(No Model.)

2 Sheets—Sheet 1.

B. F. LEWIS.

CARRIAGE SPRING.

No. 249,189. Patented Nov. 8, 1881.

Fig. 1.

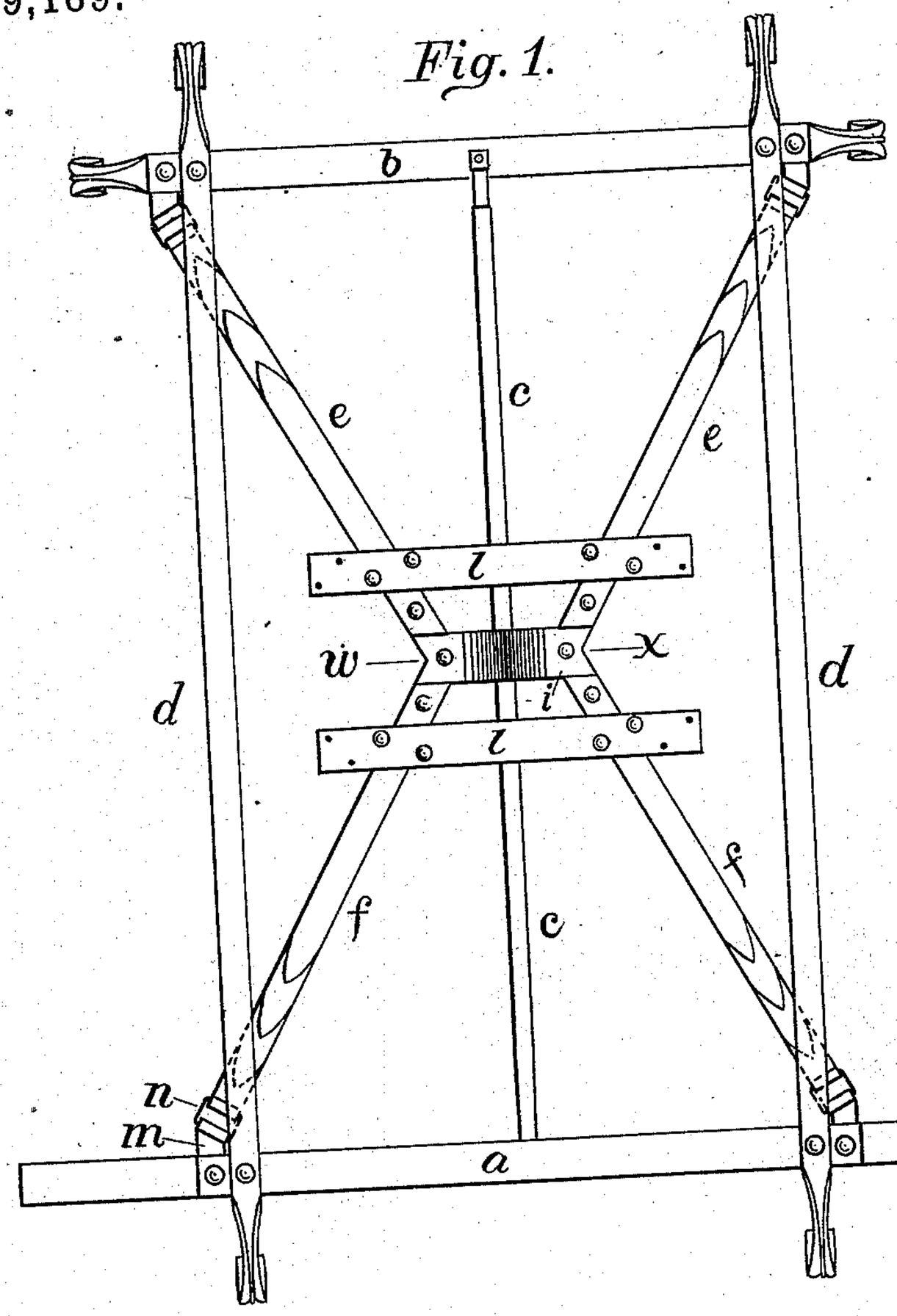


Fig. 3.

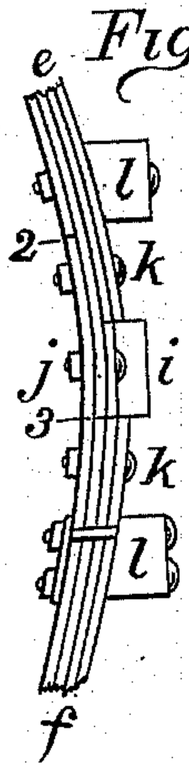


Fig. 4.

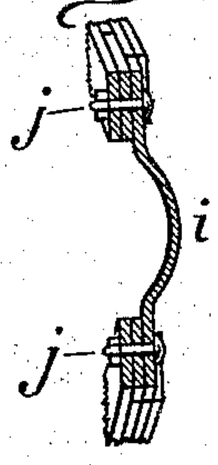
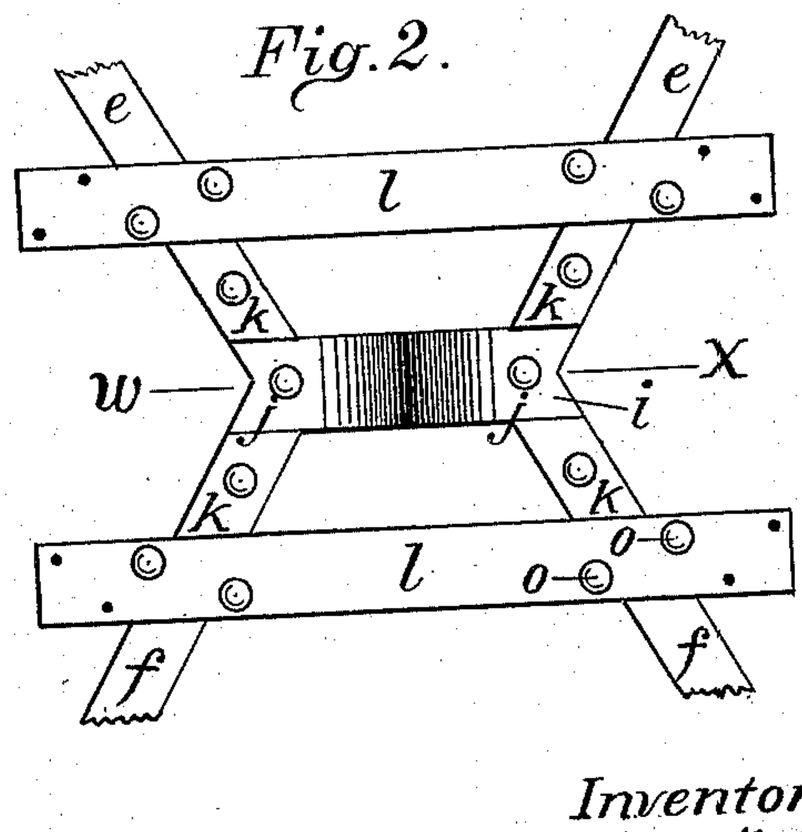


Fig. 2.



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(No Model.)

2 Sheets—Sheet 2.

B. F. LEWIS.

CARRIAGE SPRING.

No. 249,189. Patented Nov. 8, 1881.

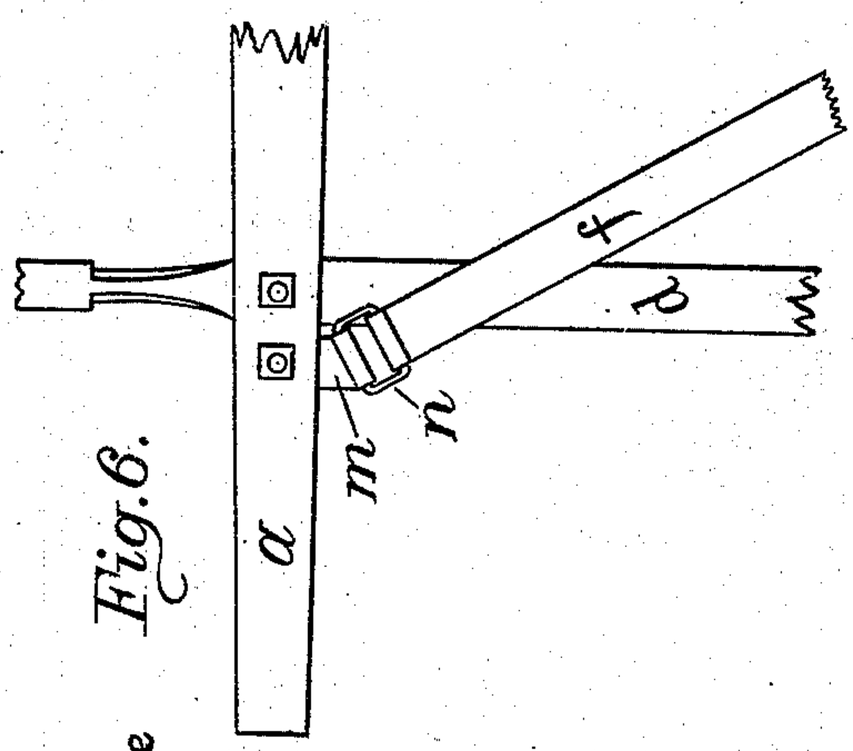


Fig. 6.

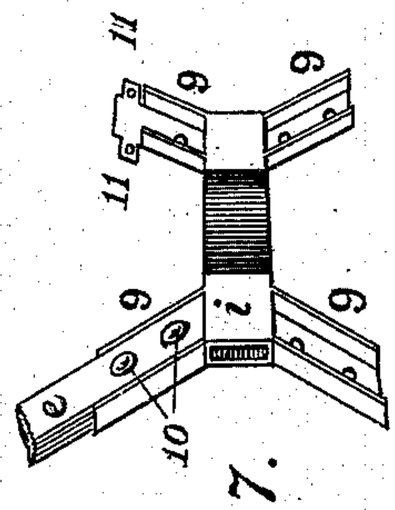


Fig. 7.

Fig. 8.

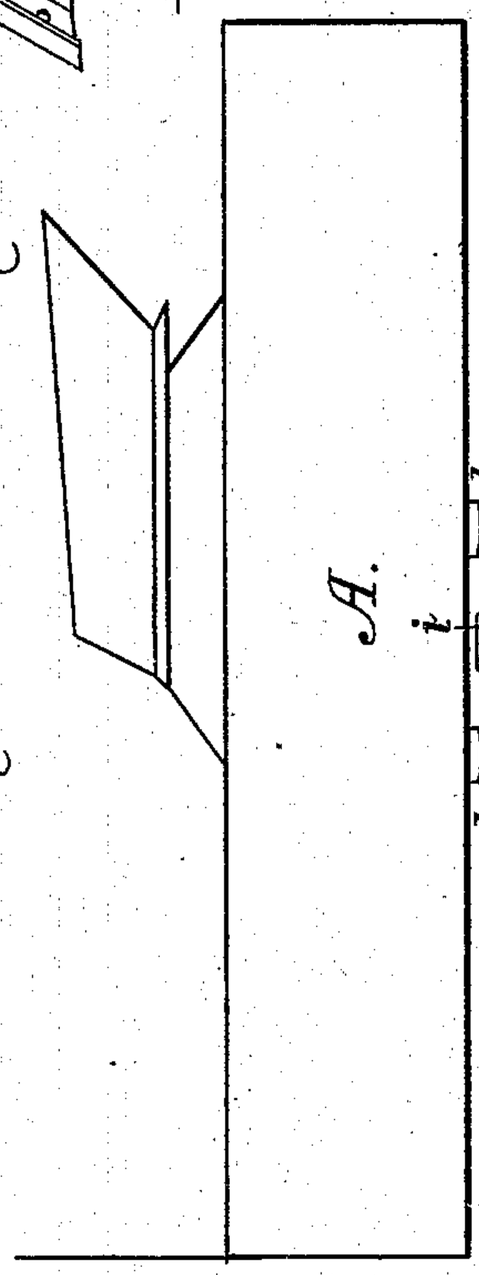
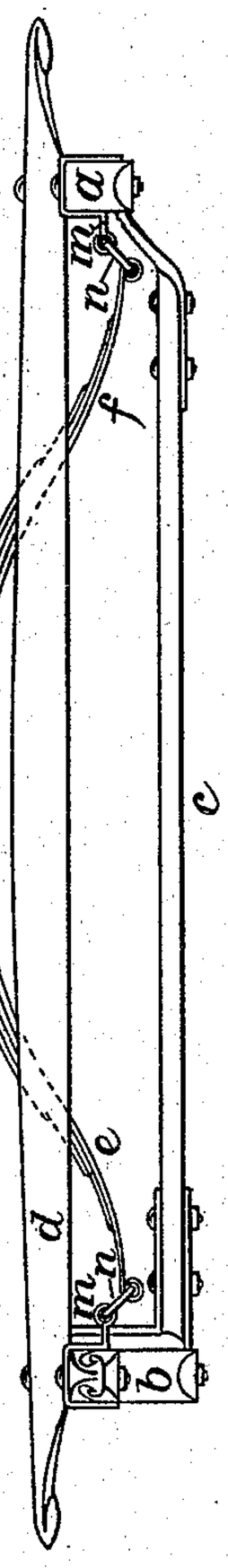


Fig. 5.



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UNITED STATES PATENT OFFICE.

BENJAMIN F. LEWIS, OF AMESBURY, MASSACHUSETTS.

CARRIAGE-SPRING.

SPECIFICATION forming part of Letters Patent No. 249,189, dated November 8, 1881.

Application filed December 8, 1880. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. LEWIS, of Amesbury, State of Massachusetts, have invented an Improvement in Carriage-Springs, of which the following is a specification.

The object of my invention is to effect certain improvements in that class of springs which, at the respective ends thereof, are shackled to the hind axle and the long rocker or head-block of the carriage, and which, as usually constructed, are known as "side springs;" and my invention will be hereinafter fully described, and specifically defined in the appended claims.

Figure 1 is a top or plan view of my springs as affixed to the under work or gear of a carriage. Fig. 2 is an enlarged detached view, showing the central portion of the springs, as shown in Fig. 1. Fig. 3 is an edge elevation of the central portion of the springs as viewed from the left in Fig. 2. Fig. 4 is a vertical section as taken on line *w x*, Figs. 1 and 2. Fig. 5 is a side elevation of the parts shown in Fig. 1 with a body mounted upon the springs, and taken as viewed from the left in said Fig. 1. Fig. 6 is a detached enlarged view, showing a portion of the hind axle, an outside reach, perch, or spar, and a spring, all as they are respectively connected together, and as inverted or upside down. Fig. 7 is a perspective view of a central cast-metal spider formed to receive the converging ends of the spring-arms, and Fig. 8 is a transverse section taken through one of the spring-seats of said casting and of the spring therein seated.

In these views, *a* represents the hind axle; *b*, the long head-block or rocker; *c*, the central drop-perch; and *d d*, the outside perches, all which parts are not only not new, but are all well known. Said springs are each formed with the front arm or member, *e*, and the rear arm or member, *f*, said arms being united at the center in the manner to be described, and being at such center deflected toward the center perch, *c*, so that the arms of each spring in their vertical planes constitute an obtuse angle, as shown. The two springs are rigidly united at their centers by the upwardly-curved center or arch-bar, *i*, which is united to the springs by the bolts *j j*, as shown. The lower leaf of one arm of each of said springs extends past the center to the point indicated at 2, while the parts of the leaf next above meet at one edge of bar *i*, as indicated at 3, and the two upper leaves terminate at the respective edges of bar *i*. Said two lower leaves and bar *i* are united by the central bolts, *j*, while the adjacent bolts *k*, as also the bolts *o o*, (which latter secure the body-bars *l l* to the springs, as shown,) all serve to unite the several leaves of the springs.

The outer ends of the spring-arms are secured to the rocker and head-block by the shackle-plates *m* and connecting-links *n*, as shown. The arms of the springs when shackled outside of perches *d*, as shown, pass under the same, and by the drop of center perch, *c*, and the arched form of center bar, *i*, the body may be "low hung," and yet allow sufficient vertical action to the springs.

Instead of uniting the front and rear arms of each spring in the manner described, and then uniting the two by the arch-bar *i*, a central spider may be formed of malleable iron with four seats, in which to secure the arms of the springs, and with bar *i* formed as an integral part of such spider; and in Fig. 7 the bar *i* is shown as formed tubular, to give largely-increased strength with but slightly-increased weight, while the four angular or trough-like arms or processes, 9, are formed thereon, as shown, and at the desired obliquity thereto. The inner ends of the spring-arms are seated in said processes 9, as shown at *e* in said figure, and are secured therein by bolts 10, as shown, or by a clip, which would inclose the spring and be itself secured in the yoke-like ears 11, formed as shown on one of said processes 9.

By forming my springs with the several arms oblique to the axis of the vehicle, a longer spring can be employed than if the same were arranged parallel to the perches; and by forming such springs so that the front and rear arms of each spring are oblique to each other, or meeting at an angle instead of being in a right line, and yet having the spring on each side of the vehicle, an entire spring within itself, but united to that on the opposite side by bar *i*, the springs act together with greater uniformity and with a more nearly level position of the body when the load on opposite sides is unequal than if the springs were par-

allel with the perches or extended diagonally from one corner of the under work to the other, as has been sometimes done.

I claim as my invention—

1. The combination of axle *a*, head-block *b*, drop central perch, *c*, outside perches, *d d*, and the diagonally-arranged spring-arms *e f*, respectively secured to said head-block and axle beneath and outside said side perches, *d*, substantially as specified.

2. The central arch-bar, *i*, having the trough-like arms or processes 9 formed thereon to receive the spring-arms, substantially as specified.

3. The combination of the central spider formed to receive the spring-arms, and the said spring-arms therein secured, substantially as specified.

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