

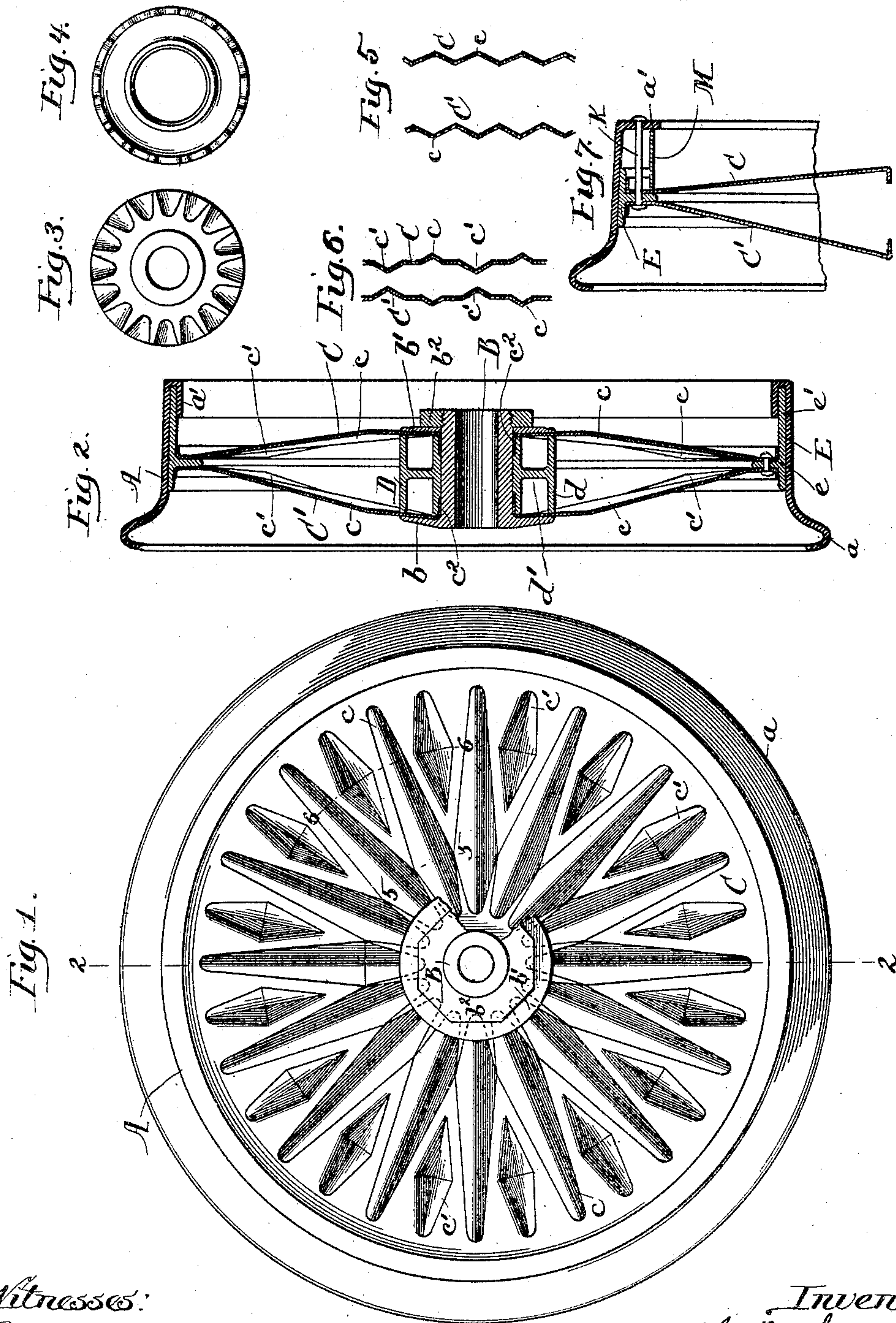
(No Model.)

2 Sheets—Sheet 1.

L. B. SMYSER.  
CAR WHEEL.

No. 474,421.

Patented May 10, 1892.



Witnesses:  
Fred Borlach  
J. B. Carpenter

Inventor:  
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 10.

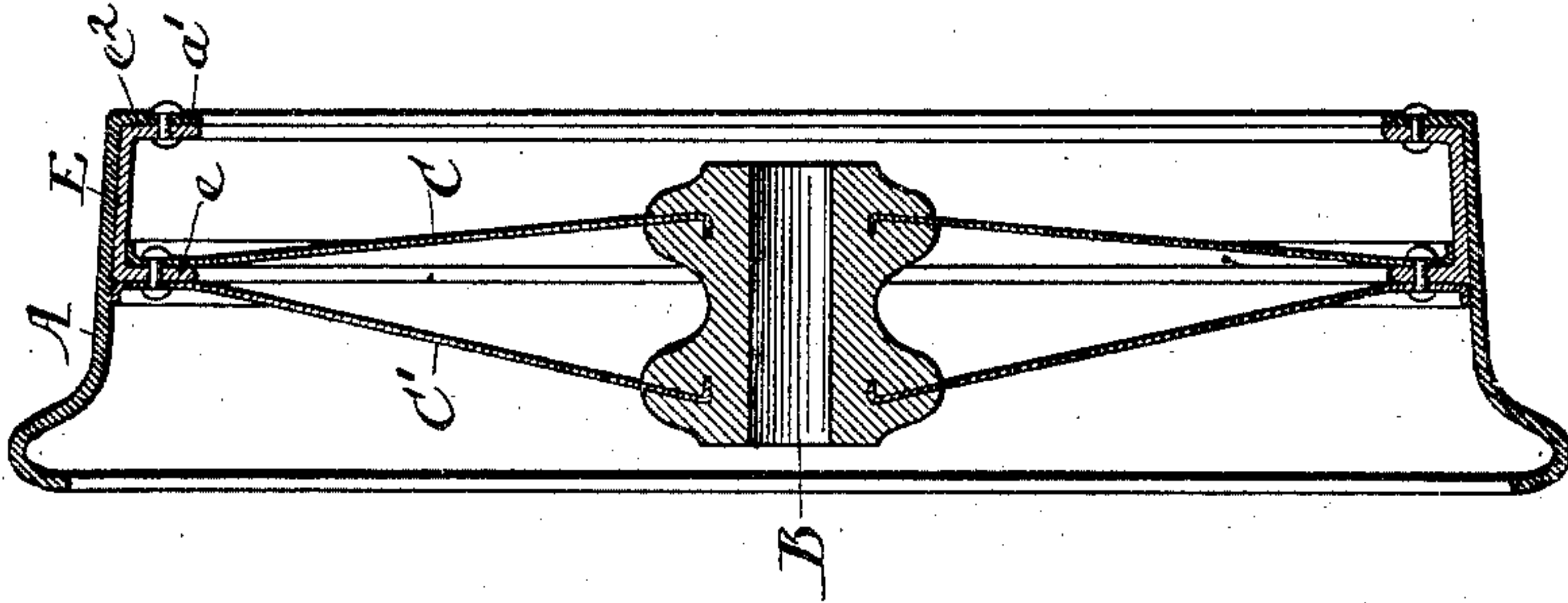


Fig. 11.

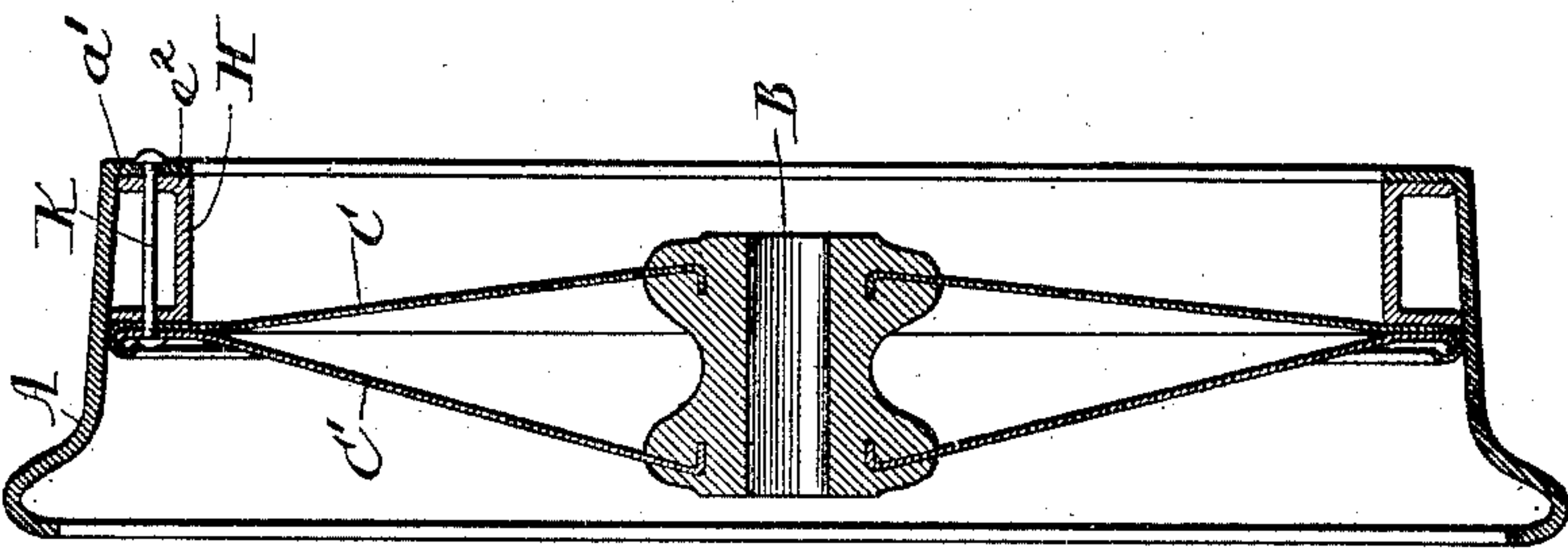


Fig. 9.

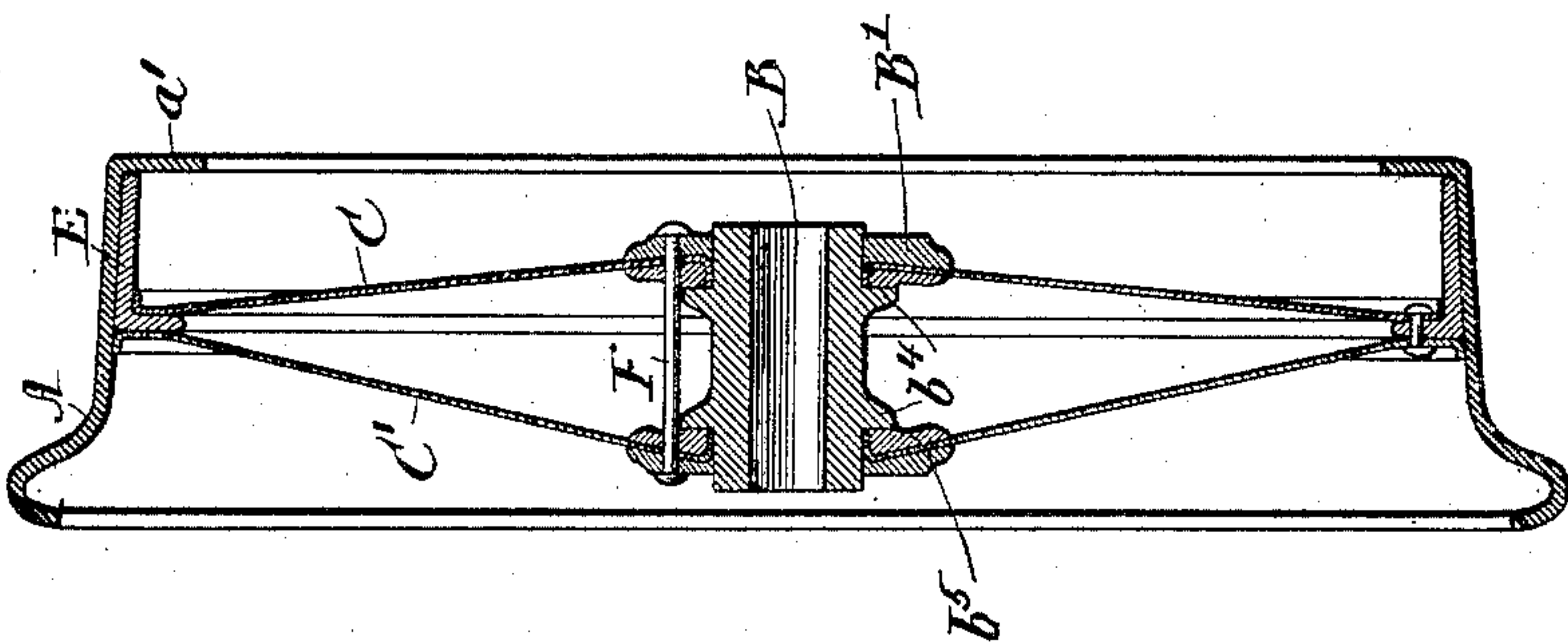
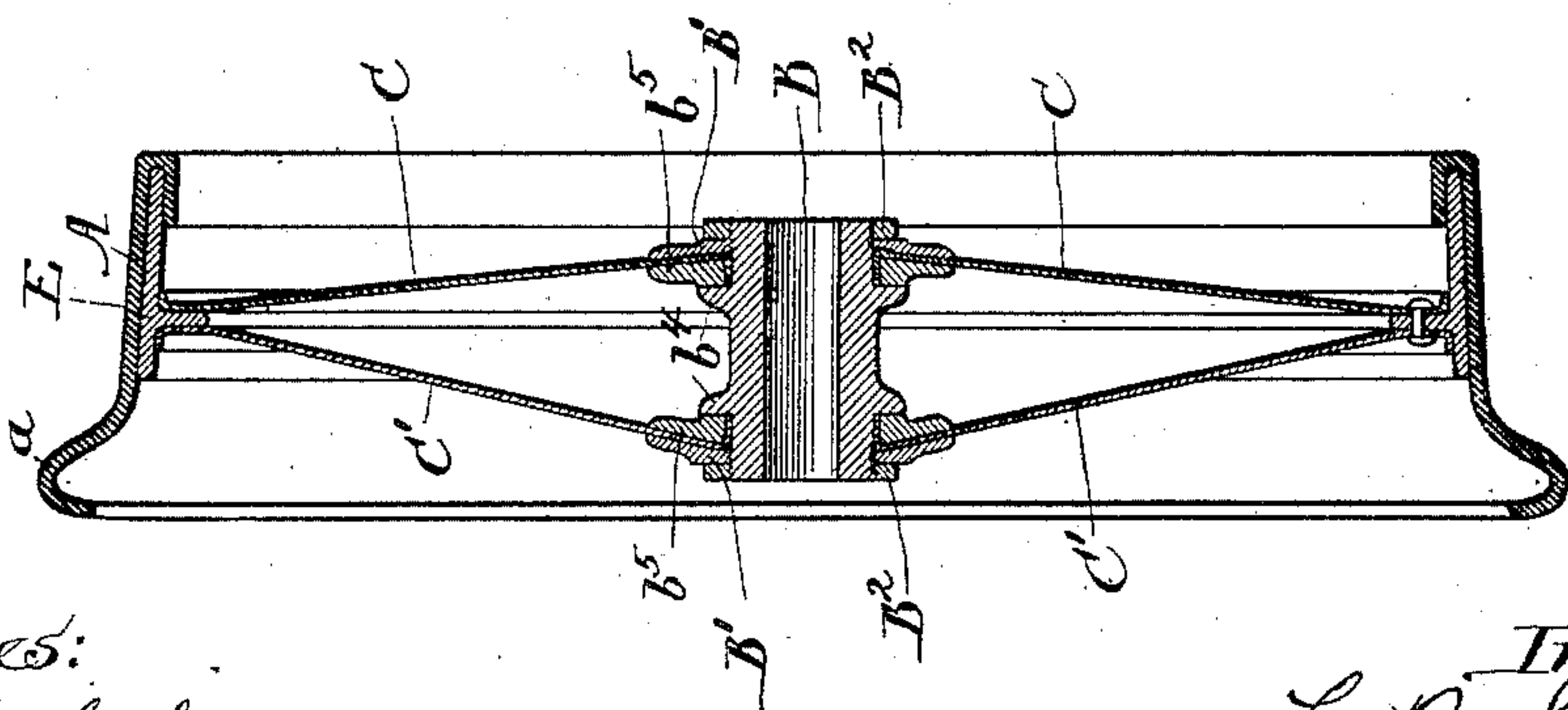


Fig. 8.



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# UNITED STATES PATENT OFFICE.

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## CAR-WHEEL.

SPECIFICATION forming part of Letters Patent No. 474,421, dated May 10, 1892.

Application filed November 30, 1891. Serial No. 413,458. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS B. SMYER, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful  
5 Improvements in Car-Wheels, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

10 My present invention has relation more particularly to that class of car-wheels the bodies of which are made of plates of metal suitably united to the metallic hubs and tires.

The object of invention is to produce a simple, light, strong, and durable construction of  
15 car-wheel, and this object I have accomplished by the novel features of invention hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the  
20 claims at the end of this specification.

Figure 1 is a view in side elevation of a car-wheel embodying my invention. Fig. 2 is a view in vertical cross-section on line 2 2 of Fig. 1. Fig. 3 is an end view of the hub, looking toward its flange. Fig. 4 is an end view  
25 of the spacing-block that encircles the hub. Fig. 5 is a view in cross-section on line 5 5 of Fig. 1. Fig. 6 is a view in cross-section on line 6 6 of Fig. 1. Fig. 7 is a view in vertical  
30 transverse section through a modified construction of wheel. Figs. 8, 9, 10, and 11 are views in vertical cross-section through wheels embodying features of my invention, the constructions being modified in certain particu-  
35 lars.

Referring more particularly to the construction illustrated upon the first sheet of the drawings, A designates the tire, and B denotes the hub of the wheel. The body of the wheel  
40 consists of dished metal plates C and C', these plates being pressed into proper shape from comparatively thin sheets of steel and being arranged with respect to each other as shown—that is to say, with their centers separated at  
45 considerable distance where they are joined to the hub and with their outer edges brought approximately together where they are connected with the tire. The plates C C' are formed with the raised and depressed corru-  
50 gations c and c', as shown, the corrugations c extending approximately the radial length of

the plates and converging about the hub-openings of the plates, while the depressed corrugations c' are located in those portions of the plates between the outer ends of the corruga- 55  
tions c. The central portions of the plates C and C' are preferably formed with the int-  
turned flanges c<sup>2</sup>, and between the inner portions of the plates is set the annular space-  
block D, that is preferably in the shape of the 60  
letter H in cross-section. This annular space-  
block D has its outer portion d connected with its inner portion by the web d, and the outer  
portion d of the block is corrugated to cor- 65  
respond with the corrugations in the oppo-  
site parts of the plates C and C'. So, also, the inner face of the block D is preferably  
recessed to receive the intumed flanges of the plates C and C'. The hub B has one  
end furnished with a flange b, the inner face 70  
of which is preferably corrugated to corre-  
spond with the corrugations of the coinci-  
dent parts of the metal plates C and C', and over the opposite end of the hub B fits the  
retaining-ring b', the inner face of which is 75  
also corrugated to correspond with the por-  
tions of the plates C and C', against which it bears. The retaining-ring b' is firmly  
clamped against the metal plate by means of  
the screw-threaded nut b<sup>2</sup>, that is preferably 80  
formed of polygonal contour, so that it can be readily operated in order to firmly bind  
the parts together. The outer edges of the  
body-plates C and C' are riveted to an annu- 85  
lar tread-plate E, the web e of which sets be-  
tween the edges of the plates, and prefer-  
ably the edges of the body-plates are slightly  
flanged or flared outwardly to afford a better  
bearing with the annular tread-plate E. The  
outer face of the annular plate E bears 90  
against the inner face of the tire A, the an-  
nular plate being disposed in such relation to  
the tire that the web e of the plate shall come  
beneath that part of the tire-tread which nor-  
mally bears upon the central portion of the 95  
rail, and is consequently subjected to the  
most constant and direct strain. As the tire  
A is formed of sheet metal and of as light  
weight as can be employed for such purpose,  
it is desirable to reinforce the tread of the 100  
tire, so as to enable it to better resist the  
strains to which all parts of the tread are sub-



jected, and particularly is this reinforcing of the tire-tread desirable where the wheel is used for hand-cars that are constantly lifted violently off and onto the tracks. For this reason I prefer to form the annular plate E with a flange  $e'$ , extending beneath the outer portion of the tread of the tire, thereby greatly increasing the strength of the tire-tread at all points. Another advantage of thus extending the plate E beneath substantially the entire tread of the tire is that the frictional contact between the broad outer face of this plate and the inner face of the tire when the plate has been forced into position within the tire will avoid the necessity of bolting the plate to the flange of the tire. The tire A is formed with the rail-flange  $a$  of a shape corresponding with the shape of the "standard-gage-railway-wheel flange," and is formed, also, preferably with the inner flange  $a'$ , that may be doubled inward and clamped against the flange  $e$  of the plate E; or this flange  $a'$  might extend at right angles to the tread of the wheel.

A wheel constructed in accordance with the above description will possess a very great degree of strength, since the arrangement of the body-plates C and C' is such as to most effectively distribute the strain about the hub of the wheel. So, also, the corrugations of the plates are such as to effectively guard against any danger of the plates collapsing under strain, and the inturned edges of the plates, clamped as they are between the annular plate or block D and the hub, are securely held against possibility of withdrawal or displacement and afford a square bearing against the hub for the centers of the plates. The tread-plate E serves not only to securely retain the outer edges of the body-plates C and C' together and to the tire, but affords such a bearing beneath the tread of the tire as to distribute the strains or shocks from the tread of the wheel to the body in most direct manner.

In the form of my invention illustrated in Fig. 8 of the drawings the tire A of the wheel and the body-plates C and C' are of substantially the construction hereinbefore described, although the plates are not shown as corrugated in this form of my invention. So, also, the annular tread-plate E is the same as that hereinbefore described, and in like manner is united to the outer edges of the body-plates C and C'. In this form of the invention, however, the hub B is shown as screw-threaded at both its ends and is formed with annular ribs  $b^4$  about its central portions. Against these raised ribs  $b^4$  bear the annular rings  $b^5$ , within the openings of which and between such rings and the hub B set the inturned flanges of the plates C and C'. Against the central portions of the plates bear the retaining-rings B', which may be screw-threaded in correspondence with the ends of the hub, and preferably, also, screw-threaded nuts or washers B<sup>2</sup> engage with the threaded ends of the

hub and serve to firmly hold the rings B' and  $b^5$  against the body-plates C and C' and securely retain the rings in position upon the hub.

In the embodiment of my invention illustrated in Fig. 9 the tire A is of the same construction as that illustrated in the preceding figures of the drawings, except that the interior flange  $a'$  extends at right angles to the tread of the tire. In this form of the invention the body-plates C and C' are of the same general construction as that hereinbefore described, except that the plate C is of slightly greater diameter than the plate C' in order to enable the outer edge of this plate C to bear directly against the inner face of the tire-tread. In this construction the tread-plate E extends only on one side of its inner web  $e$ ; but the outwardly-flanged edge of the plate C serves to supplement the tread-plate in transmitting the strain from the tire to the body of the wheel. In this form of invention, as in the forms above described, the tread-plate is extended to the outer edge of the tire-tread and the advantages incident to such construction are attained. The hub B is formed with the annular ribs  $b^4$ , and is provided with rings B' and  $b^5$ , corresponding to the rings illustrated in Fig. 8 of the drawings; but in this form of the invention the hub is not screw-threaded, and the rings are held in proper position with respect to the hub and the body-plates C and C' by means of through-bolts F, that pass through the plates and the rings.

The modified form of wheel shown in Fig. 10 of the drawings has a tire A, corresponding with the tire hereinbefore described, and in this form the body-plates C and C' correspond with the body-plates illustrated in Fig. 9 of the drawings. So, also, the tread-plate E extends to the extreme outer portion of the tread. In this figure of the drawings I have shown the tread-plate as formed with an inwardly-extending flange  $e^2$  abutting against the flange  $a'$  of the tire A and riveted thereto for greater security. In this last-described wheel the hub B is shown as formed of cast metal, this hub being cast about the inner portions of the body-plates C, so that a firm union of the plates and hub is secured.

In the form of the invention illustrated in Fig. 11 of the drawings the hub B is shown as in the last-described figure. In this construction, however, the outer edges of the body-plates C and C' are brought together in such manner that the outer edge of the plate C' extends beyond and overlaps the outer edge of the plate C and bears against the inner face of the tire-tread. So, also, in this form of the invention the outer portions of the wheel-body are joined by through-bolts K to the depending flange  $a'$  of the tire by means of a channel-plate H, that extends from the wheel-body to the depending flange of the tire.

In the form of wheel illustrated in Fig. 7 of



the drawings the body-plates C and C' are the same as those illustrated in Figs. 1 and 2, and these body-plates are united to the hub B in the same manner. The tread-plate E (shown in this view of the drawings) does not extend the entire distance from the body to the outer edge of the tread, but is bolted to the body-plates C and C' and to the interior flange *a'* of the tire by through-bolts K. In order to hold the wheel-body at proper distances with respect to the interior flange *a'* of the tire, a spacing-ring M is placed between the outer portion of the wheel-body and the interior flange *a'*, so that when the parts are joined together, as illustrated in the drawings, the spacing-ring M will serve to hold the wheel-body in proper position with respect to the tire.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A car-wheel the body whereof is composed of metal plates having inwardly-turned flanges about their hub portions and a space block or ring between which and the hub the flanges of said metal plates extend, and a hub and tire suitably connected to said plates, substantially as described.

2. A car-wheel the body whereof is composed of metal plates having inwardly and outwardly turned flanges at their inner and outer edges, a flanged hub to which said body is secured, and a flanged tread-plate to which the outer portion of said body is bolted, substantially as described.

3. A car-wheel comprising a hub and tire and a body united to said hub and tire, said body being composed of metal plates C and C', having the alternately-arranged long and short radial corrugations *c* and *c'*, substantially as described.

4. A car-wheel comprising a metal hub and tire, a body consisting of two dished metal plates united to the hub, and a metal tread-plate having a central flange or rib and lateral flanges on each side of said central flange and bearing against the inner face of the tire-tread, substantially as described.

5. A car-wheel comprising a metal hub and tire, a body formed of metal plates C and C', suitably united to the hub, and a tread-plate serving to connect said metal plates with the tire, said tread-plate consisting of a metal ring having an inwardly-extending web and having a flange extending from the outer edges of the metal plates to the edge of the tire-tread, substantially as described.

6. A car-wheel comprising a metal hub and metal tire and a body united to said hub and tire, said body consisting of dished plates C and C', having radial corrugations extending from approximately the hub to the tire, and a space-block D, set between said corrugated plates and having correspondingly-corrugated edges and corrugated rings to retain said plates in position upon the hub, substantially as described.

7. A car-wheel comprising a body formed of metal plates C and C', a metal hub to which such plates are attached, a tread-plate consisting of a metal ring having an inwardly-extending web and having a flange extending from the outer edge of the metal plates to approximately the edge of the tire-tread, and a tire having at the edge of its tread an inwardly-turned flange, between which flange and the tread of the tire said tread-plate is held, substantially as described.

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