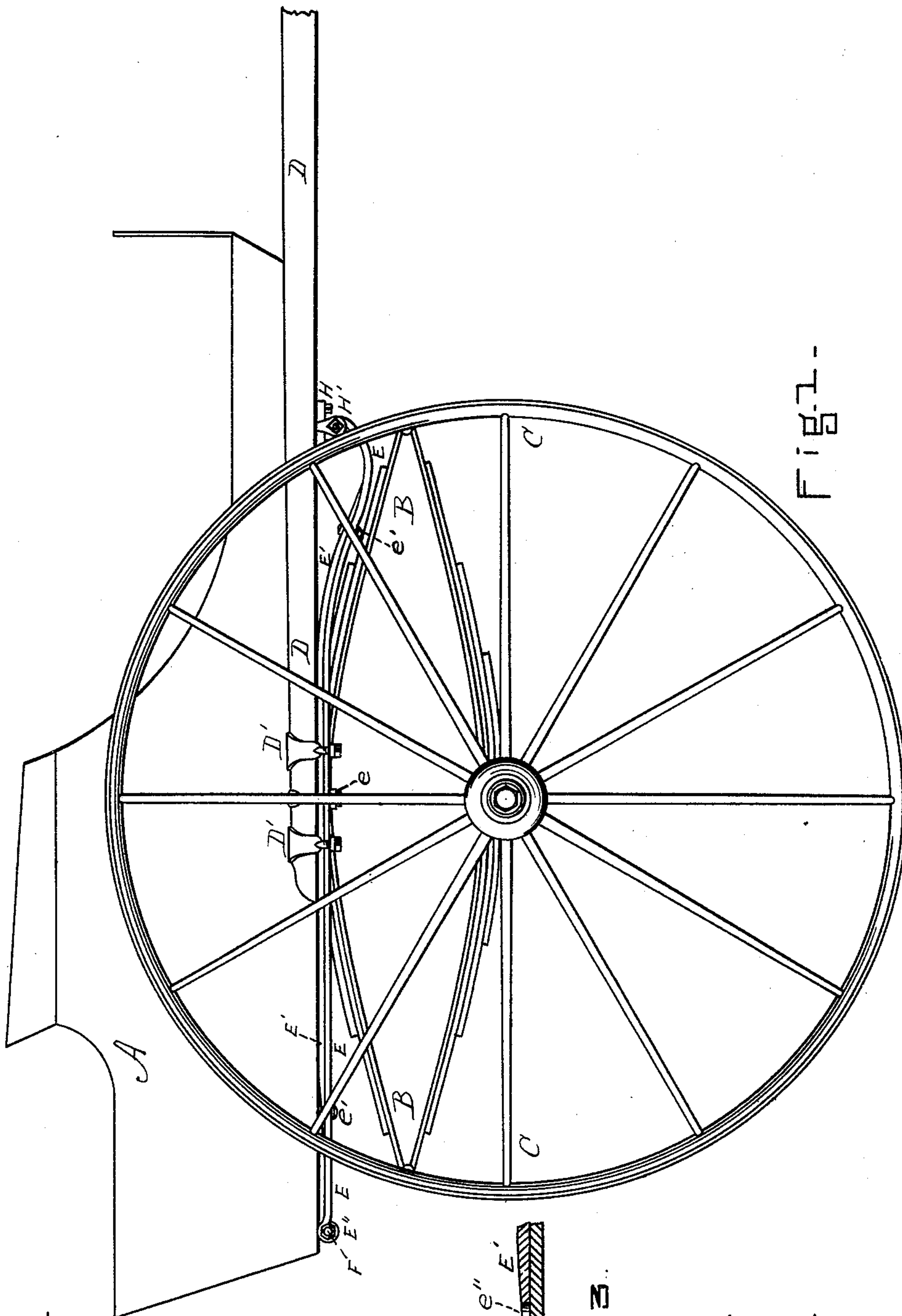


2 Sheets—Sheet 1.

TWO WHEELED VEHICLE.

Patented Oct. 29, 1889.



J. M. Hartnett.
J. M. Brown

NO
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INVENTORS.

James Neal
Charles F. Boles
By their Atty

Henry Williamson

(No Model.)

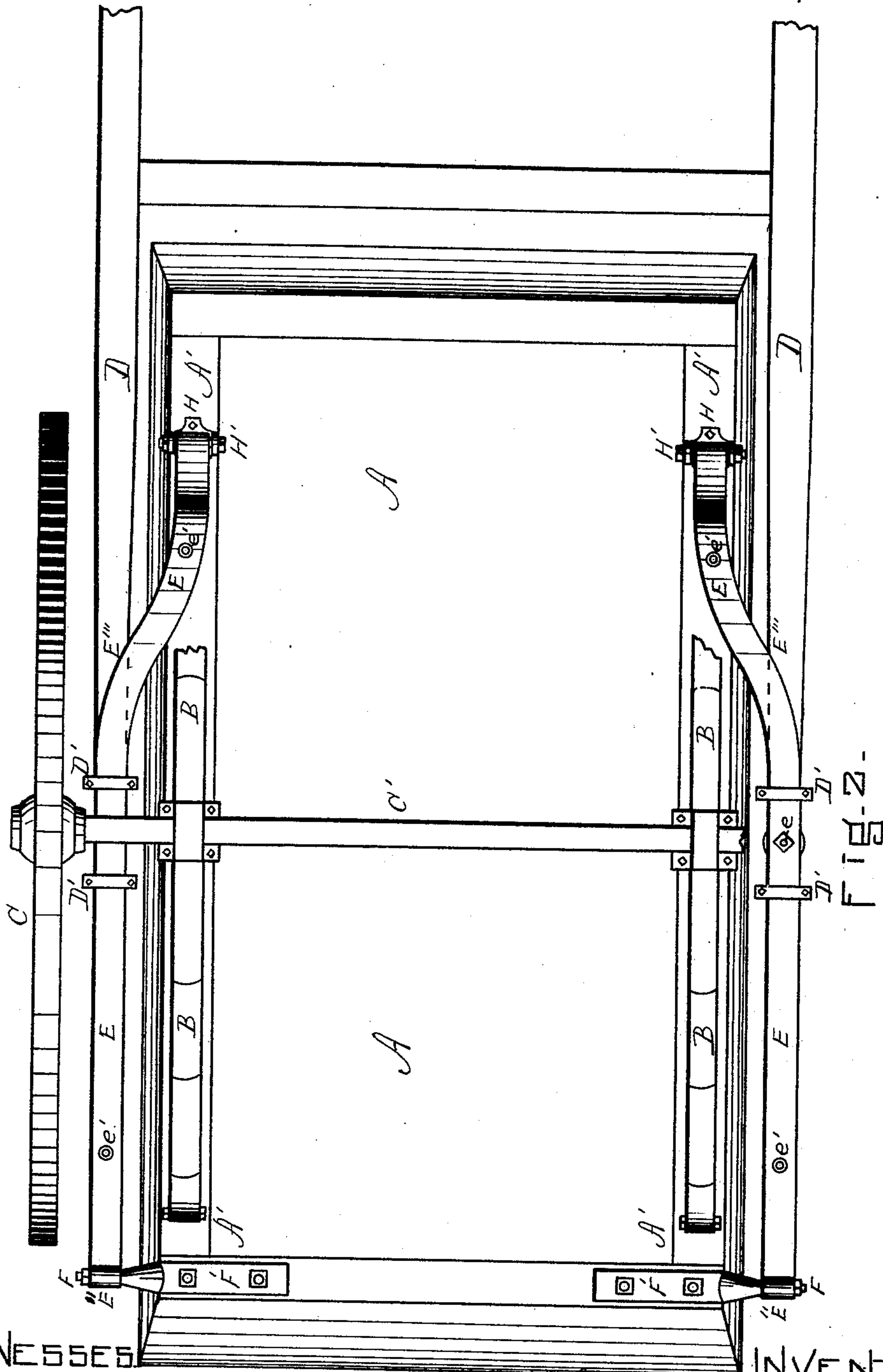
J. NEAL & C. F. BOLSER.

2 Sheets—Sheet 2.

TWO WHEELED VEHICLE.

No. 414,117.

Patented Oct. 29, 1889.



WITNESSES

J. M. Hartnett.

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INVENTORS

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UNITED STATES PATENT OFFICE.

JAMES NEAL AND CHARLES F. BOLSER, OF AMESBURY, MASSACHUSETTS.

TWO-WHEELED VEHICLE.

SPECIFICATION forming part of Letters Patent No. 414,117, dated October 29, 1889.

Application filed July 3, 1889. Serial No. 316,451. (No model.)

To all whom it may concern:

Be it known that we, JAMES NEAL and CHARLES F. BOLSER, both of Amesbury, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Two-Wheeled Carriages, of which the following is a specification.

This invention relates to the construction and arrangement of the shaft-springs in two-wheeled carriages, the object being to neutralize as far as possible the effect of the motion of the horse upon the carriage, so that it may ride easily and smoothly and with as little shake and jar as possible.

The nature of the invention is fully described below, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a two-wheeled carriage embodying my improvement. Fig. 2 is a plan of the under side of the same, one of the wheels and a portion of the axle being removed. Fig. 3 is a sectional detail of a portion of a spring.

Similar letters of reference indicate like parts.

A represents the body, A' the sill, B the ordinary spring, C the wheels, and C' the axle, of a two-wheeled carriage, all constructed as usual.

D D are the shafts, which extend back to and terminate at a point about over the axle.

E E are the shaft-springs. Each of these springs has two or more leaves, (in the drawings two are shown,) the upper leaf E' being rigidly secured centrally at *e* to the main spring E, and secured at its ends by means of bolts *e'* and slots *e''* (see Fig. 3) on the spring E. The rear end of each shaft is secured to the spring E on that side by means of clamps D' D' or other suitable means, at about the center of the spring, directly over the axle. Each of the springs E is attached to the sill A' of the carriage-body at its ends at points

well to the rear and front of said carriage-body, so that the springs are connected with the carriage at their ends and with the shafts at their centers, over the axle.

Any suitable means may be used to attach the springs E to the carriage. In the drawings the rear ends fold over pins or bolts F at E'', extending from plates F', bolted to the carriage. The front portions of the springs curve inward at E''' to avoid the shafts, and are connected at their ends by joints at H' with plates H, bolted to the carriage. By this means the jar and shake caused by the motions of the horse are taken up and neutralized to a very large extent, while the inequalities of the road are lessened by the ordinary spring B.

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a two-wheeled carriage, the combination, with the shafts D and carriage-body A, of the shaft-springs E, secured to said shafts at about the centers of the springs over the axle, and secured at their ends to the carriage near the forward and rear ends of the same, said springs being bent inward at E''' to avoid the shafts, substantially as and for the purpose set forth.

2. The combination, with the shafts D and carriage-body, of the shaft-springs E, secured to the shafts at D', attached at their rear ends to the carriage-body by bolts F, and plates F', bent inward at E'', and secured at their front ends to the carriage-body by joints H' and plates H, substantially as and for the purpose described.

JAMES NEAL.
CHARLES F. BOLSER.

Witnesses:

JOHN H. HARVEY,
CHARLES L. KENDRICK.