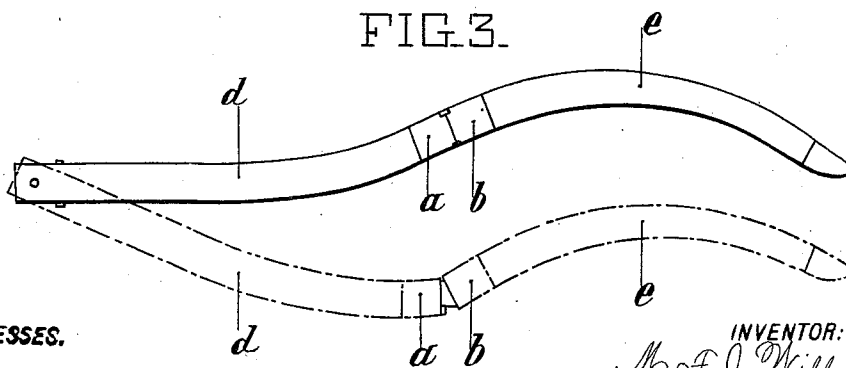
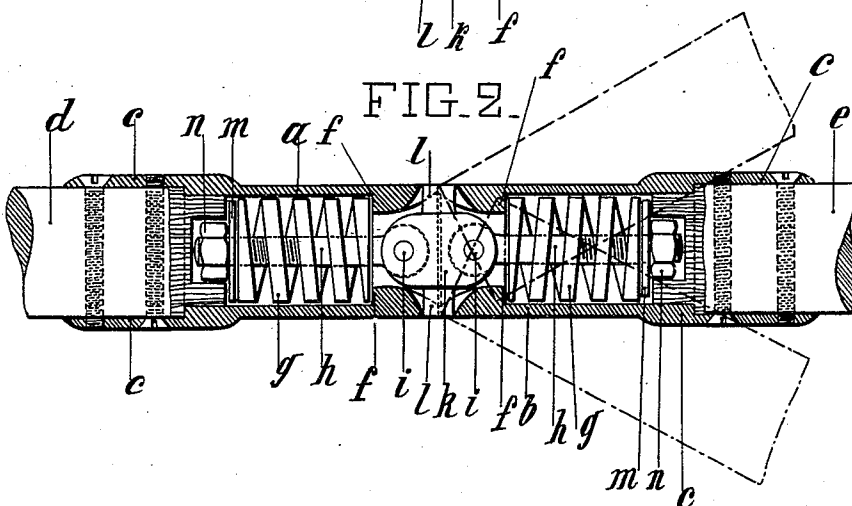
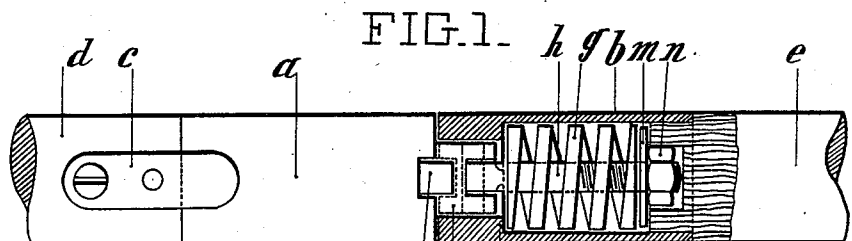


(No Model.)

M. F. J. WILLEMIN.
CARRIAGE SHAFT.

No. 565,316.

Patented Aug. 4, 1896.



WITNESSES.

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UNITED STATES PATENT OFFICE.

MARIE FRANÇOIS JULES WILLEMIN, OF PARIS, FRANCE.

CARRIAGE-SHAFT.

SPECIFICATION forming part of Letters Patent No. 565,316, dated August 4, 1896.

Application filed April 11, 1896. Serial No. 587,216. (No model.)

To all whom it may concern:

Be it known that I, MARIE FRANÇOIS JULES WILLEMIN, of the city of Paris, France, have invented Improvements in Shafts for Carriages and other Vehicles, of which the following is a full, clear, and exact description.

My invention relates to an unbreakable shaft for carriages and other vehicles characterized by the application of a kind of joint enabling the shaft to fold in the vertical direction without breaking when the horse falls.

In order that my invention may be properly understood, I have represented the same by way of example in the accompanying drawings.

Figure 1 is a plan view of the device applied, parts being in section, the shaft or thill being shown in part. Fig. 2 is a sectional side elevation, and Fig. 3 is a side elevation of the shaft having my invention applied.

In the figures similar letters of reference designate corresponding parts.

My device comprises, in principle, two sleeves or sockets *a b*, secured by means of lugs *c* and screws or bolts to the parts *d e* of the shaft. Each of the sleeves or sockets *a b* has an interior shoulder *f*, upon which bears a helical spring *g*, traversed by bolts *h*, having articulated connection, as at *i*, with the forked ends of a coupling-block *k*. This block *k* is provided with two studs *l*, engaging with corresponding recesses or holes formed in the sleeves or sockets *a b* at the meeting ends of the latter. Upon each of the bolts *h* at the outer ends is placed a disk or washer *m*, held by a nut *n*, the washers thus forming adjustable abutments for the outer ends of the springs *g*. From this it will be readily understood that the parts *d e* of the shaft, being fitted in the sleeves or sockets *a b* and united in the manner set forth, constitute a shaft absolutely rigid lengthwise.

If, through any cause, the horse falls, the weight of his body will force the part *d* of the shaft to bear upon the ground, while the part *e* under this pressure will turn about the axis *i*, as shown in dotted lines in Fig. 3. During this time the spring *g* will be com-

pressed and as soon as the animal rises again the part *e* of the shaft, under the action of this spring, will return to its original position.

If the part *d* of the shaft is raised instead of lowered, the part *e* thereof will be lowered. This movement of the part *e* of the shaft in the two directions is represented in dotted lines in Fig. 2. It follows from this arrangement that if the animal falls, no matter in what position he may lie on the shaft, the latter will not be broken.

I claim—

1. An unbreakable shaft for carriages and other vehicles, consisting of sleeves or sockets *a b* having internal shoulders *f* fitted upon the parts *d e* of the said shaft, connected by a forked coupling-block *k* provided with bolts *h* traversing springs *g* pressed against the shoulders *f* by means of disks or washers *m* and nuts *n* as described.

2. The herein-described coupling devices comprising sleeves, bolts, and a coupling-block forming an articulated connection between the bolts, the block having lugs projecting between the meeting ends of the sleeves and springs on the bolts, substantially as described.

3. A coupling device for shafts, consisting of two sleeves adapted to be secured to the sections of the shafts, said sleeves having internal shoulders and provided with recesses in their adjacent ends, a block provided with studs projecting from opposite sides and engaging the recesses of the sleeves, bolts pivoted to the block and provided with abutments on their ends, and springs surrounding the bolts and engaging the shoulders of the sleeves and abutments of the bolts, substantially as described.

The foregoing specification of my improvements in shafts for carriages and other vehicles signed by me this 25th day of March, 1896.

MARIE FRANÇOIS JULES WILLEMIN.

Witnesses:

CLYDE SHROPSHIRE,
ALBERT MOREAU.