

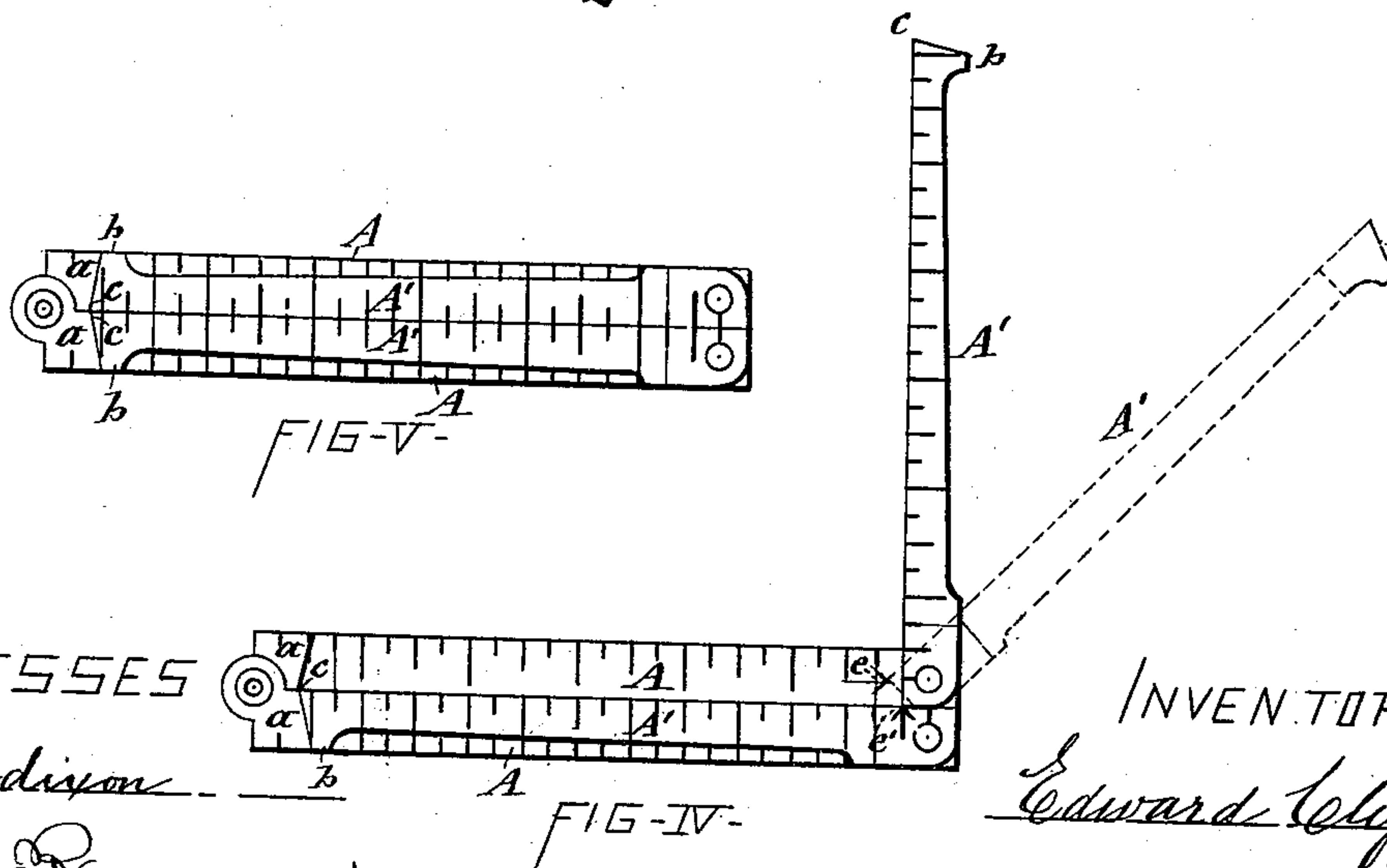
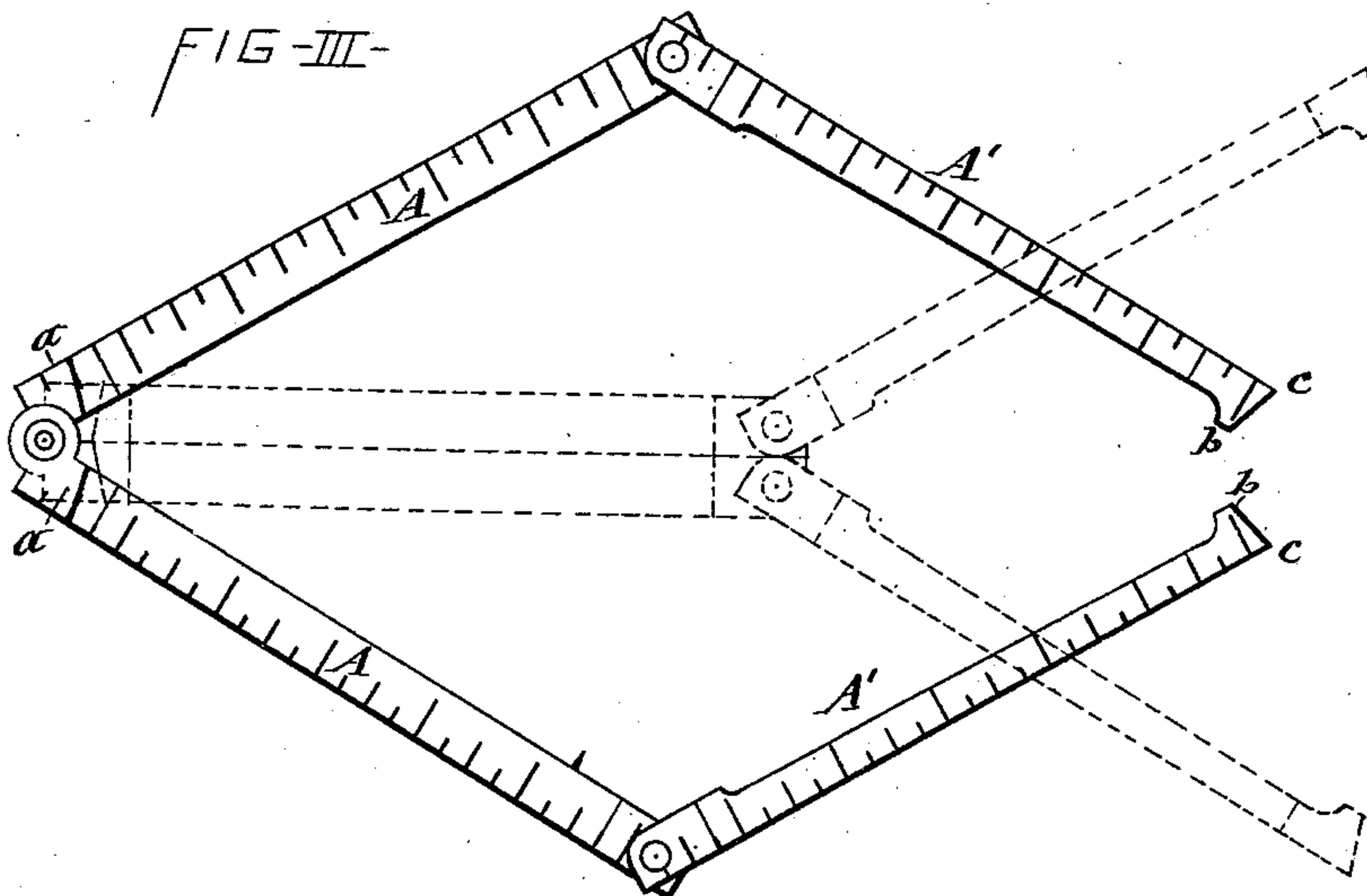
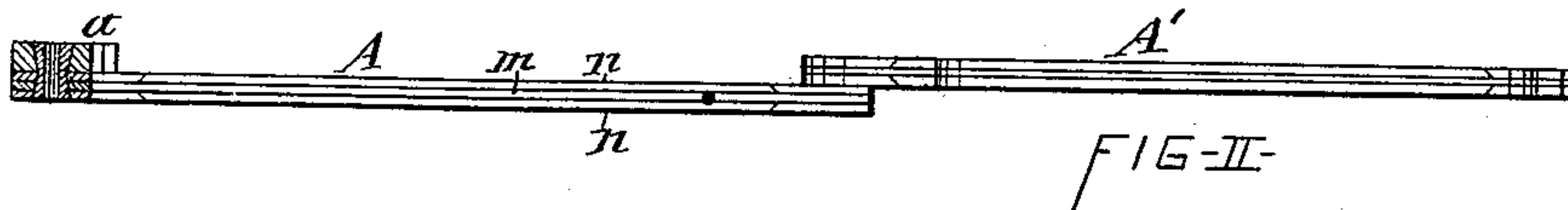
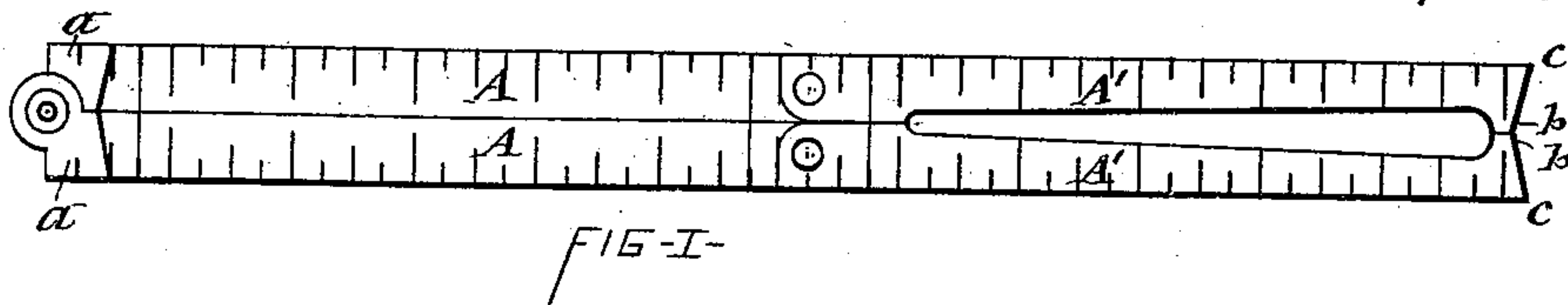
(No Model.)

E. CLIFF.

COMBINED RULE, CALIPERS, AND SQUARE.

No. 335,565.

Patented Feb. 9, 1886.



WITNESSES

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UNITED STATES PATENT OFFICE.

EDWARD CLIFF, OF OSWEGO, ASSIGNOR OF ONE-HALF TO RICHARD VOSE,
OF NEW YORK, N. Y.

COMBINED RULE, CALIPERS, AND SQUARE.

SPECIFICATION forming part of Letters Patent No. 335,565, dated February 9, 1886.

Application filed May 6, 18-5. Serial No. 164,551. (No model.)

To all whom it may concern:

Be it known that I, EDWARD CLIFF, of Oswego, in the county of Oswego and State of New York, have invented new and useful Improvements in a Combined Rule, Calipers, Square, and Gage, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention consists in a novel construction of an articulated lineal measuring-rule, which serves the additional functions of inside and outside calipers, a square, and a miter-gage, and which multiple tool is braced so as to prevent its warping or breaking by ordinary usage, and, furthermore, has its pivots expandible, so as to compensate for the wear thereof, all as hereinafter more fully described, and specifically set forth in the claims.

In the annexed drawings, Figure I is a plan view of the rule distended for employing half of its entire length. Fig. II is an edge view of the same. Fig. III is a plan view of the rule in position for use as calipers. Fig. IV is a plan view illustrating its adaptability as a square and as a miter-gage, and Fig. V is a plan view of the rule folded into its most compact form.

Similar letters of reference indicate corresponding parts.

A A and A' A' represent, respectively, the central members and end members of the articulated or jointed rule, the central members being connected with each other by a hinge, which allows them to swing in one and the same plane and fold closely edge to edge in the usual manner. The end members are connected to the flat side of the central members by pivots passing axially through the members at right angles to the plane of the rule, thereby causing the respective members to move in parallel planes.

At the joint of the central members, A A, and upon the same side on which the end members, A' A', are hinged, I attach to the central members blocks *a a*, of the same thickness as the end members, and the edges of said blocks which face the end members I incline from the outer edges of the rule to points in the meeting edges of the same nearer the pivot thereof, and the edges across the free ends of the end members I incline correspondingly, so that by

folding the end members inward and onto the central members, and then closing the latter, the end members become locked in their folded position by the engagement therewith of the inclined edges of the blocks *a a*, as illustrated in Fig. V of the drawings.

The rule is graduated along one edge throughout its length, and the main central portions of the end members are reduced in width along the opposite edge, so that when folded onto the central members, as shown in Fig. V of the drawings, the graduations of the underlying central members can be seen and used for measuring without the necessity of disturbing the end members from their folded position. The end portions of the end members are of the same width as the central members, A A. The free ends of the end members are thus formed with lateral projections *b b*, which serve as calipering-points by which to measure outside diameters. The inclined edges across the free ends of said members form sharp outside corners *c c*, by which to measure the inside diameters, as represented by dotted lines in Fig. III of the drawings. When used for the latter purpose, the central members, A A, are to be folded or closed together to form the handle of the calipers.

The inside corners of the hinged ends of the end members, A' A', are rounded, to allow said members to be swung into different angles and caliper objects of different diameters while holding the central members closed, and the outside corners of the hinged ends of the end members are made at right angles. The adjacent sides of the central members are provided with indicator marks or pointers *e e'*, which are in such relative positions that by bringing the right-angled corner of the end member, A', in coincidence with the pointer *e* the outer edge of said member is caused to stand at an angle of forty-five degrees from the outer edge of the central member, A, and by bringing the aforesaid corner in coincidence with the other pointer, *e'*, a right angle is formed between the aforesaid edges of the members A A', as shown by full lines in Fig. IV of the drawings, thus allowing the rule to be used either as a miter-gage or as a square. It is obvious that graduated arcs or quadrants may be marked or applied to the members A A instead of the sin-

gle pointer *e*, so that the members *A'* may be set at various angles; hence I do not limit myself in this respect.

In order to prevent the warping and breaking of the rule by ordinary usage, I form it of a metallic central leaf or plate, *m*, and facings *n n*, either of wood or bone or ivory or paper, or other analogous and suitable material, securely fastened to the central plate. For the joint of the rule I employ a tubular pivot of brass or other expansible metal, formed flaring externally toward opposite ends. By driving a wedging pin into the axial cavity of said pivot the latter becomes expanded to take up any wear which may have been produced on the exterior thereof, and thus the joint of the rule can be kept tight.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an articulated lineal measuring-rule, the combination, with the central members, of

the end members connected to the ends of the central members by pivots at right angles to the plane of the rule, and the free ends of said end members provided with laterally-projecting calipering-points, substantially as described and shown. 25

2. An articulated measuring-rule graduated along one edge throughout its length, and having the main portions of its end members reduced in width along the opposite edge, to expose the graduations of the underlying central members when the rule is folded, substantially as set forth. 30

In testimony whereof I have hereunto signed my name and affixed my seal, in the presence of two attesting witnesses, at Oswego city, in the county of Oswego, in the State of New York, this 1st day of May, 1885. 35

EDWARD CLIFF. [L. S.]

Witnesses:

W. A. STONE,
N. J. COYLE.