

No. 679,571.

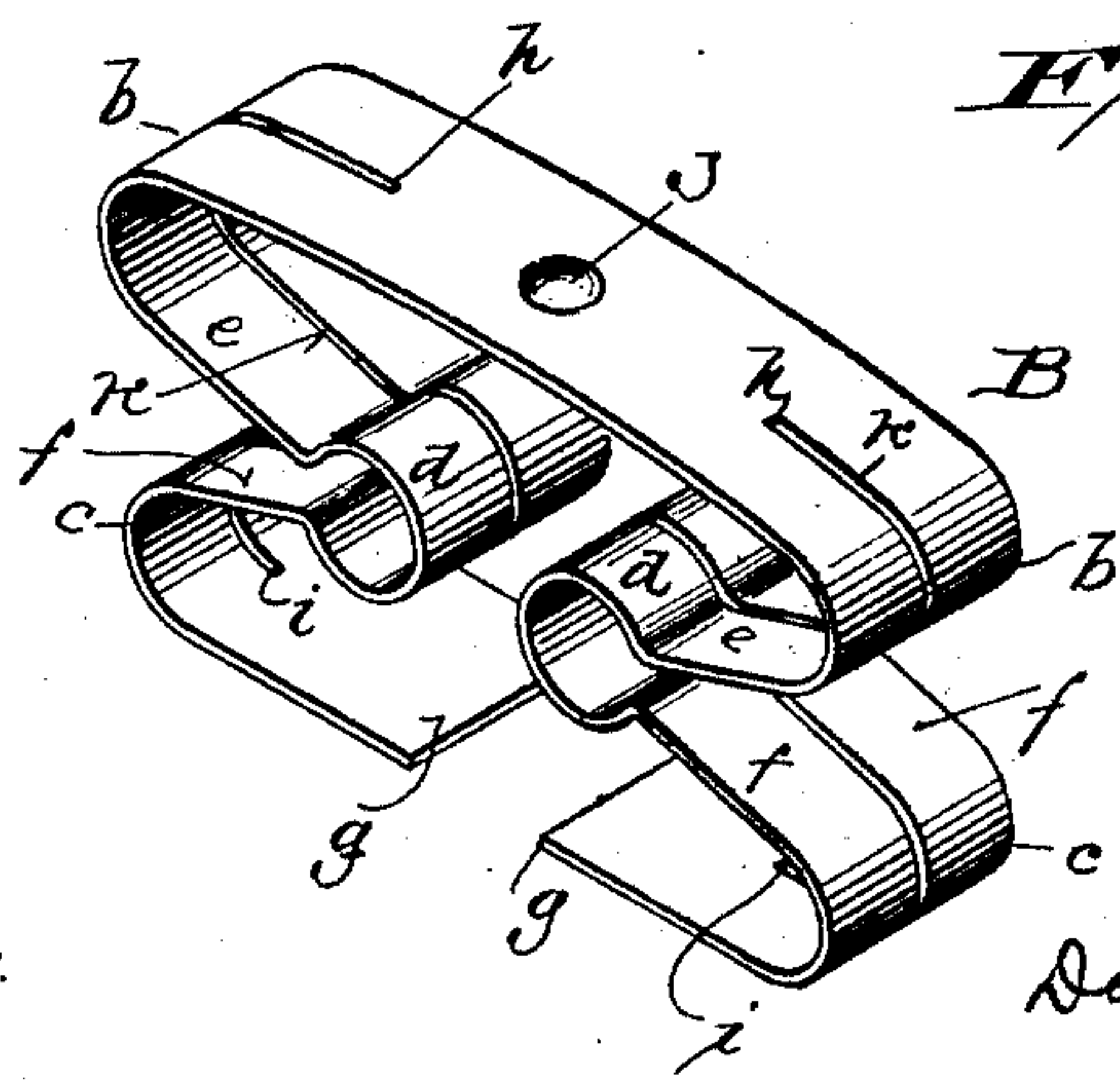
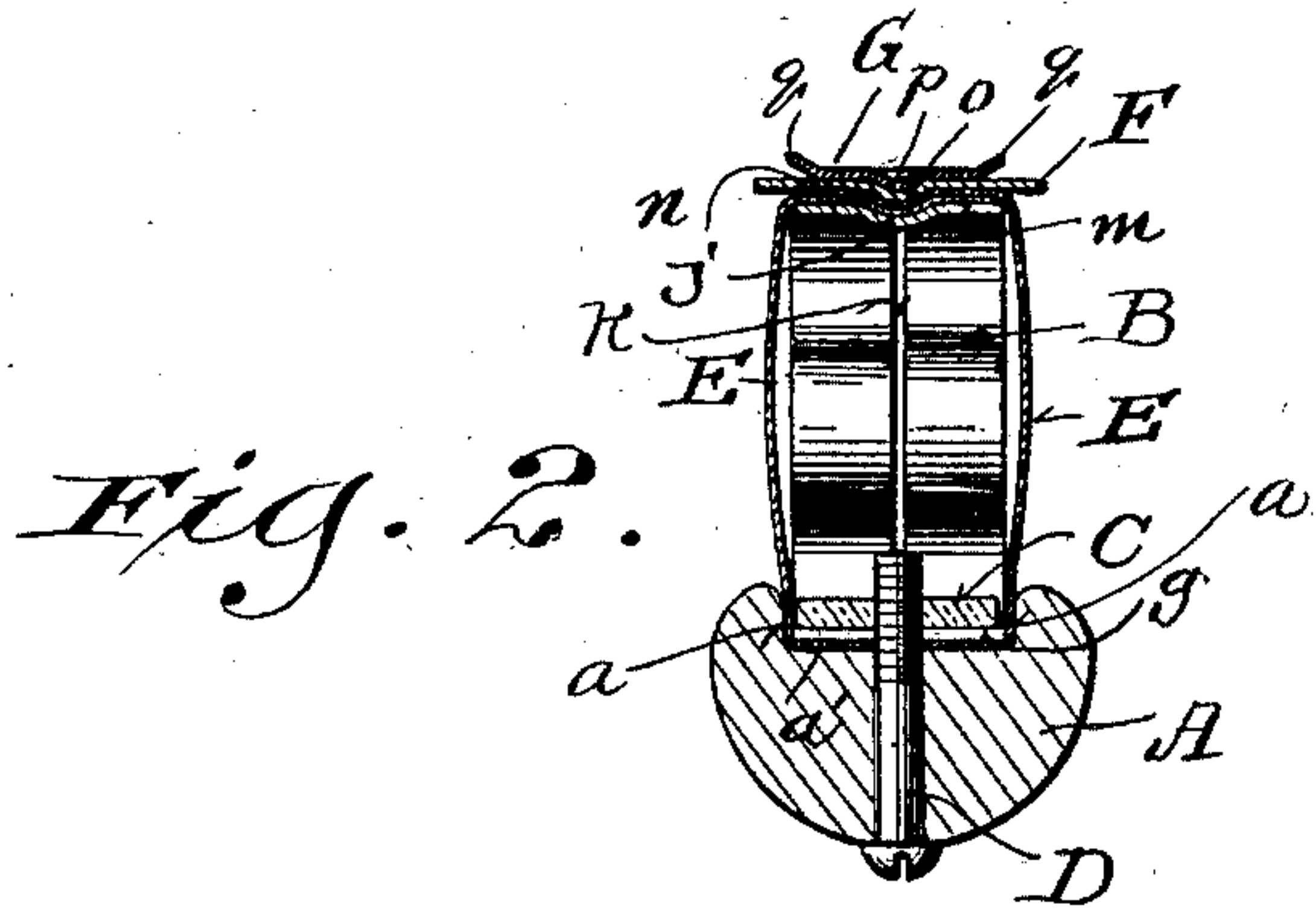
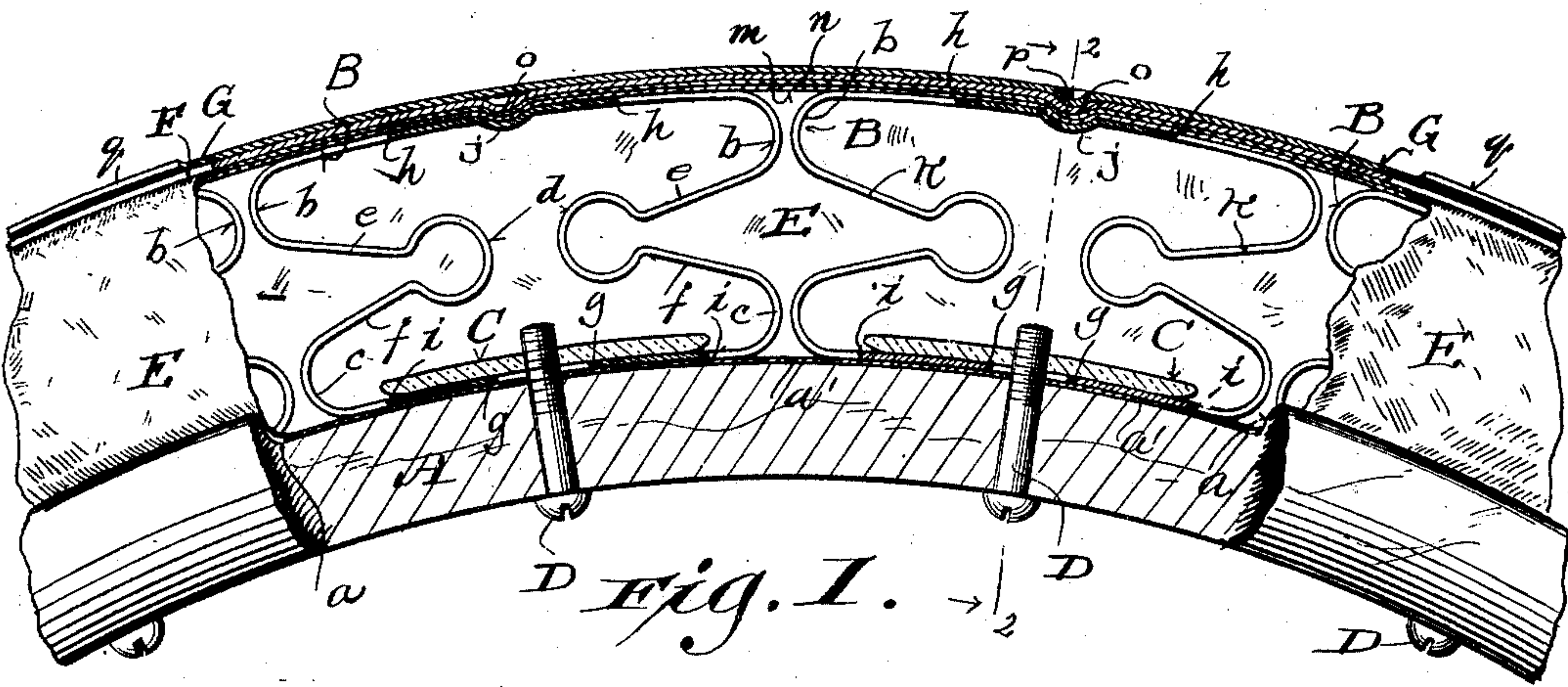
Patented July 30, 1901.

D. H. O'MEARA.  
VEHICLE WHEEL.

(Application filed July 27, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:  
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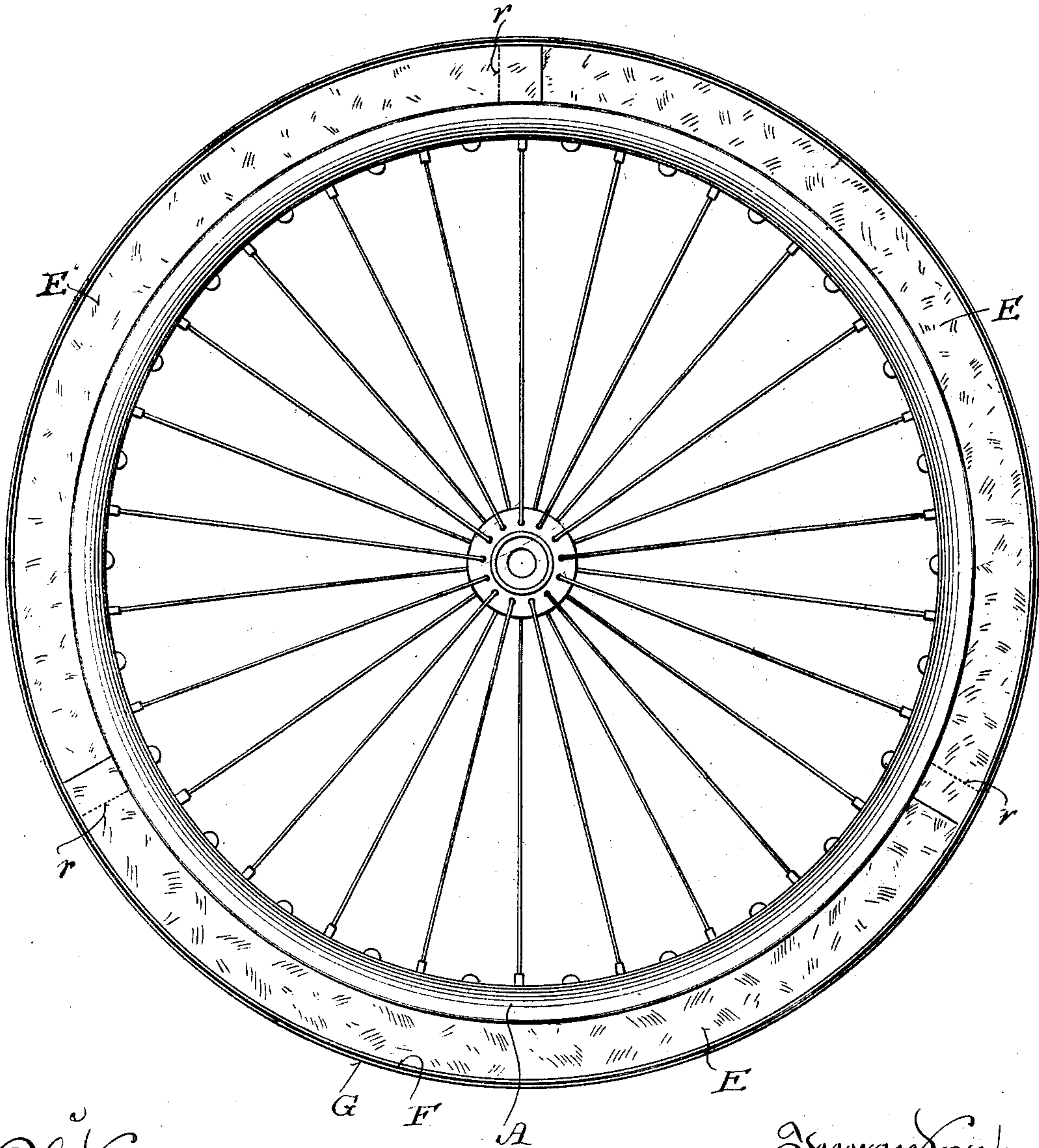
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2 Sheets—Sheet 2.

*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

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## VEHICLE-WHEEL.

SPECIFICATION forming part of Letters Patent No. 679,571, dated July 30, 1901.

Application filed July 27, 1900. Serial No. 24,966. (No model.)

*To all whom it may concern:*

Be it known that I, DENIS HENRY O'MEARA, a citizen of the United States, and a resident of Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Vehicle-Wheels; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to vehicle-wheels; and it consists in certain peculiarities of construction and combination of parts, as will be fully set forth hereinafter with reference to the accompanying drawings and subsequently claimed.

In the said drawings, Figure 1 is a representation, partly in elevation and partly in section, of the rim and tire of a wheel embodying my present invention. Fig. 2 is a transverse sectional view taken on the line 2 2 of Fig. 1. Fig. 3 is a detail perspective view illustrating the preferred form of one of the springs forming a part of my said invention. Fig. 4 is a side elevation of one of my complete wheels.

My invention is especially designed to take the place of wheels having pneumatic tires—such as are commonly employed in connection with bicycles, tricycles, automobiles, and other vehicles—and obviates the objectionable liability of such tires to being punctured or otherwise rendered unfit for use, while at the same time affording the desired resiliency and lightness.

Referring to the drawings, A represents an annular rim, preferably of wood, having an outer circumferential groove *a*.

B B designate a series of double springs made of flat spring-metal strips bent, preferably, into the shape best shown in Fig. 3. In the preferred form therein illustrated the said strips of metal are bent so as to leave the space within each spring of an approximately H shape placed flatwise, the then upper part of each double spring being of greater length between the rounded upper ends *b b* than the corresponding length between the lower rounded ends *c c*, the said upper and lower (or outer and inner) parts being united by opposed nearly circular portions *d d*, connected to the said rounded ends on converging lines *e e* and *f f* and all being made con-

tinuous and in one piece for each double spring. The opposed lower ends *g g* of the lower part of each spring are separated by some considerable space, and each end of each spring is preferably slotted, as shown at *k k*, the said slots extending continuously from the points *h h* in the top portion of the upper part to the points *i i* in the lower ends *g g* of the lower part, while centrally between the points *h h* in said top portion of the upper part the metal of the spring is depressed, as shown by the rounded concavity *j*, the metal thus forced downward forming a rounded convex boss on the under side of said top portion of the upper part.

C C represent series of washers of a width to lie between the opposed vertical edges of the described outer circumferential groove *a* in the rim A, and D D represent screws passed through corresponding bores in the said rim A and screw-threaded bores in the said washers C C, the said screws passing between the opposed ends *g g* of the lower parts of said springs B B.

E represents suitable fabric, preferably what is known as "waterproof" fabric or enameled cloth, which is interposed between the under surfaces of the lower portions of the described springs B B and the adjacent upper surface of the described outer circumferential groove *a* in the annular rim A, and then after the said springs B B have been secured in place by means of the screws D D (which pass through the adjacent portion *a'* of the said fabric) and washers C C one edge of this fabric is brought up past the side edges of said springs and over the top of the upper portions of the springs B B, as best shown at *m*, and the other edge of the said fabric E is brought up past the opposite side edges of the springs and over upon the part *m* of the fabric above the upper portions of springs B B, as best shown at *n* in Figs. 1 and 2.

It will be understood that where I have employed relative terms in this description, such as "upper" and "lower" or "over" and "under," I have reference to the relative positions of the parts, as shown in Figs. 1, 2, and 3 in the present illustration, which show the several parts belonging to the wheel-rim as if the same were taken from a portion of the wheel when said parts were in their up-



permost position, and hence that the relative positions of the corresponding parts located at opposite parts of the wheel-rim, for example, would be the reverse of the relative positions herein described.

F represents a flat inner metallic tire which is preferably formed with a series of round indentations *o o* at intervals corresponding to the described depressions *j j* in the upper surfaces of the springs B B, these indentations conforming exactly to the shape of the depressions *j j*, so as to have bosses on the inner surface of said tire which will fit within the depressions *j j* of the springs, as best shown in Fig. 1, while G represents the outer metallic tire, provided with similar indentations or depressions *p p*, save that preferably those in the outer tire are fewer in number and at greater distances apart than the indentations or depressions in the inner tire, the said metallic tires and springs being securely, but removably, united by means of the said indentations or depressions *j o p*. The said outer tire G is of less width than the inner tire F, and the edges of the said outer tire are outwardly inclined at oblique angles, as shown at *q q*. Each tire is preferably formed of a single strip of spring metal, and the inner tire F is bent around the rim outside of the overlapping edges *m n* of the described fabric E and the outer tire G bent around the inner tire and the two tires riveted together, it being desirable that the meeting ends of one tire should be at a different point from that of the meeting ends of the other tire. The said meeting ends of each tire may be united by electric welding, thus making a continuous hoop or band of each tire, or there may be additional rivets uniting the two meeting ends of one tire to the adjacent solid portion of the other tire, or the meeting ends may overlap each other and be riveted or otherwise secured together, just as is found most convenient in practice, and, as best shown in Fig. 4, the described waterproof fabric E is preferably made in a series of strips, three or more in number, having overlapping ends, as indicated by the dotted lines *r r* in said Fig. 4, which latter shows a complete wheel of the suspension-spoke variety, although my invention is not limited to use in connection with any specific form of spokes or hub.

The springs and tires are preferably made of highly-tempered steel, and there being no rubber to disintegrate or harden my wheels are practically indestructible in legitimate use, while should any of the parts become injured through accident the particular part thus injured can be readily replaced without requiring any change in the uninjured portions.

A decided advantage in forming the springs B with the described continuous longitudinal slots is that in the spring thus made the two slightly-separated sides thereof have slight independent motion, which shifts from one

side of the spring to the other, according to the inclination or angle of the wheel in use, thereby increasing the resiliency of the spring.

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

1. In a vehicle-wheel, the combination with the rim, of an annular series of double flat metallic springs secured directly thereto, each spring having upper and lower portions united by opposed inwardly-extending central portions, and a metallic tire surrounding said annular series of springs and bearing against the outer portions thereof.

2. In a vehicle-wheel, the combination with a rim, having an exterior circumferential groove, of an annular series of double flat metallic springs, whose inner portions rest within said groove; washers and screws for uniting said inner portions to said rim; and a metallic tire, surrounding said annular series of springs, and bearing against the outer portions thereof.

3. In a vehicle-wheel, the combination with the rim, of an annular series of metallic springs secured thereto; a surrounding metallic tire; and strips of fabric entirely surrounding said springs, and interposed between the rim and tire.

4. In a vehicle-wheel, the combination with the rim, and an annular series of double flat metallic springs secured thereto, the outer portions of said springs being formed with central depressions therein; of a surrounding metallic tire provided with corresponding inwardly-projecting depressions which engage with those in the adjacent outer portions of the said springs.

5. In a vehicle-wheel, the combination with a rim having an exterior circumferential groove, of an annular series of double flat metallic springs, whose inner portions rest within said groove, and are secured to said rim, and whose outer portions have central depressions therein; and a surrounding metallic tire provided with corresponding inwardly-projecting indentations which engage with the said central depressions in the adjacent outer portions of said springs.

6. In a vehicle-wheel, the combination with the rim, of an annular series of double flat metallic springs secured thereto, the outer portions of said springs being formed with central depressions therein; a surrounding metallic tire; and strips of fabric entirely surrounding said springs, and interposed between the rim and lower portions of said springs, and between the upper portions of the springs and the tire, and said tire having a series of inwardly-projecting indentations in engagement with the said central depressions in the adjacent outer portions of the said springs.

7. In a vehicle-wheel, the combination with a rim having transverse bores therethrough, of an annular series of double metallic springs,



each spring being formed of a continuous strip of flat spring metal, the outer portions of the springs being provided with central depressions therein, and the opposing ends of the inner portions of said springs being separated by some considerable space; flat washers bridging over said space and formed with central screw-threaded bores; screws passing through the bores in the rim, and engaging with said washers; and a surrounding metallic tire formed with a series of inwardly-projecting indentations in engagement with the described central depressions in the adjacent outer portions of the said springs.

8. In a vehicle-wheel, the combination with a rim, of an annular series of double flat metallic springs secured thereto, the outer portions of said springs being formed with central depressions therein; a surrounding flat metallic tire formed with corresponding inwardly-projecting indentations which engage with the said depressions in the adjacent outer portions of the said springs; and a supplemental or outer metallic tire, provided with similar indentations or depressions for engagement with those in the inner flat tire, and the edges of the said outer tire being outwardly inclined at oblique angles to the body of the tire.

9. In a vehicle-wheel, the combination with a rim, of an annular series of double flat metallic springs secured thereto; a surrounding flat metallic tire; strips of waterproof fabric entirely surrounding said springs and interposed between said rim and tire; and a supplemental or outer metallic tire, the edges of which are outwardly inclined at oblique angles to the body of the tire.

10. In a vehicle-wheel, the combination with the rim, of an annular series of double flat metallic springs secured thereto, each spring having upper and lower portions united by opposed inwardly-extending central portions, and each end of each spring being formed with a longitudinal slot extending continuously from a point in the outer part of the outer portion, to a corresponding point in the outer part of the inner portion of the said spring.

In testimony that I claim the foregoing I have hereunto set my hand, at Worcester, in the county of Worcester and State of Massachusetts, in the presence of two witnesses.

DENIS HENRY O'MEARA.

Witnesses:

HENRY F. HARRIS,  
CHARLES M. THAYER.