

(No Model.)

W. I. BUNKER.

SPRING.

No. 326,944.

Patented Sept. 29, 1885.

FIG. 1.

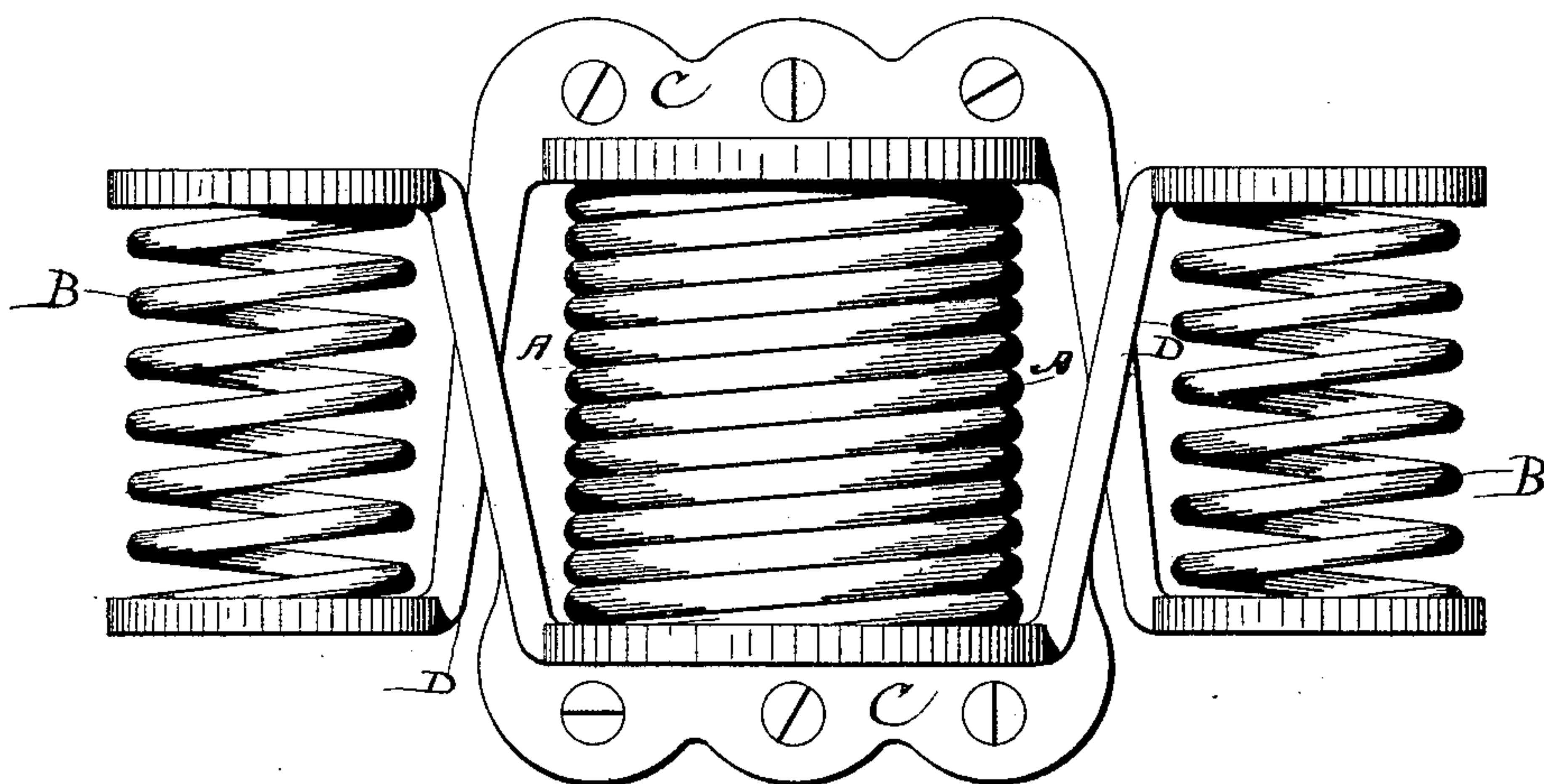
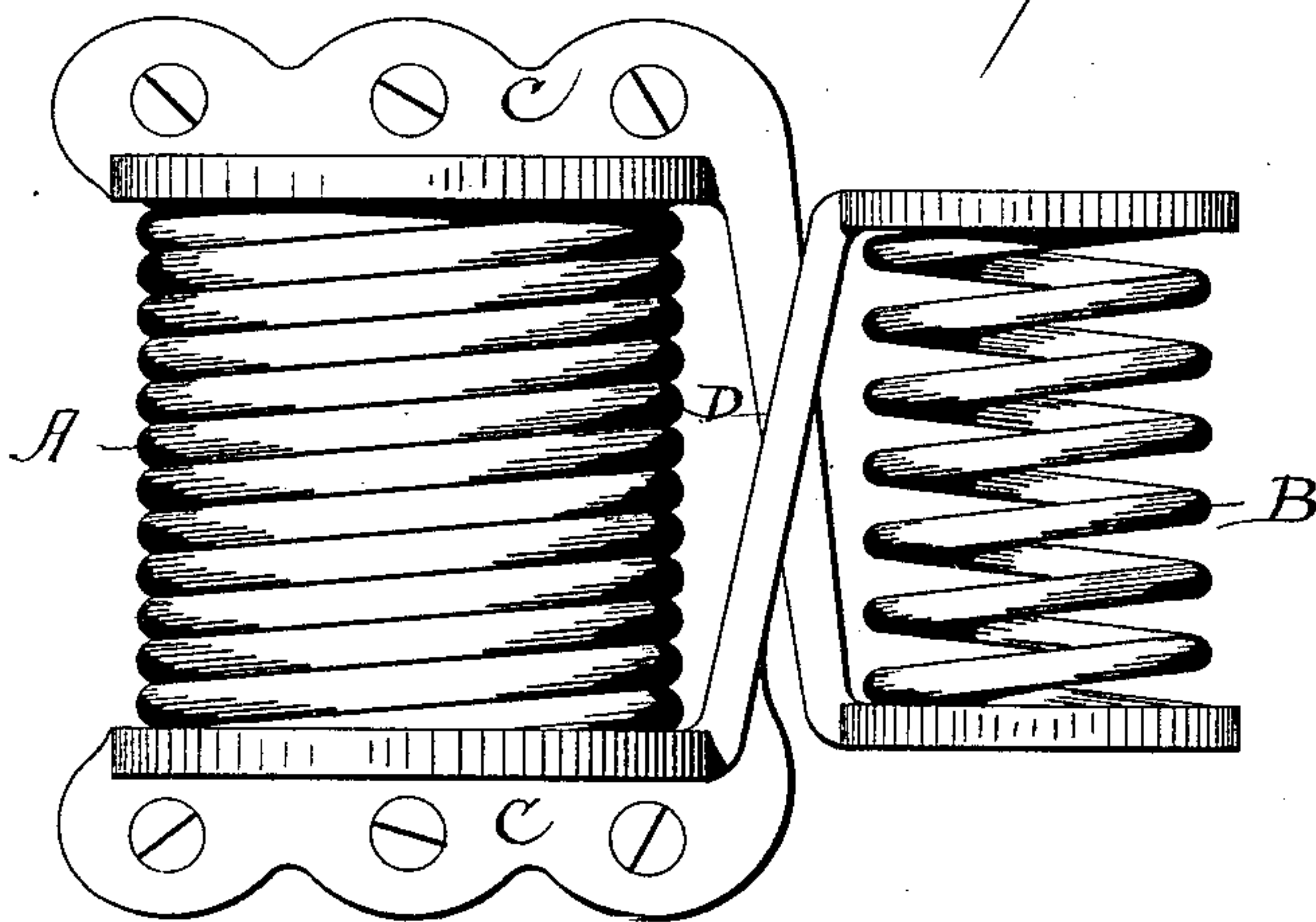


FIG. 2.



WITNESSES

*as. Pare'*  
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INVENTOR

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# UNITED STATES PATENT OFFICE.

WILLIAM I. BUNKER, OF CHICAGO, ILLINOIS.

## SPRING.

SPECIFICATION forming part of Letters Patent No. 326,944, dated September 29, 1885.

Application filed June 24, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM I. BUNKER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have  
5 invented a new and useful Improvement in Springs, of which the following is a specification.

The object of my invention is to make a spring for buggies, carriages, baby-carriages,  
10 &c., which will be at the same time both a compression and extension spring; and the invention consists, first, in the making of a compound compression and extension spring consisting of a main spring and one or more auxiliary springs placed side by side or separated,  
15 so as to have different longitudinal axes, and, second, in the making of rigid attaching-brackets of the peculiar form shown—that is, with downwardly and upwardly projecting arms or  
20 extensions, respectively, for securing the auxiliary springs.

In the accompanying drawings, Figure 1 shows my compound compression and extension spring when made of a main spring and two auxiliary springs, and Fig. 2 shows it when made of a main spring and one auxiliary spring.

A is the main spring; B, the auxiliary spring; C the attaching-brackets, and D the projecting arms or extensions of the brackets.

30 The several coils of my improved spring are made in the usual way—that is, a wire of suitable kind and size is taken and bent into a series of coils, the coils of the main spring being preferably close or contiguous when in  
35 their normal position, so that they cannot be opened or forced apart except by positive force, and the coils of the auxiliary springs being preferably open or apart when in their normal position, so that they cannot be closed  
40 or forced together except by positive force.

The attaching-brackets are made in two parts or members, which are secured, respectively, by screws or otherwise to the parts desired to be connected together—as, for instance, the axle and bed of a buggy. As shown  
45 in Fig. 1, each of these members carries two projecting arms or extensions adapted to receive and hold the side or auxiliary springs, and, as shown in Fig. 2, each of them carries one  
50 such arm or extension, one arm in either case projecting downwardly and to one side, and

the other projecting upwardly and to one side, and the two crossing, but preferably not in contact. These arms or extended portions may terminate in circular castings or be otherwise  
55 adapted to receive the ends of the springs. The springs are secured in or to the brackets in any suitable manner, but I have found a convenient method of securing them to consist in the use of a spiral thread on the inside  
60 of the bracket and circular castings, adapted to be inserted or screwed between the end coils of the springs, respectively.

It results from this peculiar construction that whenever the main spring is operated  
65 upon so as to open or separate its coils, the ends of the projecting arms or extensions will move toward each other so as to compress or squeeze together the coils of the auxiliary spring or springs, or vice versa, so that the  
70 compression of one or all of the auxiliary springs compensates for the extension of the main spring; in other words, as the main spring is opened and extended, the auxiliary spring or springs will be correspondingly  
75 closed and pressed together. The several portions of the spring will in this way assist in receiving or bearing the strain or weight, in the one case by opening the coils and in the other by correspondingly closing them. This  
80 is the principal idea of the invention, no matter to what uses the spring may be applied, whether to buggies, carriages, or other objects to which coiled springs are used, though modifications of the principle may be made—as,  
85 for instance, the number of auxiliary springs may be increased, or the coils of the main spring may be open or apart, and the coils of the auxiliary springs close or contiguous, &c.; but whatever modifications be made, the parts should  
90 always operate so that, as the coils of one spring are being opened or extended, the coils of another will be closed or compressed.

The particular advantages of my compound compression and extension spring are its compensating qualities and the safety it affords  
95 from accidents by breakage. As the coils of the main spring are opened, the coils of the auxiliary spring or springs are correspondingly closed, so that as the one becomes weakened the increasing tension produced in the  
100 other affords sufficient compensation to pre-



serve the average strength and tension of the spring. If either the main or auxiliary springs becomes broken by a sudden strain or accident, the other will receive the weight and prevent the two parts of the object connected together from becoming detached and separated.

This compound compression and extension spring is an improvement upon the one described in my patent of June 9, 1885, and although subordinate thereto, has special advantages of its own, particularly in that it enables the making of a shorter spring.

I claim—

1. As a new article of manufacture, a compound compression and extension spring, comprising a main spring, an auxiliary spring or springs, and attaching-brackets, the main spring and the auxiliary spring or springs having different longitudinal axes, and being, respectively, extension and compression springs, substantially as and for the purpose set forth.

2. As a new article of manufacture, a compound compression and extension spring, com-

prising a main spring, an auxiliary spring or springs, and two attaching-brackets, the bracket at the top of the main spring having a downwardly-projecting arm or arms, and the bracket at the bottom of the main spring having an upwardly-projecting arm or arms, and the main spring and the auxiliary spring or springs having different longitudinal axes, substantially as and for the purpose set forth.

3. As a new article of manufacture, a spring attachment for buggies, carriages, &c., comprising a main spring, one or more auxiliary springs, and two attaching-brackets, the bracket at the top of the main spring having a downwardly-projecting arm or arms, and the bracket at the bottom of the main spring having an upwardly-projecting arm or arms, such arms terminating in circular castings to receive the ends of the springs, substantially as and for the purpose set forth.

WILLIAM I. BUNKER.

Witnesses:

EPHRAIM BANNING,  
THOMAS A. BANNING.