

ROGERS & WOOD.

Car Spring.

No. 24,888.

Patented July 26, 1859.

Fig. 1

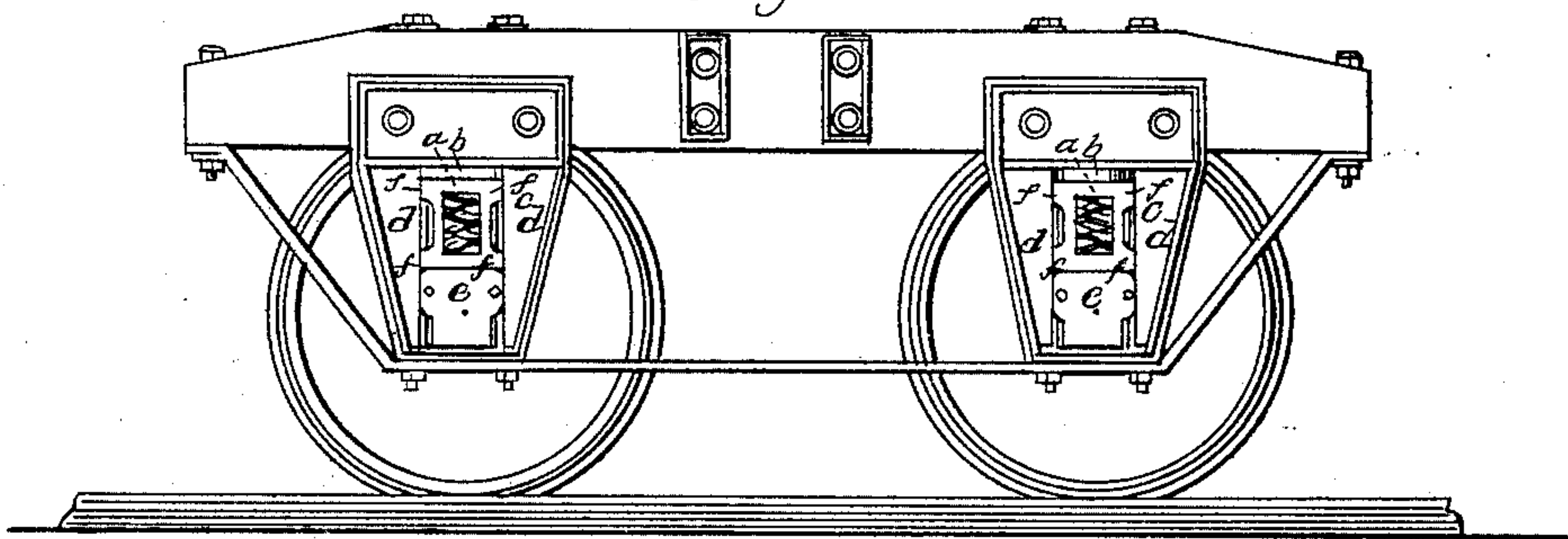


Fig. 2

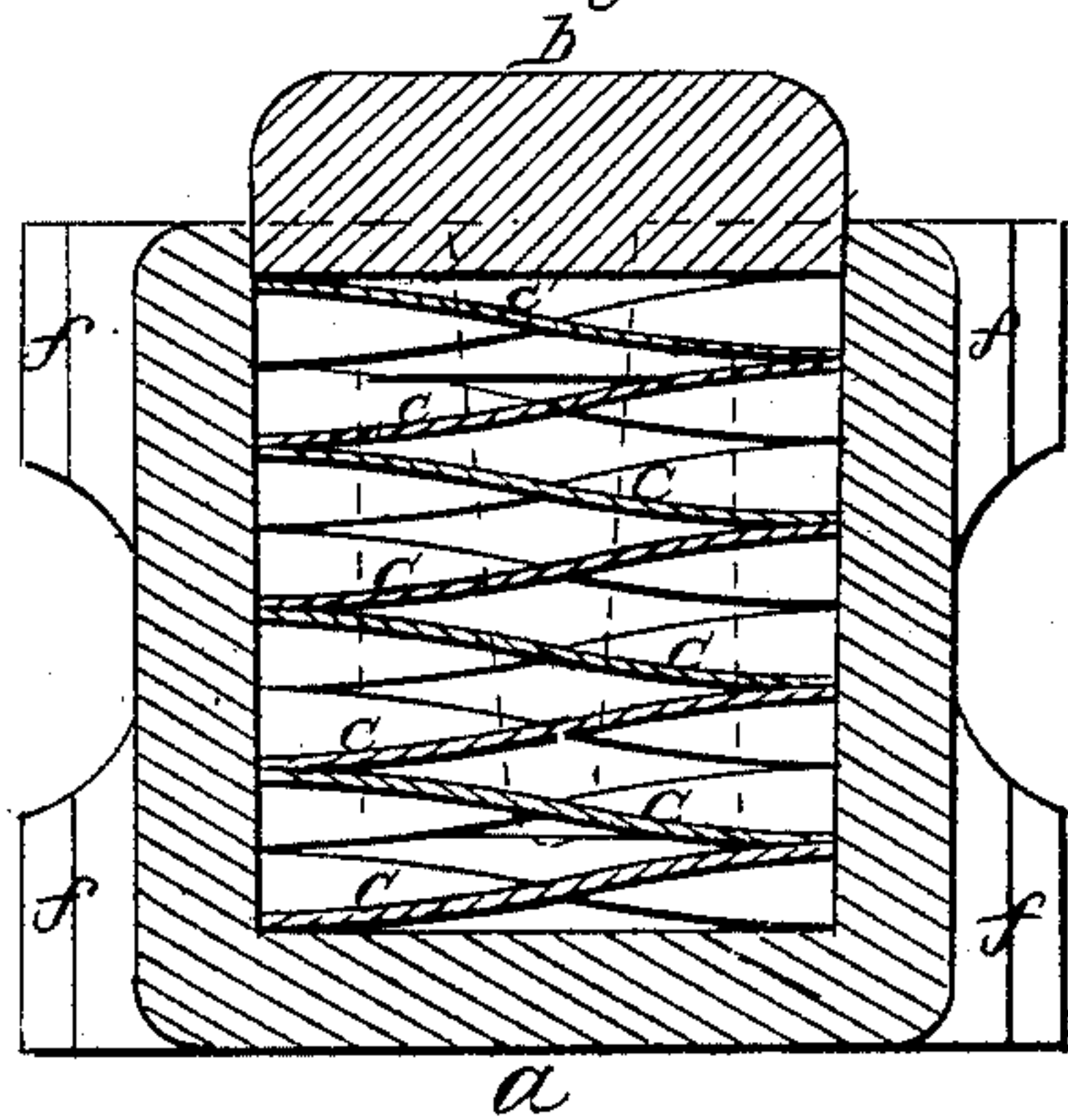


Fig. 3

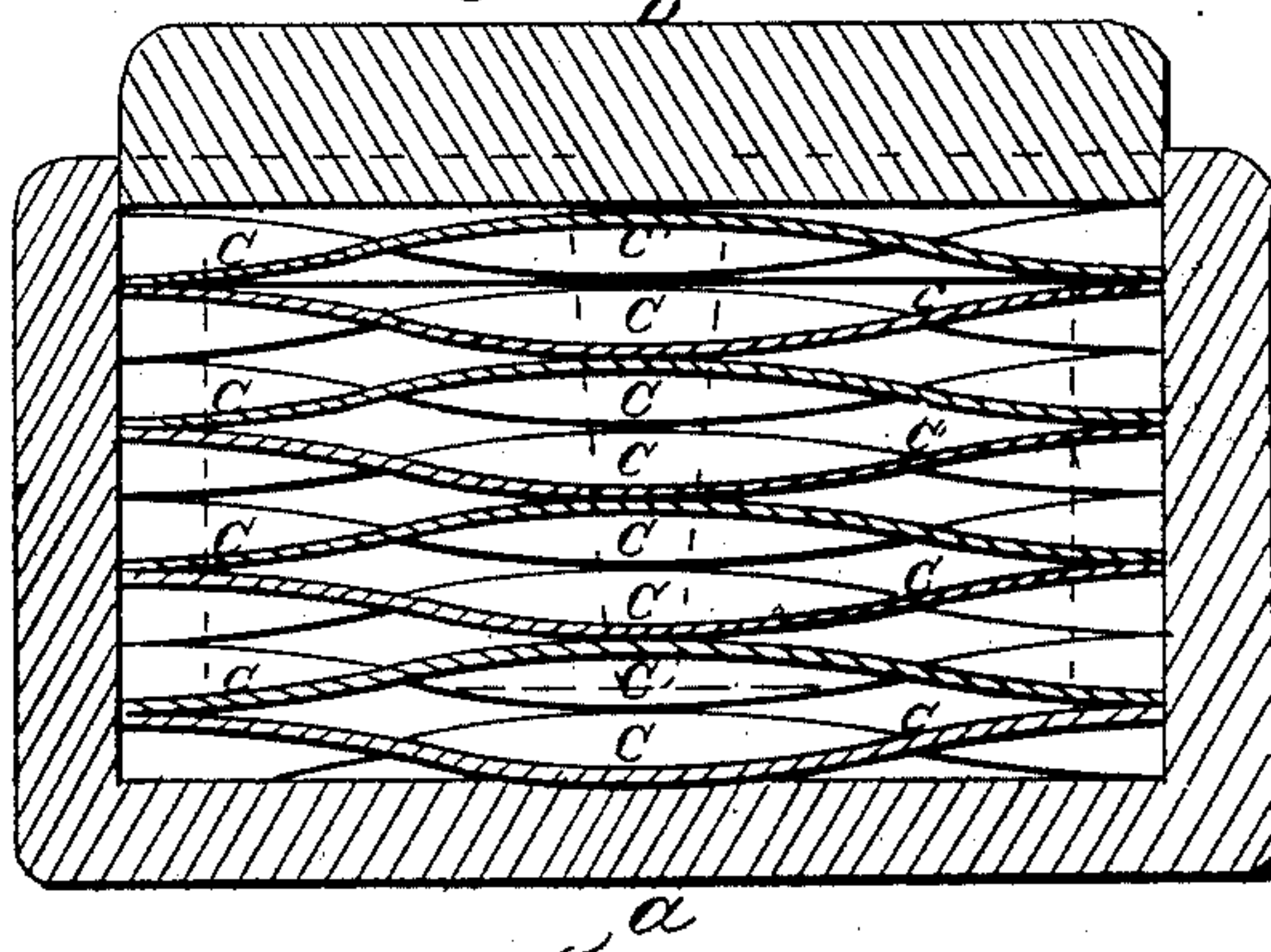


Fig. 4

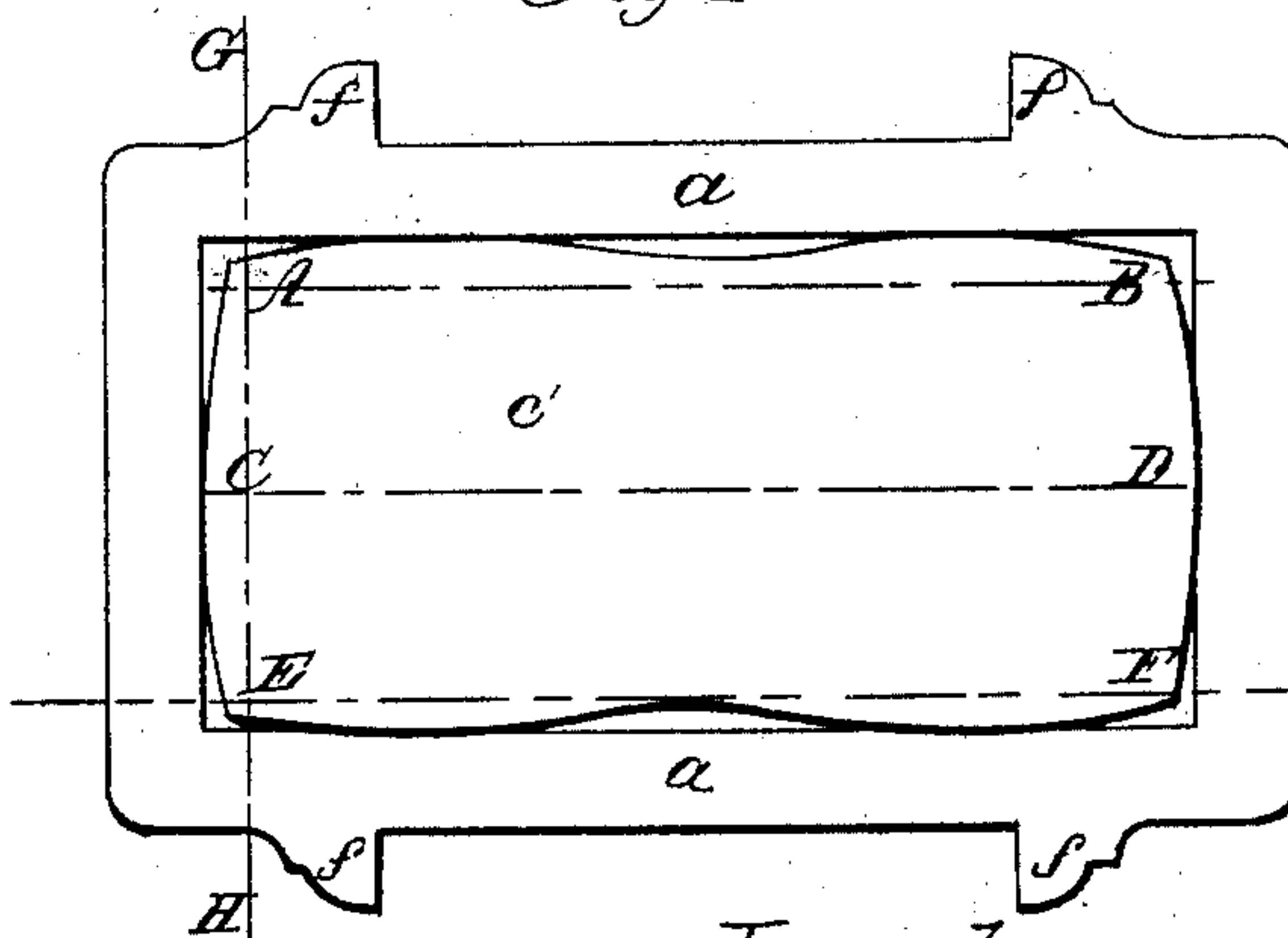
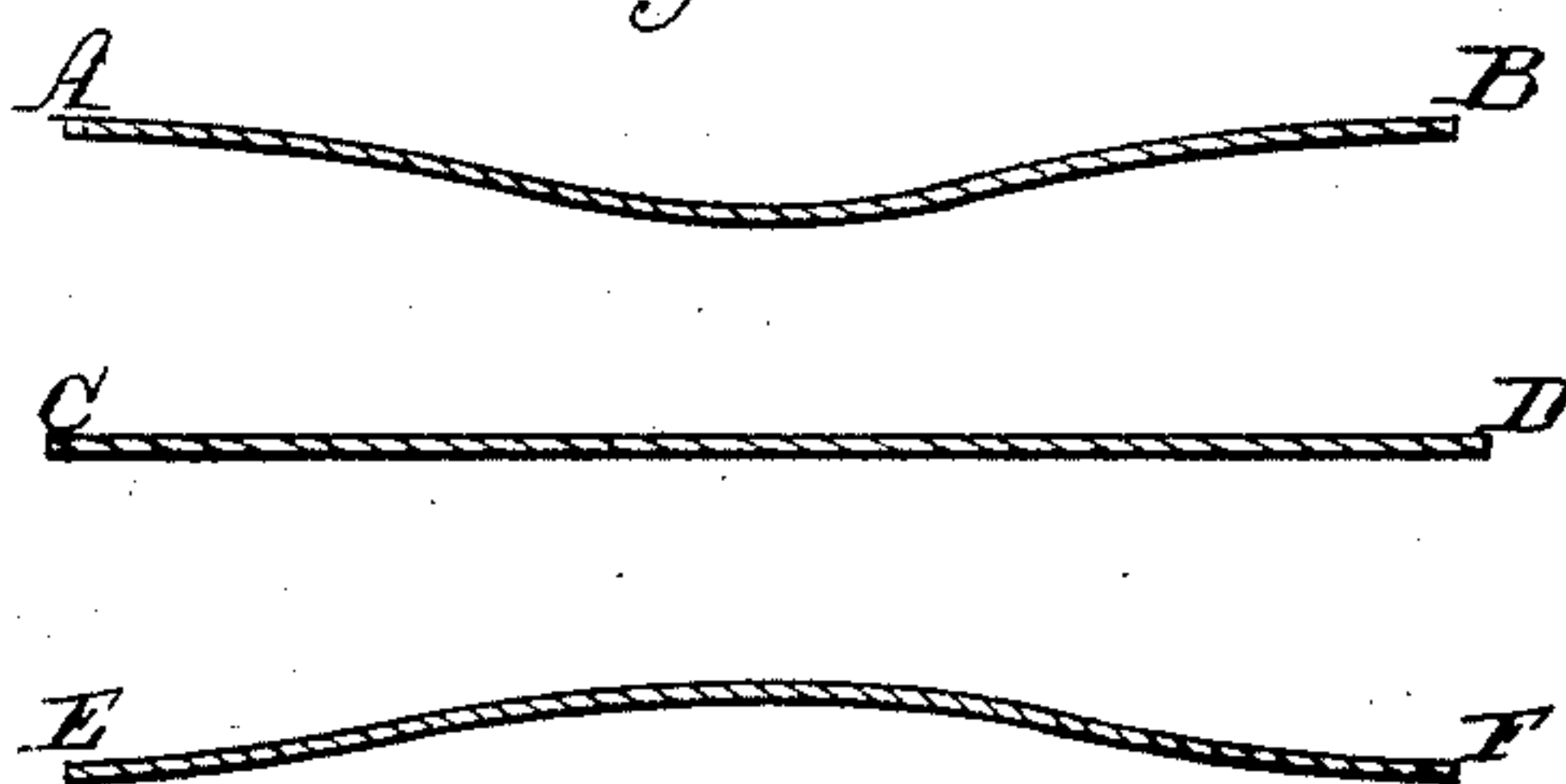


Fig. 5



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UNITED STATES PATENT OFFICE.

DAVID B. ROGERS AND J. A. WOOD, OF PITTSBURG, PENNSYLVANIA.

SPRING FOR RAILROAD-CARS.

Specification of Letters Patent No. 24,888, dated July 26, 1859.

To all whom it may concern:

Be it known that we, DAVID B. ROGERS and JOEL A. WOOD, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Springs for Railroad-Cars; and we do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the annexed drawing, forming part of this specification, in which—

Figure 1, is a side view of a truck, showing the mode of applying our improved spring. Fig. 2, is a transverse section through G H and Fig. 3 is a longitudinal section through our improved railroad car spring, through the line E—F, in Fig. 4. Fig. 4, is a plan or top view of our railroad car spring showing the top of the spring box and the topmost leaf of the springs. Fig. 5, represents longitudinal sections through one of the plates or leaves of our spring, through the dotted lines A—B, C—D, and E—F, in Fig. 4.

In the several figures like letters of reference, denote similar parts of our improved spring.

Our invention, which is designed as an improvement upon a railroad car spring invented by David B. Rogers, for which Letters Patent of the United States were granted to him on the 23d day of February, A. D. 1858, consists in placing the spring-leaves or plates, one above the other, in a box in which they fit sufficiently easily, to admit of free play; furnished with a follower, placed on top of the leaves of the spring and projecting above the top of the box, and thereby dispensing with the stakes or bolts used for uniting the leaves in one spring as described in the specification annexed to said Letters Patent and also with the rivets used to connect the contiguous corners of the leaves; so as to prevent their slipping from their bearings. Also in using, in the construction of our spring, a series of plates constructed as described but of varying thickness, so as to accommodate the springs to the various degrees of burden, they may have to carry, and give elasticity to the car body, whether more or less heavily laden.

To enable others skilled in the art to construct and use our improvements, we will proceed to describe their construction and mode of operation.

In the drawing Figs. 2, 3 and 4 represent a car spring constructed on the plan described in said Rogers patent, as modified by our improvements.

a is a box of cast iron, with four sides and a bottom, but open at top. It is about twice the length of its width, and for a railroad car may be conveniently made about seven inches long, three and one-half wide, and four inches high. These dimensions may of course be varied very materially, as occasion may require. There is an opening or slit down each side of the box, shown in Fig. 1, and by dotted lines in Figs. 2 and 3, for ease in removing or adjusting the plates or levers *c c* of the spring, which are laid horizontally inside the box, one on top of the other, but not otherwise confined in the box, than by its sides, and by the follower *b* placed loosely on top of the uppermost leaf *c'*. The leaves *c c*, &c., are made of steel, and may be made about twice the length of their width. They are all shaped alike, being of the peculiar conformation described in said Rogers patent. Each leaf or plate is so curved or twisted that the curve on one edge or side of each leaf is the reverse of the curve on the opposite edge, and a longitudinal line at the center of the plate or leaf midway from either edge, being a mean between the reversed curvature of the two sides or edges, is a straight line or nearly so. This peculiar shape is seen more clearly in Fig. 5. Each side edge of every leaf has a curvature from corner to corner, convex on one side, and concave on the other, so that the two corners on the same side of each leaf, being in the same horizontal plane. If one side or edge of a leaf *c* has a convex curvature longitudinally, the opposite side or edge has a similar degree of curvature, but reversed or concave, so that three longitudinal sections, through a single leaf *c'*, one at each side, and one in the center, are represented in Fig. 5 where A—B is a longitudinal section at one edge, E—F at the other edge, and C—D at the center, which, as before stated, is a straight line or nearly so, in practice. As the central line (as C—D Fig. 5) of each leaf or plate is a straight line, and as each leaf, before it is thus twisted or bent, has its ends square with or at right angles to the sides, these leaves *c c*, &c., of the spring cannot elongate beyond the length of the longitudinal central line C—D, even when the greatest pressure is put upon the springs, so

that it is unnecessary to make the interior of the box longer than the central length of the leaves *c c*, excepting sufficiently so to allow of a free upward and downward motion of the springs in the box *a*. These leaves *c c'*, &c., are so placed in the box, one above the other, that on each side they present alternately a convex and concave edge, so that any two contiguous leaves (*c c'* for example) touch on one side of the spring only at the point midway from either end, and on the other side of the spring the same leaves touch only at their extremities or corners. Thus each plate has three bearing points on the plate next to it, either above or below, on one side at the center of that side, and on the other side, at the two corners of that side, thus producing an equilibrium of bearing, which is one of the distinguishing advantages of the Rogers spring. These springs are placed in the box *a*, to the number of from 6 to 10, as may be desired, and a follower *b* is placed on the top of the uppermost leaf *c*. This is a block of iron, with parallel faces, and of such a length and width as to fit in, but to work freely up and down in the box, and project far enough above its sides to allow for any possible play of the springs. Thus arranged, the box of springs is placed between the pedestals *d d*, see Fig. 1, with the bottom of the box resting on the journal box *e* of the wheels, and the follower pressing against the bottom of the car. The box is kept in place by lips or flanges *f f*, projecting from the pedestals *d d*, or from the sides of the box *a* as in the drawings. This arrangement of the leaves of the Rogers spring in a box prevents their slipping from their bearings on each other, and also removes the objections to the Rogers spring caused by the breaking or wearing away of the stakes or bolts, described in Rogers's specification, by which, he united the leaves of his spring to each other between the bolsters.

The use of a loose box for holding the spring in place may be dispensed with, by the obvious modification of constructing the pedestals *d d* and journal box *e* in such a manner as to form a box in which to confine the series of leaves or plates of the spring, in which case the top spring *c'* might rest against the bottom of the truck, and the journal box *e* sliding between the pedestals would form the follower.

A great difficulty experienced in the construction of springs for rail road cars is that a spring which is sufficiently stiff and strong to retain its elasticity under a very heavy

weight, has little or no spring when the car 60 is but slightly burdened; and this is especially the case in a steel spring which has as little actual play as the Rogers spring. To remedy this defect we increase the number of leaves employed in each spring, and 65 diminish the thickness of the steel plates of which the leaves *c, c', &c.*, are formed, as they ascend in the series: that is to say, the leaf at the bottom of the box is the thickest, and those nearest the top are a little 70 thinner, the top one being the thinnest of all: or there may be only two or three different thicknesses of springs and several of each thickness used. These leaves are otherwise shaped and arranged as hereinbefore 75 described. The effect of this change in the thickness of the leaves is that, when the car is but lightly burdened the thinner springs will operate to give the necessary elasticity to the car, and the thicker springs will yield 80 more or less according to their relative strength; and as the weight in the car is increased the stronger springs come into play, thus proportioning the elasticity of the spring to the weight which it has to 85 bear.

We do not claim as new placing rail road car springs in a box or frame, in itself considered, but simply the combination and arrangement of the Rogers spring in the man- 90 ner hereinbefore described.

Having thus described our improvement in rail road car springs, what we claim as our invention and desire to secure by Letters Patent, is— 95

1. The combination of a series of plate springs, constructed and arranged as described, with a box in which they are inserted and a follower, the spring box being either separate from, or forming part of, the 100 truck; substantially in the manner and for the purposes hereinbefore set forth.

2. Also, making and using the plates or leaves of the spring, constructed and arranged as hereinbefore described, of different 105 thicknesses in the same series, for the purpose of adapting the spring to the varying degrees of pressure to which it may be subjected from time to time.

In testimony whereof, we the said DAVID 110 B. ROGERS and JOEL A. WOOD, have hereunto set our hands.

DAVID B. ROGERS.
JOEL A. WOOD.

Witnesses:

MARTIN G. CUSHING,
JAMES OLD.