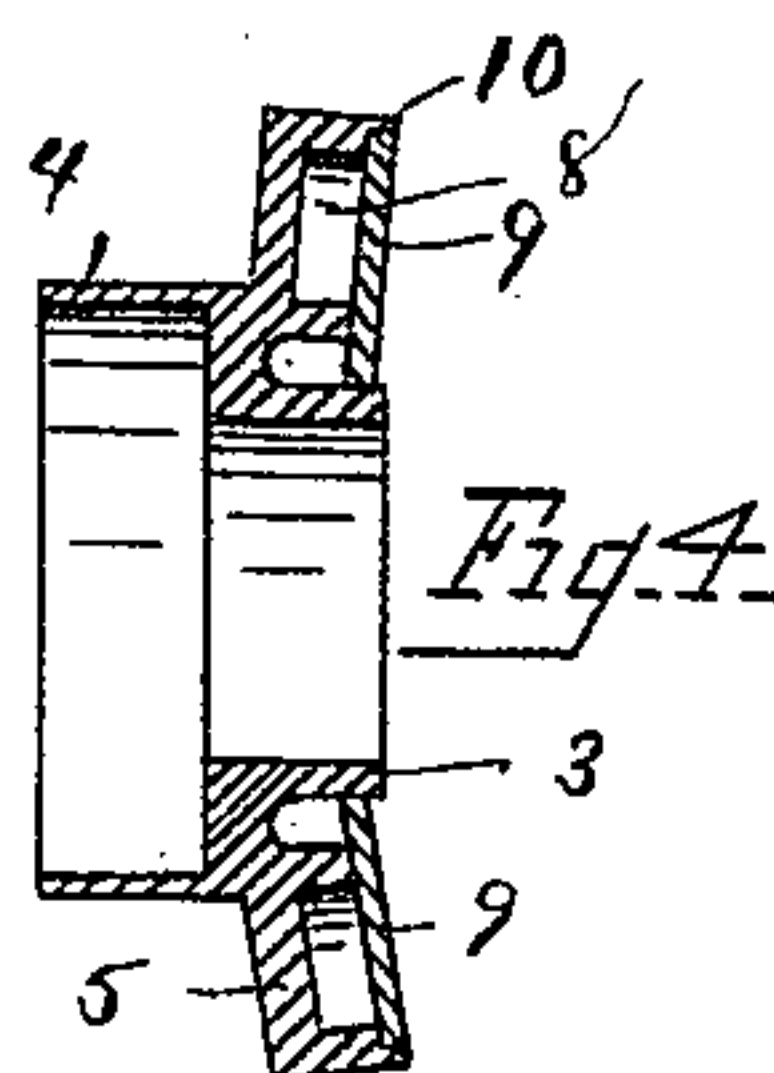
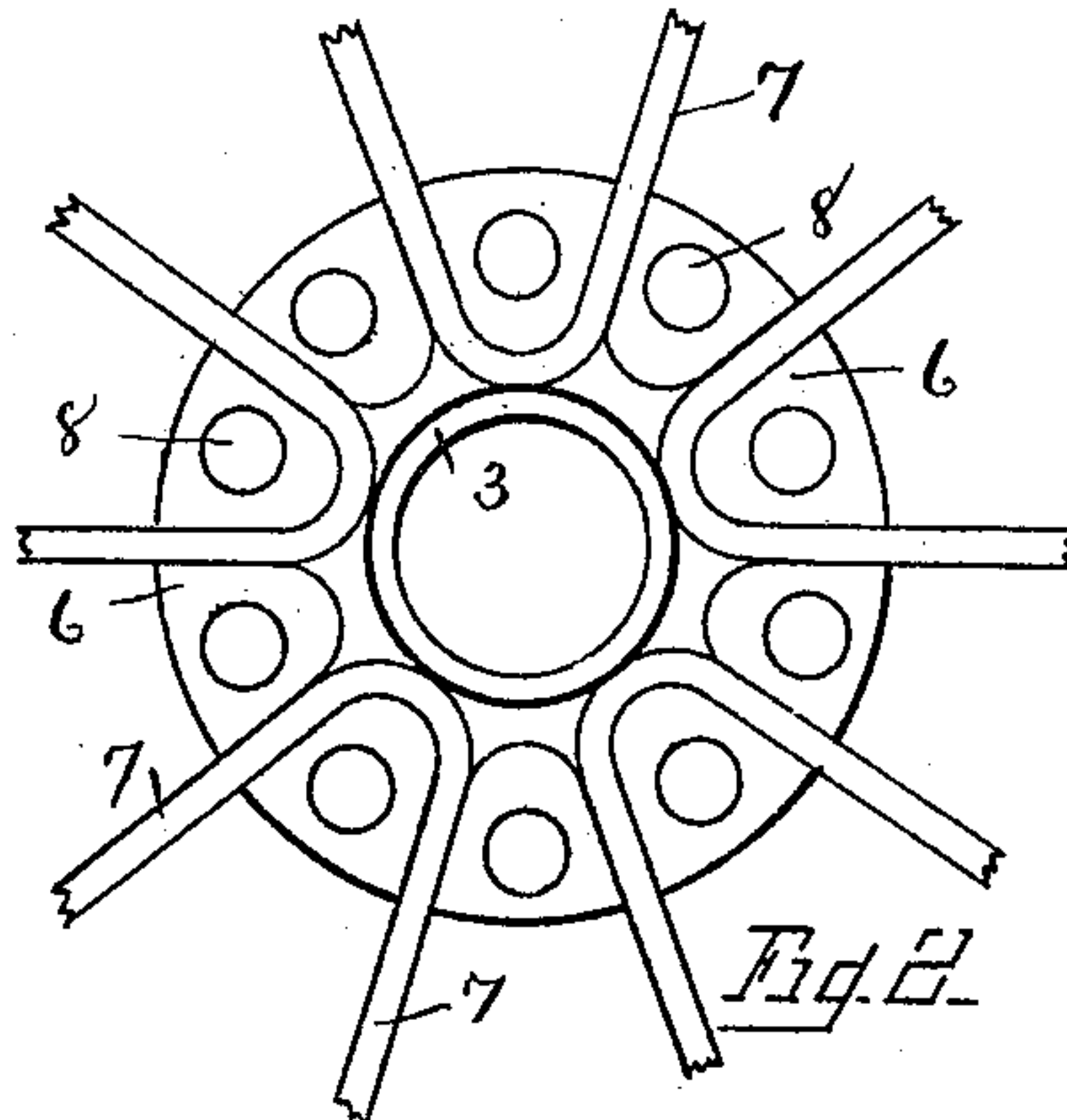
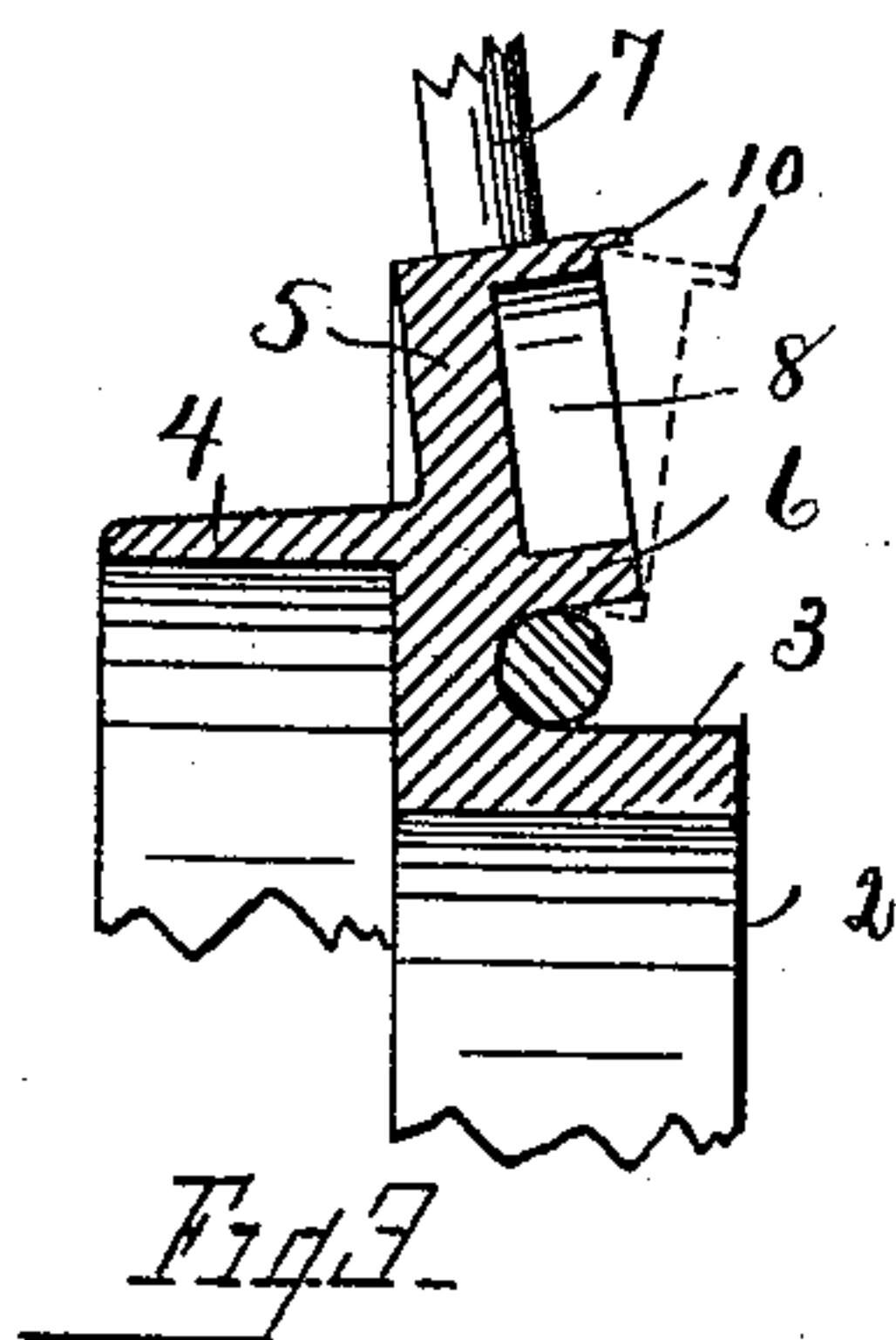
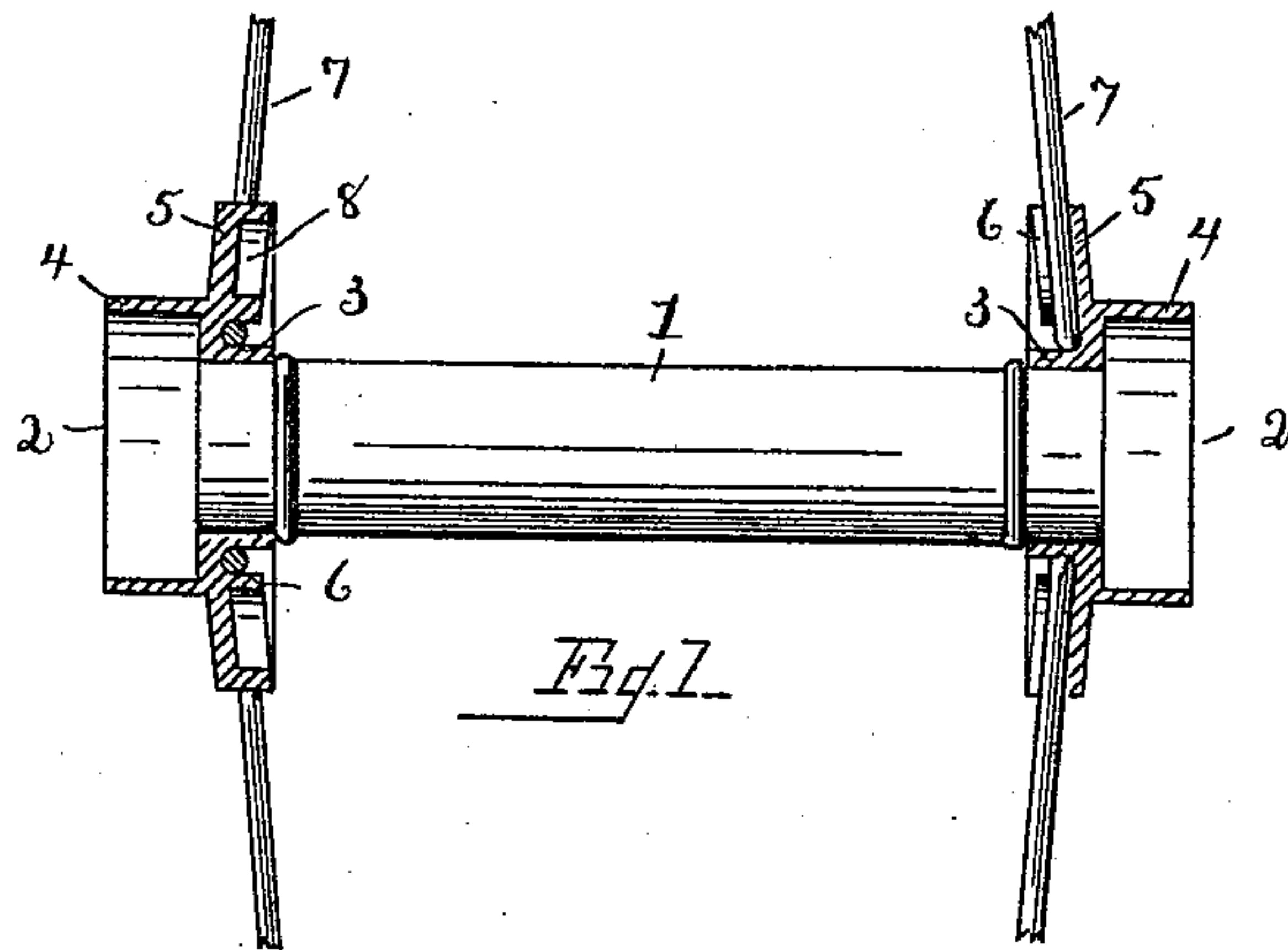


(No Model.)

G. W. HEARTLEY.
METAL WHEEL HUB.

No. 464,729.

Patented Dec. 8, 1891.



WITNESSES.

Carroll J. Webster,
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UNITED STATES PATENT OFFICE.

GEORGE W. HEARTLEY, OF TOLEDO, OHIO.

METAL WHEEL-HUB.

SPECIFICATION forming part of Letters Patent No. 464,729, dated December 8, 1891.

Application filed January 22, 1891. Serial No. 378,623. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. HEARTLEY, of Toledo, county of Lucas, and State of Ohio, have invented certain new and useful Improvements in Metal Wheel-Hubs and the Method of Securing Spokes Therein; and I 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 figures of reference marked thereon, which form part of this specification.

My invention relates to a metal wheel-hub and the method of securing spokes therein, and has for its object to simplify and cheapen the process of constructing wheels.

The invention consists in the method hereinafter described of securing metal spokes into a metal hub by springing the annular plate from a concave to a convex form, thereby causing radially-disposed lugs thereon to impinge upon the spokes and hold them firmly in place.

In the drawings, which are simply diagrammatic of one form of hub-section that I may employ in carrying out my invention, Figure 1 is a longitudinal vertical sectional view through the center of the hub-section, the connecting-box being shown in full lines. Fig. 2 is a plan view of one of the hub-sections, showing the spokes impinged by the lugs. Fig. 3 is a sectional detail view, showing in full lines the hub-plate concaved, with the spoke inserted between the annular projection of the hub and the radial lug upon the plate, and in dotted lines the plate convexed, thereby causing the radial lug to impinge upon the spoke. Fig. 4 is a longitudinal vertical section of one of the hub-sections, showing an inner disk secured in place by projections upon the hub-plate.

1 designates the tubular box, upon which is secured hub-sections 2 in any preferred manner. Each hub-section comprises a cylindrical portion 3 centrally of the section, and a sand-band 4 upon the front face of a hub-plate 5, these parts being formed integral. Upon the rear face of plate 5 are formed radial lugs 6, preferably of conical form, having their inner ends rounded to conform to

the form of the return-bend of spokes 7, to be secured thereby.

In carrying out my method I form the plate 5 of concave or saucer shape. In this construction the face or surface of the lower end of each projection inclines slightly from the central tubular portion 3, thereby permitting the insertion of the spokes between the end of the lug and the tubular extension 3. After arranging the spokes upon the hub, as shown in Fig. 2, with the hub-plate concaved, as shown in full lines, Fig. 3, I force the center of the hub-section toward the sand-band and dish the plate 5 into an inversely-dished form or into a convex form, as shown in dotted lines, Fig. 3, thereby causing the radial lugs to approach the tubular portion 3 and impinge upon the spoke, securely clamping the same between the lug and tubular portion. It will be seen that by my method each spoke is clamped at the return-bend firmly upon the central tubular extension 3, thereby preventing the spokes from radial movement, and that by reason of the hook form given to the lower surface of the end of each radial lug the spoke is firmly clasped and prevented from lateral motion.

In carrying out my method, after the spokes are arranged upon the hub-plate the convexity of the plate may be caused either by pressing upon the end of the tubular central portion 3 or by exerting pressure upon the concave side of the plate. I, however, prefer the former method, and in wheels of large size may employ a mandrel of a size to enter the tubular portion 3 and provided with an annular enlargement to spread or flare the end slightly to cause a greater degree of impingement upon the spokes, and, if desired, I may slightly flare each radial lug by forming holes 8 in the face of each, as shown, and, by a series of mandrels of the same form as has been described, flare the holes slightly with the same effect.

In some forms of wheels—as, for instance, those for use upon bicycles, velocipedes, and children's carriages of the better grade—I provide for inclosing the inner side of the wheel by a disk 9 of a corresponding convex shape to that of the hub disk when convexed, and, to hold the disk in place, form projections 10 upon the outer face of the radial lugs, which,

when the hub disk is in concave form, allows disk 9 to be placed in position, and, when the hub disk is convexed, embrace the same at the periphery and hold the disk in place, thereby adding to the finished appearance of the wheel.

It will be seen that by my method a cheap, strong, light, and durable wheel is produced, and that should the spokes become broken they may be removed by again forcing the disk plate to a concave and new ones inserted and secured by pressing the disk plate to a convex form.

What I claim is—

1. The herein-described method of securing spokes with a metal hub, which consists in forming a hub-section with a concave hub-plate having projections and an annular bearing concentric to the projections, inserting spokes between the projections and bearings, and then convexing the hub-plate to cause the projections to impinge upon the spokes.

2. The herein-described method of securing

spokes into a metal wheel-hub, consisting in placing the spokes upon a fixed object upon the hub, and then convexing a hub-plate to cause the same to bear upon the spokes.

3. The herein-described step in the art of making wheels, comprising, first, forming the hub-sections with a concave plate; second, placing spokes upon the hub, and, third, dish-ing the plate to a convexity coincident with the normal inclination of the spokes of the finished wheel.

4. In a metal wheel having a concaved hub disk provided with projections, a plate upon the inner face of the hub disk, the method of securing the plate by convexing the hub-plate to cause the projections to en-gage with the periphery of the plate.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

GEORGE W. HEARTLEY.

Witnesses:

WILLIAM WEBSTER,

CARROLL J. WEBSTER.