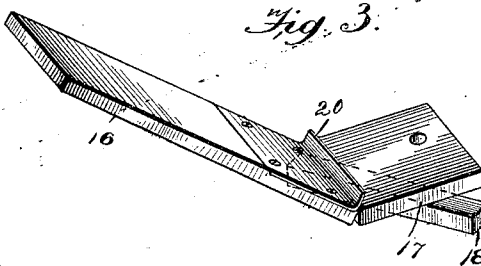
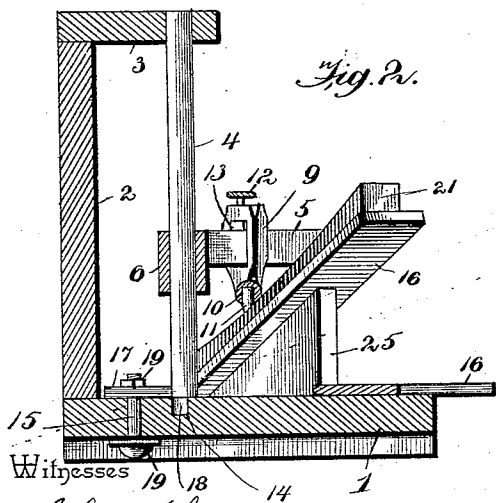
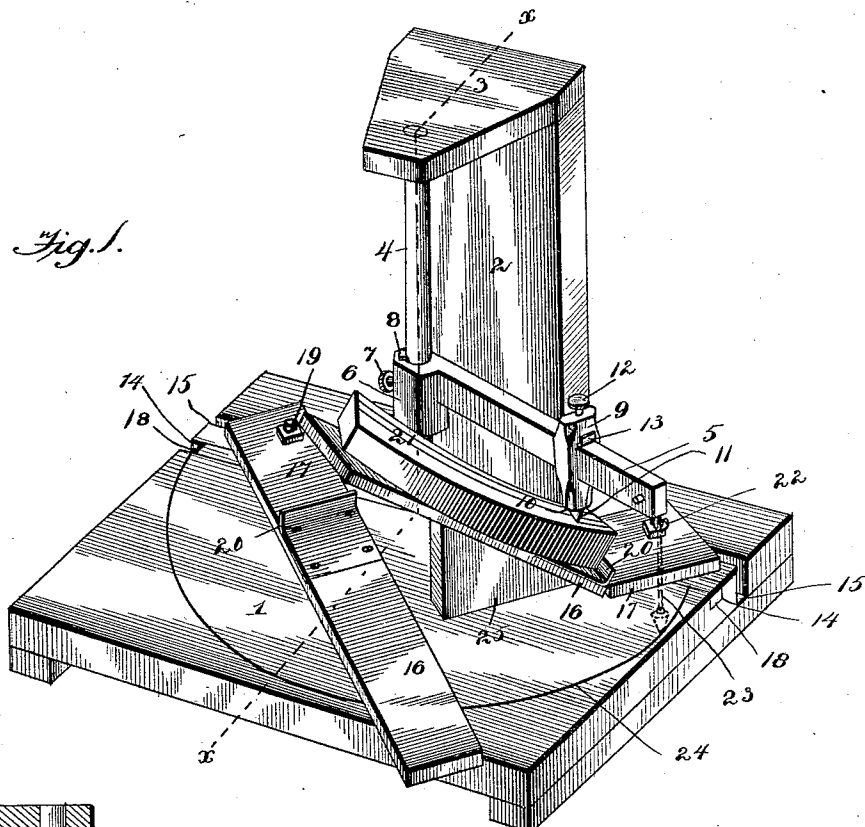


(No Model.)

W. S. KING.
STAIR CURVE.

No. 499,636.

Patented June 13, 1893.



Witnesses
John Shan.

Inventor
William S. King.

By *his* Attorneys,

O. E. & Co.

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UNITED STATES PATENT OFFICE.

WILLIAM S. KING, OF RICHMOND, KENTUCKY, ASSIGNOR OF ONE-HALF TO
FRANK L. WARDROPER AND EDGAR B. WALLACE, OF SAME PLACE.

STAIR-CURVE.

SPECIFICATION forming part of Letters Patent No. 499,636, dated June 13, 1893.

Application filed December 31, 1892. Serial No. 456,908. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. KING, a citizen of the United States, residing at Richmond, in the county of Madison and State of Kentucky, have invented a new and useful Device for Laying Off Spiral Stairs, of which the following is a specification.

My invention relates to an appliance for laying off the hand-rails and other timbers of spiral stair-cases, the objects in view being to provide a simple and accurate scriber to indicate the twist and curve necessary in the formation of those parts of a spiral stair-case, as the hand-rail, which conform to the rise and circular disposition of the steps; and furthermore, to provide means whereby the length of such timbers may be accurately determined when the plan of the proposed stairs and the rise of the steps are known.

Further objects and advantages of my invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings: Figure 1 is a perspective view of a scriber embodying my invention, with a hand-rail in process of shaping arranged thereon in the operative position. Fig. 2 is a transverse vertical section, upon line $x-x$ of Fig. 1. Fig. 3 is a detail view, in perspective, of one of the supports.

1 designates a horizontal base or floor and 2 a vertical standard rising therefrom at one side and supporting at its top a horizontal bracket, 3, which extends inward over the base or floor. A vertical spindle 4, is secured at its upper end to the overhanging bracket and at its lower end to the base or floor.

5 represents a swinging-arm, pivotally mounted upon the spindle by means of an eye 6, formed upon one end thereof and fitting loosely upon the spindle, whereby the arm may swing freely around the spindle and may be moved vertically upward and downward thereon. The swinging-arm may be locked at any desired point of the spindle by means of a set-screw 7, which is arranged in the eye 6, and engages a clamping-plate 8, whereby the latter may be caused to impinge against the surface of the spindle.

Slidably mounted upon the swinging-arm is a marker 9, provided at its lower end with a socket 10 to receive a pencil or pointer, 11, and provided at its upper end with a set-screw, 12, and clamping-plate, 13, by which it may be locked at any desired point upon the arm.

The base or floor is provided near and parallel with its rear edge with duplicate parallel slots 14 and 15, and 16 represents supports or holders which are pivotally mounted upon adjustable plates 17 having depending guides 18 to fit and slide in the slot 14 and adjusting bolts 19 to extend through and move longitudinally in the slot 15. By means of the guides 18 the adjustable plates are held in an angular position upon the base or floor and are guided when moved laterally, and by means of the adjusting-bolts 19 the adjustable-plates are locked or secured in the desired position upon the base or floor.

The supports or holders are pivotally connected to the adjustable-plates and are provided at their pivoted ends with perpendicular stops 20 to prevent them from being thrown back beyond the perpendicular and also serve as a rest or support for the lower end of a timber which is arranged upon the support, as shown in Fig. 1 at 21.

The swinging-arm is provided at its free terminal with a hook 22 to which is adapted to be attached a plumb-bob, which is shown in Fig. 1 at 23, in dotted lines.

Having thus described the construction of my appliance the operation thereof is as follows: Assuming that it is desired to lay off the hand rail of a spiral stair-case, the plan of such stair-case and the rise thereof being given, describe such plan upon the base or floor 1, as shown at 24 in Fig. 1. Make all radial measurements from the center of the spindle which is supposed to represent the center of the plan of the proposed circular stair-case. Now adjust the marker upon the swinging-arm so that the distance between the center of the spindle and the point of the marker will correspond with the distance between the center of the proposed stair-case and the center of the hand-rail which is to be applied thereto. Place the timber 21 upon the support and adjust the inclination of the latter to cor-

respond with the rise of the proposed stair-case. This support may be held at the desired inclination by any preferred means, as a triangular brace, 25, whose hypotenuse is at an inclination to its base corresponding to the angle of inclination of the stair-case. The "pitch-board" or board by which the stairs have been laid off may be used for the purpose of holding the support at the desired inclination. The swinging-arm is now turned about its center to cause the marker to describe upon the timber a line which represents the center of the proposed hand-rail, after which by setting the marker successively inward and outward the same distance and marking as before, the lateral edges of the hand-rail may be indicated upon the timber, thus showing its width. The distances between the supports of the proposed stair-case being known, such distances are laid off upon the plan which is indicated upon the base or floor, and then a plumb-bob is connected to the hook at the terminal of the swinging-arm and brought successively over the points marking such points of support. By means of a pencil or other marker a line is drawn across the upper surface of the timber at those points which the swinging-arm occupies when the plumb-bob is above the points of support, thus indicating upon the timber the length of that section of the hand rail which is under process of construction. By means of the swinging-arm, which maintains its horizontal position at all times, the upper and lower surfaces of the hand-rail are now indicated upon the ends thereof, and from the lines thus formed, by means of a square, the hand-rail is squared. When dressed upon the lines thus formed upon the surface of the timber the hand-rail will be found to conform accurately in length, twist and curvature to the proposed stair-case.

The marker may be set to suit a stair-case having a "well" of any desired diameter, and by means of suitable braces the support may

be adjusted to the desired inclination to agree with the "pitch" of the stair-case.

Changes in the form, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of my invention.

Having described the construction and operation of my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a device of the class described, the combination with a supporting base, of supports slidably mounted upon said base and capable of angular adjustment, means to adjust the inclination of said supports, and a swinging arm slidably fulcrumed upon a vertical spindle and carrying a marker, substantially as specified.

2. In a device of the class described, the combination with a base or floor, of adjustable plates slidably mounted upon the base or floor, means to lock the same in the desired position, supports pivotally mounted upon said adjustable plates and means to hold them at the desired inclination, and a swinging-arm fulcrumed slidably upon a vertical spindle, substantially as specified.

3. In a device of the class described, the combination with a base or floor provided with parallel slots, of adjustable plates provided with guides fitting in one of said slots and adjusting-bolts fitting in the other slot, adjustable supports pivotally connected to said plates and provided with supporting braces, and a swinging-arm fulcrumed upon a vertical spindle and capable of vertical adjustment thereon, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM S. KING.

Witnesses:

C. MEMPIN,
THOS. R. BENNETT, Jr.