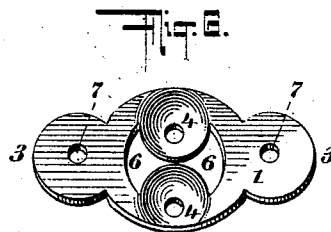
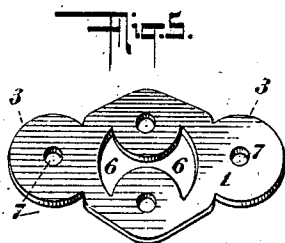
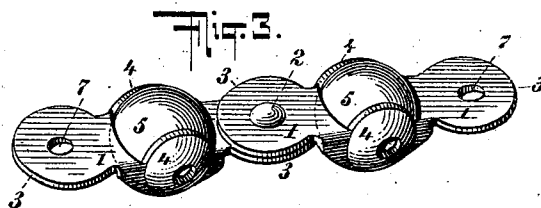
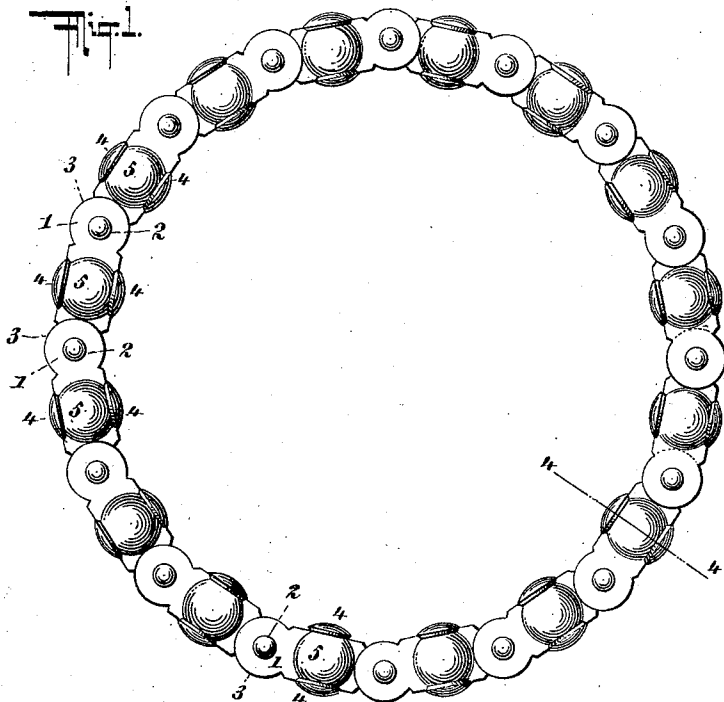


(No Model.)

H. A. BERGER.  
ROLLER BEARING.

No. 543,718.

Patented July 30, 1895.



WITNESSES:  
*Gustave Dänisch*  
*John Kehlmebeck*

INVENTOR  
*Henry A. Berger*  
BY  
*Albert H. Norris*  
ATTORNEY.

# UNITED STATES PATENT OFFICE.

HENRY A. BERGER, OF BROOKLYN, NEW YORK.

## ROLLER-BEARING.

SPECIFICATION forming part of Letters Patent No. 543,718, dated July 30, 1895.

Application filed June 17, 1895. Serial No. 552,981. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY A. BERGER, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Roller-Bearings, of which the following is a specification.

This invention relates to antifriction ball-bearings of the class having metallic or other spheres loosely held in operative connection with a carrier or frame adapted to be placed between the circle-irons of the fifth-wheels of vehicles, turn-tables, or other objects or structures having parts movable relatively to other parts.

The chief object of my present invention is to provide a new and improved ball-bearing wherein friction is reduced to a minimum by the employment of balls or spheres of suitable material held by novel means in operative connection with a carrier, cage, or frame.

To accomplish this object my present invention consists, essentially, in a ball-bearing comprising a ball or sphere and a single thickness of sheet metal provided with a ball-receiving opening and having opposite end portions bent downwardly to form two separated pendent ears of a thickness the same as the thickness of the sheet metal and struck up on their inner sides with concavities in which the ball or sphere is loosely arranged, said two ears projecting downward from opposite edge portions of the sheet metal to retain the ball or sphere.

The invention is illustrated by the accompanying drawings, in which—

Figure 1 is a plan view of a ball-bearing of circular form embodying my invention. Fig. 2 is an edge elevation of the same. Fig. 3 is a detail perspective view of two of the ball-carrying links pivoted together. Fig. 4 is a transverse sectional view through the center of one of the links, showing the ball in elevation. Fig. 5 is a perspective view of one of the link-blanks as it appears before concaving the ear portions and bending them laterally to form the opposing concaved ears; and Fig. 6 is a similar view showing the ears concaved, as they appear before bending them laterally.

In order to enable those skilled in the art to make and use my invention, I will now de-

scribe the same in detail, referring to the drawings, wherein it will be observed that the carrier, cage, or frame of my improved ball-bearing is composed of a plurality of link-plates 1, pivoted together at their extremities through the medium of pivot-pins 2 in such manner as to form a band or ring of pivotally-connected links. The links are so connected as to provide at all times a flexible carrier, cage, or frame which can be made to conform to any desired curve or circle of greater or less diameter or radius. The link-plates are each composed of a single thickness of metal and are preferably cut or stamped from sheet-steel or any other metal or material of sufficient strength or durability suitable for the purpose in hand. The form of the link-blank is clearly shown in Fig. 5, and preferably the extremities are rounded or semicircular, as at 3. The blank is cut or stamped with two oppositely-arranged ear-blanks 4, approximately circular in outline and of similar diameter or dimensions. The two ear-blanks are bent laterally and stand approximately vertical, and the inner surfaces of the ear-blanks are made concave to conform exactly, or nearly so, with the circumference of a ball or sphere 5, which is adapted to be placed between the two ears before the latter are fully bent to their normal vertical position or approximately at right angles to the upper or lower flattened surfaces of the link-plate. After the ball or sphere is properly arranged between a pair of the concaved ears 4, as before explained, the ears can be pressed toward one another to place them in their normal permanent position in such manner that the concave inner surfaces of the ears accurately or nearly accurately fit the curved surface of the ball or sphere and loosely retain the latter in proper operative connection with the link-plate.

The link-plates are each constructed with an opening or orifice 6, arranged approximately at the central portion of the plate, so that when the ball or sphere is loosely confined or retained by the concave ears the ball or sphere will project above and below the upper and lower flattened surfaces of the link-plate. By this means the lowermost portions of the balls or spheres can rest against and roll upon any stationary or other object or support—such, for example, as the lower sec-

tion of the fifth-wheel of a vehicle or turntable—while the uppermost portions of the balls or spheres can support a movable or rotatable object—such, for example, as the upper part or section of the fifth-wheel or turntable.

The end portions of the link-blanks are provided with perforations 7 for the passage of the rivets or pivot-pins, by which the several link-plates are pivotally connected together at their extremities to produce the flexible carrier, cage, or frame.

The construction of the flexible ball carrier, cage, or frame of pivotally-connected links in the manner described and shown enables it to be made of any length desired and to be subsequently divided into sections of the length required for curves or circles of varying diameters or radii, which sections can be readily fitted to circular parts from the smallest to the greatest diameter or to rectilinear parts of any length whatever.

The concaved ball-seats in the ears of the links retain the balls or spheres without the necessity of using axles or journal-pins, and if the balls are well lubricated friction is largely reduced and a noiseless easily-running ball-bearing is provided which is advantageous and useful for many purposes. The concaved ears are shown provided with central holes; but these holes are not essential. If the holes are provided, they may serve for the introduction of a lubricant.

The link-plates can be rapidly produced from sheet-steel or any other metal suitable for the purpose, and the balls or spheres can

be made according to any known or desired method. The balls or spheres are preferably composed of iron or steel; but obviously they can be made of any other material of sufficient hardness and strength.

Having thus described my invention, what I claim is—

1. A ball-bearing, consisting of a ball or sphere, and a carrier comprising a single thickness of sheet metal provided with a ball-receiving opening and having opposite edge portions bent downwardly to form two separated pendent ears of a thickness the same as the thickness of the sheet metal and constructed with concave inner surfaces in which said ball or sphere is loosely arranged, said two ears being located directly opposite one another to retain the ball or sphere, and said ball or sphere being located in the ball-receiving opening to project above and below the said single thickness of sheet metal, substantially as described.

2. A ball-bearing, consisting of a plurality, of pivotally connected link plates, each having a ball receiving opening and a pair of concaved ears, and a ball or sphere loosely arranged in and solely retained by the opposing concaved surfaces of each pair of ears.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HENRY A. BERGER.

Witnesses:

A. C. RAUTSCH,  
F. POTSHACK.