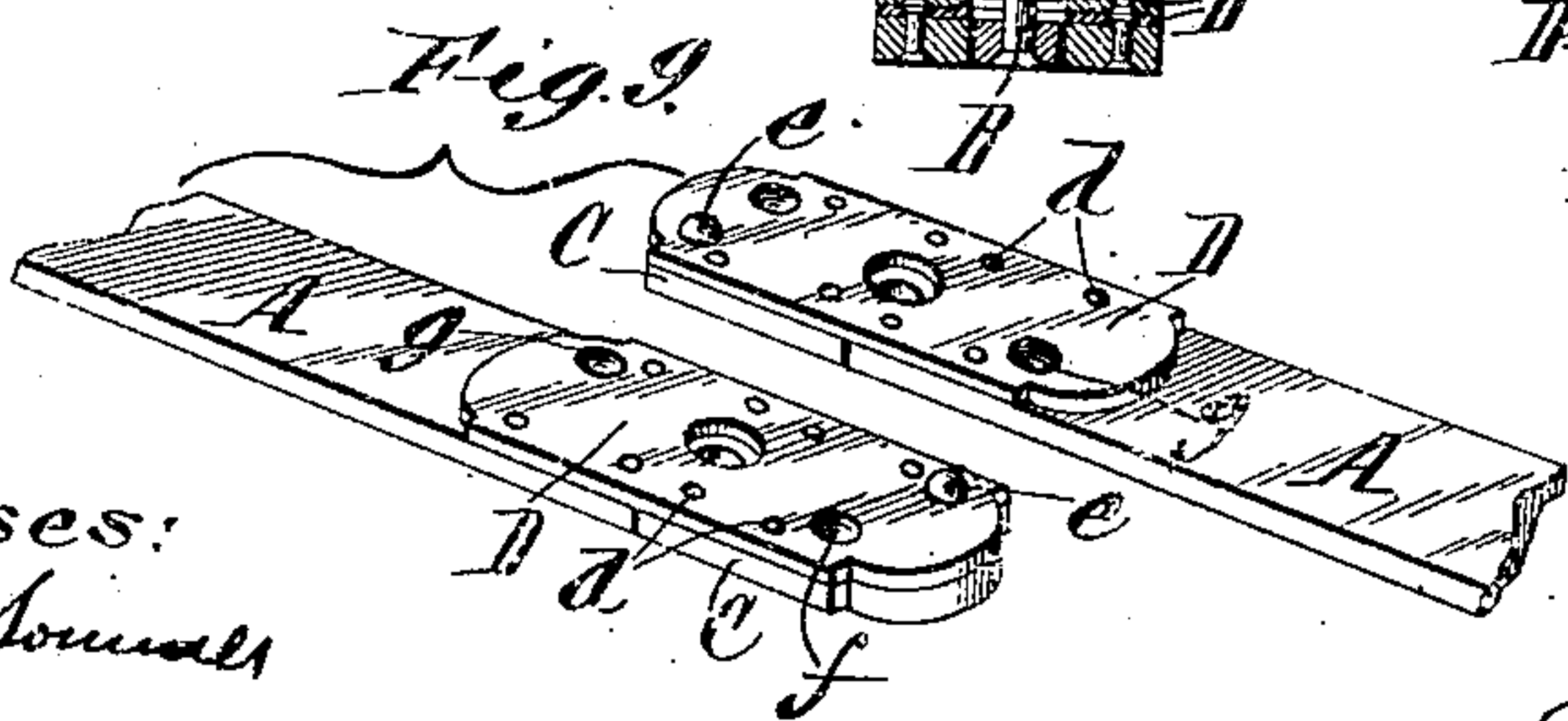
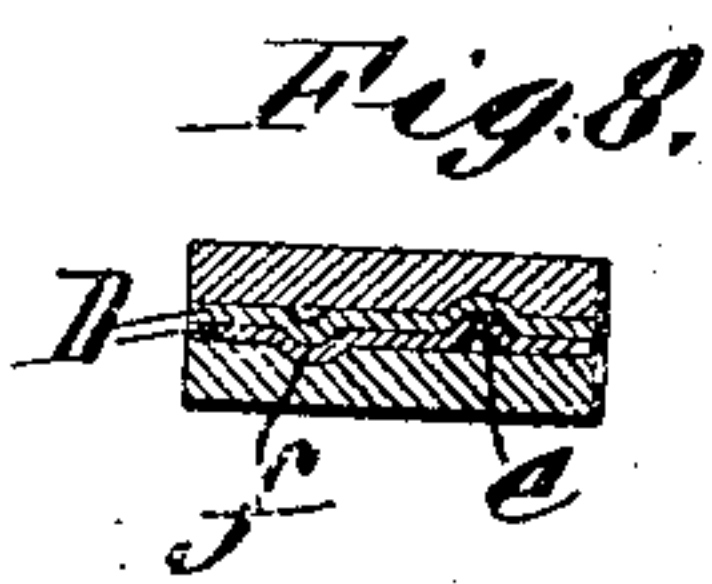
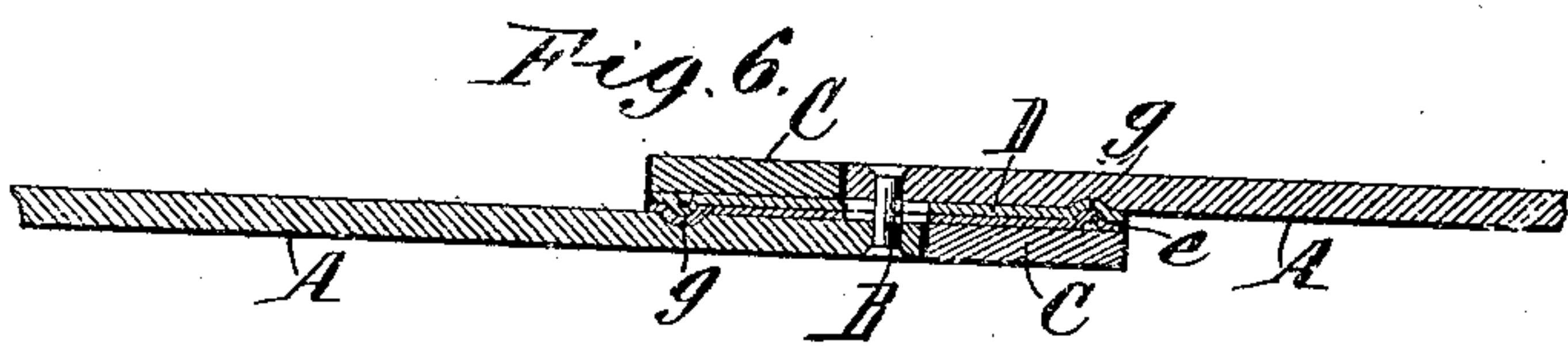
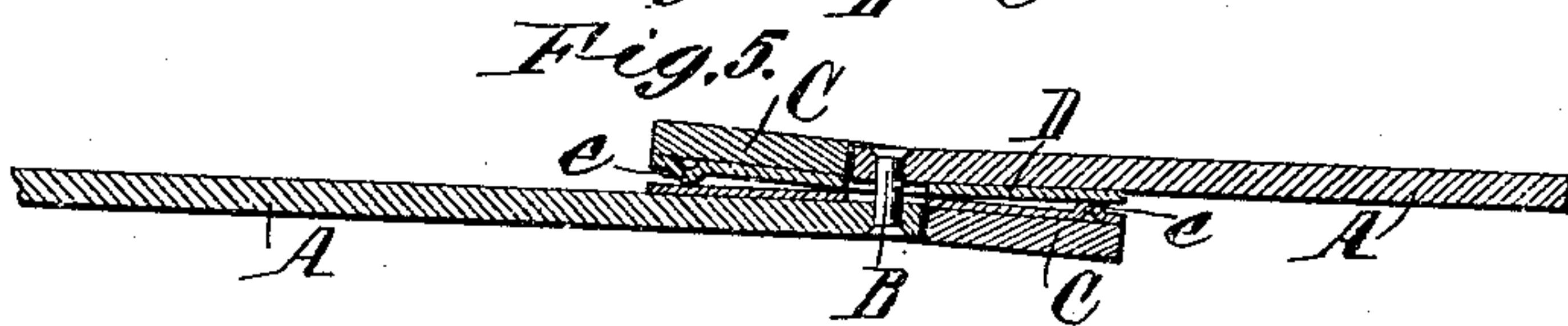
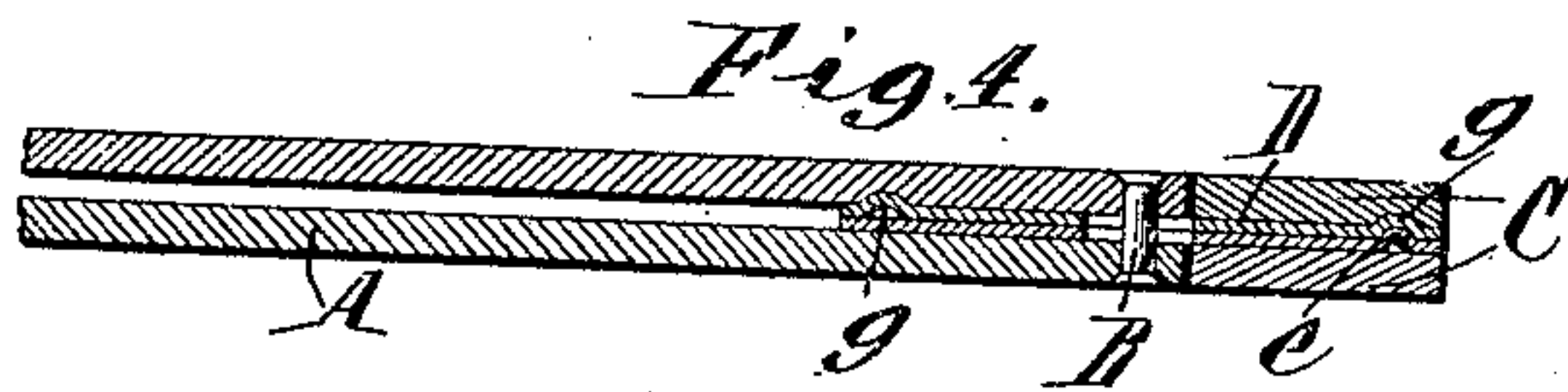
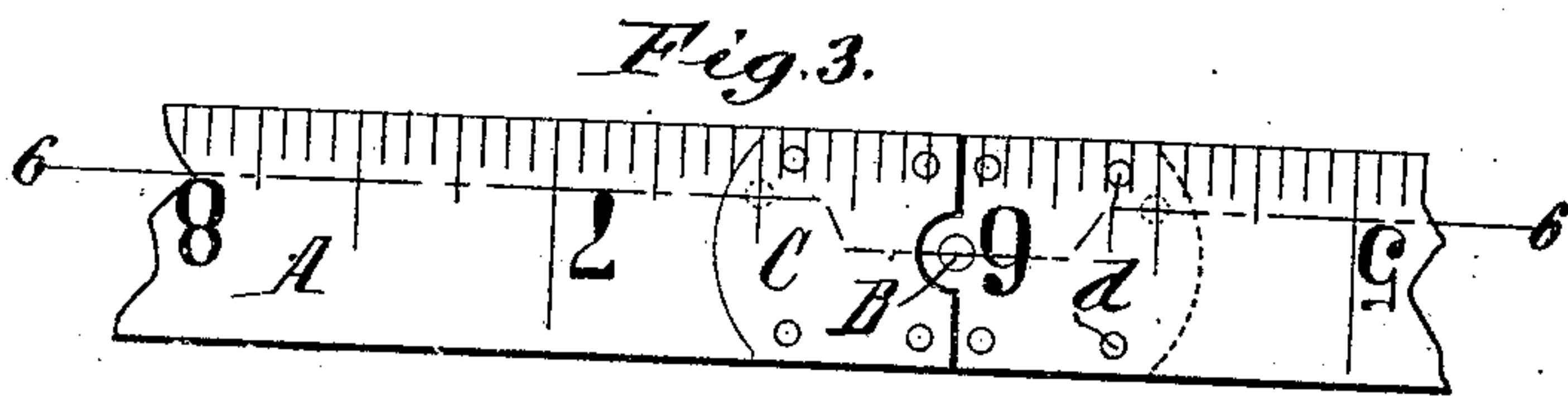
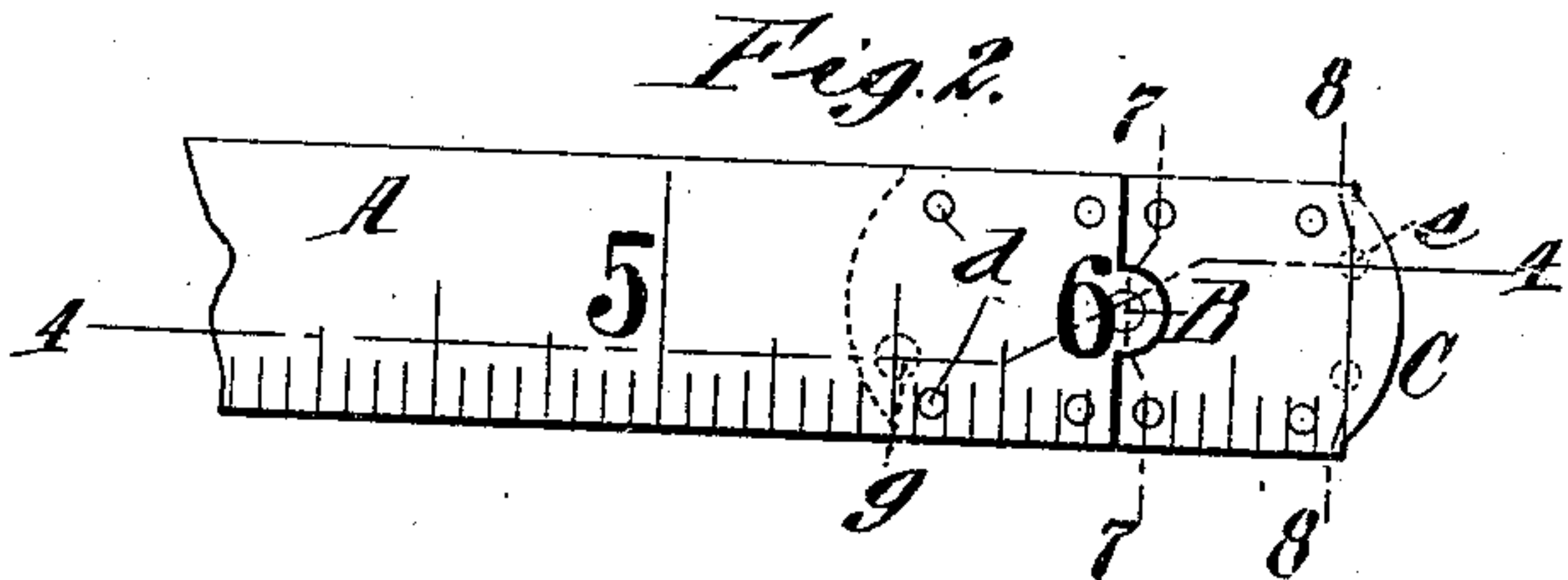


955,314.

J. F. BORNE.
FOLDING RULE.
APPLICATION FILED FEB. 15, 1909.

Patented Apr. 19, 1910.
2 SHEETS—SHEET 1.



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John H. Shoemaker

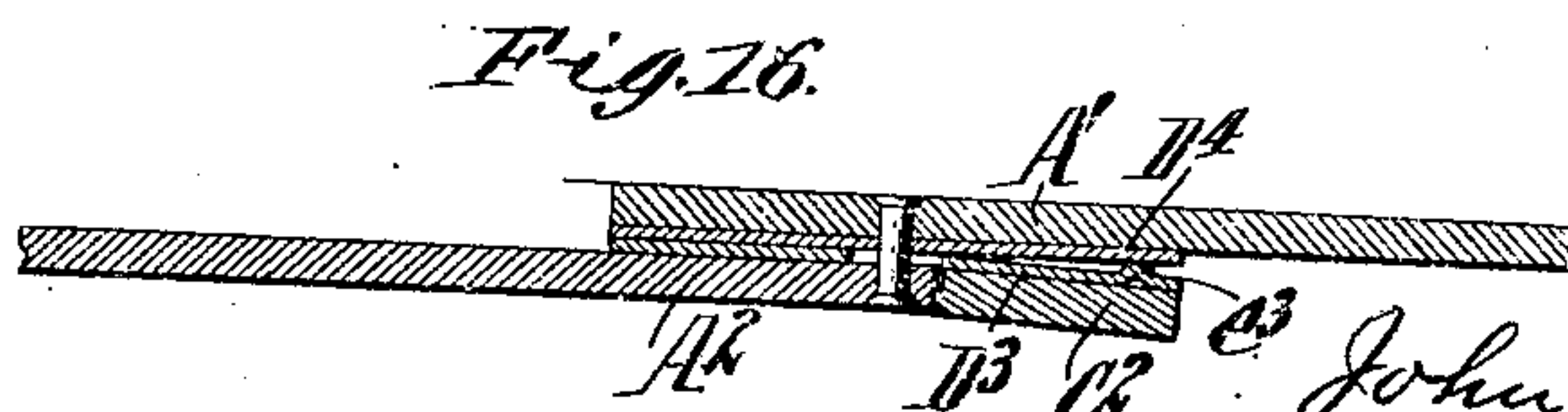
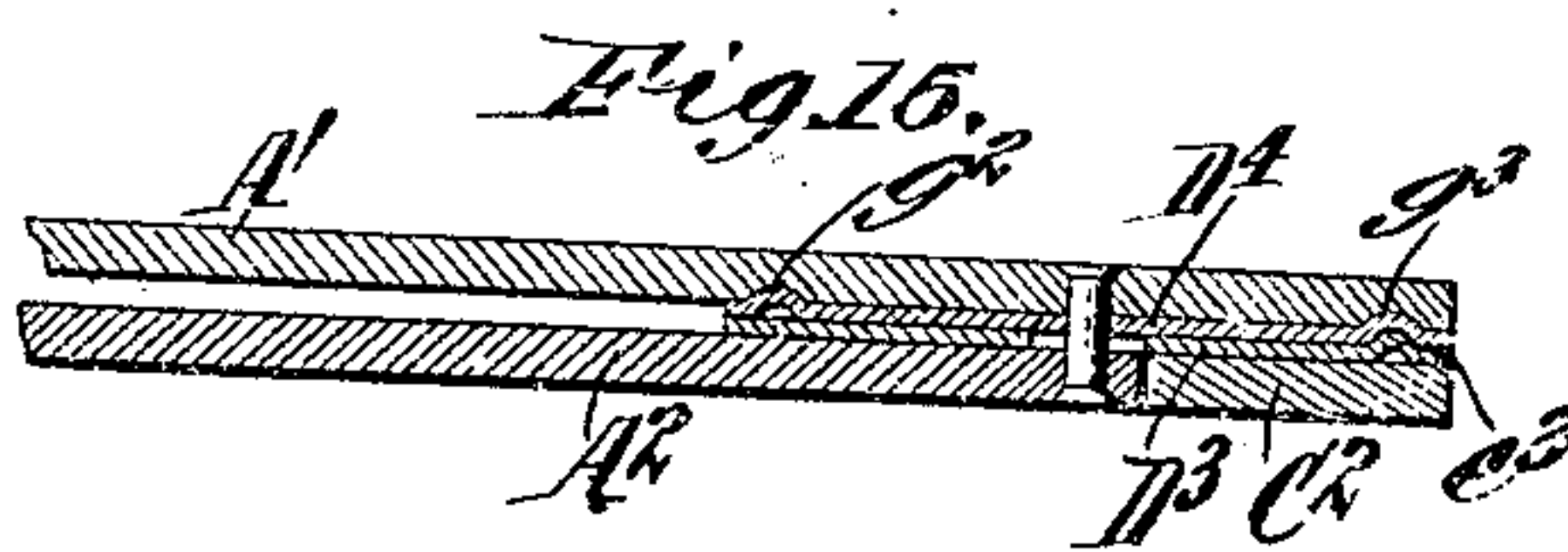
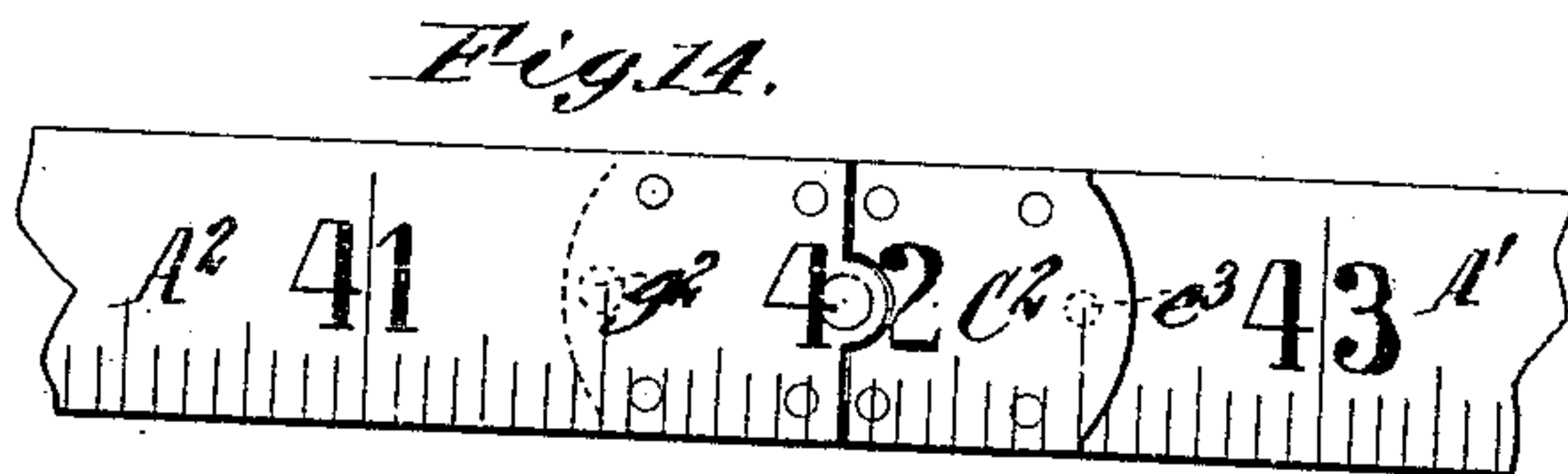
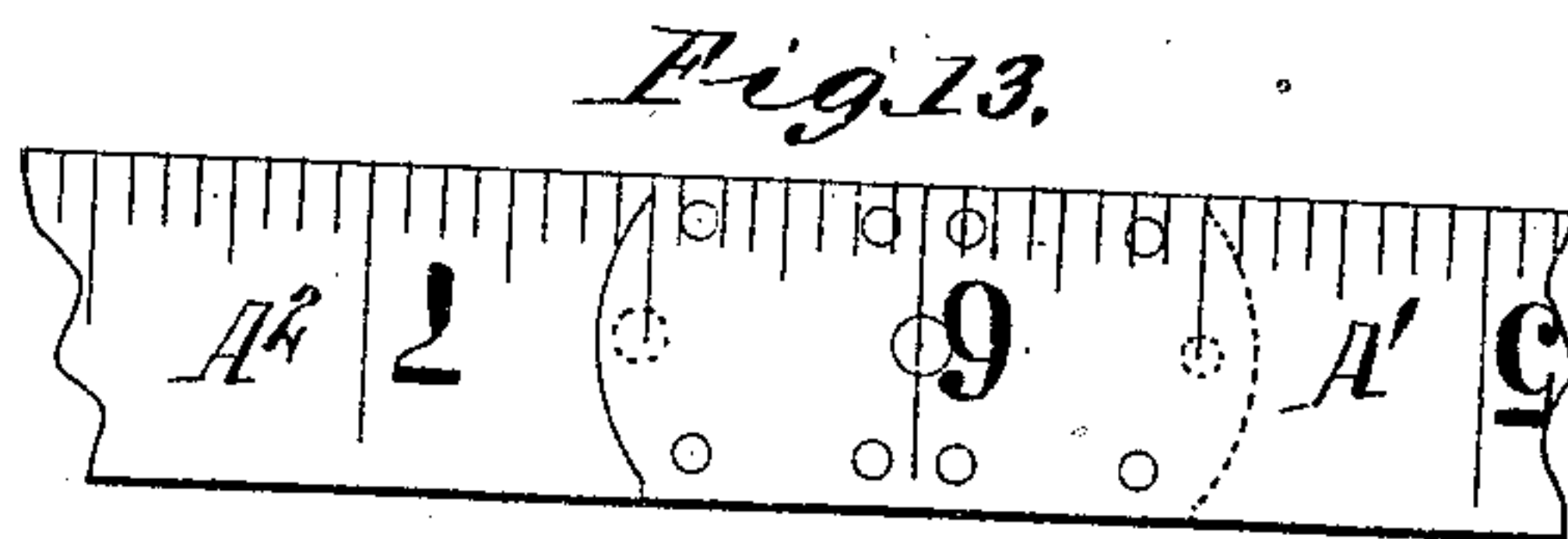
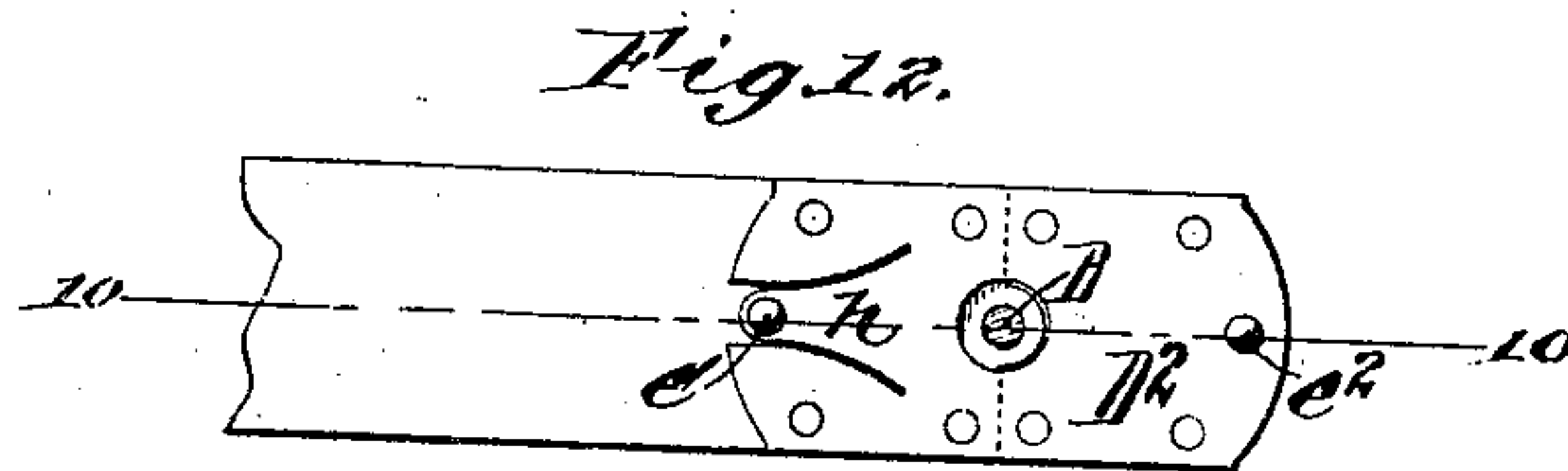
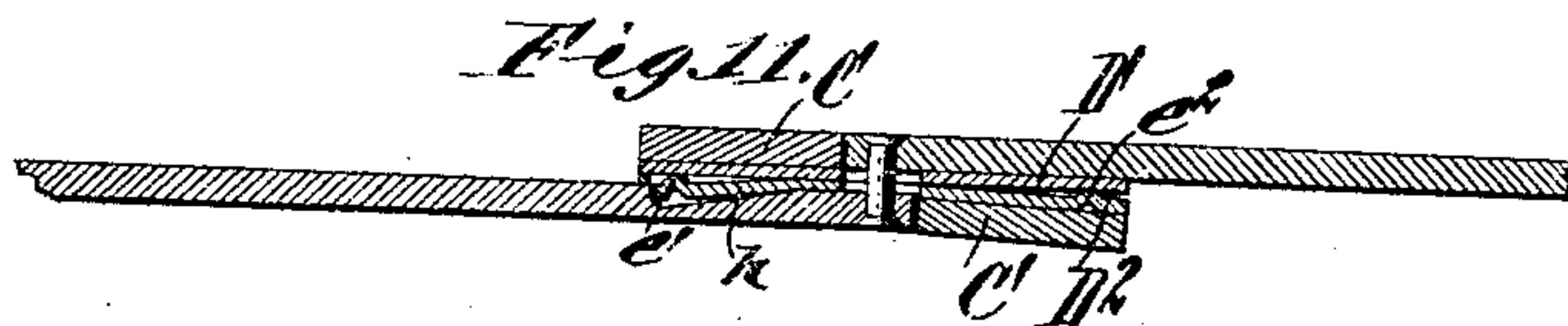
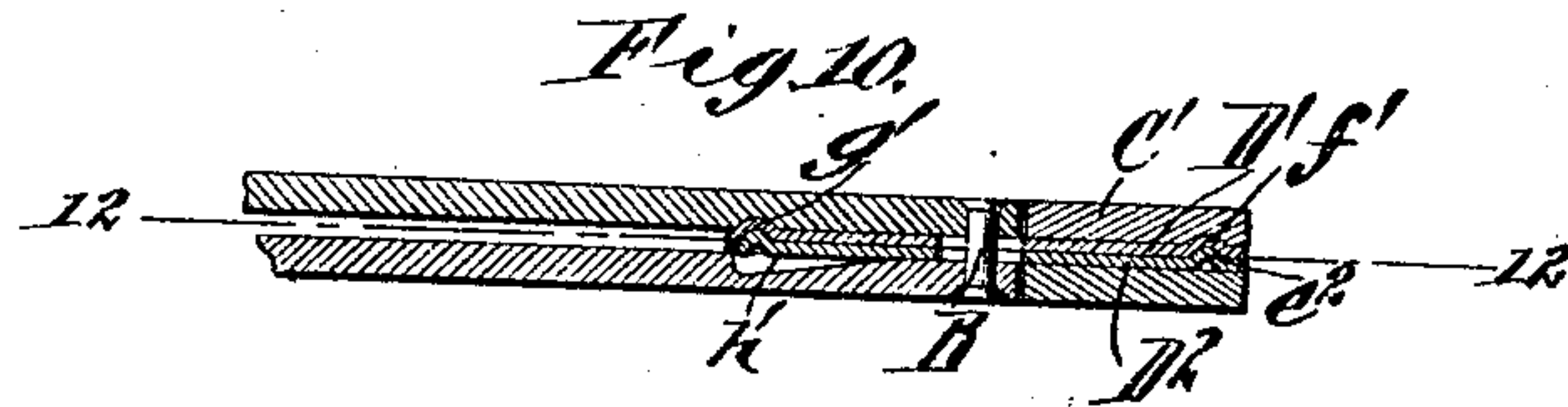
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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FOLDING RULE.

955,314.

Specification of Letters Patent.

Patented Apr. 19, 1910.

Application filed February 15, 1909. Serial No. 477,846.

To all whom it may concern:

Be it known that I, JOHN F. BORNE, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Folding Rules, of which the following is a specification.

This invention relates to folding rules of the class in which the sections are pivoted together by transverse pins which permit the sections to fold laterally or in parallel planes, and more particularly to rules of this kind in which the contiguous sections are provided with automatic locking devices for retaining them in their folded and unfolded positions.

One of the objects of my invention is to provide such rules with inexpensive locking devices which do not require the rule-sections to be constructed of steel or similar resilient material, but permit them to be made of any desired material possessing the requisite stiffness such as wood, brass, aluminum or papier mâché.

A further object is the construction of such a folding rule in which the jointed sections are doubly locked both in their folded and unfolded positions.

In the accompanying drawings consisting of 2 sheets: Figure 1 is a side elevation of the rule, folded. Fig. 2 is a fragmentary top plan view thereof in the same condition. Fig. 3 is a similar view of two rule-sections, unfolded. Fig. 4 is a longitudinal section in line 4—4, Fig. 2. Fig. 5 is a longitudinal section of two rule-sections nearly unfolded, but unlocked. Fig. 6 is a longitudinal section in line 6—6, Fig. 3, showing the rule-sections unfolded and locked. Figs. 7 and 8 are transverse sections on the correspondingly-numbered lines in Fig. 2. Fig. 9 is a perspective view of two separated rule-sections, the lower section being in its normal position and the upper one inverted to show the relation of the locking teats and recesses of the sections. Fig. 10 is a longitudinal section on line 10—10, Fig. 12, showing a modified construction of the locking devices, the rule sections being folded. Fig. 11 is a similar section showing the rule-sections nearly unfolded, but unlocked. Fig. 12 is a longitudinal section in line 12—12, Fig. 10. Fig. 13 is a fragmentary top plan view and Fig. 14 is a bottom plan view of another modified construction of the rule, both views

showing the same unfolded. Fig. 15 is a central longitudinal section of the rule-sections, folded and locked. Fig. 16 is a similar section, showing the rule-sections nearly unfolded, but unlocked.

Similar letters of reference indicate corresponding parts throughout the several views.

Referring to the construction shown in Figs. 1—9, inclusive, A indicates the rule-sections and B the transverse pivots or rivets by which the overlapping end portions of contiguous sections are joined together, so that the sections can be folded and unfolded laterally, in a manner common to this type of rules.

Beyond their connecting pivot B, the rule sections are provided with hinged or yieldable end plates or extensions C movable in a plane at right angles to the flat faces of the rule-sections. In the construction shown in the drawings, these extensions are flexibly connected to the ends of the rule-sections by thin plates or leaves D of spring steel or other suitable resilient material, preferably secured to the opposing inner faces of the rule-sections and extensions by rivets *d* or other fastenings. The joint between the rule-sections and their extensions is substantially in line with the pivot B, and sufficient clearance is left between these parts to permit the necessary swinging movement of the extension. The hinge-leaves D may be as wide as the rule-sections, as shown. They preferably extend inwardly beyond the pivot B as far as they extend outwardly beyond it and their outer ends are flush or nearly so, with the free ends of the extensions C. The latter are graduated as shown, to form continuations of the graduated rule-sections. These extensions and the rule-sections are provided in their opposing-faces with co-operating locking devices of any suitable construction which by reason of the yieldable character of the extensions snap into engagement with each other when adjacent rule-sections are fully folded or unfolded, thus reliably locking the sections in both positions and yet permitting them to be easily unlocked by using sufficient force to overcome the resistance of the hinge leaves D.

In the embodiment of the invention shown in Figs. 1—9, the extension of each rule-section is provided on its inner side near its free end

with a locking teat or projection e and a locking recess or depression f preferably arranged side by side, on opposite sides of the longitudinal center line of the extension.

5 The corresponding rule-section is provided on its inner side with a similar locking recess or socket g arranged in longitudinal alinement with the locking projection e of its extension C, the two recesses f, g and the

10 projection e of the same rule-section all being equidistant from the pivot B. By this arrangement of the locking members, when adjacent rule sections are folded, as shown in Figs. 2, 4 and 8, the projection e of each

15 extension C interlocks with the complementary recess f of the other extension, forming a double lock on the outer side of the pivot B. When the rule sections are fully unfolded, as shown in Figs. 3 and 6, the

20 projection e of each extension interlocks with the recess g of the opposing rule-section, locking the two sections together at two points located on opposite sides of the pivot lengthwise of the rule, thus producing

25 a practically rigid joint in this position of the rule-sections.

The teats or projections e are convex, rounded or beveled in order to readily ride up, either on the rule-sections or their extensions, and the corresponding recesses are correspondingly shaped.

It will be understood from the foregoing that the yieldable extensions C with their locking projections and recesses act like

35 spring catches or spring-plates which automatically lock the rule-sections the moment the corresponding locking members come into register with each other, both in the folded and unfolded positions of the sections.

An important advantage of this improvement is that the rule-sections themselves are not required to spring or yield in locking and unlocking them. The material of

45 which rule-sections can be made is therefore not confined to steel or other resilient metal, but they may be constructed of wood or other suitable non-resilient material possessing the requisite strength and stiffness.

The locking teats and recesses are preferably formed integral with the hinge-leaves D by stamping indentations in opposite sides thereof, as shown, producing a simple

55 and inexpensive construction.

In the modified construction of the rule shown in Figs. 10, 11 and 12, the extensions C^1 of adjacent rule-sections are hinged to the latter by flexible leaves D^1, D^2 respectively. One of the leaves, say D^1 , is provided in its face with a pair of locking recesses f^1, g^1 arranged equidistant from the pivot B and on opposite sides thereof lengthwise of the rule; while the hinge leaf D^2 ,

65 has a pair of locking projections e^1, e^2 , like-

wise arranged and adapted to interlock with the recesses f^1, g^1 both in the folded and unfolded positions of the rule. In this case, the inner stud or projection e^1 is preferably carried by a spring tongue h formed integral with the hinge-leaf, to permit said

70 stud to yield in folding the rule and so avoid springing of the rule-sections. As shown at h^1 , the rule-section is provided with a recess into which the tongue h recedes when

75 deflected. This construction also produces a double lock both in the folded and unfolded positions of the rule-sections.

In the modification illustrated in Figs. 13 to 16, the invention is embodied in a rule

80 having a single lock. In this case, but one of the adjacent rule-sections A^1, A^2 is provided with a yieldable extension C^2 , the hinge plate D^3 whereof is provided with a projection e^3 adapted to interlock with either

85 of two recesses g^2, g^3 formed in a plate D^4 secured to the opposing rule-section, the projection engaging the recess g^3 in the folded position of the sections, as shown in Fig. 15, and the recess g^2 in the unfolded position

90 thereof.

It will be noted that in each of the several embodiments of the invention herein shown and described, a flexible or yieldable extension is employed on one or both of a jointed

95 pair of rule-sections and that said extension and the opposing rule-section are provided with complementary locking members arranged to lock the sections both in their folded and unfolded positions.

Other changes or modifications coming within the scope of the appended claims may obviously be made, and I do not therefore wish to be limited to the particular constructions herein shown and described.

I claim as my invention:

1. In a folding rule, the combination of a rule-section, and a second rule-section connected to the first-named section by a pivot arranged at right angles to the plane of the

110 sections, to permit them to fold laterally, the second-named section being provided beyond said pivot with a yieldable graduated extension movable toward and from the face of the opposing section, said extension forming

115 a continuation of the measuring part of the second-named section and having locking means arranged to engage the first-named section.

2. In a folding rule, the combination of a

120 rule-section, a second rule-section pivotally connected therewith and provided beyond the pivot-joint with a separate extension, arranged substantially in the plane of the corresponding rule-section to form a continuation

125 thereof, and means for yieldingly hinging said extension to the corresponding rule-section, said extension and the first-named rule-section having cooperating locking

130 members.

3. In a folding rule, the combination of a rule-section, a second rule-section pivotally connected therewith and provided beyond the pivot-joint with a separate extension, and an elastic hinge-leaf connecting said extension with the corresponding rule-section, said leaf and the first-named rule section having coöperating locking members.

4. In a folding rule, the combination of a pair of rule-sections, and a pivot connecting the same, each of said sections being provided beyond said pivot with a yieldable extension arranged substantially in the plane of the corresponding section to form a continuation thereof, and each of said extensions having a locking member arranged to engage a coöperating locking member on the opposing rule-section.

5. In a folding rule, the combination of a pair of rule-sections, a pivot connecting the same, each of said sections being provided beyond said pivot with a separate extension, and elastic hinge-leaves connecting said extensions with the respective rule-sections, said leaves being provided with complementary projections and recesses arranged to lock the rule-sections in their folded and unfolded positions.

6. In a folding rule, the combination of a pair of rule sections pivotally connected together, each of said sections being provided beyond the pivot-joint with a yieldable extension capable of swinging toward and from the opposing rule-section, each extension having a projection and a recess arranged to interlock with the complementary members of

the opposing extension when the rule-sections are folded.

7. In a folding rule, the combination of a pair of rule-sections pivotally connected together, each of said sections being provided beyond the pivot-joint with a yieldable extension capable of swinging toward and from the opposing rule-section, each extension having a projection and a recess arranged to interlock with the complementary members of the opposing extension when the rule-sections are folded and each section having a recess arranged to interlock with the projection of the opposing extension when the sections are unfolded.

8. In a folding rule, the combination of a pair of rule sections pivotally connected together, each of said sections being provided beyond the pivot-joint with a yieldable extension, each extension having a locking projection and a locking recess located on opposite sides of the longitudinal center line of the extension and arranged to interlock with the complementary members of the opposing extension when the rule sections are folded, and each section having a recess located diagonally opposite the recess of the corresponding extension and arranged to interlock with the projection of the opposing extension when the sections are unfolded.

Witness my hand this 11th day of February, 1909.

JOHN F. BORNE.

Witnesses:

C. F. GEYER,
E. M. GRAHAM.