(No Model.)

E. CLIFF.

SEMI-ELLIPTIC SPRING.

No. 474,159. Patented May 3, 1892.

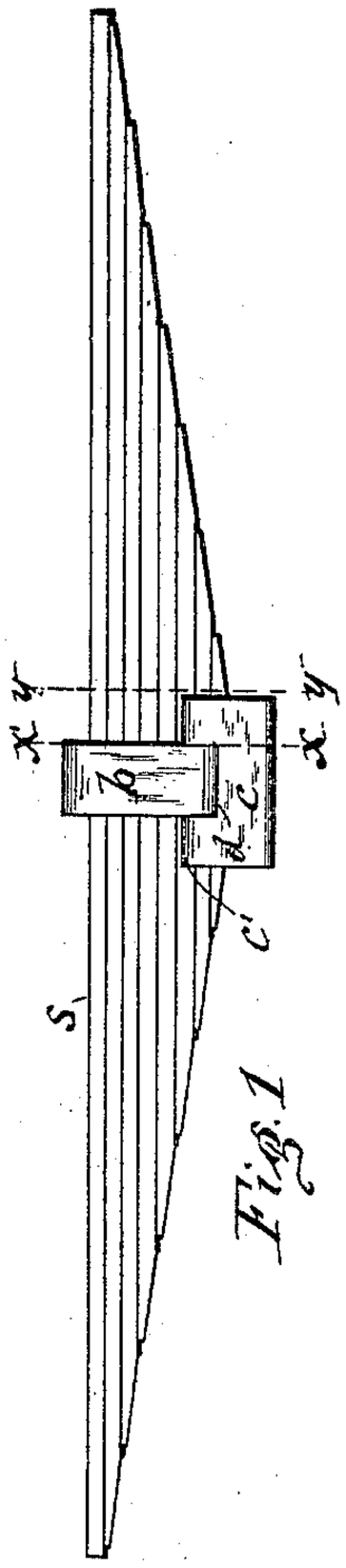

Fig. 1

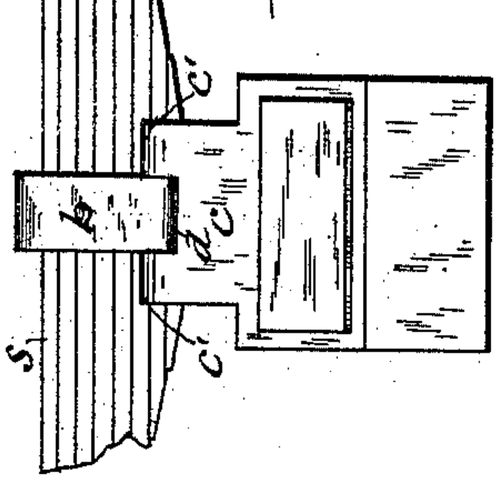

Fig. 5

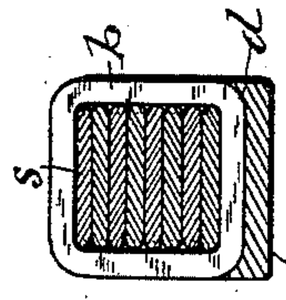

Fig. 3

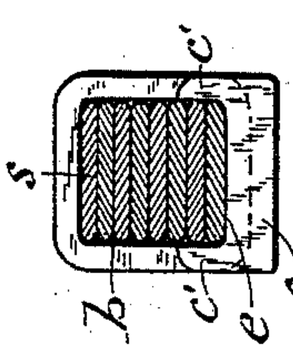

Fig. 2

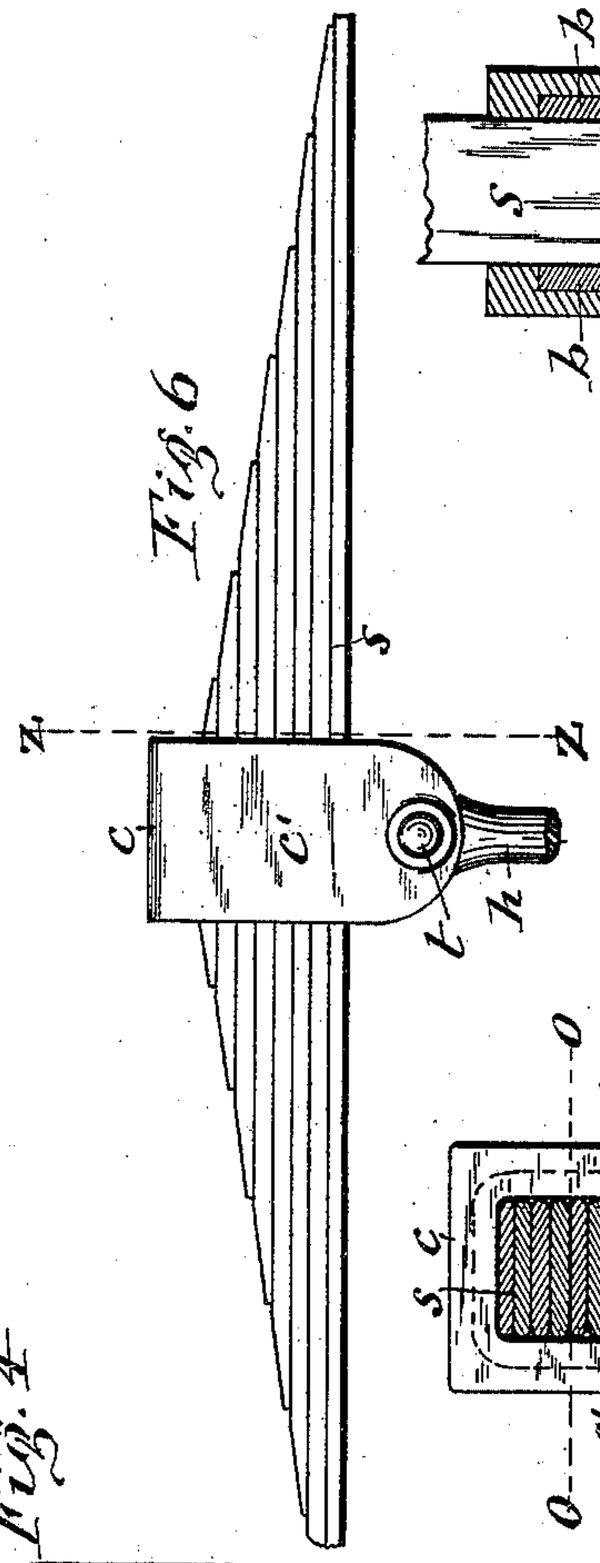

Fig. 6

Fig. 7

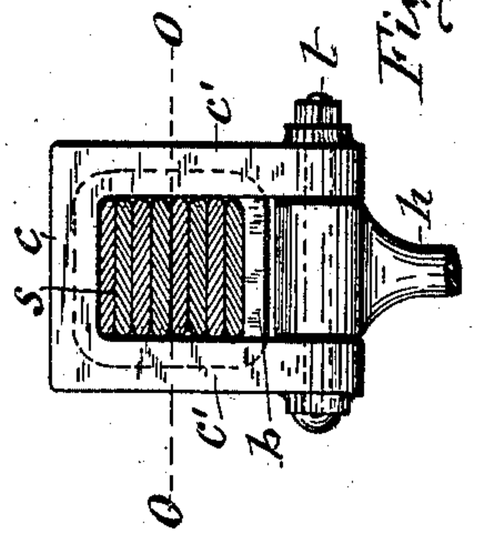

Fig. 8

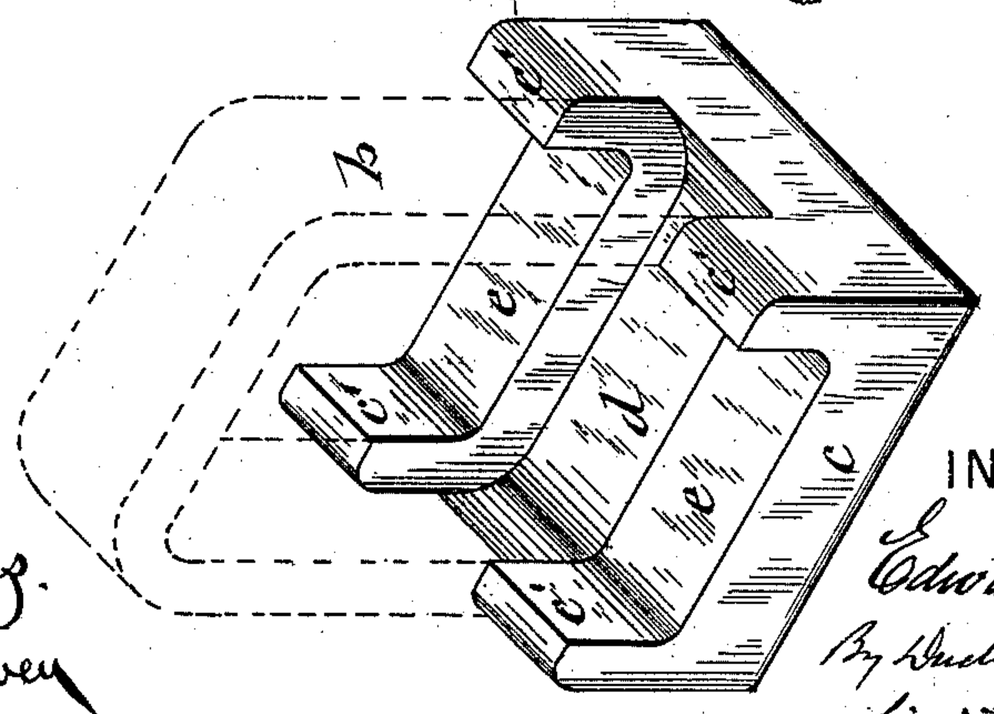

Fig. 4

WITNESSES:

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UNITED STATES PATENT OFFICE.

EDWARD CLIFF, OF NEWARK, NEW JERSEY.

SEMI-ELLIPTIC SPRING.

SPECIFICATION forming part of Letters Patent No. 474,159, dated May 3, 1892.

Application filed December 1, 1891. Serial No. 413,713. (No model.)

To all whom it may concern:

Be it known that I, EDWARD CLIFF, of Newark, in the county of Essex, in the State of New Jersey, have invented new and useful Improvements in Semi-Elliptic and Analogous Springs, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of springs which are composed of laminated elongated leaves—such as the so-called "semi-elliptic" and similarly-shaped springs, and is especially desired on the semi-elliptic supporting-springs of locomotives and tenders. Such springs are usually provided with a stout metallic band, which closely embraces the spring transversely at its center, and inasmuch as the center of the spring requires a broad firm bearing on the journal-box or other part of the truck the said band was formed of the required width to afford such a bearing. Such a construction, however, binds the spring to such a degree as to partly deprive it of its elasticity.

The object of my present invention is to obviate said defect; and to that end the invention consists, essentially, in the combination, with a semi-elliptic or analogous elongated laminated spring, of a narrow band embracing said spring transversely and a bearer connected to said band and projecting from the sides thereof and out of binding-contact with the spring, all as hereinafter more fully described, and set forth in the claims.

In the annexed drawings, Figure 1 is a side view of a semi-elliptic spring embodying my improvements. Figs. 2 and 3 are transverse sections, respectively, on lines *x x* and *y y* in Fig. 1. Fig. 4 is a detached isometric view of the bearer, which is employed in connection with the narrow spring-band. Fig. 5 is a side view showing said bearer attached to or formed directly on the journal-box of a truck-axle. Fig. 6 is a side view of my improvement as employed for a suspensory-support. Fig. 7 is a transverse section on line *z z* in Fig. 6, and Fig. 8 is a longitudinal section on line *o o* in Fig. 7.

Similar letters of reference indicate corresponding parts.

s denotes the semi-elliptic spring, composed of a series of leaves in the usual and well-known manner, and *b* represents the metallic band which closely embraces said spring transversely at its center. This band I form as narrow as possible but consistent with the strength required of said band, the reduction of its width being compensated for by an increased thickness of the band, in connection with this narrow band I employ the bearer *e*, consisting of a plate considerably wider than the band to obtain the necessary broad seat for the spring. Said bearing-plate may be formed of either pressed or drop-forged steel or iron or malleable casting, and in some cases it may be formed directly on the journal-box on which the spring is to be mounted, as represented in Fig. 5 of the drawings. In either case the bearing-plate *c* is formed with a recess or groove *d* across its center, and in said recess is seated directly the band *b*, which is held firmly in its position by the vertical walls of the recess. The recess *d* is of such a depth as to form at opposite sides thereof the seats *e e*, upon which the spring rides. These latter seats terminate with flanges *c' c'*, which abut against opposite sides of the spring, and thus prevent lateral displacement of the spring on the bearing-plate, the longitudinal displacement of the spring being prevented by the band *b*, confined in the recessed seat *d*, as before described.

By the bearings *e e* the spring receives a broad bearing equal to that afforded by the broad so-called "butt-band" heretofore applied to springs of this character, and at the same time the narrow band *b* obviates binding the spring and impairing the elasticity thereof.

When a suspensory-support is to be connected to the center of the spring, I extend the flanges across the sides of the spring and make them of sufficient length to cause them to project beneath the spring, where I perforate them for the reception of a bolt *t*, as shown in Figs. 6 and 7 of the drawings. To the said bolt is connected the usual hanger *h*.

It will be observed that the described bearer, with its flanges, is without binding-contact with the spring, and does not interfere with the elasticity thereof.

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

1. In combination with the spring *s*, the bearing-plate *c*, formed with the recess *d* across its center, and the band *b*, embracing the spring and seated directly on the bottom of said recess, as set forth.

2. In combination with the spring *s*, the band *b*, embracing said spring, and the bearing-plate *c*, formed with the recessed seat *d* for the band and with seats *e e* for supporting the spring at opposite sides of said band-seat, as set forth.

3. In combination with the spring *s*, the band *b*, embracing said spring, and the bearing-plate *c*, formed with the recessed seat *d* for the band, seats *e e* for the spring at opposite sides of the said band-seat, and flanges *c' c'* on the spring-seats engaging opposite sides of the spring, substantially as described and shown.

In testimony whereof I have hereunto signed my name this 27th day of November, 1891.

EDWARD CLIFF. [L. S.]

Witnesses:
THOMAS FEENEY,
R. G. REYNOLDS.