(No Model.)

J. MORRISON.

COMBINED PLUMB, LEVEL, AND RULE.

No. 342,303. Patented May 18, 1886.

Fig. 1.

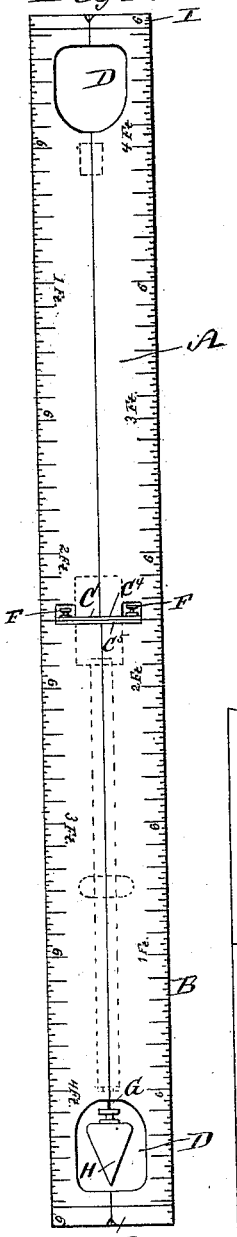


Fig. 2.

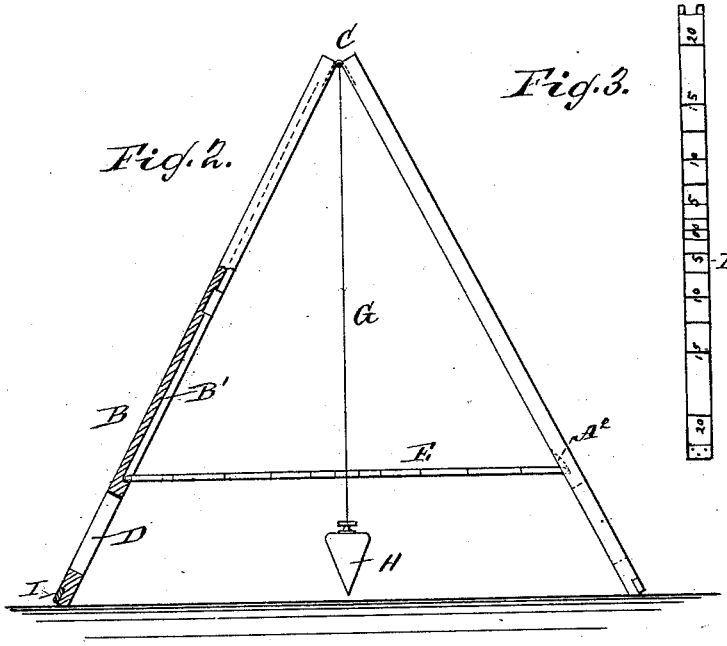


Fig. 3.

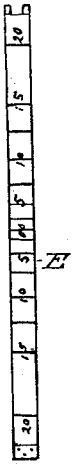


Fig. 4.

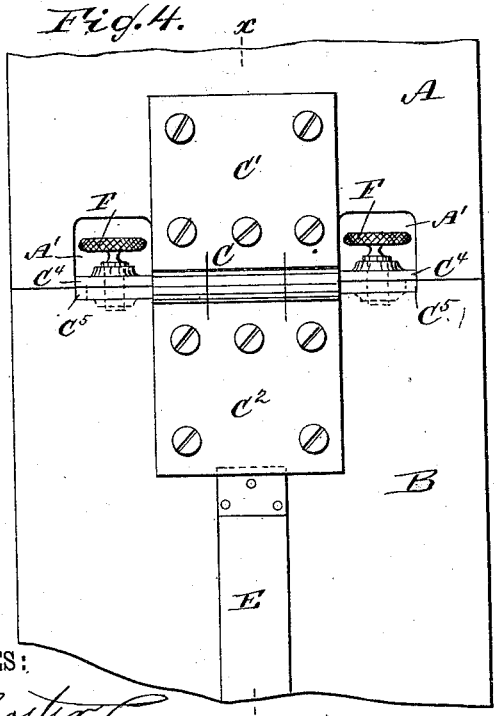


Fig. 5.

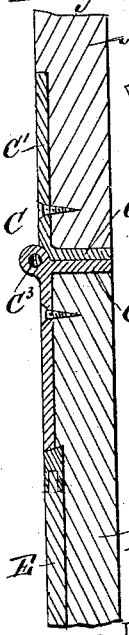
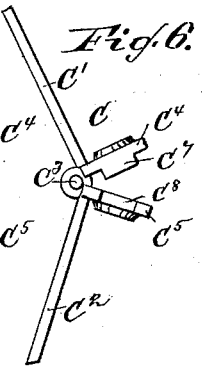


Fig. 6.



WITNESSES:

Theo. G. Hoster. C

C. Sedgwick

INVENTOR:

J. Morrison

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN MORRISON, OF ST. LOUIS, MISSOURI.

COMBINED PLUMB, LEVEL, AND RULE.

SPECIFICATION forming part of Letters Patent No. 342,303, dated May 18, 1886.

Application filed January 19, 1886. Serial No. 189,230. (No model.)

To all whom it may concern:

Be it known that I, JOHN MORRISON, of St. Louis, and State of Missouri, have invented a new and Improved Combined Rule, Plumb, and Level, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved tool which is to be used for general measuring, and also for leveling and plumbing, which tool can be folded to a size convenient for transportation or pocket use.

The invention consists of a rule made in hinged sections, of a plumb, and of a graduated straight-edge pivoted to one section.

The invention also consists of various parts and details, as will be more fully described and set forth hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation of my improvement, showing the rule and plumb. Fig. 2 is a side elevation of the improvement showing it as a level. Fig. 3 is a face view of the graduated straight-edge. Fig. 4 is a detail face view of the hinge which joins the sections. Fig. 5 is a cross-section on the line *x x*, Fig. 4. Fig. 6 is a detail side elevation of my improved hinge.

As shown in the drawings, the rule is made of two sections hinged together; but any number of sections may be joined in the manner hereinafter described.

The sections A and B are united by a hinge, C, and each section is provided on its face with a scale divided into feet, inches, and sub-divisions of the latter. The outer ends of the sections A and B are each provided with an aperture, D, which is used as a hand-hole or as an aperture for the plumb-bob to play in.

The section B is provided on its under side with a recess, B′, in which can be folded the straight-edge E, hinged near the aperture D to the section B. The graduations on the face of the straight-edge represent degrees and sub-divisions of the same commencing at the center with "0" and running upward to the right and left, the spaces between the lines of the graduations being proportional to the tangent of the angle measured.

The hinge C consists of the hinge-plates $C' C^2$, fastened by means of screws to the sections A and B, respectively, which plates C′ and C^2 are united by the pin C^3 to form the hinge proper. The plates C′ C^2 are provided with the plates C^4 C^5, respectively, which stand at right angles to the plates C′ and C^2. The plates C^4 and C^5 also extend sidewise from the plates C′ and C^2, and can be securely fastened to each other by means of the thumb-screws F, placed in recesses A′ in the section A.

Each end of the plate C^5 is provided with a recess, C^6, in which fits a lug, C^7, attached to each end of the plate C^4, so as to prevent the said plates C^4 and C^5 from shifting upon each other, and hence stiffening the hinge C.

The plate C^2 of the hinge C is slightly beveled on its lower edge to receive a corresponding bevel formed on the upper edge of the straight-edge E, so that when the straight-edge E is placed in its recess B′ of the section B the upper beveled edge may be sprung under the beveled edge of the plate C^2, to hold it in position.

The plumb-cord G, provided on its lower end with a plumb-bob, H, has its upper end attached to the center of the hinge C, and hangs vertically midway between the sections A and B.

My improved tool can be used as a rule by securing the different sections together by means of the thumb-screws F, fastening the plates C^4 and C^5 to each other, so as to form a straight rule of the different sections. The graduations are continuous on the different sections and read up on one edge of the sections and down on the other.

The tool can be used as a plumb, as shown in Fig. 1, by using the aperture D in the section A as a hand-hole, so that the plumb will play in the aperture D of the section B.

The tool can be used to determine inclinations to the horizontal plane by unscrewing the thumb-screws F and placing the sections A and B in the position shown in Fig. 2. The straight-edge E is swung downward, the outer edge of the same being placed in a recess, A^2, made in the under side of the section A, so as to form an isosceles triangle.

The plumb-cord G with its plumb-bob H is suspended vertically from the hinge C, and any variation of the lower ends of the sections

A and B from a horizontal plane will be indicated by the plumb-cord G on the graduated straight-edge E, to either the right or left.

The straight-edge E can be held in the recess B′, as before stated, and the sections A and B folded one on the other, so that the plumb-cord G is held between the sections, and the plumb-bob H held in the two apertures D of the sections A and B, thereby folding the tool into convenient shape for transportation or pocket use.

The outer ends of the sections A and B are provided with strengthening-ferrules I, so as to protect the rule from rapid wear. The tool can also be used as a straight-edge when extended to its full length in any desired manner.

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

1. A combination-tool consisting of two or more sections hinged together and provided at their outer ends with apertures and on their edges with graduated scales of feet, inches, and subdivisions of the latter, of a plumb cord and bob suspended from the center of the hinge uniting the sections, and of a hinged graduated straight-edge, substantially as herein shown and described.

2. A combination-tool consisting of the sections A and B, connected by the hinge C and having the apertures D at their outer ends, the plumb-cord G, the bob H, and the pivoted graduated straight-edge E, substantially as herein shown and described.

3. The section A, having the apertures A′ and the section B, in combination with the hinge C, consisting of the plates C′ and C^2, and the plates C^1 and C^5, capable of being fastened together by means of the thumb-screws F, substantially as herein shown and described.

4. The section A, having the apertures A′, the plate C′, attached to the section A and provided with the plate C^1, having the lugs C^7, in combination with the section B, to which is attached the hinge-plate C^2, provided with a plate, C^5, having the recesses C^6 at its outer ends, together with the thumb-screws F and hinge pin or pintle C^3, substantially as herein shown and described.

5. The section B, having a recess, B′, and the hinge-plate C^2 of the hinge C, in combination with the graduated straight-edge E, which can be folded into the recess B′ and held therein by the lower beveled edge of the plate C^2 of the hinge C, substantially as herein shown and described.

6. The sections A and B, having apertures D, and united by the hinge C, in combination with the plumb-cord G and the bob H, substantially as herein shown and described.

7. The sections A and B, having the apertures D, united by a hinge, C, and held together by the thumb-screws F, in combination with the plumb-cord G and the plumb-bob H, substantially as herein shown and described.

JOHN MORRISON.

Witnesses:
JULIUS HURTER,
ARCHIBALD HUTTON.