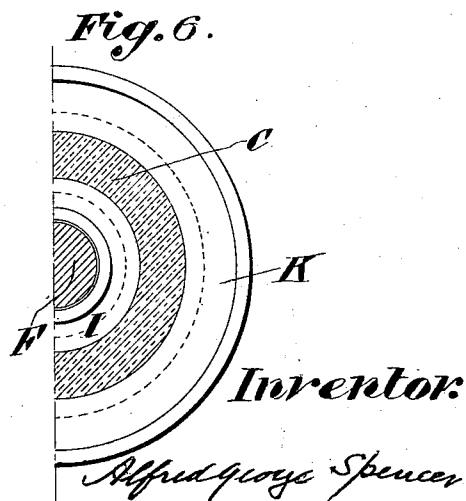
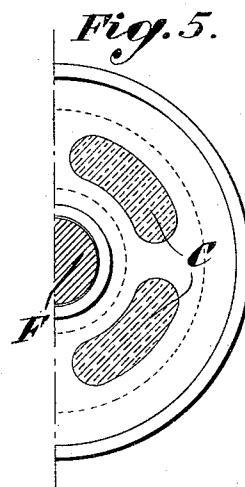
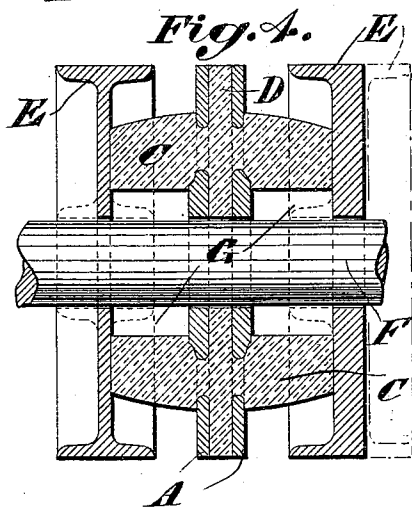
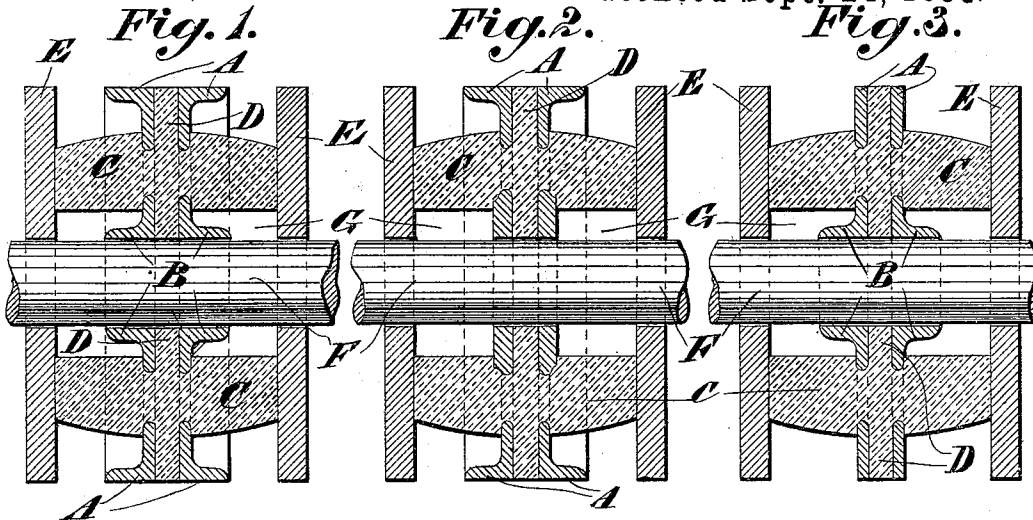


(No Model.)

A. G. SPENCER.
CAR SPRING.

No. 546,831

Patented Sept. 24, 1895.



Witnesses.

Edmund S. Shaw
Wm. H. Brown

Inventor.

Alfred George Spencer

UNITED STATES PATENT OFFICE.

ALFRED GEORGE SPENCER, OF LONDON, ENGLAND.

CAR-SPRING.

SPECIFICATION forming part of Letters Patent No. 546,831, dated September 24, 1895.

Application filed July 31, 1894. Serial No. 519,051. (No model.) Patented in England March 19, 1886, No. 3,906; in Belgium February 9, 1893, No. 103,305, and in Argentine Republic July 11, 1893, No. 1,319.

To all whom it may concern:

Be it known that I, ALFRED GEORGE SPENCER, a subject of the Queen of Great Britain and Ireland, residing in Cannon Street, in the city of London, England, have invented Improvements in Buffer and other Springs Constructed of India-Rubber, (which has been patented in the following foreign countries: Great Britain and Ireland, March 19, 1886, No. 3,906; Belgium, (granted to Frank Spencer,) February 9, 1893, No. 103,305, and Argentine Republic, (also granted to Frank Spencer,) July 11, 1893, No. 1,319;) and I do hereby declare that the following is a full and exact description thereof.

In some kinds of india-rubber springs—for example, such as described in the specifications of previous British patents granted to George Spencer, No. 168, A. D. 1866, and No. 758, A. D. 1877, and others—the stroke is limited by cup-rings, cup-plates, or nozzles, or in some cases by a combination of such parts.

With springs of the kind referred to, as ordinarily constructed, if full compression should suddenly occur, so that there is contact of cup or dividing plates or of metallic cup-rings, with one another or with end or dividing plates, or of nozzles with plates, shocks are liable to result, and my present invention is designed to obviate breakage and to relieve or lessen the severity of the shock communicated to the body of the vehicle or other object to which the spring is applied. For this purpose I construct the spring with metallic end rings or plates, with metallic intermediate rings or plates, and with an india-rubber body into which the metallic intermediate rings or plates are molded, and which body is made with a part or parts of itself located between the said intermediate rings or plates, so as to constitute a supplementary spring or elastic part or parts, in such a manner that not only are loose elastic parts that might be mislaid or accidentally omitted dispensed with, but that even should contact of metallic parts occur there will be a reserve of elasticity to counteract or take up the consequent shock or shocks, as I will now more particularly explain by aid of the accompanying sheet of illustrative drawings, in which—

Figures 1 to 4, inclusive, are central longi-

tudinal sections of various forms of buffer-springs according to this invention, and Figs. 5 and 6 are cross-sections of buffer-springs illustrating different arrangements of cup-plates.

Referring to the drawings, Fig. 1 shows my improved spring made with two perforated metal cupped plates A A, which are formed with nozzles B B, are embedded in the parts C C of the india-rubber body, and are separated by a portion D of the same india-rubber body, which portion serves to relieve shocks, as aforesaid, should the outer rims of the cup-plates A A and the nozzles B B meet the end or dividing plates E E, while at the same time obviating all possibility of the said portion D being accidentally omitted when putting together the various parts constituting the complete spring.

Fig. 2 shows the same spring but without the nozzles B B, the outer rims of the cupped plates A A being in this case alone employed to limit the stroke of the spring. The form here illustrated may in some cases be modified by making the india-rubber to nearly fit the rod F instead of leaving a clear space G G around it, as shown.

Fig. 3 illustrates the same spring as Fig. 1 without the outer rims to the plates A A, the nozzles B B on the embedded perforated plates A A being in this case alone employed to limit the stroke of the spring. C C is the india-rubber body, D the portion thereof that serves to relieve shocks as aforesaid, and E E are the end plates.

Fig. 4 shows the same spring without the outer rims or nozzles to the intermediate plates A, the stroke being in this case limited by the rims of the cupped dividing or end plates E E, the portion D of the india-rubber body located between the perforated embedded plates A A serving to relieve shocks as aforesaid. Two end plates, such as that shown at E to the right, may be used instead of one of each kind, as shown, according to requirement, and instead of a single dividing cupped plate, such as that shown at E to the left, two plates, such as that shown at E to the right, placed back to back, may be substituted as indicated, partly in full lines and partly in dotted lines.

Instead of using embedded perforated plates, such as shown in the previously described examples, and one form of which is partly represented in face view in Fig. 5, there
5 may obviously be substituted for each perforated plate two separate embedded plates, one example of which is partly shown in face view in Fig. 6, the one embedded plate I surrounding the rod after the manner of a nozzle
10 and the other plate K being embedded in the outer circumference of the india-rubber body C. Springs with embedded plates, such as just described in reference to Fig. 6, but in other respects the same as described in reference to Figs. 1, 2, 3, and 4, are correctly illustrated in longitudinal section by Figs. 1, 2,
15 3, and 4. In some cases it may be convenient to use cupped plates K, Fig. 6, without nozzle plates I.

20 What I claim is—

A spring provided with metallic end rings or plates, with metallic intermediate rings or plates, and having an india-rubber body into which said intermediate rings or plates are molded, said india-rubber body having a
25 part or parts of itself located between said intermediate rings or plates so as to constitute a supplementary spring or elastic part or parts integral with said india-rubber body, and which will afford, at all times a reserve
30 of elasticity, substantially as herein described for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALFRED GEORGE SPENCER.

Witnesses:

EDMUND S. SNEWIN,
WM. O. BROWN.