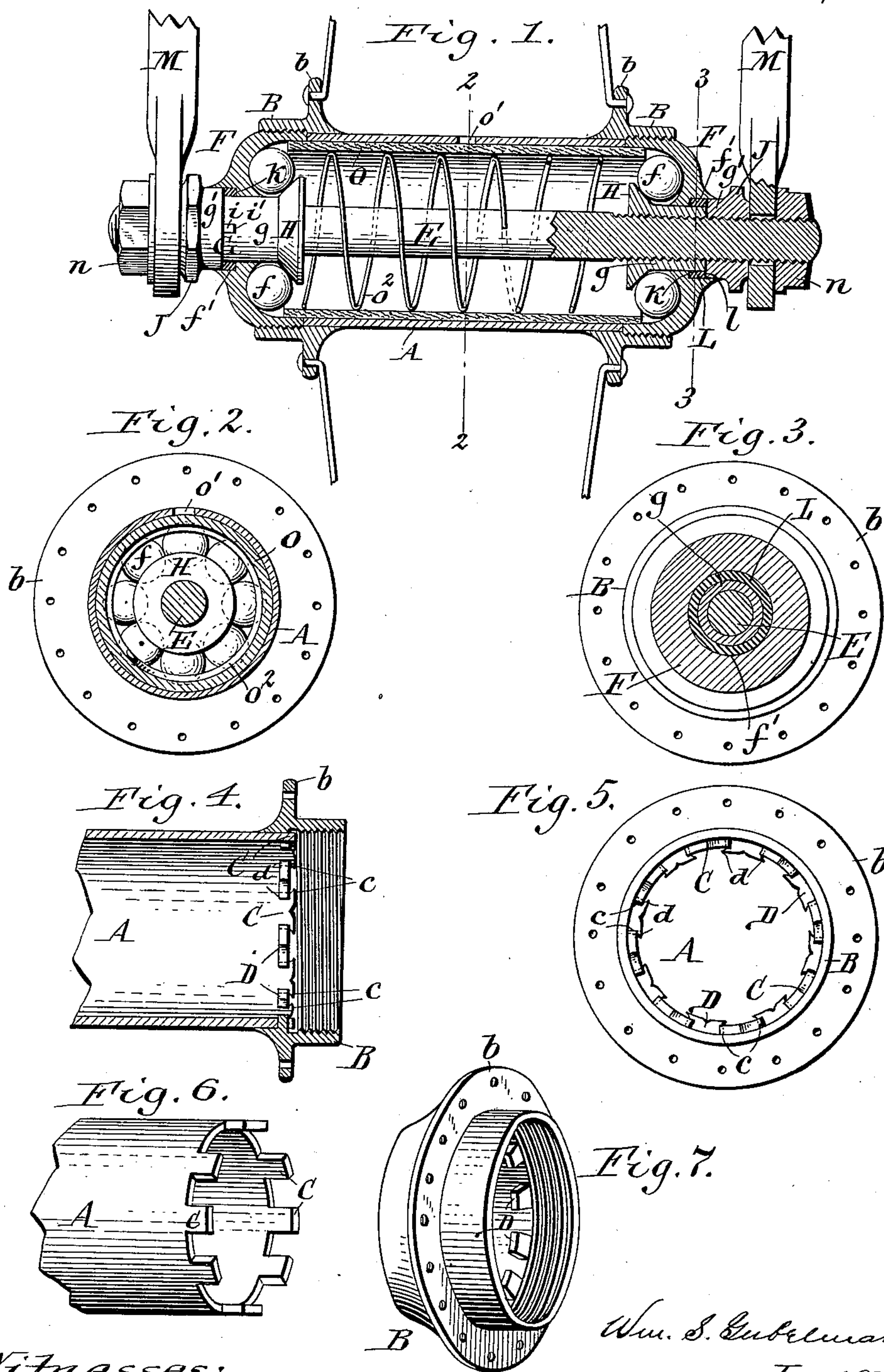


(No Model.)


W. S. GUBELMANN.
BALL BEARING.

No. 605,870.

Patented June 21, 1898.



Witnesses:
Henry L. Deck.
F. Grotzer. Wilhelm.



Wm. S. Gubelmann,
Inventor
By Wilhelm & Bonner,
Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM S. GUBELMANN, OF BUFFALO, NEW YORK.

BALL-BEARING.

SPECIFICATION forming part of Letters Patent No. 605,870, dated June 21, 1898.

Application filed March 9, 1897. Serial No. 626,606. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. GUBELMANN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Ball-Bearings, of which the following is a specification.

This invention relates to ball-bearings which are particularly desirable for velocipedes.

The objects of my invention are to improve the means whereby the tubular members are connected, to provide simple means for uniformly lubricating the working parts, to render the bearing dust-proof, and to permit of readily adjusting the bearing.

In the accompanying drawings, Figure 1 is a longitudinal section of a wheel-hub embodying my improvements. Figs. 2 and 3 are transverse sections in lines 2-2 and 3-3, Fig. 1, respectively. Fig. 4 is a fragmentary longitudinal section of the hub casing or barrel and the spoke-sleeve. Fig. 5 is an end view of the same. Fig. 6 is a perspective view of one end of the hub-casing. Fig. 7 is a similar view of the spoke-sleeve.

Like letters of reference refer to like parts in the several figures.

A represents the tubular barrel or casing of the hub, and B B the spoke-sleeves, mounted on the ends of the casing and provided with annular spoke-flanges *b*. The spoke-sleeves may be connected with the casing in any suitable and well-known manner, but preferably by the following means:

C represents an annular row of longitudinal lugs or projections arranged on each end of the casing, and D represents an annular row of radial lugs formed on the inner side of each spoke-sleeve about midway of its length. Each spoke-sleeve is slipped over one end of the casing until its radial lugs fit into the spaces between the longitudinal lugs of the casing and bear against the bottom of these spaces. The length of the lugs on the hub-casing and the spoke-sleeve is such that when these parts are slipped one upon the other the casing-lugs project slightly beyond the outer side of the sleeve-lugs, and the inner ends of the latter project slightly beyond the inner side of the casing-lugs. After the lugs of the casing and sleeve have been interlocked the ends of the lugs of the casing are upset or riveted over the outer side of the

sleeve-lugs, as shown at *c*, Figs. 4 and 5, thereby firmly drawing the sleeve-lugs against the bottom or shoulder on the casing between its lugs and effectually preventing longitudinal displacement of the spoke-sleeve on the hub-casing. The inner ends of the sleeve-lugs are also upset or riveted over the inner side of the casing-lugs, as shown at *d*, Figs. 4 and 5, thereby firmly drawing the casing-lugs against the bottom of the spaces between the sleeve-lugs and avoiding any looseness between these parts. This manner of connecting the hub-casing and spoke-sleeve is very simple and durable and less expensive than brazing. It is obvious that this means of connecting two tubular members is also useful for connecting the tubular members of a velocipede-frame and similar parts.

For the purpose of rendering the bearing easy of adjustment the same is constructed as follows:

E represents the axle or spindle, which is arranged lengthwise in the casing and which has its end portions provided with an external screw-thread.

F F represent two bearing-cups provided on their inner sides with ball races or grooves which engage with the outer sides of two annular rows of balls *f*. Each of these cups is provided with an axial opening *f'* and is secured to the adjacent spoke-sleeve by an external screw-thread formed on the periphery of the cup and engaging with an internal screw-thread formed on the outer portion of the spoke-sleeve.

G G represent two internally-screw-threaded adjusting-sleeves mounted on the screw-threaded portions of the axle and extending through the axial openings of the bearing-cups. Each of said sleeves consists of an inner section *g* and an outer section *g'*, arranged side by side, the joint between the same being preferably arranged within the axial opening of the bearing-cup. The inner sleeve-section is provided at its inner end with a bearing-cone H, which bears against the inner side of the adjacent row of balls *f* and which is of larger diameter than the axial opening of the bearing-cup. The two sections of the adjusting-sleeve are coupled, so as to rotate together by interlocking lugs and recesses *i i'*, formed, respectively, on the opposing ends of the sections. Upon turning the adjusting-sleeve its screw connection with the axle

causes it to move lengthwise thereon and carry the cone toward or from the balls for adjusting the bearing. For the purpose of permitting the adjusting-sleeve to be turned conveniently its outer section is provided with a head J, which is larger in diameter than the axial opening of the bearing-cup and which is provided with flat sides for the reception of a wrench.

10 In order to prevent dust from creeping through the joint between the bearing-cup and the adjusting-sleeve, a packing is provided which is constructed as follows: The outer portion of the axial opening in the bearing-cup is somewhat larger than the inner portion thereof, thereby forming an outwardly-facing shoulder *k* in said opening. The outer sleeve-section fits snugly into the enlarged outer portion of the cup-opening, and the inner sleeve-section is of smaller diameter and fits into the inner portion of the cup-opening, thereby exposing the inwardly-facing shoulder *l* on the inner end of the outer sleeve-section. *L* represents a packing-ring which bears with its inner and outer sides against the shoulders *k* *l* of the cup and outer sleeve-section, respectively, thereby effectually excluding dust from the bearing.

M *M* represent the forks or supports of the velocipede-frame, through which the outer ends of the axle pass and which are clamped against the outer ends of the adjusting-sleeves by clamping screw-nuts *n*, arranged on the axle and bearing against the outer side of the supports.

O represents a lubricating-tube which fits against the inner side of the casing, with its ends arranged close to the balls, cups, and cones of the bearing. This tube is made of cotton, felt, or other absorbent material and is saturated with oil through an oil-opening *o'* in the central portion of the casing. This oil is carried to the bearings by the absorbent tube and given off gradually and uniformly, thereby keeping the bearings moist and lubricated. In order to prevent the lubricating-tube from collapsing, a retaining device *o''*, consisting, preferably, of a spiral spring-wire is placed inside of the lubricating-tube and which holds the tube against the inner side of the casing.

I claim as my invention—

1. The combination with an outer tubular member provided on its inner side between its ends with an annular row of lugs leaving the end portions of the tubular member extending from opposite sides of the lugs, of an inner tubular member arranged in one end of the outer tubular member and provided at its inner end with an annular row of longitudinal lugs which fit into the spaces between the lugs of the outer tubular member, substantially as set forth.

2. The combination with an outer tubular member provided on its inner side between its ends with an annular row of radial lugs leaving the end portions of this member ex-

tending from opposite sides of the lugs, of an inner tubular member fitted into the inner end portion of the outer member and provided with an annular row of longitudinal lugs which engage with said radial lugs, and a bearing-cup having an external screw-thread which engages with an internal screw-thread in the outer end portion of the outer tubular member and bearing against the shoulder formed by the lugs of the inner and outer tubular members, substantially as set forth.

3. The combination with the casing and the axle having its end portion provided with an external screw-thread, of a bearing-cup connected with the casing and provided with an axial opening, an internally-screw-threaded adjusting-sleeve mounted on the screw-threaded portion of the axle and consisting of inner and outer sections arranged in the axial opening of the bearing-cup, a cone arranged on the inner end of the inner sleeve-section and having a diameter larger than the axial opening of said cup, a head arranged on the outer end of the outer sleeve-section and having a diameter greater than the diameter of the axial opening of the bearing-cup, and a coupling device connecting the opposing ends of the inner and outer sections of the adjusting-sleeve, substantially as set forth.

4. In a bearing, the combination with the casing and the axle or spindle having its end provided with an external screw-thread, of a bearing-cup connected with the casing and provided with an axial opening the outer portion of which is of larger diameter than the inner portion thereof forming an outwardly-facing shoulder in said opening, an internally-screw-threaded adjusting-sleeve mounted on the threaded portion of the axle or spindle and consisting of an inner and an outer section, the outer section of which is larger in diameter than the inner section forming an inwardly-facing shoulder on the outer section, a packing-ring bearing against the outwardly-facing shoulder of the cup and the inwardly-facing shoulder of the outer sleeve-section, an interlocking lug and recess formed on the opposing ends of the sleeve-sections, a cone arranged on the inner sleeve-section, and a row of balls arranged between said cup and cone, substantially as set forth.

5. In a bearing, the combination with the axle and the casing journaled on the axle, of an absorbent lubricating-tube arranged within the casing, and a spiral wire which bears against the inner side of the lubricating-tube and presses the same against the inner side of the casing, substantially as set forth.

Witness my hand this 5th day of February, 1897.

WILLIAM S. GUBELMANN.

Witnesses:

THEO. L. POPP,
KATHRYN ELMORE.