

(No Model.)

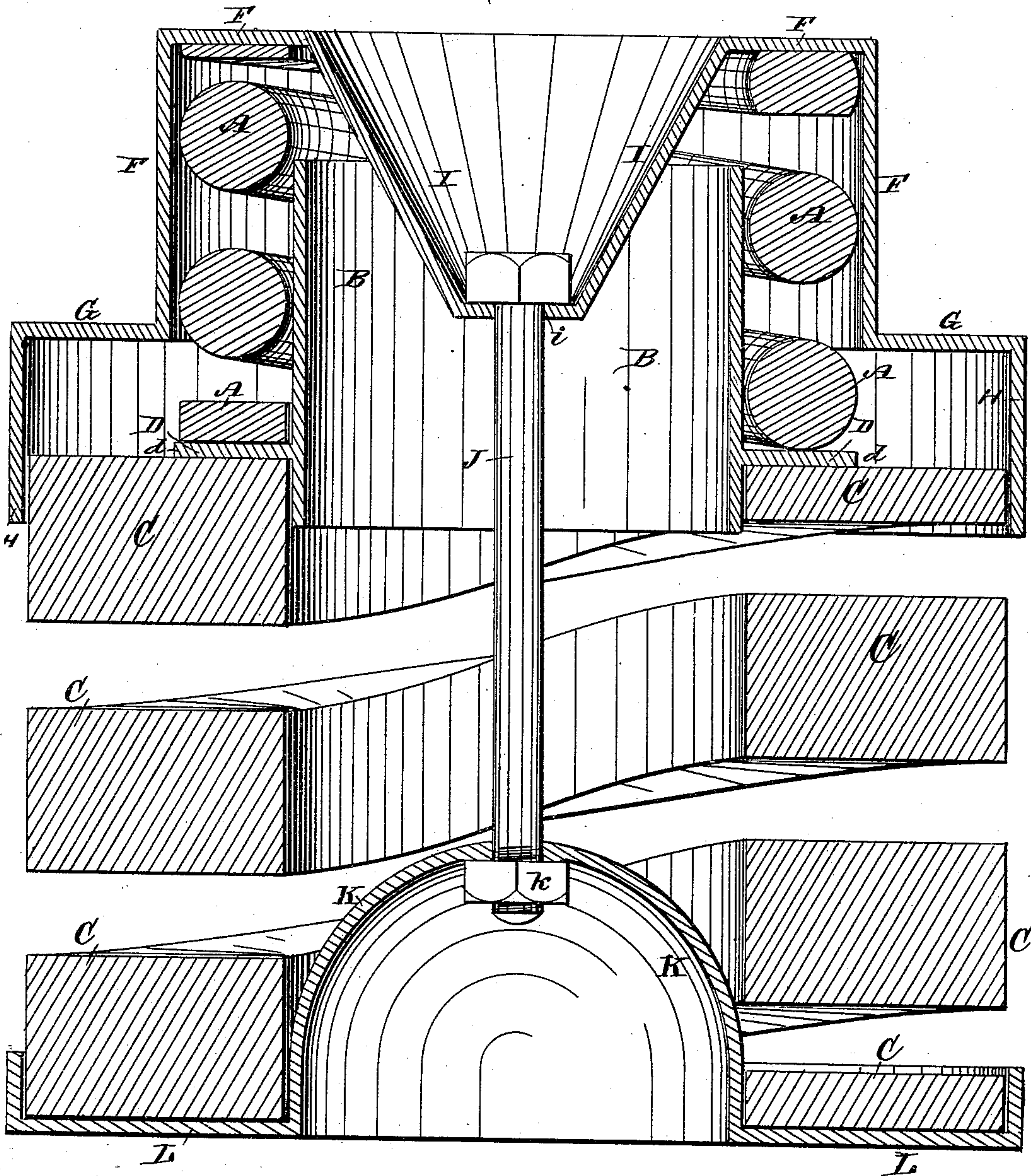
2 Sheets—Sheet 1.

R. VOSE.  
CAR SPRING.

No. 349,070.

Patented Sept. 14, 1886.

Fig. 1.



WITNESSES:

*John S. Scher*  
*D. F. Clark*

INVENTOR

*Richard Vose*  
BY

ATTORNEY



(No Model.)

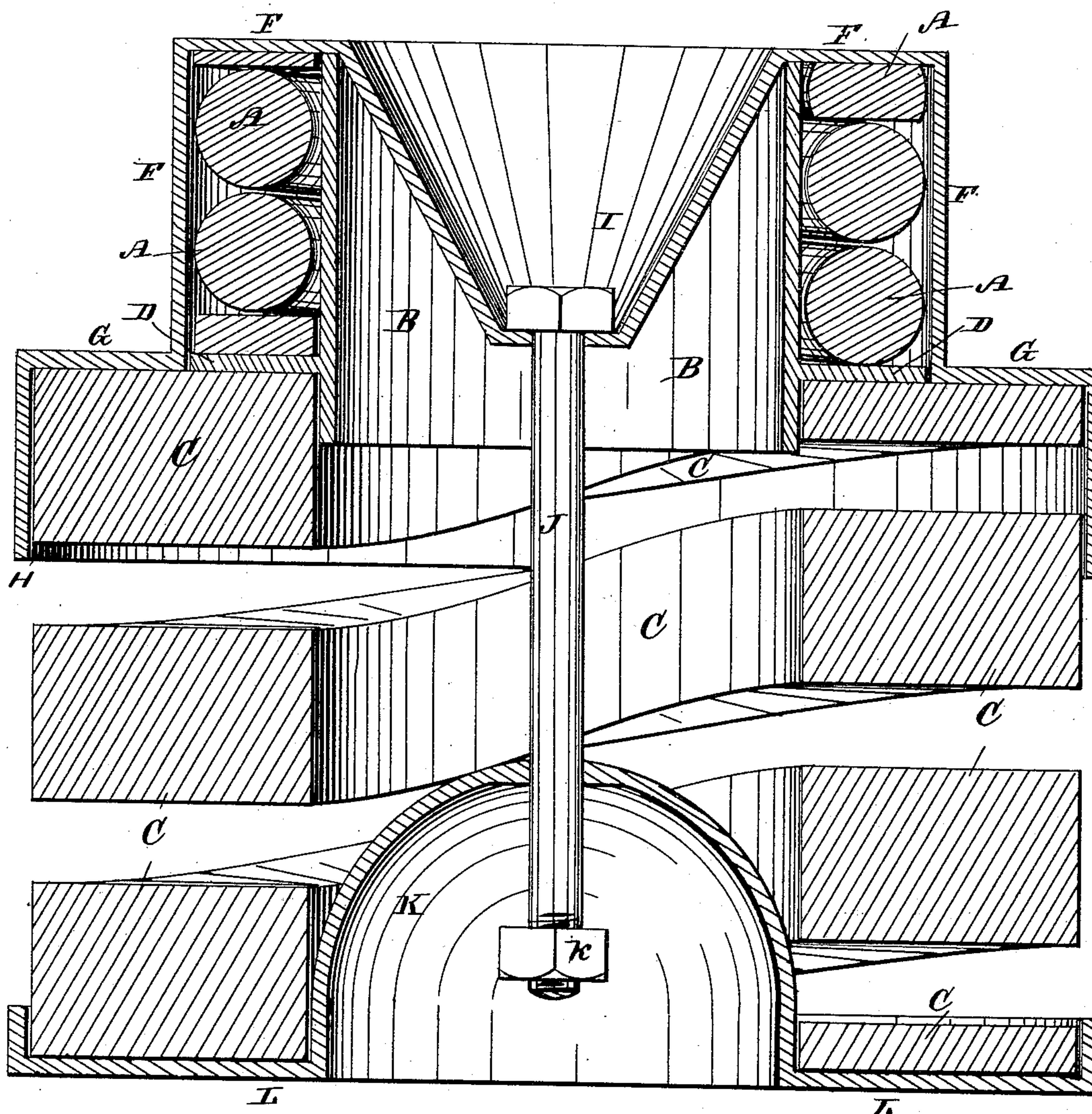
2 Sheets—Sheet 2..

R. VOSE.  
CAR SPRING.

No. 349,070.

Patented Sept. 14, 1886.

Fig. 2.



WITNESSES:

*John S. Eibel*  
*D. P. Clark*

INVENTOR

*Wm. H. Vose*  
BY

ATTORNEY



# UNITED STATES PATENT OFFICE.

RICHARD VOSE, OF NEW YORK, N. Y.

## CAR-SPRING.

SPECIFICATION forming part of Letters Patent No. 349,070, dated September 14, 1886.

Application filed November 8, 1883. Serial No. 111,163. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD VOSE, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Car-Springs, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to that class of car-springs which are made up from a plurality of spiral coils arranged in relation to one another, and especially to that class in which the coils entering into the structure of the spring are so graduated as to adapt the latter to the carrying of both light and heavy loads, its object being to simplify the construction of this form of spring, and to produce one which shall not only possess great sensitiveness when carrying either a light or a heavy load, but which shall also have greater strength, and shall hold the constituent coils in their proper relation respecting one another with greater certainty than has been possible with the springs heretofore in use.

To this end my invention consists, first, in the combination, with a main or principal coil and an auxiliary coil mounted above said main or principal coil, of an open cylindrical casting of a size to substantially fit the interior of said coils arranged within the same, and provided with a flange or rim projecting from its periphery and interposed between the upper end of the main or principal coil and the lower end of the auxiliary coil, whereby not only are the coils held in their proper relation respecting one another, but all pressure applied to the upper end of either the auxiliary spring or the cylindrical casting is transmitted to the main or principal coil through the intervention of said flange; second, in the combination, with said main or principal coil, the auxiliary coil mounted upon the former, and the open cylindrical casting provided with the projecting flange or rim interposed between the upper end of the main or principal coil and the lower end of the auxiliary coil, of a cover resting upon such auxiliary coil and extending down and around the same, and adapted to rest upon the upper end of the main coil when the auxiliary coil has been exhausted; and, third, in various other combi-

nations and arrangements of parts, as hereinafter described.

Referring to the drawings, Figure 1 is a sectional view of my improved spring, showing the relation of the various parts when in its normal position; and Fig. 2 is a like sectional view showing the upper auxiliary coil compressed to its lowest limit, and the main or principal coil brought into action.

C is the main or principal coil, which is formed by bending a rod of the desired cross-section about a mandrel, and L is a base-plate, upon which it rests. This base-plate is preferably made in the form of a disk, with its outer edge turned upward in the form of a flange, to embrace the outer lower end of the main or principal spring, and with its center portion bulged upward in the form of a semi-sphere, K, which enters and substantially fits the interior of said coil. Inserted in the upper end of this main or principal coil so as to nearly fill the same is the lower end of the casting B, which is made in the form of an open cylinder, and is provided at a suitable distance from such end with a projecting rim or flange, which is adapted to rest upon the upper end thereof. This rim or flange is made of such diameter as to extend but partially across the top of said coil C, and supports the auxiliary coil A, which rests thereon and encircles the upper portion of the cylindrical casting B. The auxiliary coil is made of an internal diameter to substantially fit the exterior of the cylindrical casting B, in order to be held thereby from lateral movement, and is somewhat longer than that portion of it which is above the flange D, so that when resting upon the latter it extends some distance above the upper end of the former.

E is a cover, which rests upon the top of the auxiliary coil A, and is provided at its outer edge with the depending circular portion F, which extends down and around the outside of said spring, and in its center it is provided with the depressed conical cup-shaped portion I, extending down and within the cylindrical casting B. The depending portion F of the cover E is made of such length that when the auxiliary spring A is depressed to its lowest limit, and the under side of the cover E rests upon the upper end of the cylindrical



casting B, its lower end, which is provided with the lip or rim G and depending flange H, will rest upon the upper end of the main or principal coil C, outside the flange D, making therewith and with said lip or rim a bearing of substantially the same width as the diameter or thickness of the rod or bar out of which said coil is formed.

The coils A and C, I make of such resisting power that the former will support and carry an empty car or one that is partially loaded, and the latter a car which is heavily loaded, with but a small degree of compression, respectively; and in order that the parts of the spring may be held together, I employ the bolt J, which passes through an aperture, i, in the bottom or apex of the cup-shaped portion I of the cover E, and a similar aperture in the semi-spherical portion K of the base-plate L, beneath which it is secured by a nut, k.

A spring constructed as above set forth, when placed in proper position under a car, will operate as follows: The weight of the car resting upon the top of the cover E will press said cover down upon the upper end of the auxiliary coil A, which in turn will transmit the weight thus applied to the main or principal coil C through the intermediary of the flange D. If the weight applied to the auxiliary coil be that of an empty car, or of one that is but partially loaded, only that coil will be affected, the main or principal coil serving merely as an elastic support or base therefor, and the parts will remain in substantially the position shown in Fig. 1; but if, on the other hand, the weight applied to the cover be that of a heavily-loaded car, then the auxiliary coil will be compressed until the under side of the cover E rests upon the upper end of the cylindrical casting B, and the lower end of the depending portion F of the said cover, with the lip or rim G, rests upon the upper end of the main or principal coil C, as shown in Fig. 2, when the weight will be transferred through these parts to said main or principal coil, which will thereby be brought into action and continue to act until the load is removed, the flange H holding the parts in their proper relation respecting one another.

From the foregoing it will be seen that I produce a spring which is adapted to the carrying of both light and heavy loads with the same degree of yielding action and resiliency, and which, by reason of the peculiarities in the construction of the cover and interior cylindrical casting, and their arrangement in connection with the other parts entering into the spring, not only retains the constituent coils in their proper relation respecting one another with great firmness and certainty, but which possesses greater strength and durability than

has been possessed by the springs heretofore in use.

While I have shown and described the form of spring which, upon the whole, I consider the most desirable, I do not limit myself strictly thereto, as it is obvious that the same may be modified in its details in various particulars without departing from the spirit of my invention.

Having described my invention and one means by which it is or may be carried into effect, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination, with a main or principal coil and an auxiliary coil mounted above the same, of an open cylindrical casting arranged within said coils, and provided with a flange or rim projecting from its periphery and interposed between the upper end of the main or principal coil and the lower end of the auxiliary coil, substantially as described.

2. The combination, with a main or principal coil, an auxiliary coil mounted above the same, and an open cylindrical casting arranged within said coils and provided on its periphery with a flange or rim which is interposed between the upper end of the main or principal coil and the lower end of the auxiliary coil, of a cover resting upon the top of said auxiliary coil and extending down and around the same, and adapted to rest upon the upper end of the main or principal coil when the auxiliary coil is compressed, substantially as described.

3. The combination, with a base-plate, a main or principal coil arranged thereon, an auxiliary coil mounted above the latter, and an open cylindrical casting of a size to substantially fit the interior of said coils arranged within the same and provided on its periphery with a projecting flange or rim, which is interposed between the top of the main or principal coil and the lower end of the auxiliary coil, of a cover resting upon the auxiliary coil and extending down and around the same, so as to take bearing at its lower end upon the top of the main or principal coil when the auxiliary coil has been compressed, substantially as described.

4. The combination, with the main or principal coil C, the auxiliary coil A, and the open cylindrical casting B, provided with the flange or rim D, of the cover E, having the downwardly-extending portion F, lip or rim G, and downward-projecting flange H, as and for the purposes set forth.

RICHARD VOSE.

Witnesses:

JOHN S. SILVER,  
D. P. CLARK.