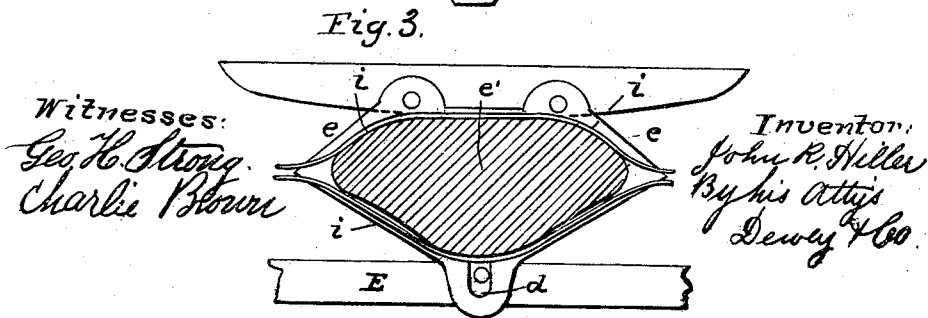
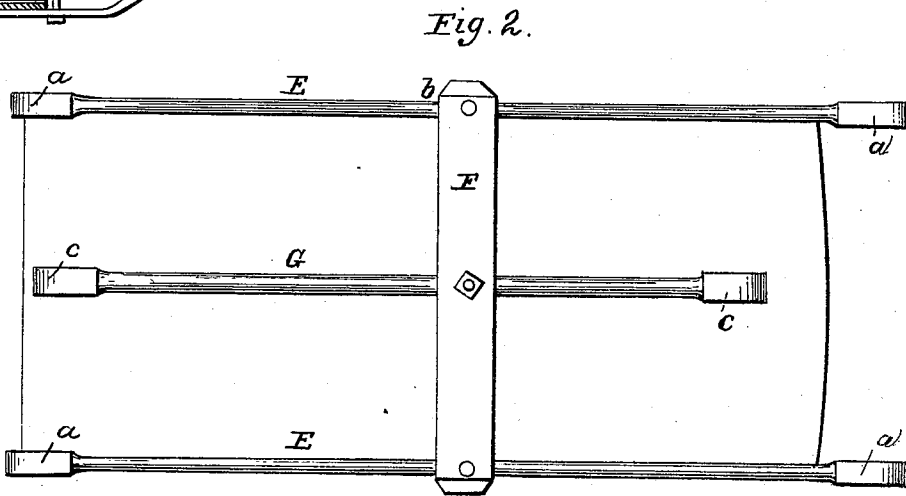
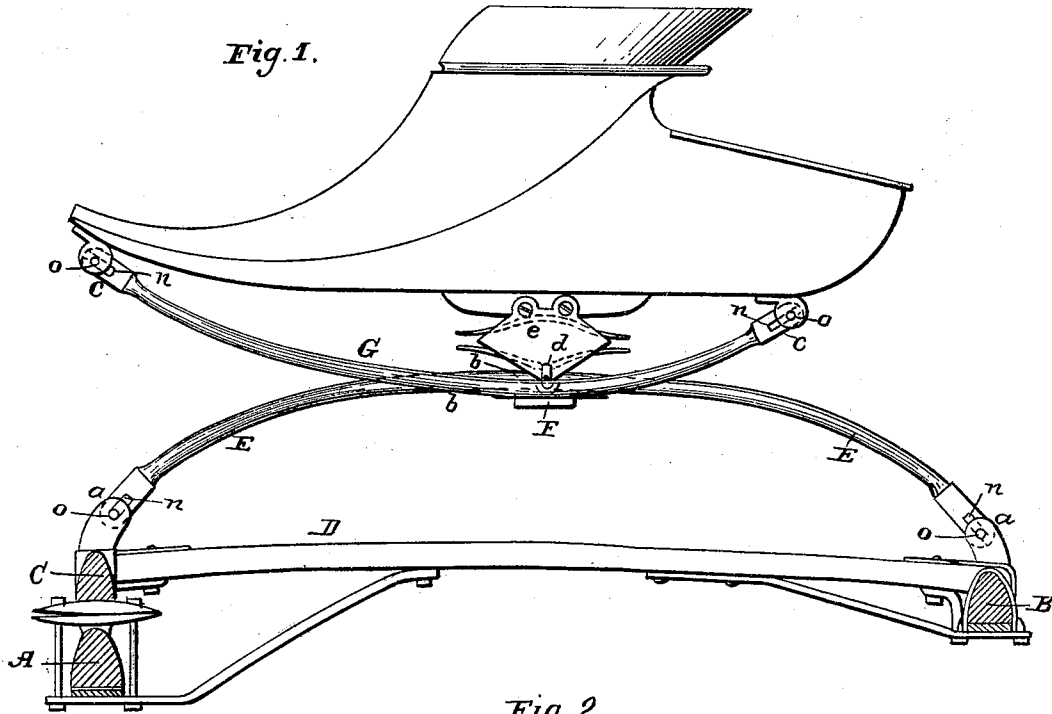


J. R. HILLER.
Carriage Spring.

No. 106,817.

Patented Aug. 30, 1870.



UNITED STATES PATENT OFFICE.

JOHN R. HILLER, OF WOODLAND, CALIFORNIA, ASSIGNOR TO HIMSELF
AND CLARK ELLIOTT, OF SAME PLACE.

IMPROVEMENT IN CARRIAGES.

Specification forming part of Letters Patent No. 106,817, dated August 30, 1870.

To all whom it may concern:

Be it known that I, JOHN R. HILLER, of Woodland, county of Yolo, State of California, have invented an Improvement in Carriages; and I do hereby declare the following description and accompanying drawing are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvements without further invention or experiment.

My invention relates to an improvement in buggies and carriages in which, by a peculiar arrangement of the springs and their connections, all the motion imparted in traveling is given directly from the center of the body, and the carriage rides much easier than those of ordinary construction.

It further consists in combining suitably-inclosed rubber springs with wood springs in constructing a carriage, so that a more noiseless and easy riding carriage is produced.

I effect the first part of my invention by the use of curved elliptic or other suitably-shaped wood springs, two of which are fastened at each side to the ends of the reaches, so as to rise toward the center, while another one has its ends attached to the front and back of the body, so that its center curves downward. The centers of these springs are united by a stout transverse bar, which is firmly fastened to each.

The second part of my invention consists in uniting the two side springs with the body by means of suitably-shaped blocks of rubber, which are so inclosed by plates that, while retaining their elasticity, they cannot be crushed out of shape by any severe pressure to one side. The end connections of the wood springs are also kept from jarring by means of rubber springs.

Referring to the accompanying drawing for a more complete description of my invention, A is the front, and B the rear, axle-bed of a carriage; C, the bolster, and D D the reaches. E E are two curved wood springs, attached, one at each side of the bolster and the rear axle-bed at *a a*. These springs rise in an arch toward their centers, *b*, at which point they are firmly connected by a stout transverse bar, F. Another similarly-curved spring, G, has its ends *c c* fastened at or near the ends of the

carriage-body, and its center, arching downward, is also securely fastened to the bar F at a point between the springs E. By this manner of constructing and attaching the springs all motion received in passing over rough ground is transmitted to the body at the center, instead of at the ends, as in other forms of carriages, excepting the comparatively small amount of resistance that may be offered by the spring G at the points *c*, for as the spring G, like the body itself, is supported by the springs E, the spring G is chiefly employed in balancing the body upon its central support, and preventing a too severe wrench upon its connection there with the springs E. The side motion, as well as this, is also greatly reduced.

The two side springs, E E, are connected to the body at their centers in the following manner: Two metal plates, *e e*, are fastened, as most convenient, to the lower part of the carriage-body, and extend down, one each side of the spring, as shown. A vertical slot, *d*, is made at the lower part of each plate, and a pin which extends out through the slot from the side of the spring guides it in its motion. Between these plates is a block of rubber, *e'*, which is made in any suitable shape. In the present case it is made tapering toward each end, and springs *i*, curved to inclose it, are placed above and below between the plates *e*, as shown. The upper of these springs is fastened to the body, and the lower one to the spring E, and any motion forward or back will cause them to compress the rubber in that direction without forcing it out of place. If the pressure should be too great for the elasticity of the rubber, the ends of the springs *i* will be brought together, and thus give an additional resistance.

In order to give a still further elasticity, and at the same time prevent the connections at the ends of the springs E and G from working loose, a slot is made in each of these ends, and a block of rubber, *w*, is placed in it, so as to rest on the bolt *o*. This is more especially necessary in the spring G, as, when the carriage-body rocks forward and backward, it causes considerable end motion, which the elasticity of the spring G would not be sufficient for.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The springs E E, with the spring G and the connecting-bar F, constructed and operating substantially as herein described.

2. The combination, with the springs E, of the elastic blocks e, when said blocks are held by springs i, arranged to furnish additional support, if required, substantially as specified.

In witness that the above-described invention is claimed by me I have hereunto set my hand and seal.

JOHN R. HILLER. [L. S.]

Witnesses:

H. G. BURNETT,
CLARK ELLIOTT,
GILES E. SILL.