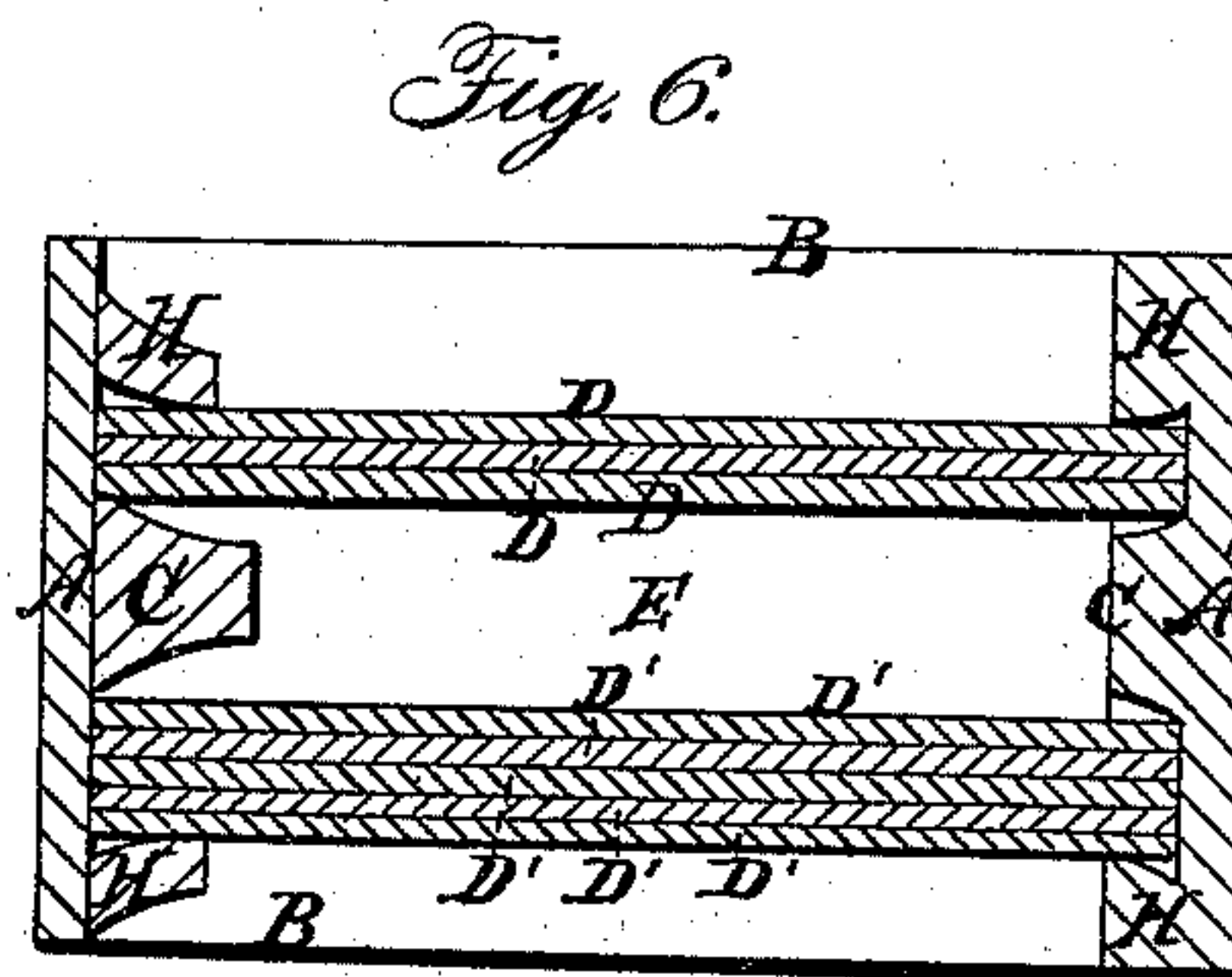
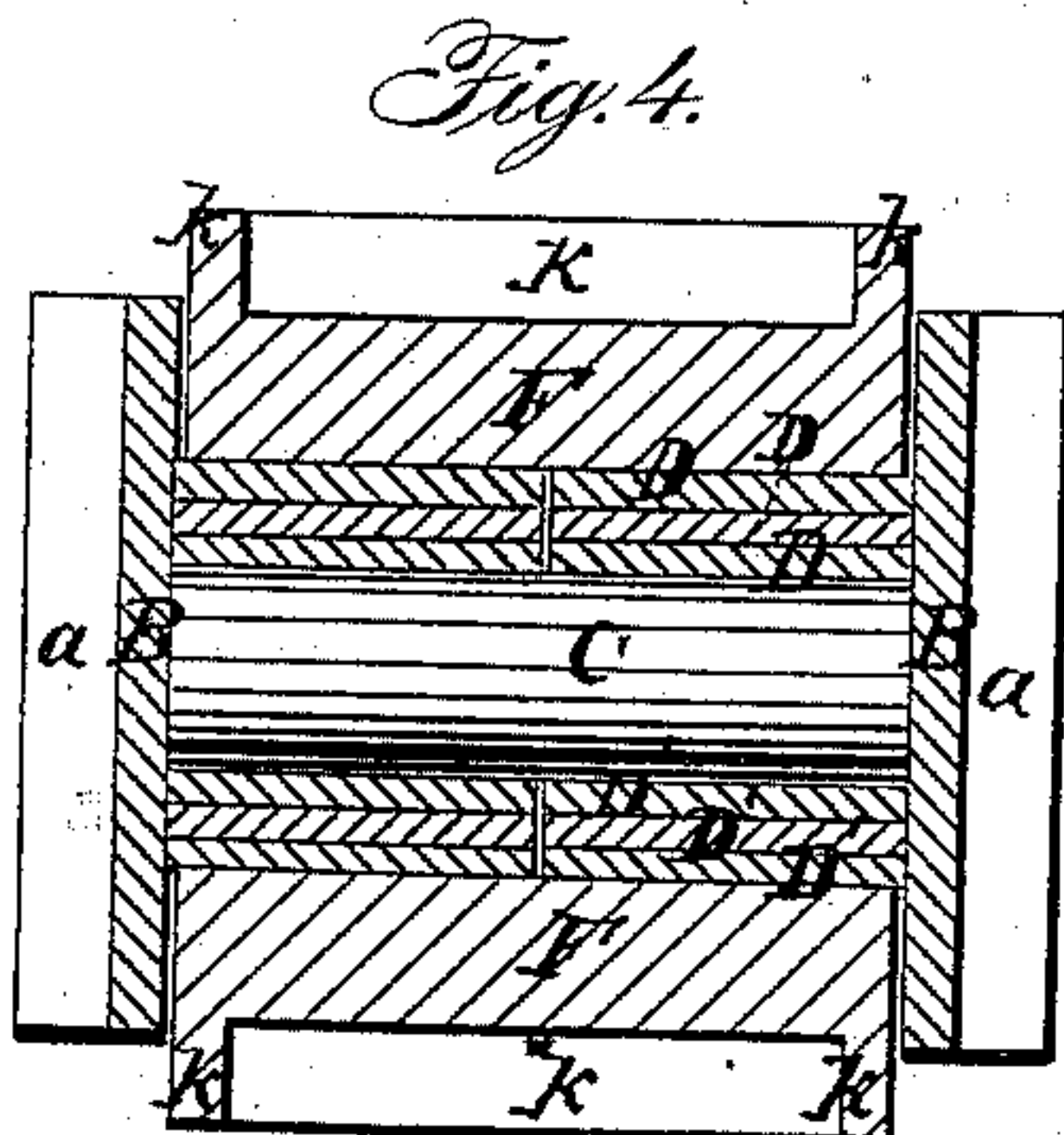
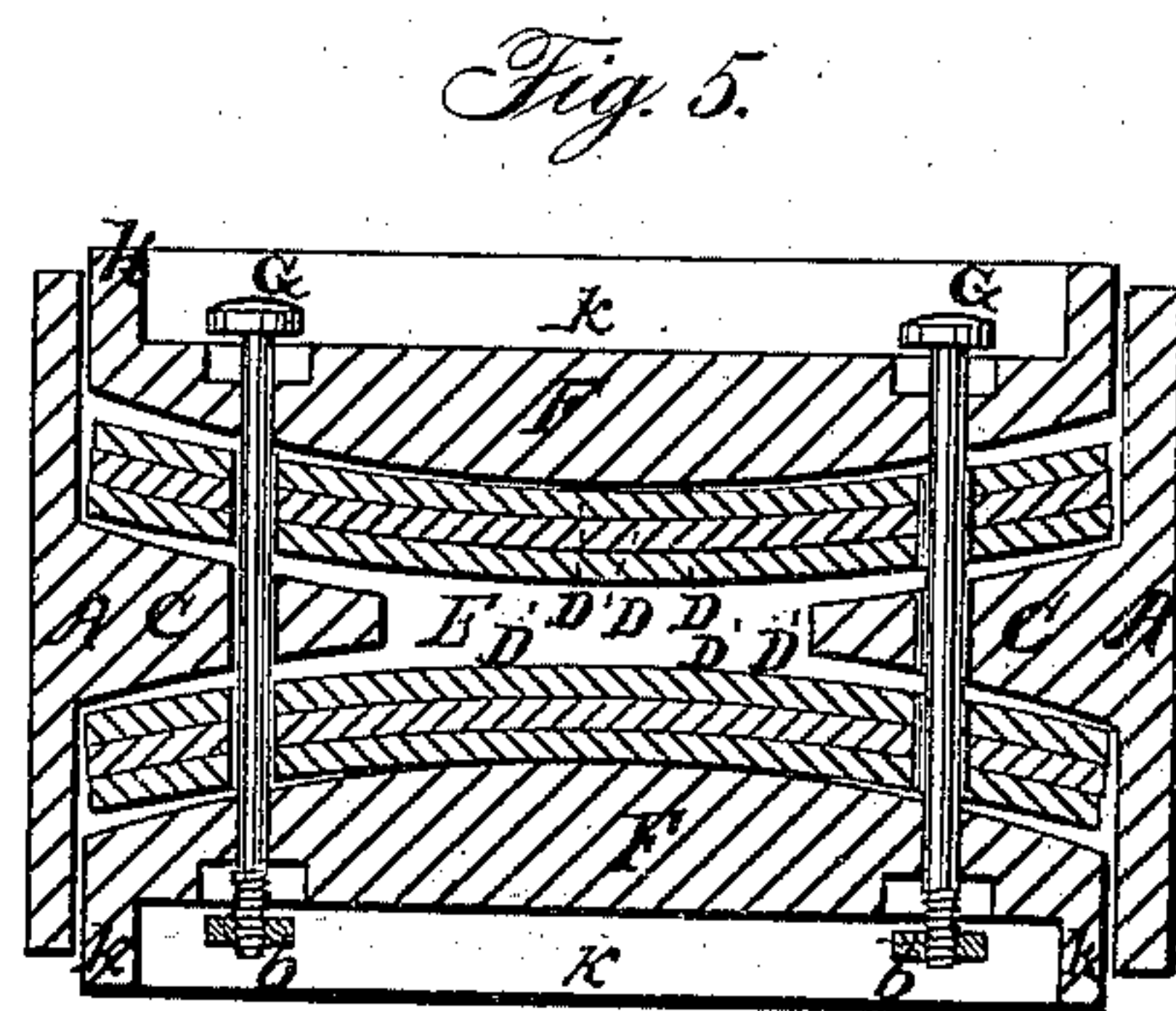
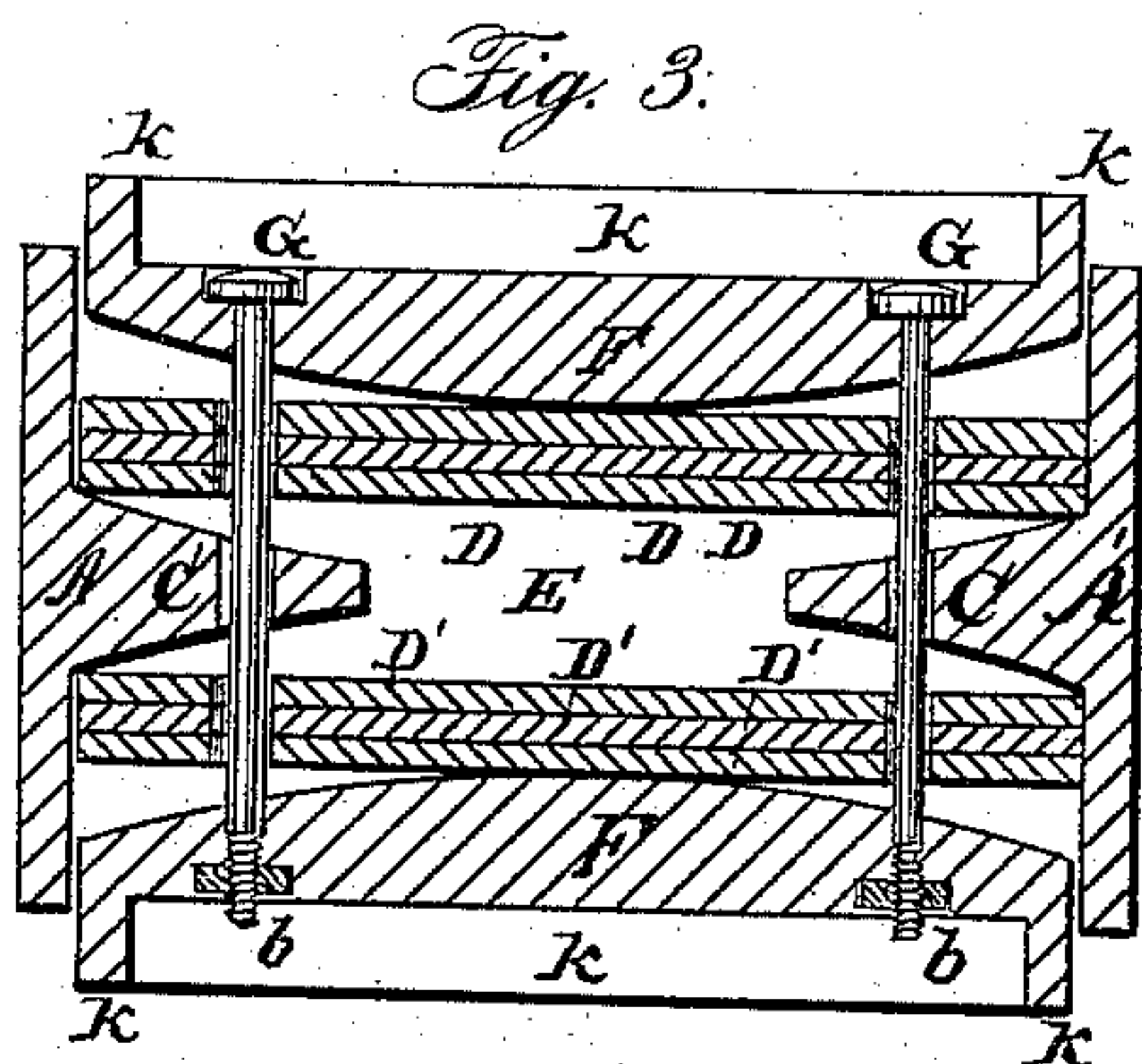
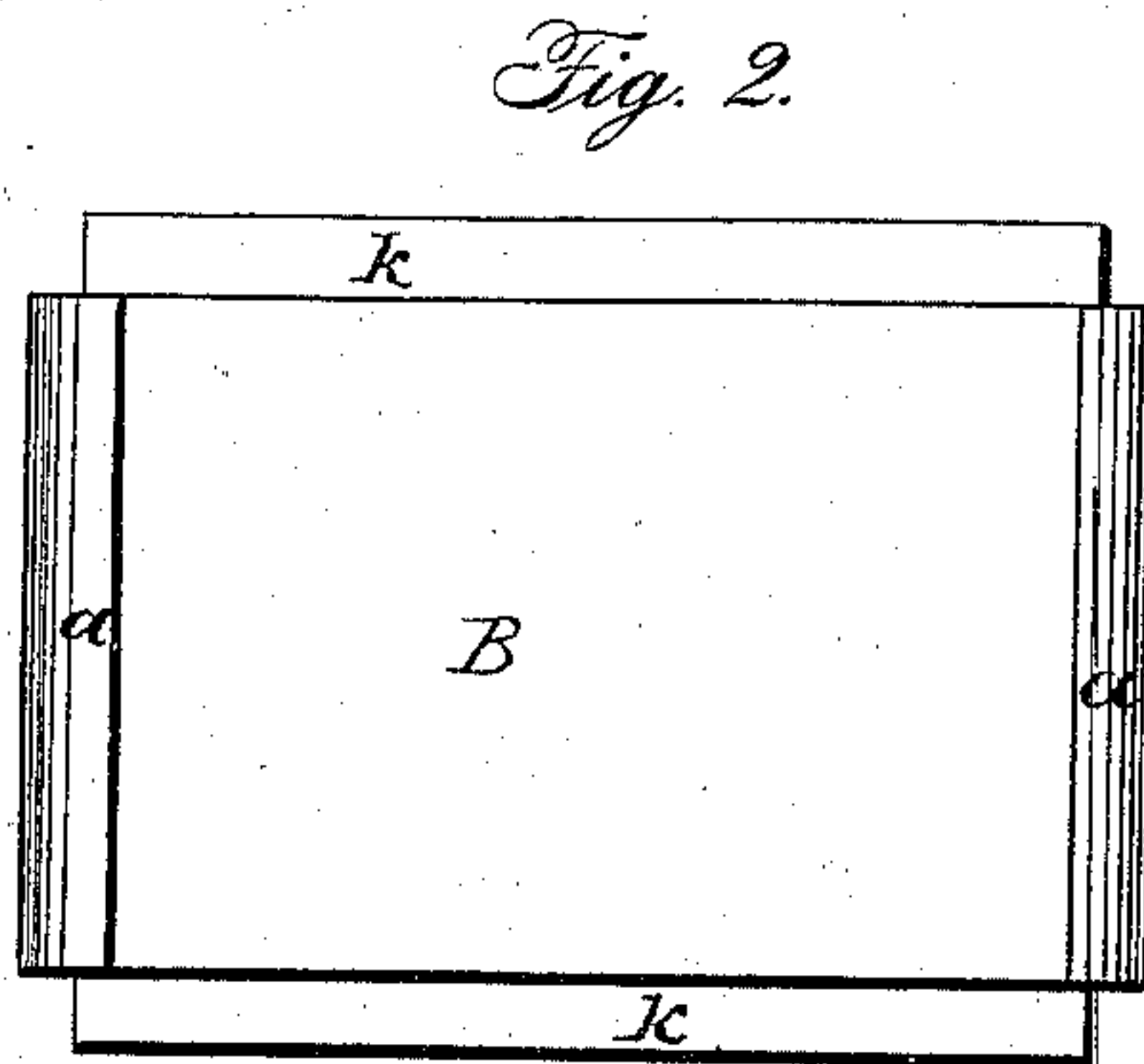
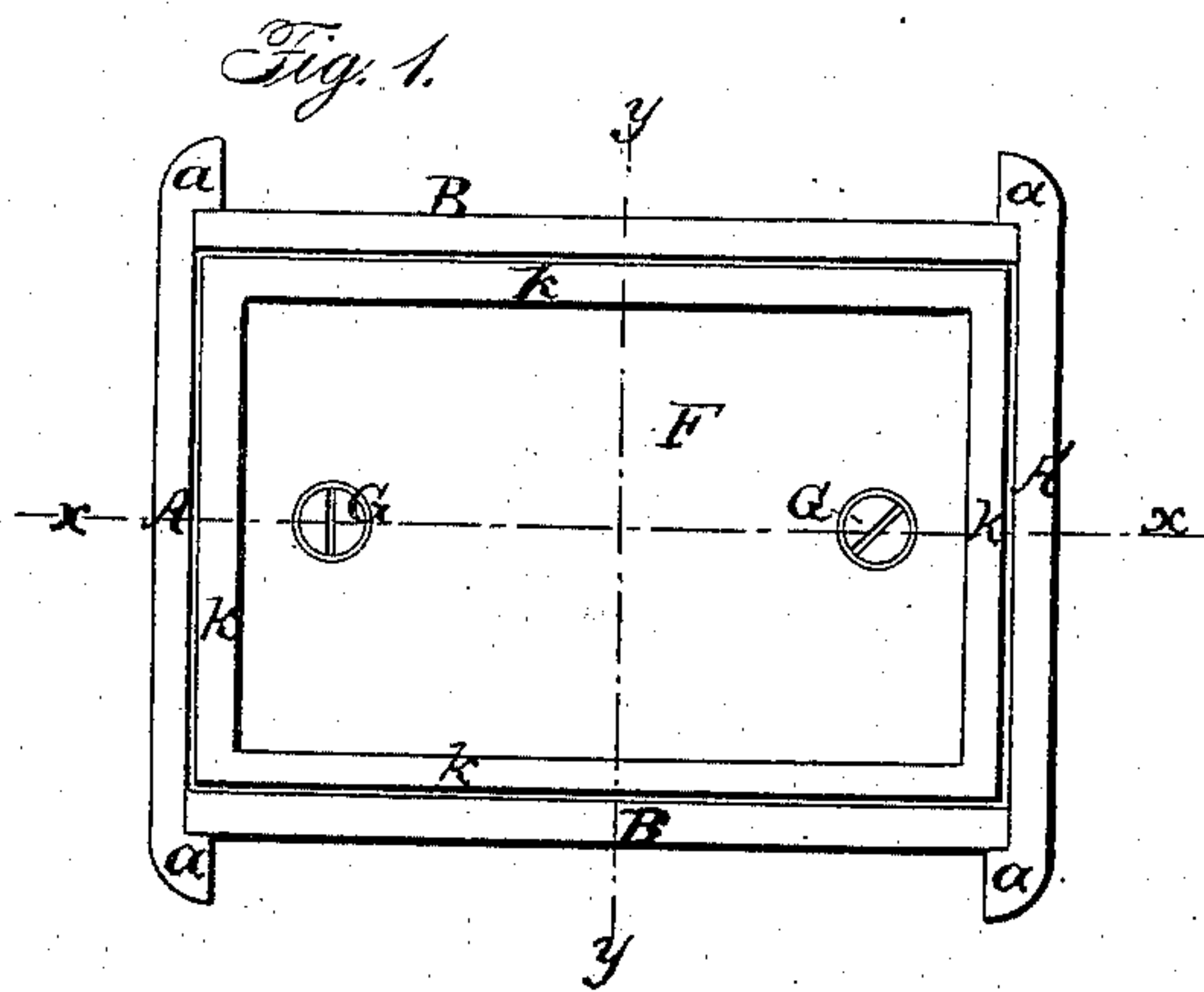


G. DOUGLASS.

Car Spring.

No. 39,901.

Patented Sept. 15, 1863.



Witnesses:

Randolph C. Lytle
A. King

Inventor:

George Douglass
Per Robbing & Burr
Atty.

UNITED STATES PATENT OFFICE.

GEORGE DOUGLASS, OF SCRANTON, PENNSYLVANIA.

IMPROVEMENT IN CAR-SPRINGS.

Specification forming part of Letters Patent No. **39,901**, dated September 15, 1863.

To all whom it may concern:

Be it known that I, GEORGE DOUGLASS, of Scranton, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Improvement in Railroad-Car Springs; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification, and of which—

Figure 1 is a top view, and Fig. 2 a side elevation, of my improved pedestal car-spring; Fig. 3, a longitudinal section thereof in the line *x x*, and Fig. 4, a cross-section in the line *y y*, of Fig. 1, showing the relation and peculiar arrangement of its several parts; Fig. 5, a longitudinal section of the spring when partially compressed, showing the manner and direction of its vibrations. Fig. 6 is an additional sectional view of the spring, illustrating different modes of securing the elastic levers *D D'* in their proper positions.

Similar letters indicate like parts in each of the drawings.

My improved pedestal car-spring is arranged within an open rectangular case or frame, whose ends *A A'* are so prolonged beyond the sides *B B* as to form flanges *a a a a* to embrace the jaws of the pedestals which guide the vertical movements of the car with reference to its axles. The inner face of each of these end pieces, *A* and *A'*, of the spring, case, or frame, is fitted with a central horizontal ledge or projection, *C*, Fig. 3, extending across the same, parallel with its top and bottom edges, and these ledges *c c* support the ends of one or more plates of elastic well-tempered steel *D D'*, constituting the spring proper. The width of the projections or ledges *c c*, and consequently the extent or depth of the open central chamber, *E*, formed in my improved spring, is increased or diminished in their manufacture to accommodate and control the amount of vibration desired, the degree of their stiffness or elasticity being regulated by the temper, weight, and number of the elastic leaves or plates *D D'* introduced therein.

I finish, complete, and protect my improved springs by cap-plates *F F*, made to fit neatly and closely within the upper and lower edges of the case or inclosing-frame *A A'*; and to obtain the full resilient power of the elastic

leaves of my improved spring, and secure uniformity in their action and movement, I make the inner faces of the cap or bearing-plates of a convex form, so that pressure therefrom is first applied immediately to the center of the spring proper. The cap-plates are secured in their place upon the elastic leaves, and these also retained in an active position by means of simple flat-headed uniting-bolts *G G*, Figs. 3 and 5, which pass through apertures formed for the purpose in the cap-plates *F F* and elastic leaves *D D'*, and are fastened by means of nuts *d d*, as clearly shown in Fig. 5. It is evident, however, that as the spring is compressed the ends of these rigid bolts *G G* will be left projecting above the outer face of the cap-plates. To provide for this fact, and to protect the bolts from injury by contact with resisting surfaces, I form a flange or rim, *k k*, upon the outer edge of these cap-plates *F F*, (see Figs. 1 and 3,) projecting so far above the outer face thereof as to leave or form a recess thereon equal to the extent of vibration in the spring. When, however, it is desirable to avoid altogether the use of bolts in securing the elastic leaves or plates *D* and *D'* in their proper positions, I add a second cleat or projection, *H*, upon the inner side of the end plate, *A*, of the frame, as shown in Fig. 6, parallel with the supporting-ledge *c*, and at such a distance therefrom as to receive and embrace the full number of elastic leaves *D D* desired in the particular spring. The lower side of this cleat or projection *H* may be advantageously formed, as shown by the sectional view thereof, Fig. 6—that is, with an inward slope, but this is not strictly essential.

Instead of forming a recess to receive the ends of the elastic leaves by attaching projections to the side of the frame, as shown in Figs. 3, 5, and upon one side of Fig. 6, it is evident that the side may be made thick enough to admit of the formation of a suitable recess immediately therein, as is clearly illustrated by the side *A'* of Fig. 6.

In securing the ends of the elastic plates within recesses one of the end pieces, *A*, of the frame or spring-case is left loose until the elastic leaves are placed in position, when, by fastening the same, the whole combination is secured.

I believe that a concavo-concave form is

best adapted to the purpose for which I use the supporting flanges or ledges *c c*, but I do not limit myself thereto, for a convexed form may be used, and I contemplate any form of projection which will properly sustain or confine the ends of the elastic plates of my improved spring, and serve to separate the distinct series when placed in the position herein described; nor do I desire to limit myself to the particular mode of supporting the weight of the load upon the center of the spring, as herein described, for any device for upholding the weight upon the center of the elastic plates will subserve my purpose, although in view of the fact that by the use of a convexed block or cap-plate, in compressing the spring-plates, the bearing-surface gradually increases, and the plates are thereby proportionally protected from strain, as their elasticity is gradually overcome. I prefer such a form in the construction and arrangement of my spring.

The elastic plates or leaves may be broad, or so narrow as that two or more may be placed side by side in filling the width of the frame. I usually arrange them in pairs, as shown in Fig. 4, with semicircular notches, to embrace the bolts *G G*, passing centrally through the division-line between them, as shown in Fig. 5. Any suitable number of these elastic plates *D D* may also be superimposed one upon another in building up the spring, its stiffness being, as already stated, in a measure regulated by their number as well as by their size. Hence I propose to make my spring more generally useful and desirable by placing a greater number of these plates upon one side of the central vibrating chamber, *E*, Fig. 3, than on the other, as is clearly illustrated in Fig. 6, so that the one side being more yielding and elastic, and therefore more sensitive, will vibrate freely

under the weight of even an empty car, leaving the more powerful side to act when an increased weight overcomes the elasticity of the lighter section. The peculiar construction of my spring prevents an undue strain upon the elastic plates by limiting the extent of their play or curvature to a point within their maximum of elasticity. Hence they can be made very durable, whereas their simplicity on the other hand permits them to be made at a low cost and repaired very cheaply.

The arrangement of my improved springs in rectangular frames makes them eminently suitable for combination with the pedestals and axles of railroad-car trucks, and for this end they are especially designed.

As the use of a series of elastic bars or leaves of steel, supported or confined at their ends alone, and their compression by the use of a centrally-convexed bearing-plate, has been substantially claimed in patents heretofore issued, I do not regard these features of my spring as exclusively my own invention; but

What I do claim therein as new, and desire to secure by Letters Patent, is—

An improved railroad-car spring formed of one or more series of straight elastic plates, when said elastic plates are compressed from opposite directions, and so confined in a rectangular frame as to leave an intermediate vibrating space between each distinct series, controlling the extent of their curvature, all substantially in the manner herein set forth.

The foregoing specification of my improved railroad car spring signed by me this 1st day of June, A. D. 1863.

GEORGE DOUGLASS.

In presence of—

F. R. SHILSTONE,
DENNIS TIERNEY.