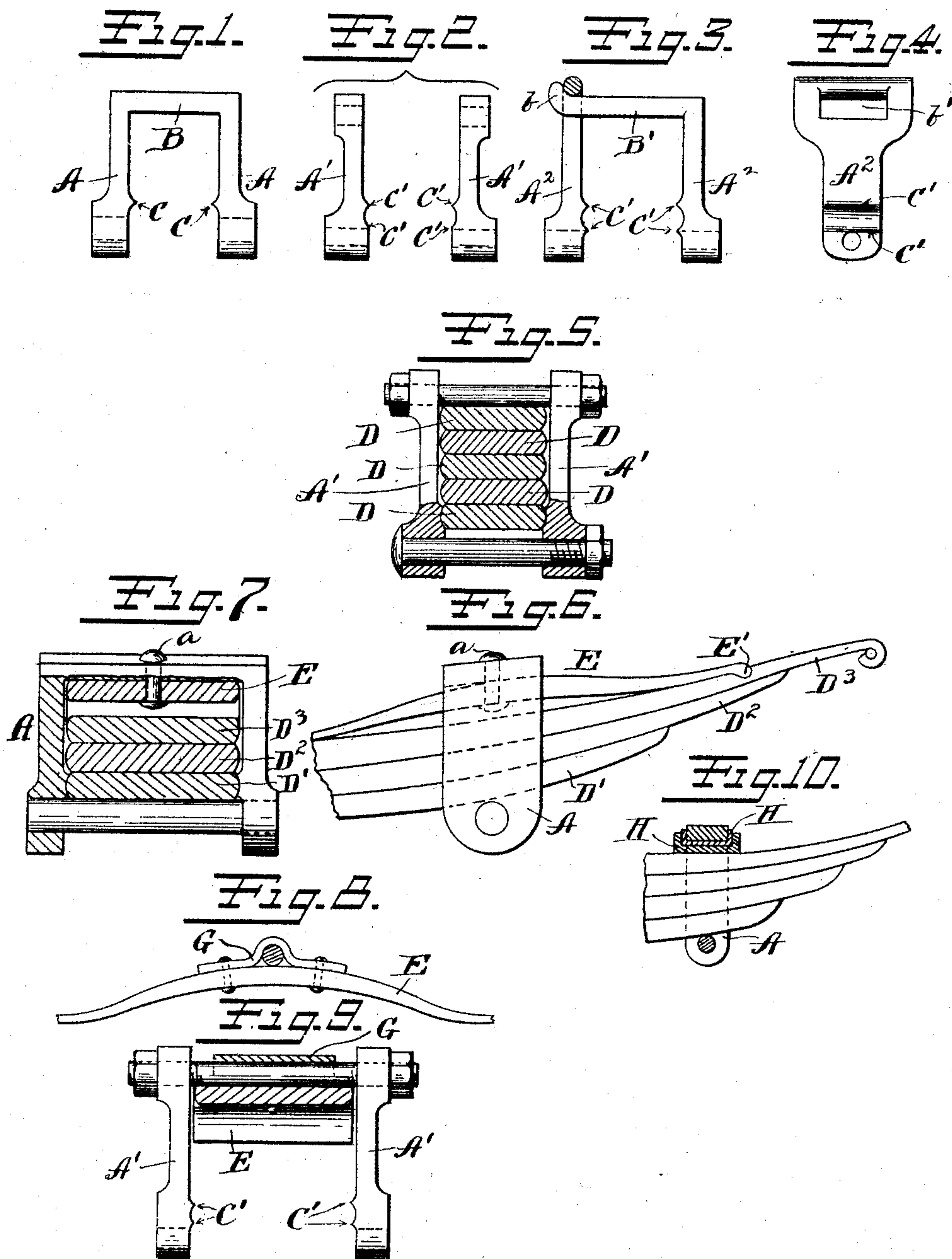


907,184.

Patented Dec. 22, 1908.

2 SHEETS—SHEET 1.



Witnesses:  
*Chas. A. Reed*  
*Langdon Moore*

Inventor  
M. L. SENDERLING  
By *his Attorneys*  
*Paul H. Spence & Thos. H. White*

907,184.

Patented Dec. 22, 1908.

2 SHEETS—SHEET 2.

Fig. 12.

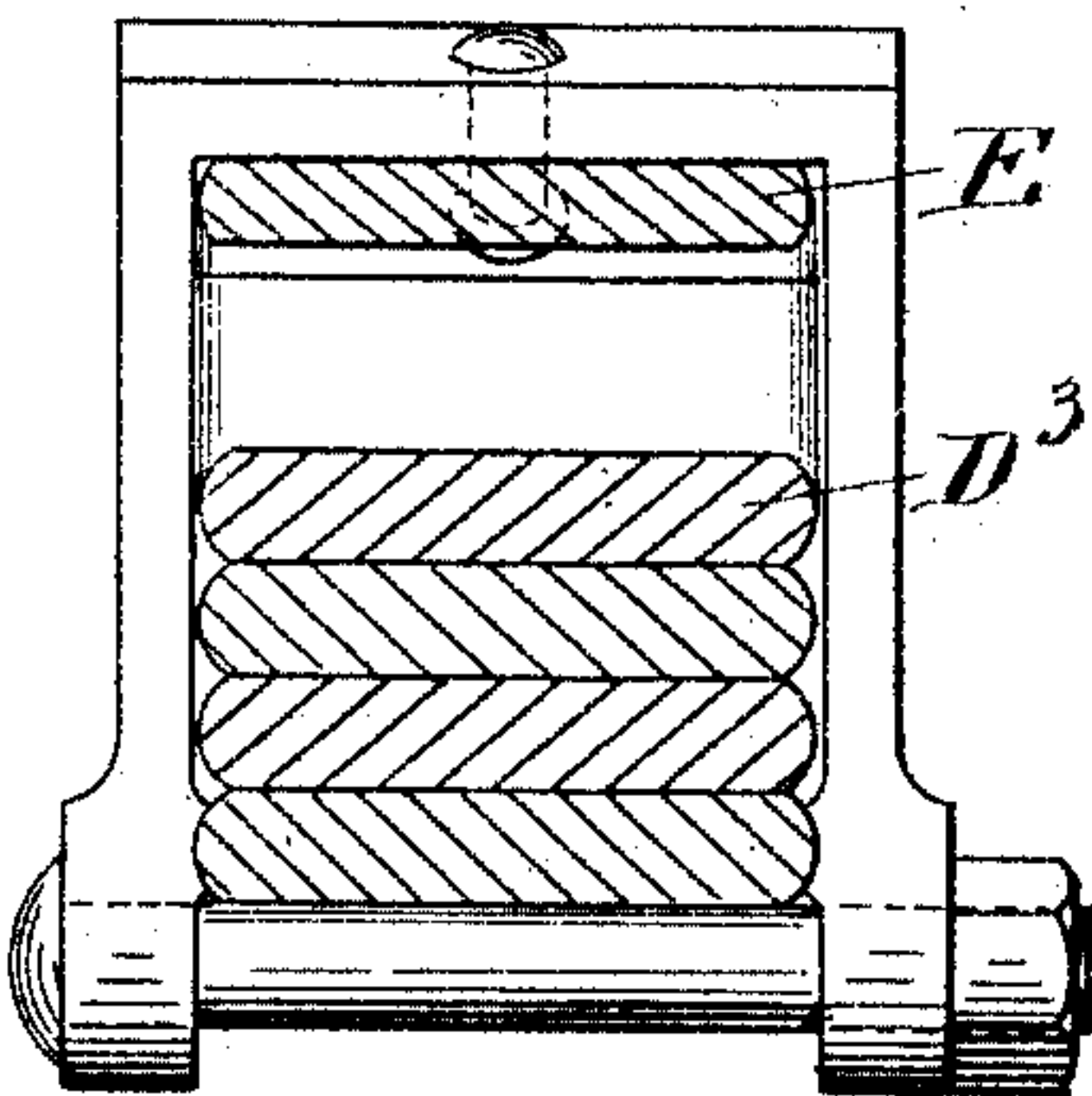


Fig. 11.

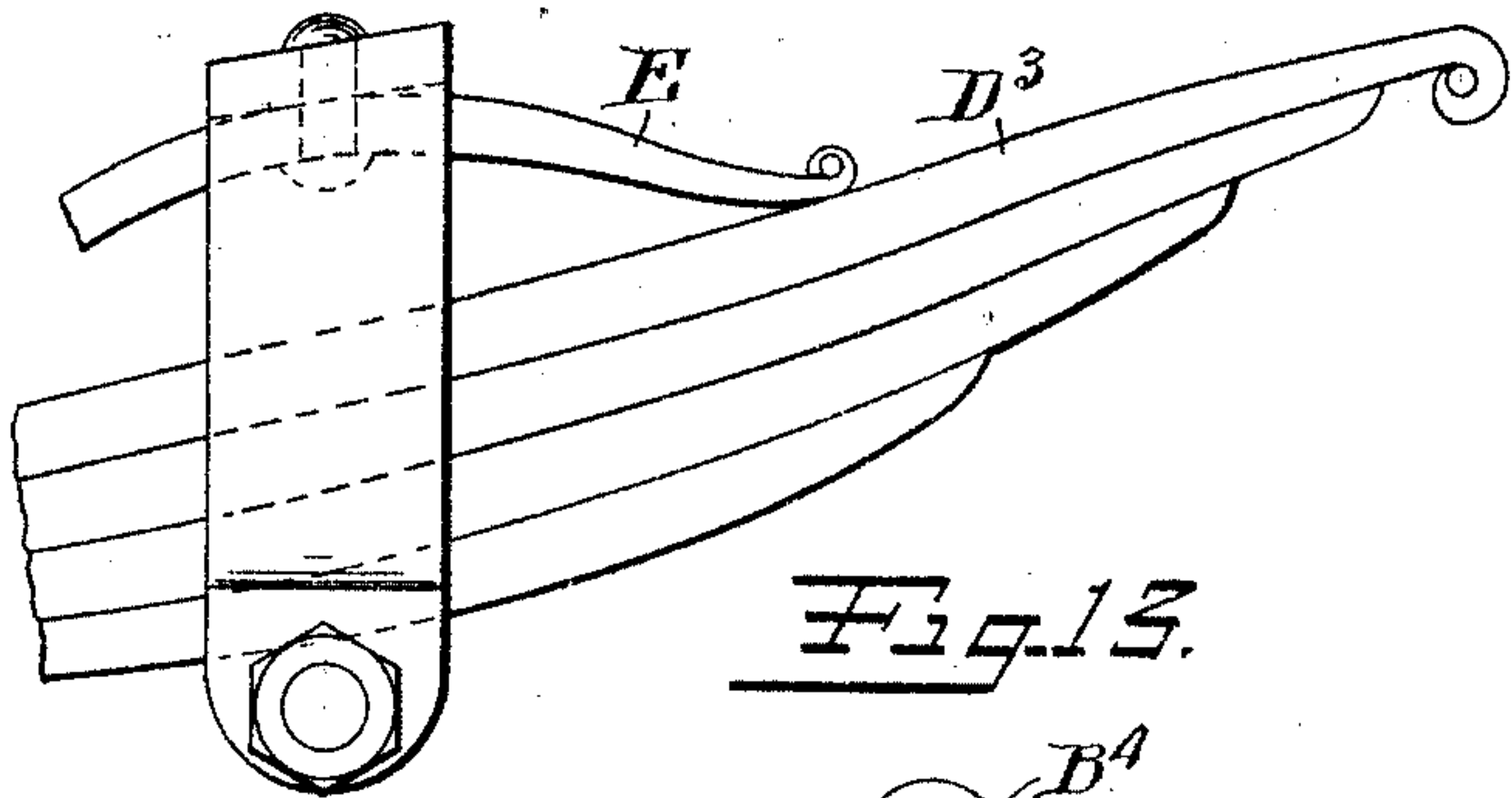


Fig. 13.

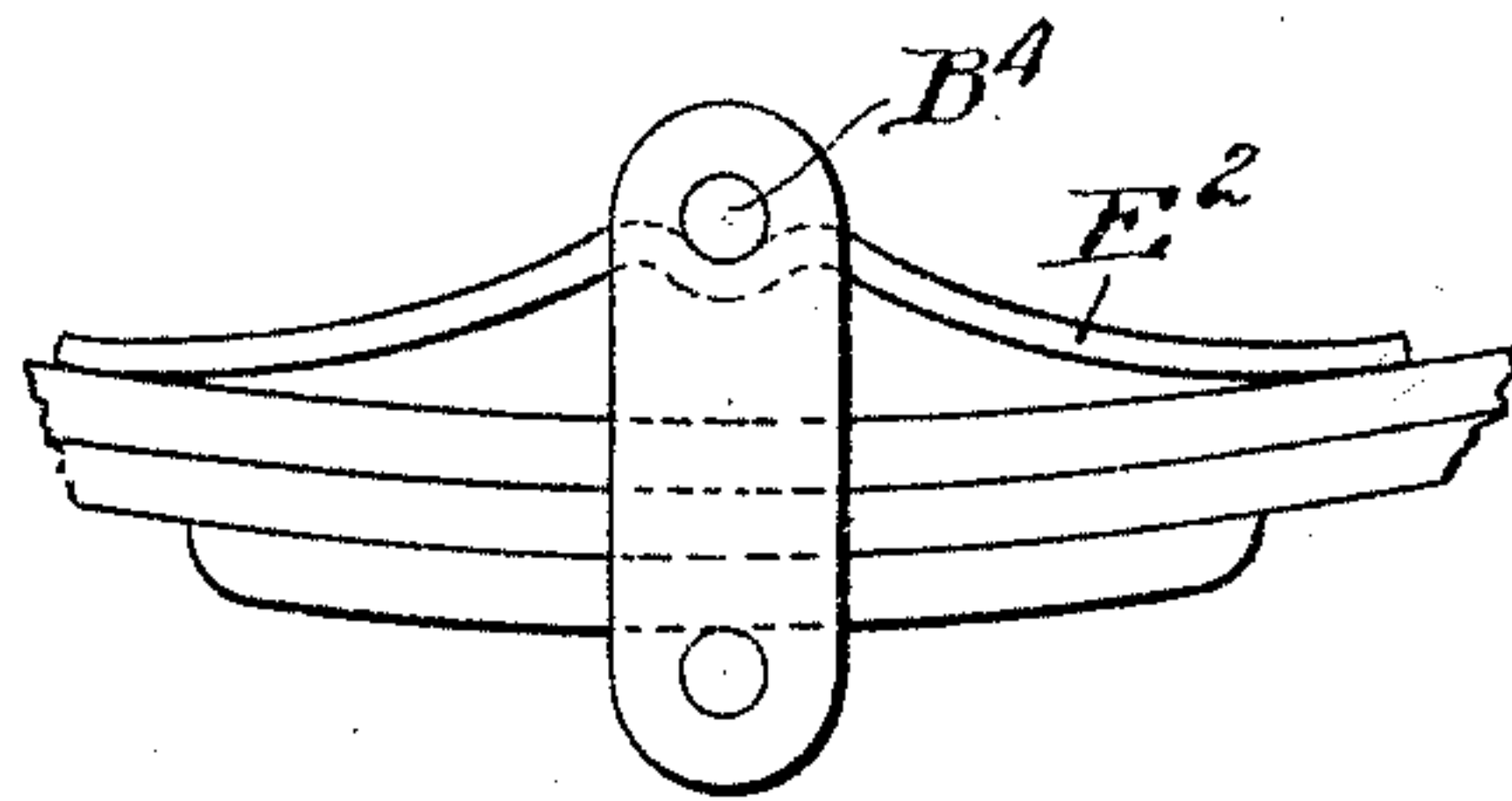


Fig. 16.

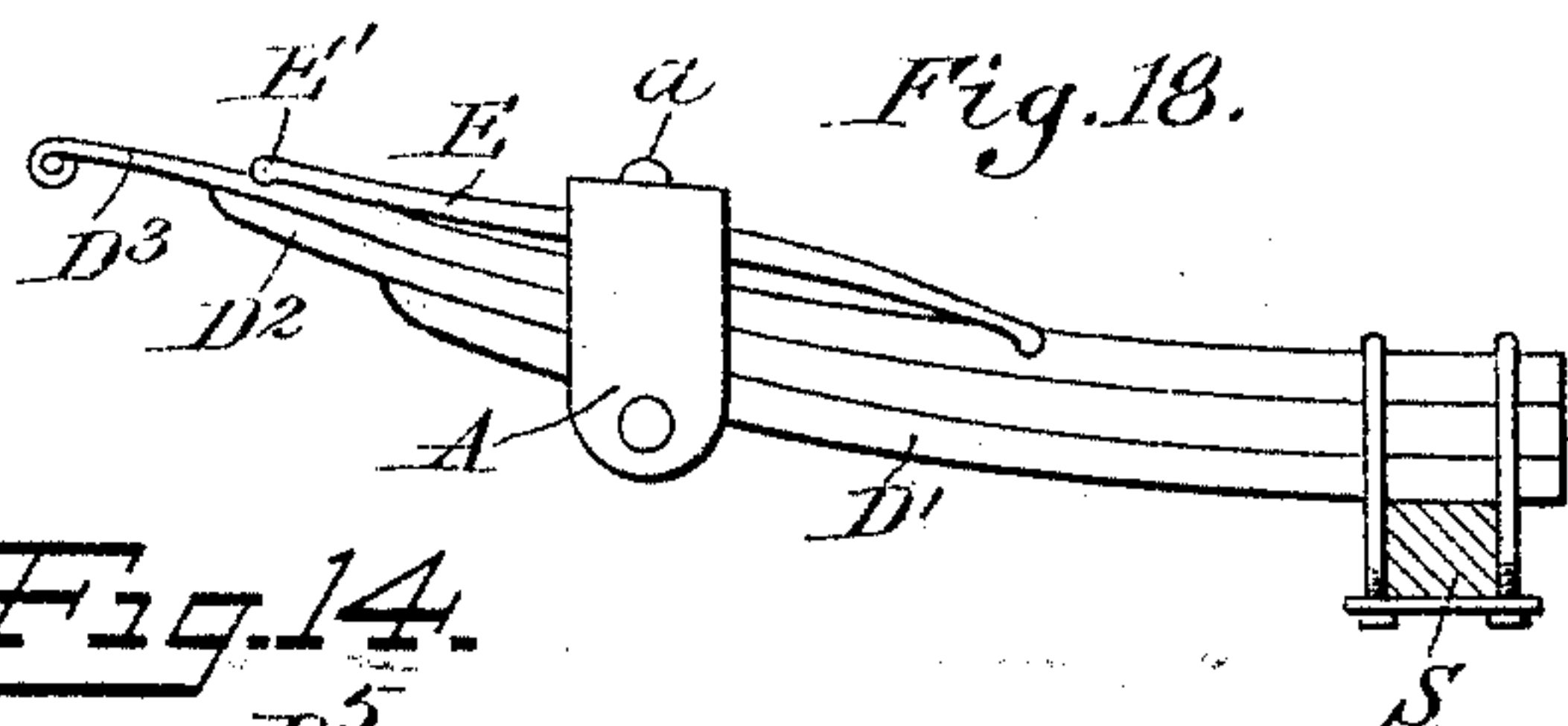
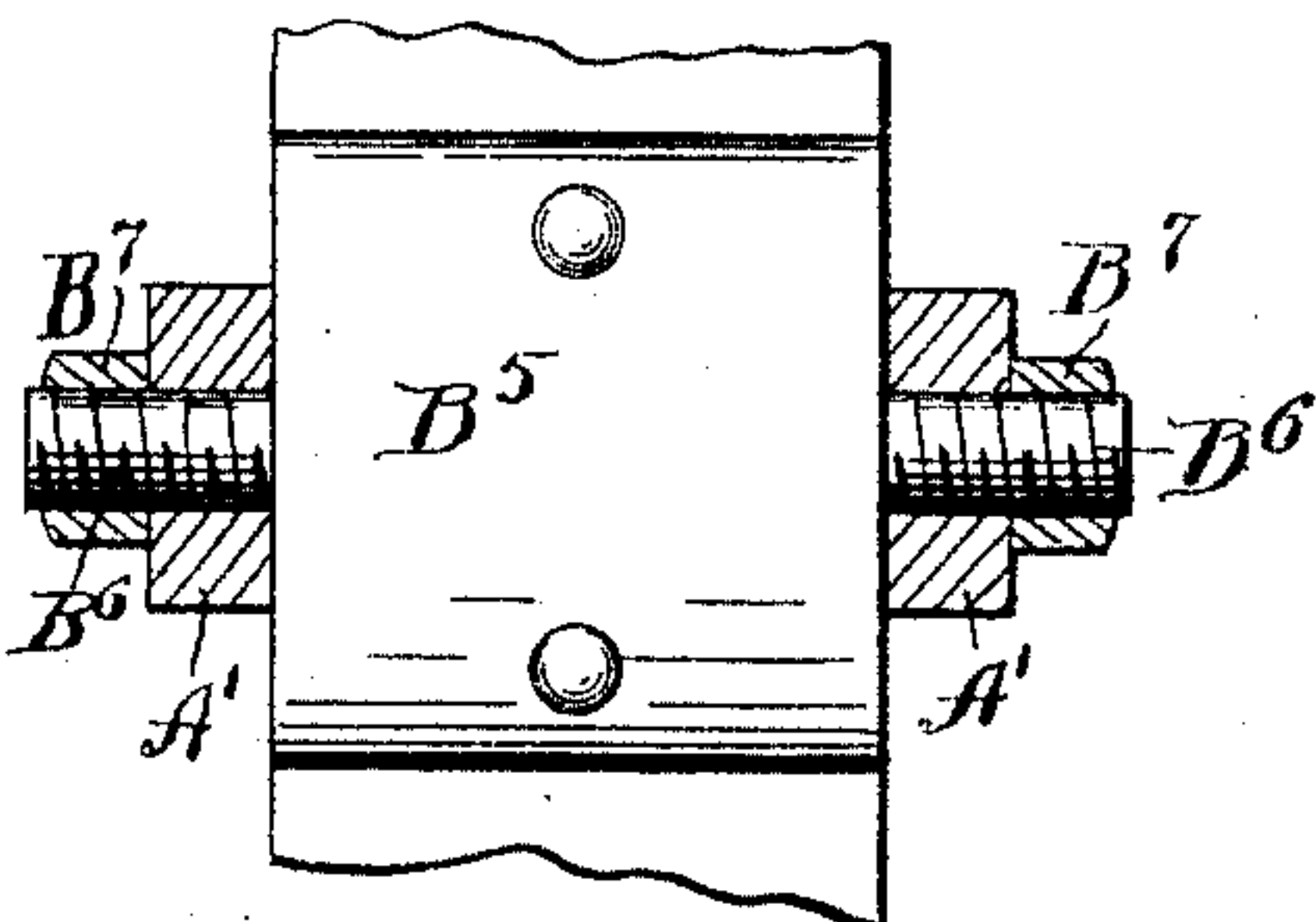


Fig. 15.

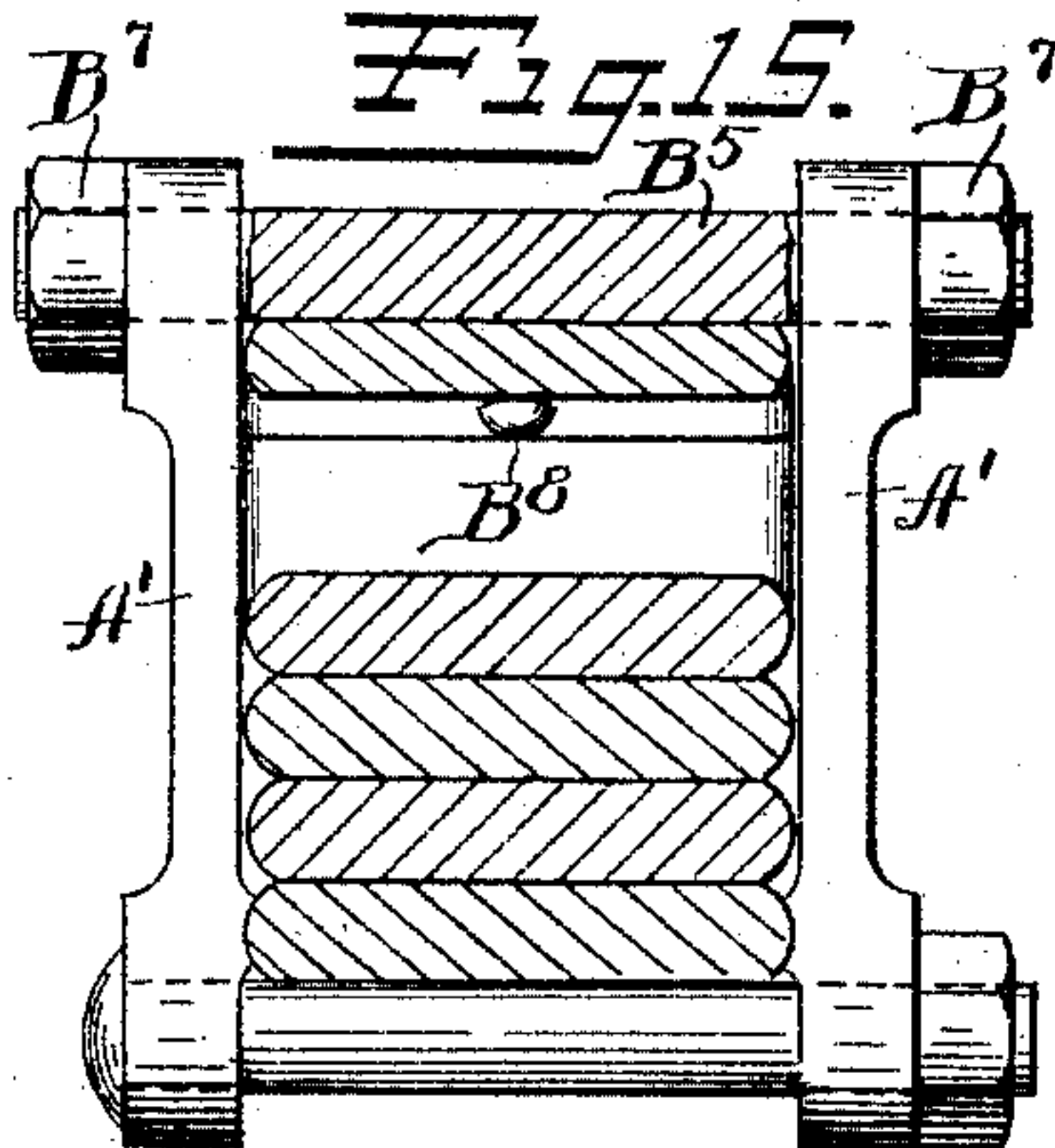


Fig. 14.

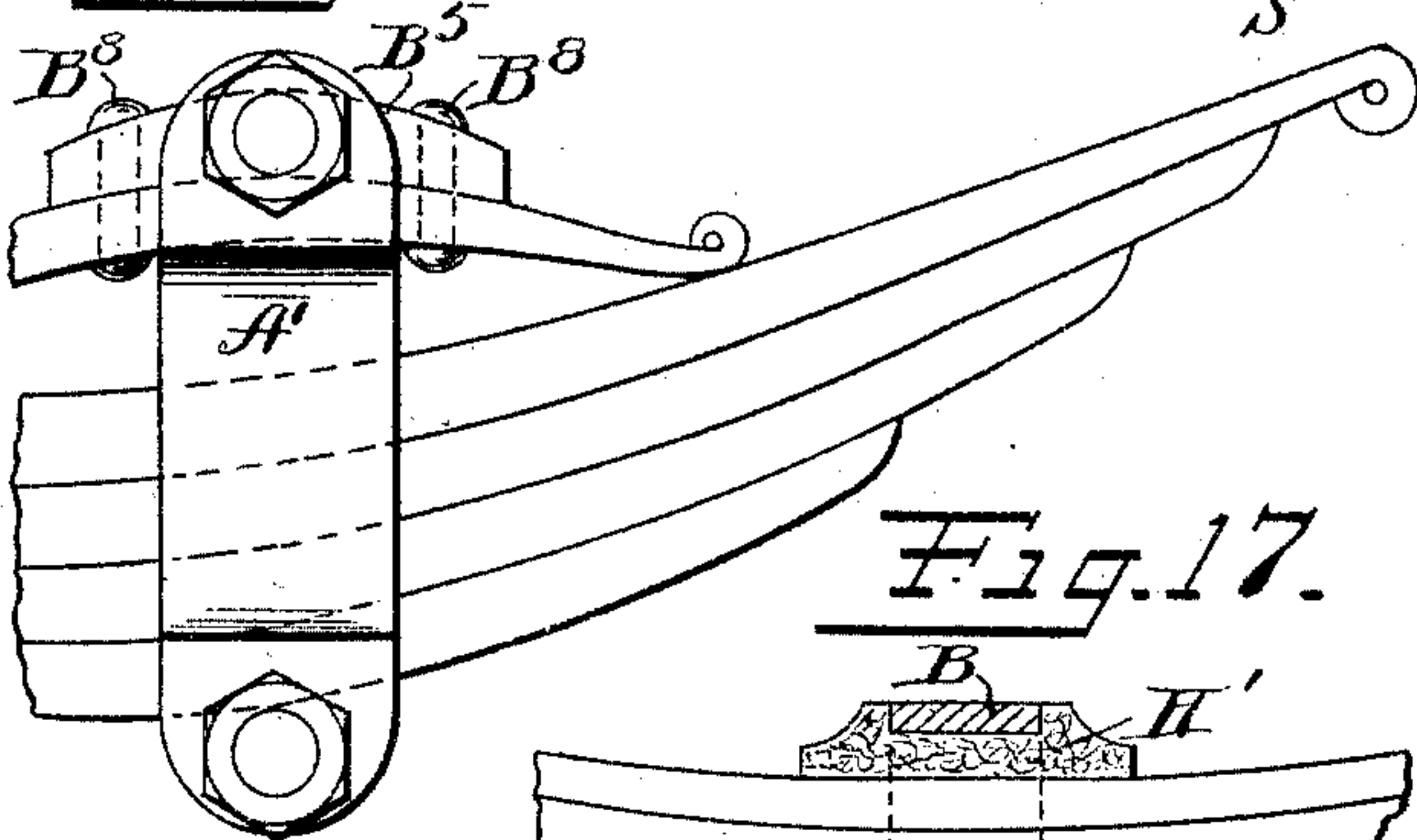
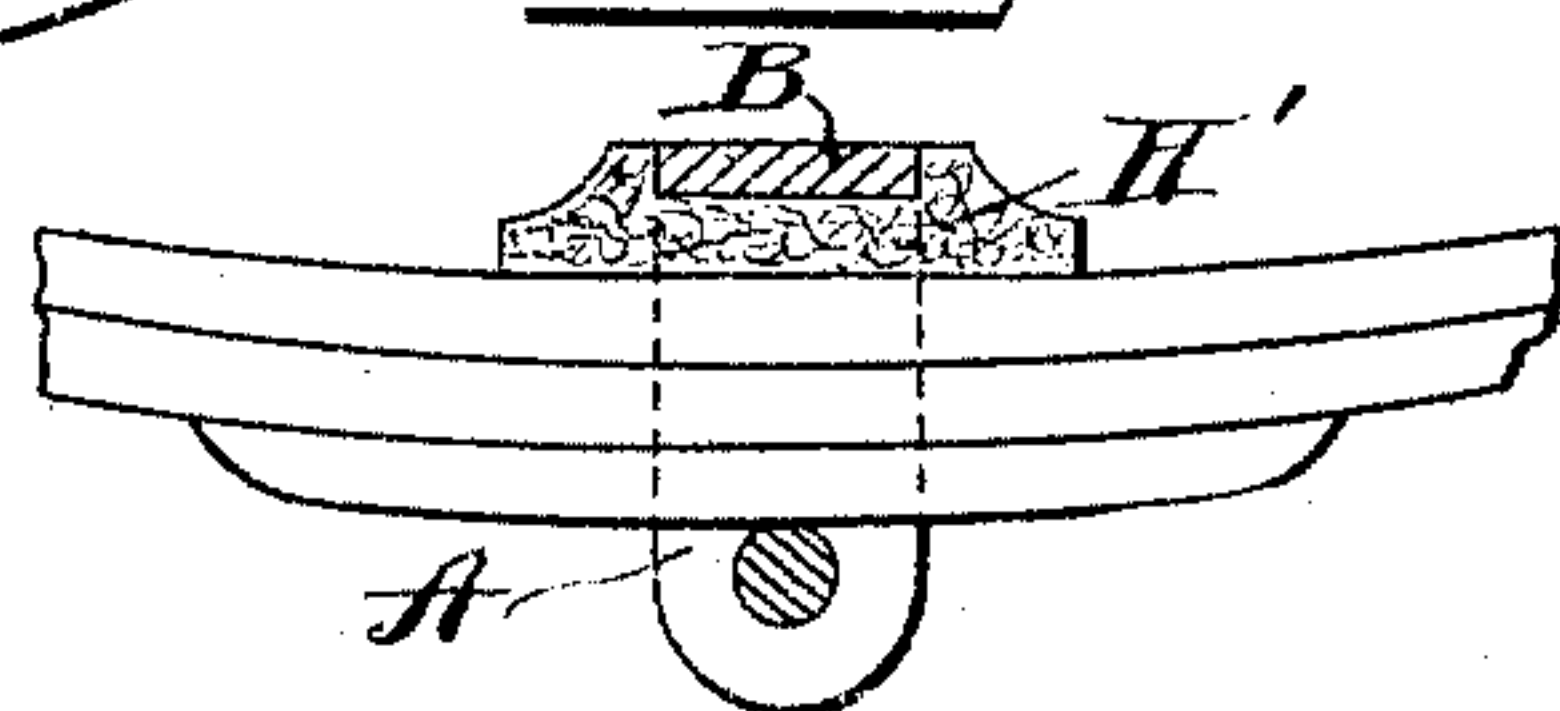


Fig. 17.



Witnesses:

*Chas. H. Reed*  
*Langdon Moore*

Inventor

*M. L. SENDERLING*  
By his Attorneys  
*Bartley, Bannister & Mitchell*



# UNITED STATES PATENT OFFICE.

MARTIN L. SENDERLING, OF JERSEY CITY, NEW JERSEY.

## CLIP AND SPRING CONSTRUCTION.

No. 907,184.

Specification of Letters Patent.

Patented Dec. 22, 1908.

Application filed May 13, 1907. Serial No. 373,306.

*To all whom it may concern:*

Be it known that I, MARTIN L. SENDERLING, a citizen of the United States, residing at Jersey City, Hudson county, New Jersey, have invented certain new and useful Improvements in Clip and Spring Construction, of which the following is a full, clear, and exact description.

My invention relates to improvements in springs.

One object of my invention is to provide an improved recoil check, the purpose of which is to prevent undue strain upon the longer leaves when the recoil occurs, thereby lessening the danger of breakage.

Another object of the invention is to provide an improved clip construction by which the clip may be readily attached to any spring without the necessity of providing an inter-locking stud or rivet, making connection with a spring leaf such as now commonly employed.

In the drawings I have shown various modifications of the invention.

Figure 1 is a front elevation of a clip constructed to embody my invention in one form. Fig. 2 is a similar view of another form, having separate cheek pieces. Fig. 3 is a similar view of another form, having separable cheeks, one of the latter being shown partly in section. Fig. 4 is a view of one of the cheek pieces shown in Fig. 3. Fig. 5 is a sectional view of a set of spring leaves with a clip in place, said clip being shown partly in section. Fig. 6 is a side elevation of one end of a spring fitted with my improved recoil check and with my improved clip applied thereto. Fig. 7 is a sectional view thereof. Fig. 8 is a side elevation of a recoil checking device. Fig. 9 is a section thereof. Fig. 10 is a fragmentary view of one end of a spring with a clip in place, the latter being shown partly in section. Fig. 11 is a view similar to Fig. 6, but showing a slight modification. Fig. 12 is a view similar to Fig. 7 but showing a slight modification. Fig. 13 is a view similar to Fig. 8 but showing a modification. Fig. 14 is a side elevation of a modification. Fig. 15 is a vertical section thereof. Fig. 16 is a plan view partly in section of Fig. 14, partly broken away. Fig. 17 is a side elevation of a modification, partly in section. Fig. 18 is a side view of the spring and the support therefor, the latter being in section.

In Fig. 1, A—A are the side bars of a clip

united at their upper ends by the cross-bar B. C—C are gripping shoulders at the inner sides of the bars A—A and arranged to grip one of the spring leaves so as to tightly hold the same. The lower sides of the bars A—A are provided with the usual eyes to receive a bolt.

In Fig. 2, A'—A' are the side bars adapted to be united by a bolt at the upper ends instead of by an integral cross-bar, such as shown in Fig. 1, and at the lower ends by the usual bolt. In this case there are two shoulders C'—C' on each bar arranged to grip the opposite edges of one of the spring leaves.

In Figs. 3 and 4, A<sup>2</sup>—A<sup>2</sup> are side bars of a clip provided with my improved gripping shoulders, C'—C', as in Fig. 2. B' is a cross-bar formed integrally with one of the sides A<sup>2</sup> and arranged to make a detachable connection with the other side bar by having a hooked end *b* adapted to pass through a perforation *b'* in the opposite leaf.

From the foregoing it will be seen that the leading feature of my improved clip is to provide means for causing the side bars to grip one of the leaves at the opposite edges thereof. The clip construction otherwise may vary in many respects as the drawings indicate.

In Fig. 5 I have shown a clip similar to that shown in Fig. 2 as it would appear in place, holding a number of spring leaves D—D—D.

In Fig. 6 I have shown one end of a spring in which D'—D<sup>2</sup>—D<sup>3</sup> represent the spring leaves at one end of a spring for taking the load. The main leaf D<sup>3</sup> is provided with the usual eye at the end. A represents the clip (like Fig. 1) the upper bar of which may be riveted to a reversed shock absorbing leaf E, the middle part of which is preferably bowed slightly away from the main leaf D<sup>3</sup>, although it might lie directly adjacent to the same. E' represents an overturned end of recoil leaf E adapted to overstand the side edges of the leaf D<sup>3</sup> to prevent the parts E and D<sup>3</sup> from getting out of line. The rivet *a* prevents the recoil leaf E from shifting longitudinally relatively to the clip while the gripping shoulders at the inner side of the clip engage the leaf D' preventing the longitudinal displacement of the clip itself on the spring, as before described.

In Figs. 8 and 9 I have shown another form of securing the clip to the recoil leaf. In this construction, instead of directly con-



necting the clip A' (like Fig. 2) to the recoil leaf E by a rivet, as in Fig. 6, I provide a plate G which is riveted to the recoil leaf, there being a space between the plate G and  
 5 said leaf E to permit the upper pin of the clip to pass through, as shown.

Inasmuch as my improved clips are applicable to any spring, and inasmuch as some springs vary in thickness, shimming pieces  
 10 H—H as shown in Fig. 10 may be provided if desired.

In Figs. 11 and 12 I have shown a construction similar to that shown in Fig. 6, save that the recoil leaf is more bowed, and  
 15 the end of this leaf is curled up instead of being bent down to embrace the sides of the leaf D<sup>3</sup>.

In Fig. 13 the recoil leaf E<sup>2</sup> is not only bowed up, but is dished at the center to stand under the pin B<sup>4</sup> of the clip. In this  
 20 instance any recoil in the upper leaf will be absorbed by the spring E<sup>2</sup> as before. The advantage in this construction over that shown in Figs. 6, 8 and 11 being merely that  
 25 the recoil leaf is self-retained against longitudinal movement.

In Figs. 14 to 16 A'—A' are the side bars of the clip, as in Fig. 2. B<sup>5</sup> is a saddle-piece having integral extensions B<sup>6</sup>—B<sup>6</sup> to which  
 30 the side bars A'—A' are secured, these extensions B<sup>6</sup> are screw-threaded to receive nuts B<sup>7</sup> as in the case of a bolt. The saddle-piece B<sup>5</sup> may be riveted to the recoil spring as at B<sup>8</sup>—B<sup>8</sup>.

35 In Fig. 17 I have shown conventionally a fiber or yielding shimming block H' instead of metal shimming blocks H—H shown in Fig. 10.

40 In Fig. 18 I have shown a spring such as shown in Fig. 6, illustrating the same

mounted upon a support S, in this instance representing a vehicle axle.

The recoil leaf being located between the main support and the end of the main leaf, serves to yieldingly yet powerfully resist and  
 45 absorb the shocks and strains occasioned by quick and severe recoil action of the load carrying spring.

What I claim is—

1. In a vehicle spring, a spring support, a  
 50 main load bearing leaf carried thereby, a longitudinally extending recoil spring between said main support and the end of said main leaf, a clip therefor, said clip being engaged with said recoil spring at a point inter-  
 55 mediate the ends thereof.

2. In a vehicle spring, a spring support, a main load bearing leaf carried thereby, a recoil spring between said spring support and the end of said main leaf and bearing on  
 60 said main leaf and extending longitudinally therewith, and a clip embracing said main leaf and holding said recoil spring at a point intermediate its length and intermediate the  
 65 end of said main leaf and said support.

3. In a vehicle spring, a spring support, a main load bearing leaf carried thereby, a recoil spring between said support and the end of the said main leaf and bearing on said  
 70 main leaf, and a clip embracing said main leaf and engaging said recoil spring at a point intermediate its ends, the middle portion of said recoil spring being spaced away from the main leaf, the ends of the former being free  
 75 to work on the latter at one side of the main support.

MARTIN L. SENDERLING.

Witnesses:

R. C. MITCHELL,  
 LANGDON MOORE.