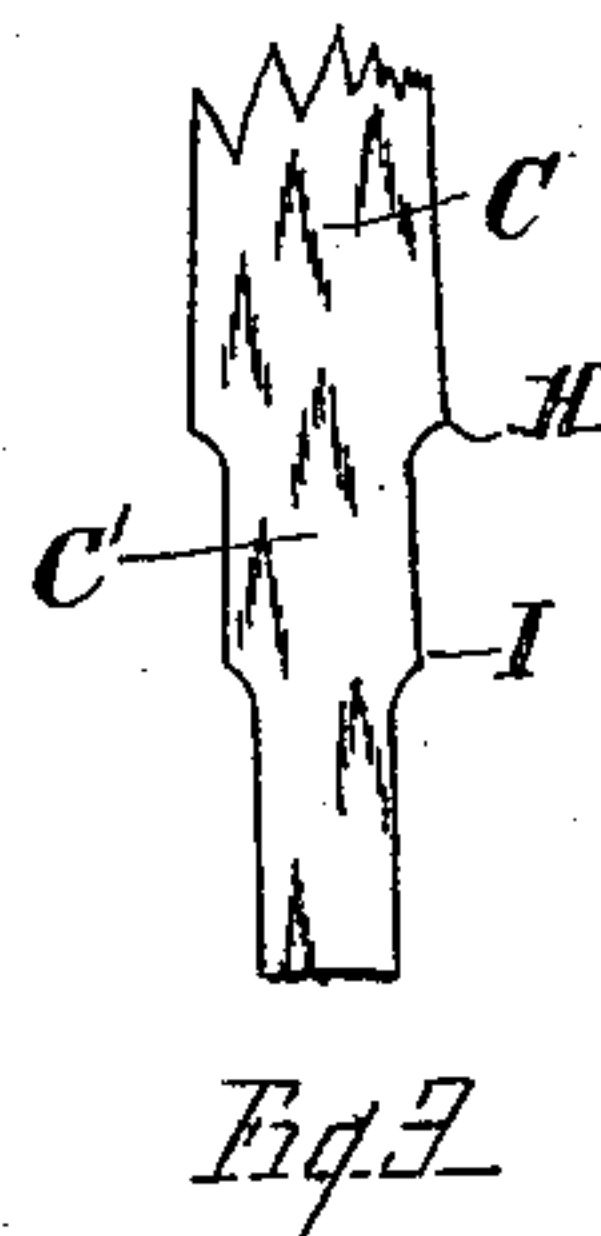
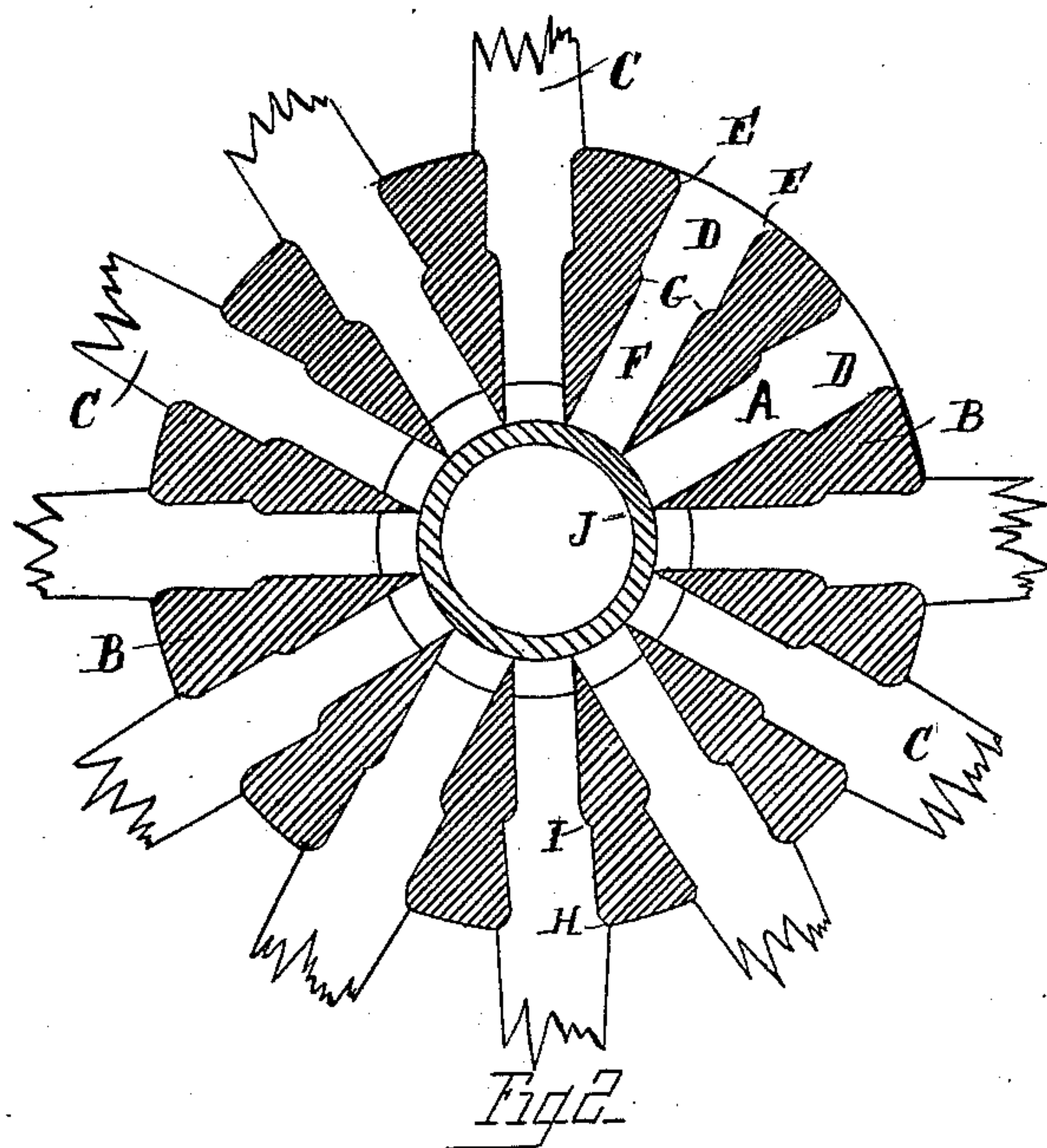
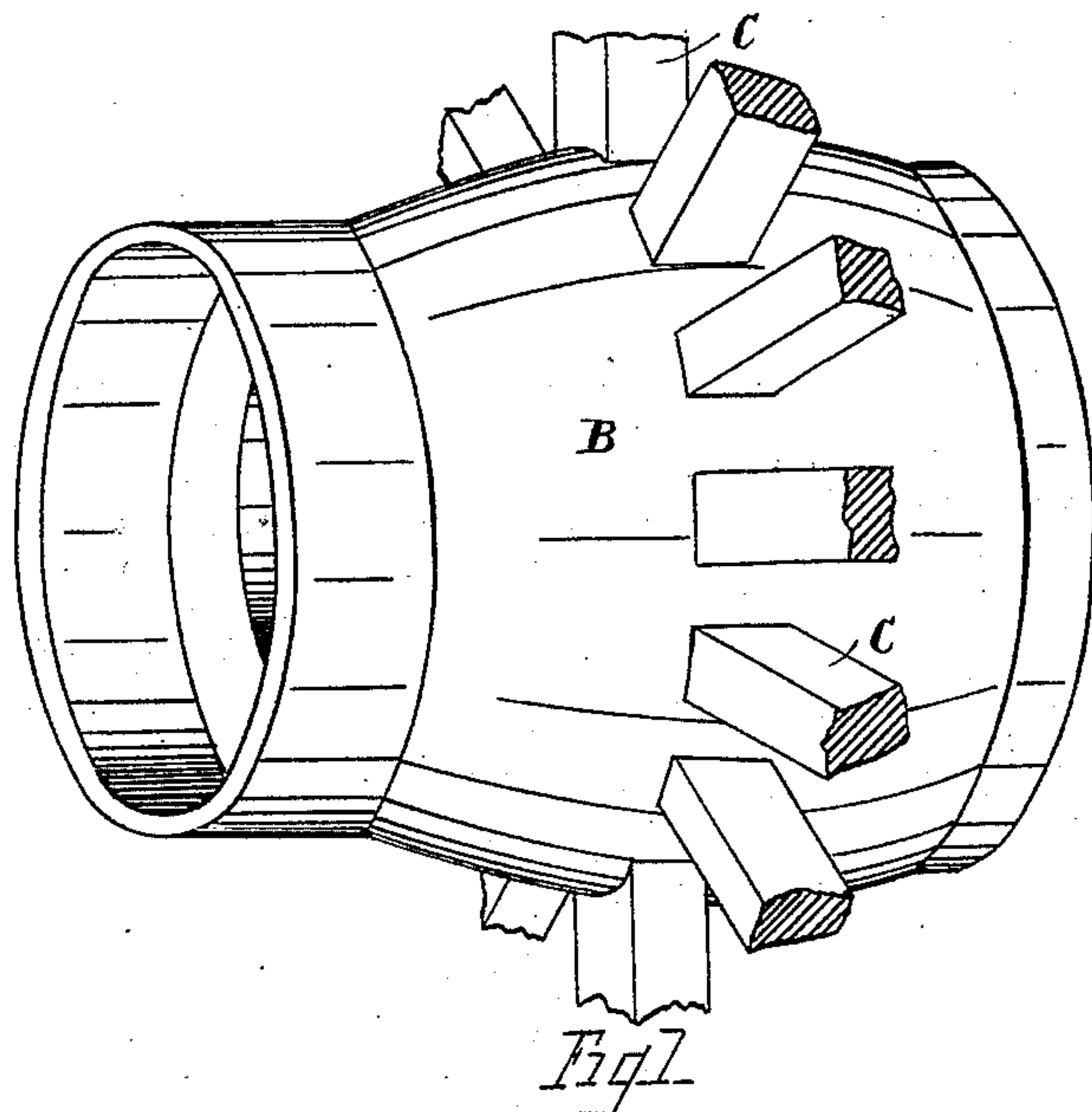


(No Model.)

E. T. MILLEN & C. F. MILBURN.  
VEHICLE WHEEL.

No. 424,121.

Patented Mar. 25, 1890.



WITNESSES

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Atty



# UNITED STATES PATENT OFFICE.

EDGAR T. MILLEN, OF AUBURNDALE, AND CHARLES F. MILBURN, OF TOLEDO,  
ASSIGNORS TO THE MILBURN WAGON COMPANY, OF TOLEDO, OHIO.

## VEHICLE-WHEEL.

SPECIFICATION forming part of Letters Patent No. 424,121, dated March 25, 1890.

Application filed November 22, 1889. Serial No. 331,170. (No model.)

*To all whom it may concern:*

Be it known that we, EDGAR T. MILLEN and CHARLES F. MILBURN, citizens of the United States, residing, respectively, at Auburndale and Toledo, both in the county of Lucas and State of Ohio, have invented certain new and useful Improvements in Vehicle-Wheels; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

Our invention relates to vehicle-wheels; and has especial relation to the novel formation of the spoke-tenons and the hub-mortises.

The object of the invention is to provide for greater strength to the spoke at the point of greatest strain, and also to allow of maximum amount of material between the mortises of the hub.

A further object of the invention is to so form the spoke-tenons that they may be of great strength at their inner ends and yet at the same time allow the partitions between the hub-mortises to extend the full depth of said mortises, whereby the tenons are afforded firm bearings throughout their length.

The invention will first be described in connection with the accompanying drawings, and then pointed out in the claim.

In the drawings, Figure 1 is a perspective view of a complete hub with the spoke broken off. Fig. 2 is a transverse vertical section of the same with two of the spokes removed. Fig. 3 is a detail view of one of the spoke-tenons.

Referring to the drawings, B represents the wheel-hub, and C the spokes.

A indicates the mortises in the hub for the reception of the spoke-tenons. These mortises are each formed with flaring or curved shoulders at its outer end, as seen at E, and from these shoulders E inward a suitable distance, preferably about half-way, the mortise is made comparatively large. Inward from

this large portion D the mortise is reduced in size, leaving curved shoulders at G, this smaller portion F of the mortise extending through to the boxing J of the hub. We thus form a mortise of differential areas in cross-section with the sides in radial alignment with the shoulders G, which construction permits the partitions between the mortises to extend the full length of said mortises, and thus afford a bearing for the spoke-tenon throughout its length.

In forming the tenon C' on each spoke C we first reduce the thickness of the spoke at H, rounding or curving the shoulders thus formed, and then still further reduce its thickness at I, forming those shoulders in like manner. As thus constructed the thicker portion of the tenon will fit the portion D of the mortise, with its shoulders H resting in the outer flaring portion E, and the thinner portion of the tenon will fit portion F of the mortise, with its shoulders I resting on the shoulders G of the mortise.

It will be seen that by the above-described construction the portion of the spoke-tenon usually the first to break is made of more than the usual size and strength, and also that by reducing the thickness of the inner end portion of the spoke-tenon the partitions between the mortises may extend the whole length of the tenon, thereby providing a greater bearing-surface than heretofore.

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

In a vehicle-wheel, double-tenoned spokes having rounded shoulders and a hub having corresponding spoke-sockets, the partitions between which extend the full length of said sockets, for the purposes stated.

In testimony that we claim the foregoing as our own we hereby affix our signatures in presence of two witnesses.

EDGAR T. MILLEN.

CHARLES F. MILBURN.

Witnesses:

AUGUST W. GOSSMAN,  
WILLIAM WEBSTER.