

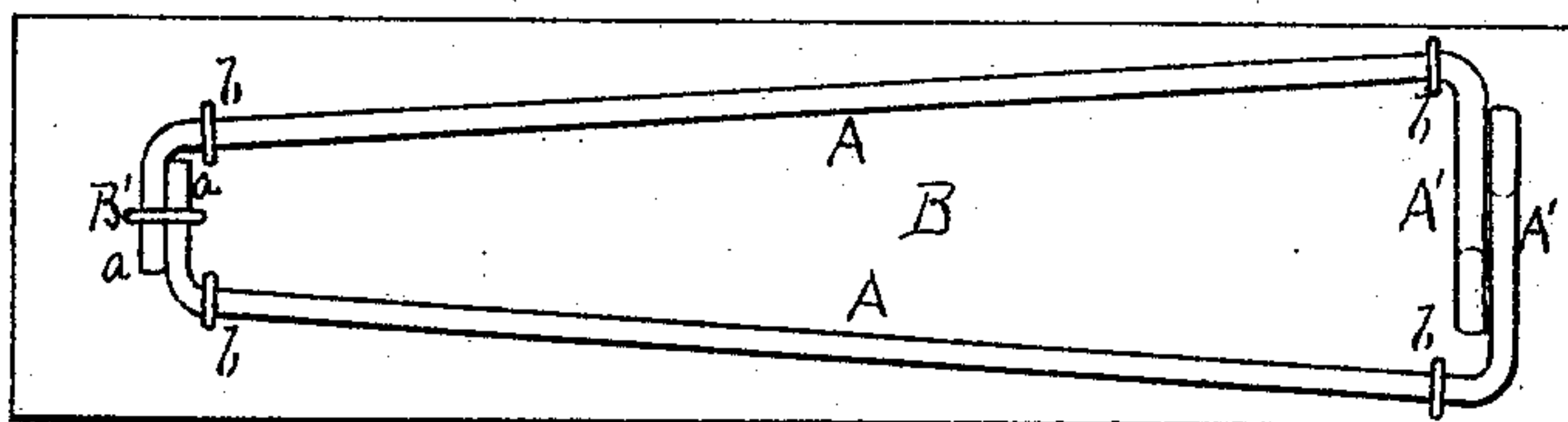
B. HERSHEY & R. F. GAGGIN.

Improvement in Torsion-Springs for Vehicles.

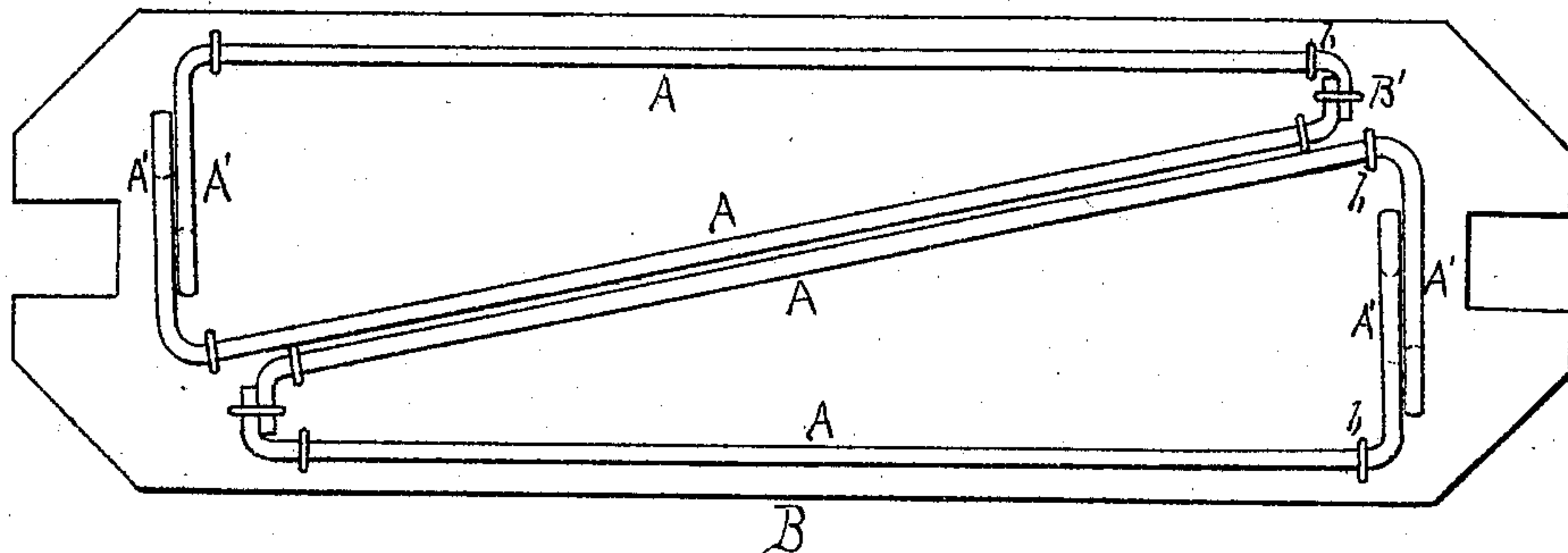
No. 116,187.

*Fig. 1.*

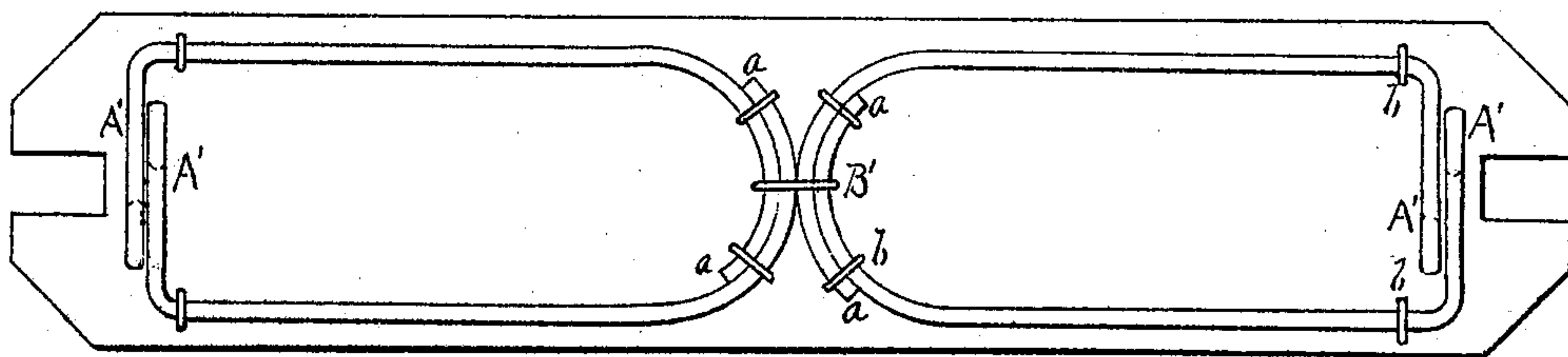
Patented June 20, 1871.



*Fig. 2.*



*Fig. 3.*



Witnesses:

J. C. Brecht.  
Edwin James

Inventor.

B. Hershey & R. F. Gaggin.  
per J. E. & Holmead  
Attorney.

# UNITED STATES PATENT OFFICE.

BENJAMIN HERSHEY AND RICHARD F. GAGGIN, OF ERIE, PENNSYLVANIA,  
ASSIGNORS TO THEMSELVES, E. GEER, AND RICHARD DUDLEY.

## IMPROVEMENT IN TORSION-SPRINGS FOR VEHICLES.

Specification forming part of Letters Patent No. 116,187, dated June 20, 1871.

*To all whom it may concern:*

Be it known that we, BENJAMIN HERSHEY and RICHARD F. GAGGIN, of the city and county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Torsion-Springs for Vehicles; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing and the letters of reference marked thereon making part of this specification, in which—

Figure 1 is a plan view of our improved V-shaped spring arranged on the bolster-plate. Fig. 2 is a plan view of two of our improved V-shaped springs arranged on the bolster-plate. Fig. 3 is a plan view of two of our improved U-shaped springs arranged on the bolster-plate.

Our present improvement in torsion-springs is designed for all classes of vehicles used as land conveyances, such as carriages, wagons, carts, &c., and is especially adapted for springing railroad cars.

It is well known to those familiar with this branch of the mechanic art that of all styles of torsion-springs now in use the most popular, owing to their conceded superiority, are the U or curved and the V or angular. This is due to the fact, as is fully illustrated in B. Hershey's patent of March 28, 1871, that no other form of spring is capable of being so advantageously arranged on a bolster or other bed-plate as the springs of this style, as no other springs, owing to their form, so economize the space, and at the same time furnish the same length of rod for torsional action as do the U or curved and the V or angular. While practical experience has demonstrated the advantages of the curved or angular springs over all others, it has developed only a single defect, and that is this: Of course, in all torsional springs the elasticity of the spring is produced by and is due entirely to the twisting or wrenching of the rod. When a straight rod is used the strain incident to the torsional action of the spring is easily supported and resisted at the point of its rigid or fixed center or bearing; but not so in the U and V when made, as they now are, of one continuous rod, as the curve or angle of these springs is caused to resist an entirely different and far greater strain. The

lever or turned-in arms, when the torsional action of the spring is exerted, necessarily so turns the long arms of the spring as to twist them in directions directly contrary. The result is that this opposite wrenching of the rod is exceedingly liable to break the same at its angle or curve.

To remedy this defect is the object of our present invention; and consists in so forming and cutting or splitting the rods that they can be so arranged that the head of the one shall fit or lap over the other, and be secured at the same fixed center or axial bearing in such manner as to preserve the outline of the curved or angular spring. This secures to our improvement all the advantages of the U or curved and the V or angular, and at the same time avoids their single defect—the wrenching of a single rod at the same time in directly opposite directions.

To enable others skilled in the art to make and use our invention, we will now proceed to describe its construction and operation.

A A represent the spring-rods that compose the spring, and which are constructed of suitably-tempered steel. These rods are formed with the usual lateral lever-arms A' A', through which the torsional action of the spring is exerted. These spring-rods A A are secured to the bed-piece B by means of a central or axial staple-bearing, B', and additional staple-supports b b, arranged as shown. In Fig. 2 our improvement is shown as applied to the V or angular, and in Fig. 3 to the U or curved spring.

Heretofore springs of the class or character illustrated in the accompanying drawing have invariably been constructed out of a single rod. Practical experience has shown that the springs thus formed are always more or less liable to break at or near their angle or curve, or at that section which is secured by the center bearing-staple B'. The reason of this is obvious: When pressure is applied in depressing the lever-arms A' A' toward the bolster-plate, which necessarily twists each of the arms A A inwardly or toward the center of the bolster-plate, this, as the arms A A are opposite, causes a wrenching of the rod in directions which are directly contrary. An immense strain is the result, and one that is not prop-



erly equalized, but which has to be resisted almost entirely at the center bearing B' of the spring.

By our improvement we obviate all this difficulty, secure all the advantages due to the angular or curved form, and, comparatively speaking, accomplish the same without adding to the cost of the spring.

As will be seen by reference to the drawing, instead of using a single rod we use two, or a rod cut into two sections, each the exact counterpart of the other, and each so constructed that the shoulder-bearing *a* of the one shall fit or lie over the shoulder-bearing *a* of the other. By this arrangement it will be seen that the spring is not subjected to the counter-strain of being wrenched at the same time in opposite directions, but each spring-rod, in its torsional action, is only required to resist the effect of

a single wrenching, and always in a uniform direction.

Having thus fully described our invention, what we claim therein as new, and desire to secure by Letters Patent of the United States, is—

The **V** or angular and the **U** or curved spring, formed of two rods or sections, so as to avoid the opposite wrenching of the rod during the torsional action of the spring, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

BENJAMIN HERSHEY.

RICHARD F. GAGGIN.

Witnesses:

JACOB F. WALTHER,

CH. STREUBEN.