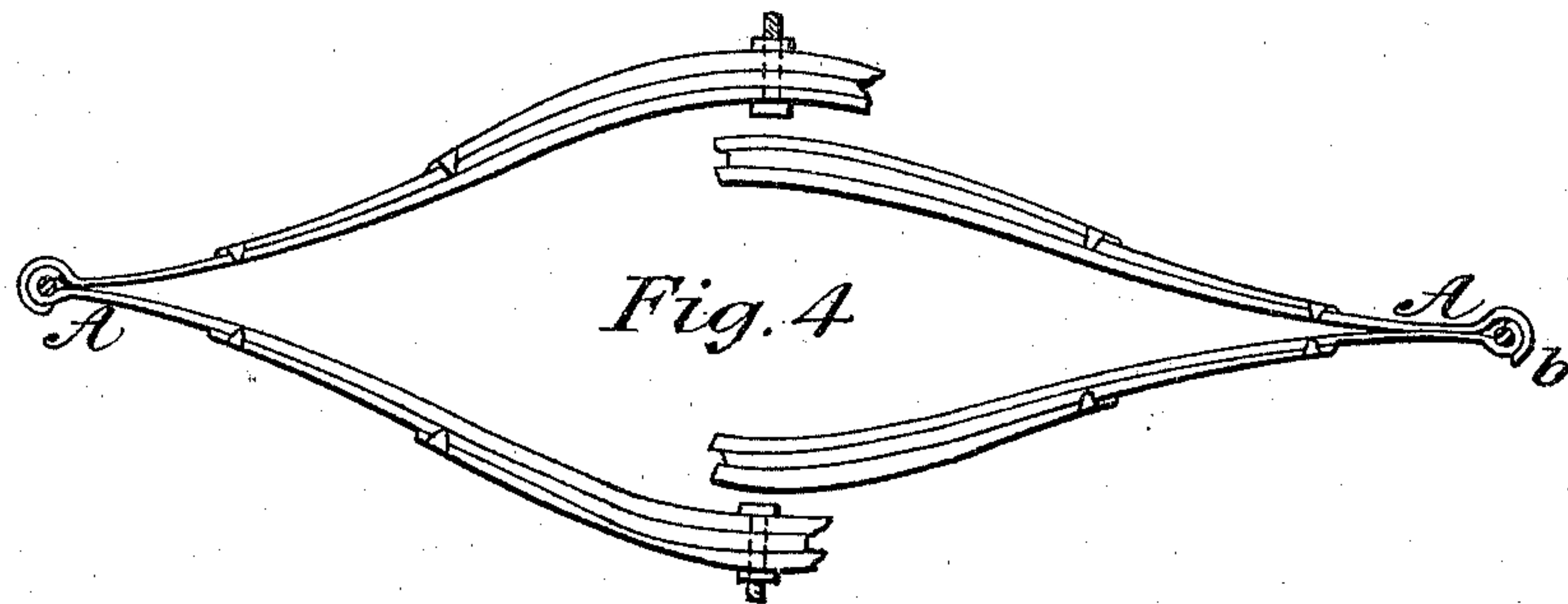
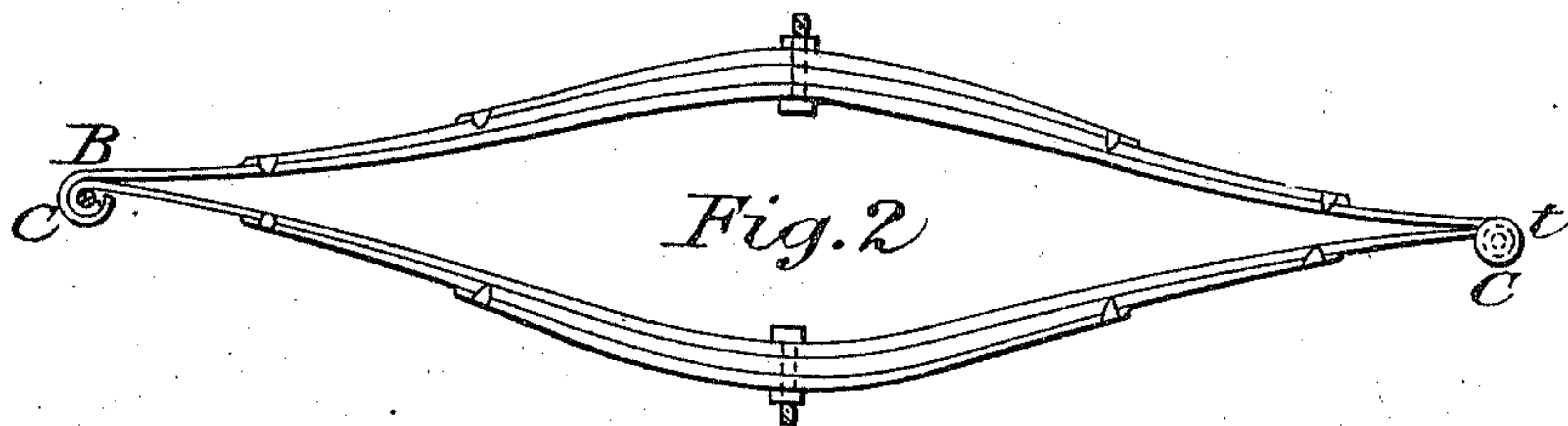
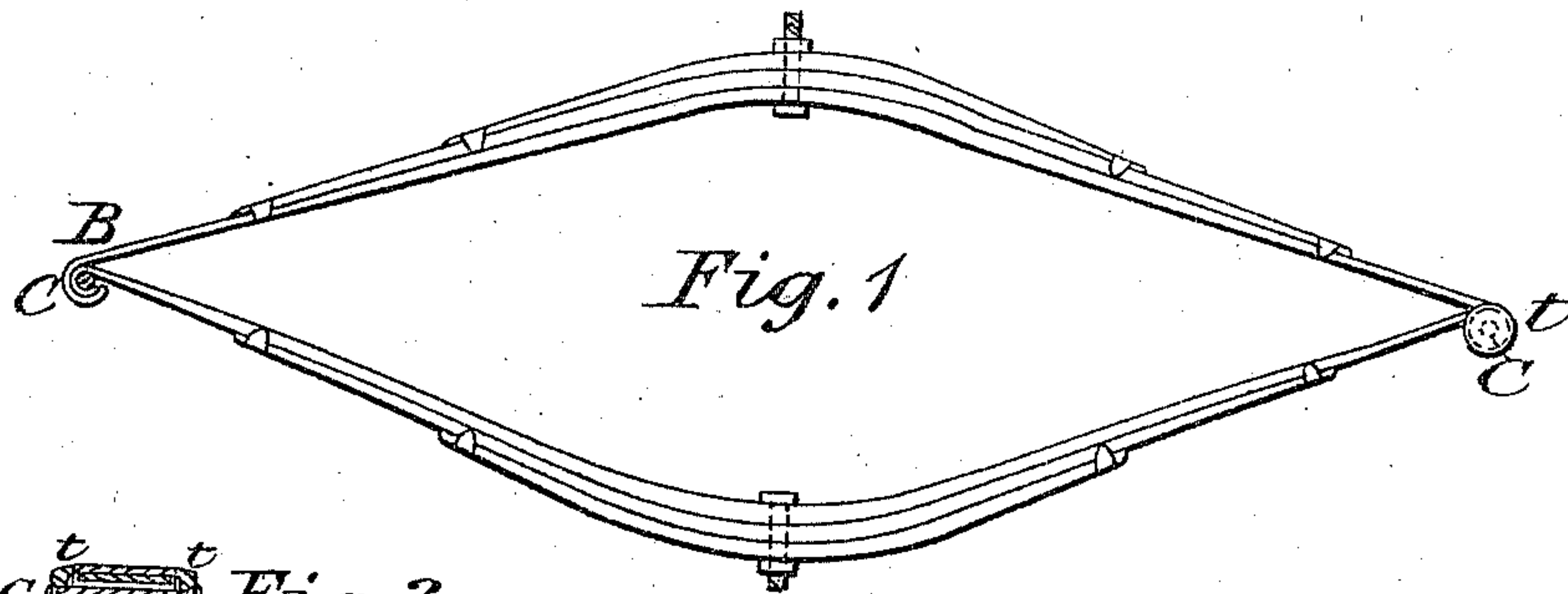


W. A. SWEET.
Carriage Spring.

No. 97,458.

Patented Nov. 30, 1869.



Witnesses:

Reuben Murray
Wm G Vincett

Inventor:

Wm. A. Sweet

United States Patent Office.

WILLIAM A. SWEET, OF SYRACUSE, NEW YORK.

Letters Patent No. 97,458, dated November 30, 1869.

IMPROVED ELLIPTIC SPRING.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, WILLIAM A. SWEET, of the city of Syracuse, county of Onondaga, and State of New York, have invented a new and useful Improvement in "Elliptic Springs;" and I do hereby declare the following to be a sufficiently clear and exact description of the same, that any one skilled in such matters may, reference being had to the accompanying drawings, which form a part of this specification, construct and use my invention.

The nature of my invention consists in the combination of a concave washer with the curved end or curl of an elliptic spring, in such a manner that it shall bind only on the outer leaf, thereby permitting the inner leaf to work perfectly free from the binding-action of the rivet or bolt, that holds the two leaves together, when said leaves are both curled in the same direction, or one around the other.

Figure 1 is a view of my spring at rest, with the washers removed at one end, to give a better view of the joint.

Figure 2 is a view of the same compressed, to show the manner in which the leaves fold together upon each other.

Figure 3 is a vertical section through the "curls" or curved ends of the inner leaves, and shows the concave washers binding or clamping only the outer curl or end of the spring.

Figures 4 and 5 are views of portions of springs, as now usually constructed, and are here introduced for the purpose of more clearly describing the nature and advantages of my invention.

The usual method of forming the curls or ends of the inner leaves of such springs is best shown at figs. 4 and 5, where one leaf is curved around the end of the other, but in the opposite or reverse direction, thereby throwing the weight or pressure of the spring upon the rivets, that bind the leaves together; consequently, while the rivet is held firmly within the inner curl, the washers, if any are used, or the ends of the rivet must not bind the outer curl, else freedom of action in the joint will be prevented.

Such a construction also soon causes the rivet to be so worn, that its binding-action is not complete, and, in the course of time, becomes quite inefficient.

To partly obviate this difficulty, these leaves are so curved by some manufacturers, as to bring the inner faces of the leaves near the rivets in close proximity to each other, as shown at A, fig. 4.

By such a construction, the pressure is wholly or partially removed from the rivet, when the spring is compressed, the point *a* serving as a fulcrum between the two leaves. But it often happens that when a spring so constructed is heavily laden, this fulcrum serves not only to relieve the pressure on the rivet, but to actually open the curls on the ends of the leaves, as shown at *b*, figs. 4 and 5.

The view at fig. 5 is enlarged, to show the manner more distinctly of how the curl or joint is opened.

Having thus briefly explained some of the points in the springs in common use, but little need be said to show the nature and advantages of my invention, as a glance at figs. 1, 2, and 3, will show that the rivets cannot, under any circumstances, be compressed by the curl of the spring, but will, under any conditions of labor or rest, only be required to hold the washers in their proper position.

As shown at B, figs. 1 and 2, the ends of the inner leaves of the spring are both curled in the same direction around the rivet C, one of the leaves, of course, enclosing the end of the other, and thus the inner faces of the two leaves are always in contact with each other, and when compressed, as shown at fig. 2, fold gradually together, or upon each other, and thereby dispense completely with the action of a fulcrum, as already explained in figs. 4 and 5.

The washers for holding the leaves in working position are so countersunk on their inner faces, that however tightly the rivet may compress or bind them together, they clamp the edge of the leaf only on the end of the outer curl, leaving the inner one to work perfectly free, as best seen at fig. 3, where the inner faces of the washers *t t* are shown as touching only the ends of the outer curl of the spring.

Having made thousands of these springs for vehicles of various kinds, and especially for seat-springs of mowing-machines and harvesters, I have had most excellent opportunities of comparing the two styles here shown, and since I began the construction of such springs, as shown at fig. 1, or with my improvements, I have not been able to sell any of the old pattern, as shown at fig. 4.

The greater ease in forming the leaves so as to fit together nicely, under all degrees of pressure, constitutes, in my opinion, a very "useful" feature of my invention, and the immense saving to the consumer, in avoiding breakages, which often occur at the fulcrum at fig. 5, or in the old style, makes my improvement of great value to the public.

I do not wish to be understood as claiming, broadly, so curving or curling the leaves of such springs, as I am aware that it has been done before; neither do I claim the concave washer, by itself, as that is well known in the mechanic arts; but

What I do claim, and desire to secure by Letters Patent, is—

The combination, in an elliptic spring, of the concave washers *t t* and rivet C, when clamping the outer leaf of springs, whose curls are formed substantially as described.

WM. A. SWEET.

Witnesses:

JNO. H. SEMMES,
BOYD ELIOT.