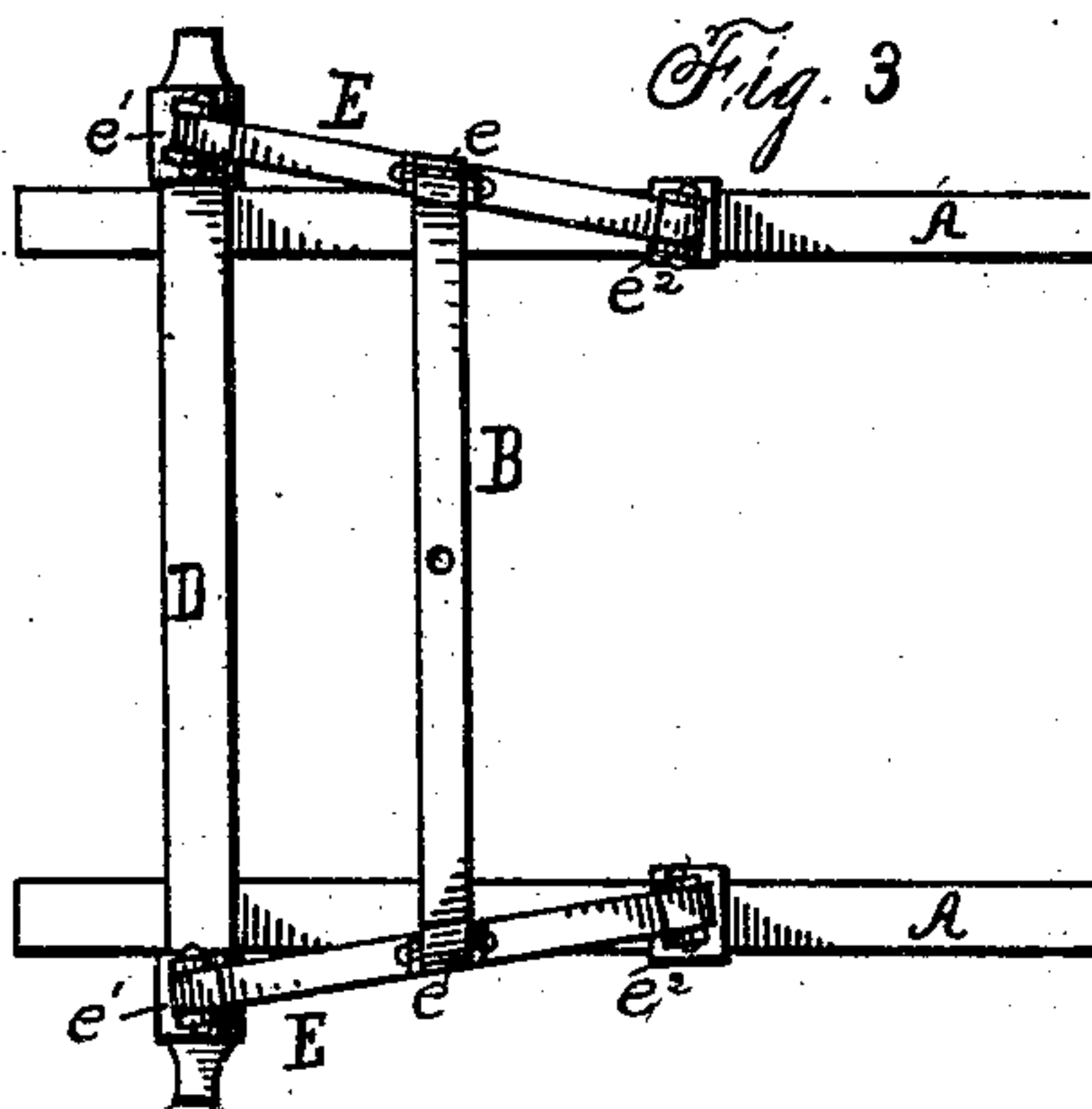
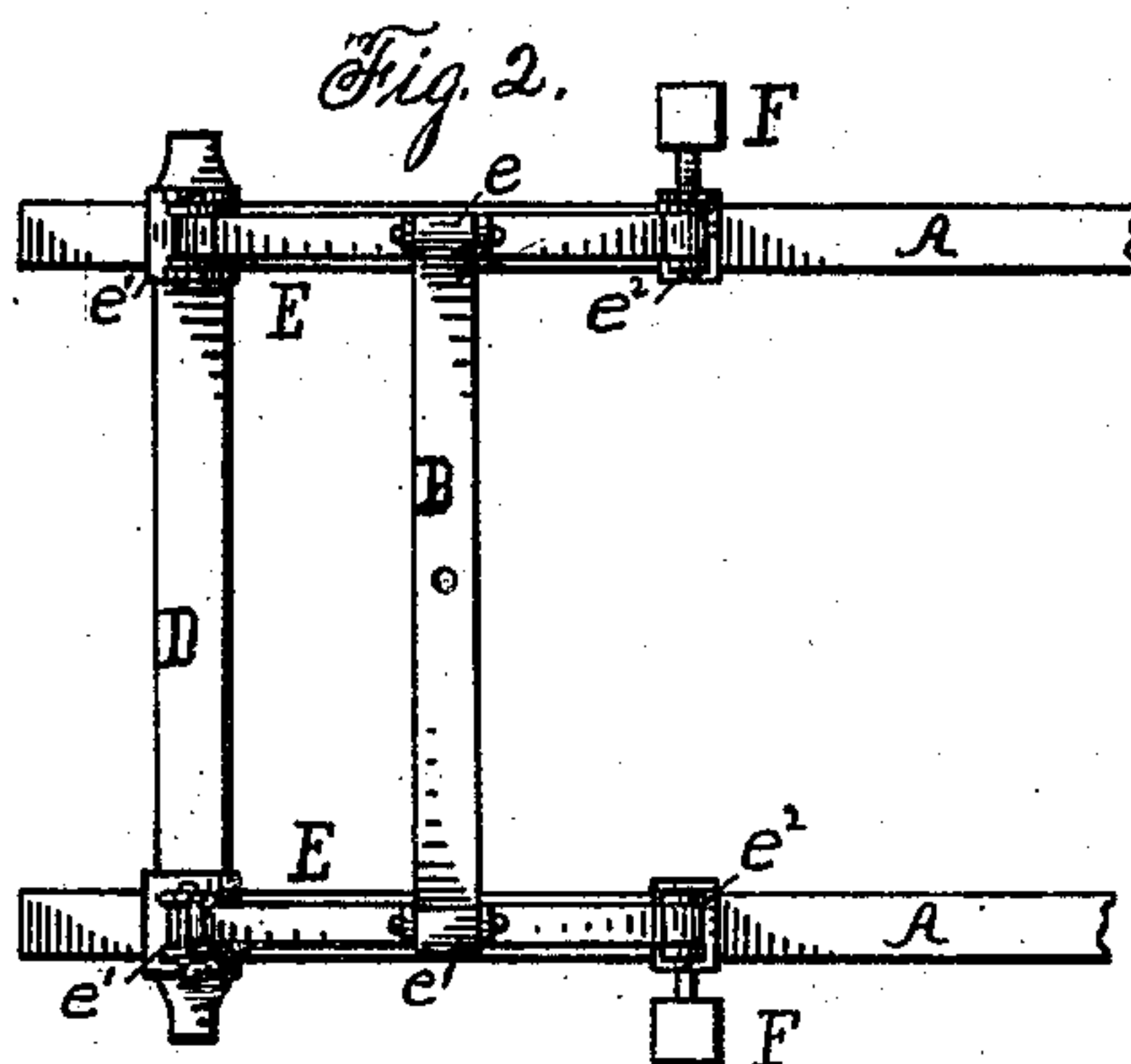
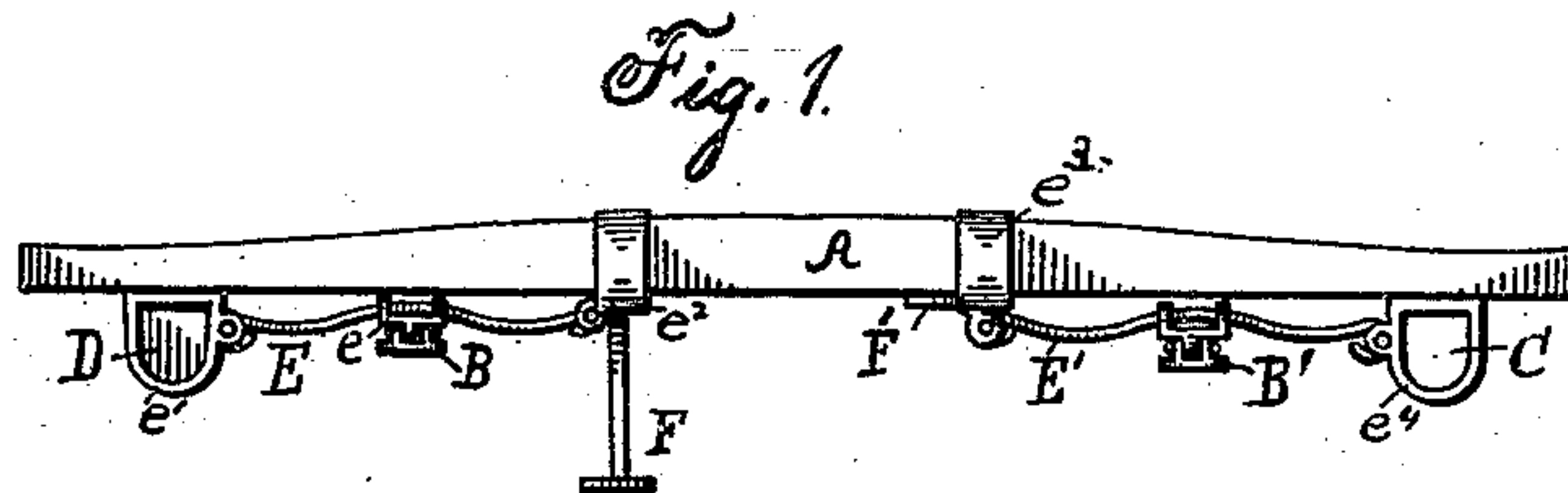


(No Model.)

J. KENGEL.
SIDE SPRING VEHICLE.

No. 273,289.

Patented Mar. 6, 1883.



WITNESSES

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JOSEPH KENGEL, OF DETROIT, MICHIGAN.

SIDE-SPRING VEHICLE.

SPECIFICATION forming part of Letters Patent No. 273,239, dated March 6, 1883.

Application filed November 23, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH KENGEL, of Detroit, county of Wayne, State of Michigan, have invented a new and useful Improvement in Springs for Side-Bar Vehicles; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

The present invention relates to springs for that class of vehicles in which side bars are rigidly connected with a front head-block and rear axle, so as to preserve the parallelism of said bars and permit the vehicle-body to be connected with springs suspended from a rigid part of the running-gear.

The invention consists in the combination of a front and rear pair of longitudinal springs, convexed upward at their middle part, and having their respective front and rear ends connected with the side bars, a transverse spring being connected with the convexed centers of each pair of longitudinal springs for the direct support of the body of the vehicle.

In the drawings, Figure 1 is a side elevation of a device embodying my improvements. Fig. 2 is an inverted plan view of the front portion of the same. Fig. 3 is a variation, showing the longitudinal springs extended diagonally beyond the side bars,

A represents the side bars, which are rigidly secured to the front head-block, D, and the rear axle, C, and to these parts are connected, by means of ordinary shackles, a front and rear pair of semi-elliptic longitudinal springs, E and E'. Semi-elliptic cross-springs B and B' are connected with the middle portions of these longitudinal springs by means of ordinary shackles, e.

I prefer to secure the forward end of the spring E to the head-block and the rear end of the same to the side bars in any suitable manner—as, for instance, by clips e^1 and e^2 over the head-block and side bars.

The clip e^2 and the step F may be properly combined in a single piece, and also the wearing-plate F' and the clip e^3 .

I prefer to clip the forward end of the

spring E' about the side bar, as shown at e^3 , and the rear end to the bed-piece C, as shown at e^4 .

It is evident that the forward end of the spring E might be clipped or otherwise properly secured to the side bar instead of the head-block, if desired. So, also, the rear end of the spring E' may be suitably secured to the side bar instead of to the bed-piece. I would have it understood that I contemplate securing the extremities of said longitudinal springs in any proper way. I prefer to locate these springs E and E' directly beneath the side bars; but it is obvious that they might extend diagonally across from the side bars to the bed-piece or head-block without departing from the principle of my invention, as shown in Fig. 3, in which case the cross-springs can be extended beyond the side bars, increasing the flexibility. There may be, in addition, any desired number of braces.

The operation of the device is apparent. The extremities of each of the cross-springs being secured intermediate of the horizontal springs gives great flexibility to the springs as a whole, since, as each cross-spring bears upon two longitudinal springs at their extremities, the vehicle-body is provided with three springs at each end, making a total of six springs for vehicles of this order. Moreover, as the longitudinal springs are preferably located beneath the side bars, with the middle portion convexed upward and lying close to the side bars at the point where the cross-springs are attached thereto, the whole device is very neat and tasteful in appearance.

I am aware that a spring-frame for side-bar vehicles has been constructed of transverse semi-elliptical springs centrally secured to the front head-block and rear axle, longitudinal springs connected with the extremities of said transverse springs and the side bars, and transverse body-supporting springs secured to the middle of said longitudinal springs.

What I claim is—

The combination, with a front head-block and rear axle and a pair of side bars rigidly secured thereto, of a front and rear pair of semi-elliptic longitudinal springs, E and E', having their middle portions convexed up-

ward, shackles or clips for connecting the
said springs with the head-block, rigid side
bars and rear axle, and the transverse semi-
elliptic springs B and B', connected with
5 the convexed middle parts of the longitudi-
nal springs, as and for the purpose herein set
forth.

In testimony whereof I sign this specification
in the presence of two witnesses.

JOSEPH KENGEL

Witnesses:

N. S. WRIGHT,

WILLIAM F. FORD.