4 Sheets--Sheet 1.

D. E. PARIS.

Torsional Springs for Vehicles.

No. 169,032. Patented Oct. 19, 1875.

Fig. 1.

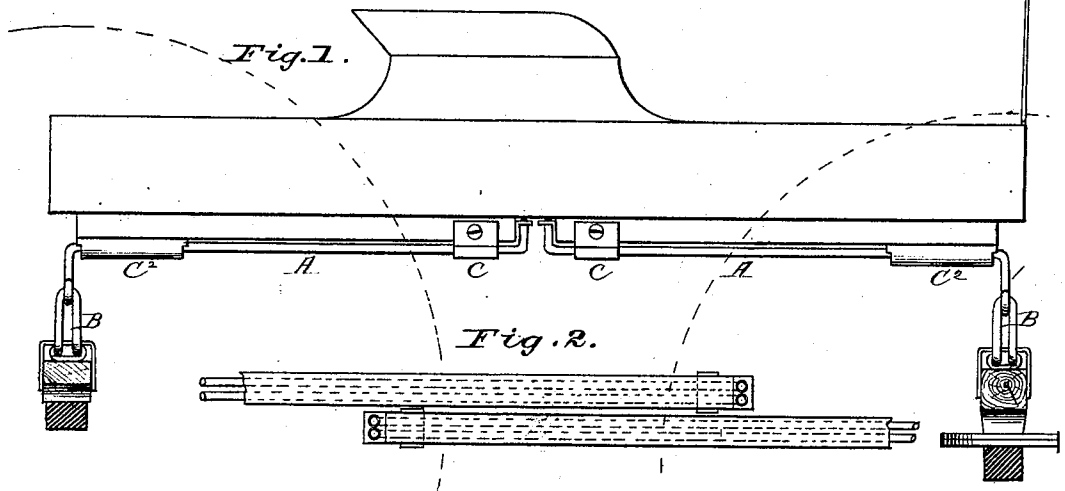


Fig. 2.

Fig. 3.

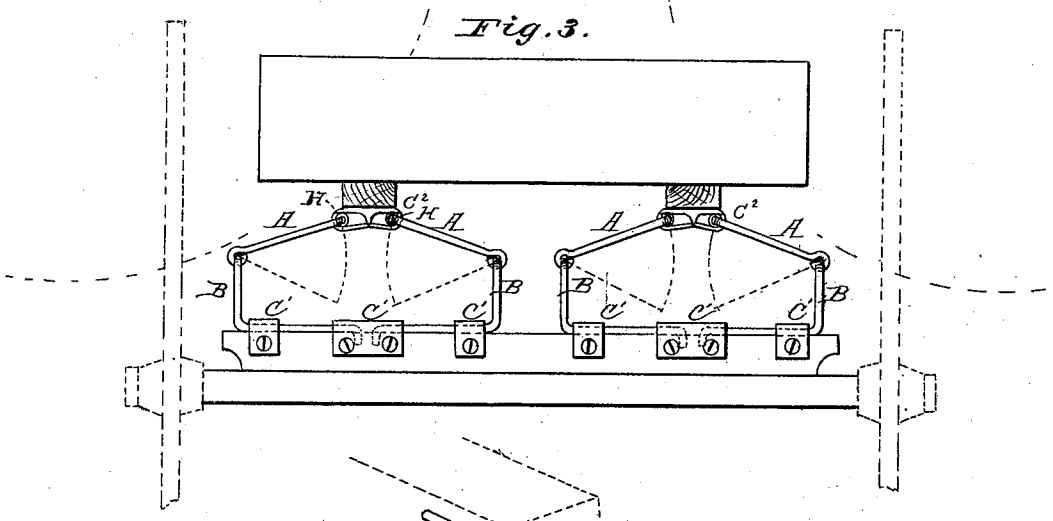
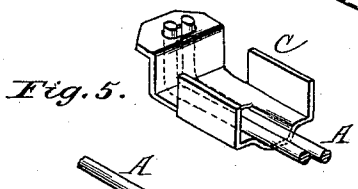


Fig. 5.



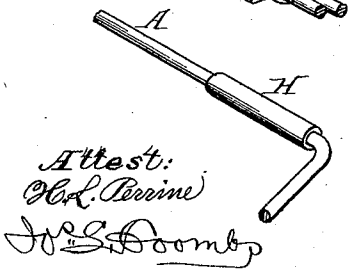


Fig. 4.

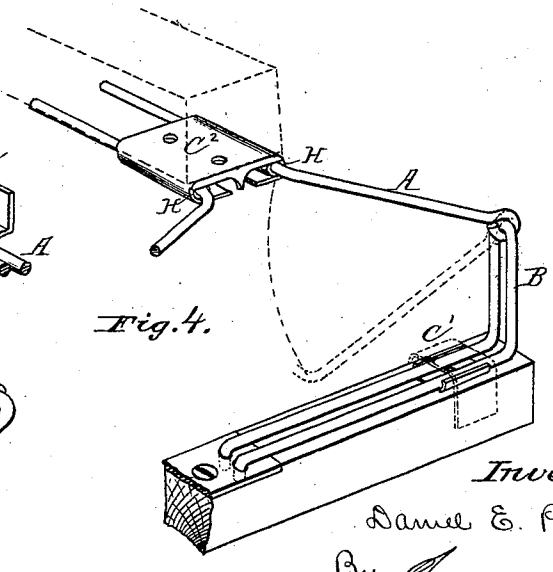


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Fig. 6.

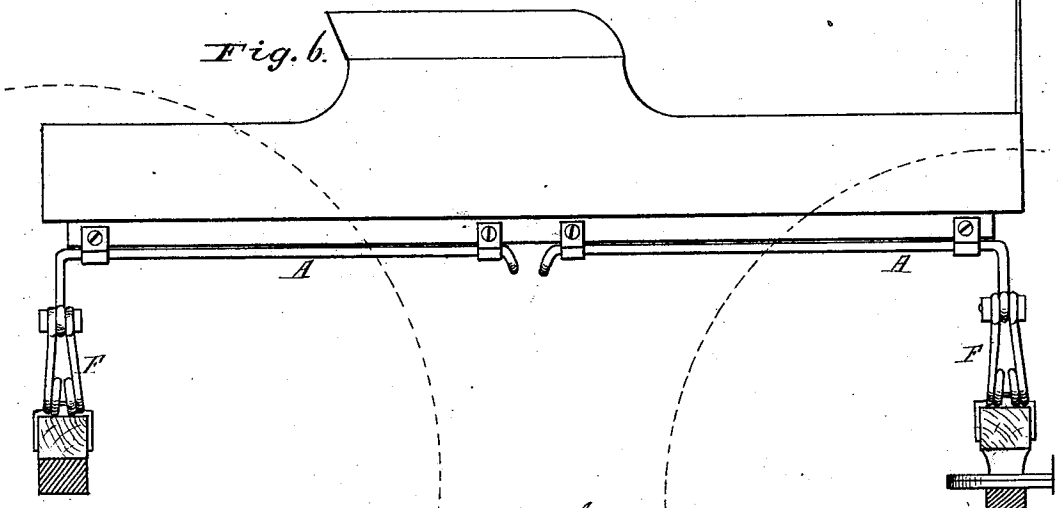


Fig. 7.

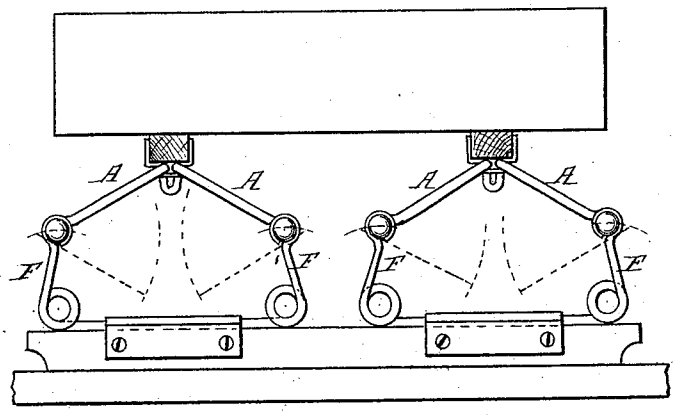


Fig. 8.

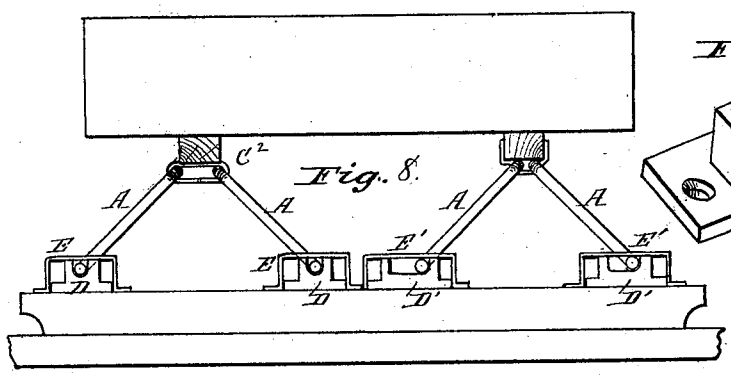
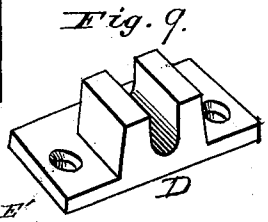


Fig. 9.



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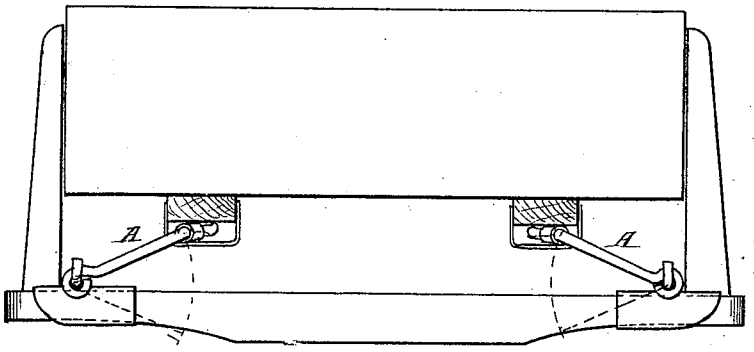


Fig. 10.

Fig. 11.

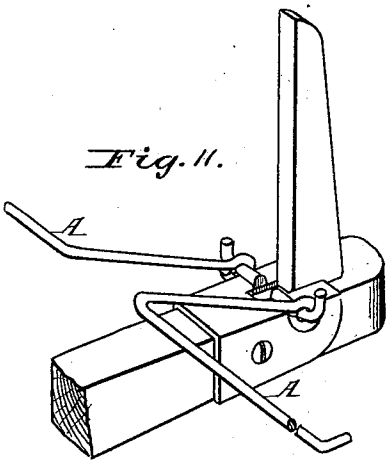
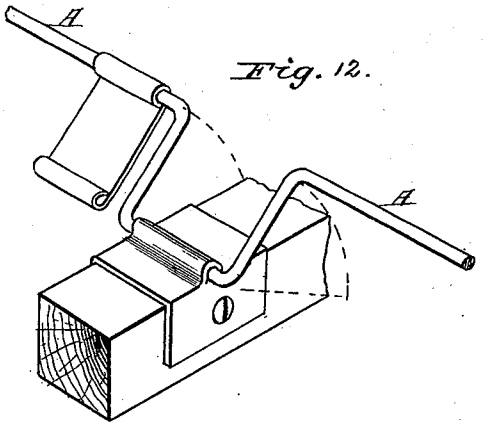


Fig. 12.



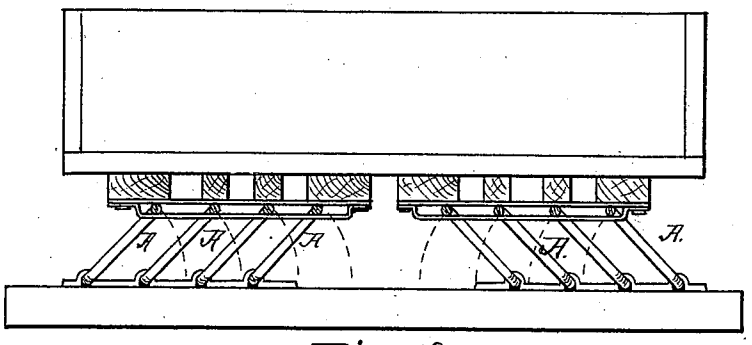


Fig. 13.

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Fig. 14.

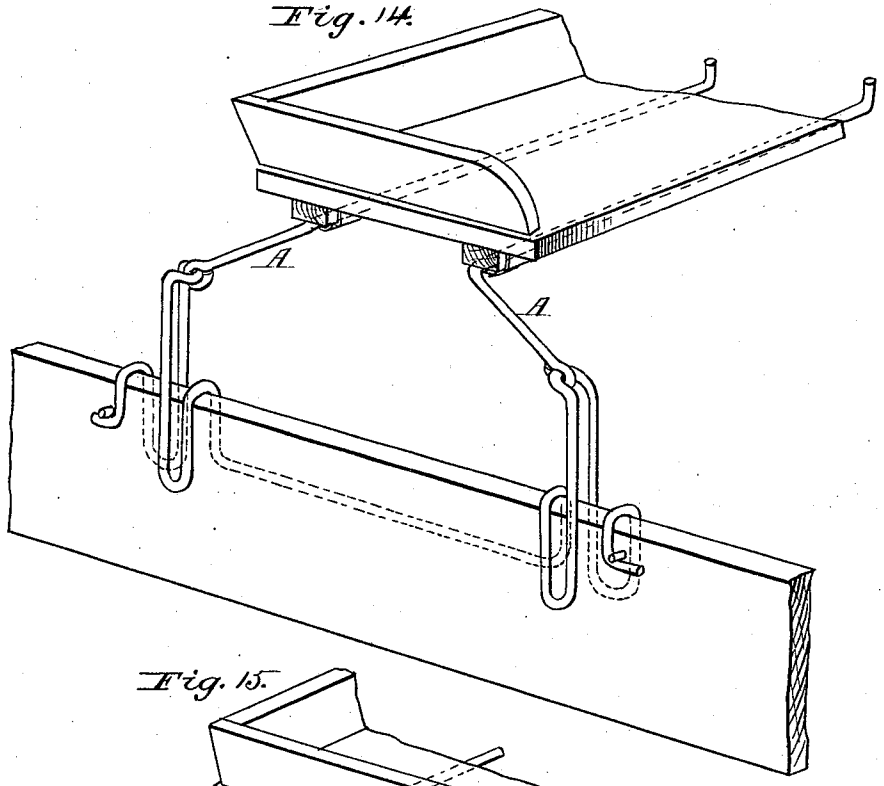


Fig. 15.

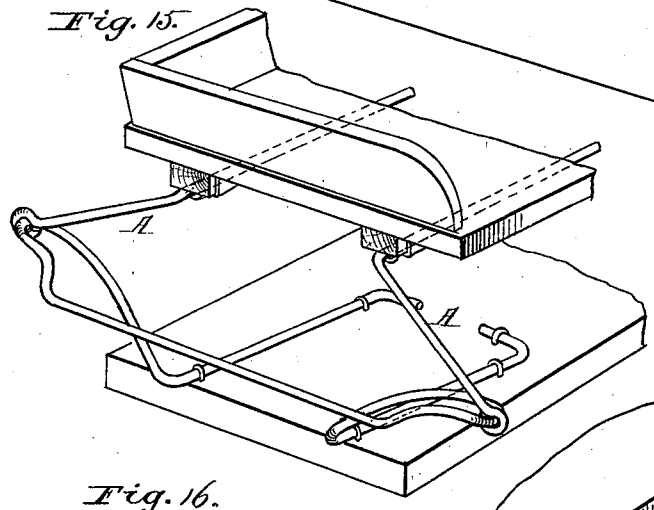


Fig. 16.

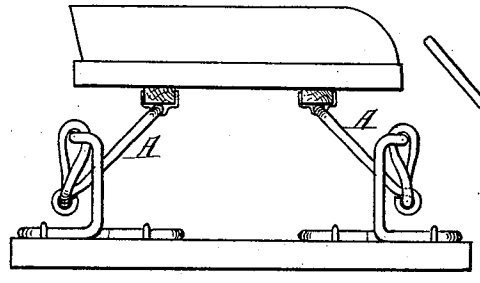
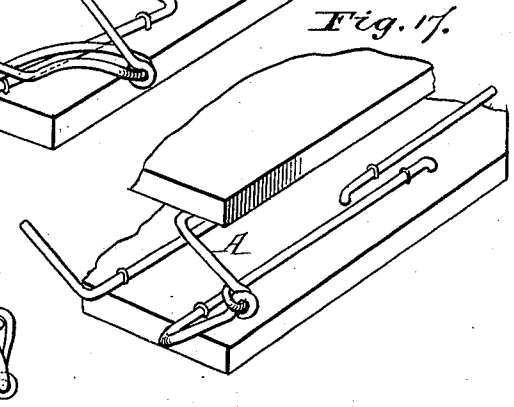


Fig. 17.



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By James La. Norris.
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UNITED STATES PATENT OFFICE.

DANIEL E. PARIS, OF TROY, NEW YORK.

IMPROVEMENT IN TORSIONAL SPRINGS FOR VEHICLES.

Specification forming part of Letters Patent No. **169,032**, dated October 19, 1875; application filed July 27, 1875.

To all whom it may concern:

Be it known that I, DANIEL E. PARIS, of Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Torsional Springs, of which the following is a specification:

This invention relates to certain improvements in springs for wagons and other vehicles, for supporting the bodies or seats of the same; and it consists in a means of attaching and confining the springs to the body of the vehicles and supporting parts.

In the drawings, Figure 1 represents a side elevation of an ordinary wagon with torsion-springs applied to the same. Fig. 2 is a detached view, showing the means of securing the springs to the body or seat. Figs. 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, and 17 represent the application of the clamp to various forms and arrangements of springs.

The letter A represents a wire of steel or other elastic metal fastened at one end to the under surface of the body or seat of a wagon, and extending to the sides of the same, where it is bent at an angle forming an arm, which is secured at its end, either directly to the bolster or axle of the wagon, or to the spring B, secured thereto. Two of such springs, A A, are generally employed, running parallel with each other beneath the body or seat, and they may be united at their ends under the seat, instead of having the same fastened in the wood. These wires are secured to the body or seat by means of metallic caps or clamps C, which set over the same, and are secured to the wood by means of screws or otherwise, and allow the wires to twist or play within the same, in order to secure the full torsional effect of the springs. A slight lateral play, as shown in Fig. 1, may also be allowed the wires, so as to make available the flexible power as well as the torsional power of the springs. When the wires A are connected directly to the axle or other portion of the wagon their ends are bent at right angles, and are secured in sockets D attached to the same in any suitable manner, being confined therein by means of caps or covers E setting over the same, as indicated by the letters E and D.

If desired, such sockets may be constructed so as to allow some play to the ends of the springs, so as to provide for the flexible motion of the same. The wires A may be attached, if desired, to upright flexible springs F, formed of bent wires, secured to the axle or other portion of the wagon forming a compound spring, in which the torsional and flexible powers of the wires are obtained in full effect. In such cases the ends of the wires A are looped instead of bent, as in the first instance, and secured directly over the wire of the springs F on the rivets or screws attached to the same.

In order to get the proper torsional effect of the spring where the body or seat is not of sufficient length or width to admit of a sufficiently long spring to be attached to the center, as before described, such springs may be attached at intermediate points between the opposite sides, passing each other, as shown in Fig. 17.

The springs A may be secured at their ends to the wagon body or seat by simply bending the same, and inserting them in the wood, confining them by means of staples or clamps secured over the wires.

I find it preferable, however, to secure them by means of an improved clamp, C, Fig. 5, which forms a bearing for the ends, and secures them at the same time, as will be perceived.

When the springs are constructed as illustrated in Figs. 1, 3, and 4, with a lateral play in the clamp C^2 at the sides of the wagon, a sleeve, H, is passed over the portion working in the clamp, forming a friction-roller thereon, to allow free play, as indicated.

In Fig. 13 the torsional springs A A are represented as arranged in a series of parallel rows, the ends being rigidly attached to the body or seat of the carriage, as before described, said springs being confined loosely at their sides by means of a long clamp and socket, E^2 and D^2, Fig. 8.

The springs or standards F may be variously formed, as shown in the different modifications of the drawings. They are generally constructed of wire bent in various shapes to suit the purpose, and secured similarly to the

wires A by means of clamps C^1, or in any other convenient manner, to the axle or bolster, or other portion of the carriage.

It will be perceived upon reference to the drawings that the body or that portion of the spring secured to the bottom of the wagon or seat, when the same is depressed, will fall between the springs B B, the bent arms of the springs A acting as levers, twisting the portion of said wires attached to the carriage body or seat during the full torsion of the metal. The lateral motion of the wires A, or the springs B, or the two combined, brings into play the flexible power of said springs, forming a combined spring possessing many advantages.

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

1. The combination of the torsion-springs A A, secured to the wagon body or seat at their ends by means of a clamp, C, and at their sides by the clamp C^2, and the double flexible springs B B, secured to the truck of the carriage at their ends by bending and inserting the same therein, and at their sides by a clamp, C^1, the whole adapted to operate together, substantially as described.

2. In combination with the springs A A, secured rigidly to the carriage body or seat, the clamps C^2 for securing them loosely at the sides, and the friction-rollers H H, to facilitate their operation, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of the subscribing witnesses.

DANL. ELDON PARIS.

Witnesses:

JAMES L. NORRIS,

ALBERT H. NORRIS.