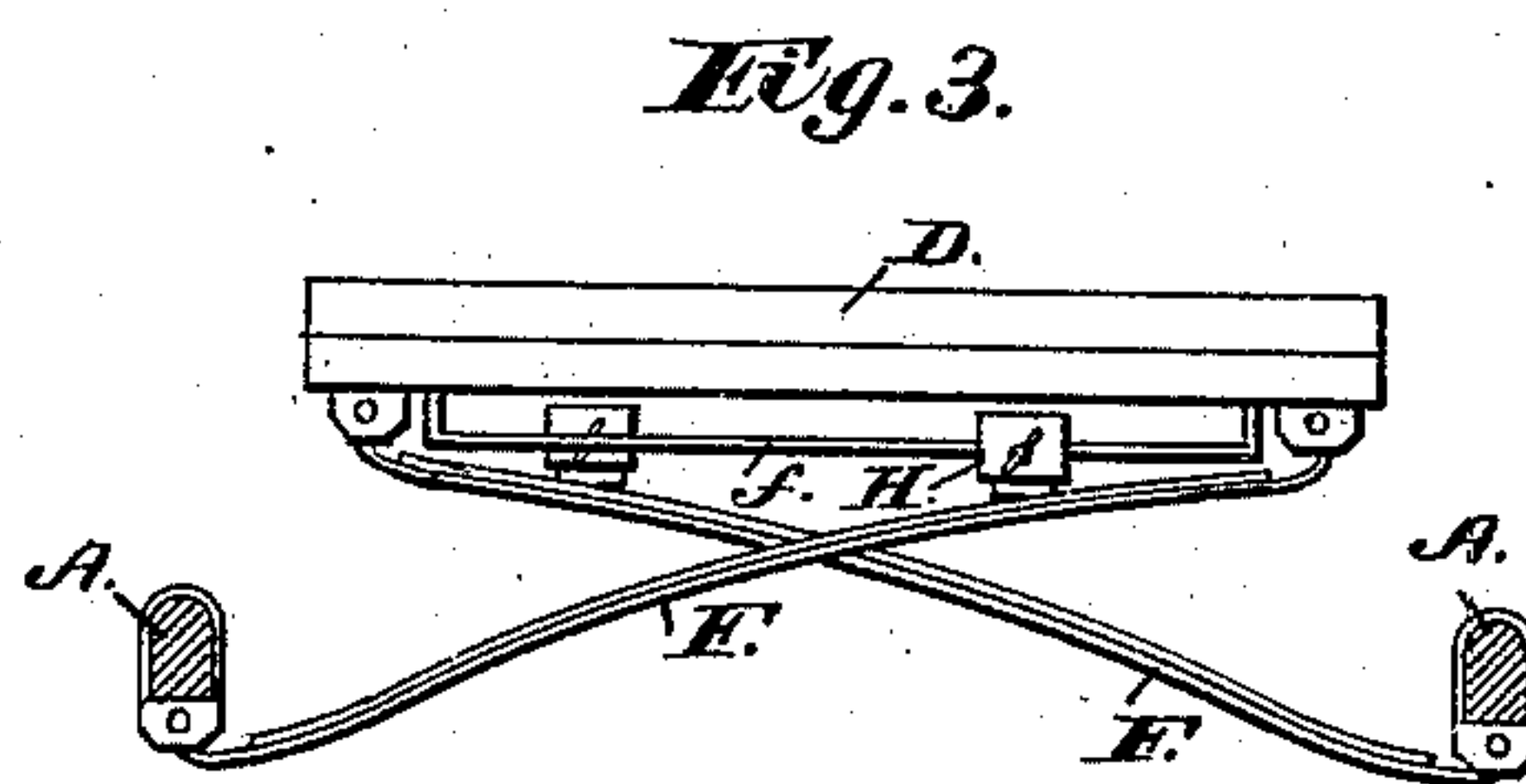
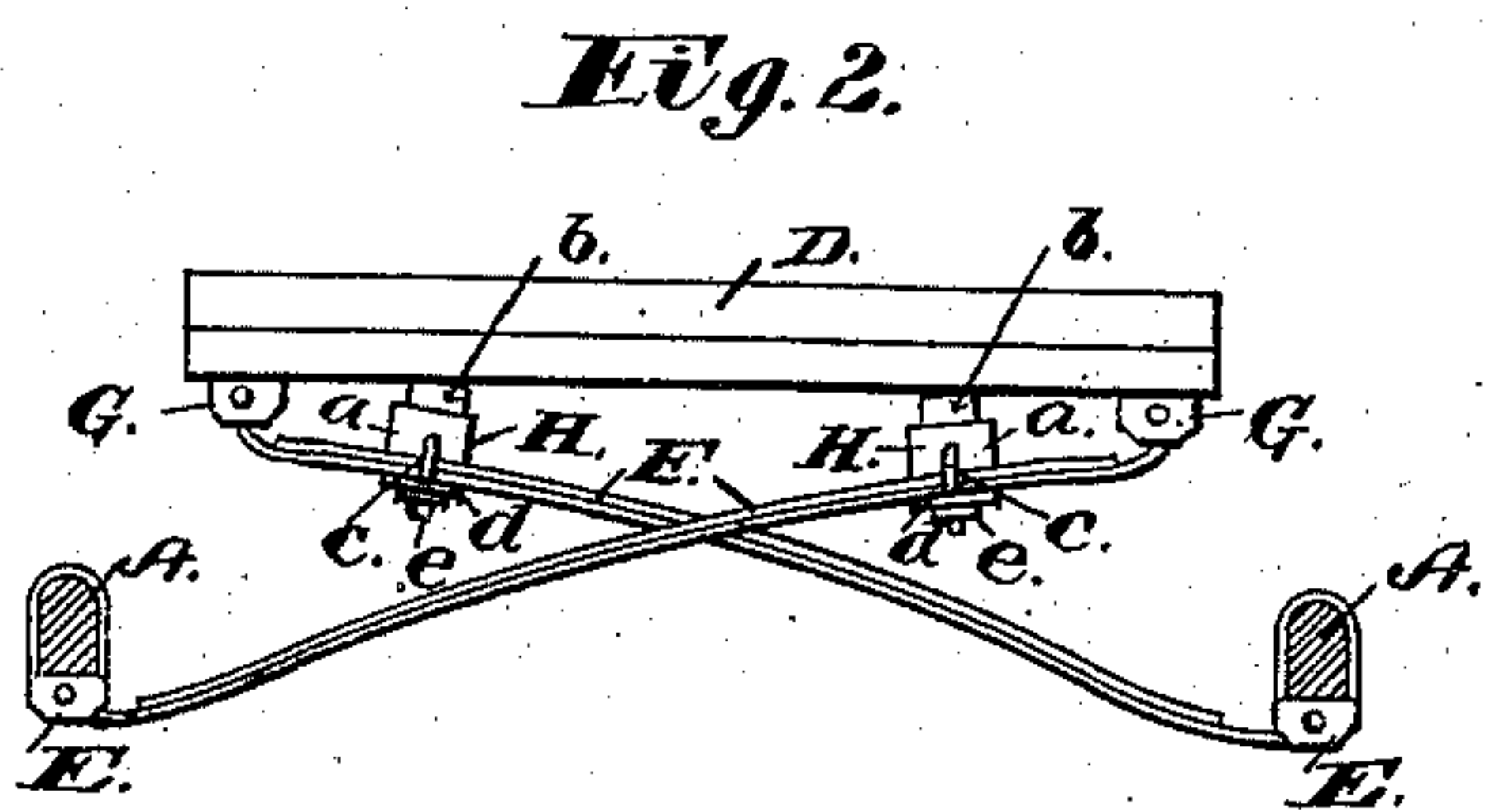
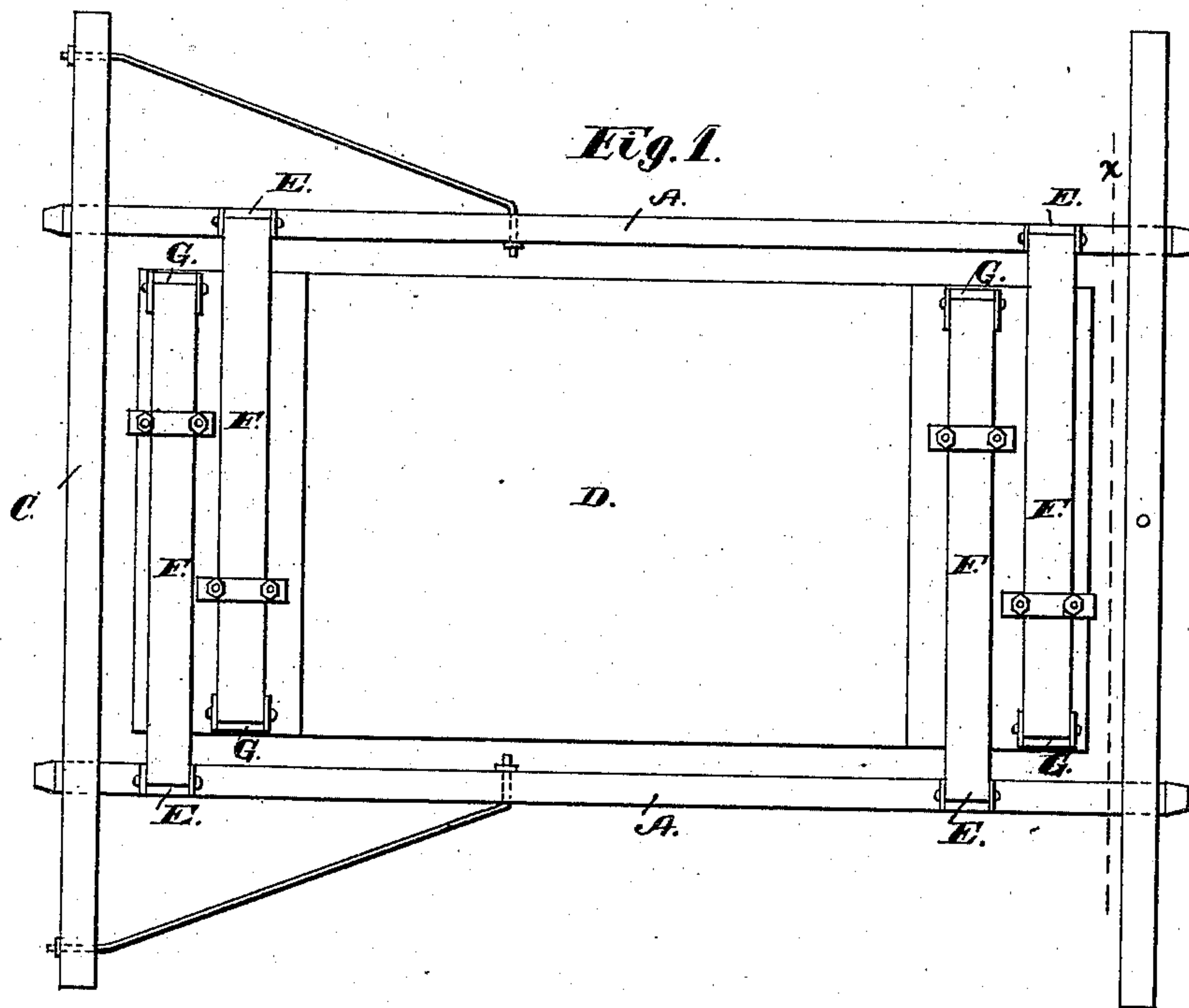


M. WOODHULL.
Vehicle-Spring.

No. 224,859.

Patented Feb. 24, 1880.



Witnesses;
Chas. M. Beck
P. H. Gunkel

Inventor;
Morris Woodhull
by Beck & Ritchie
his Attys;

UNITED STATES PATENT OFFICE.

MORRIS WOODHULL, OF DAYTON, OHIO.

VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 224,859, dated February 24, 1880.

Application filed December 1, 1879.

To all whom it may concern:

Be it known that I, MORRIS WOODHULL, of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Vehicle-Springs; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an improvement in vehicle-springs of that class more particularly adapted to side bars, and also side-spring buggies.

The nature of the invention can be readily understood by reference to the following description and accompanying drawings, in which—

Figure 1 is an inverted plan view of the running-gear of a cross-spring side-bar buggy, showing the application of my invention. Fig. 2 is an end elevation of the same through the line *xx* of Fig. 1. Fig. 3 is a corresponding view, showing a modification of my invention.

A A represent the side bars, supported in the usual way upon the bolster and axle C. D is the bottom of the body or bed, and is hung in place as follows: At each end of the bars A are secured clips E, from which leaf-springs F, of the shape indicated, pass, and, intersecting each other, are fastened on opposite sides to pivots or shackles G, attached to the under side of the body, as seen in Fig. 2. There are two pairs of these cross or intersecting springs, one pair at each end of the body, as represented in Fig. 1. The ends of these springs are not rigidly fastened at either end, but are hung upon pivots, as shown, so that greater play and elasticity are obtained.

To render this arrangement more perfect I apply adjustable fulcrums H to the springs, as seen in Figs. 1 and 2. These fulcrums consist of metal socket-pieces *a*, resting upon the top of the springs, and containing in their upper ends rubber or other soft and elastic pads *b*, which bear against the bottom of the body or bed, as shown.

Clip-bolts *c* extend down upon each side of the spring, so as to embrace it, and are connected by a clamping-link, *d*, as represented. Nuts *e*, screwed upon the lower ends of the

bolts, serve to secure the whole in place, and by loosening them the fulcrums may be adjusted by sliding them to any desired point upon the springs.

These fulcrums and the springs, hinged at both ends, constitute the essence of my invention, for by them the elasticity of the springs can be regulated at will to suit light or heavy loads.

By sliding these fulcrums toward each other under the middle of the body the springs will have the greatest elasticity, and will be adapted for light ordinary weights or loads.

If it is desired to increase the tension or rigidity of the springs the fulcrums are moved from each other toward the pivots G. As the springs are inclined they thus act as wedges, and serve, practically, to shorten the spring and thus render it more rigid.

If it is desired to carry a heavy load on one side of the vehicle and a light one on the other the fulcrums are so shifted that the resistance on the side of the bed destined to carry the heavy weight is greater than on the opposite side. By this means the springs may be adjusted to a nicety to carry the body level with unequal weights on either side.

I am aware that it is not new to employ adjustable spiral or other springs in connection with pivoted rigid cross-bars, said adjustable springs being the only ones employed to give elasticity to the bed; and I am aware that cross-springs have been employed before, and lay no claim to such, *per se*; but I do not wish to be limited to the construction or employment of leaf-springs, as they may be solid and be made of drawn steel; nor do I limit myself to the construction and mode of attachment of the adjustable fulcrums, as they may be made and applied in various ways, one of which is shown in Fig. 3, where the fulcrums, instead of being fastened on springs, are secured on rods *f*, attached to the under side of the bed or body, and are held at any destined point by thumb-screws. Again, this arrangement of the springs and fulcrums may be applied to other classes of vehicles besides those known as "side-bar buggies;" and the

springs, instead of running from side to side of the body, may run from end to end, thus adapting them as side springs.

Having thus fully described my invention,
5 I claim—

The combination, with cross-intersecting vehicle-springs, of adjustable fulcrums or rests, whereby the elasticity of the springs may be

regulated to suit the character of the load, as set forth.

Witness my hand this 20th day of November, A. D. 1879.

MORRIS WOODHULL.

Witnesses:

PATRICK H. GUNCKEL,
CHAS. M. PECK.