A. WOOD.

Side-Spring Vehicle.

No. 203,977. Patented May 21, 1878.

Fig: 1

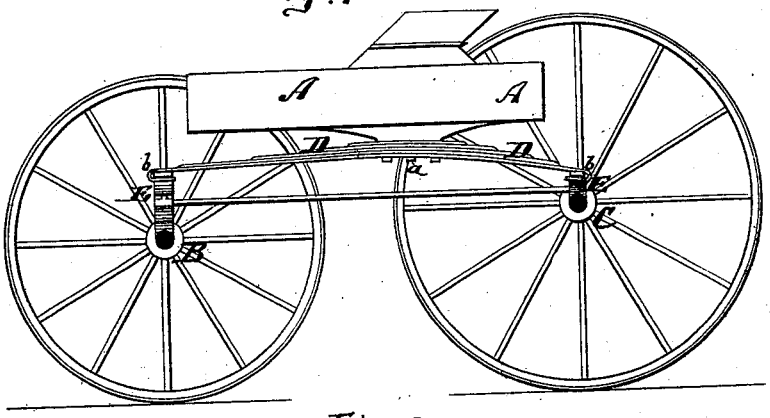


Fig: 2

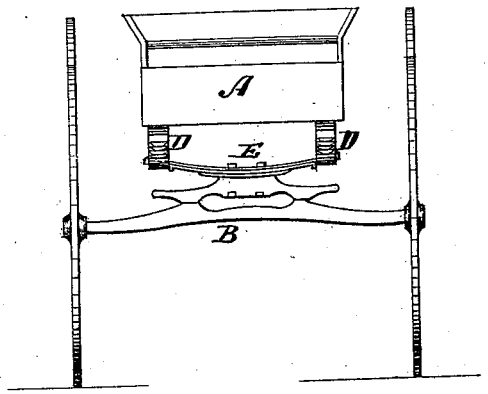
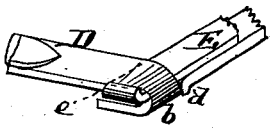


Fig: 3



Witnesses:
John C. Tumbridge
A.V. Briesen

Inventor:
Arthur Wood
by his attorney
A.V. Briesen

UNITED STATES PATENT OFFICE.

ARTHUR WOOD, OF GRAND RAPIDS, MICHIGAN.

IMPROVEMENT IN SIDE-SPRING VEHICLES.

Specification forming part of Letters Patent No. **203,977**, dated May 21, 1878; application filed April 8, 1878.

To all whom it may concern:

Be it known that I, ARTHUR WOOD, of Grand Rapids, in the county of Kent and State of Michigan, have invented a new and Improved Side-Spring Wagon, of which the following is a specification:

Figure 1 is a side elevation of my improved side-spring wagon; Fig. 2, an end elevation of the same; and Fig. 3, a detailed perspective view, showing the manner of connecting the side spring to the end or cross spring.

Similar letters of reference indicate corresponding parts.

My invention consists, first, in arranging the springs of a vehicle so as to afford a proper support for the seat when near the rear of the body.

The invention also consists in forming a hook on the end of the side spring, causing the same to engage over the end of the cross-spring between two stops in said cross-spring, all as hereinafter more fully described.

In the drawing, the letter A represents the body of a suitable vehicle. B and C are the axles thereof, and D D the side springs, which rest on cross-springs E E, and support the body A, in the manner indicated in Figs. 1 and 2. The side springs D D are of metal, and composed of several leaves, the lowest leaf being the longest and the uppermost the shortest.

It will be seen by reference to Fig. 1 that the hole which receives the central bolt *a*, that connects the leaves of the spring D, is not in the center of the spring, nor of any of its leaves, measuring it lengthwise, but is nearer the back end of each leaf, including the lower leaf, and below the center of the seat.

It will also be seen by reference to Fig. 1 that the leaves overlap proportionately more at the back, and yet are all shorter back of the bolt *a* than at the front of said central bolt *a*, and that the curve on the back portion of the spring is sharper than at the front. This curve and the extra length of the leaves make the back portion of the spring much stiffer, and bring the strongest part of the spring directly under the middle of the seat, instead of under the middle of the body A, as is the common practice in side-spring wagons.

By this arrangement the body is carried nearer a level, and is less liable to tip or tilt forward or back, or to sway from side to side, as in common side-spring buggies. By connecting the ends of these side springs D D directly with the cross or end springs E E the rattling of the running part of the vehicle is not conveyed to the body.

By having the side springs D D made of metal and placed directly beneath the body A, the buggy or wagon is made neater and more graceful than a wooden side-spar buggy, yet by doing away with the wooden side spar the buggy is enabled to make shorter and quicker turns, and the body is permitted to be hung higher or lower, at pleasure, or according to the taste of the builder.

The ends of the side springs D D are formed into hooks *b*, that engage over the end portions of the end springs E E, as shown in Fig. 3, said end springs having stops *d* and *e*, between which the side spring is confined, as shown.

By this connection all shackles and equalizers heretofore employed are done away with, and the side springs are enabled, when a weight is brought upon the vehicle, to slide upon the end springs, and thereby to relieve the springs from strain.

Instead of forming the hook *b* on the side spring and the stops *d e* on the end spring, the hook may be formed on the end spring and the stops on the side spring.

I am aware of the spring shown in Patent No. 156,122, in which the bolt passes through the center of the lower leaf, but nearer to the front ends of the upper leaves, leaving their back ends extending farther to the rear. In my spring the leaves extend less far to the rear of the bolt than to the front, thereby strengthening the back without weakening the front, while the body has its bearing on the spring at a point directly below the center of the seat, so that there is no strain on the spring or connections resulting from the back tilting of the body.

I claim—

1. The combination, with the body having the seat nearest the rear end, of a spring, with leaves arranged to impart greater stiffness at the rear, and united at a point between the center and the rear axle and directly below the seat, as set forth.

2. The within-described connection between the springs at right angles, consisting in the bent end of one spring clamping the other between its turned-up end *e* and a stop, *d*, as set forth.

AURHUR WOOD.

Witnesses:
VAN E. YOUNG,
GEO. GRAY, Jr.