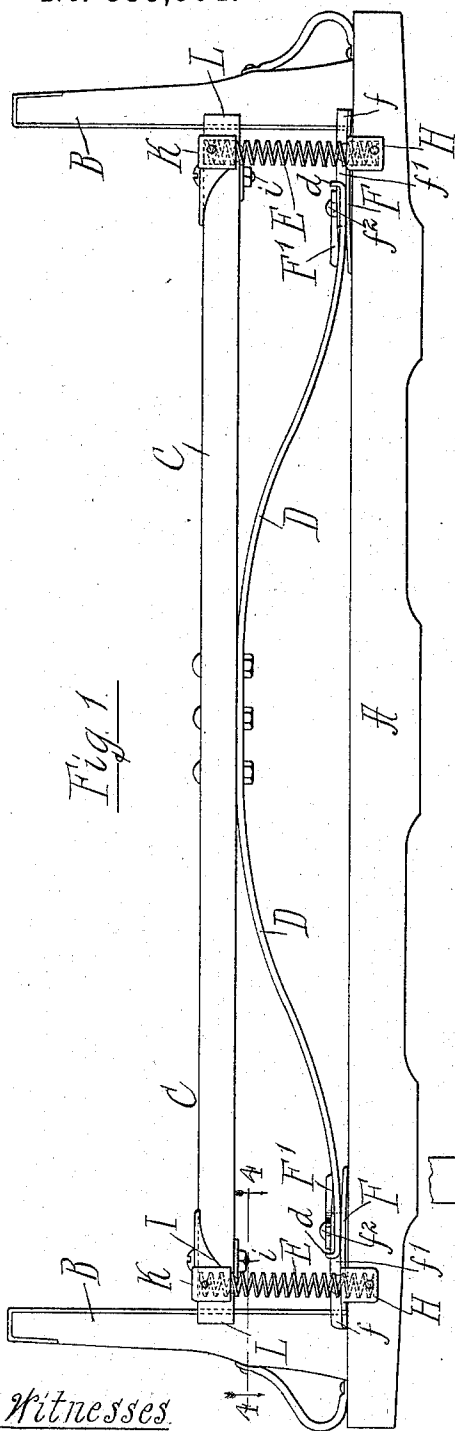


(No Model.)

N. L. HOLMES.
BOLSTER SPRING.

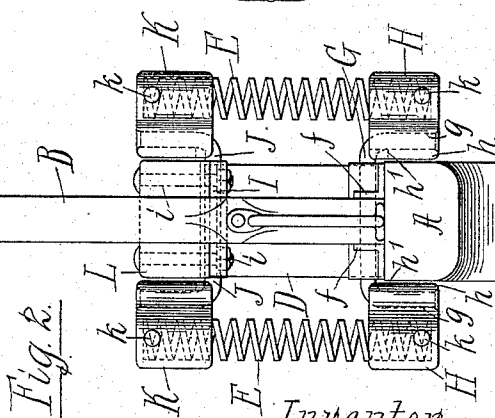
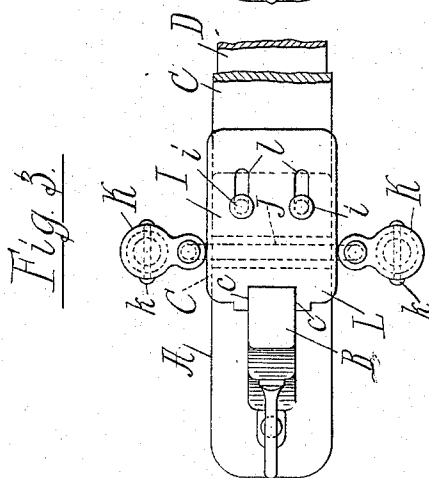
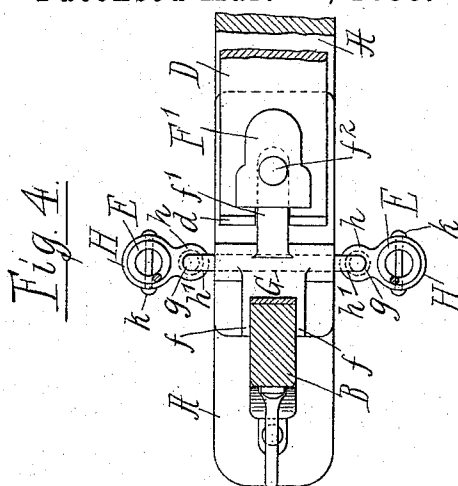
No. 535,904.

Patented Mar. 19, 1895.



Witnesses.

Jno. W. Adams!
Louis M. F. Whitehead.



Inventor
Nathan L. Holmes
by Clayton, Pole & Brown,
his Attorneys.

UNITED STATES PATENT OFFICE.

NATHAN L. HOLMES, OF RACINE, WISCONSIN, ASSIGNOR TO THE ACME
ADJUSTABLE POLE COMPANY, OF SAME PLACE.

BOLSTER-SPRING.

SPECIFICATION forming part of Letters Patent No. 535,904, dated March 19, 1895.

Application filed January 12, 1894. Serial No. 496,585. (No model.)

To all whom it may concern:

Be it known that I, NATHAN L. HOLMES, of Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in Bolster-Springs; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in bolsters for vehicles and particularly to that class wherein an auxiliary spring bolster or supporting bar is used in connection with an ordinary or non-yielding bolster of the kind commonly used on wagons, carts and the like.

The invention has for its object to produce a construction the parts of which are so arranged as to prevent excessive strain or wear coming upon them, to provide a spring supported bolster which shall readily respond to relatively light loads, at the same time to produce a structure capable of sustaining the most severe strains without injury, and one which will support its load steadily under all conditions.

The invention consists in the matters hereinafter described and particularly pointed out in the appended claims and will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a bolster constructed in accordance with my invention. Fig. 2 is an end elevation of the same. Fig. 3 is a top or plan view of the same, and Fig. 4 is a horizontal sectional view, taken on the line 4—4 of Fig. 1.

Referring to said drawings, A designates a bolster and B B the stakes or guide standards therein, these parts being of any common construction.

C designates an auxiliary spring bolster yieldingly supported upon the main bolster A by means of a leaf spring D and coiled springs E E, the latter arranged at each end thereof, as hereinafter described. The supporting bar C is adapted to fit loosely between the standards B B and is provided with recesses or ways *c c* at either end adapted to engage the standards and hold the bar from lateral displacement. The bolster C is sustained at its

center by the single leaf spring D, which latter is in turn supported at each end upon a bearing plate F with which the end of the spring has sliding engagement. This bearing plate F rests flatly upon the main bolster A adjacent to the guide standard B, being provided with retaining lugs *f f* adapted to engage the said standard at either side and thus prevent its lateral displacement, as clearly shown in Fig. 4. The sliding connection between the leaf spring D and said plate F is constructed as follows: That part of the plate F upon which the spring D is adapted to slide is provided centrally with a rib or raised portion *f'* extending longitudinally thereof or in the direction of the length of the spring, and said spring is slotted or cut away at its center for some distance from the end in such manner as to fit over this rib *f'*. A plate F' is secured transversely upon the rib *f'* above the spring D by means of a bolt or rivet *f''*, as shown in Fig. 4, and in order to prevent said plate from becoming separated from the end of the spring when the auxiliary bolster is removed from the main bolster, the end of the spring is turned up or provided with nibs *d d* adapted to engage the edge of the plate and thus hold them together. The vertical thickness of the rib *f'* is greater than the thickness of the leaf spring D and the under side of the plate F' is beveled adjacent to the said spring D in such manner as to permit free sliding movement of the latter upon the plate F when in position upon the bolster, as clearly shown in the drawings.

The arrangement of the coiled springs E E is as follows: Mounted in a transversely arranged bearing formed on the plate F is a rod G having down-turned ends *g g* each of which carries a cup-shaped socket H adapted to receive the end of one of the said coiled springs E. These sockets are shown as secured to the downturned ends of the rod G by means of thimbles *h h* through which the ends of the rod pass, the latter being riveted therein by slightly upsetting the same. These thimbles *h h* are shown as being made of a length slightly longer than the right-angled part of the rod G and provided with notches *h' h'* within which the horizontally arranged part of the rod G enters, thus serving to hold the

said sockets rigidly in a certain fixed relation to the supporting rod, in this instance in the same plane with the axis of the rod G.

A second bearing plate I having a transversely arranged pivot rod J is secured to the under side of the auxiliary bolster C vertically above the plate F, the ends of the pivot rod being in this instance turned upwardly and carrying sockets K K similar to those before described, as clearly shown in the drawings. Said plate I is secured to the piece C by means of bolts *i i*. A protecting cap or casting L is secured over the end of the piece C by means of the bolts *i i* passing there-through, said cap forming the end proper of the piece C and being cast with a way or groove therein adapted to engage the guide standard B. Adjustment of said cap endwise of the piece C is provided by means of the slot-shaped bolt apertures *l l*, as clearly seen in Fig. 3.

The coiled springs E E are interposed between the corresponding pairs of sockets H and K. They are secured therein preferably by means of rivets *k k* passing transversely through the sockets and the coil of the spring therein near the closed end of the socket, as shown in Fig. 3.

A bolster thus constructed possesses advantages not heretofore attained, so far as I am aware. By the arrangement of the sockets for the springs E E upon pivotal supports, as shown, said springs are free to assume a position adapted to take any strain brought thereon in a direct line regardless of the relative positions of the main and auxiliary bolsters, thus absolutely preventing any twisting or cramping strain coming upon said springs. The location of said springs outside of rather than between the two bolsters permits the use of longer and more resilient springs and therefore greatly lessens the liability of breakage of the latter. The illustrated novel combination of the coiled and leaf springs arranged as described produces a most desirable result. This will be better understood by consideration of the fact that the leaf spring affords a most satisfactory means of supporting the principal part of the load, but by reason of its attachment at its central part only, the spring is extremely liable to be broken under the violent lurching or cramping strains to which it is subjected, unless it be in some manner protected from such strains. The location of the coiled springs at the extreme ends of the bolster affords such a protection for the leaf spring by preventing any extreme tilting of the bolster C and at the same time distributing the weight or strain over the whole bolster. The result of this combination of springs is to produce a durable bolster, although the springs of which may be made relatively weak, which will, by its construction, reduce to a minimum the lurching strains caused by the tilting or vibration of the bolster. Again, it will be found that riding will be very much improved and easier in a ve-

hicle to which my improvement has been applied, while the load will be carried more steadily under all circumstances.

It is to be noted that various other forms of pivotal connections or supports for the ends of the coiled springs might be employed with substantially the same effect of allowing the spring to maintain a direct line between its points of attachment, but the yoke or crank-arm form herein shown is for various reasons deemed most desirable. For instance, with this form of connection, I am enabled not only to use a spring of greater length, but owing to the fact that the point of attachment of the spring with said yoke is considerably removed from the pivotal axis of the latter, any lateral shifting of the spring at either end will cause the yoke to promptly rock in its bearing to meet the changed condition, notwithstanding the fact that there may be considerable friction between said bearing and the yoke due to the weight of the load thereon.

Another and important advantage of the present construction consists in the arrangement of the bearing plate in such manner that while affording a support upon which the end of the leaf spring may rest and slide, yet it affords also a stationary support for the coiled supporting springs which is not in any way affected by the action of the leaf spring sliding thereon.

I claim as my invention—

1. A bolster spring comprising vertically arranged coiled supporting springs located at the ends of the bolster, one at each side thereof, said springs being connected at their ends with the bolster and supporting bar by means of pivotal or hinged connections, substantially as set forth.

2. A bolster spring comprising two vertically arranged coiled supporting springs located at each end of the bolster, one at each side thereof, and hinged yokes mounted on the bolster and supporting bar and engaged with the ends of the springs, substantially as set forth.

3. In a bolster spring, the combination with a vertically arranged coiled compression spring arranged at the end of the bolster and at one side thereof, of a pivotal connection between the end of said coiled spring and the part against which it acts, whereby lateral strain on the spring is avoided, substantially as set forth.

4. A bolster spring comprising a leaf spring interposed between the supporting bar thereof and its support, said spring having sliding engagement at its ends with one of said parts, and coiled springs arranged vertically at each end of the bolster, one at each side thereof, said coiled springs having pivotal connection at their ends with the parts against which they act, substantially as set forth.

5. A bolster spring, comprising a leaf spring interposed between the supporting bar thereof and its support, bearing plates having sliding engagement with the ends of the spring and adapted to rest on the bolster support,

vertically arranged coiled supporting springs arranged at the ends of said bolster, one at each side thereof, yokes arranged transversely of and pivoted to said bearing plates and affording support for the lower ends of the springs, and pivoted yokes carried by the bar of said bolster-spring affording attachment for the upper ends of the coiled springs, substantially as set forth.

10 6. The combination with a leaf spring for an auxiliary bolster or the like, of a bearing plate for the end of said spring, said plate having a central, longitudinally arranged rib, and a retaining plate secured on said rib, the

end of said spring being longitudinally slot- 15
ted so as to fit over said rib between the retaining and bearing plates and provided with an upturned part adapted to engage said retaining plate and prevent the separation of the parts, substantially as set forth. 20

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses.

NATHAN L. HOLMES.

Witnesses:

C. CLARENCE POOLE,
ALBERT H. GRAVES.