(No Model.)

T. J. FARRELL.

Locomotive Spring.

No. 233,666. **Patented Oct. 26, 1880.**

Fig. 1.

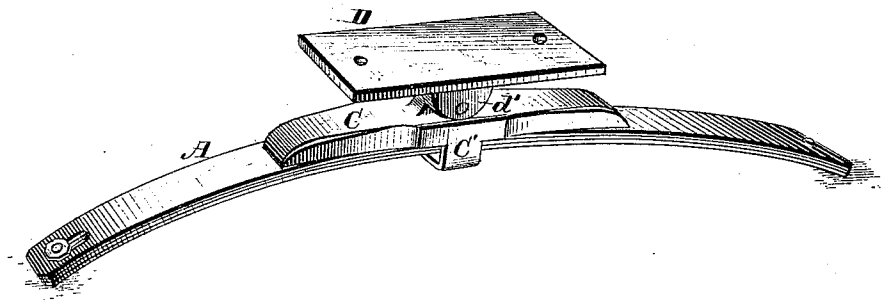


Fig. 2.

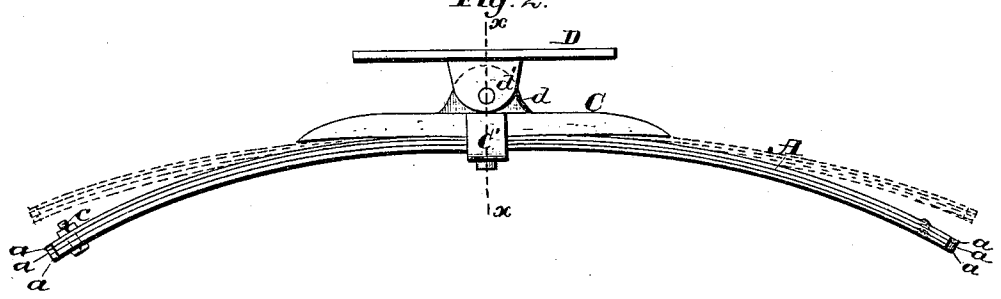
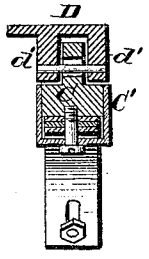


Fig. 3.



Attest:

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UNITED STATES PATENT OFFICE.

THOMAS J. FARRELL, OF FORT HOWARD, WISCONSIN.

LOCOMOTIVE-SPRING.

SPECIFICATION forming part of Letters Patent No. 233,666, dated October 26, 1880.

Application filed August 23, 1880. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. FARRELL, a citizen of the United States, residing at Fort Howard, in the county of Brown and State of Wisconsin, have invented new and useful Improvements in Locomotive-Springs, of which the following is a specification.

This invention relates to springs in which the bearing upon the convex side of the spring is distributed over the spring in proportion to the weight sustained.

My improvement is especially applicable to springs for locomotives, although it may be used in connection with springs for other vehicles.

It consists in the combination, with a half-elliptic spring, of an elongated bearing secured to the central portion of the spring with its bearing-surface normally resting upon the convex side of the spring only at the point of connection between the spring and bearing, and a casting or saddle hinged to the said bearing by a knuckle-joint, all as hereinafter more fully described.

In the accompanying drawings, Figure 1 is a perspective view of a half-elliptic spring with my improvement applied thereto. Fig. 2 is a side view of the same; and Fig. 3, a transverse central section taken on a vertical plane indicated by the line *x x*, Fig. 2.

Like letters in the several figures indicate like parts.

The letter A designates a half-elliptic many-leaved spring, the leaves *a a* of which are of uniform length and breadth, and held in position with relation to each other by the usual teats B, or by a bolt, *c*, passed through slots in the said leaves, either mode of keeping the leaves in place being suitable.

The letter C designates an elongated cast or wrought metal bearing, which is applied to the spring. This bearing rests upon the convex upper face of the spring, and is secured in place by means of a clip, C′, or in any other suitable way, the rigid connection and fixed point of contact between the bearing and the spring being at a point intermediate of their ends.

When the spring is in its normal position, as shown in full lines in the several figures of the drawings, the plane horizontal under side of the bearing rests upon the spring only at the central portion of its bearing-surface. In proportion as the spring is straightened out under the weight, however, an increased area of bearing-surface bears upon it, and hence, the bearing-surface being distributed upon the spring in proportion to the weight, the spring resistance will be greatly increased as the spring straightens out and all danger of breakage be avoided.

In Fig. 2 the dotted lines *y y* indicate a spring partially straightened out with the greater part of the bearing-surface of bearing C resting upon the spring.

To adapt the spring-connection between the axle and the frame to changes of grade or irregularities in the road, I provide a metal saddle or casting, D, which is hinged to the bearing C by a knuckle-joint. This joint, as herein illustrated, consists of a lug, *d*, of the lower bearing, connected between the two lugs *d′ d′* to the saddle by a bolt, d^2, passed through the three lugs; or the single lug may be formed with the saddle and the two lugs with the lower bearing, if found desirable. This saddle or casting is secured to the locomotive-frame and the ends of the half-elliptic spring, are retained by stirrups or hangers in the usual way.

It will, of course, be evident that in place of the half-elliptic spring herein shown and described, a full elliptic form of spring might be employed.

My improvement is not only applicable to locomotive steam-engines and tenders, but also to all classes of road-engines, wagons, cars, and other vehicles.

In place of the bolt connecting the lugs which constitute the knuckle-joint, as above described, any other suitable form of joint which dispenses with the bolt may be employed.

Should one of the leaves of the springs break, it can readily be removed and be replaced by another leaf, which will be carried along with the locomotive to which this spring is especially applicable.

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

The combination, with a half-elliptic spring,

of the elongated bearing C, secured to the central portion of the spring with its bearing-surface normally resting upon the convex side of the spring only at the point of connection between the spring and bearing, and a casting or saddle, D, hinged to the said bearing by a knuckle-joint, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

THOMAS J. FARRELL.

Witnesses:
J. H. McHENRY,
O. D. MAHON.