

J. R. WELCH.
METAL WHEEL SPOKE.
APPLICATION FILED DEC. 17, 1906.

899,476.

Patented Sept. 22, 1908.

Fig. 1.

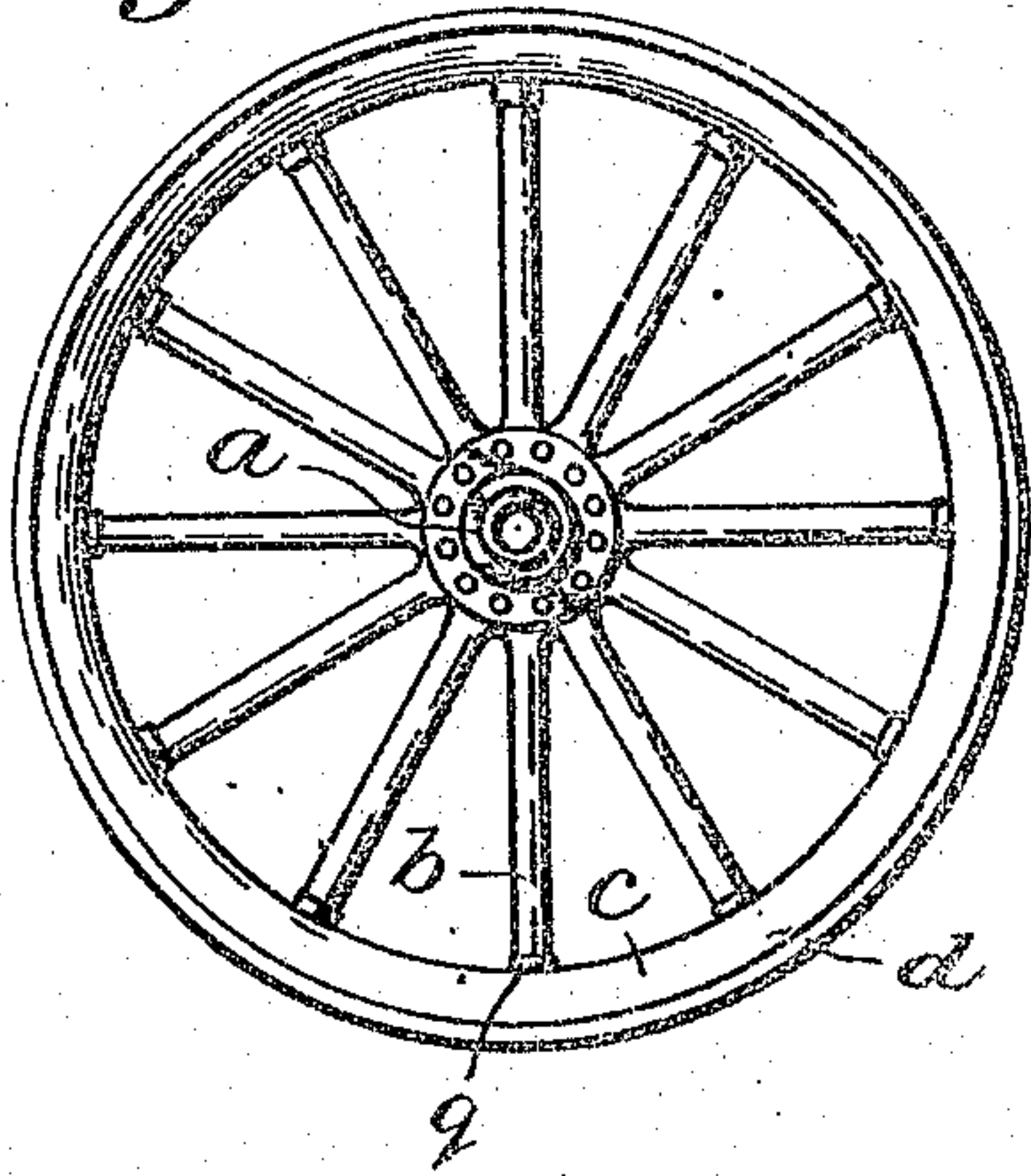


Fig. 2.

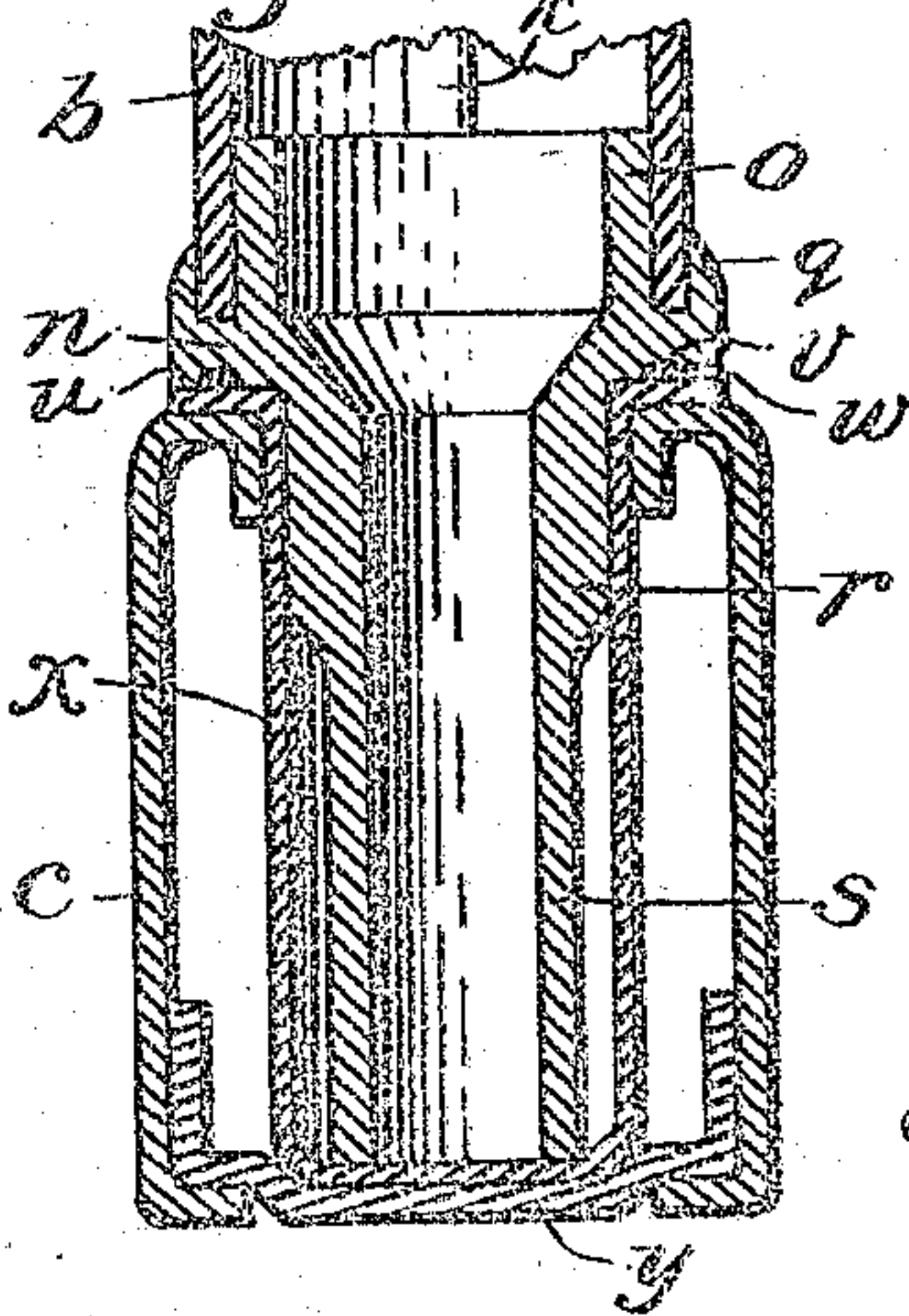


Fig. 3.

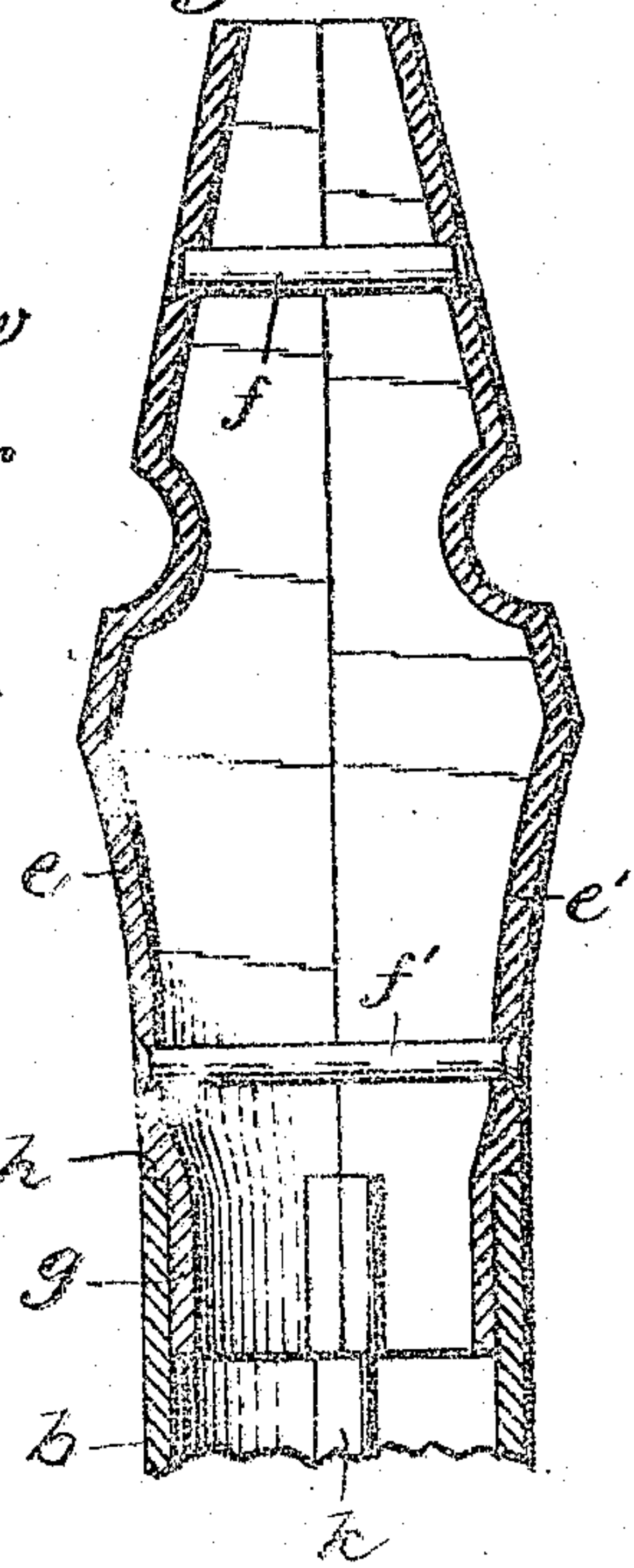


Fig. 4.

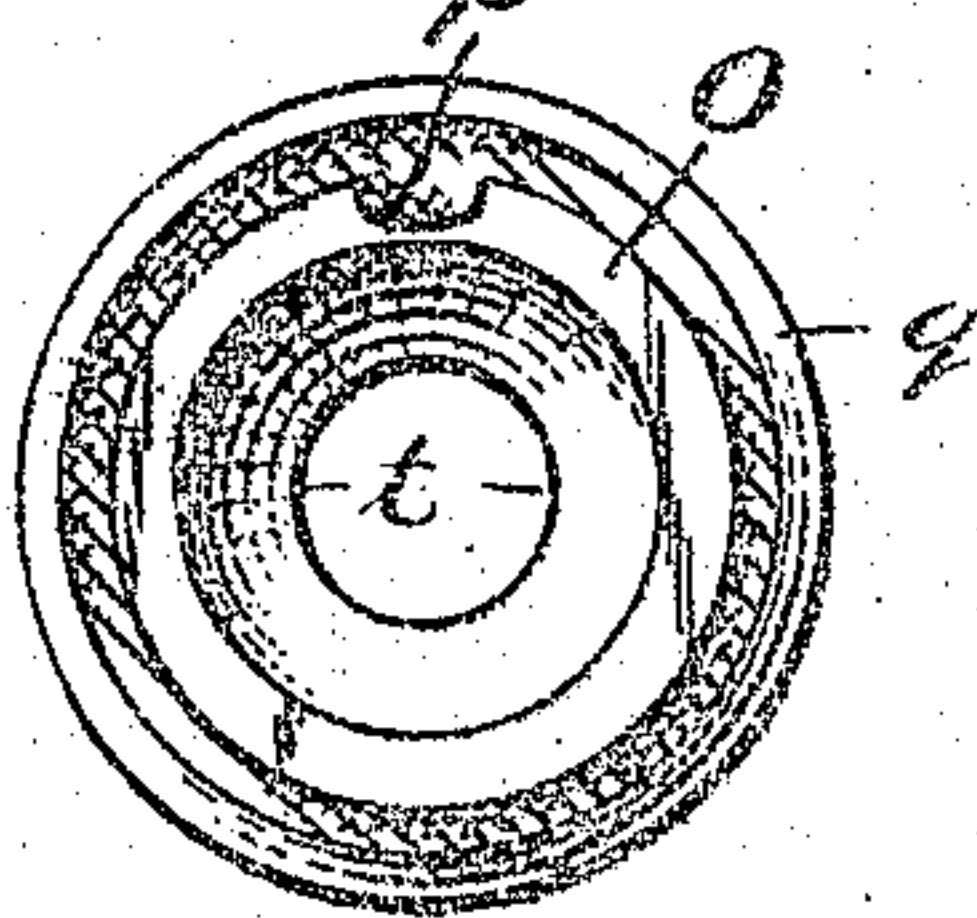


Fig. 5.

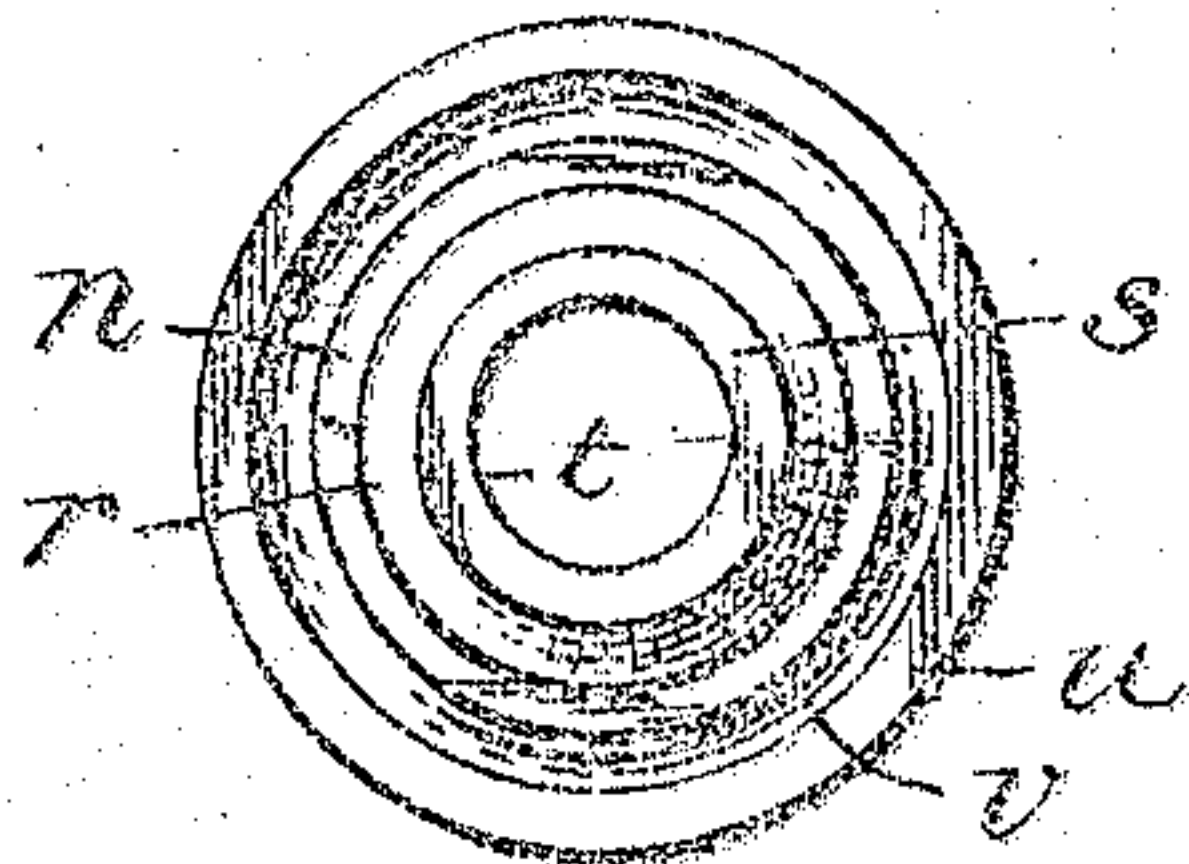


Fig. 6.

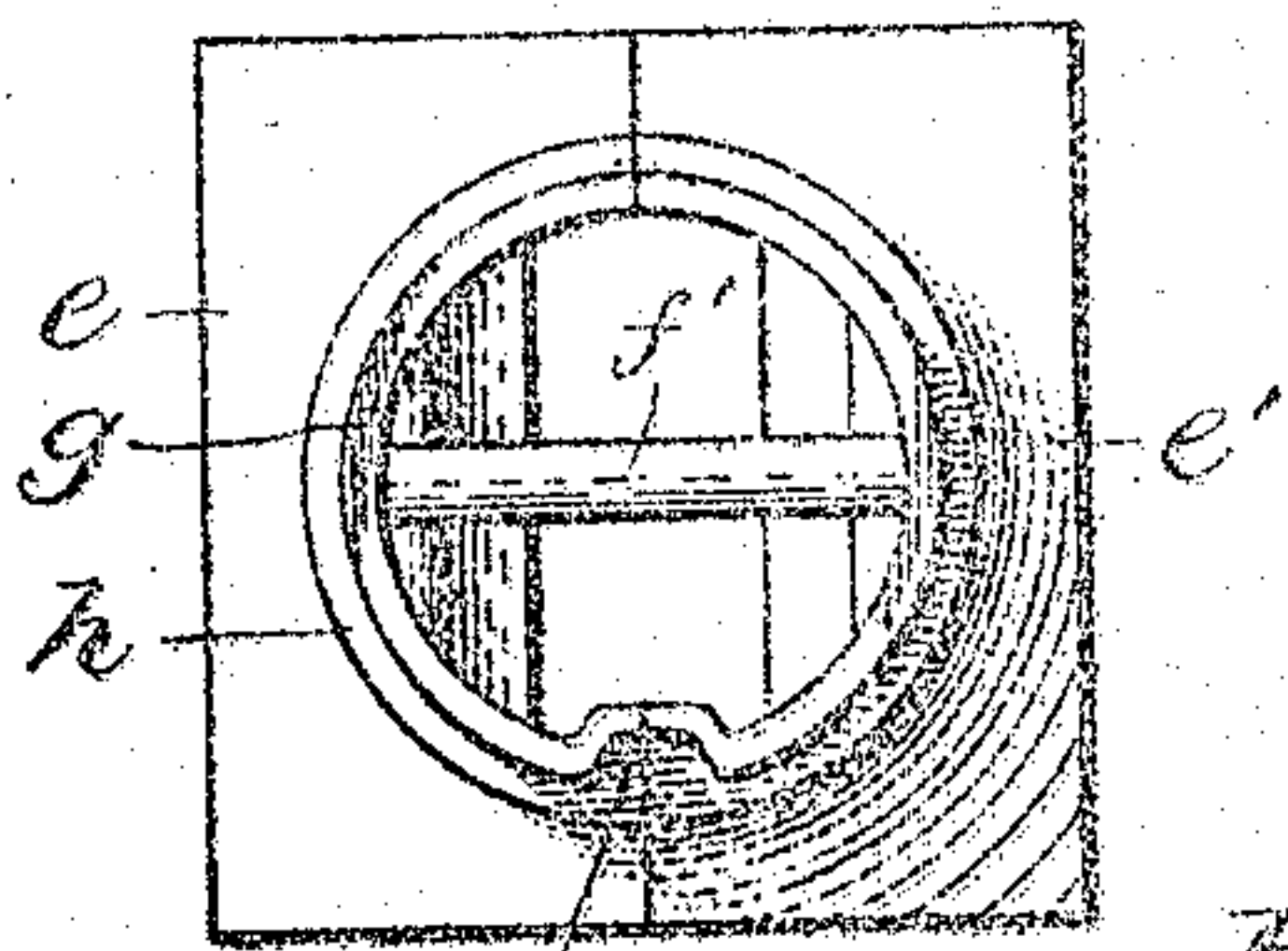


Fig. 7.

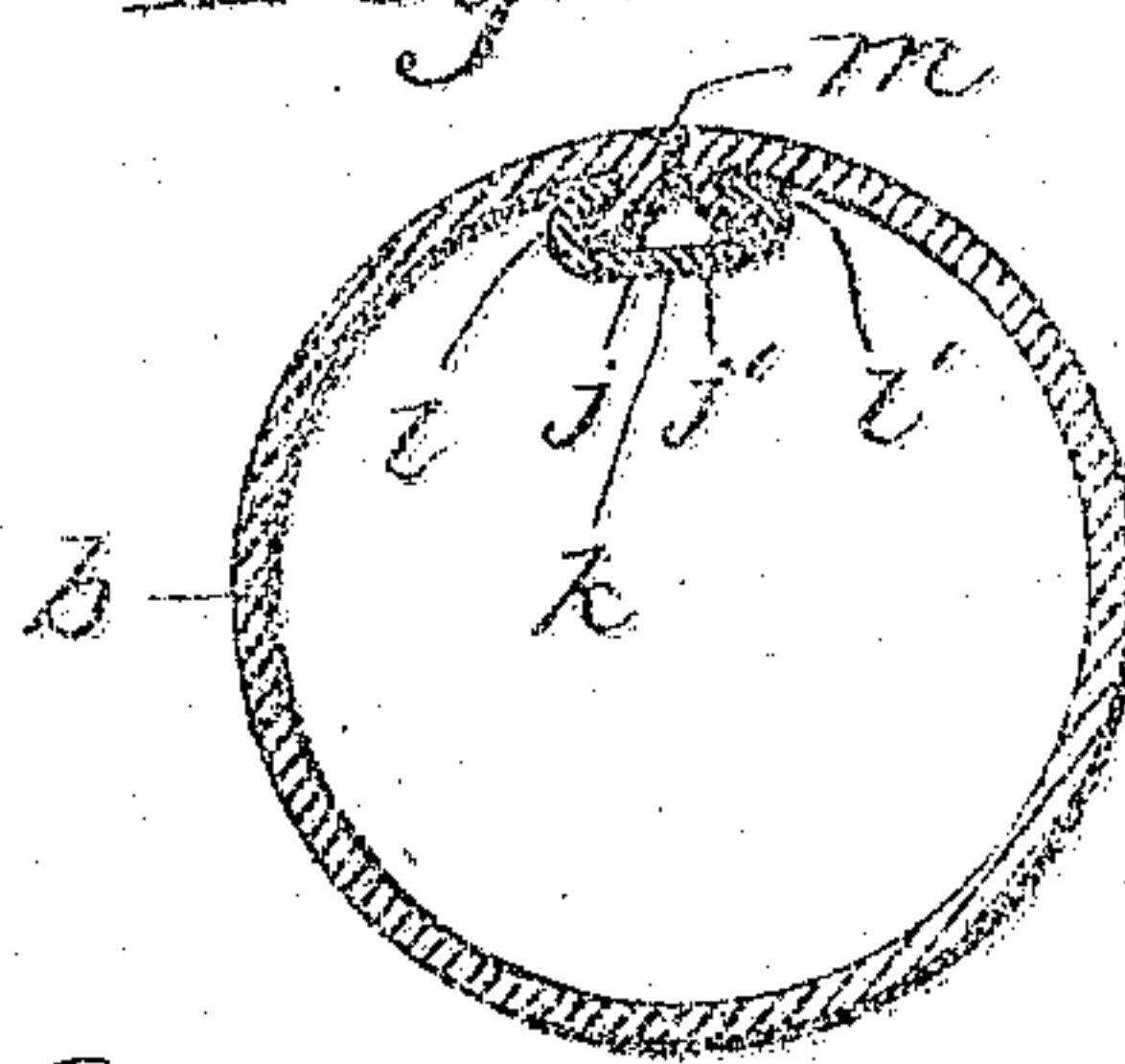


Fig. 8.

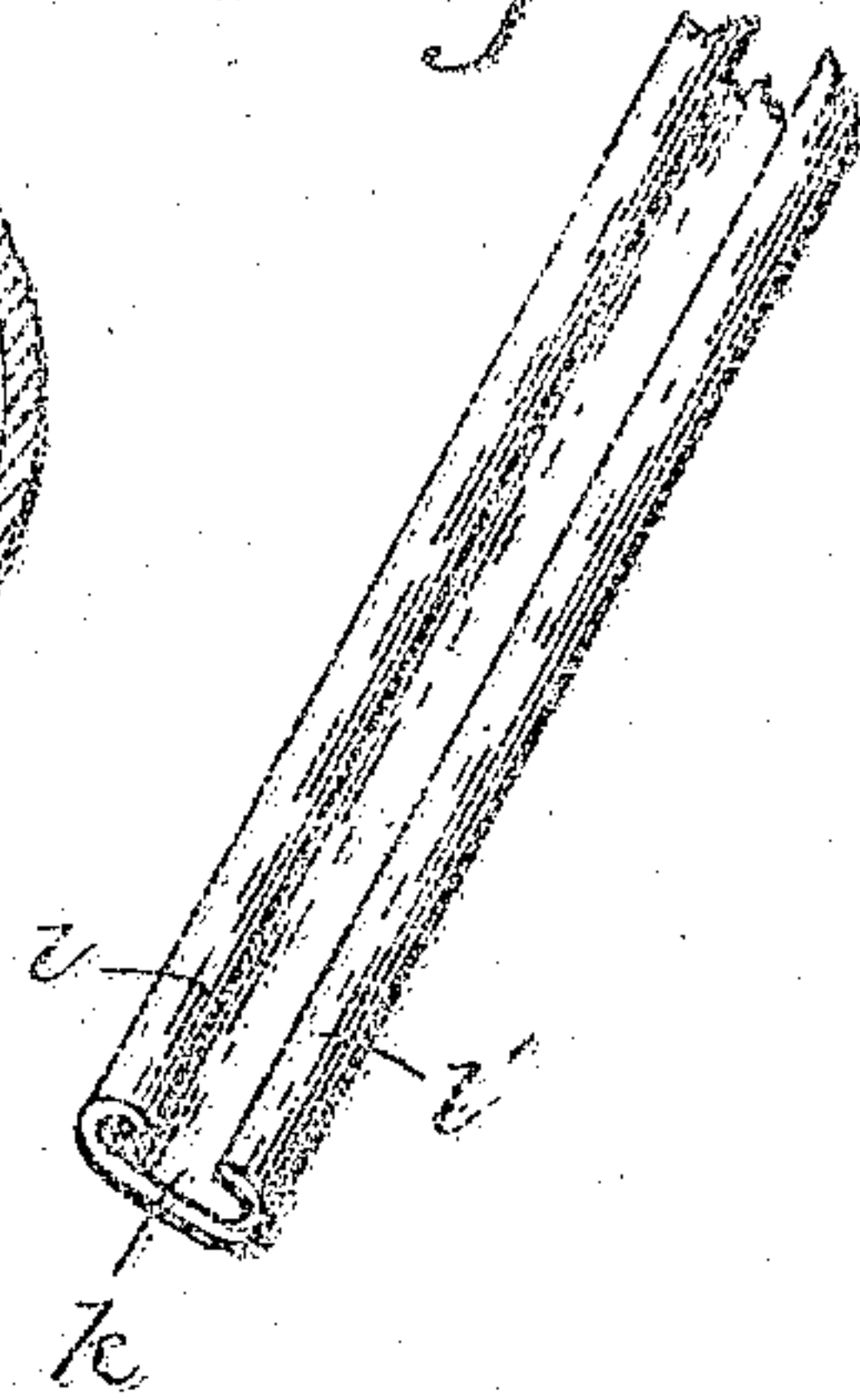
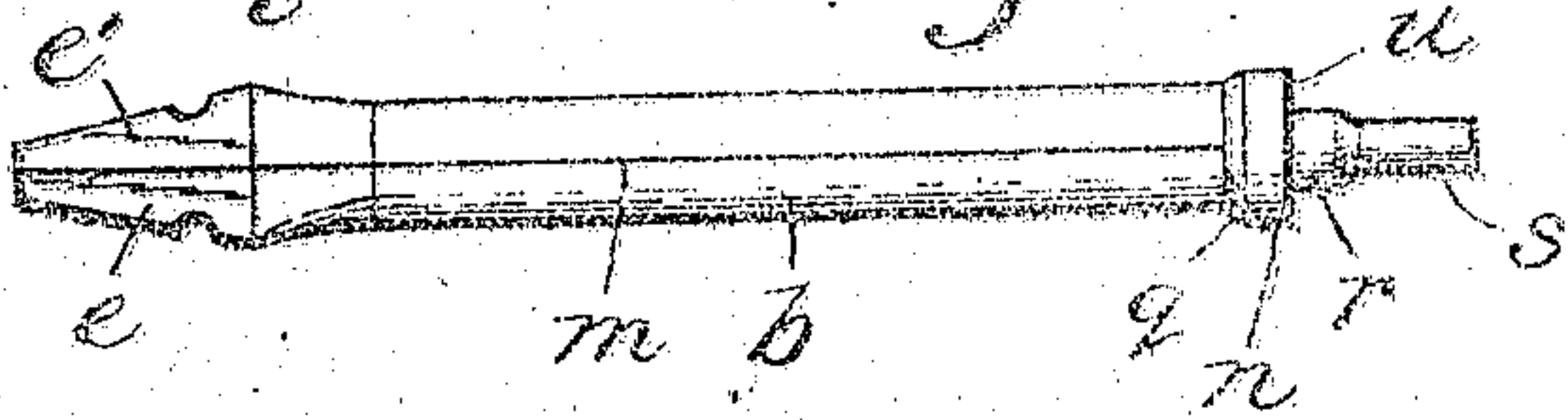


Fig. 9.



WITNESSES:

J. H. Gardner.
M. D. Besty.

INVENTOR:

John R. Welch.
BY E. J. Silvers.
ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN R. WELCH, OF ALEXANDRIA, INDIANA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE AMERICAN STEEL WHEEL COMPANY, OF ALEXANDRIA, INDIANA, A CORPORATION OF INDIANA.

METAL WHEEL-SPOKE.

No. 899,476.

Specification of Letters Patent.

Patented Sept. 22, 1908.

Application filed December 17, 1906. Serial No. 348,102.

To all whom it may concern:

Be it known that I, JOHN R. WELCH, a citizen of the United States, residing at Alexandria, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Metal Wheel-Spokes; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to the type of metal spokes that are known as the "built up" type, the present invention having reference particularly to a spoke comprising a sheet metal main part and separately formed end parts attached to the main part.

The object of the invention is to provide a metal wheel spoke that may be made at the minimum cost and which will be very strong and durable in use, further objects being to improve the construction of the several parts of the spoke to the end that the spokes may be conveniently assembled and connected to the hubs and rims and may be adapted to be used with either metal or wooden rims.

With the above-mentioned and other objects in view, the invention consists in a metal wheel spoke comprising a main body part formed of rolled sheet metal and with a lock seam or joint, a novel form of tenon piece attached to one end of the body part for connection with the wheel hub, and a novel form of tenon piece attached to the opposite end of the body part for connection with the wheel rim or felly, and the invention consists further in the novel parts and combinations and arrangements of parts as herein-
after particularly described and claimed.

Referring to the drawings Figure 1 is a view of a wheel in elevation having the improved spokes; Fig. 2, a longitudinal central sectional view of an end of the improved spoke in connection with the wheel felly; Fig. 3, a longitudinal central sectional view of the opposite end part of the improved spoke; Fig. 4, an end view showing the inner end of the tenon piece adapted to be connected to the felly; Fig. 5, an end view of the outer end of the tenon piece; Fig. 6, an end view of the end piece of the spoke that is adapted to be connected to the wheel hub; Fig. 7, a transverse sectional view of the body part of the spoke; Fig. 8, a fragmentary per-

spective view of the joint lock of the body portion of the spoke; and, Fig. 9, a side view of the complete spoke.

Similar reference characters in the various figures of the drawings designate like elements or features of construction.

In the drawings *a* designates the wheel hub; *b*, the main or body part of the improved spoke, *c* a wheel felly or rim which is continuous and requires certain of the present improvements in order that the spokes may be expeditiously and advantageously assembled and connected to the felly or rim; and, *d* designates the tire of the wheel.

In the present invention the tenon piece that is designed to be connected to the hub is formed of two counter-part halves *e* and *e'*, and the halves may be made either as drop forgings or as castings, and are held together by means of two rivets *f* and *f'*, and may also be brazed together if desired. The external contour of the complete end piece may be variously shaped to be suitably assembled with other spokes in the hub. Each complete end piece has a tubular end *g* that has a circular exterior somewhat less in diameter than the adjacent parts of the end piece with a shoulder *h*, and one side of the circular end has a groove *i* therein to receive the joint lock of the body part of the spoke, one end of the body part being attached to the exterior of the circular end abutting against the shoulder *h*. The end piece and the body part may be secured together by various means, preferably by being brazed.

The body part *b* of the spoke is composed of a strip of sheet metal rolled up so as to be tubular and the two edges of the strip that are brought together are turned inwardly in the form of locking-hooks *j* and *j'*, extending from end to end of the body part. A joint lock *k* is formed of a strip of metal of the same length as the body part *b* and having its two longer edges turned over, one toward the other, to form grip hooks *l* and *l'*, the whole length of the strip, this being preferably composed of rolled sheet metal, or if desired, may be made as a casting, and the hooks *l* and *l'* are brought into engagement with the hooks *j* and *j'* forming a strong joint lock. In order to make the most perfect joint, the parts are brazed together as at *m*, and may be finished so that the joint would be invisible. It should be understood that the body part *b* and the joint lock *k*, in this

construction, may be made of thicker metal than would be possible to use if the joint were formed as heretofore as a lap seam, so that in the present construction a stronger body part of the spoke may be made than has heretofore been practicable. The other tenon part for connection with the felly, comprises a seat part *n* from which extends an annular end part *o* that is inserted in an end of the body part *b* and has a groove *p* in its exterior to receive the joint lock of the body part, and an annular collar *q* extends around the exterior of the body part *b*, all being suitably secured together preferably by means of brazing. The tenon part also comprises an integral tenon *r* adapted to be forced into the sockets of the felly, the tenon having an end part *s* of reduced diameter adapted to be inserted loosely into the sockets when assembling the spokes, so that the spokes may at first be placed obliquely to the axes of the sockets, and then permit the hub, or part of it, to be connected to the hub ends of the spokes, whereby the spokes may be forced simultaneously into their sockets in the rim.

The tenon piece is composed of a single piece of metal, either as a forging or as a casting and preferably has a bore *t* extending therethrough longitudinally so as to eliminate unnecessary weight, the whole tenon piece being circular in cross-section. At the junction of the seat part *n*, and the tenon *r*, is a shoulder *u* in which is an annular groove *v* in which is inserted an annular packing *w*, that is designed to effect a tight joint between the spoke and the felly part against which the shoulder *u* is seated. In some cases the felly or rim may have thimbles *x* in the spoke sockets. The periphery of the felly or rim may have a reinforcing band *y*. The packing *w* is designed to prevent the admission of water to the tenon or the spoke, to prevent rusting of the tenon, it being understood that the parts of the periphery of the felly will be brazed together so as to exclude water from the inner end of the tenon.

From the foregoing description of construction, it will be apparent that the improved spoke is so designed that all parts thereof may be made of any degree of strength that may be required in practice, and is particularly adapted for use in con-

nection with hollow metal rims, and like other spokes may be removed and replaced by others if occasion should require it.

Having thus described the invention, what is claimed as new is—

1. In a metal wheel spoke, the combination with a hollow body part, of a tenon part comprising a seat portion extending into the body part, and an annular integral collar extending about the exterior of the body part concentric to the portion that extends into the body part, said tenon part being secured to the body part.

2. In a metal wheel spoke, the combination with a hollow spoke body part, of a tenon part comprising a seat portion extending into the body part and secured thereto, and a tenon portion having an end part that is less in diameter than the base of the tenon portion, said end part being of uniform diameter and longer than the base of the tenon portion, said seat portion having an annular external shoulder beyond the end of said body part around the larger base part of said tenon portion.

3. In a metal wheel spoke, the combination with a hollow spoke body part, of a tenon part having a seat portion extending into the body part and secured thereto, an annular external shoulder beyond the body part and having an annular groove therein, and a tenon portion extending beyond said shoulder, the greater part of said tenon being less in diameter than the remaining part thereof, said smaller part being the end part of the tenon portion of the tenon part.

4. In a metal wheel spoke, the combination with a hollow spoke body part having a joint lock protruding on the inner side thereof, of a tenon-piece comprising two counter-part halves and two rivets securing the halves together, said tenon-piece having a tubular end part that is less in diameter externally than the remaining part thereof and having an external groove receiving the joint lock, said end part extending into the spoke body and secured thereto.

In testimony whereof, I affix my signature in presence of two witnesses.

JOHN R. WELCH.

Witnesses:

A. A. GALLMAN,
J. T. BRONMEN.