

(No Model.)

2 Sheets—Sheet 1.

F. H. RICHARDS.
COMBINATION TOOL.

No. 264,341.

Patented Sept. 12, 1882.

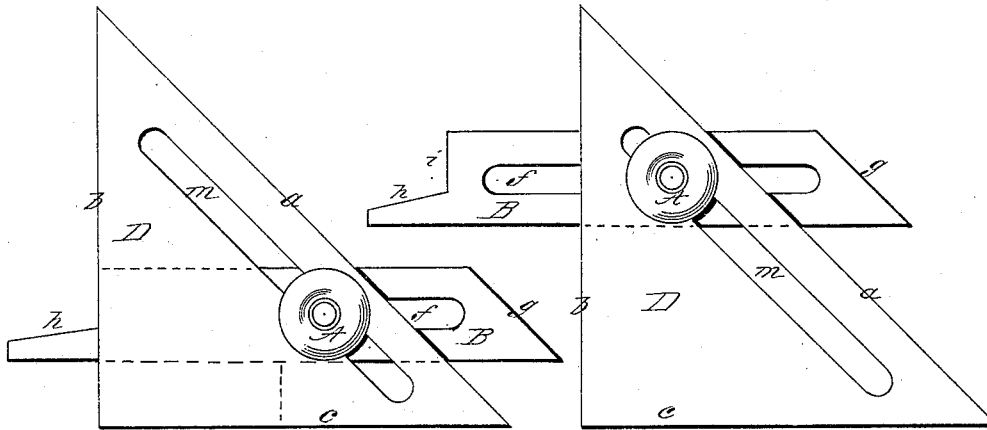


Fig. I,

Fig. II,

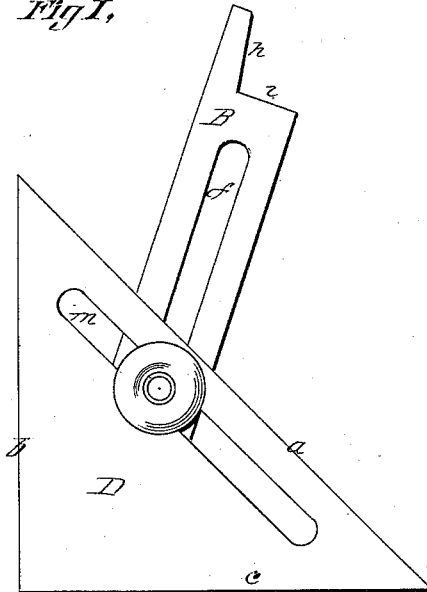


Fig. III,

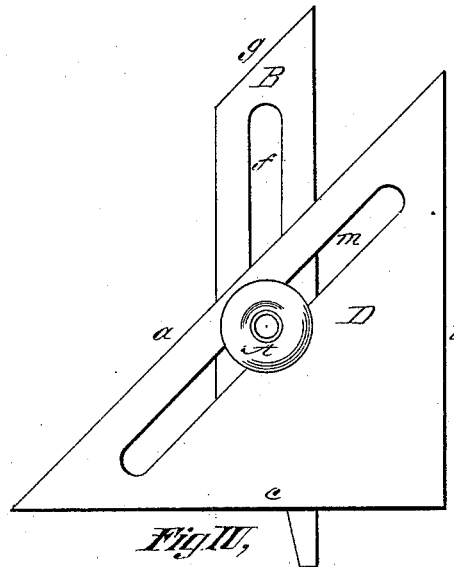


Fig. IV,

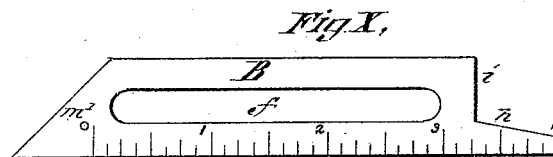


Fig. X,

Witnesses,
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Wm. H. Chapin

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By Henry A. Chapin
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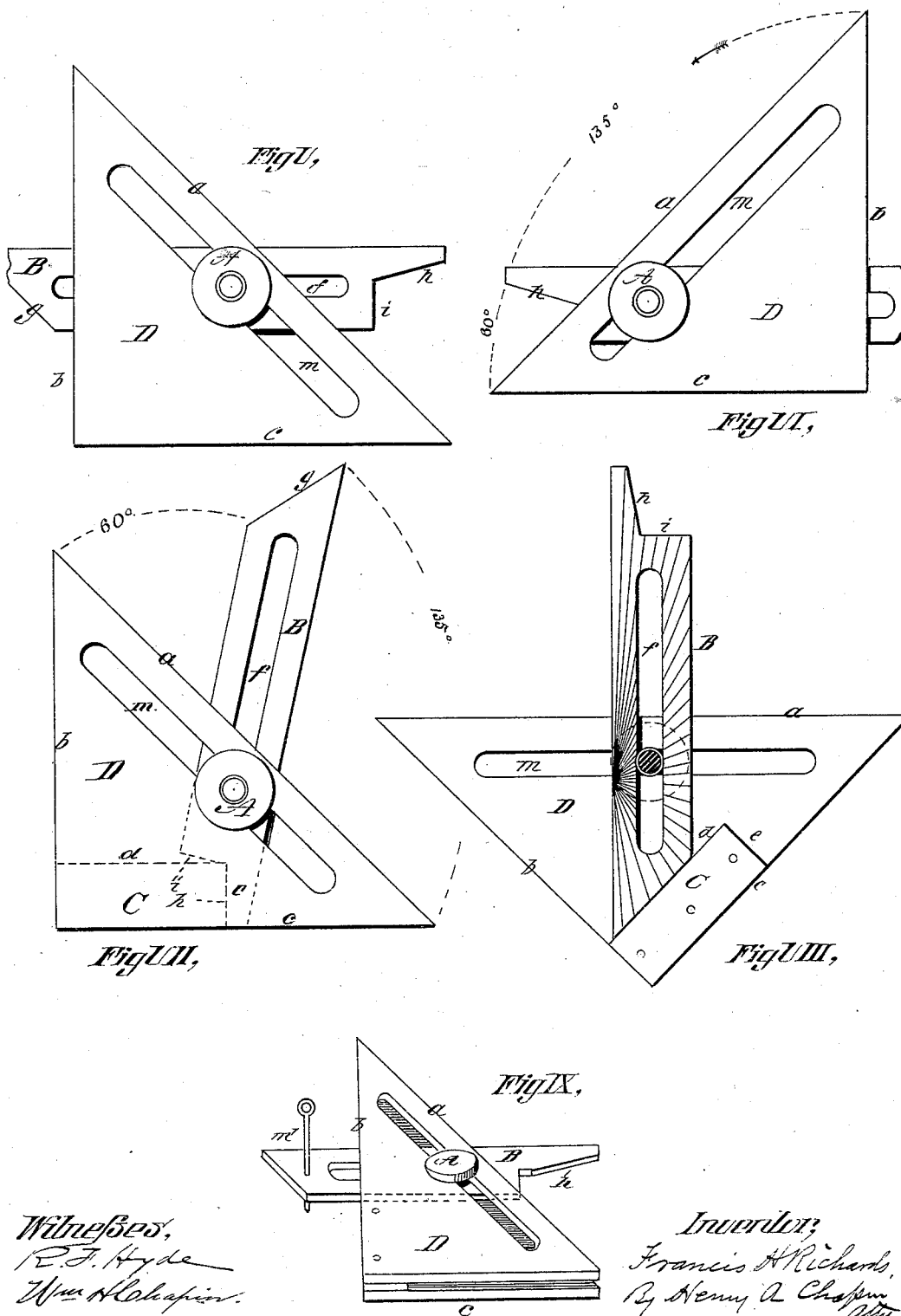
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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF SPRINGFIELD, MASSACHUSETTS.

COMBINATION-TOOL.

SPECIFICATION forming part of Letters Patent No. 264,341, dated September 12, 1882.

Application filed May 2, 1882. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Combination-Tools, of which the following is a specification.

This invention consists of a combined stock and blade of such construction as to be capable of being relatively arranged to form various tools, and so take the place in one device of many tools heretofore separate and distinct.

In the drawings, Figures I, II, III, IV, V, VI, VII are plan views of my device with the blade and stock arranged to form in effect as many separate tools. Fig. VIII is also a plan view of a distinct tool with a part of the stock of the device removed. Fig. IX is a perspective view of the device as a special tool, and Fig. X is a view of one side of the blade detached.

My device consists of a stock, D, having three straight edges, *a b c*, in the form of a right-angle triangle, and a slot, *m*, parallel to the edge *a*; a stop, C, rigidly attached to the stock, and whose straight edges *d e* form two sides of a parallelogram, having its other sides coincide with the straight edges *b c* of the stock; a blade, B, provided with a longitudinal slot, *f*, and having its ends formed respectively into straight edges *g* and *h i*, designed to bear upon the stop C; and a clamp-screw, A, having its stem pass through the openings *m f* in stock and blade, and by means of which the stock and blade are secured together in the required relative position. For convenience I form the stock of two corresponding sections removed by an interval to admit of the free play of the blade between them when released by the clamp-screw A, and forming jaws to come in immediate contact with the blade to bind it when compressed by the action of the clamp-screw. The opposite surfaces of the stop C form broad bearings, to which the sides of the stock are rigidly secured, and from which point they have sufficient spring to form the jaws, as aforesaid, while the surfaces *d e* of the stop are in position to be operative upon the end surfaces of the blade to cause its pro-

jecting edges to form various angles with the straight edges of the stock.

The blade B is provided with a scale of equal parts upon one side, and upon the other one of radiating graduations adapted to be used in combination with one edge of the stock, whereby the instrument is made to serve the purpose of a protractor; and said blade has also in one end a hole through it to receive a marking-point, *m'*. The said parts are adjusted to constitute a protractor by setting blade B so that one of its radial lines is parallel with one edge of the stock D.

In operation the blade may be arranged in relation to the sides *b c* of the stock to rest upon either surface, *d e*, of the stop C to form a try-square, as shown in Fig. I, a depth-gage or a surface-gage by means of the scale upon its blade, as well as a tool for taking inside calibers, while by inserting the marker *m'* a marking-gage is formed, as shown in Fig. IX; and, as the gage can be swung upon any side of the stock, it may be used with any edge of the stock to form a bevel.

When the edge *a* of the stock forms with the other edges an angle of forty-five degrees the blade having one end edge at the same angle to its side can be combined with the stop C and edge *a* to form, as shown in Fig. VIII, a convenient T-square for draftsmen. When the opposite end of the blade is formed into the edges *h i* the blade may be combined with the side *a* and stop C to give known and frequently-required angles, as shown in Figs. VI and VII, to form thread-gages. When the side *a* is varied from the angle of forty-five degrees to the sides of the stock the angles of the ends of the blade are changed from the angles shown to have a known relation to the sides of stop C to give the angles required. By these means a compact device is formed, capable of being with little trouble converted into any one of many tools, all of which are in frequent use by mechanics.

Now, having described my invention, what I claim is—

1. In combination, the stock D, made in the form of an isosceles triangle, provided with the slot *m* therethrough parallel with its longest side, and having the stop C secured there-

to, whose inner edges stand at right angles to the shorter sides of said triangle, the slotted blade B, having the edges *g h i* on its ends, said edges *g h* standing at an incline to the parallel edges of said blade, and the clamp-screw A, substantially as set forth.

2. In combination, the stock D, provided with the slot *m*, and having the stop C secured thereto, the clamp-screw A, movable in said slot to different positions on said stock, and the slotted blade B, having the edges *g h i* on its ends, said edges *g h* standing at an incline to the parallel edges of said blade and the edge *i* at right angles thereto, substantially as set forth.

3. In combination, the triangular stock D, having an opening between its sides to receive the blade B, and having the slot *m* through said sides, the clamp-screw A, movable in said slot to different positions in said stock, and the blade B, having the slot *f* therein and graduation-marks thereon radiating from a point on one edge of said blade, substantially as set forth.

FRANCIS H. RICHARDS.

Witnesses:

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