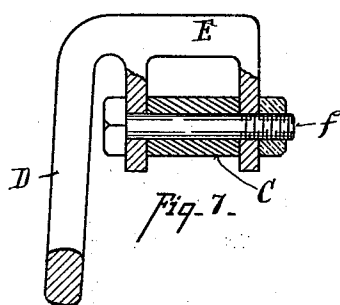
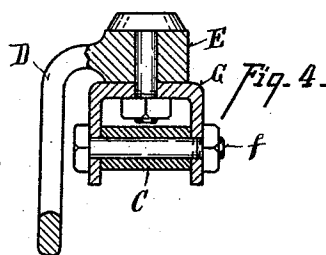
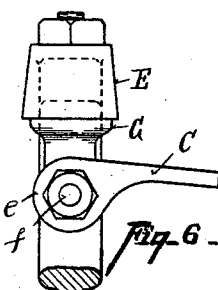
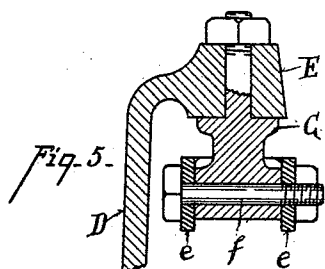
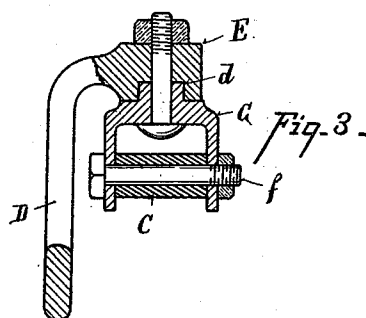
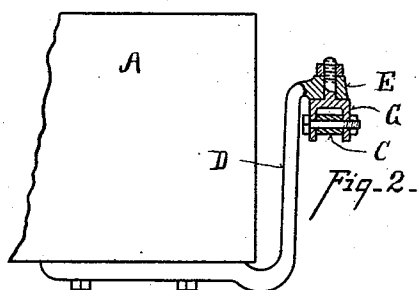
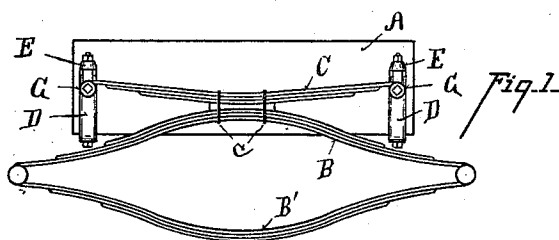


(No Model.)

C. A. BEHLEN.
SPRING SUPPORT FOR BODY LOOPS.

No. 554,107.

Patented Feb. 4, 1896.



Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES A. BEHLEN, OF CINCINNATI, OHIO.

SPRING-SUPPORT FOR BODY-LOOPS.

SPECIFICATION forming part of Letters Patent No. 554,107, dated February 4, 1896.

Application filed May 27, 1895. Serial No. 550,849. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. BEHLEN, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain
5 new and useful Improvements in Body-Loop Spring-Supports, of which the following is a specification.

The object of my invention is to provide a shackle-support for an end elliptic spring of
10 a carriage, so that the spring is suspended by outwardly-pendent shackles, whereby the spring is allowed free movement without requiring stops, avoiding the contact of the springs with the supporting parts and the use
15 of shackle-joints, thereby obtaining a strong durable support and a perfectly free and untrammelled action of the spring.

The features of my invention will be more fully set forth in the description of the accompanying drawings, making a part of this
20 specification, in which—

Figure 1 represents an end elevation of my improvement in position for use. Fig. 2 is a side elevation showing the spring-supports in
25 section. Fig. 3 is a similar view of the spring-supports, showing a modified form of constructing the same. Fig. 4 is another modification of the support shown in Fig. 2. Fig. 5 is still another modification. Fig. 6 is a front
30 elevation of the parts shown in Fig. 5. Fig. 7 is another modification of the spring-support.

A represents the carriage-body; B B', ordinary elliptic springs, the lower limb, B', supported upon a head-block or an axle in the
35 usual manner.

C represents the suspending cushioning-spring. It is rigidly connected to the limb B by clips or bolts c.

It has been difficult to suspend an end elliptic spring by means of a supplemental hung spring superimposed upon a common elliptic spring because of the wear and rattle of the joints and the lack of a rigid support for the
40 suspending spring. I overcome these difficulties by providing rigid connection of the supports for the spring C to the body-loops D D, which are shown as connected to the under side of the carriage-body, each having
45

an outward-turned arm and an overhanging
head E, to which heads the supports of the spring C are rigidly attached and suspended from the under side.

In practice I prefer to have the spring C slightly curved and hinged to a shackle-bolt
55 rigidly connected to the body-loops, which by reason of their construction have sufficient elasticity to yield outwardly and inwardly to take up the lengthening and shortening of the spring as it raises and lowers under the vi-
60 brations of the body.

By curving the spring slightly, as shown, about one half of the flexibility of the body-loop arms is in an inward direction and the other half of the yielding motion is outward
65 from the normal vertical position of the arms of the body-loops. Thus the body-loops themselves take up the lengthening and shortening spring movements, and this allows the springs to be firmly supported by unyielding
70 shackles rigidly connected to the body-loops.

I have shown four forms of pivotal shackle-supports for the springs connected to the body-loops, all of them being of the shackle
or stirrup form.

G represents shackles which are rigidly secured to the overhanging heads E of the body-loops D D, preferably by employing a bolt passing through these parts.

In Fig. 3 I have shown a shackle provided
80 with a boss d seated in a correspondingly-formed recess in the overhanging head E. This secures a more rigid attachment of the shackles to the heads.

In Fig. 4 the bolt is shown as made separate
85 from the shackle instead of being formed integral therewith, as shown in Fig. 2.

In Figs. 5 and 6 I have shown the shackle modified so as to support the spring C when it is provided with ears e; but this is one of
90 the usual forms of journaling the spring upon its pivotal bolts.

In Fig. 7 I have shown the limbs of the shackle made integral with the head E of the body-loop D.

By this construction the side movement of the carriage-body due to the use of shackle-links for the spring-couplings is avoided.
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This form of construction also accomplishes another very important result—the longitudinal movement of the body which takes place when links or hinged couplings are employed is almost wholly overcome.

It has been proposed to support elliptic springs by a spring connection with the body-loop, but in such cases a swinging shackle with a stop device has been employed, an instance of which is shown in Letters Patent No. 533,429, granted me February 5, 1895; but by making the spring but slightly curved, which supports the elliptic spring, and hinging it to a rigid shackle it will serve as a cushion spring-support having but very little vertical movement, yet sufficient to overcome the jars occasioned by the sudden compression of the elliptic spring, and avoiding the

stops applied to the swinging shackle, which is also objectionable.

I claim—

The combination of the body-loops having outturned arms provided with overhanging heads, the supporting-shackles G, rigidly secured to said heads and depending therefrom, pivot-bolts *f* supported in the shackles, the cushioning supporting-spring C having its end hinged upon said bolt, and the elliptic spring rigidly secured to said cushioning-spring, substantially as specified.

In testimony whereof I have hereunto set my hand.

CHARLES A. BEHLEN.

Witnesses:

W. R. WOOD,
C. W. MILES.