2 Sheets—Sheet 1.

J. S. LASH.

CAR-SPRING.

No. 184,973. Patented Dec. 5, 1876.

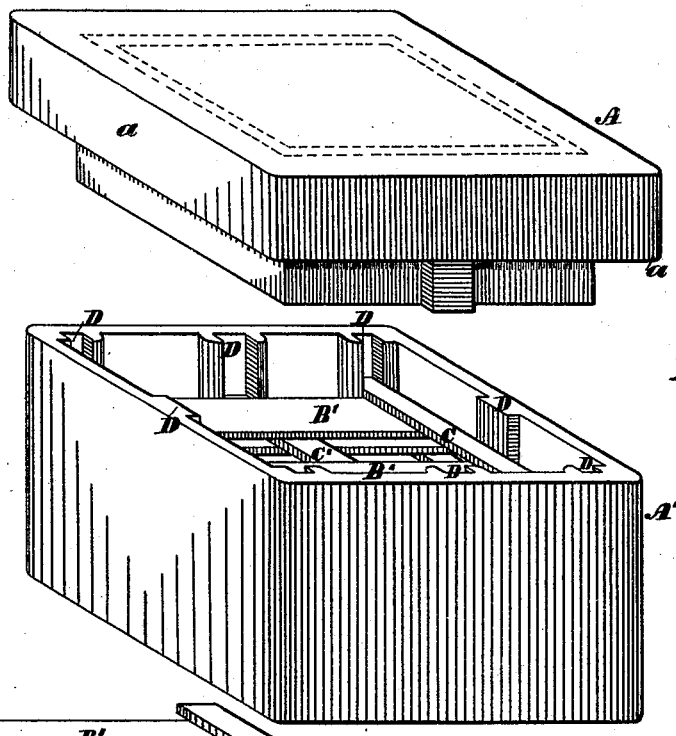

Fig. 1

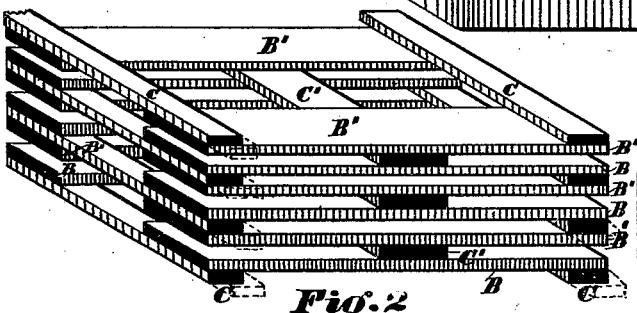

Fig. 2

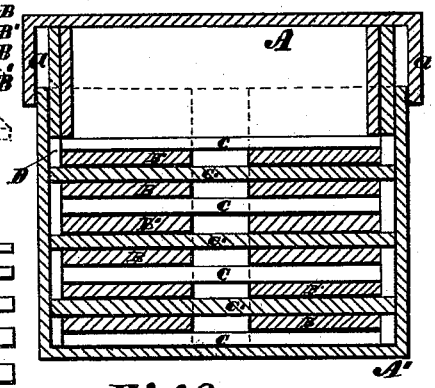

Fig. 3.

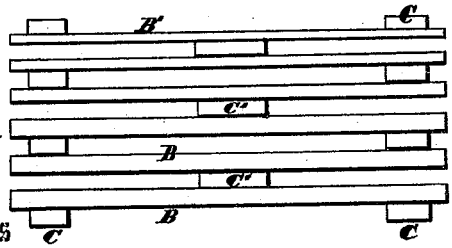

Fig. 7

Witnesses

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2 Sheets—Sheet 2.

J. S. LASH.

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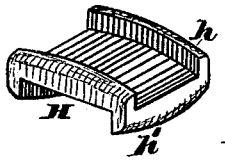

Fig. 6

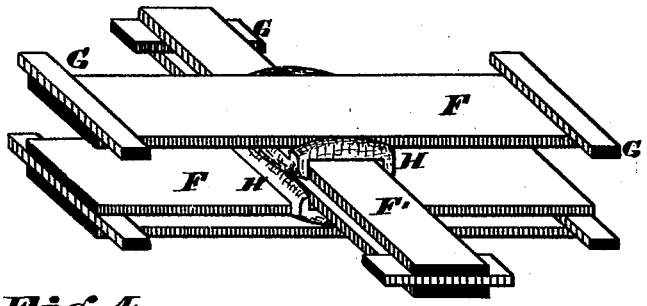

Fig. 4

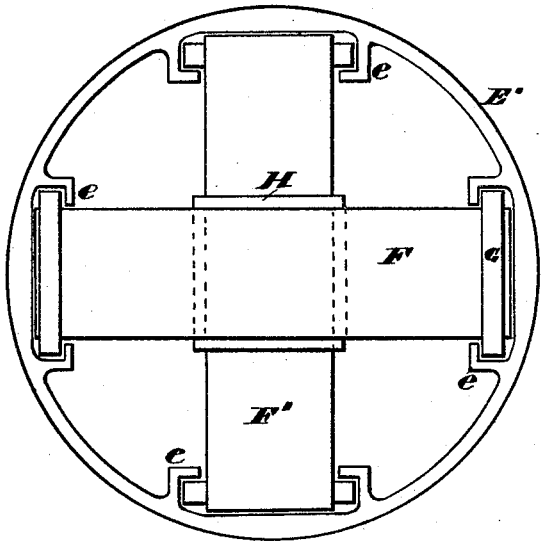

Fig. 5

Witnesses

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UNITED STATES PATENT OFFICE.

JOHN S. LASH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO CYRUS CHAMBERS, JR., OF SAME PLACE.

IMPROVEMENT IN CAR-SPRINGS.

Specification forming part of Letters Patent No. **184,973**, dated December 5, 1876; application filed March 25, 1876.

To all whom it may concern:

Be it known that I, JOHN S. LASH, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Car-Springs; and do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a perspective of my invention; Fig. 2, a perspective, showing the manner of arranging the springs so as to have alternate end and center supports. Fig. 3 is a vertical transverse section. Fig. 4 is a perspective, showing the arrangement of the springs when applied to circular boxes. Fig. 5 is a top view of a circular box and springs, with the cover removed; Fig. 6, detail view of the center supports for springs when placed in circular boxes. Fig. 7 is a front elevation of a series of graduated springs.

The object of my invention is to provide a very effective car-spring which may be constructed by comparatively unskilled hands and at relatively slight expense.

My improved car-spring consists of a series of flat elastic plates, laid one upon the other, with intervening movable fulcra or supports in a telescopic or sliding box.

Referring to the accompanying drawing, A A′ represent the two sections of a sliding or telescopic spring-box, either of said sections, but preferably the former, serving as a lid. The section A fits within the section A′, as shown, and is provided with downwardly-projecting edges or hangers *a* for the exclusion of dust from said lower section. B B′ are flat steel plates, forming the spring, laid in one, two, or more ranks or piles, and separated horizontally by bars C C′. The plates B B′ and bars C C′ are arranged with relation to each other substantially as follows: On the bottom of the section or lower box A′ are laid two bars, C C, one at each end of said section. Two plates, B B, in the same horizontal plane, are then laid on the said bars, their ends resting on the latter, so that they may be sprung or elastically depressed in the center. A bar, C′, is then laid across the middle of the plates B, and on top of this are placed two other plates, B′ B′, these latter thus being supported or supplied with fulcra at their middle point, so that their ends may be sprung or elastically depressed. Two bars, C C, are then laid across the ends of the plates B′ B′, and the pile continued, as already described. When completed, it will be found that the plates B B will yield elastically in the middle or between their ends, while the plates B′ B′ will be depressed at their ends, thus producing an alternate central and end depression, which has the effect of rendering the whole pile of plates or springs elastic throughout. D D are cleats or ribs, secured to or formed on the side of the section or lower box A′, and designed to keep the plates and bars forming the spring in position within said box.

The foregoing construction relates particularly to a square or rectangular box. For a circular box a modification similar to that shown in Figs. 4 and 5 may be employed. E′ therein shows the lower sliding box or section, having vertical cleats *e e*. F F′ are the steel plates, laid across one another. G G are the bars supporting the ends of the plates F, and H the fulcra interposed between the alternate plates F′. Said fulcra are formed in the shape of blocks having their upper and lower surfaces curved or rounded, so as to permit the plates F′ to rock across them, and provided with flanges *h h′*, to keep them in place.

The advantage of the foregoing construction is that it provides a very strong, elastic, and durable spring, which may be constructed at very slight expense, the labor of cutting and fitting the plates in the boxes being so plain and easy that it may be safely intrusted to boys or other unskilled labor.

By reversing the sections A A′ so as to bring the latter above, the dust-excluders *a* may be dispensed with.

In order to make a spring of this construction ride easily under a light as well as a heavy load the plates B B′ may be of various thicknesses, the lowest plate being the thickest and the others decreasing in thickness as

they ascend. If desired, there may be a uniform gradation of the plates as they ascend, or two or any other number of them may be of the same thickness, so that they will be graded in pairs, triplets, or any other multiple of a single plate. By this construction the weight will first fall upon the upper or lightest plate or plates, and if the load be a light one it will ride easily thereon. As the load is increased the heavier plates below become compressed, and in this way the spring adjusts itself to whatever weight it may have to bear, riding easily under any and every circumstance. In Fig. 7 the plates thus graded are seen, the lowest plate being the heaviest and the others decreasing in thickness as they ascend, the top plate being the thinnest or lightest.

What I claim as my invention is—

1. The combination of the sections A A′, the latter having cleats or ribs D, the elastic plates B B′, and interposed bars C C′, the several parts being constructed and arranged for operation substantially as shown and set forth.

2. A car-spring composed of a series of graduated plates, or plates of varying thicknesses laid one upon the other with interposed movable fulcra or supports, so as to cause said spring to ride easily under a light as well as a heavy load, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 22d day of March, 1876.

JOHN S. LASH.

Witnesses:
M. DAN'L CONNOLLY,
SAML. J. VAN STAVOREN.