

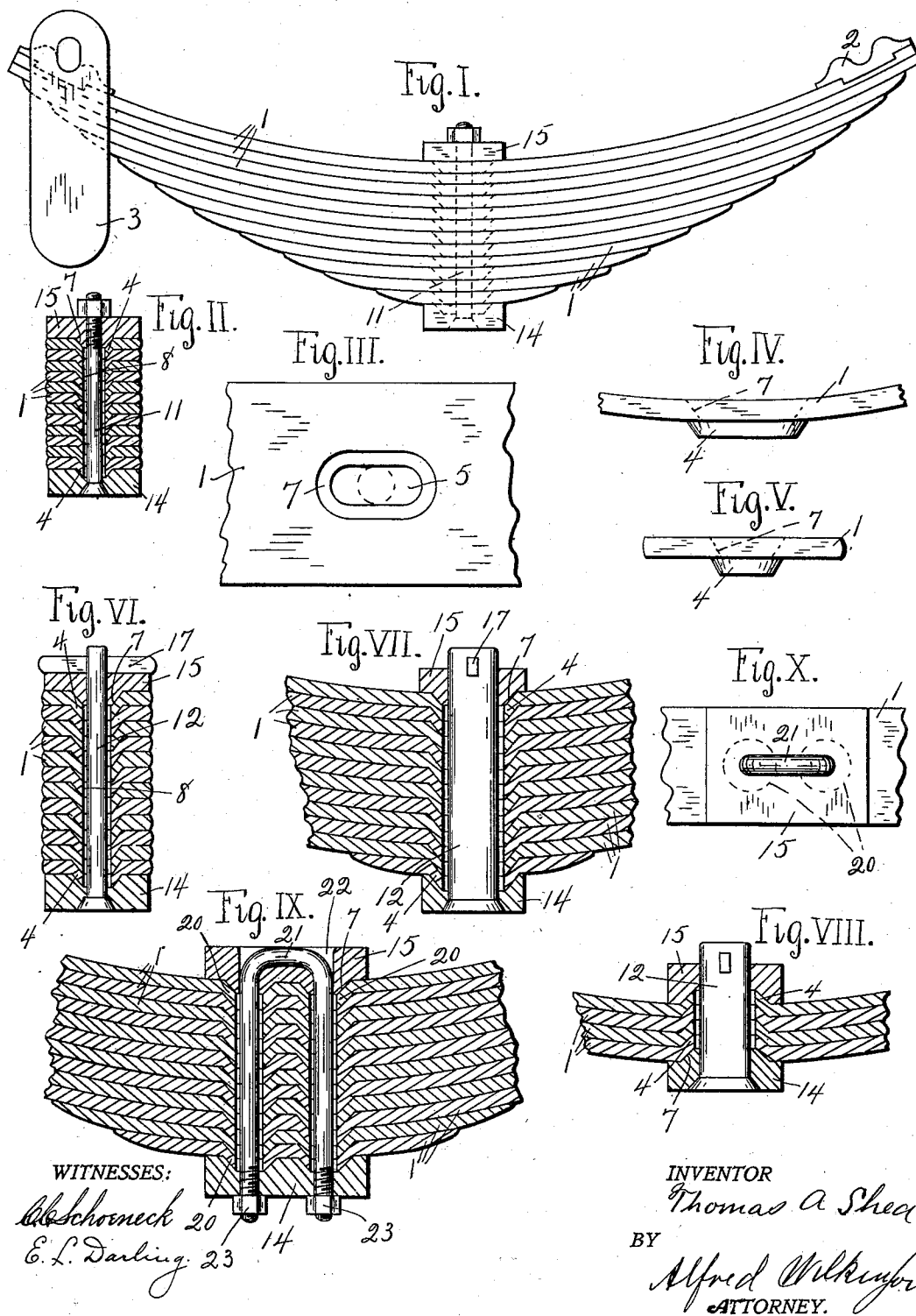
No. 718,733.

PATENTED JAN. 20, 1903.

T. A. SHEA.
LEAF SPRING.

APPLICATION FILED MAY 15, 1901.

NO MODEL.



UNITED STATES PATENT OFFICE.

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LEAF-SPRING.

SPECIFICATION forming part of Letters Patent No. 718,733, dated January 20, 1903.

Application filed May 15, 1901. Serial No. 60,314. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. SHEA, of Oswego, in the county of Oswego, in the State of New York, have invented new and useful
5 Improvements in Leaf-Springs, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to an elliptic or semi-
10 elliptic spring having a number of leaves superimposed, and particularly adapted for carrying locomotives, cars, &c.

The invention consists in forming each leaf with a central elongated lug by forcing down
15 the metal so that on one face of each leaf there is a projecting lug, on the other a corresponding elongated depression. These lugs correspond in all the leaves, so that they fit snugly when the leaves are assembled, and
20 from their elongated form, which is an important feature of my invention, absolutely prevent all lateral or longitudinal displacement of the leaves and all turn, twist, or rotation of the leaves one on the other, which
25 would cause irregular projection of their ends. The lug is perforated to receive the retaining bolt or key, and so strengthens and braces the leaf, so that it is not weakened by the metal removed for the hole. Furthermore,
30 these lugs take all the lateral and longitudinal strain, so that the bolt, key, or other securing means is subjected to tensile strain only.

My invention will be understood by reference to the accompanying drawings, in which
35 the reference-numerals of the specification indicate the same parts in all the figures.

Figure I is a side elevation of a semi-elliptic spring, showing my invention. Fig. II is a cross-section of the preceding through the
40 bolt. Figs. III and IV are respectively a top plan and a side elevation of a portion of a single leaf. Fig. V is a front elevation of a detached leaf. Figs. VI and VII are respectively a cross-section and longitudinal section
45 showing the leaves of the spring connected by a key instead of a bolt. Fig. VIII is a longitudinal section of a spring, showing a mere reversal in the formation of the lugs. Figs. IX and X are respectively a longitudinal
50 section and a top plan in which two

smaller perforated lugs are substituted for one elongated lug.

In the figures, 1 1 indicate the leaves of an elliptic or semi-elliptic spring, provided with the usual dabs or end plates 2, carrying the
55 hangers 3 and formed with the longitudinally-elongated lugs 4. (Best shown in Figs. III, IV, and V.) The lugs as here shown are formed with an elongated hole 5, though this may be made round, as indicated in dotted
60 lines in Fig. III, to receive a bolt. The lugs are externally tapered to fit the corresponding countersunk portion or depression 7 of the succeeding leaf, and where perforated
65 are internally made straight at 8, forming a straight hole, as shown in Figs. II and VI, for the bolt 11 or key 12.

14 indicates the spring-seat, made in various shapes to set in the saddle or bolster and fitting the lug of the lowest or short leaf to
70 prevent turning of the seat and to hold it firmly in position. 15 is a corresponding plate fitted to the upper leaf and acting as a washer for the nut or key.

In Figs. I and II a round and threaded bolt 11
75 is used to connect the leaves, and in Figs. VI and VII a key 12, held in place by a cross-key or cotter 17. A strap might be used for the bolt. Heretofore the leaves have been held in position by a continuous band to pre-
80 vent turning and displacement of the leaves one on the other; but this was not entirely successful and did not hold the leaves in perfect position on account of their working and
85 loosening within the band. Furthermore, the bolt or key or retaining-strap is cheaper in the first instance than the band and may be used again after the spring has been taken
90 apart for repairs, while the band was pressed on hot and then shrunk, so that when removed it was injured and could not be used again. As shown in the other figures, I have shown a construction in which the lugs project
95 downwardly; but in Fig. VIII a reversal is illustrated with the lugs projecting upwardly, which might be used where desired. It will be understood that where a key is used an elongated hole is necessary, but for a bolt only a round hole.

In Figs. IX and X is shown a modification 100

in which two round lugs arranged a short distance apart on the longitudinal axis of the leaf are substituted for a single elongated lug. Here the two lugs perform the same function
 5 of relieving the bolt of lateral and longitudinal strain and preventing the displacement of the leaves. The spring-seat 14 and top plate 15 are correspondingly formed, and the leaves are connected by a loop or U-shaped
 10 bolt 21, fitting groove 22 in the top plate and having usual nuts 23 23.

By my invention I have produced a superior and economical spring, in which the leaves are retained positively in position under various strains.
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Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In combination in a leaf-spring, a series
 20 of superimposed leaves, elongated, perforated lugs or projections on each leaf, said successive projections being correspondingly formed to fit the corresponding depressions in the adjacent surface of the next leaf, permitting the leaves to lie in close contact, preventing turning of the leaves on each other,
 25 the lugs being formed with one or more registering perforations and a key or keys arranged in said perforations to connect the
 30 leaves together.

2. In combination in an elliptic or semi-elliptic spring, a series of leaves of gradually-diminishing length, each leaf being formed with an integral central lug of greater diameter in the direction of the length of the leaf
 35 than at right angles thereto, said lugs projecting on one face of the leaf and being concave on the other, whereby the projecting lug of one leaf fits the concavity in the next, said
 40 lugs being formed with one or two perforations, and a bolt or bolts fitting said perforations.

3. In combination in a leaf-spring, a series of superimposed leaves of gradually-diminishing length, said leaves being centrally perforated to receive a securing-key, an elongated
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ridge around the hole on one surface of each leaf being formed so as to leave a corresponding cavity in the other surface, a spring-seat fitting the lower leaf, a top plate
 50 fitting the upper leaf, a key fitting the perforations and a cross-key fitting one end of said key to retain the leaves in position.

4. In combination in a leaf-spring, a series of superimposed leaves of gradually-diminishing length, said leaves being formed with a central elongated hole for a securing-key, integral elongated ridges or lugs surrounding
 55 said holes on one surface of each leaf, said ridges being straight on their inner face and tapering on their outer, the leaves being formed on their opposite faces with cavities corresponding to said ridges or lugs, a spring-seat fitting the lug of the lowest leaf, a corresponding top plate fitting the cavity in the
 60 upper leaf, and a key and cross-key for retaining the leaves in position.

5. In combination in an elliptic or semi-elliptic spring, a series of superimposed leaves of gradually-diminishing length, each leaf
 70 being formed with two round holes a short distance apart in its longitudinal axis and with tapering depressions around said holes on one surface, integral lugs surrounding said
 75 holes on the opposite surface of each leaf having straight inner faces and tapering exterior faces corresponding to said concavities, a spring-seat formed to fit the lugs of the lower leaf, a top plate formed to fit the concavities of the top leaf and being grooved to receive
 80 a bolt, said spring-seat and top plate being perforated to correspond to the leaves, and a U-shaped bolt fitting said holes to retain the leaves, spring-seat and top plate in position, and nuts fitting the ends of said bolt.
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In testimony whereof I have hereunto signed my name.

THOMAS A. SHEA. [L. S.]

Witnesses:

C. C. SCHOENECK,
 E. L. DARLING.