvements in the construction of such apparatus, as hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a perspective view of an apparatus constructed according to my invention. Fig. 2 illustrates in perspective adjustable connections of certain posts with horizontal bars. Fig. 3 represents one of such connections in plan view. Fig. 4 is a perspective view of a holder and support for a rafter-gaging rule. Fig. 5 is a vertical central section of the holder shown in Fig. 4. Fig. 6 illustrates a gaging-rule for main rafters in connection with a post. Fig. 7 illustrates the apparatus as adjusted for gaging a valley-rafter. Fig. 8 illustrates the adjustment for hip-rafters. Fig. 9 represents a squaring-rule which is used in gaging certain rafters and in laying out bevels. Fig. 10 represents gaging-rules for valley-rafters. Fig. 11 represents a gaging-rule for main rafters. Fig. 12 shows in edge view the squaring-rule and a bevel-square. Fig. 13 illustrates the squaring-rule with hooked arms in connection with the frame.

A designates the main frame, which is rectangular and has an outward flange *a*, which represents the wall-plate of a building. Two outer posts (indicated, respectively, by B and C) are adjustably mounted on two sides of said frame, and an interior post D is adjustably mounted on a horizontal bar H, which extends across the frame A, as shown. These parts may be graduated in twelfths and inches. Another horizontal bar I extends at right angles from the bar H, with which it is adjustably connected, and is adjustably secured to the post C.

E and F indicate two ridge-boards, which

are connected at their inward ends with a head or holder G, which is adjustably secured to the interior post D, the said ridge-boards being respectively located in the same vertical planes with the bars H and I, which are to be arranged on center lines of the building. The said ridge-boards extend outward at a right angle one with the other, being supported in their horizontal position by the holder G on post D and holders *b* and *c*, which are adjustably secured to the posts B and C.

The interior post D is adjustably secured to the bar H by means of a cylindrical holder K and a frame connected with said holder and adjustably secured to said bar H. The said frame has slotted cylindrical heads *d*, through which the bar H is passed, and curved braces *e*, which serve to secure the bar I in position at right angles with said bar H, the bar I at its inward end being fast to the frame connected with the holder K.

The post C is mounted on the frame A by arms *f*, which are fast on the post and movably grasp the flange *a*, the post being adjustably secured to the frame A by slotted holder L, fast on the post, and a screw-clamp *g*. The holder L has arms *h* projecting therefrom and connecting with a slotted cylindrical head *i*, and the bar I extends through the head *i*, between the arms *h*, and through the holder L, so that said bar is movably connected with the post C. (See Figs. 2 and 3.)

The post B is movably mounted on the frame A by arms *f'* and secured by a screw-clamp *r*. One end of the bar H is secured to the post B.

J indicates a holder which is removably placed on the two ridge-boards near the intersection of said boards, the slotted heads *m* fitting thereon. To the heads *m* are fixed two converging plates *n*, arranged at a right angle to each other, a slot or opening *l* being left between their outer edges for the admission of a gaging-rule, as hereinafter stated. (See Figs. 4 and 5.) Another opening or slot *l'* is formed in the ridge-boards at the intersection of said boards to receive one end of a gaging-rule employed in gaging for a valley-rafter when the holder J is not used, it being removed. An inclined bottom *o* is provided for the holder J.

p indicates a holder which is adapted to

be removably secured either to the post B or to the post C, the holder being shown in Fig. 1 connected with the former. From the holder *p* extends a forked arm *q*, which serves

5 to support in position one end of a rafter-gaging rule when used in connection with the ridge-board E (see Fig. 6) or the ridge-board F.

M indicates a pivoted plate located at one corner of the frame A, said plate having at
10 one corner two perforated tongues extending therefrom, (indicated by 3 and 4.) The plate M has perforations 1 and 2 for the purposes hereinafter stated, and said plate is connected by a central screw with a fixed bar,
15 (indicated in broken lines at *x*.) For setting the plate M with the tongues extending outward or inward the central screw may be turned to loosen it and the plate then turned to the desired position and the screw tight-
20 ened.

N indicates a squaring-rule having a slot *s* and marks of measurement, as shown in Fig. 9. The said squaring-rule is hooked at one end, as seen at *t*, and has two curved hooked
25 arms *u* and a spring *v* secured thereto for the purpose of connecting said rule with a ridge-board or with the frame A. A pair of additional arms, (indicated at *u'*), which are similar in construction to the arms *u*, are in-
30 tended for connection with the arms *u* by screws *v'* when said rule N is connected with the frame A.

O indicates two rules for gaging valley-rafters, each of said rules having a spring *y* and
35 a tongue *w*. These two rules are beveled on opposite sides for gaging on opposite parts.

P indicates a gaging-rule for main rafters, said rule having a tongue *w'* and a spring *y'*. The gaging-rules are marked on both sides
40 for convenience in use, and marks of measurement are also made on the frame A and on the posts for the proper adjustment of parts.

The apparatus may be constructed of any convenient size, say on a scale of one inch to
45 a foot, the frame A being fourteen inches square, and, for example, say the main building is fourteen feet square and to have a half or square pitch roof and a wing twelve feet wide. Now for measuring for main rafters
50 for the main building use the bar H and the ridge-board E, both being on the same vertical plane, and for the wing use the bar I and the ridge-board F.

For main rafters of the main building set
55 the pivoted plate M with the tongues 3 and 4 extending outward and move the bar H to the seven-inch mark on the frame A—that is, to the center line of the main building. Secure the holder *p* with the forked arm *q* on the
60 post B at the proper elevation. Then raise the holder G, with the ridge-boards E and F, to the seven-inch mark on the post D and secure said holder. Move the ridge-boards and the bar I back, so that the outer end of the ridge-
65 board E will extend against the rafter-gaging rule P when the latter is in position for gaging. (See Fig. 6.) Then place rule P in posi-

tion with its spring *y'* in the perforation in the tongue 3 of the plate M and the upper end of the rule resting in the forked arm *q* of the
70 holder *p* and adjust said rule so that the working line 5 thereon runs to a point which is exactly even with the upper edge of the ridge-board E, as seen in Fig. 6. Then the rule P will indicate on the working line the length
75 of the main rafters.

For valley-rafters and cripple-rafters raise the holder G, with ridge-boards E and F on post D, so that the upper edge of the ridge-board E is even with the upper edge of the
80 gaging-rule P and secure to post D, as the measurement for valley and cripple rafters is on the upper edge of said gaging-rule. Remove the rule P and move the bar I, with the ridge-boards, to the six-inch marks on the
85 frame A and on the bar H—that is, to a center line of the wing, which is only twelve feet wide—and secure the ridge-boards E and F to the posts B and C by holders *b* and *c*. Remove the holder J and place a gaging-rule O for val-
90 ley-rafters in position with its spring *y* in the perforation 2 of the plate M, the tongue of said rule resting on the plate M between the tongues 3 and 4 and the upper end of the rule resting in the slot or opening *l'* at the angle
95 formed by the two ridge-boards at their junction, (see Fig. 7,) and the length of a valley-rafter will be indicated by the marks and figures on the upper edge of the said gaging-rule.

To ascertain the length of cripple-rafters,
100 space them off on the ridge-board E, marking with a pencil. Then take the squaring-rule N and begin at the first space-mark from the main rafters, connecting said rule with said ridge-board, placing the spring *v* under its
105 lower edge and the hook *t* and the hooks on the arms *u* on its upper edge, the main part of the squaring-rule lying on the gaging-rule P, (see Fig. 7, in which the squaring-rule and cripples are indicated in broken lines,) and
110 the rule N with its edge at the first space-mark will indicate, at the point where it intersects the rule P, the length of the first cripple-rafter. Then move the rule N to the next space-mark and proceed as before.
115

The ridge of the main roof of the building and that of the wing roof being of the same height, but the wing being two feet narrower than the main building, the pitch of the roof of the wing will be greater than that of the
120 other, and the length of the main rafters for the wing may be ascertained in substantially the same manner as before stated, using the gaging-rule P in connection with the plate M, ridge-board F, and forked arm *q*, the bar I
125 being adjusted to the center line of the wing. Remove the holder *p*, with arm *q*, from the post B and adjust said holder on the post C. Place the gaging-rule P in position with its spring in the perforation in the tongue 4 of
130 the plate M, with the upper end of said rule resting in the forked arm *q* on the post C, and proceed in the same manner as before stated for main rafters for the main building

and for cripple-rafters, using the squaring-rule.

If the ridge of the main building is higher than that of the wing, obtain the length of the main rafters of the main part at the full height of the pitch wanted. Then lower the ridge-board to the height of the ridge of the wing and move the bar H and ridge-board E toward the plate M until you have the same pitch of roof as before on the main part and obtain the length of the main rafters again. Then proceed for valley-rafters and cripples, as before, at the last height obtained and add the difference of lengths of the two main rafters as taken to the cripple-rafters on the main part.

The bevels of all rafters may be obtained by using a common bevel-square when the parts are in position for measurement. To ascertain the bevels of cripple-rafters, the squaring-rule being in position connected with the ridge-board for measuring cripple-rafters, (see Fig. 12,) place the bevel-square T on the squaring-rule with the blade of the square extending down through the slot *s* of the squaring-rule against the valley-rafter-gaging rule. This will give the down cut at the lower end of the cripple-rafter, and the down cut at the upper end will be the same as on the main rafters. To ascertain the bevel up the rake, place the body of the bevel-square on the edge of the squaring-rule N with the blade parallel with the rafter-gaging rule, as seen at T in Fig. 8.

For cottage or hip roofs adjust the plate M with its corner *z* outward and place the holder J on the ridge-boards. (See Fig. 8.) Raise the ridge-boards to the height desired. Move the bars H and I one inch farther than the width wanted, as the holder J takes up one inch. Then place the gaging-rule, with its tongue on the corner *z* of the plate M, with its spring in the perforation 2 of said plate and the upper end of said rule in the slot or opening *l* of the holder J, and said rule will indicate the length of the hip-rafters. The length of the main rafters is obtained by placing the squaring-rule with its curved arms connected with the flange *a* of the frame A, its spring extending under said frame, and said rule, resting on the holder J, will indicate the length of the main rafters.

For jack-rafters secure the additional curved arms *u'* to the curved arms *u* of the squaring-rule N by the adjusting-screws *v'*, as seen in Fig. 13. Place the squaring-rule in connection with the flange *a* of the frame A, with the upper end of said rule resting on the hip-rafter-gaging rule. (See Fig. 8.) Adjust the screws *v'* to set the squaring-rule at the right pitch or inclination. Then space off and proceed in the same manner as before for cripple-rafters. In Fig. 8 is shown in plan the arrangement for measuring main, hip, and jack rafters, some of these being indicated in broken lines, the holder J being employed only for cottage or hip roofs. If there

is to be a deck at the peak of the roof, the holder J will represent one corner of the deck. If there should be no deck, then one side of the holder J will represent the ridge, and the rafters will be measured in the same manner.

I claim—

1. In an apparatus for ascertaining the length and bevels of rafters, the combination with a rectangular frame, of two outer posts, adjustably mounted on said frame, a horizontal bar H and an interior post adjustably mounted on said bar, a horizontal bar I, extending at right angles from said bar H and adjustably connected therewith, two ridge-boards in position at a right angle one with another and adjustably connected with said posts, a swiveled, perforated plate, adapted to support a gaging-rule and an adjustable support to hold said rule in position, substantially as and for the purposes described.

2. The combination, with a main frame, of two movable, horizontal bars, adjustably connected and placed at right angles one with another, three posts, two of which are adjustably connected with said frame, one being adjustably connected with a horizontal bar, two ridge-boards having an opening *l'* at their joint, and holders supporting said ridge-boards, said holders being vertically adjustable on said posts, and a slotted holder adapted to be removably placed on both of said ridge-boards, and said holder being adapted to receive and support one end of a gaging-rule, substantially as and for the purposes described.

3. The combination, with the frame, adjustable posts and ridge-boards of a rafter-gaging apparatus, of an adjustable, perforated plate, having perforated tongues, and a gaging-rule, adapted for connection with said plate, substantially as set forth and described.

4. The combination with a frame, horizontal bars H and I, and adjustable posts of a rafter-gaging apparatus, of an adjustable connection or coupling of said bars with one of said posts, said coupling being formed of a frame connected with one of said posts and provided with slotted cylindrical heads, through which one of said bars extends, and curved braces for the other horizontal bar which extends at right angles from the bar H and is fast to said frame, substantially as and for the purposes described.

5. The combination with a frame and ridge-boards, of a rafter-gaging rule which is provided at, one end, with hooked arms and a spring and a slot *s*, substantially as and for the purposes described.

6. The combination with a frame A, provided with a flange *a*, of a squaring-rule provided with hooked arms at one end, and a pair of additional hooked arms adapted for adjustable connection with the hooked arms first mentioned, substantially as shown and described.

7. The combination with the frame of a

rafter-gaging apparatus, of a series of posts movably mounted on said frame, two ridge-boards carried by said posts and secured together at a right angle, a holder, adapted to
5 be removably placed on said ridge-boards, and provided with two converging plates, an opening l being left between their outer edges, and an opening l' being formed between said ridge-boards at their junction, substantially
10 as set forth and described.

8. The combination, with the frame of a rafter-gaging apparatus, of the horizontal

bars, ridge-boards and posts, a coupling of one of said posts with a horizontal bar, I, said coupling being provided with a slotted holder 15 having arms h and a slotted head i connected with said arms, substantially as set forth and described.

In testimony whereof I have affixed my signature in presence of two witnesses.

EDWIN H. HORTON.

Witnesses:

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ALENA STIFF.