

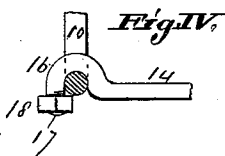
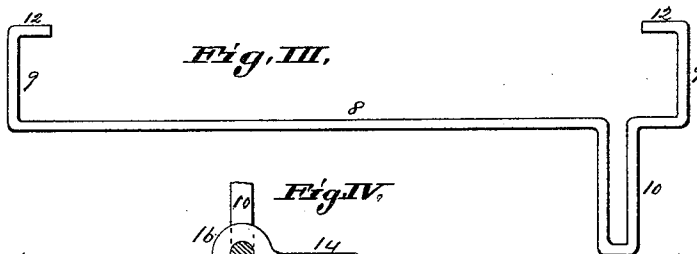
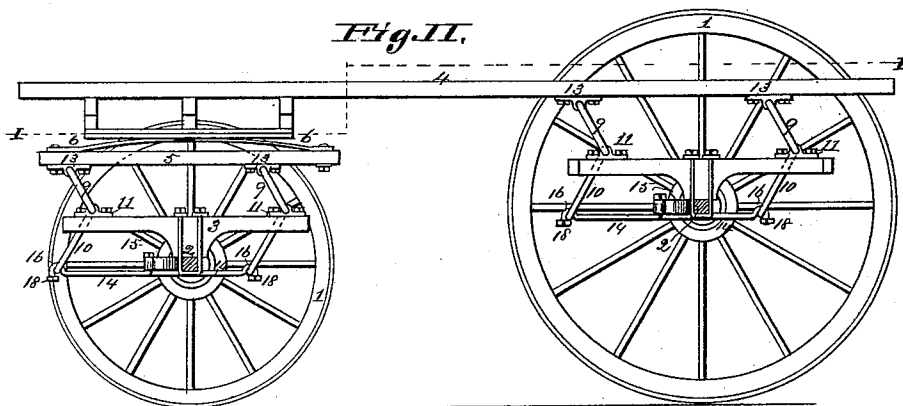
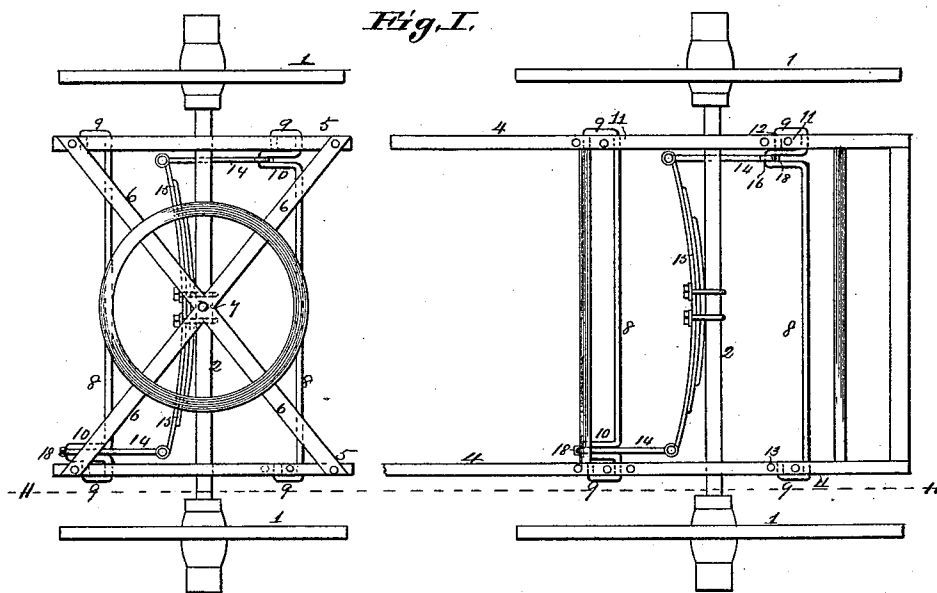
(No Model.)

2 Sheets—Sheet 1.

T. O'CONNOR.
SPRING VEHICLE.

No. 461,767.

Patented Oct. 20, 1891.



Attest:
Henry O. Rohrer
George E. Cruise.

Inventor:
Timothy O'Connor.
By Knight Bros.
Atty.

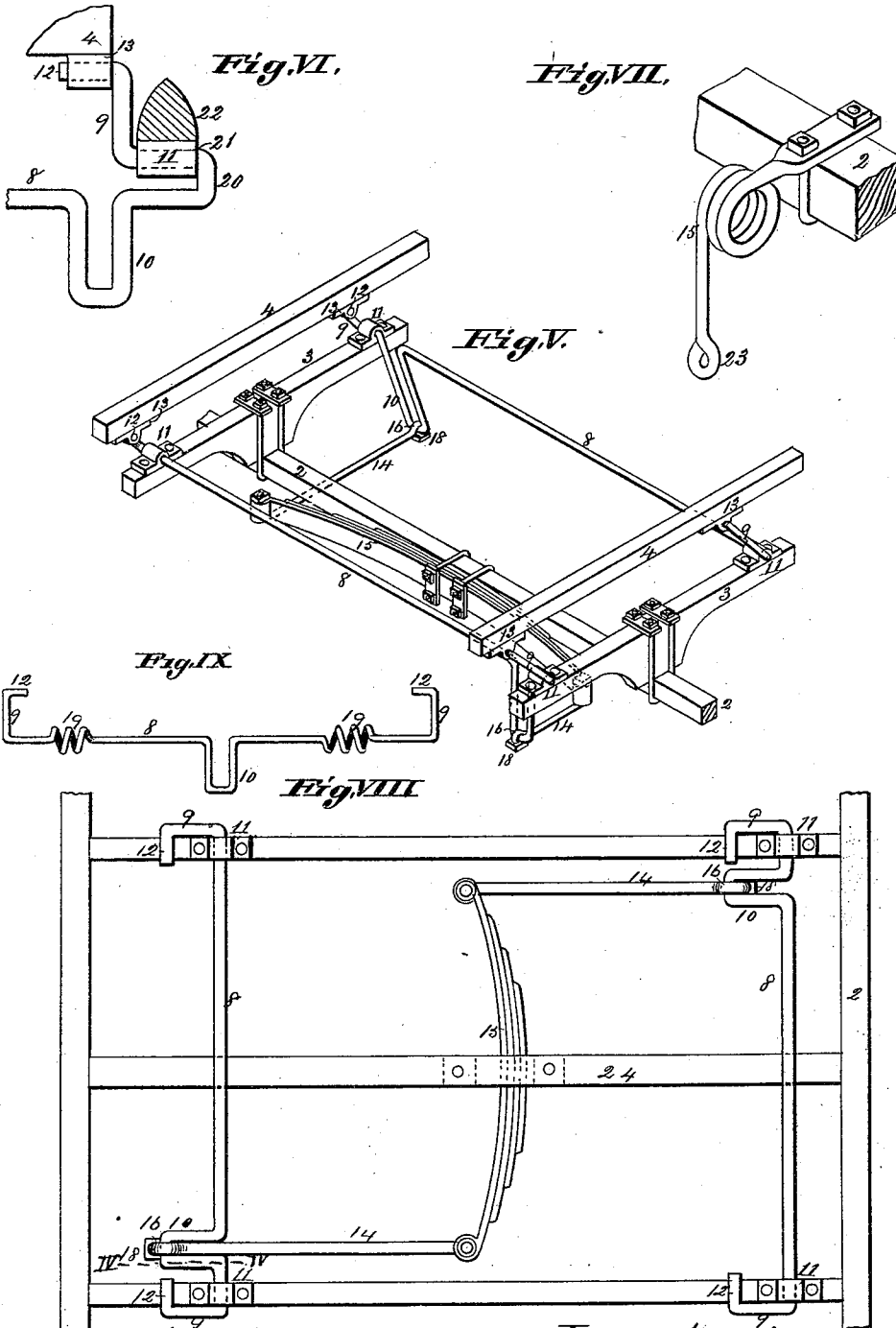
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Attest:
Harry S. Rohrer,
George E. Cruise.

Inventor,
Timothy O'Connor.
By *Thos. H. B. B.*
Atty.

UNITED STATES PATENT OFFICE.

TIMOTHY O'CONNOR, OF ST. LOUIS, MISSOURI.

SPRING-VEHICLE.

SPECIFICATION forming part of Letters Patent No. 461,767, dated October 20, 1891.

Application filed February 3, 1891. Serial No. 380,042. (No model.)

To all whom it may concern:

Be it known that I, TIMOTHY O'CONNOR, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Spring-Vehicles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This improvement relates to the spring connections. The novel features are set forth in the claims.

Figure I is a top view showing part of a platform-wagon frame with the improvement applied thereto, part of the frame being removed, as indicated by section-line I I, Fig. II. Fig. II is a longitudinal section taken at II II, Fig. I. Fig. III is a side view of the suspension-bar. Fig. IV is an enlarged detail longitudinal section taken at IV IV, Fig. VIII. Fig. V is a perspective view of the spring connection as applied to a single axle. Fig. VI is a detail transverse section showing one end of the suspension-bar in elevation, with connection to the side bar and body of a vehicle. Fig. VII is a detail perspective view showing a modified form of spring. Fig. VIII is a plan of a wagon-frame, showing the spring attached to the perch. Fig. IX shows a modified form of the suspension-bar in side view.

Figs. I, II, and V show the improvement as applied to a platform-wagon or a two-wheeled vehicle, in which a complete spring system is applied to a single axle. This form as applied to a platform-wagon will be first described.

1 are the wheels, 2 the axles, and 3 head-blocks clipped to the axles. 4 is the body-frame. There is a frame over the fore axle, having side bars 5 and diagonal bars 6, the latter being connected to the fore end of the body-frame by a king-bolt 7 or equivalent connection.

The suspension-bars are composed of a rock-shaft or rod 8, with cranks 9 and 10. The shaft rocks in bearings 11 near the ends of the head-blocks, the shaft extending transversely (or parallel with the axle) from block to block. The cranks 9 at the ends of the shaft are bent at a right angle, their ends 12 forming journals that work in the boxes 13, fixed in case

of the hind part of the vehicle to the under side of the body-frame and at the fore part of the vehicle in boxes 13, fixed to the bottom of the bars 5. The cranks 10 are connected by rods 14 to the ends of a spring 15, which in Figs. I, II, and V is seen elliptic and clipped to the axle. The construction is such that the weight of the body upon the cranks 9 (which are normally inclined, as shown) tends to straighten the spring, and thus the body has the required spring-support. In order to make the connection between the crank 10 and the connecting-rods 14 detachable, the end of the rod is bent into a semicircular form at 16 and has a screw-thread at 17 to receive a nut 18, that bears against the wrist of the crank and prevents the disengagement of the rod from the crank. (See Fig. IV.)

It will be seen that the described spring connection will give steadiness to the body while allowing a free vertical movement, because the transverse suspension-bars will tend to prevent the rocking movements of the body, as the tendency of the two cranks 12 will be to descend equally. This would, however, be modified somewhat by the torsional movement or twisting of the suspension-bar. To give the suspension-bar more elasticity, helices 19 may be formed in it, as seen in Fig. IX.

In Fig. V the improvement is shown as applied to a two-wheeled vehicle or road-cart. The foregoing description applies to this, the same reference-numbers being used.

In Fig. VI is illustrated the manner of applying the improvement to a "side-bar" vehicle, the suspension-bar in this case having a return-bend 20, whose upper part 21 forms the rocking journal in the box 11, which is secured to the under side of the side bar 22. The arm or crank 9 is thus upon the inside of the side bar.

In Fig. VII is shown a modification of a spring 15, the spring in this case being helical in form and having one end clipped to the axle, while the other is turned into an eye 23, to which one of the rods 14 is connected, there being in this case a separate spring for each of the rods 14.

In Fig. VIII is illustrated a way of applying the improvement to a four-wheeled vehicle, a single half-elliptical spring 15 being attached to the reach 24, and there being only

two suspension-bars, whose cranks or arms 9 are connected to the body near its four corners.

I claim as my invention—

- 5 1. In a wheel-vehicle, the two rocking suspension-bars, each having crank-arms 9 connected to the body of the vehicle and each a crank 10, said cranks being connected to the opposite ends of a half-elliptic spring connected to the axle, substantially as set forth.
- 10 2. The combination of the single axle, the half-elliptic spring attached to the middle of the axle, the head-blocks 3, attached to the axle near its ends and at right angles thereto,
- 15 and the two suspension-bars 8, journaled on the head-blocks and having crank-arms journaled to the bed-frame or bars 5 and having cranks 10 connected, respectively, to the opposite ends of the half-elliptic spring, substantially as set forth.
- 20 3. The combination, in a platform-wagon, of the two axles 2, the four head-blocks 3, two upon each axle, the four suspension-rods 8,

with crank-arms 9 and cranks 10 and journaled upon the head-blocks, a spring 15 upon 25 each axle, with its ends connected, respectively, to the cranks 10 of the two suspension-bars, and the bars 4 and 5, connected, respectively, to the crank-arms 9 of the rear and front platforms, respectively, substantially as set 30 forth.

4. The rocking suspension-bar 8, having cranks 9 and 10 connected, respectively, to the body and the spring 15 and having the helices 19, substantially as set forth. 35

5. The combination, in a wheel-vehicle, of the head-blocks 3, suspension-bar 8, boxes 11, cranks 9 and 10, boxes 13, body-frame 4, connecting-rods 14, and spring 15, all constructed and adapted to operate substantially as set 40 forth.

TIMOTHY O'CONNOR.

In presence of—

SAML. KNIGHT,
THOMAS KNIGHT.