No. 688,490. Patented Dec. 10, 1901.

T. A. SHEA.

CAR SPRING.

(Application filed Apr. 4, 1901.)

(No Model.)

Fig. I.

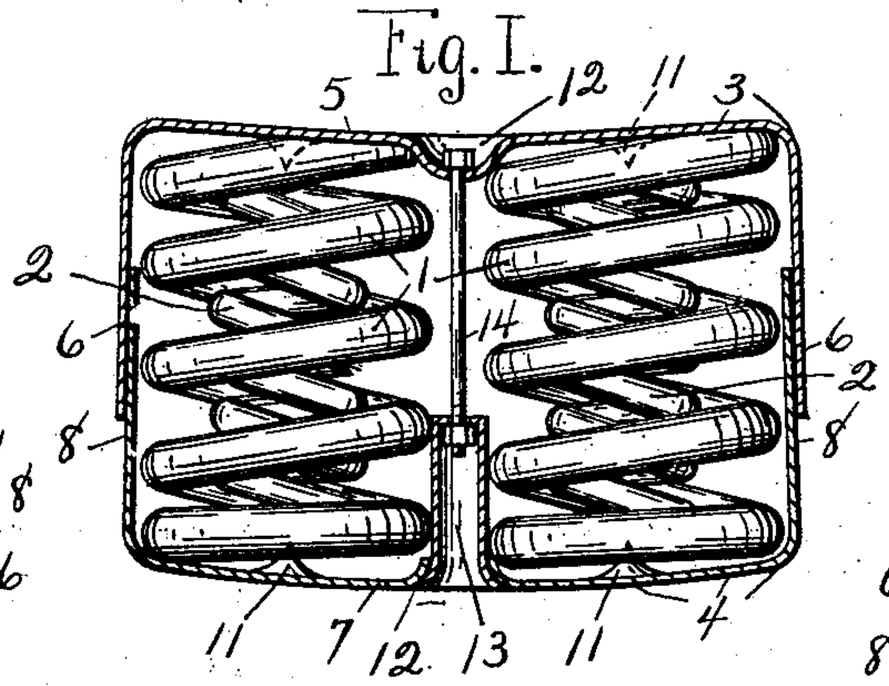


Fig. V.

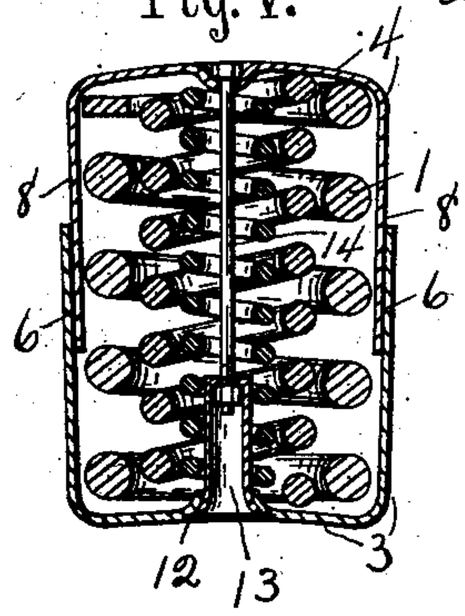


Fig. VI.

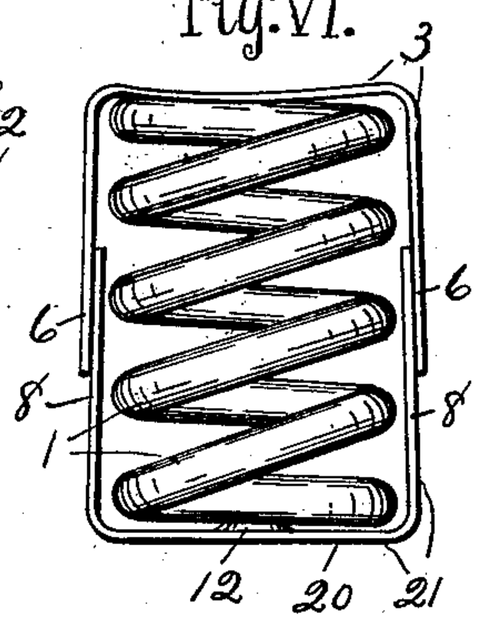


Fig. II.

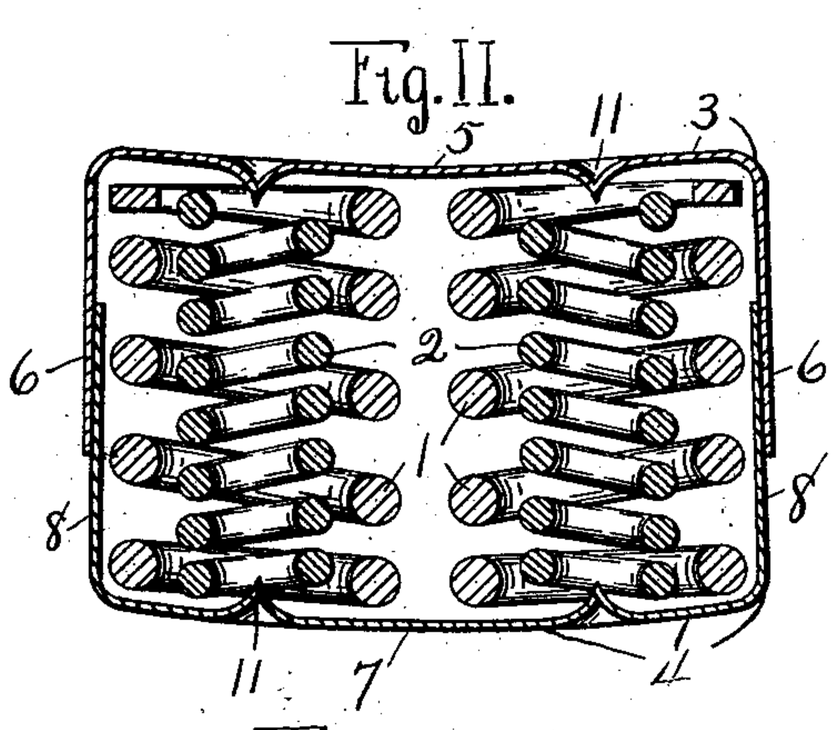


Fig. III.

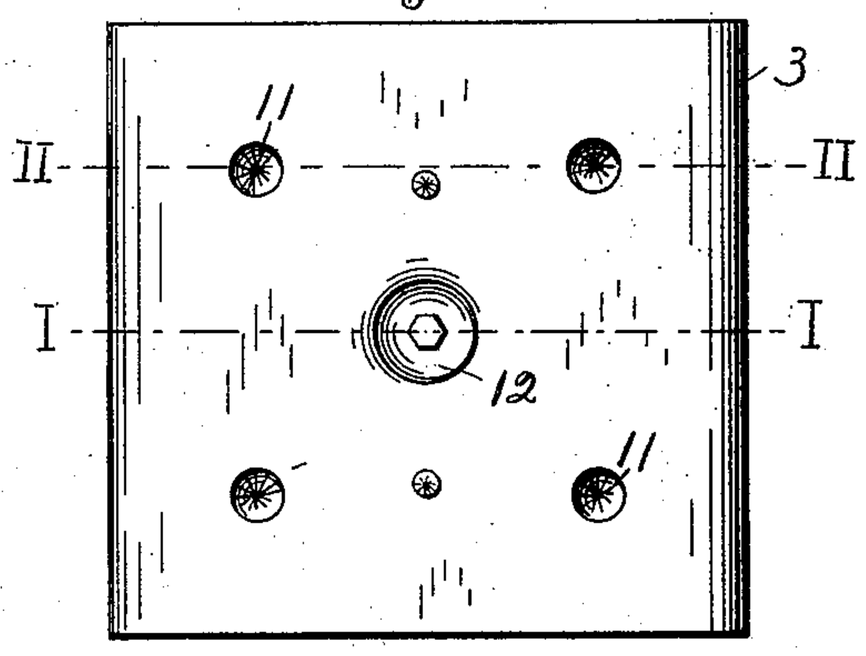


Fig. VII.

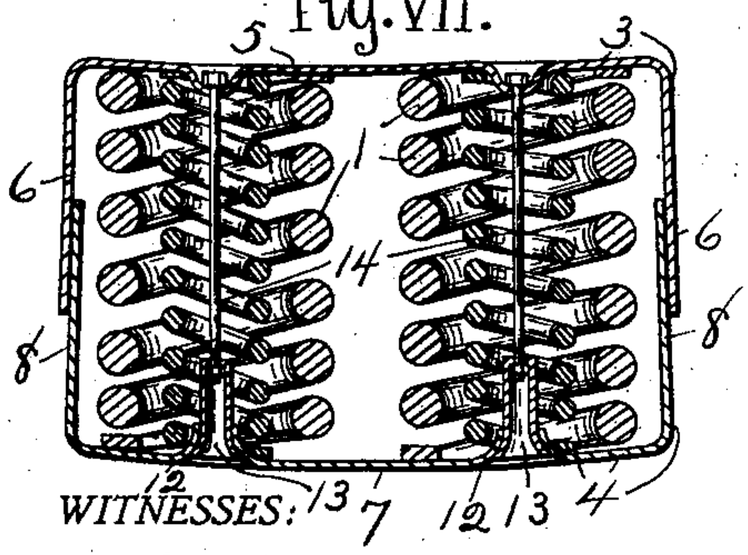


Fig. IV.

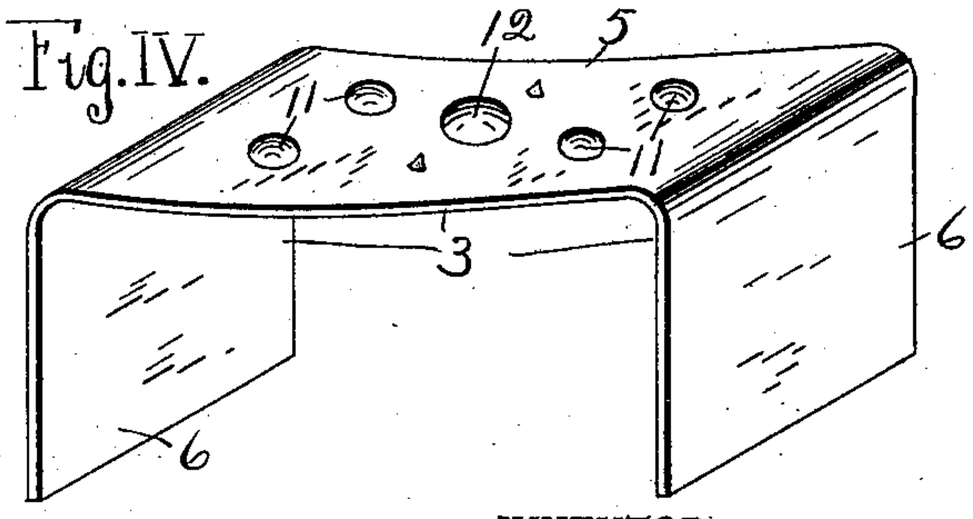
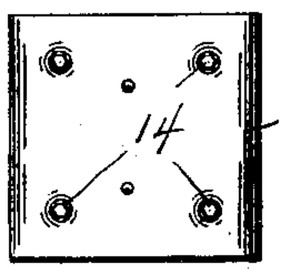


Fig. VIII.



WITNESSES:

C. C. Schornecker

E. L. Darling.

INVENTOR

Thomas A. Shea

BY

Alfred Wilkinson

ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS A. SHEA, OF OSWEGO, NEW YORK, ASSIGNOR TO GEORGE B. SLOAN, JR., OF OSWEGO, NEW YORK.

CAR-SPRING.

SPECIFICATION forming part of Letters Patent No. 688,490, dated December 10, 1901.

Application filed April 4, 1901. Serial No. 54,283. (No model.)

To all whom it may concern:

Be it known that I, THOMAS ALEXANDER SHEA, of Oswego, in the county of Oswego, in the State of New York, have invented new and useful Improvements in Car-Springs, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to cap-plates for coil-springs, combining the functions of retaining the springs in position and retarding their recoil.

It consists, essentially, in forming both cap-plates with integral side flanges arranged to be forced into frictional engagement by the load. The base of one or both plates is slightly curved, tending to straighten out under load and spring the flanges into engagement. Preferably the base of one plate is made convex, the base of the other concave, and the flanges of the convexly-formed plate are arranged within the flanges of the concave plate, whereby the flanges of the one are sprung in and of the other out into engagement, the greater the load and the greater the surfaces of the flanges in contact the greater the friction and the effect of retarding the recoil and lessening vibrations.

My invention will be understood by reference to the accompanying drawings, in which the same reference-numerals used in the specification indicate the same parts in all the figures.

Figure I is a vertical section of my peculiar cap-plate used with a cluster of springs taken on line I I of Fig. III. Fig. II is a vertical section through the springs, taken on line II II of Fig. III. Fig. III is a top plan view. I have in these three figures shown an arrangement in which four main coil-springs are retained between the cap-plates by a single bolt with a supplementary coil-spring in each main coil. The smaller coils may be omitted and any suitable number of springs be arranged in a single cluster. Fig. IV is an isometric view of the concave cap-plate detached. Fig. V is a side elevation showing my invention adapted to a single main coil-spring with two inner coils and the arrangement of plates reversed, the convex above and the concave below. Fig. VI is a simple modification showing the upper plate slightly concave, but the base of the lower flat, so that all spring takes place in the upper, by which its flanges are thrown in against those of the lower plate. Figs. VII and VIII are respectively a section and a plan of an arrangement of parts, showing the use of four retaining-bolts.

In the figures, 1 indicates the main coil spring or springs, retained in position between the concave and convex cap-plates 3 and 4. As shown in Figs. I to IV, the upper plate has a slightly concave base 5 and integral downwardly-extending flanges 6 6. The lower plate has a slightly convex base 7 and integral flanges 8 8, arranged within the flanges 6 6 and adjacent thereto. Both plates may be formed with lugs 11 11 to maintain the springs in position and are recessed at 12 12 to receive the thimble 13 and the single retaining-bolt 14. These cap-plates, of which one is shown detached in Fig. IV, combine the functions of retaining-plates and means for retarding the recoil and lessening the vibrations. They should be made of tempered spring-steel, giving a little spring to the flanges, so that by the application of pressure—that is, by the load—there is a tendency to straighten out the bases of the two plates, springing out the flanges 8 8 of the convex plate and correspondingly springing in the flanges of the concave plate, so that practically the entire adjacent surfaces of the flanges are brought into contact, distinguishing my invention from devices intended for similar purposes in which there is a limited amount of frictional contact.

I have shown in Figs. I, II, and III inner coil-springs 2 2 arranged within the outer or main coils and in Fig. V three coils arranged one within the other—a common arrangement for providing auxiliary springs with maximum sustaining capacity, for which my peculiar cap-plates are particularly adapted.

The position of the concave and convex plates evidently may be reversed, as shown in Fig. V, where the upper plate is made convex and the lower concave. As the flanges of the convex plate are sprung out by the load, they must be arranged within the flanges of the concave plate, which are sprung in. If

desired, the convexity or concavity may be omitted in one of the plates and its base 20 be made straight, as shown in Fig. VI in the lower plate 21. Here less effect is produced by the load, for the flanges of the top or convex plate only are affected, they being sprung out into engagement with the flanges of the lower plate.

My peculiar cap-plates combine in a strong, simple, and economical form the functions of retaining-plates and of recoil-retarders. The vibrations may be absolutely controlled and regulated by increasing or diminishing the size of the flanges—that is, the size of the friction-surfaces.

The spring-cluster or single spring retained within my peculiar plates may be arranged in any suitable position between the bolsters of car-trucks.

My invention is particularly adapted for use with cars of various sorts, but may be applied to other vehicles and to other purposes.

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

1. The combination with a coil-spring of upper and lower cap-plates having side flanges arranged adjacent to each other, one or both of said plates being formed to spring the flanges of the respective plates into frictional engagement under pressure.

2. In combination with one or more coil-springs, an upper cap-plate having downwardly-depending flanges, and a lower cap-plate having flanges upwardly extending adjacent to the upper-plate flanges, one of said plates having a convexly-formed base and having its flanges arranged within the flanges of the other plate, said cap-plates being formed of tempered spring-steel, whereby the flanges of the convexly-formed cap-plate are sprung outwardly under pressure into frictional engagement with the flanges of the other cap-plate.

3. In a car-spring, the combination with one or more coil-springs of upper and lower cap-plates inclosing said springs, means for securing the cap-plates together to retain the coils in position, integral side flanges on said plates arranged adjacent to each other, one of said plates having a concavely-formed base, and having its flanges arranged outside of the flanges of the other plate, said cap-plates being formed of tempered spring-steel, whereby the flanges of the concavely-formed cap-plate are sprung inwardly under pressure into frictional engagement with the flanges of the other cap-plate.

4. In a car-spring, the combination with a cluster of coil-springs of upper and lower cap-plates, said plates having flanges extending on the sides of the coils and adjacent to each other, means for connecting said plates together to retain the coils in position, one of said plates having a concavely-formed base, the other having a convexly-formed base, and the flanges of the convexly-formed plate being arranged within the flanges of the concavely-formed plate, said cap-plates being formed of tempered spring-steel, whereby their flanges are sprung into frictional engagement under pressure.

5. In combination in a car-spring, a cluster of coil-springs, a spring-steel upper cap-plate having a concave base, and downwardly-arranged flanges, a lower cap-plate of spring-steel having a convex base, and upwardly-extending flanges arranged within the cap-plate flanges, and a single bolt for connecting the plates and holding the coils in position, whereby the flanges are sprung into frictional engagement under pressure.

6. In a car-spring, the combination with the coil-spring, of cap-plates having integral side flanges arranged adjacent to each other, the base of one or both of said plates being curved, tending to spring the side flanges of the two plates into frictional engagement under load, and means for connecting the plates and retaining the parts in position.

7. In a car-spring, the combination with coil-springs, of upper and lower cap-plates, integral side flanges arranged in contact, and curved bases to spring the flanges into frictional engagement under load, and a bolt for connecting the plates.

In testimony whereof I have hereunto signed my name.

THOMAS A. SHEA. [L. S.]

Witnesses:

C. C. SCHOENECK,

E. L. DARLING.