

H. W. LIVINGSTON.  
VEHICLE-SPRING CONNECTION.

No. 183,013.

Patented Oct. 10, 1876.

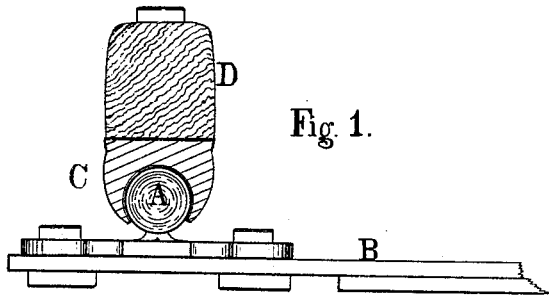


Fig. 1.

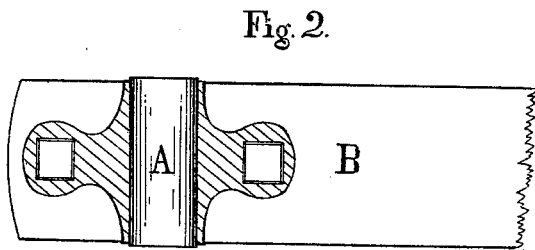


Fig. 2.

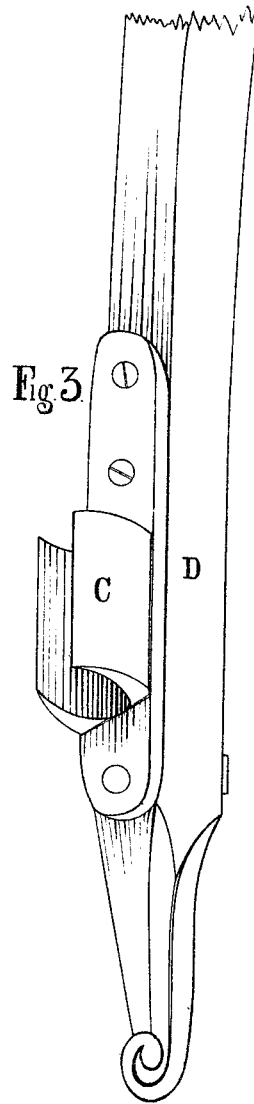


Fig. 3.

Witnesses.

*Frank J. Collier.*  
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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN VEHICLE-SPRING CONNECTIONS.

Specification forming part of Letters Patent No. **183,013**, dated October 10, 1876; application filed September 16, 1876.

*To all whom it may concern:*

Be it known that I, HENRY W. LIVINGSTON, of the town of Livingston, in the county of Columbia and State of New York, have invented a Device for Connecting the Side Bars and Semi-Elliptical Springs of Wagons together, of which the following is a specification:

The object of my invention is to connect the side bars of half-spring wagons to the ends of the springs by means of a cylinder and socket attachment, so constructed and combined as to allow the greatest freedom of motion with the least possible wrenching or strain of the parts, and specially to prevent the spring of the side bars from causing any strain upon or lateral displacement of the leaves of the spring on which they rest.

My device consists of a cylinder of iron, A, attached transversely to the ends of the semi-elliptical spring B, either to the front or hind one, (I prefer to attach them to the rear spring,) and of an iron socket or slotted cap, C, attached to the rear ends of the side bars D, which last shall embrace the former, thus combining the two together, but yet so loosely as to slide easily back and forth horizontally to the extent of the spring of the side bars. The slots in these sockets or caps C are made a little wider than the attachment of the cylinder to the spring, so as to accommodate the rolling or lateral play of the side bars caused by the expansive and resilient motions of the semi-elliptical spring. The cylinder A and slotted longitudinal socket C are of the same length, and made to fit each other nicely, (not so perfectly as the piston of a steam-cylinder, but more like the plunger-valve of a horizontal hydraulic pump,) so as to exclude the dust and dirt.

The spring of the side bars D D is accommodated by the sliding of the slotted cap or socket C upon the cylinder A, they being of sufficient length to allow of the greatest expansion and contraction or resilience of the side bars of which they are capable without becoming disconnected.

The cylinder A may be attached to the end of the semi-elliptical spring B either by two

small bolts, as shown in the drawings accompanying and forming part of this specification, (see Figs. 1 and 2,) or by a single bolt, or be formed on and made out of the ends of the spring itself by swaging or rolling up such ends into the form required.

For ease of carriage and durability of parts this device, as a mode of attaching the side bars D D to the spring B, excels all others in use because every possible motion of the parts is provided for and accommodated in the simplest and most efficient manner; and, considering economy, the device is itself not only one of the most simple and efficient of attachments, and, therefore, most economical, but it preserves all the other parts of the wagon by relieving them from undue strain and unnecessary wear and tear.

It is evident that these devices A and C may be reversed in their respective individual attachments—that is to say, A, the cylinder, may be attached to the side bar, and C, the slotted sliding cap, may be attached to the spring, so that the cylinder will slide in the cap, instead of the cap sliding on the cylinder; but I prefer the mode hereinbefore described.

Figure 1 of the accompanying drawings is a transverse sectional view of the cylinder and socket-cap combined. Fig. 2 is a top view of the spring B and cylinder A attached thereto. Fig. 3 is a perspective view of the longitudinal socket-cap C, showing its attachment to the side bar.

I claim as my invention—

1. The combination of cylinder A and longitudinal socket or slotted cap C, one being attached to spring B, and the other to side bar D, substantially as and for the purpose herein described.
2. The combination of side bars D with the semi-elliptical spring B by means of the cylinder A and longitudinal socket-cap C, substantially as and for the purpose hereinbefore set forth.

HENRY W. LIVINGSTON.

Witnesses:

FREDK. J. COLLIER,  
HENRY HOUSE.