

B. HERSHEY.

Improvement in Torsion-Springs for Vehicles.

No. 116,186.

Patented June 20, 1871.

Fig. 2.

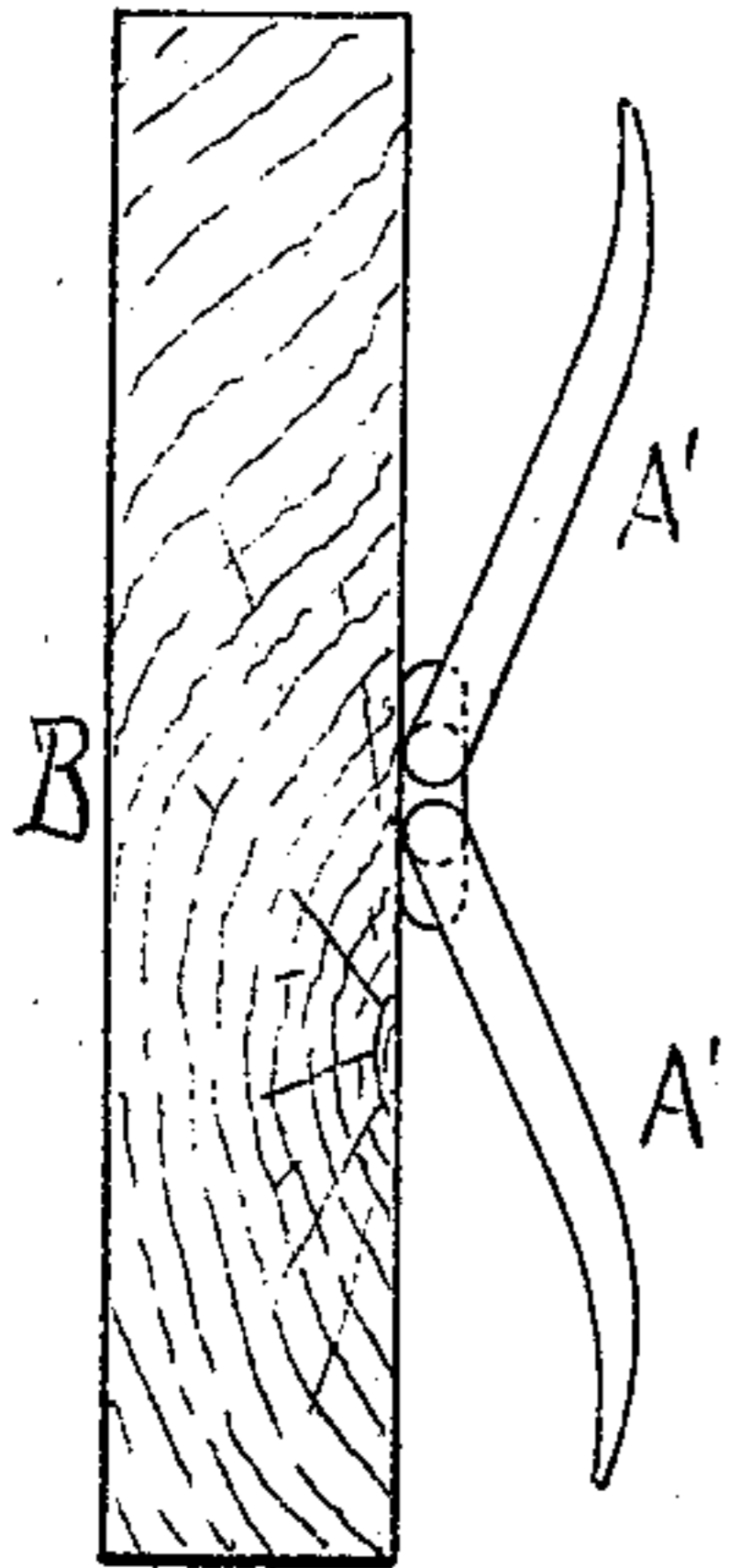


Fig. 1.

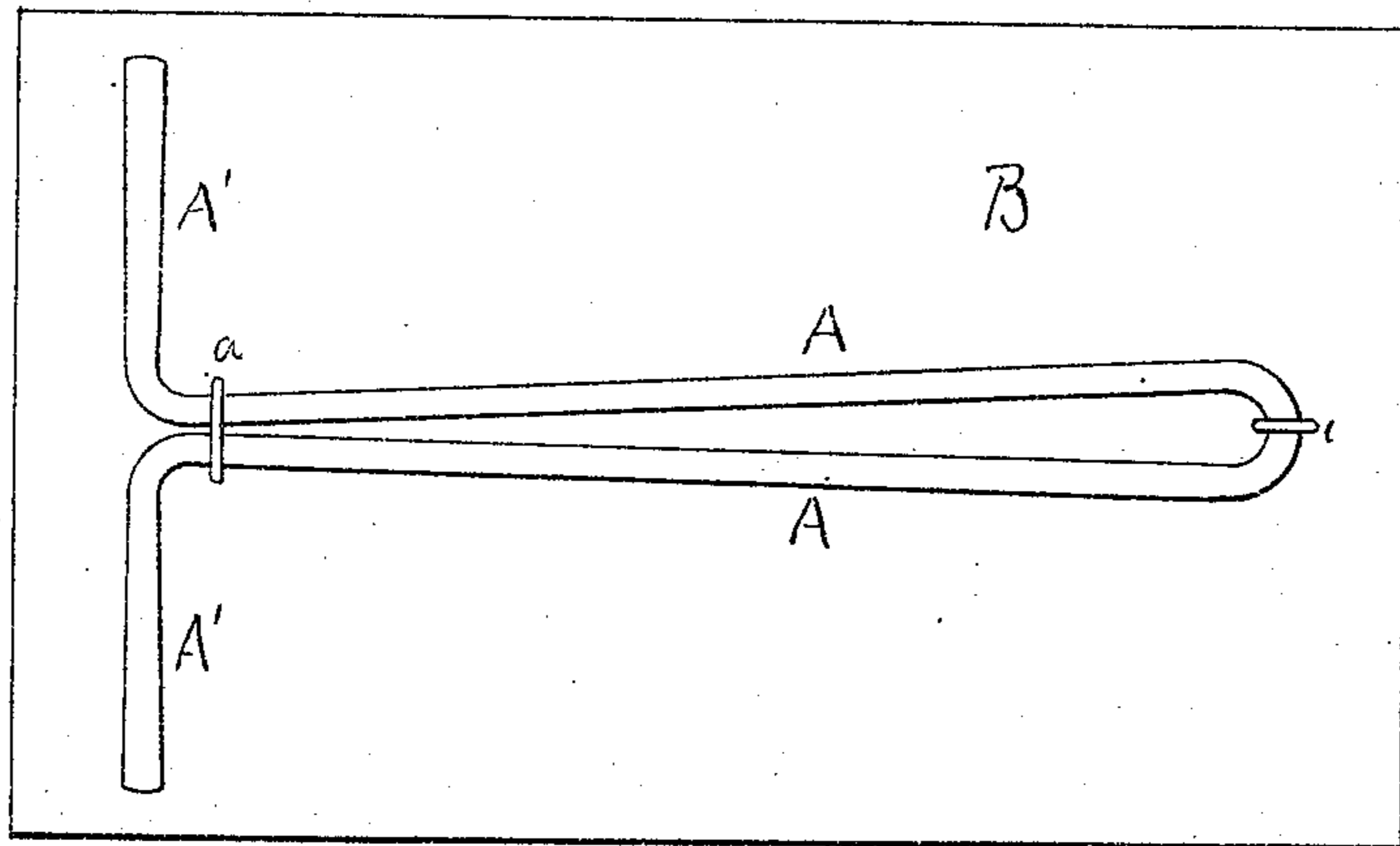


Fig. 4.

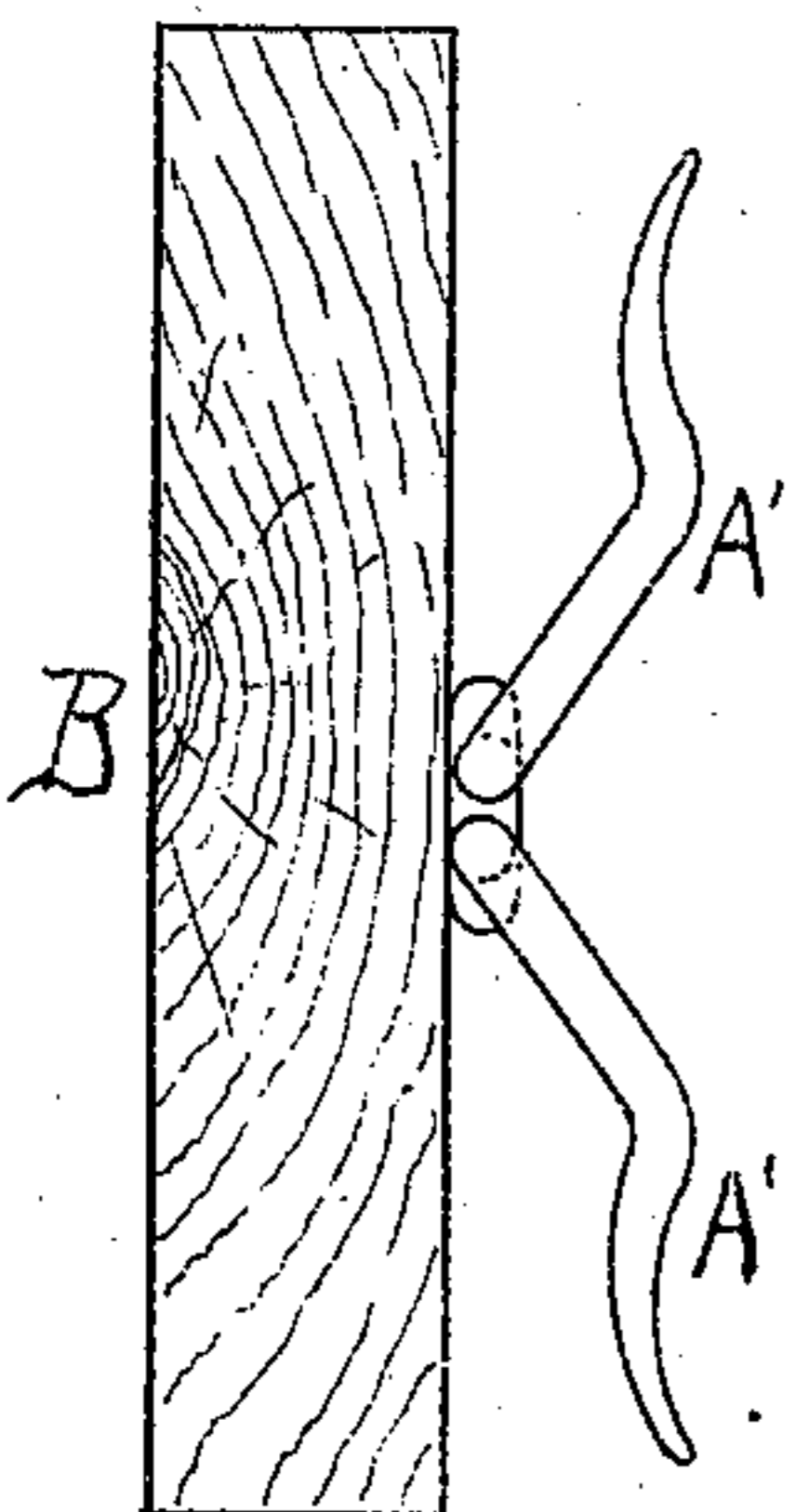


Fig. 3.

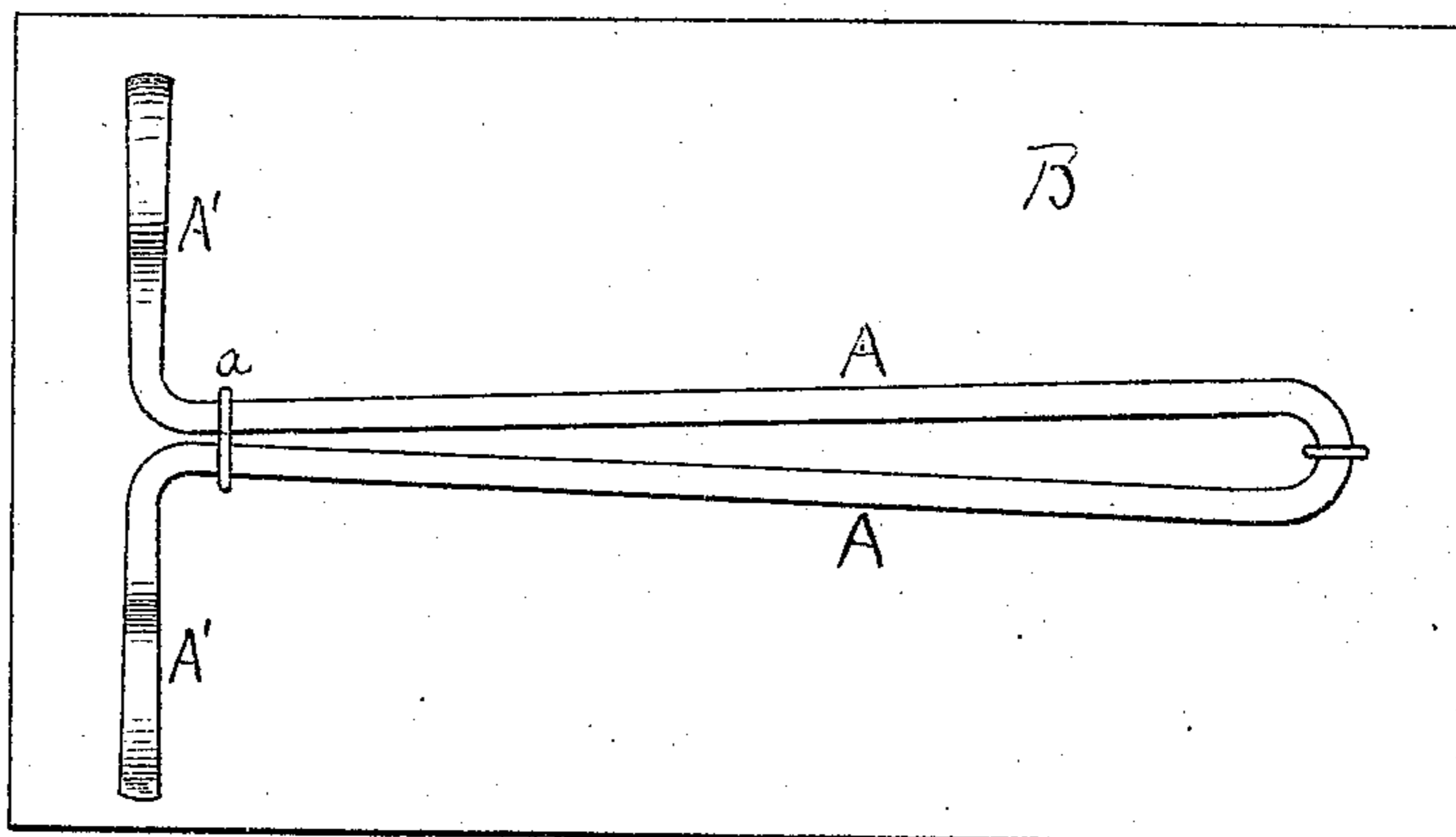


Fig. 5.

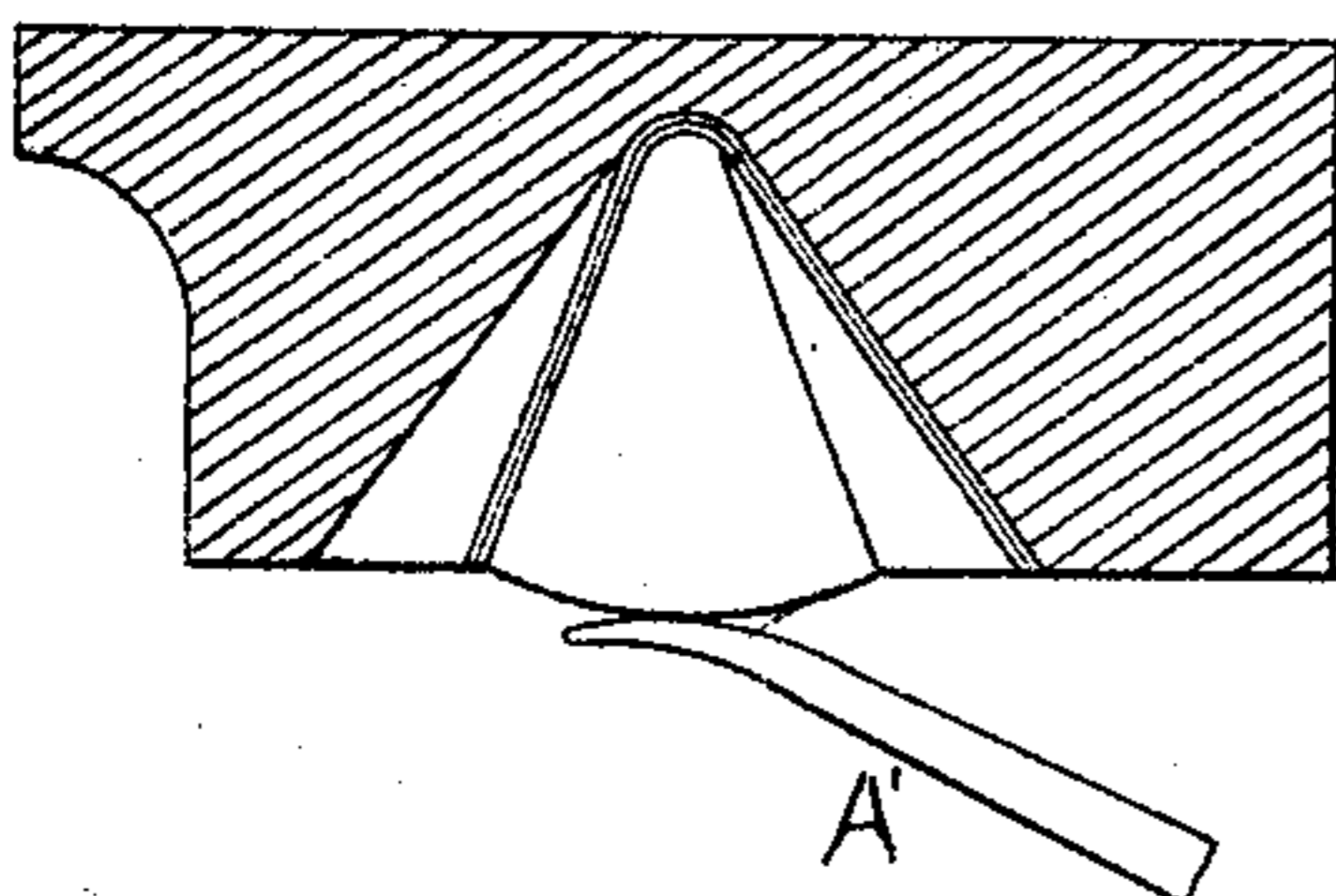
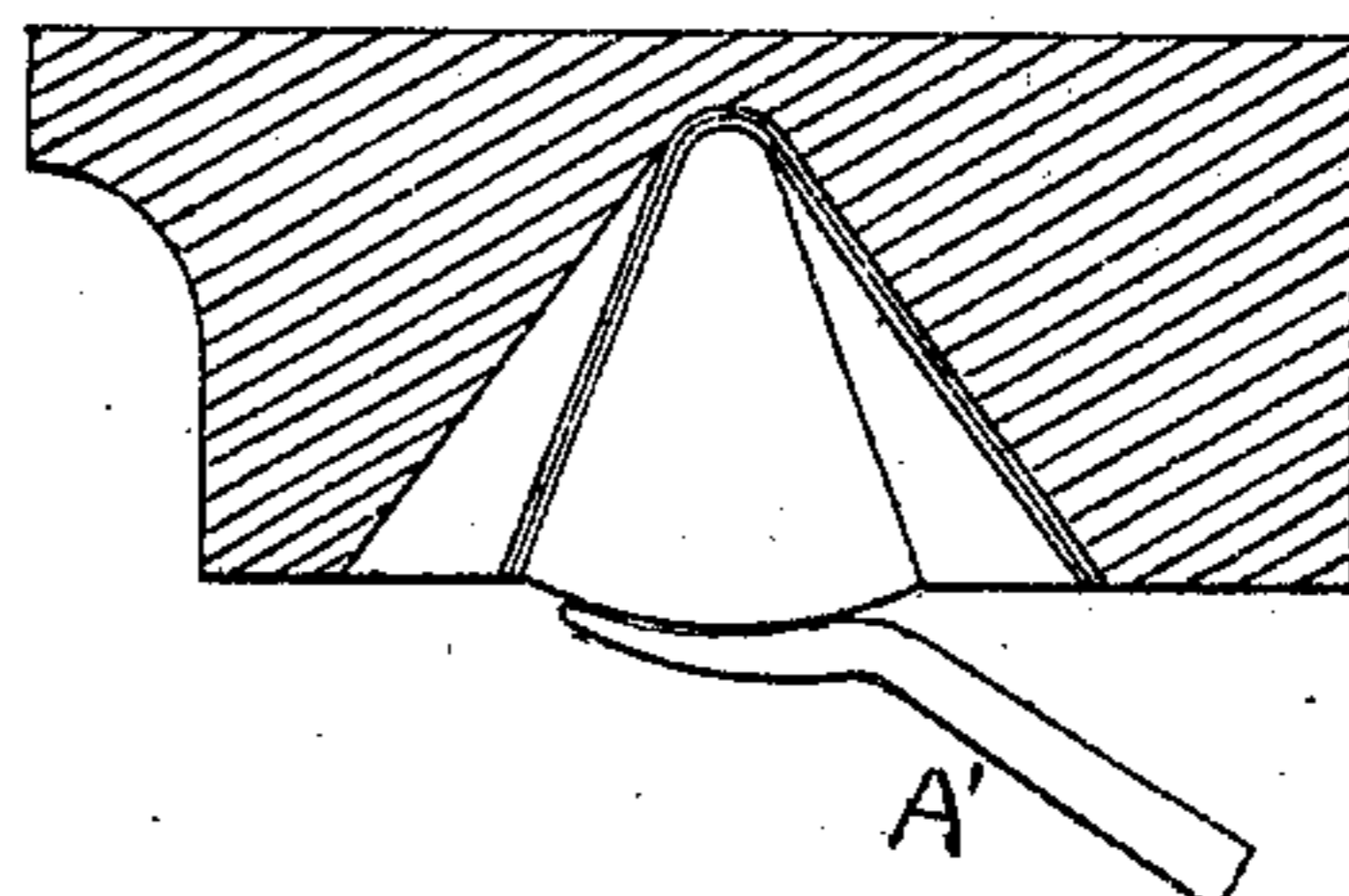


Fig. 6.



Witnesses:
Edwin James.
Wm Jones.

Inventor:
Benjamin Hershey
per J. P. D. Holmead
Attorney

UNITED STATES PATENT OFFICE.

BENJAMIN HERSHEY, OF ERIE, PENNSYLVANIA, ASSIGNOR TO HIMSELF,
E. GEER, RICHARD DUDLEY, AND RICHARD F. GAGGIN.

IMPROVEMENT IN TORSION-SPRINGS FOR VEHICLES.

Specification forming part of Letters Patent No. 116,186, dated June 20, 1871.

To all whom it may concern:

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

Figure 1 is a plan view. Fig. 2 is an end view of Fig. 1. Fig. 3 is a plan view, the lever-arms being convexed. Fig. 4 is an end view of Fig. 3. Figs. 5 and 6 illustrate the spring as applied to a rocker-plate.

My present improvement in torsion-springs, like those of my former patents, is designed for all classes of vehicles which are used as a means for land conveyance, such as carriages, wagons, carts, &c., and is most admirably adapted for springing railroad cars. Heretofore, as is well known, in this class of springs the lateral lever-arms have invariably been turned in, so meeting or crossing each other as to have their normal or original bearing at or near the center of the bolster or other bed-piece. The result is, owing to this central bearing and tread of the lever-arms of the spring, the load is sustained at the center of the bolster-plate, which usually causes a rocking or swaying to-and-fro motion, and which movement is not desirable. This difficulty is entirely obviated in the present improvement, and is accomplished without additional cost in the manufacture of the spring, and also without in any manner effecting its torsional action or power. To secure the result stated, and this it is which constitutes the chief advantage of my improvement, I simply reverse the position or direction of the lateral lever-arms of the spring. While it is now the uniform practice in manufacturing to turn these arms in, in my improvement they are turned out, so that when the spring is secured, instead of the tread of the lateral lever-arms being at the center of the opposite bolster-plate, it shall be at the sides of the same. My invention also consists in constructing the lateral lever-arms of the spring of such form as to leave a concaved recess on its inner face as applied to the bolster or other bed-plate. This portion of my invention is especial-

ly applicable to and is designed to be used in connection with the anti-friction rocker-plate described and claimed in the patent issued to R. Dudley and myself, as joint inventors, February 28, 1871. The great advantage of this arrangement is that, owing to the fact that the curve of the lever forming an arc of a circle different from that of the head of the rocker-plate in operation, a lengthening of the lever in accordance with the weight to be resisted is effected. My invention also consists in giving to the spring such a looped form as will leave its broadest section at the head and its narrowest at the point or angle from which the lateral lever-arms project or turn out. The advantage of this form in connection with the lateral lever-arms, when so formed as to extend from the spring in opposite directions, will readily suggest itself.

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

The spring shown in the accompanying drawing is a loop or reverse V or angular spring—that is, instead of its narrowest portion being at its head or closed section, it is at its open section, or at such point as the elbows formed by the lateral lever-arms A' A' are turned off from the main shanks or arms of the spring. In a spring thus constructed, instead of the arms A A at their lower section being secured in independent rigid bearings to the bed or bolster-plate B, they can be secured by a single bearing, *a*, as is its other end. Another advantage of this style of spring is, while it economizes the space on the bolster-plate as much as any angular or V-spring, its head does not form such an acute angle, and consequently the strain incident to the opposite torsional action of the spring is not centered so much at a given point, but, on the contrary, is equalized along its broad head. But this is not the chief advantage of my present improvement; that consists in the form or direction given to the lateral lever-arms A' A'. Instead of turning them in, as has heretofore been done, I turn them out, so that, while they project from the long arms A A, as usual, and nearly at right angles thereto, they do not meet or cross, but, on the contrary, extend out in opposite directions, as clearly shown in the drawing. The result is they do not rest on the opposite bolster or other

bed-plate at or near its center, and consequently the resistance of the load is not borne at the center, but at the sides of the bolster-plate. This equalizes the bearing and avoids all rocking of the spring, which is objectionable, and always liable to occur with the turned-in lateral lever-arms.

These turned-out arms, I desire it understood, are applicable to all curved, angular, and looped springs, and also equally applicable to straight springs. When the latter are used, instead of running the straight arms parallel at the side of the plate, with the lever-arms turned in, I propose to run them parallel down the center with the lever-arms turned out; and I also desire it understood this principle of turning the arms out is equally applicable whether the lateral lever-arms A' A' are formed in one piece with the long arms A A or formed independent thereof and afterward attached by head and socket-joint or any other equivalent means.

The remaining feature of my invention is especially designed for use in connection with the rocker-plate described and claimed in the patent issued to R. Dudley and myself, as joint inventors, February 28, 1871, and hereinbefore referred to. In that patent the lateral lever-arm met and acted as illustrated in Fig. 5.

In Fig. 6 my improvement is shown, and consists in giving to the face of the lever that is to act on the plate a convex face. The degree of the curvature is not uniform, but varies a

little, so that the plate shall not enter and work in the recess of the lever as in a close cap. The advantage of this variation is this: while the first bearing of the rocker is fixed, the depression of the lever will so alter its position as to change its bearing, and consequently, in effect, lengthens or shortens the lever as the pressure to be resisted in the load to be borne is increased or diminished.

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

1. The looped spring, when the same is so formed that its narrowest section shall be at the point from which the lateral lever-arms turn off, substantially as described.

2. The looped torsion-spring, when the lateral lever-arms are so turned out as to project in opposite directions, substantially as described.

3. The lateral lever-arms, when the same are formed with a concave face as to act in connection with rocker-plates, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BENJAMIN HERSHEY.

Witnesses:

J. F. WALTHER,

E. STREUBER.