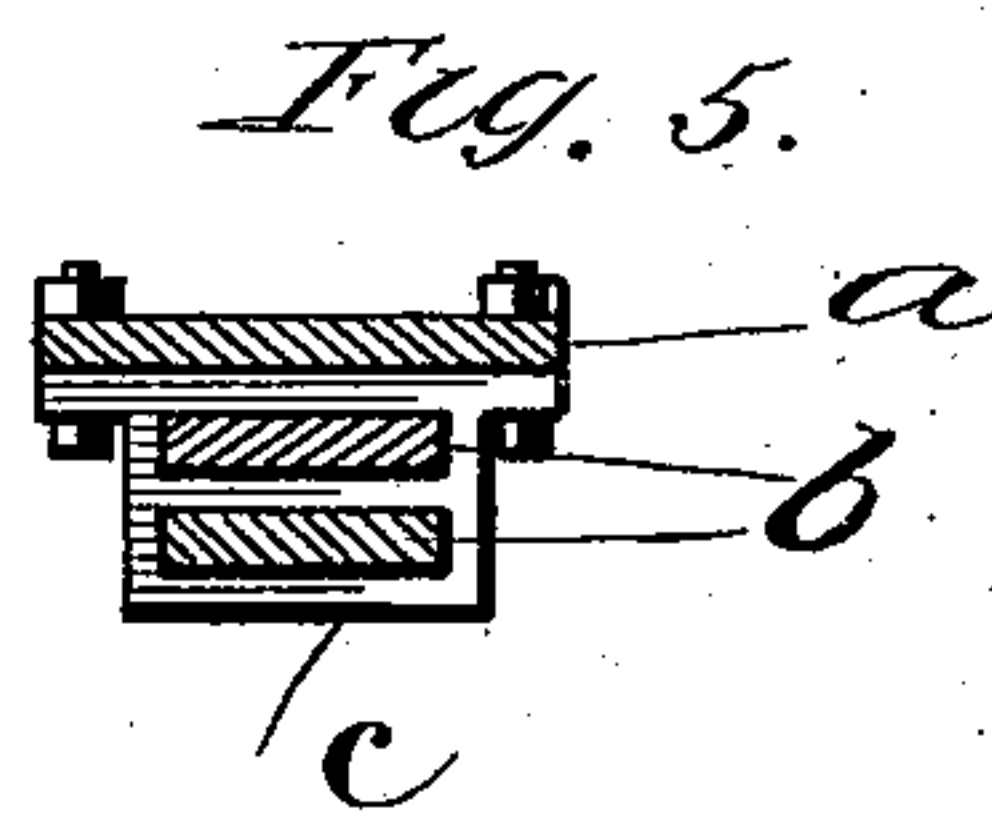
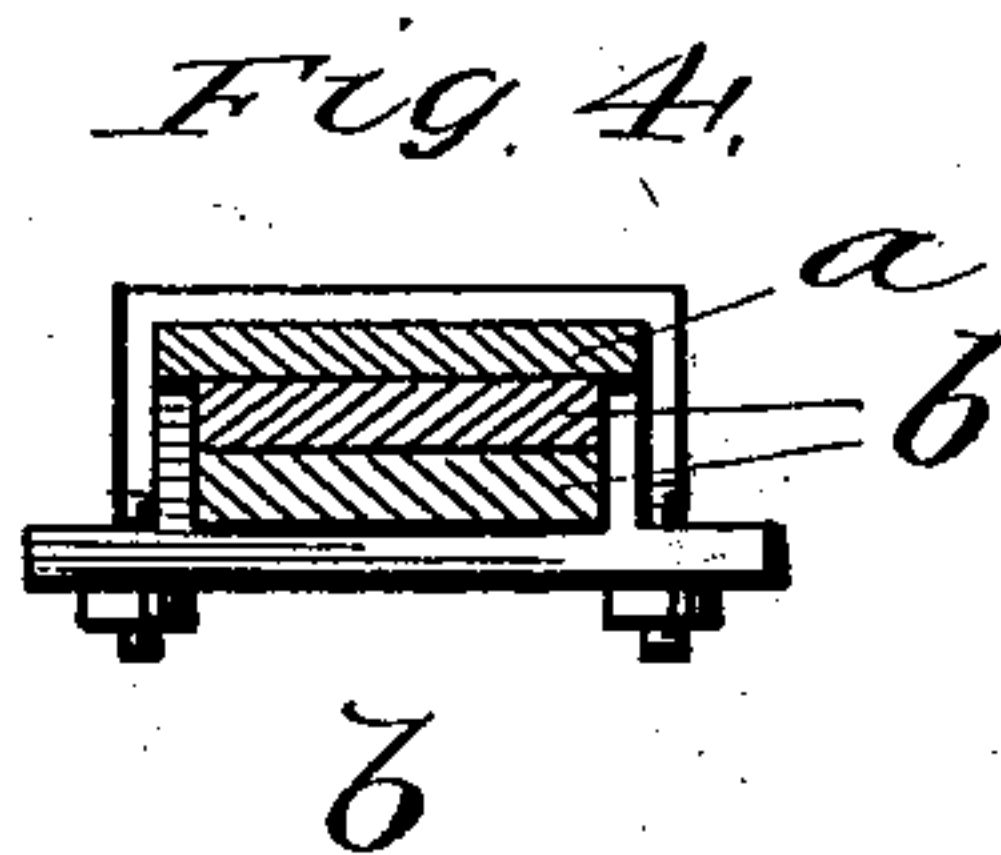
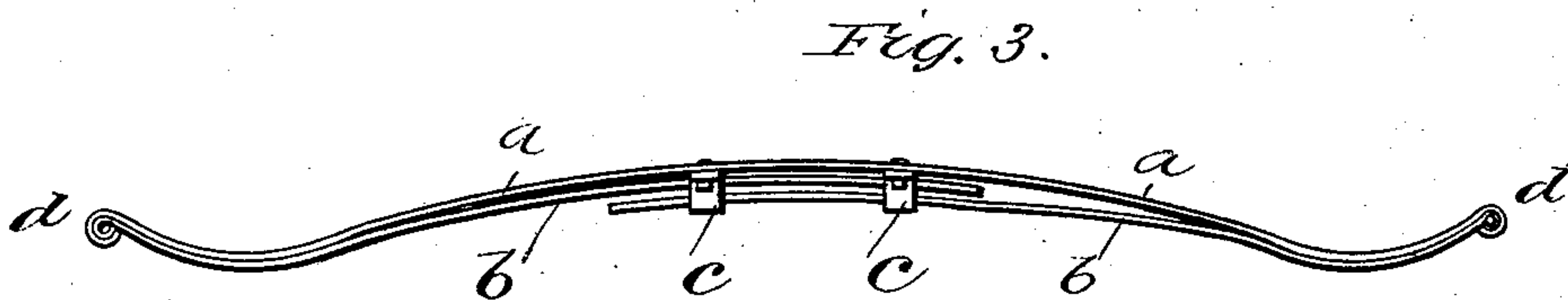
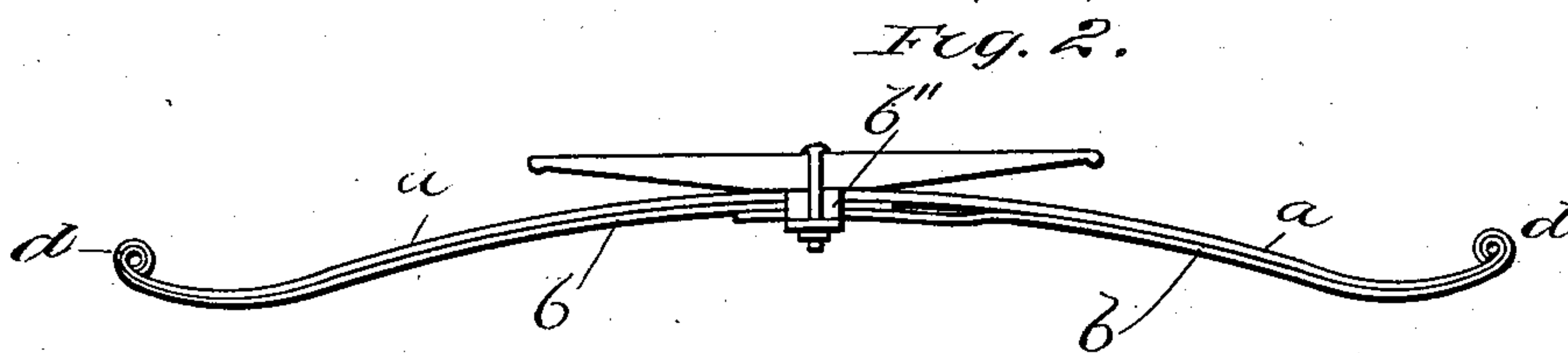
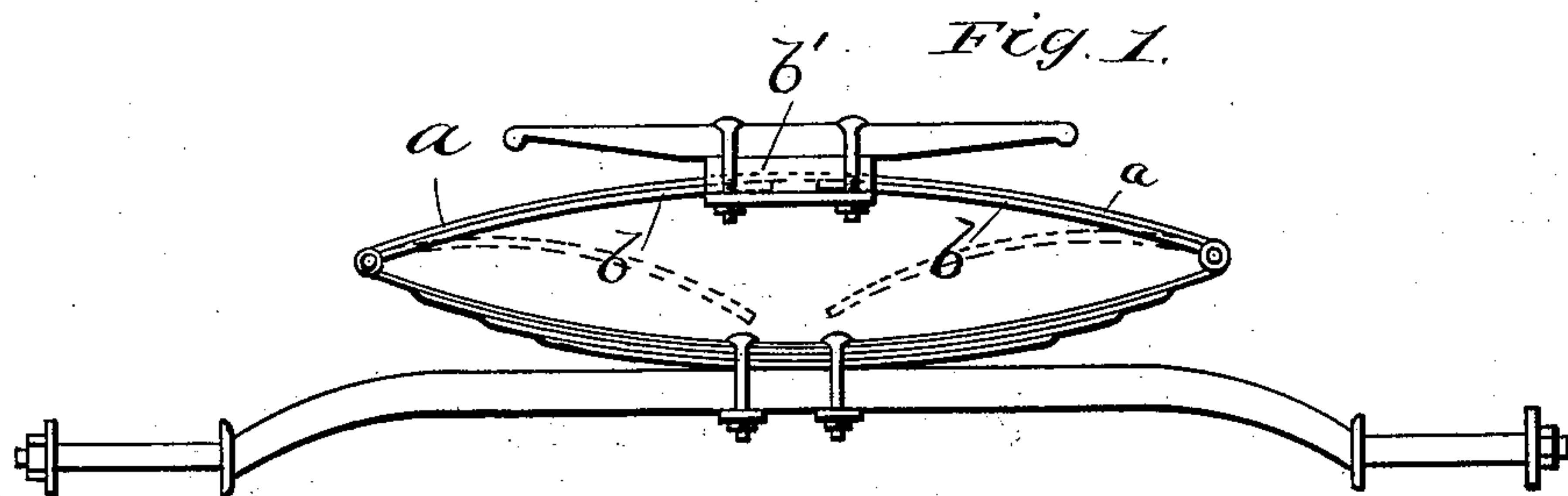


(No Model.)

W. G. MOWRY.  
VEHICLE SPRING.

No. 506,523.

Patented Oct. 10, 1893.



Witnesses  
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# UNITED STATES PATENT OFFICE.

WILLIAM G. MOWRY, OF GREENWICH, NEW YORK.

## VEHICLE-SPRING.

SPECIFICATION forming part of Letters Patent No. 506,523, dated October 10, 1893.

Application filed January 18, 1893. Serial No. 458,827. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM G. MOWRY, a citizen of the United States, residing at Greenwich, in the county of Washington and State of New York, have invented certain new and useful Improvements in Vehicle-Springs, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a new and improved spring, and it relates particularly to improvements on that class of springs for which Letters Patent were granted to me January 3, 1893, and numbered 489,321, and it has for its object to produce a more durable spring and at the same time to improve its operation and its appearance.

In the drawings:—Figure 1 is a side elevation showing my improved spring used in connection with the lower half of an elliptic spring. Fig. 2 is a side elevation showing another form of the spring; and Fig. 3 shows a modification of the keepers; and Figs. 4 and 5 are detail sectional views.

In the drawings *a* designates the main spring, which is a flat or leaf-spring curved slightly longitudinally, or it may be straight if desired. Secured to one side of this main spring are two short auxiliary springs *b b*. These springs are curved, and if desired, may terminate at their inner ends a little short of the middle of the main spring, as shown in Fig. 1, and said inner ends are held loosely against the main spring by a long keeper *b'*. This keeper may be secured to the main spring, or may embrace said spring and be securely bolted to the vehicle, if found desirable. The auxiliary springs may also be secured to the main spring as shown in Figs. 2 and 3 wherever either of said arrangements is found desirable. In Fig. 2 the inner ends of the auxiliary springs are lapped, one above the other, and are loosely held against the main spring by a keeper *b''* which embraces them and the main spring at the middle of the spring, said keeper being securely bolted to the wagon body. As shown in Fig. 3 their inner ends overlap one above the other at the middle of the main spring, and are held loosely in position by means of keepers *c*. These keepers *c c* are secured to the main spring, one on each side of the middle,

and each of said keepers is formed with two retaining loops *c' c'* through which extend the auxiliary springs *b*. These retaining loops are formed one above the other as shown, in order that when the springs *b b* are placed therein one will be over the other, and the dividing wall of said loops serves to separate the springs *b b* from each other and the inner wall of the keeper separates the inner spring from the main spring. This arrangement is advantageous in that it makes the springs more resilient and springy by doing away with the great amount of friction that would be caused between the springs if they should slide on each other when being acted on by a weight. These keepers *c c* are so placed on the main spring that each of the auxiliary springs will pass through both of them, thus providing two retaining and guiding loops for each of the springs *b*. The springs *b b* are preferably of a different curvature than the main spring as shown in dotted lines in Fig. 1, and are of such strength that when their inner ends are placed in the keepers or retaining loops, they will tend to arch the main spring, and all conform to the same curvature, but I do not wish to limit myself to this construction, as the springs may all be of the same curvature if desired without departing from the spirit of the invention. The auxiliary springs *b* are secured to the spring by placing their outer ends one on top of the other and wrapping or curling them together, thus practically locking the end of one spring around the end of the other spring. This curling of the springs may be done as shown at *d* in Figs. 2 and 3, that is, the main spring curled around the auxiliary spring, or vice-versa, as the exigencies of the case may require. By thus securing the ends of the springs together I obviate the necessity of weakening said springs by cutting holes in them through which to pass the bolts or other fastening devices. The curled ends of the springs may be so shaped as to form the eyes of the spring and thereby serve the double purpose of forming exceedingly simple and durable fastening devices for the springs, and forming at the time the eyes of the spring, thus effecting a saving in material and labor.

Having thus fully described my invention, what I claim is—



1. A vehicle spring consisting of a main leaf-spring, a supplemental spring secured to one of its sides, said springs being normally of different curvatures, one end of the supplemental spring being coiled up with one end of the main-spring, thereby securely locking them together, whereby the supplemental spring may be bent up against the main spring and the tension of said supplemental spring serving to arch the main spring against its tension, substantially as described.

2. A vehicle spring consisting of a main-leaf spring, two auxiliary or supplemental springs secured to one side of the main spring, means for holding the inner ends of the auxiliary springs against or nearly against the main spring, the outer ends of said springs being wrapped or coiled around with the ends of the main spring, said curling of the springs serving to lock the springs together, said springs being normally of different curva-

tures and one of them being stronger than the other, whereby the weaker is forced to conform to the curvature of the stronger when they are secured together at the middle of the main spring, substantially as described.

3. A vehicle spring consisting of a main leaf spring, auxiliary springs secured at their outer ends to the main spring at the ends thereof, the inner ends of the auxiliary springs overlapping one above the other at the middle of the main spring, a keeper for loosely retaining the inner ends the auxiliary springs in position against the main spring, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM G. MOWRY.

Witnesses:

WILLARD D. WRIGHT,  
BENJAMIN F. GILKISON.