

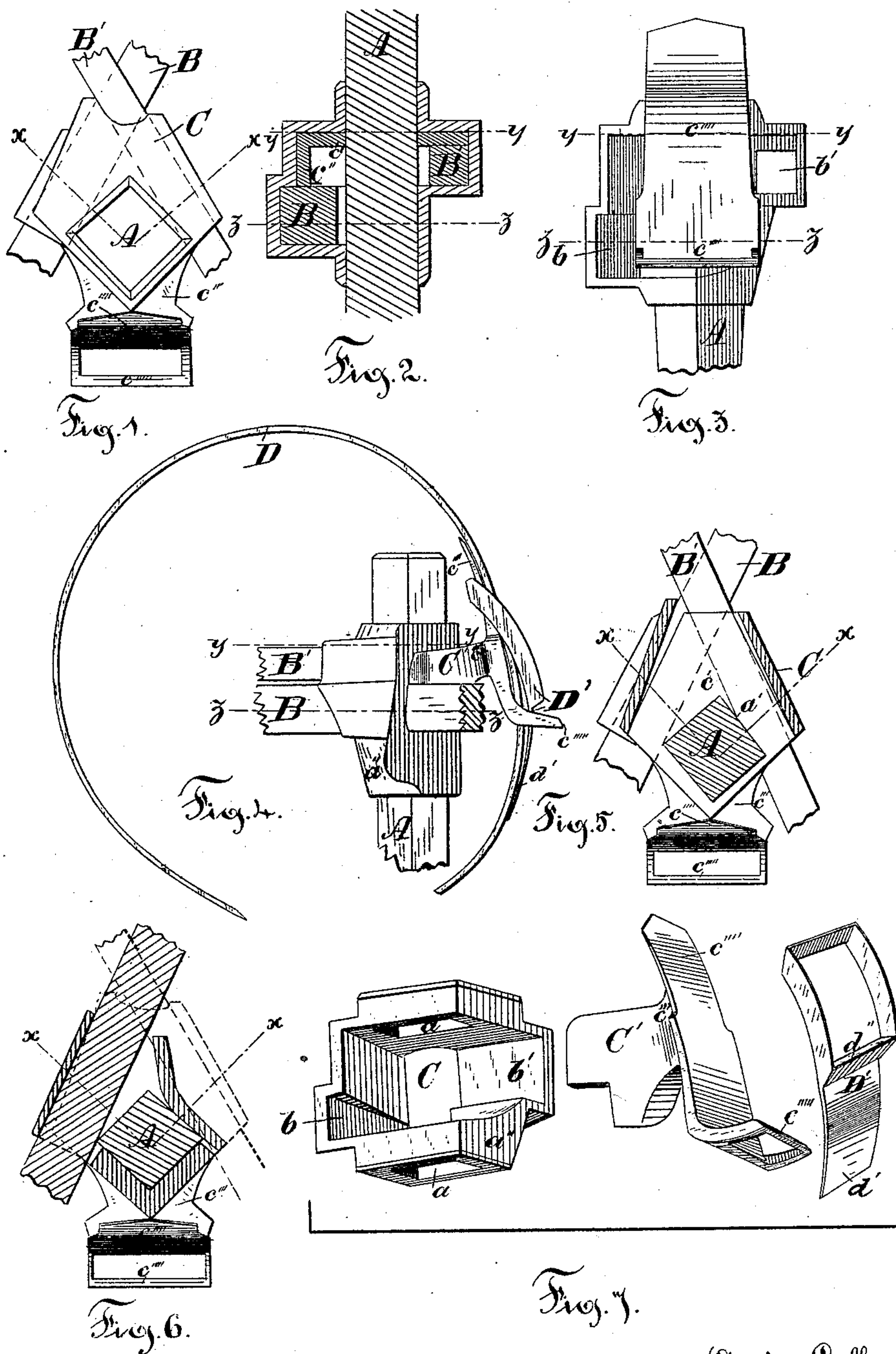
(No Model.)

2 Sheets—Sheet 1.

A. CALLANDER.  
HARROW.

No. 411,009.

Patented Sept. 17, 1889.



Witnesses:  
F. Blanchet  
J. Hurcomb.

Austin Callander  
Inventor  
A. Harvey  
Attorney

(No Model.)

2 Sheets—Sheet 2.

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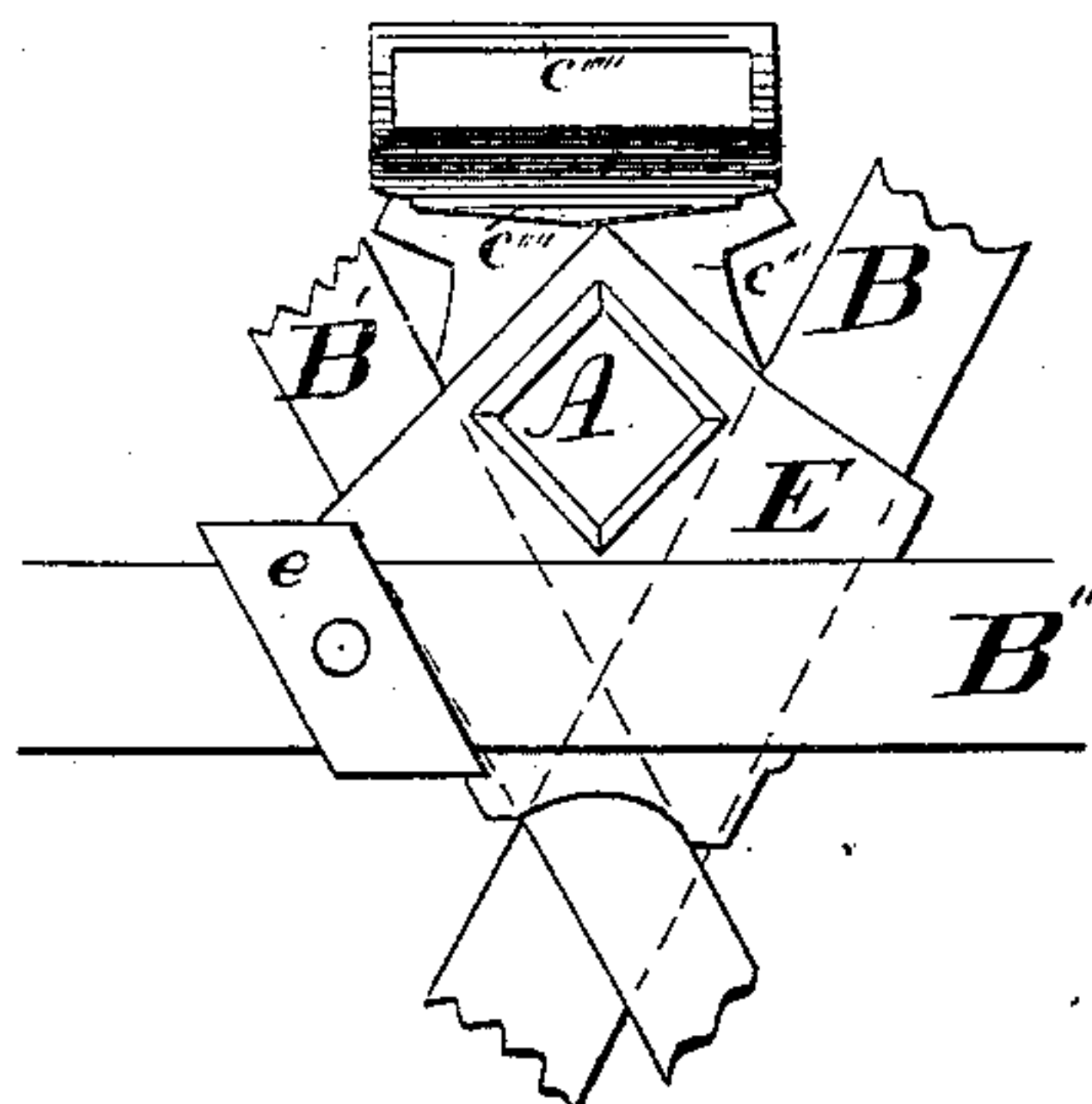


Fig. 9

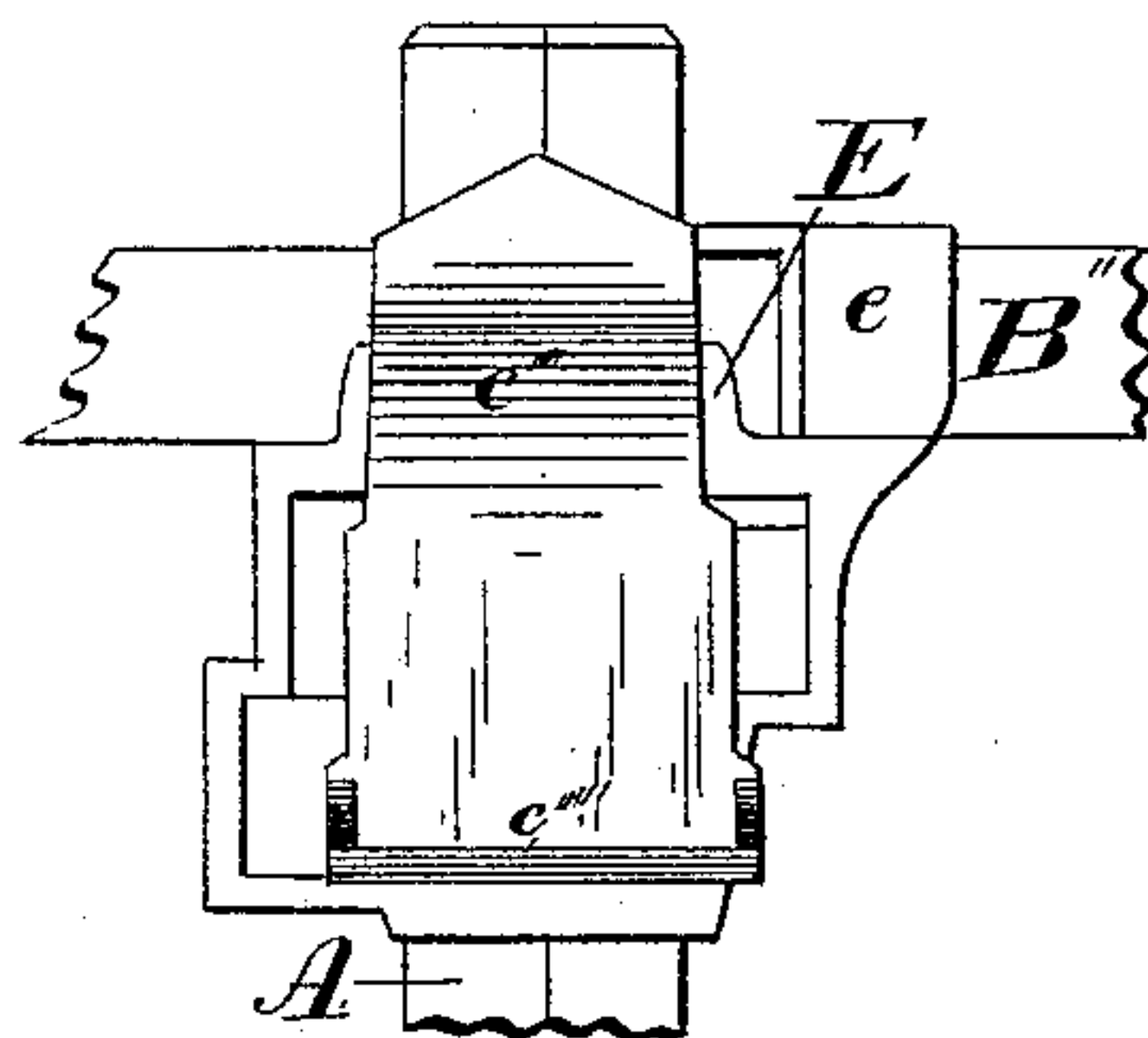


Fig. 10

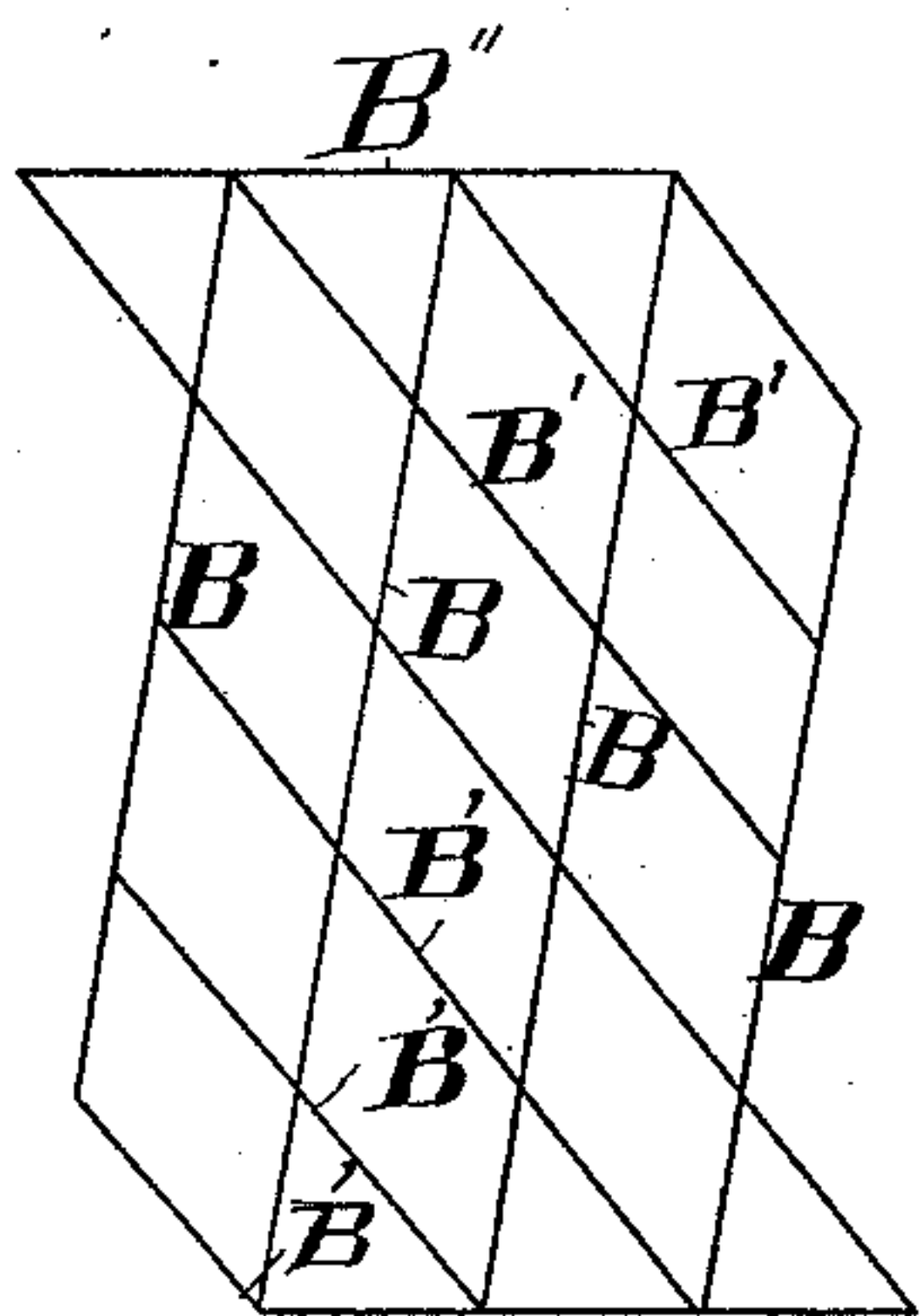


Fig. 11

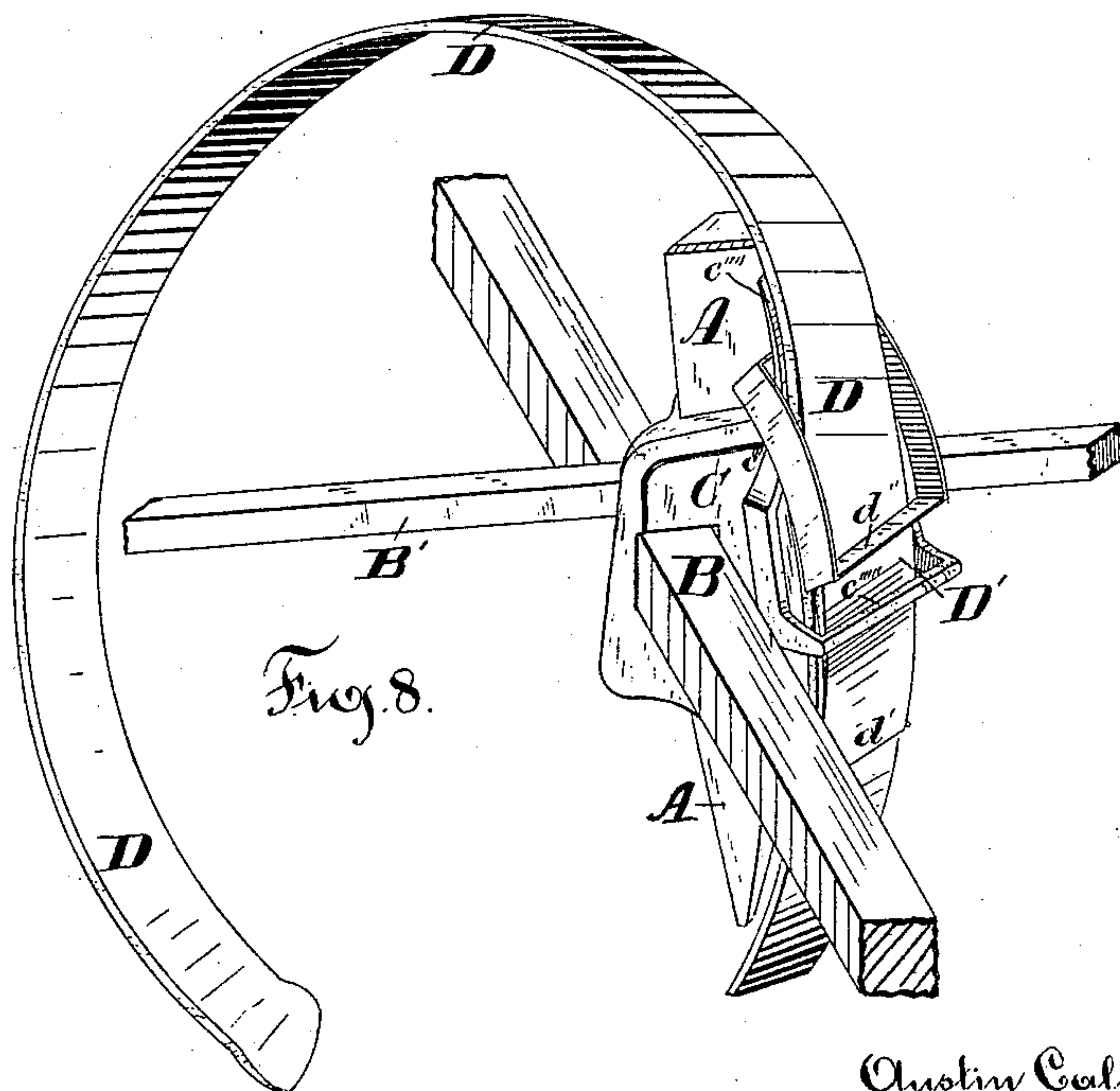


Fig. 8

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# UNITED STATES PATENT OFFICE.

AUSTIN CALLANDER, OF MERRICKVILLE, ONTARIO, CANADA.

HARROW.

SPECIFICATION forming part of Letters Patent No. 411,009, dated September 17, 1889.

Application filed February 27, 1888. Serial No. 265,382. (No model.) Patented in Canada June 8, 1887, No. 26,912.

*To all whom it may concern:*

Be it known that I, AUSTIN CALLANDER, of Merrickville, in the Province of Ontario, in the Dominion of Canada, have invented new and useful Improvements in Harrows, (for parts of which I have received a Canadian patent, No. 26,912, bearing date the 8th of June, 1887,) of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to the couplings or clips employed at the intersection of the bulls and teeth of harrows.

The object of my invention is a coupling or clip that can be produced at less cost without decreasing its efficiency, that will hold a straight tooth, and also a spring-tooth, if desired, and by means of which the parts of a harrow can be assembled with greater facility, with less labor, and at less expense.

Figure 1 is a top view of my improved coupling, the spring-tooth being omitted. Fig. 2 is a vertical section of the same on the broken line  $x x$ , Figs. 1, 5, and 6. Fig. 3 is a front elevation of the same, the spring-tooth attachment being omitted. Fig. 4 is a side elevation of the same, showing the spring-tooth attached. Fig. 5 is a horizontal section of the same on line  $y y$ , Figs. 2, 3, and 4. Fig. 6 is a horizontal section of the same on line  $z z$ , Figs. 2, 3, and 4. Fig. 7 is a perspective view of the same, the loose piece being separated. Fig. 8 is a perspective view of a complete joint with spring-tooth attached. Fig. 9 is a top view of an end clip having an ear for holding the cross-bar. Fig. 10 is an elevation of the same. Fig. 11 is a diagram of an assembled harrow.

A is the straight harrow-tooth. B B' are the bulls; B'', the front and rear cross-bars; C, the plain joint clip or coupling with the loose piece C'.

D is the spring-tooth, D' a loose wedge-piece for securing the latter, and E the end-joint clip or coupling.

The clip or coupling C consists, essentially, of a casing providing a mortise of ample size to receive the straight tooth A and the bulls B B', respectively, all in their proper relative positions to one another. It is made with a minimum amount of metal consistent with

required strength, and of a shape enabling it to be produced by molding or die-forging in, a less expensive way than has heretofore been the case. For this purpose the clip is given a conical shape in horizontal and vertical section, internally as well as externally, the wide or front corner containing the vertical mortise  $a$  and incasing the tooth A, the face being made open and the opening so made provided with and adapted to be closed by a loose or separate piece or section C'. This loose piece consists of an angular face setting with a portion of its edges against the bulls, also of a top plate  $c'$ , having a mortise  $a'$ , for the insertion of the pin or tooth A. One of the edges of this plate projects into the mortise  $b'$  and rests upon and wedges between the upper bull B', while the other edge is turned down to form a cheek  $c''$ , the lower edge of which rests and wedges upon the lower bull B. The mortise  $a'$  in the section C' corresponds with the mortise  $a$  in the main body of the clip, but is so placed that the driving in of the tooth A will wedge the section C' tight into the opening, and also press the lips of the edges against the bulls, thereby insuring a tight hold.

The section C' is further provided with a forward-projecting neck  $c'''$ , connecting an upwardly-tapering tongue  $c''''$ , curved to the shape and position of the spring-tooth D and a loop or stirrup  $c'''''$ , through which the spring-tooth passes.

D' is a wedge-clip, consisting of a buckle shaped head embracing the tooth and upper end of the tongue  $c''''$  and terminating in a tapering tail  $d'$ , which passes through the stirrup  $c'''''$  and wedges the tooth D in it, a shoulder  $d''$ , adapted for driving, being provided in the square eye of the head.

In order to secure the cross-bars B'', I provide the clips E, in every respect similar to the clips C, except having in addition an extra mortise-lug  $e$  for the reception of the cross-bar B'', as shown in Figs. 9 and 10.

The loose section C' has the advantage that in assembling the parts of a harrow the bulls may be inserted in the clips loosely and with great ease and facility, and need not be driven in, as they necessarily must if the clip is in one piece and the mortises more or less tight-



fitting upon the bars. The section C' being inserted after the bulls force the latter in their proper position, and when the pin or tooth A is driven in it wedges all the pieces tight together. Another and greater advantage is that if made of cast-iron it can be more easily molded, only one core being required—viz., the core for the mortise *a*, while the other portions will "draw" easily, and the cost of the castings are thus materially reduced. The clip or coupling could also be readily forged by mechanical process, the facings or rims *a''* on the top and bottom being for that purpose dispensed with, so that the eyes *a* may be readily punched in the top and bottom plate.

If it is not desired to use spring-teeth, they may be left off or removed by loosening the wedges D'.

I am aware that a clip provided with mortises admitting the bulls and tooth are not new, and such I do not broadly claim; but

I claim as my invention—

1. The combination, in a coupling-section C', of the angular face, the top *c*, cheek *c'*, mortise *a'*, neck *c''*, upwardly-tapering tongue *c'''*, and stirrup *c''''*, substantially as set forth.

2. In a harrow, the combination of the bulls B B', crossing each other at an angle and held in a coupling, the main body of a coupling C, having mortises for the free insertion of the

bulls and for the tight insertion of the tooth A, a loose section C', having a mortise for the tooth A, and faces pressing against the bulls when wedged in the main body by said tooth, the tooth A passing through the main body of the coupling and the loose piece C' and wedging the latter against the bulls, said loose piece provided with an attachment *c''*, *c'''*, and *c''''*, substantially as set forth.

3. In a harrow, the combination of the bulls B B', crossing each other at an angle and contained in a coupling, the main body C of a coupling provided with mortises for the free insertion of the bulls and a vertical mortise for a straight harrow-tooth, a loose coupling-piece C', provided with faces impinging on the bulls, and a mortise to be engaged by the harrow-tooth and locked in said body, said piece C' being provided with an attachment *c''*, *c'''*, *c''''*, for the reception of a spring-tooth, the straight tooth A, passing through said coupling and engaging the loose piece and wedging the bulls, the spring-tooth D, and the spring-tooth clip D', substantially as set forth.

Signed in the presence of the undersigned witnesses.

AUSTIN CALLANDER.

Witnesses:

JOHN R. LAVELL,  
W. E. TEUITTE.