

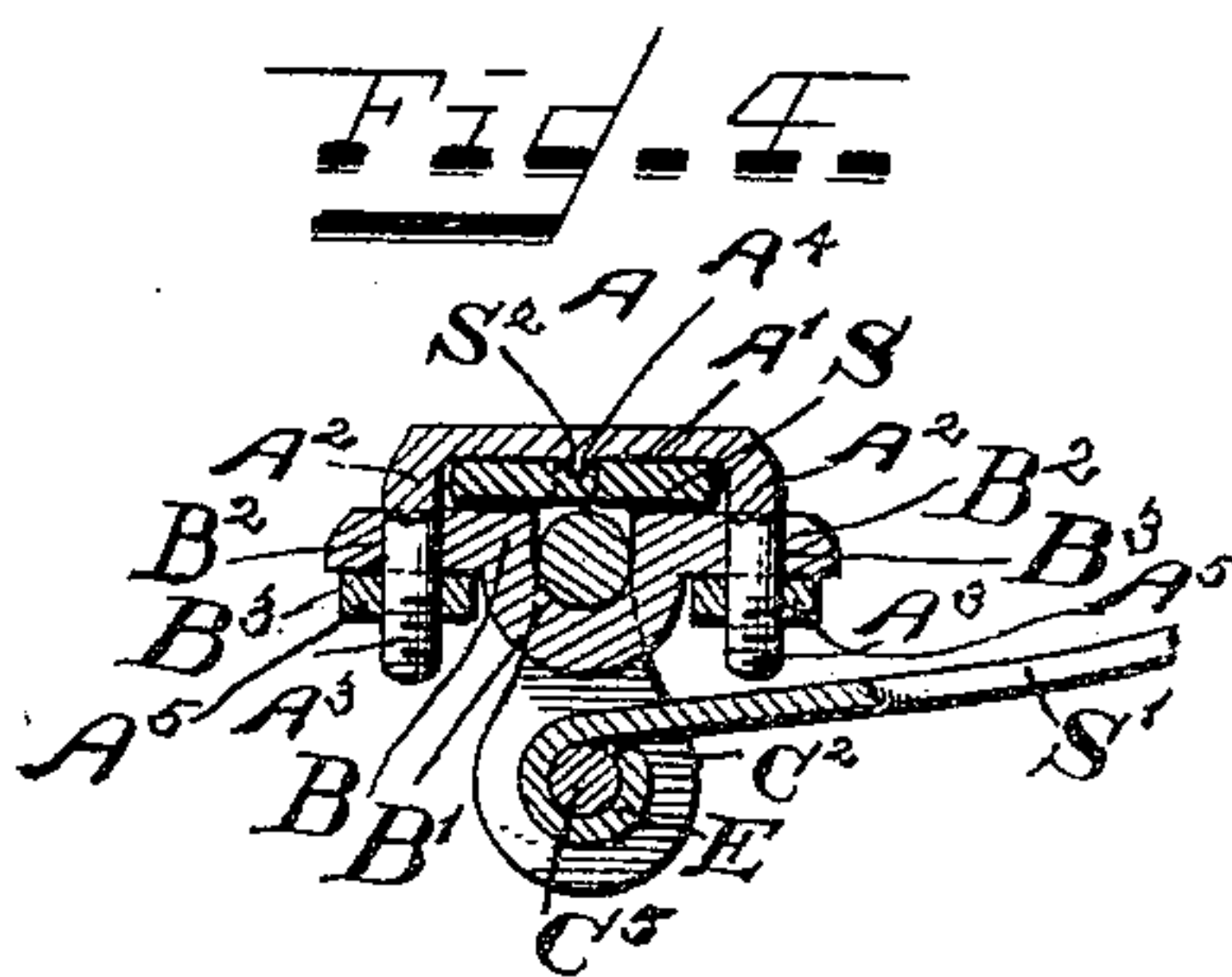
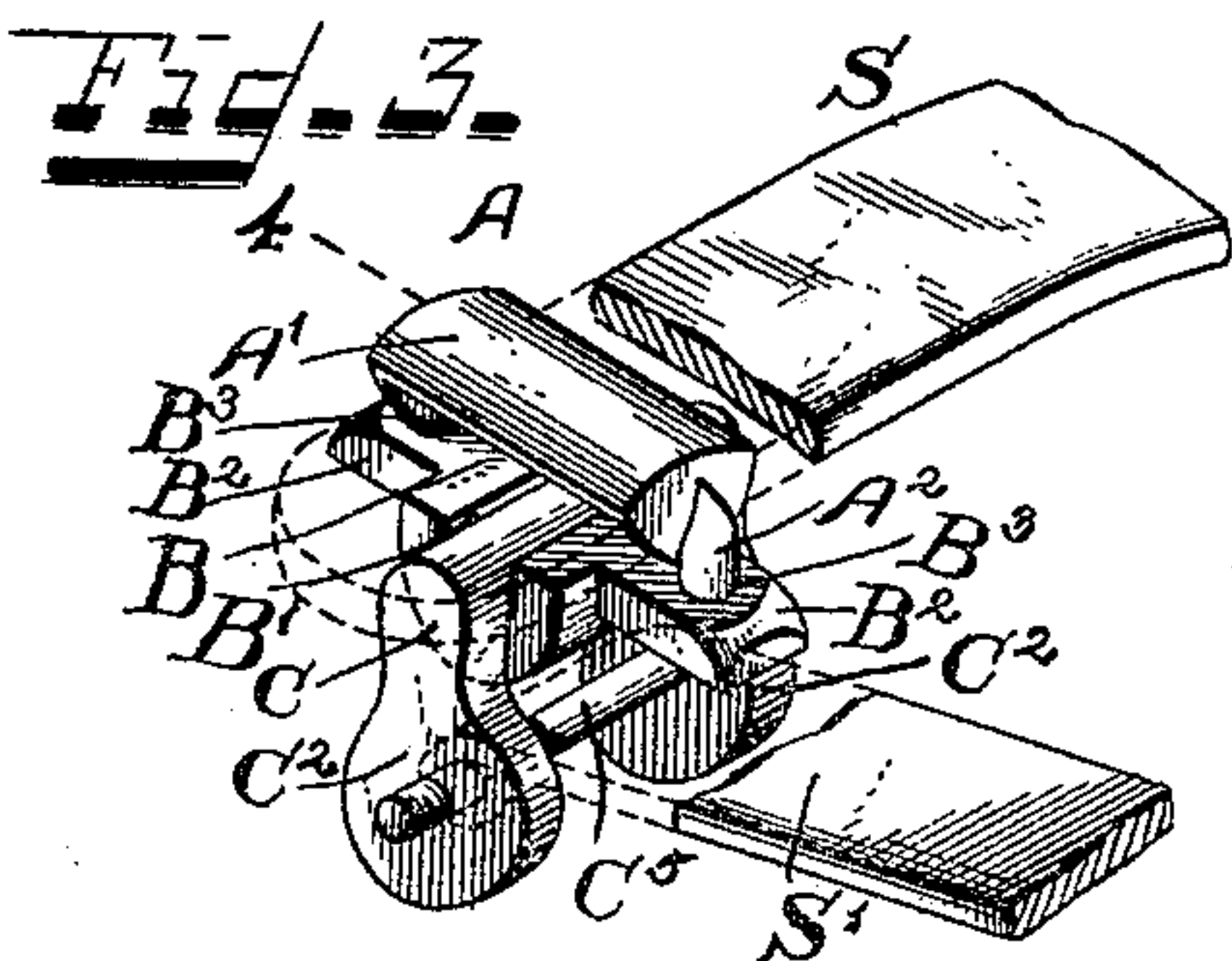
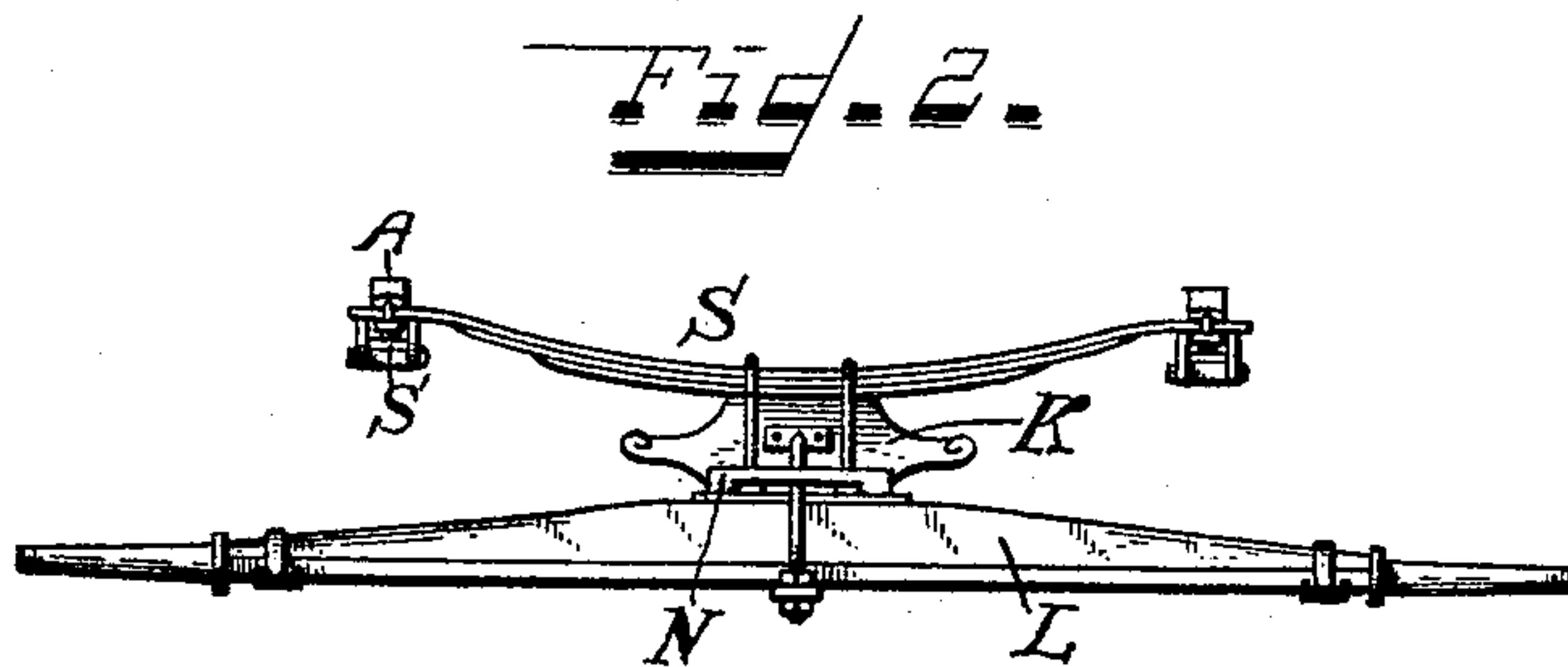
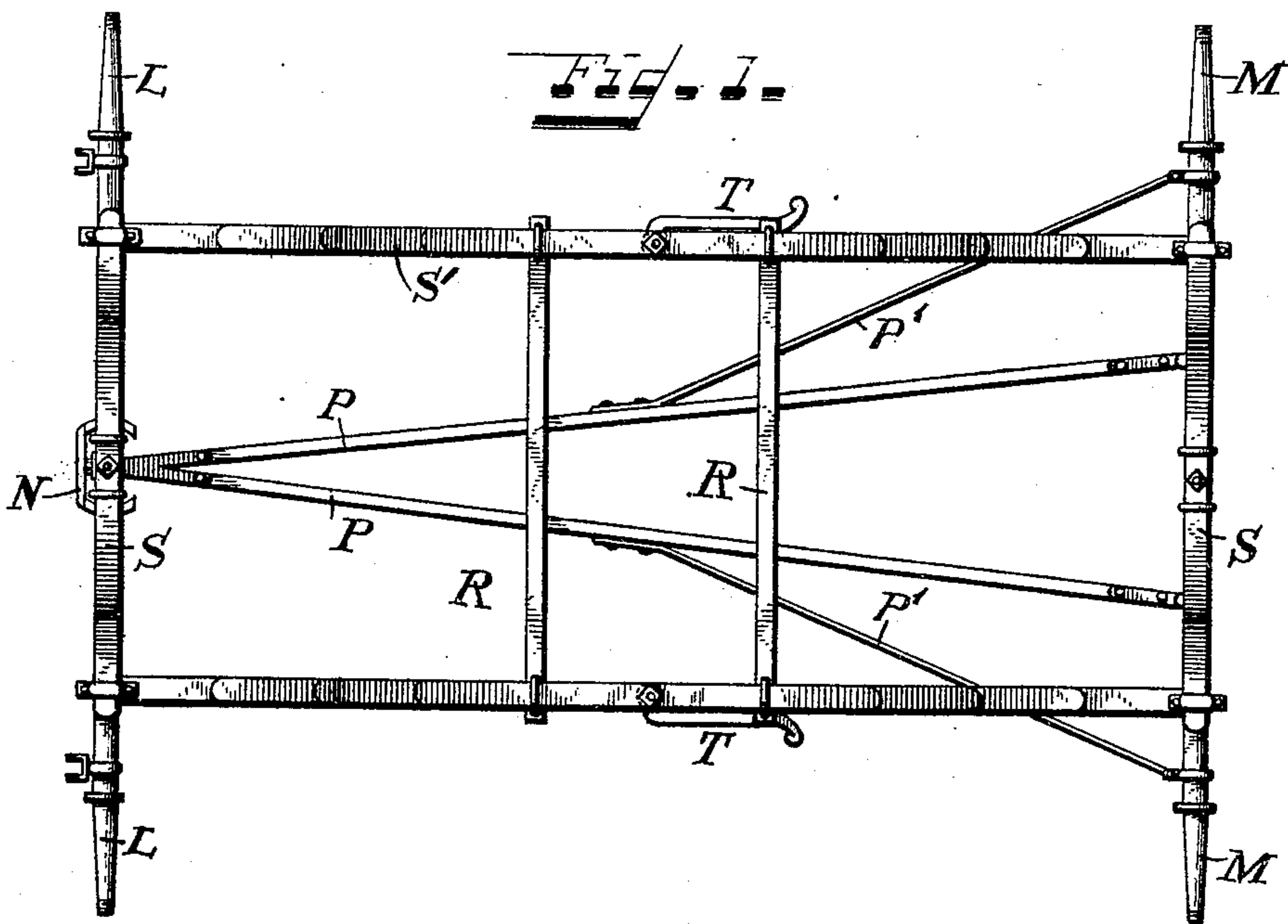
(No Model.)

2 Sheets—Sheet 1.

E. B. SMITH.
VEHICLE SPRING.

No. 500,515.

Patented June 27, 1893.



Witnesses:
Henry Appleton
H. Smith

Inventor:
Ezra B. Smith
per Wm. Hubbell Fisher,
Attorney.

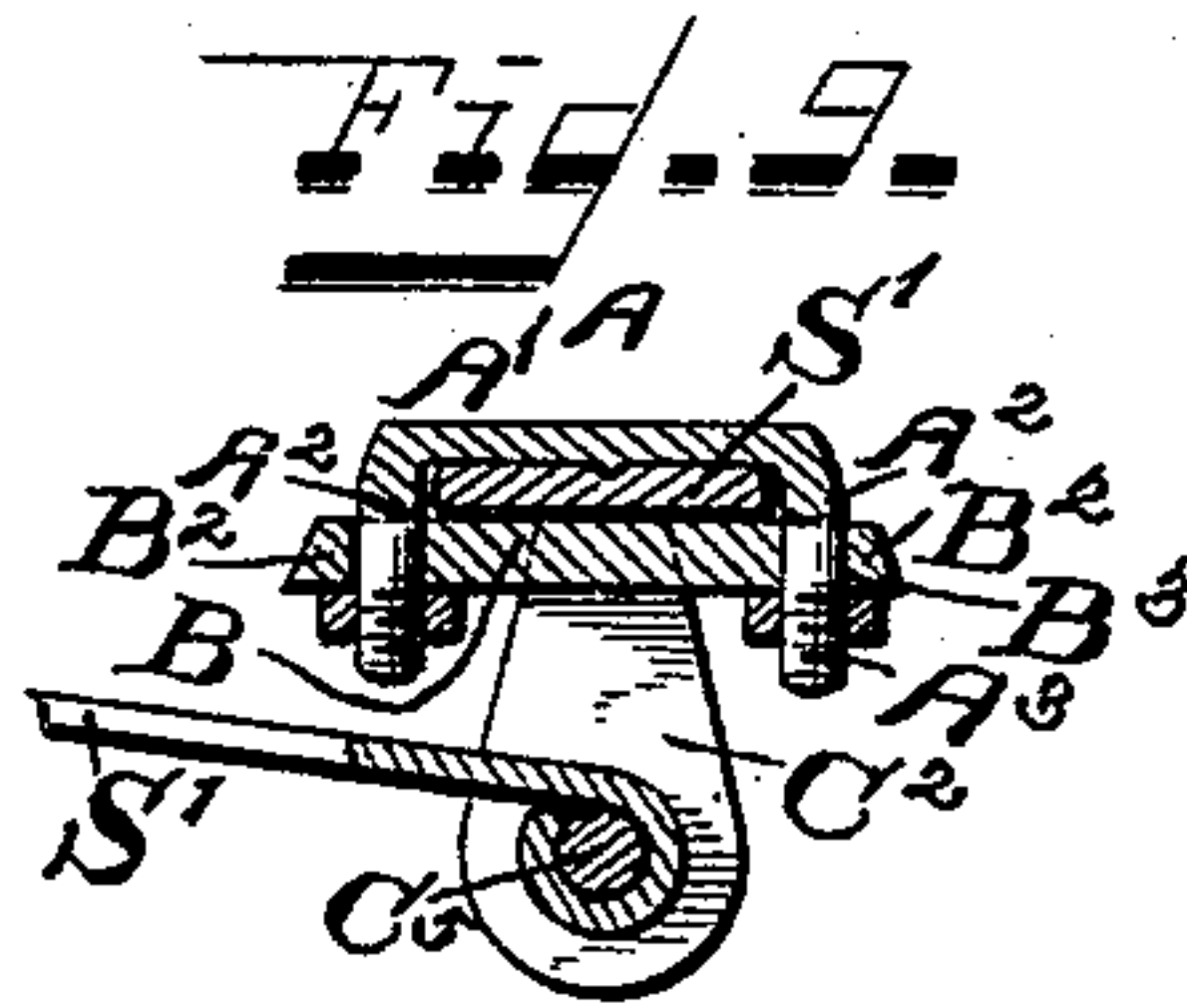
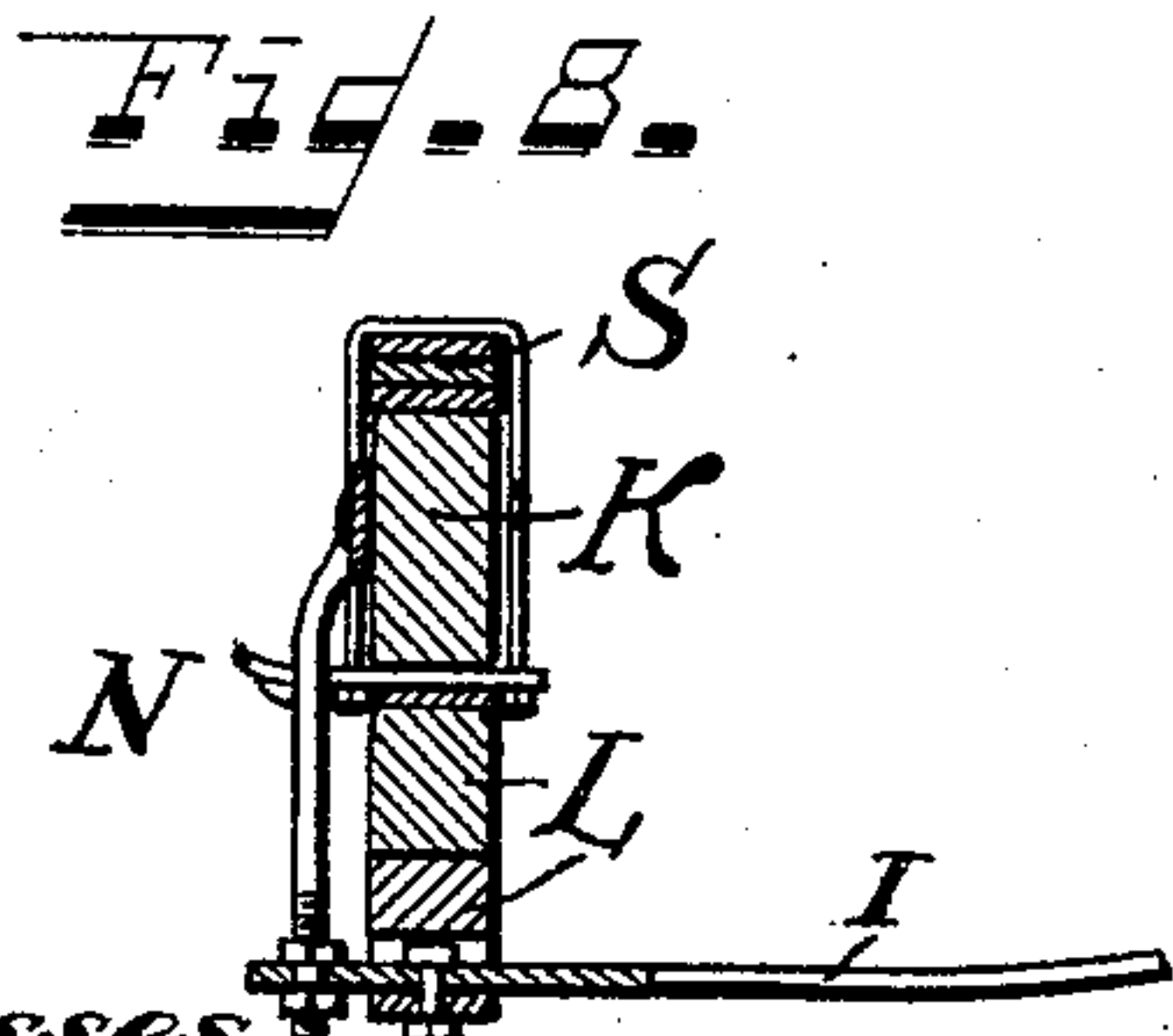
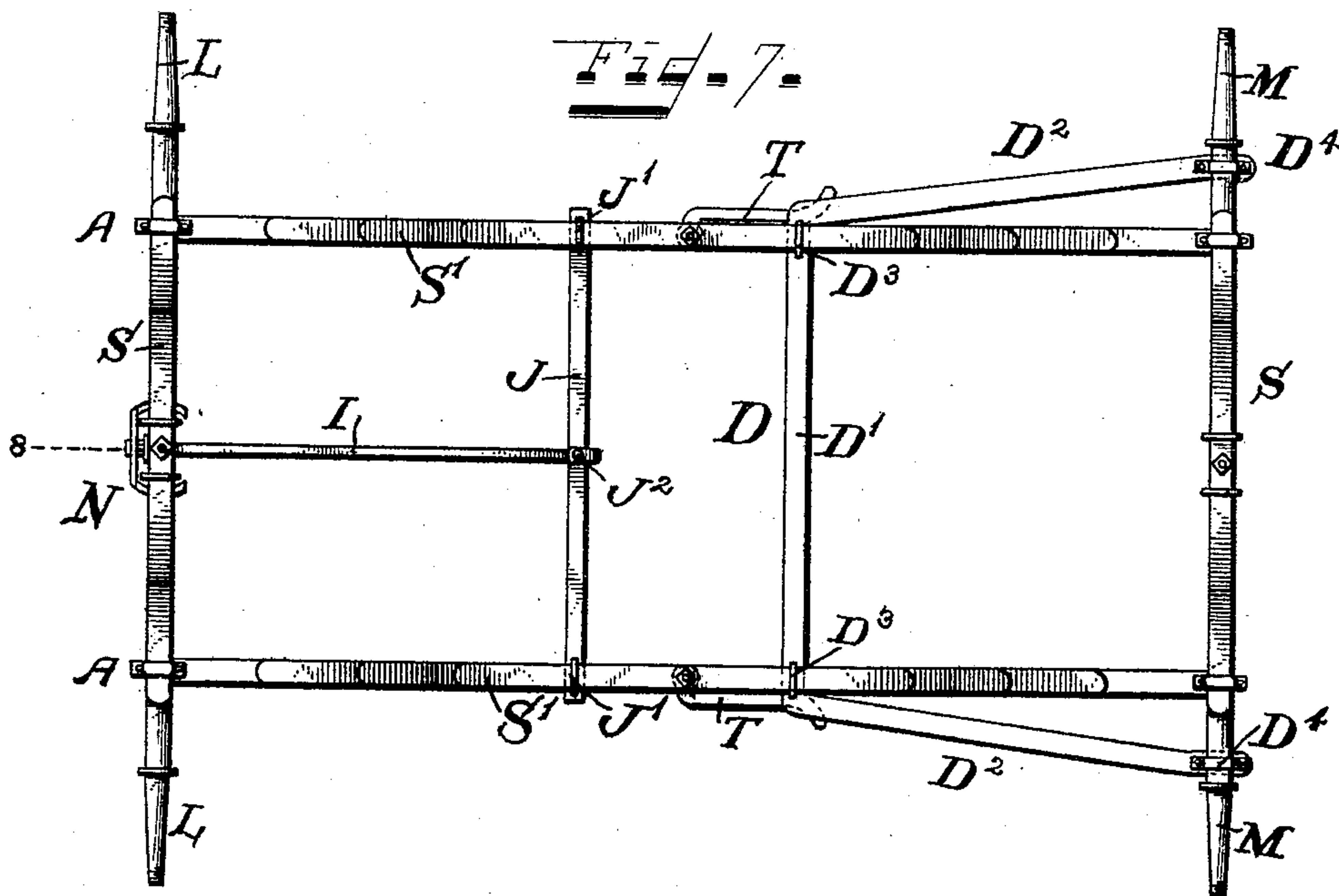
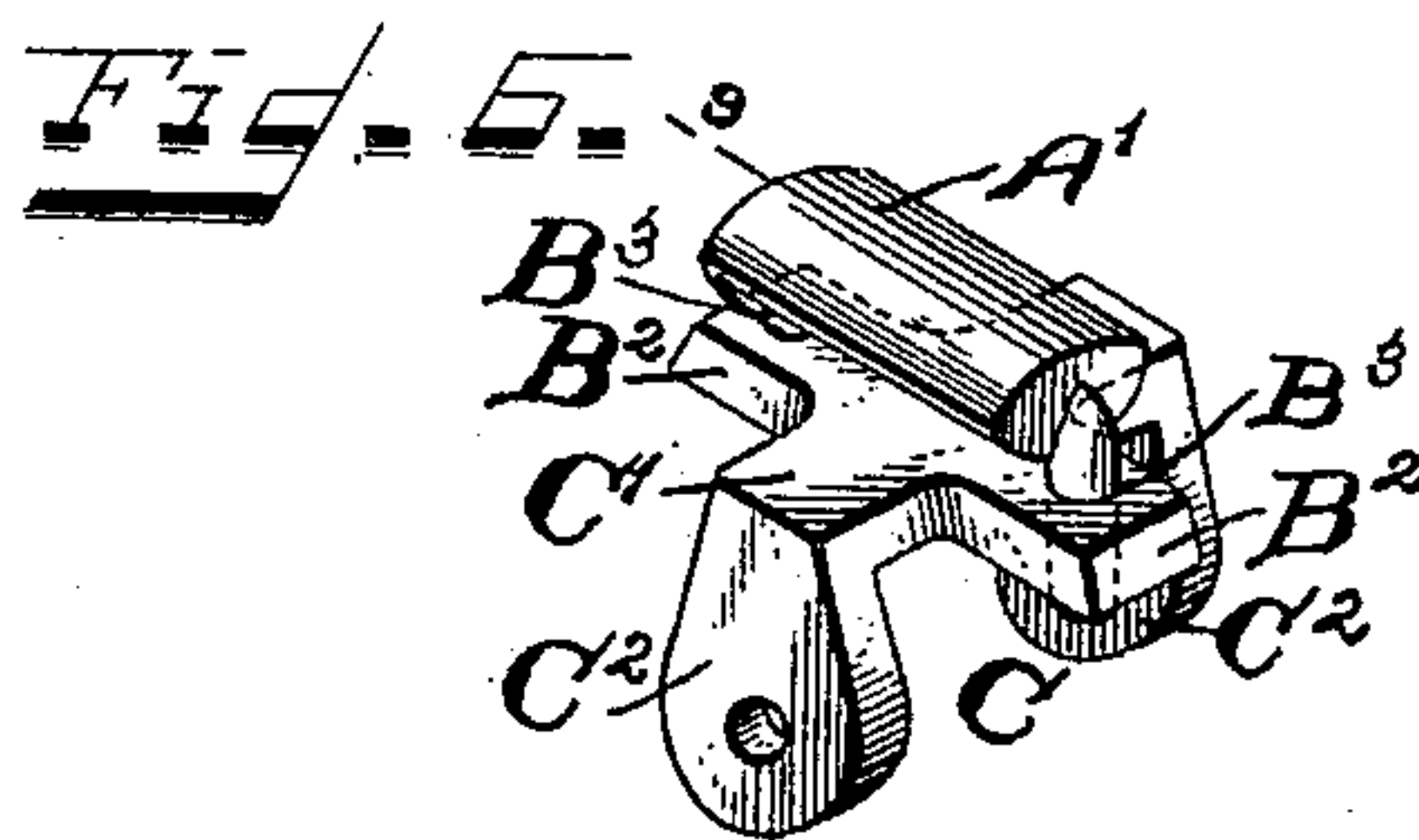
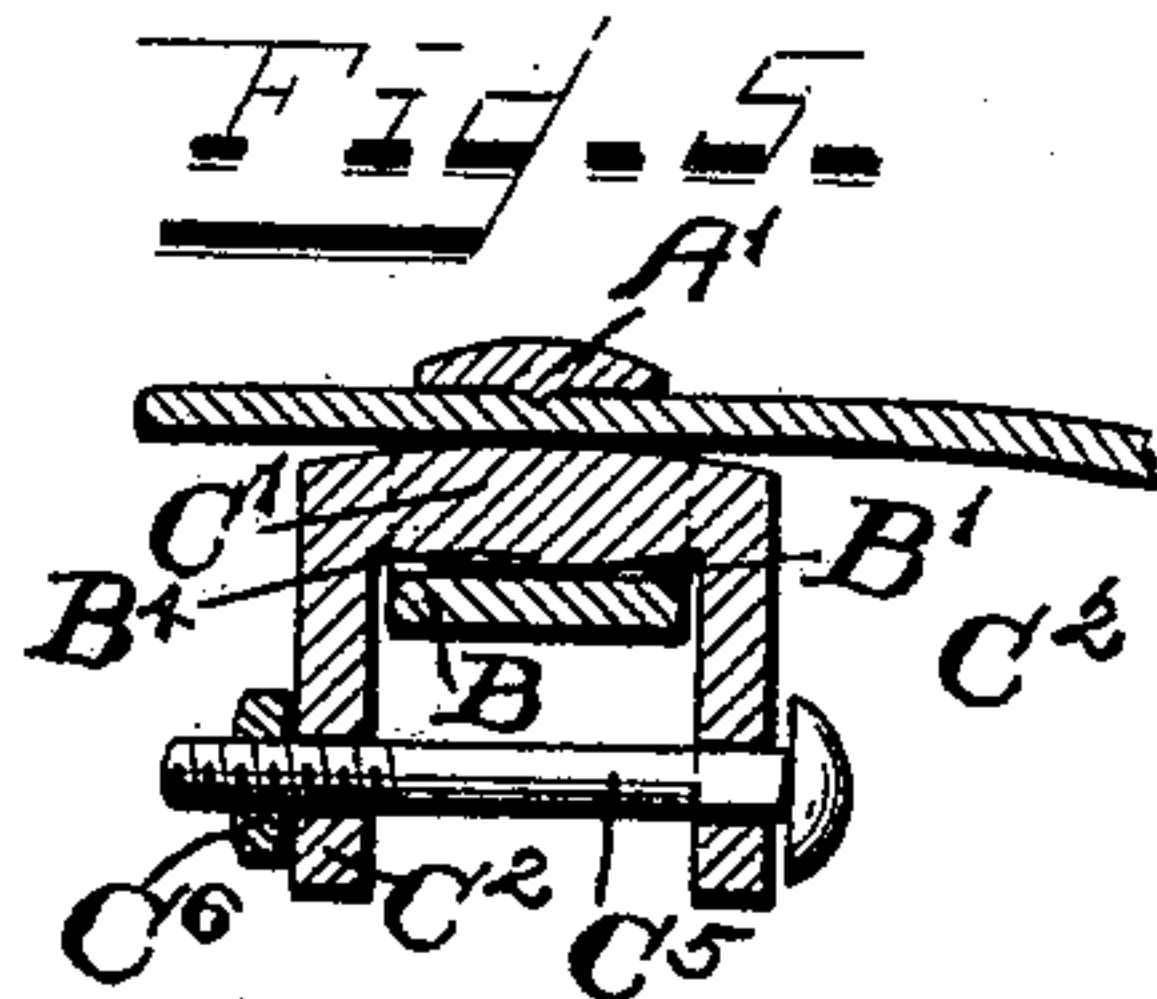
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2 Sheets—Sheet 2.

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VEHICLE SPRING.

No. 500,515.

Patented June 27, 1893.



Witnesses:
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UNITED STATES PATENT OFFICE.

EZRA B. SMITH, OF CINCINNATI, OHIO, ASSIGNOR OF ONE-HALF TO THE VICTOR MANUFACTURING COMPANY, OF COVINGTON, KENTUCKY, AND CINCINNATI, OHIO.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 500,515, dated June 27, 1893.

Application filed October 8, 1892. Serial No. 448,239. (No model.)

To all whom it may concern:

Be it known that I, EZRA B. SMITH, a citizen of the United States of America, and a resident of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Vehicle-Springs for Road-Vehicles, of which the following is a specification.

My invention is more particularly adapted for buggies and light road wagons.

The several features of my invention and the various advantages resulting from their use conjointly or otherwise will be apparent from the following description and claims.

In the accompanying drawings making a part of this specification, and to which reference is hereby made,—Figure 1 is a plan view of a vehicle gear illustrating one application of my invention. Fig. 2 is a view of the front end of said gear. Fig. 3 is a view in perspective of a coupling constructed according to my invention, the adjacent end of the spring which this coupling is designed to unite being broken away and indicated by dotted lines, in order to enable my coupling the better to be seen. Fig. 4 is a view partly in section, of the device shown in Fig. 3, the section being a vertical transverse one and taken in the direction of the dotted line 4 of Fig. 3. Fig. 5, sheet 2, is a vertical, central transverse section of the devices shown in Fig. 4, and taken at right angles to the section shown in Fig. 4, the lower cross bolt in elevation. Fig. 6 is a plan in perspective of a modified form of my coupling. Fig. 7 is a plan view of a second kind of vehicle gear to which certain features of my invention are applied. Fig. 8 is a vertical, central section of a front axle, fifth wheel and braces, taken in the plane of the dotted line 8 of Fig. 7. Fig. 9 is a vertical central section of the coupling shown in Fig. 6, and taken in the plane of the dotted line 9 of Fig. 6. Certain parts of this figure are, obviously, in elevation.

My invention in general consists of a novel and exceedingly useful means of uniting the adjacent ends of springs located at an angle to one another.

The invention allows one to make three styles of gear from one.

I will now proceed to specify the invention in detail.

A indicates a clip piece having back A' , and downwardly extending ends A^2 , A^2 , each of said ends having the screw threaded extensions A^3 . The distance between the inner portions of the ends A^2 is equal to or slightly in excess of the breadth of the terminal portion of the spring to which it is to be fitted. On the under side of the back A' is a teat or other projection A^4 , whose function will be hereinafter described.

Opposite to and beneath the piece A is a piece B having centrally a semicircular recess or depression B' running at right angles to the length of the piece A. Each end B^2 of this piece B extends under the adjacent end A^2 of piece A and has a vertical opening B^3 through which the threaded extension A^3 of said piece A may pass. To return to the recess B' . The bottom portion B^4 of the interior of this recess (see Fig. 5) is not flat, but curved convexly, being higher in the mid-length of the recess and lower at each end.

C indicates a swinging shackle of the usual and well known form, but of such width between its arms C^2 , C^2 , that its main or body portion C' may enter the recess B' , and rest upon the bottom B^4 thereof, while the arms C^2 , C^2 , snugly fit against the ends of the portion B' , but not so tightly as to prevent them from freely oscillating. The bottom side of the main portion may be curved as shown in Fig. 5.

The mode in which this device as thus far described is applied in connecting two springs is as follows:—In the end portion of a spring, as for instance, the front cross spring S, is formed an opening or recess S^2 . If this be a recess, and not a hole extending through the spring, it is located in the upper side of the end portion of the spring. The piece A is now laid on the end of the spring, the latter being located between the ends A^2 , A^2 , of the piece. The teat A^4 projects into the recess S^2 of the spring. The piece B holding the swinging shackle C is now applied to the under side of the spring and directly beneath the piece A. The extended screw threaded portions A^3 , A^3 , of the piece A respectively

pass through the openings B^3, B^3 , of the ends B^2, B^2 of the piece B, and project below the latter. Upon these projecting portions of the pieces A^3, A^3 , are respectively screwed
 5 their respective nuts A^5, A^5 . The effect of this last operation is to firmly clamp the end of the spring between the pieces A and B, and firmly attach these together with the swinging link to the spring. The end of a
 10 side spring as S' having the well known eye E, is now attached to the swinging shackle C by the usual bolt C^5 passed first through one arm C^2 of the shackle, then through the eye E of the shackle, and then through the other
 15 arm C^2 of the shackle, and then secured in place by a nut C^6 . To the other end of the front cross spring S is connected a device like the device A, B, C, and the mode of connecting the device to the spring end is also
 20 similar. To the shackle of this second device is connected the other or opposite side spring S' of the vehicle.

The rear end of each side spring S' may be connected to the adjacent end of a rear cross
 25 spring by a device A, B, C, like that described. But the rear ends of said side springs are preferably connected to the ends of the rear cross spring by the following device, viz: The upper portion A is exactly similar to the portion
 30 heretofore described, but the under portion and the shackle are in one piece, substantially as shown in Figs. 6 and 9, that is to say, the main or body portion C' of the shackle is made in one piece with the end portions $B^2,$
 35 B^2 and with the body B^4 of the piece B, the recess in the body portion B being omitted as unnecessary in this form of device. The end of the spring S' is inserted between the body A' of the piece A and the combined portion
 40 C', B, B^2 , already described. The teat A^4 of the piece A enters the recess S^2 in the spring S, and the bolts A^3 pass through the respective ends B^2, B^2 , and receive the nuts A^5, A^5 , as aforementioned. This end of the spring S
 45 is thus held firmly in place, while the spring S' being connected to the arms C^2, C^2 , by the bolt C^5 , as aforementioned, holds the end of the spring securely in position. Such a construction of course prevents the shackle from
 50 swinging, but if the front connecting devices have swinging shackles, as shown, these latter will ordinarily be quite sufficient to accommodate the elongation of the spring.

It is obvious that my coupling devices are
 55 exceedingly compact and enable the cross springs to be connected to the side springs very closely and without a large amount of intervening material of a complicated nature built in between the adjacent ends of the two
 60 springs in order to unite them.

The Brewster side bar gear is one quite popular, at times, and consists, as is well known, of side bars connected at their respective ends to the adjacent ends of the front
 65 and rear cross springs as S, S. It frequently becomes desirable to change said gear by substituting side springs for the said side bars.

By means of my invention, this substitution can be very easily and quickly accomplished and the springs S', S' , will take the place of
 70 the said bars and be connected as already described and as shown, and will be arranged in connection with the rear cross bar, substantially as shown in Fig. 1. Of course, the gear may, in the first instance, be made as shown
 75 in Fig. 1. In such gear, L represents the front axle, M the rear axle, and N a well known form of fifth wheel. The particular construction of the fifth wheel is not material to my invention. Beneath the front cross spring S
 80 and the said fifth wheel N is the usual bolster K.

P, P, represent the divergent perches and P', P' , the brace respectively connected at one end to the perches at or near the center,
 85 and, at the other ends, to the rear axle respectively nearer to the wheel than the points where the said perches are connected to the axle.

R, R, represent customary braces extending from one side spring S' to the other side
 90 spring S' , and forming supports for the body of the vehicle. Such gear is well known and is what is known as a rigid gear.

My invention is applicable to a platform
 95 spring, which has in it the arrangement of front and rear cross springs S, S, united to the side springs S', S' , substantially as shown in Fig. 7. In such event, the cross springs will be connected to the rear axle, as shown
 100 in Figs. 1 and 7, by means of the brace D, consisting of the straight portion D' extending from one side spring S' to the other side spring S' , and attached to each spring by a suitable clip D^3 , or equivalent connection.
 105 At the straight or body portion D' of the brace are the arms D^2 . These arms extend backward and the rear end of each arm is connected substantially as shown, to the rear axle by a clip as D^4 , or equivalent device.
 110 The front axle L is connected to the side springs S', S' , by means of a central spring I, centrally connected to the axle preferably at a point underneath the same, substantially
 115 as shown in Fig. 8 and extending backward and upward to a cross bar J, which latter is fastened to the side springs S', S' , at or near its end by a clip or equivalent device J', J' , substantially as shown. This spring I is made
 120 of spring steel and the elasticity thereof is best utilized by curving the rear end of the spring under and then up behind the cross bar J and then bringing the end of the brace I over the top of the cross bar J and there
 125 bolting it at J^2 to the said cross bar. By this last described gear freedom of the side springs S', S' , to elongate as they are depressed by a load or vertical thrust, is given without the necessity of a swinging shackle connection, for the reason that the rear and front axles
 130 are permitted to separate the distance the side springs elongate. Consequently, in this description of gear, the devices for connecting the ends of the side springs S', S' , to the

cross springs S, S, are preferably of the kind illustrated in Figs. 6 and 9.

What I claim as new and of my invention, and desire to secure by Letters Patent, is—

1. In a shackle, the combination of the clip piece A, having the extensions A^2, A^2 , having screw threaded terminations, and the piece B having the ends B^2, B^2 , provided with openings through which pass the extensions A^2, A^2 , and provided at each side with a shackle arm C^2 , for the reception of a bolt or connecting piece C^5 , a space being left between the pieces A and B, for the reception of the end of one of the springs, and means for preventing the said spring from slipping from its place, substantially as and for the purposes specified.

2. The combination of the clip piece A carrying the screw threaded arms, nuts and teat A^4 , and the piece B, carrying the side pieces or arms C^2 , having bolt C^5 , and spring S' connected at end to said bolt, and spring S whose end is inserted between pieces A and B at right angles to spring S' , and having recess S^2 for the reception of teat A^4 , substantially as and for the purposes specified.

3. In a shackle, the clip piece A carrying the arms A^2, A^3, A^2, A^3 , and the piece B having ends B^2, B^2 , for the reception of the arms A^2, A^3 , and having the recess B' , and the swinging piece C whose body is located in recess B' , and has arms C^2, C^2 and cross bolt C^5 , for enabling one spring S' to be connected to said cross-bolt, and another spring S to be connected between pieces A and B, at an angle to spring S' , provision being made to prevent the spring S from slipping out from between pieces A and B, substantially as and for the purposes specified.

4. The combination of the clip-piece A carrying the screw threaded arms, and teat A^4 , and piece B, having ends B^2, B^2 , for the reception of the said arms, and provided with recess B' , the clip piece A having projection A^4 , and spring S inserted between the pieces A and B and provided with recess S^2 receiving teat A^4 , and the swinging piece C having body C' received into recess B' , and having arms C^2 provided with cross piece C^5 , and spring S' at right angles to the spring S and connected to said cross-piece, substantially as and for the purposes specified.

5. The combination of the clip-piece A carrying the screw threaded arms, and teat A^4 , and piece B, having ends B^2, B^2 , for the reception of the said arms, and provided with recess B' , the clip piece A having projection A^4 and spring S inserted between the pieces A and B and provided with recess S^2 receiving teat A^4 , and the swinging piece C having body C' received into recess B' , and having arms C^2 provided with cross-piece C^5 , and spring S' at right angles to the spring S and connected to said cross-piece, the body C' being provided longitudinally with the curved convex surface, substantially as and for the purposes specified.

6. The combination of the clip-piece A carrying the screw threaded arms, and teat A^4 , and piece B, having ends B^2, B^2 , for the reception of the said arms, and provided with recess B' , the clip piece A having projection A^4 and spring S inserted between the pieces A and B and provided with recess S^2 receiving teat A^4 , and the swinging piece C having body C' received into recess B' , and having arms C^2 provided with cross piece C^5 , and spring S' at right angles to the spring S and connected to said cross-piece, the body C' being provided with the curved convex surface, and the upper portion being likewise provided longitudinally with the curved convex surface, substantially as and for the purposes specified.

7. A spring platform having end springs S, S, and side springs S', S' , the forward end spring S being united at its ends to the forward ends of the side springs, by means of devices, each having piece A, A^2 , and piece B, B', B^2 , bolted thereto, and piece C, C', C^2 , the spring S being inserted between pieces A and B, and the spring C connected to the bolt of arms C^2 , the forward and rear axles being connected by a rigid perch connection, substantially as and for the purposes specified.

8. A spring platform having end springs S, S, and side springs S', S' , the forward end spring S being united at its ends to the forward ends of the side springs, by means of devices, each having piece A, A^2 , and piece B, B', B^2 , bolted thereto, and piece C, C', C^2 , the spring S being inserted between pieces A and B, and the spring C connected to the bolt of arms C^2 , and the rear spring S being connected to the side springs by a device consisting of piece A having arms A^2 , with nuts, and piece B having arms or extensions B^2 , receiving said arms, and carrying the arms C^2 , provided with cross bolt to which the rear spring S' is connected, while the end of the adjacent side spring S' extends between the pieces A and B, and is there interlocked, the rear axles being connected by a rigid perch connection, substantially as and for the purposes specified.

9. A spring platform, having front and rear and side springs, without rigid perch connections, the ends of adjacent springs connected by piece A, A^2 , and piece B, carrying arms C^2 , and cross piece C^5 , connected to the side spring, while the piece A carries a teat A^4 , the end spring being received between the pieces A and B, and receiving the teat A^4 , into a depression S^2 , substantially as and for the purposes specified.

10. A spring platform, having front and rear and side springs, without rigid perch connections, the ends of adjacent springs connected by pieces A, A^2 , and piece B, carrying arms C^2 , and cross piece C^5 , connected to the side spring, while the piece A carries a teat A^4 , the end spring being received between the pieces A and B, and receiving the teat A^4 into a depression S^2 , in combination with the front brace I substantially parallel to the side springs and connected to the front portion of

the running gear, and the cross brace J clipped at each end to its adjacent side spring S', the brace I having a curve at its rear end whereby it curves up around the rear side of cross bar J, and then connected thereto, and brace D', D², D², whose forward cross portion is fastened to the side springs, and its side portions run rearward to the rear axle and are there connected, substantially as and for the purposes specified.

11. A spring platform, having front and rear and side springs, without rigid perch connections, the ends of adjacent springs connected by piece A, A², and piece B, carrying arms C², and cross piece C⁵, connected to the side spring, while the piece A carries a teat A⁴, the end spring being received between the pieces A and B, and receiving the teat A⁴ into a de-

pression S², in combination with the front brace I substantially parallel to the side springs and connected to the front portion of the running gear, and the brace J clipped at each end to its adjacent side spring S', the brace having a curve at its rear end whereby it curves up around the rear side of brace J, and then connected thereto, and brace D', D², D², whose forward cross portion is fastened to the side springs and rub iron T, and its side portions run rearward outside of the springs to the rear axle, and are there connected, substantially as and for the purposes specified.

EZRA B. SMITH.

Attest:

WM. F. MUCHMORE,
K. SMITH.