3 Sheets—Sheet 1.

C. SHEA.

Compensating Spring.

No. 95,736. Patented Oct. 12, 1869.

Fig. 1.

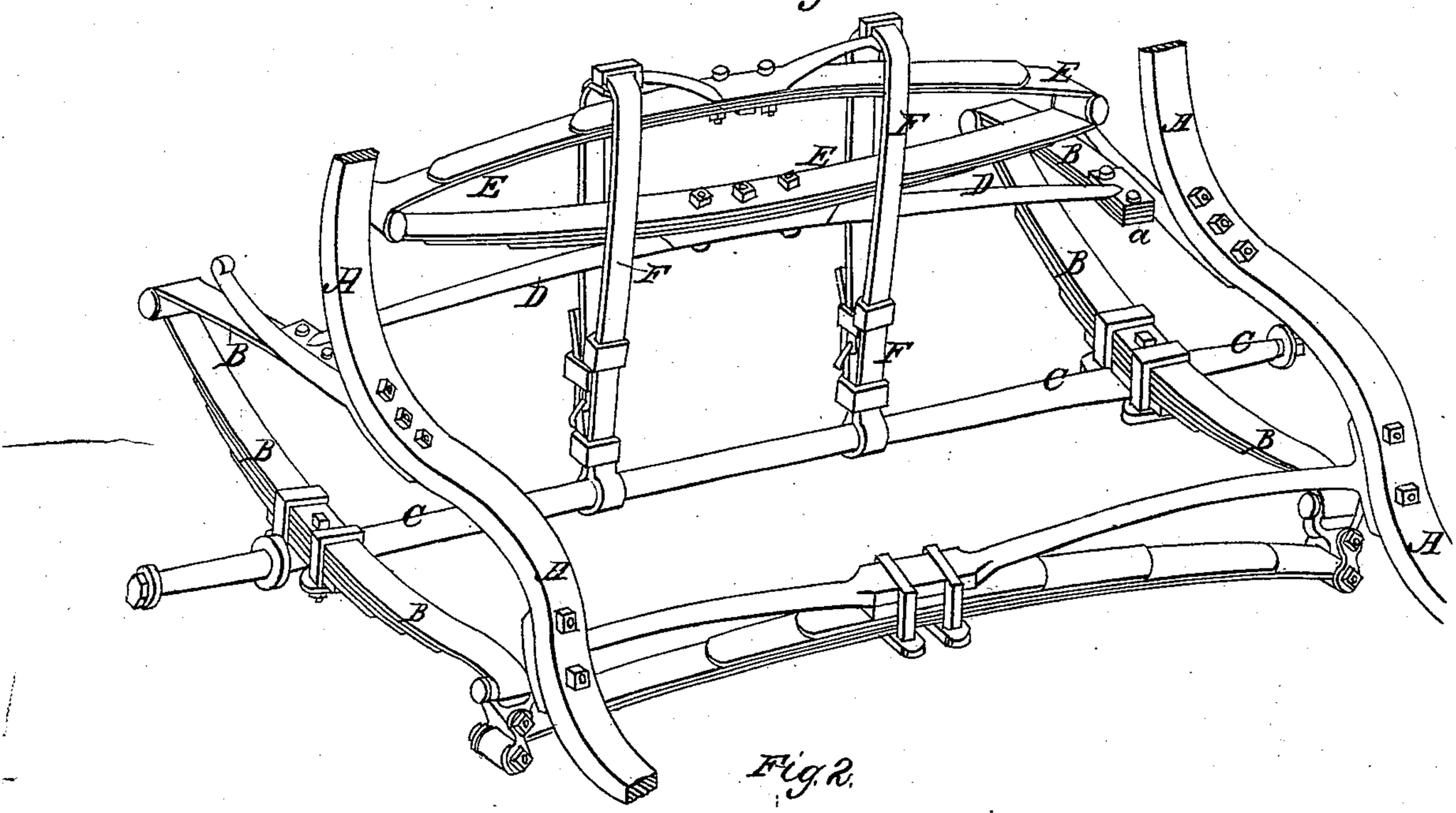


Fig. 2.

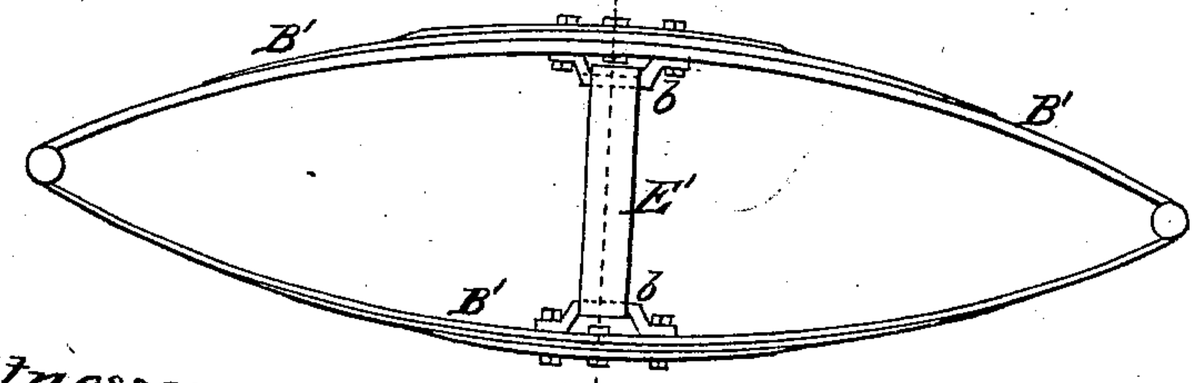
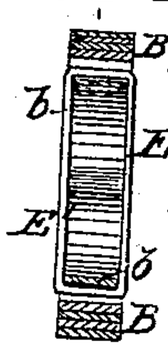


Fig. 3.



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3 Sheets—Sheet 2.

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Compensating Spring.

No. 95,736. Patented Oct. 12, 1869.

Fig. 4.

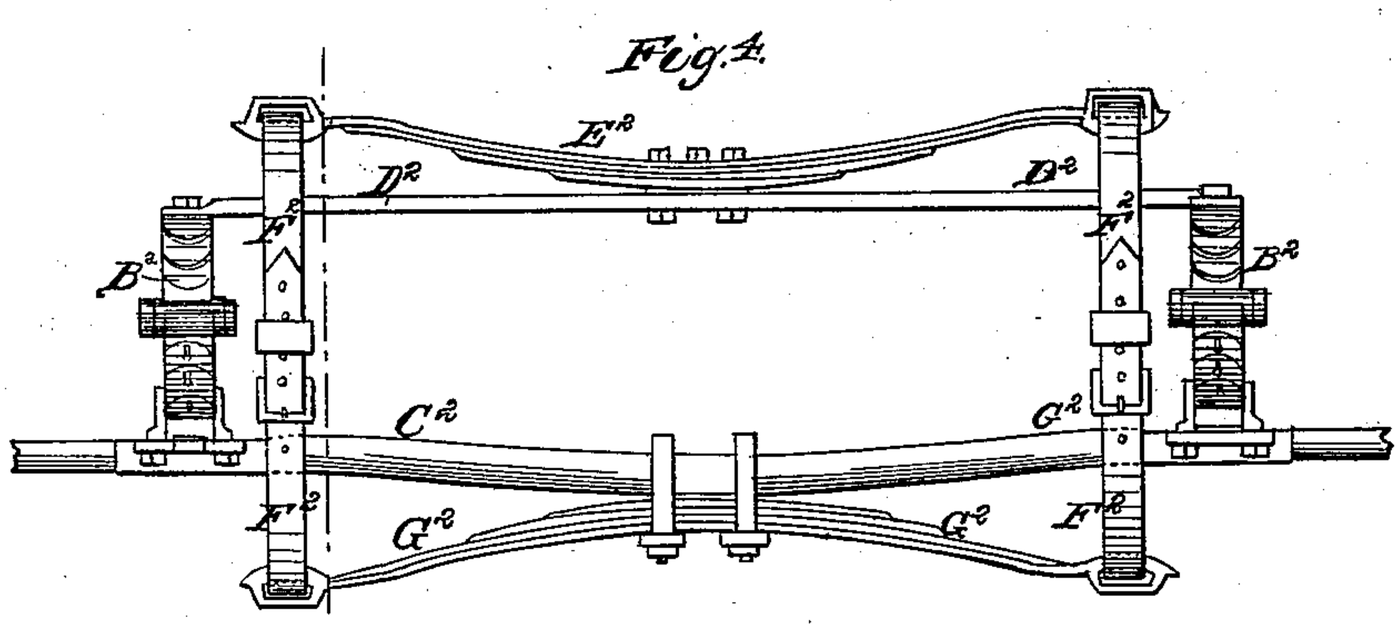


Fig. 5.

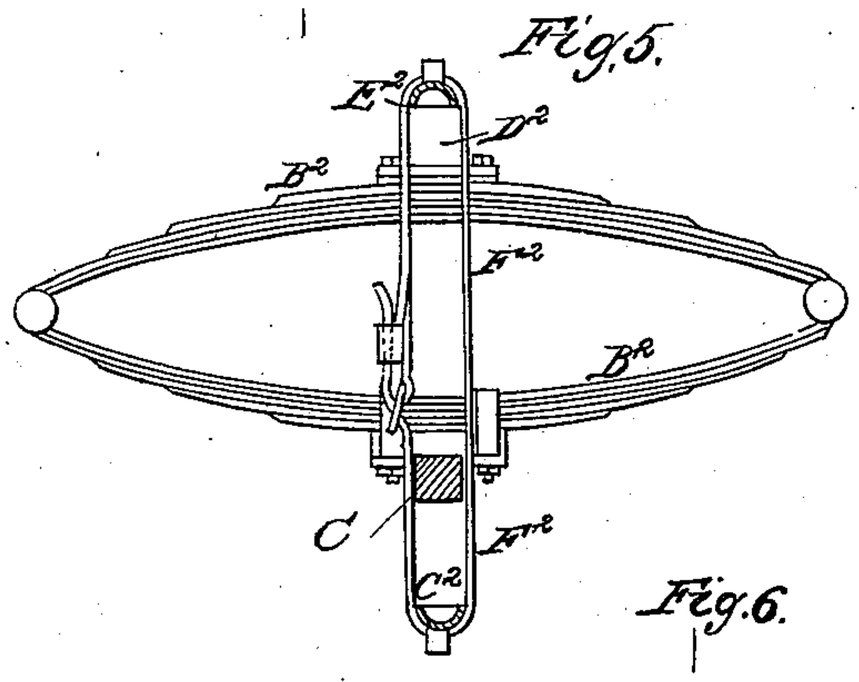


Fig. 7.

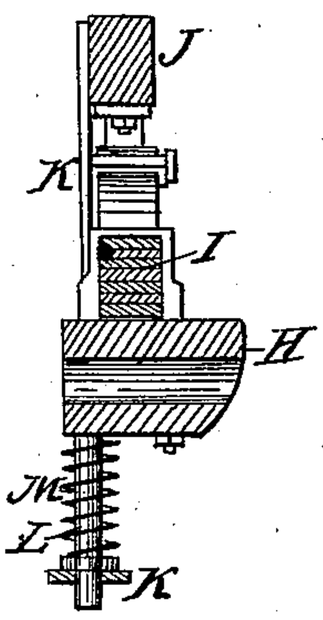
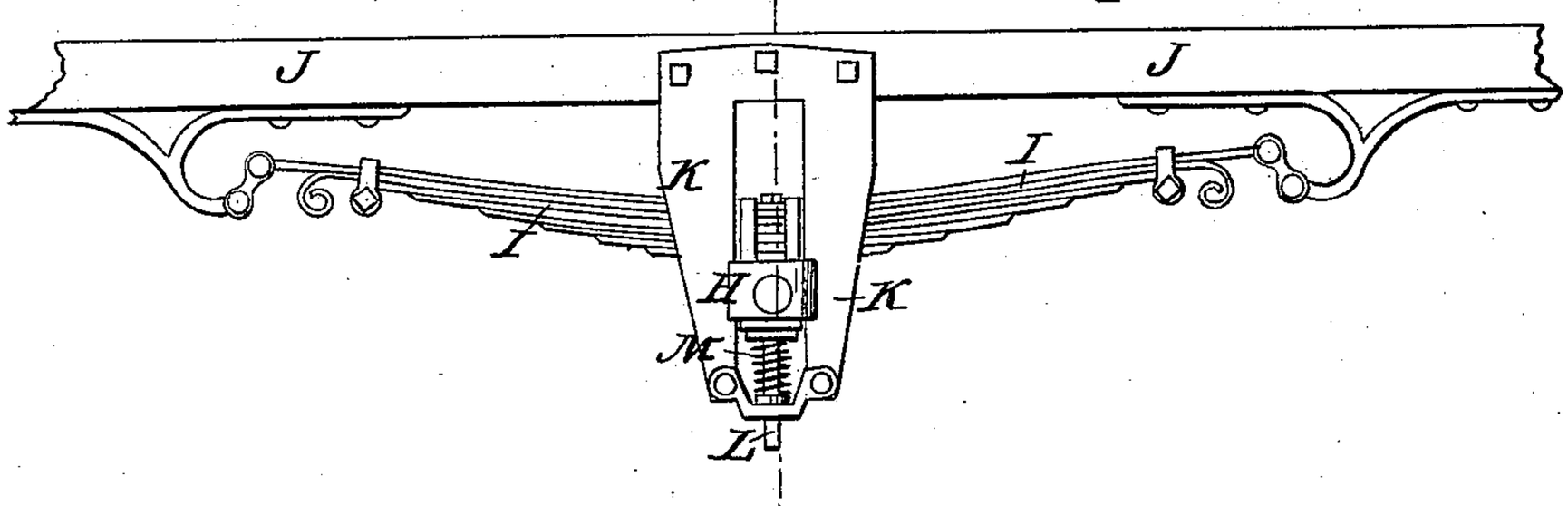


Fig. 6.



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3 Sheets—Sheet 3.

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Compensating Spring.

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Fig 8

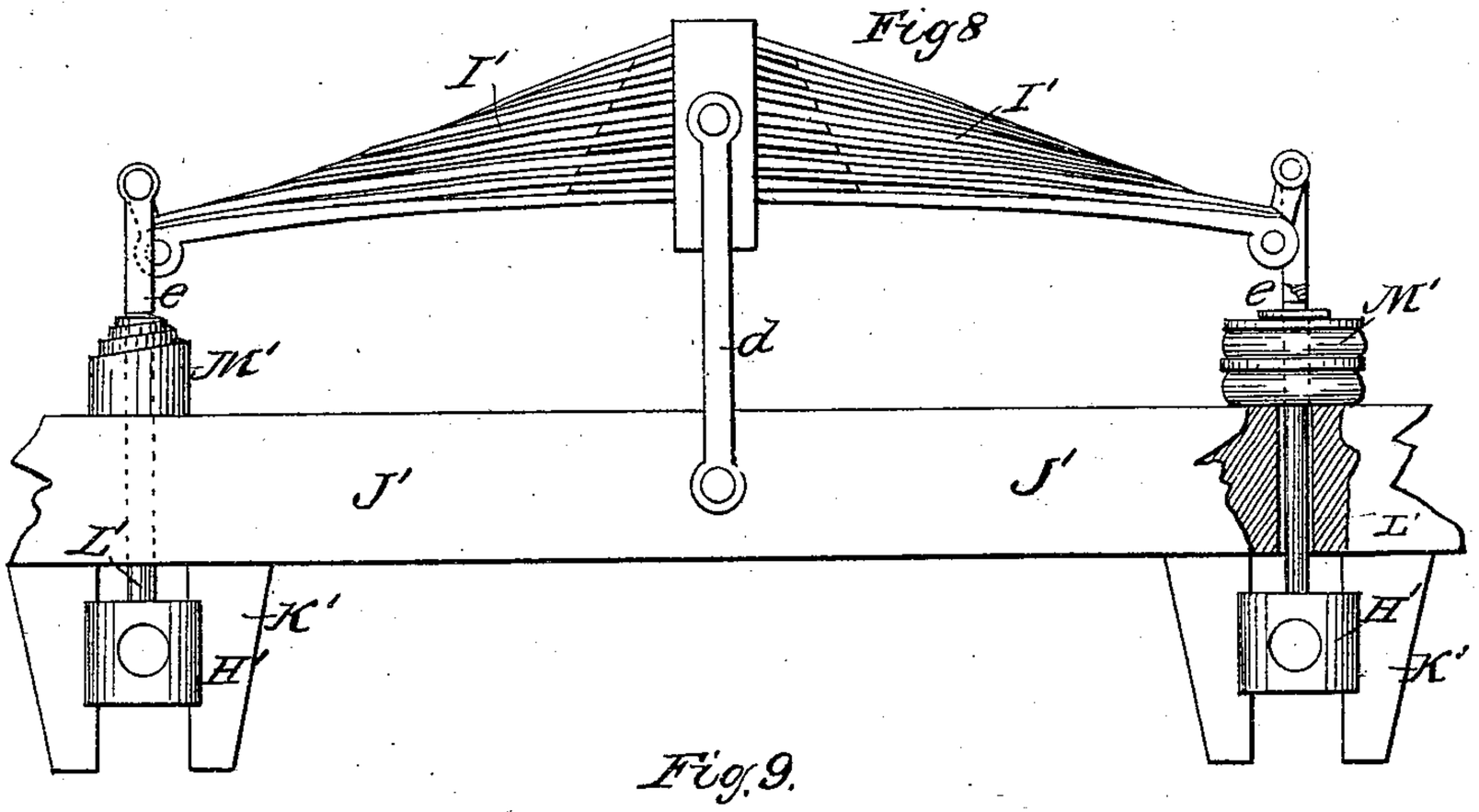

Fig. 9.

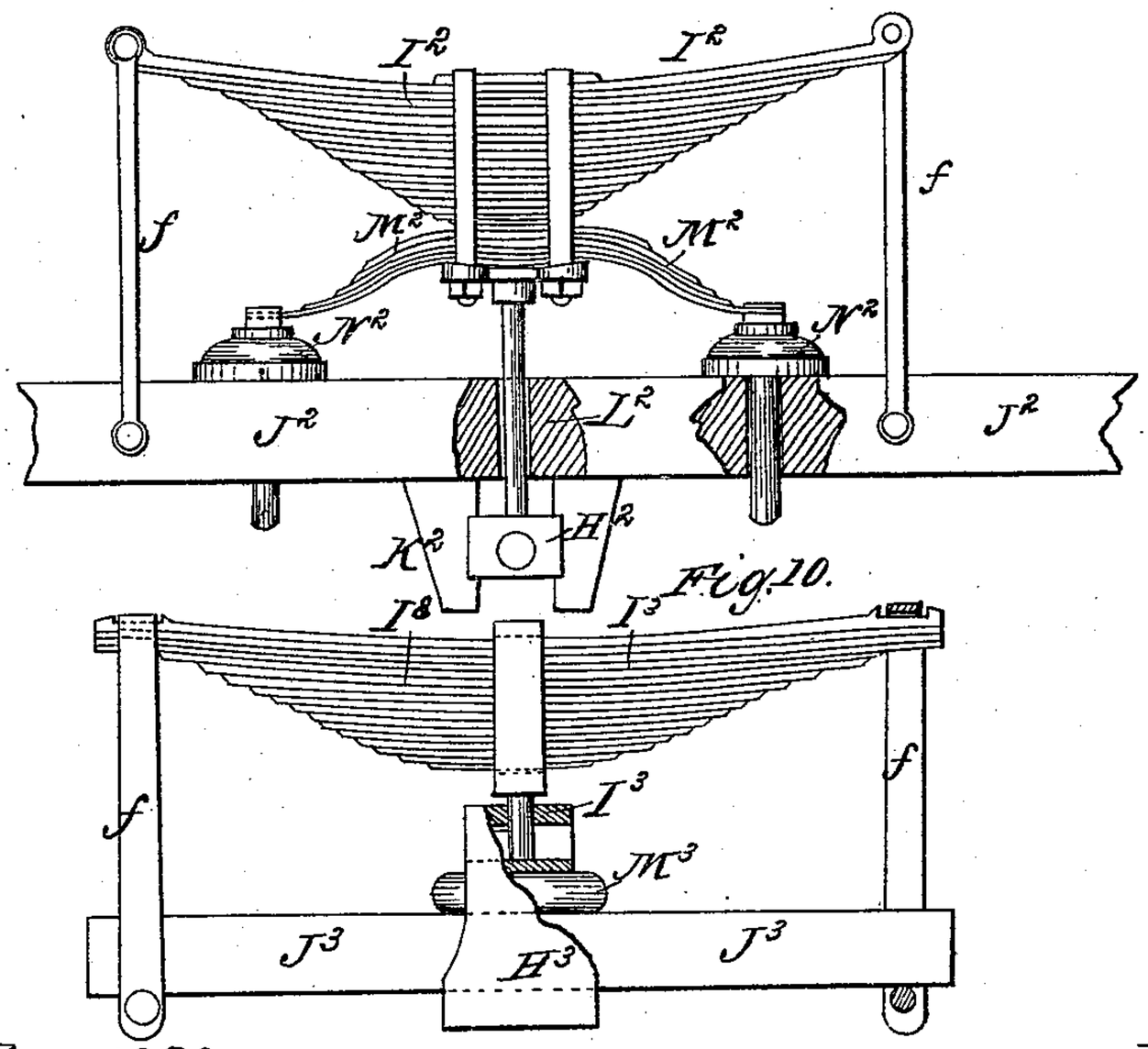

Fig. 10.

Witnesses.

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Attorneys

UNITED STATES PATENT OFFICE.

CHARLES SHEA, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN COMPENSATING OR EQUILIBRIUM SPRING.

Specification forming part of Letters Patent No. **95,736**, dated October 12, 1869.

To all whom it may concern:

Be it known that I, CHARLES SHEA, of Newark, in the county of Essex and State of New Jersey, have invented a new and Improved Compensating or Equilibrium Spring; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, Sheet I, represents a perspective view of my improved spring attachment to carriages. Fig. 2, Sheet I, is a side view of a modification of the same. Fig. 3, Sheet I, is a transverse section of spring shown in Fig. 2. Fig. 4, Sheet II, is a side view of a modification of the carriage-spring. Fig. 5, Sheet II, is an end view of the same. Fig. 6, Sheet II, is a side view of a railroad-car spring provided with my compensating attachment. Fig. 7, Sheet II, is a vertical transverse section of the same. Figs. 8, 9, and 10, Sheet III, are side views of modifications of the car attachment.

Similar letters of reference indicate corresponding parts.

The object of this invention is to provide means for avoiding the jar and inconvenience on carriages and railroad-cars, and for economizing springs on the same.

The invention consists, chiefly, in providing compensating-springs in connection with the ordinary springs on carriages, cars, locomotives, &c., the said compensating-springs being so arranged that they act in opposite directions to the mainsprings. When the pressure is on the main or bearing spring it is off the compensating-spring, and when on the latter it is off the former.

It is well known that carriages and wagons when loaded are not as liable to break their springs as they are when not loaded, because in the latter case the great shock produced when one of the wheels drops into a depression will produce a rebound of the carriage-body injurious to the spring. In railroad-cars the same effects on the springs are experienced when the cars pass over badly-fitted rail-joints.

By my invention all these defects are entirely overcome, as the additional counteracting springs keep all the mainsprings so balanced that they cannot become overstrained when the weight on them is suddenly thrown off, with a tendency of stretching them in the wrong direction.

In the accompanying sheets of drawings are illustrated various modifications of my invention, showing it applied to various kinds of vehicles. It will be noticed that in all cases the same principle is applied, to wit, that of providing a counteracting spring to the main bearing-spring of a vehicle.

In Fig. 1, A represents the sills or side pieces of a carriage or wagon body, resting upon the upper arms of springs B B, which are strapped to the axle C, as usual. The springs B are made in form of jointed arms, as shown. The upper arms *a a* are connected with each other by a rod, D, upon which a compensating-spring, E, is placed, said spring being, by means of straps F F, connected with the axle C. When the springs B are compressed by a load the spring E is expanded and without any effect. But when, by a shock, the springs B are expanded with violence, they are relieved by the spring E, which is compressed to arrest the outward action of the springs B. Thereby not only the spring but also the carriage-body and its appendages are protected from injury, and the person of the rider from discomfort.

In Figs. 2 and 3 is illustrated a modification adapted to elliptic springs B^1, which are used on many vehicles. In this case the compensating-spring E^1 is in form of a rubber-strap, connecting the two plates of the spring by being fitted through ears *b* on the same. When the spring B^1 is suddenly expanded the strap F^1 is stretched to relieve the same, and to aid in bringing the parts back to the required equilibrium.

The straps F, in Fig. 1, regulate the power of the spring E, as they are lengthened and shortened.

In Figs. 4 and 5 a modification is illustrated, showing how my invention can be applied to carriages or wagons which have elliptic springs B^2 on the ends of the axle C^2, and at right angles to the same. The upper parts of the springs are connected by a rod, D^2, on which a flat spring, E^2, is firmly secured in the middle. To the under side of the axle is also

secured a spring, G^2, similar to E^2. The ends of E^2 and G^2 are connected with each other by leather or other belts F^2. When the springs B^2 are pressed together, the straps F^2 are slackened, and no effect is made on the springs E^2 G^2. But when the bearing-springs are violently expanded, the belts will be stretched on their spring-holders, to counteract the mainspring.

Wagons may, however, receive other kinds of springs, and I do not confine myself to the details herein set forth. Rubber, metal, and other material may be used for the compensating-springs in various suitable forms.

To railroad-cars, locomotives, and tenders the invention is also applicable and of value.

In Figs. 6 and 7 is illustrated one mode of arranging it on cars. In this the axle-box H, which is strapped to the mainspring I, that is suspended from the truck-frame J, works up and down in a slotted plate, K. L is a pin suspended from the box H, and fitted through an aperture in the lower end of K. A spiral volute or rubber or other suitable spring, M, is interposed between H and the lower part of K, and fitted around L. When a weight presses upon the frame J the spring I is stretched as the frame is lowered; but when, by sudden jars, the frame is thrown up it compresses the spring M, and thereby prevents all parts from coming into violent contact and from injury thereby.

In Fig. 8 is shown a device for the front trucks of locomotives and for tenders. The truck-frame J^1 is supported by the boxes H^1, which are in pairs, connected with the ends of the mainspring I^1, said mainspring being, by a link, *d*, and strap, fitted at the middle upon the frame J^1. Volute springs, or rubber cushions or other springs M^1 are interposed between every box H^1, and a shoulder, *e*, of the pin L, by which such box is connected with the mainspring. The spring M^1 will then have the same effect on the mainspring as in the cases before set forth.

Figs. 9 and 10 show two forms of locomotive-spring bearings. In Fig. 9 the mainspring I^2 has its ends, by straps *f*, connected with the frame J^2, while its middle rests on a pin, L^2, which projects from the box H^2. A flat spring, M^2, projects from the lower part of the spring I^2, and has its ends supported on rubber cushions N^2, as shown, said cushions being formed on pins which fit loose into the frame.

In Fig. 10 the pin L^3, by which the spring I^3 is connected with the axle-box H^3, is represented as fitting upon a rubber or other spring-cushion, M^3, which is placed upon the frame J^3. In all of these cases the springs M, M^1, M^2, and M^3 act as compensating-springs, in the manner and for the purpose hereinbefore set forth.

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

The spring E, when connected with the axle by straps F, and with the bearing-springs B by a rod, D, all arranged and operating as described.

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Witnesses:

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ALEX. F. ROBERTS.