

No. 863,664.

PATENTED AUG. 20, 1907.

M. L. SENDERLING.  
VEHICLE SPRING.  
APPLICATION FILED OCT. 15, 1906.

Fig. 1.

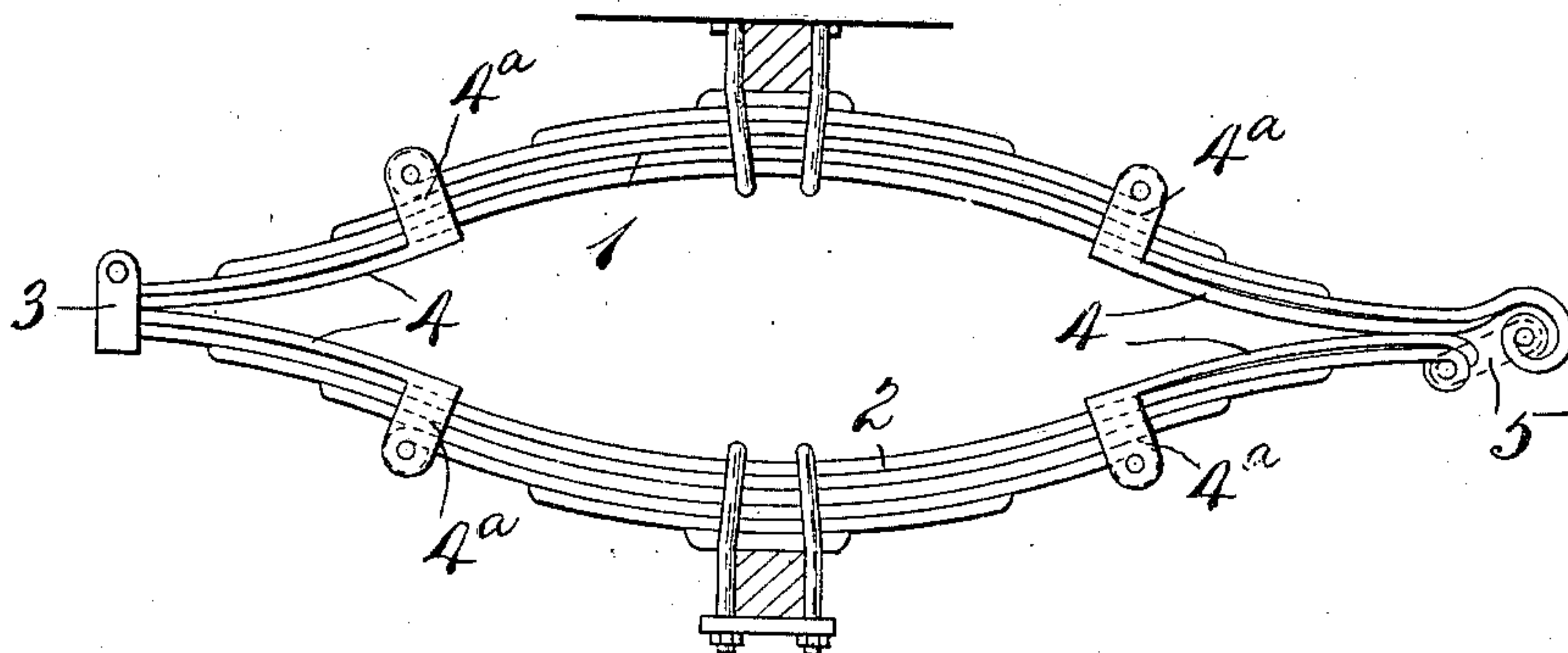


Fig. 2.

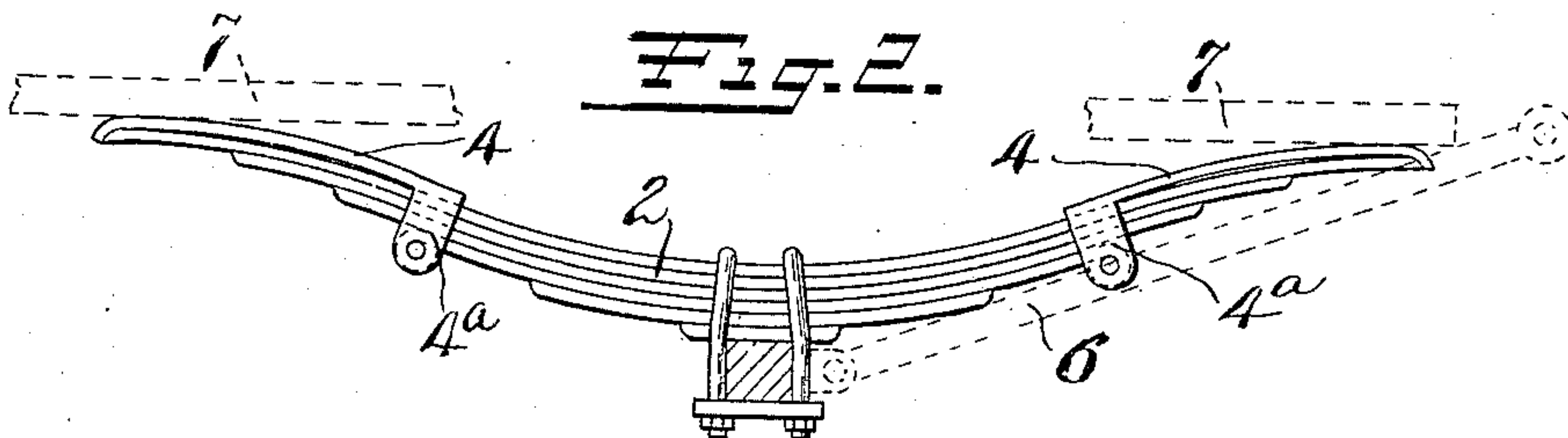
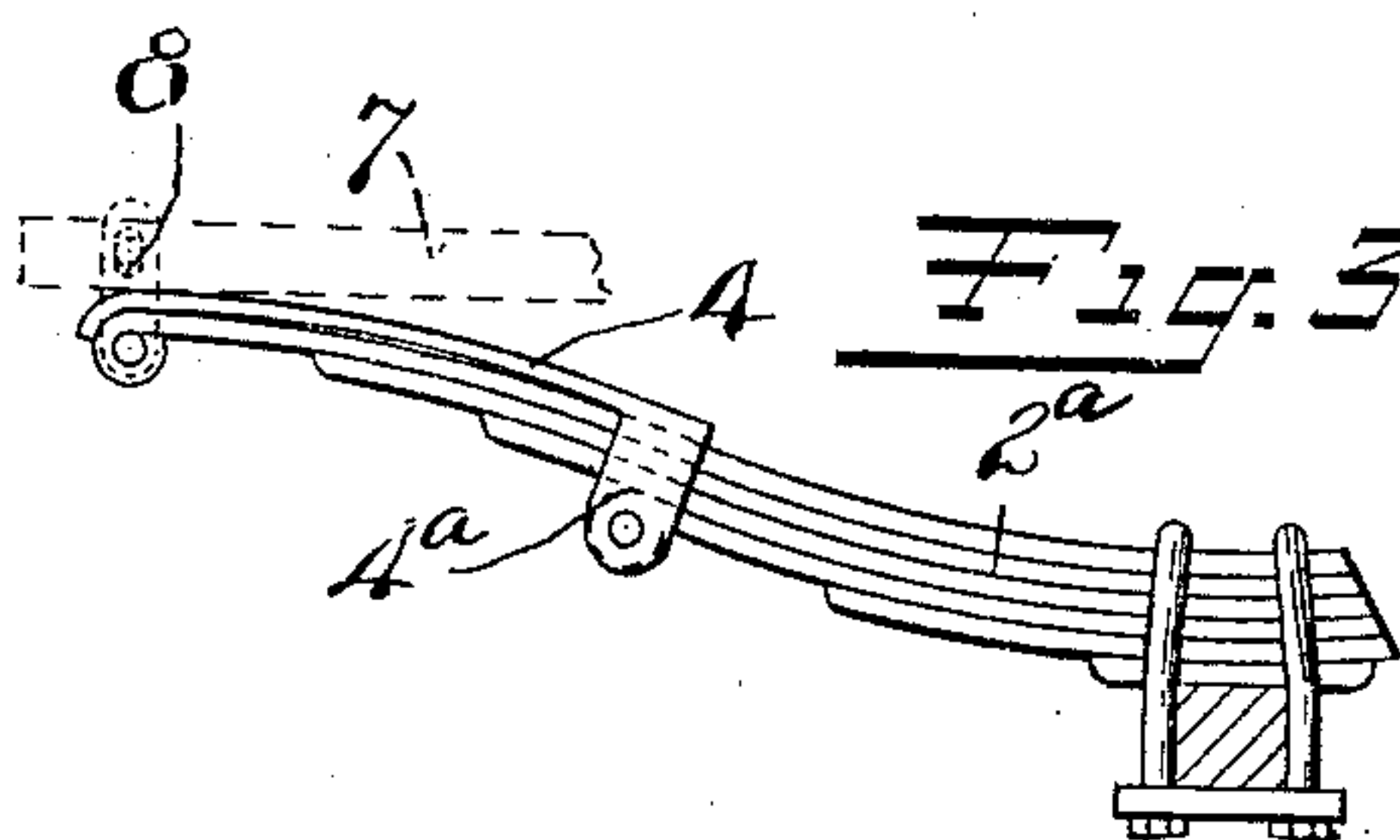


Fig. 3.



2 Witnesses

*Chas. A. Reed*  
*L. Ireland*

Inventor

*M. L. SENDERLING*

By his Attorneys  
*Barthelme & McArthur*



# UNITED STATES PATENT OFFICE.

MARTIN L. SENDERLING, OF JERSEY CITY, NEW JERSEY.

## VEHICLE-SPRING.

No. 863,664.

Specification of Letters Patent.

Patented Aug. 20, 1907.

Application filed October 15, 1906. Serial No. 338,925.

To all whom it may concern:

Be it known that I, MARTIN L. SENDERLING, a citizen of the United States, residing at Jersey City, county of Hudson, New Jersey, have invented certain new and useful Improvements in Vehicle-Springs, of which the following is a full, clear, and exact description.

My invention relates to improvements in vehicle springs, and is essentially an improvement upon that type of spring made the subject matter of my former application Serial No. 201,134, filed April 1, 1904, in which the spring is so arranged that its load bearing points will automatically adjust themselves differentially to the weight of the load.

In the accompanying drawings, Figure 1 is a side elevation of a spring of full-elliptic type, constructed to embody my improvement. Fig. 2 is a modification, representing a semi-elliptic spring. Fig. 3 represents a quarter-elliptic spring.

1 and 2 in Fig. 1 represent the upper and lower members of a full-elliptic spring. Each of these members is composed of a plurality of leaves suitably secured and operating in the manner and for the purpose set forth in my former application. At one end these spring members may be suitably secured, as by a keeper 3, while a link 5 may connect the other ends. Where in my former application these spring members were shown to bear directly on each other at their ends, in the present case this direct bearing contact is avoided and wearing shoes are interposed whereby any friction occasioned by the action of the spring will not wear the spring members proper. These wearing shoes are indicated at 4, and in the full-elliptic type they are arranged in sets as indicated. The preferable way of securing these wearing shoes to the spring members is by means of a clip-like member 4<sup>a</sup>, preferably formed with each of the wearing shoes and secured to one of the intermediate leaves, for instance by forming a roll on the end of said leaf to receive the clip bolt. The spacing from the clip bolt to the arch or bridge of the clip is preferably slightly greater than the thickness of the several leaves embraced by said clip. It will thus be seen that each wearing shoe presents a protective covering for that part of the spring where heavy wear would otherwise occur, and yet the construction is such that there is no rigid connection which will impair or retard the free working of the several spring leaves as the spring is flexed, which working is essential to the most effective operation of such a device. It should be understood that in the drawings I have illustrated only the preferred method of securing the shoes.

In Fig. 2 I have shown the invention as applied to a semi-elliptic spring and in this figure the same ref-

erence numerals employed in Fig. 1 refer to similar parts. In this figure the only substantial difference is in the elimination of the upper member of the spring. In this form it may be desirable to employ a radius rod such as illustrated at 6 in dotted lines. 7-7 are parts of the sill of the wagon supported by the spring. The radius rod is connected at one end to the support of the spring, while at the other end it may be connected to the rigid part of the body.

In Fig. 3 I have shown my invention as applied to a quarter-elliptic spring, the same reference numerals used therein referring to parts similar to those shown in Figs. 1 and 2. In this case the longer leaf of the quarter-elliptic spring member 2<sup>a</sup> may have an eye rolled at one end whereby it may be connected with the sill or other rigid part of the vehicle by means of a coupler 8 or otherwise.

In the operation of a spring of this character and as pointed out in my former application, the supporting point shifts longitudinally along the spring from the end toward the center according to the load imposed. This shifting contact would result in substantial wear were it not for the provision of my improved wearing shoe. Furthermore, by its use, the necessity of unduly hardening the spring blades at what would otherwise be the points of direct contact with the part bearing supported is avoided.

What I claim is:—

1. In a device of the character described, a spring member including a plurality of leaves of different lengths, a part supported by said spring member, a wearing shoe carried by said spring member and arranged between the end of the latter and the part to be supported thereby and secured to one of the shorter leaves.

2. In a device of the character described, a spring member including a plurality of leaves of different lengths, a part to be supported thereby, a wearing shoe carried by the spring member, and covering and protecting the bearing face thereof, a clip connecting said wearing shoe with one end of one of the shorter leaves.

3. In a device of the character described, a spring member including a plurality of leaves of different lengths, a part to be supported by said spring member, a wearing shoe carried by said spring member and connected at one end to one end of one of the shorter leaves, the free end of the wearing shoe overstanding and protecting the supporting end of the spring member.

4. In a device of the character described, a spring member comprising a plurality of leaves of different lengths, a support for said spring intermediate of the ends, a wearing shoe at and for each end of said spring, means of connection for each of said wearing shoes intermediate the ends of the spring and said support and with one of the shorter leaves.

5. In a spring of the full-elliptic type, a plurality of spring members, each member including a plurality of leaves of different lengths, a support for one of said members, the ends of both members being suitably connected to each other, and an intermediate wearing shoe carried by one of said spring members and overstanding and protect-

ing the bearing end of that member, and arranged between said bearing end of said member and the bearing end of the other member and a connection between said shoe and one of the shorter leaves.

- 5 6. In a spring of the full-elliptic type, a plurality of spring members, each including a plurality of leaves of different lengths, a support for one of said members, the ends of both members being suitably connected to each other, an intermediate wearing shoe carried by one of said
- 10 spring members and overstanding and protecting the

bearing end of said member, and arranged between said bearing end of said member and the bearing end of the other member, and a clip formed integrally with the shoe and arranged to embrace a plurality of spring leaves and to be connected to one of the shorter leaves.

M. L. SENDERLING.

Witnesses:

R. C. MITCHELL,

L. VREELAND.