

W. H. WIEGMAN.
STAIR GAGE.
APPLICATION FILED JAN. 3, 1910.

1,006,815.

Patented Oct. 24, 1911

2 SHEETS—SHEET 1.

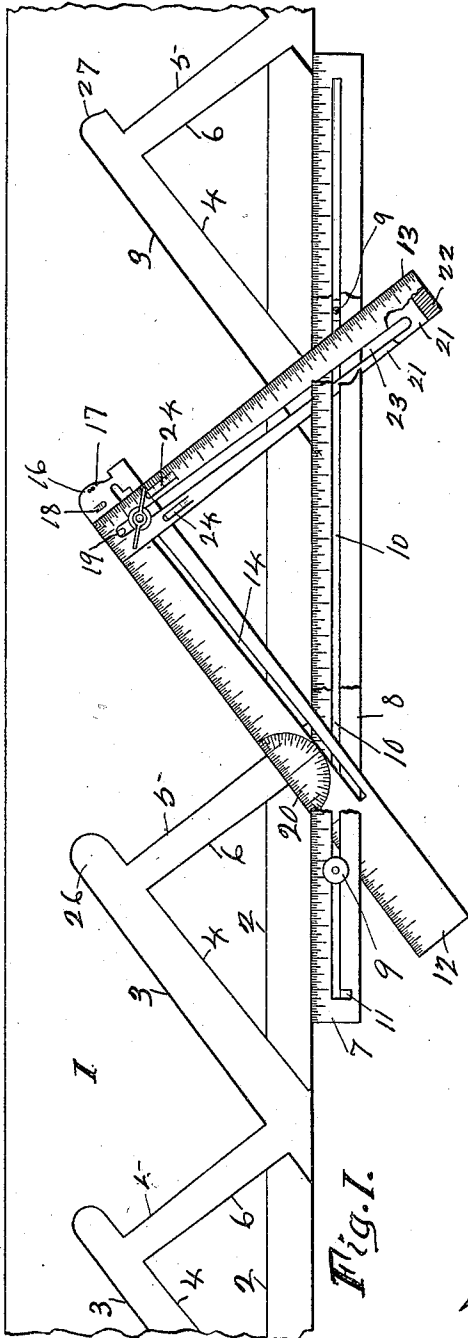


Fig. 1.

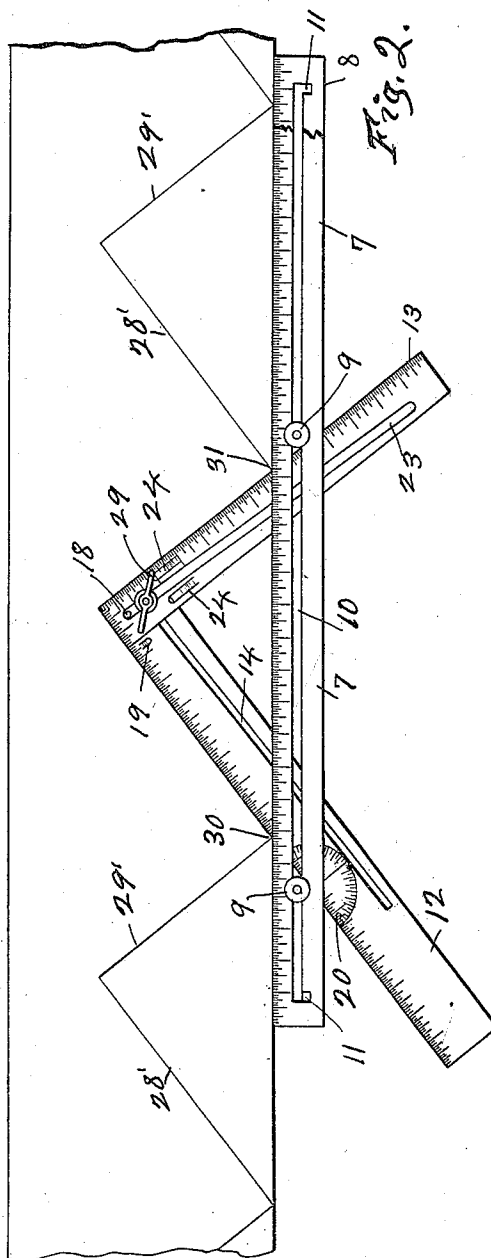


Fig. 2.

Witnesses
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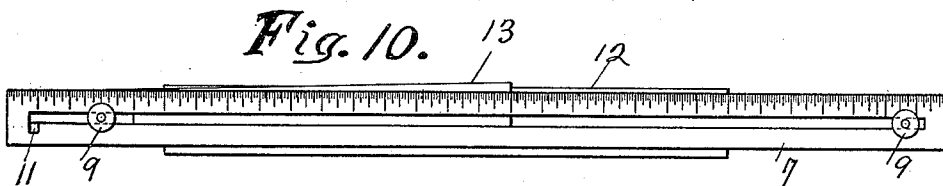
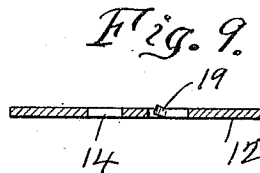
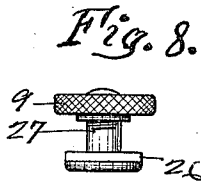
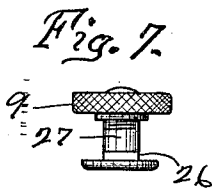
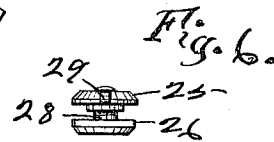
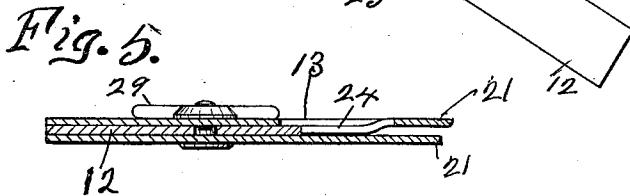
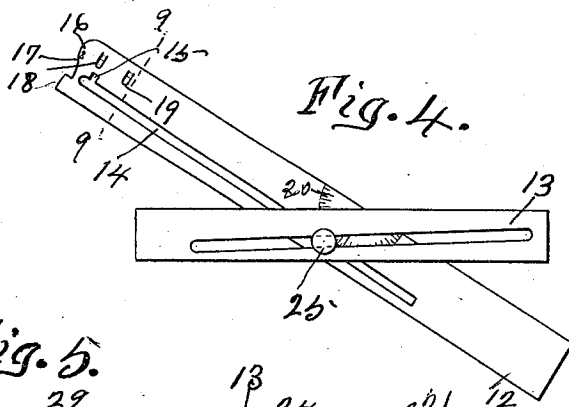
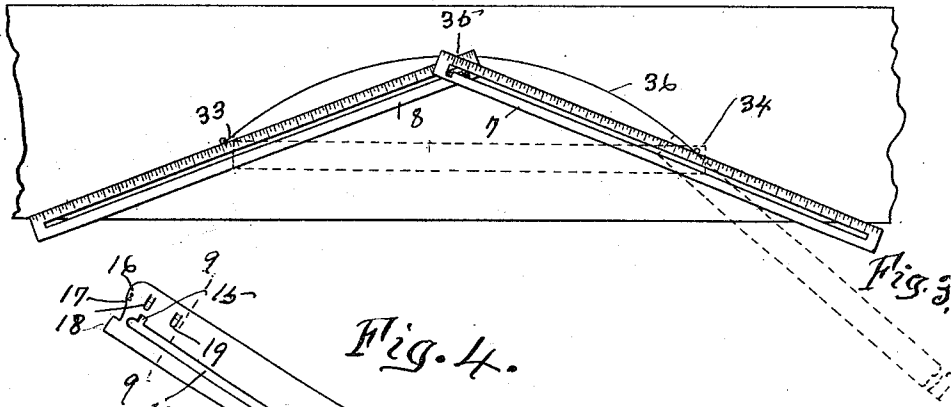
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By Walter P. Denny
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2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

WILLIAM H. WIEGMAN, OF FORT WAYNE, INDIANA, ASSIGNOR TO WIEGMAN STAIR
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STAIR-GAGE.

1,006,815.

Specification of Letters Patent.

Patented Oct. 24, 1911.

Application filed January 3, 1910. Serial No. 536,092.

To all whom it may concern:

Be it known that I, WILLIAM H. WIEGMAN, a citizen of the United States, residing at Fort Wayne, in the county of Allen, in the State of Indiana, have invented certain new and useful Improvements in Stair-Gages; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in stair-gages so constructed and arranged as to be adapted not only for stair construction, but also for various other purposes.

It is well known that in stair construction the opposite ends of the tread and the riser of each step are fitted into intersecting right angular grooves in the inner adjacent faces of the opposite parallel stringers, and tightly wedged therein without nailing; that these recesses must be wedge shaped, and the recess for the tread must be of a different width than the recess for the riser. It is also well known that the usual way of laying out such stair work is to employ either a common square or a "pitchboard", and two wedge-shaped pieces of proper width to outline the recesses for the tread and riser respectively for each step; and that by this method great care and considerable skill is required to secure the necessary accuracy and uniformity, as a deranging mistake is easily made. It is also well known that the work of laying out of rafters for a roof in the usual way by an ordinary square to secure the desired rise and run, or the proper lines for the ridge and plate cuts requires considerable care and skill to avoid a serious error.

The object, therefore, of my present invention is to provide a convenient and easily operated adjustable gage which is not only adapted to be employed in stair construction and for the laying out of rafters by an operator of ordinary skill, but which is also adapted to be used with equal facility as an ordinary steel-square, as a bevel-square, as a sliding rule, and as a means for laying out segments for the top of window frames and the like.

My invention consists of three coöperative parts a square whose parts are pivotally

connected at their meeting ends, and are provided with longitudinal slots, and a graduated two-part straight edge with which the sections of the square are adjustably connected, and within which they are adapted to be folded in use.

The novel features of my invention reside in the construction and coöperative relation of the three operative parts whereby they are adapted without structural change or addition of parts for the various functions above enumerated.

Similar reference numerals indicate like parts throughout the several views of the drawings in which—

Figure 1 is a plan view of my invention with the straight edge broken away, showing its use upon a stair stringer. Fig. 2 is a similar view of my invention in laying out a stringer for a common open stairway. Fig. 3 is a plan view of the two-part straight edge extended and showing its use in laying out the arc for the top of a window casing. Fig. 4 is a bottom plan of the two sections of the square used as a bevel gage. Fig. 5 is a cross-section of the square to show one of the details of construction. Fig. 6 is a detail of binding-screw for the pivoted ends of the square. Figs. 7 and 8 are detail views taken at right angles to each other of the binding screws for the straight edge sections of the invention. Fig. 9 is a cross-section on 9—9 of Fig. 4 to show the upturned lug of the blade which interlocks with the slot of the tongue when these two parts are used as a square. Fig. 10 is a view of my invention when the three operative parts are folded together.

All parts of my invention are preferably made of suitable metal.

The stringer 1, of the usual form, is shown in Fig. 1, as having the usual gage line 2 laid off upon the inner face thereof and adjacent to and parallel with the lower edge thereof. On the same face of this stringer are shown the relative arrangement of the lines 3 and 4 for the tread recess and the lines 5 and 6 for the riser recess, as laid out by the use of my invention.

The straight edge portion of my invention consists of two identical metal strips 7 and 8 firmly secured together in use near their opposite ends by means of the thumb-screws 9. Each straight section 7 and 8 has a similar longitudinal slot 10 nearly its entire

length. Each of these slots 10 has at one end a lateral notch 11 for the purpose hereafter described, and arranged at opposite ends of the straight edge Figs. 2 and 3.

Each section 7 and 8 is graduated in inches upon one side and one edge thereof, and numbered from left to right as usual.

The square is formed of a blade 12 and a tongue 13. The blade consists of a steel plate properly graduated and provided with a longitudinal slot 14 slightly out of parallel relation with the sides thereof and provided near its outer end with a lateral notch 15 for the purpose hereafter described. The adjacent end of the blade is rounded as shown in Figs. 1 and 4, and has near the rounded edge two properly placed apertures 16 and 17 for the purpose hereafter described. The same end of the blade has a pair of integral transversely arranged upturned tongues 18 and 19, Fig. 4. The blade 12 is also provided with a graduated arc 20 near the central portion thereof.

The tongue 13 is formed of two identical metal strips 21 Fig. 1, rigidly secured together at their outer ends by means of the interposed short plate 22. These strips 21 have registering longitudinal slots 23 which are inclined to the edges thereof. The upper one of the strips 21 forming the tongue 13 of the square is provided near its inner end with a pair of parallel longitudinal downwardly bent tongues 24, Figs. 1, 2 and 5, adapted to engage the inner and adjacent edge of the blade 12 to secure the coacting parts of the square in their right angular relation in use. In use the blade 12 is firmly secured between the said strips of the tongue in any desired adjustment by means of the binding-screw 25 Fig. 6.

When the three parts of my invention are used together as one tool the free ends of the blade 12 and the tongue 13 are arranged between the two parts of the straight edge, and are firmly secured therein in any desired adjustment by means of the thumb-screws 9 which pass through the slots 10, Figs. 1 and 2.

The thumb-screws 9 and the binding screw 25 are of common and well understood construction, each having an angular lug 26 which rests in the respective slots 10 and 23 to prevent the respective screws 27 and 28 from turning therein. The binding-screw 25 is preferably provided with the radial wings 29, Figs. 1, 2, 5 and 6.

The operation and manner of employing my invention for the performance of its various functions may be briefly stated as follows: To employ my invention in stair construction the operator first secures the tongue 13 in right angular relation with the blade 12, which he readily does with absolute accuracy by so adjusting the parts that the free ends of the tongues 24 abut

squarely against the inner edge of the blade 12, Figs. 1 and 2, and the adjacent end of the slot 23 is engaged by either the tongue 18 or the tongue 19 after which the binding screw 25 is firmly tightened. For ordinary housed stairs the end of the slot 23 of the tongue 13 is engaged with the tongue 19 thereby leaving a suitable projection of the adjacent end of the blade, as shown in Fig. 1, but for the common open stairs the slot 23 is engaged with the tongue 18, Fig. 2. For the housed stairs, when the tread of the steps is the usual thickness, viz., one and one-eighth inches, the tongue is rigidly secured to the blade or body portion 12 in the position shown in Fig. 1, or at the beginning of the first inch mark. He now sets the device to secure the desired rise and run, or the height and width of the steps as follows: Assuming the usual nine inch run or width of step is desired, he sets the blade or body portion 12 to measure nine inches from the gage line 2 to the outer edge of the tongue, and to secure the desired rise or height of the step he sets the tongue 13 to measure the predetermined height of step from the gage line 2 on the outer edge of the tongue 13 to the outer edge of the blade or body portion 12, as shown in Fig. 1. The operator next adjusts the straight edge firmly against the lower edge of the stringer 1, as shown, and then rigidly secures it in such relation to the said parts of the square by tightening the thumb-nuts 9, after which my invention is in condition for use as follows: He simply places the invention upon the inner face of the stringer with the inner edge of the straight edge firmly against the lower edge of the stringer, as shown in Fig. 1. When the other parts of the device are set as above described no mistake in securing a uniform rise and run of the stairs can be made so long as he places the device each time in such a position that the outer edge of the blade or body portion coincides with the junction of the previously laid out line 5 with the gage line 2. When my invention is thus placed in position the operator readily marks off the lines 3 and 4 for the step and 5 and 6 for the rise as follows: For a tread having a thickness of one and one-eighth inches the operator draws a line along the outer edge of the blade down to the straight edge, and draws another line along the outer edge of the slot 14, and for a tread having a thickness of one and three eighths inches mark in the same manner except he draws the lower line along the inner edge of the slot 14. As the slot 14 is inclined to the parallel edges of the blade it is evident the above mentioned lines will give the desired wedge shape to the cut in the stringer for the end of the step. To secure the lines 5 and 6 for the riser which always has a thickness of seven eighths of

an inch, the operator draws the line 5 along the outer edge of the tongue 13 and draws the line 6 along the inner edge of the slot 23. To secure a circular outer end of the step supporting recess 26 the operator inserts his awl in either the hole 16 as when the recess 26 is to be one and one eighth inches wide, or in the hole 17, as when the recess 26 is to be one and three eighths inches wide, thereby marking with his awl the place where he sets the screw point of the bit which cuts this portion of the recess. When an "O. G.", nosing for the step recess 26 is desired, as shown at 27, the operator simply marks around the end of the blade.

It is thus obvious that by the employment of my invention the outline for a stairs can be quickly, conveniently and accurately laid out, with no appreciable liability of making a mistake.

To employ my invention as a common steel square as for laying out the rise and run of an open stairs, he sets the tongue 13 with the inner end of the slot 23 in engagement with the tongue 18, and with the free end of the tongue 24 abutting the inner edge of the blade 12 Fig. 2, after which he firmly secures the parts in that position by means of the screw 25. The rise and run is secured in the same manner as above described, and the lines 28' and 29' are obtained by marking along the outer edges of the blade and tongue respectively.

In the use of my invention shown in Fig. 2, it is necessary for the operator to remember that the graduations of the blade 12 begin one inch from the inner end as seen in Fig. 1, whereby in getting a 9 inch run in Fig. 2 he must set the blade at the eight inch mark, which is just nine inches from the inner end thereof.

My invention can be employed as a bevel square in the usual way by employing simply the blade and tongue in connection with the graduated arc 20 in a well understood manner, as shown in Fig. 4.

In the use of my invention for laying out the rafters for a roof, the operator sets the parts in the relation shown in Fig. 2, and then sets the straight edge on the tongue with its upper edge at the number of inches corresponding to the rise or height of the roof in feet, for example seven feet, as shown in Fig. 2, and then set the other end of the straight edge on the blade at the number of inches corresponding to the run of the roof, that is, one half of the width of the roof, for example nine feet, as shown. The distance in inches from the meeting of the graduated edges of the straight edge and of the blade and tongue at 30 and 31 respectively gives the exact length of the rafters in feet, and marking off the rafter arranged in parallel relation with the straight edge, by a line drawn along the

outer edge of the tongue gives the plumb or ridge cut for the upper end of the rafter, and a line drawn along the outer edge of the blade gives the plate cut for the lower end of the rafter.

To use my invention for describing a segment of a circle for window casings and the like the operator removes the blade 12 and the tongue 13 and then adjusts the sections 7 and 8 into the angular relation in Fig. 3 which position is obtained by arranging the screws 27 in the respective lateral notches—in the slots 10. He now drives two nails at 33 and 34 whose distance apart equals the width of the arch at the top of the window casing. He then connects the two nails by a straight line, and so adjusts the angle of the coacting parts 7 and 8 that their upper edges at their union will be at a point above the said straight line whose distance from the line equals the desired width of the segment, for example four inches. He now sets the point of his pencil at the junction of their upper edges at 35 and by moving the tool first to the right into the position shown in dotted lines in Fig. 3, keeping the upper edges of the parts firmly against the pins 33 and 34 during the movement, and then in like manner moving the tool to a corresponding position to the left he will accurately and readily describe the arc 36.

Having thus described my invention and the manner of employing the same what I desire to secure by Letters Patent is:

1. A stair-gage consisting of a straight edge formed of two parallel plates provided with coincident longitudinal slots each having a notch in one end thereof, said plates being secured in operative relation by means of thumb screws, and a square whose parts are adjustably united, each of whose parts is provided with a longitudinal slot said square being adapted for an adjustment between the two plates of the said straight edge, said thumb screws in such adjustment firmly securing the parts of the square, the parts of the square having means for securing them in an interlocked engagement.

2. A stair gage consisting of a straight edge having two parallel sections which are graduated in inches and have registering slots with right angular notches in one end thereof; a square having detachable sections which are longitudinally slotted and adjustably united, one of said sections having a plurality of lugs adapted to engage one end of the slot in the other section, and the last mentioned section having a plurality of lugs adapted to engage the inner edge of the first mentioned section; and means for firmly securing the square sections in any desired adjustment between the straight edge sections and for firmly securing the straight edge sections together.

3. In a stair-gage the combination of two substantially identical straight-edge sections each having a longitudinal slot provided at one end with a lateral notch, and means for
5 securing the sections together in any desired longitudinal adjustment, and in a limited angular adjustment, as and for the purpose described.

Signed by me at Fort Wayne, Allen county, State of Indiana, this 24th day of 10 December, 1909.

WILLIAM H. WIEGMAN.

Witnesses:

AUGUSTA VIBERG,
WATTS P. DENNY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."