

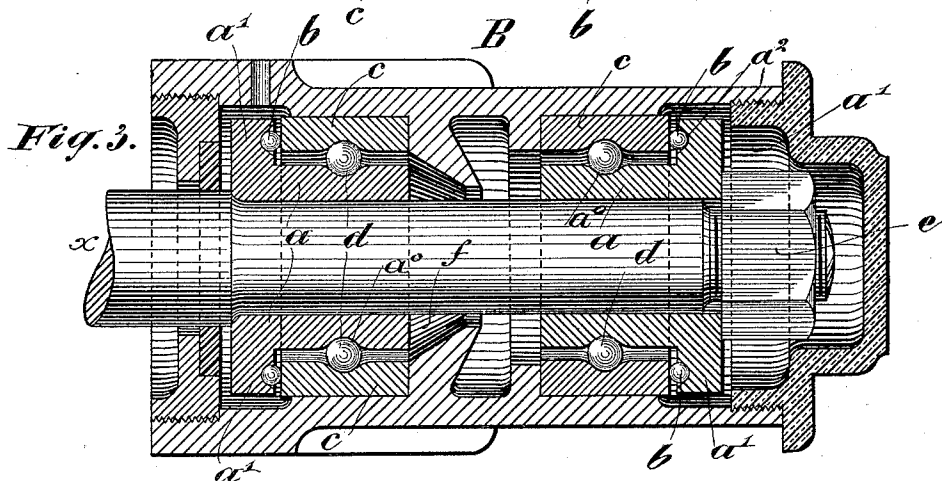
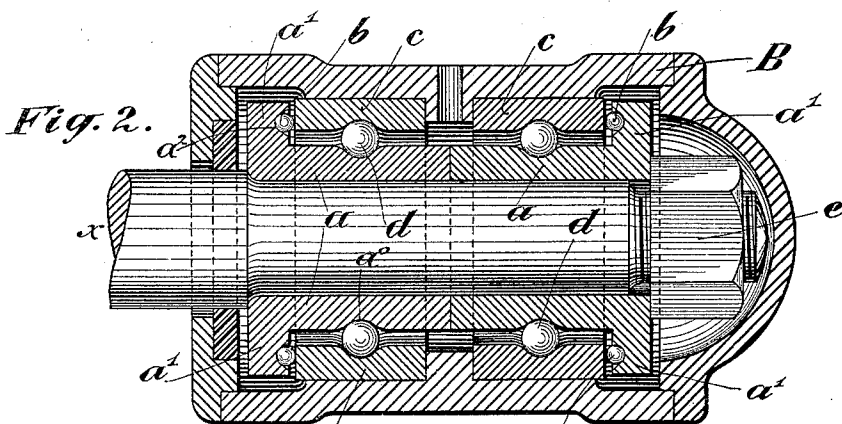
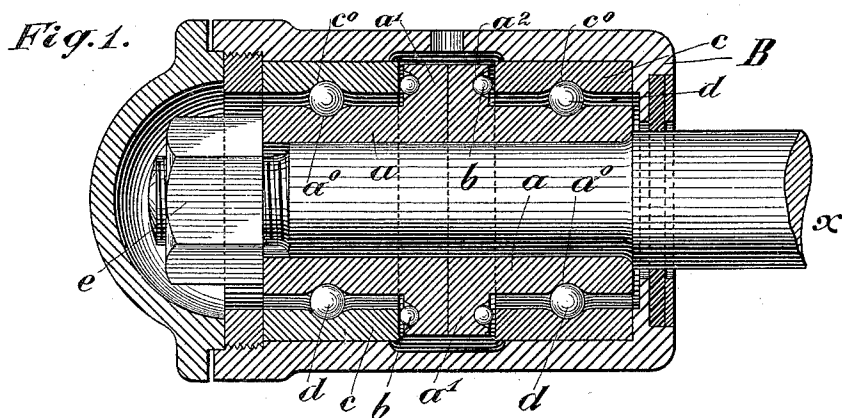
(No Model.)

3 Sheets—Sheet 1.

H. SCHUPPISSER.
BALL BEARING.

No. 584,296.

Patented June 8, 1897.



Witnesses:
Geo. W. Jackson.
R. Lloyd Pelouze.

Inventor.
Hermann Schappisser
by *George H. Rague*
Attorneys.

(No Model.)

3 Sheets—Sheet 2.

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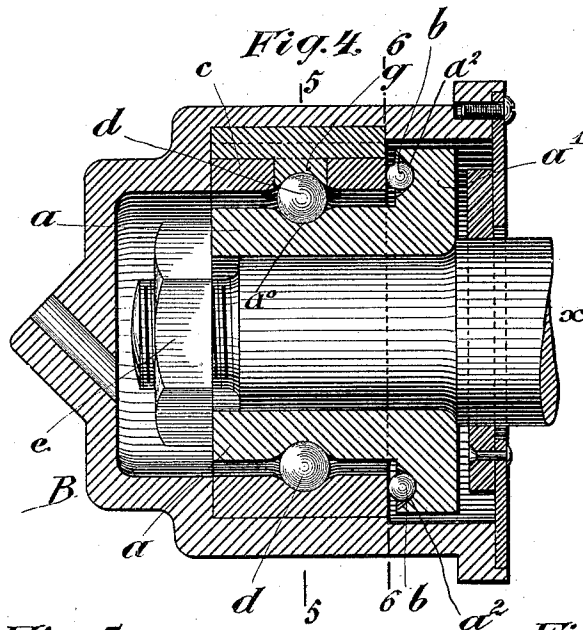


Fig. 5.

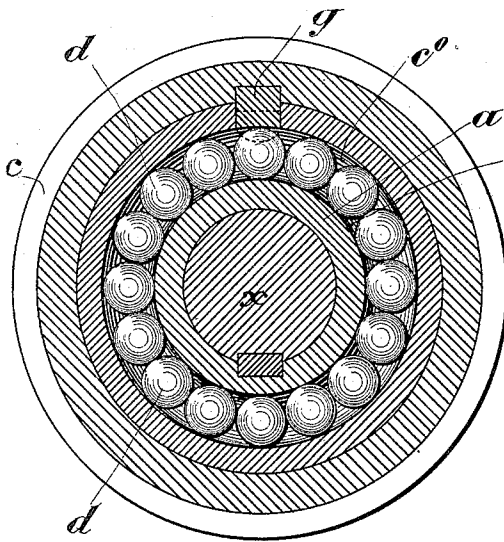
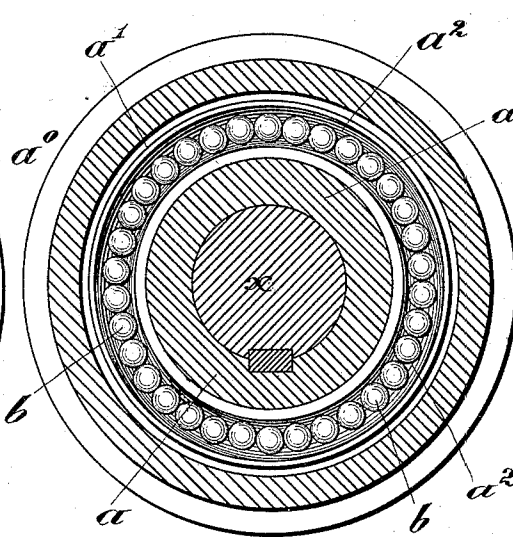


Fig. 6.



Witnesses:
Geo. W. Finkel.
R. Lloyd Pelouze.

Inventor.
Hermann Schuppiesser
by *Lothar Regener*
Attorneys.

(No Model.)

3 Sheets—Sheet 3.

H. SCHUPPISSE.
BALL BEARING.

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Fig. 7.

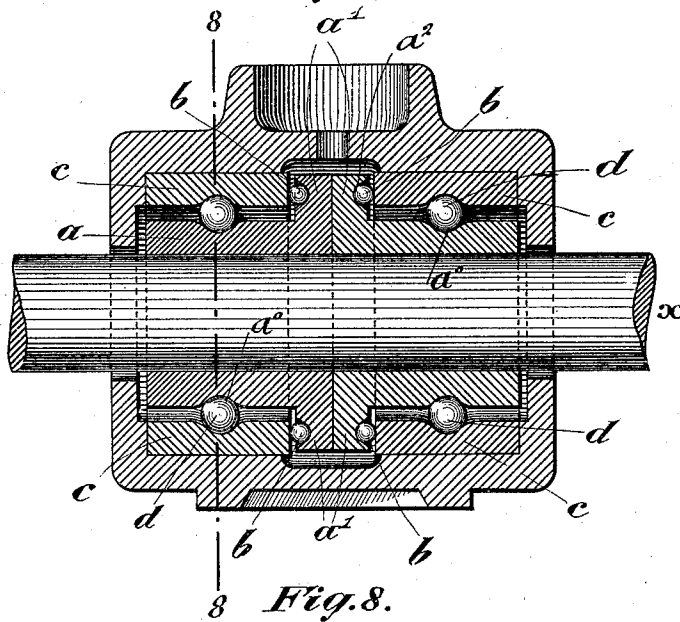
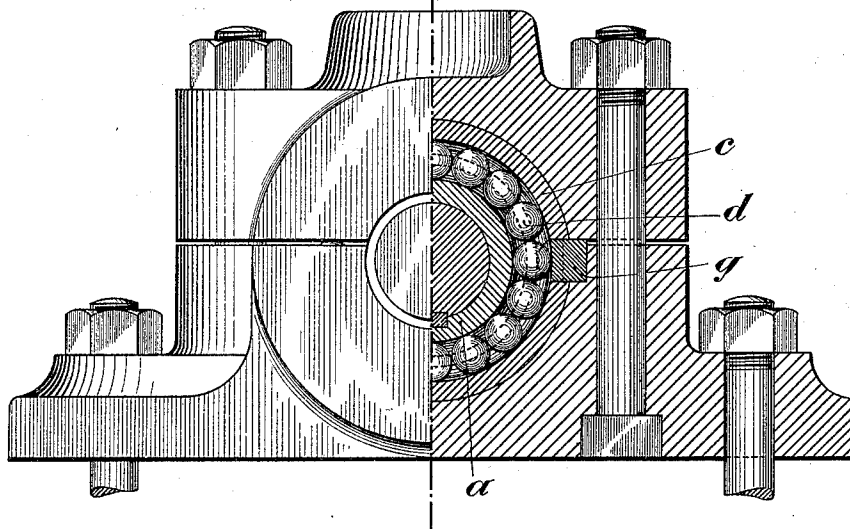


Fig. 8.



Witnesses:
Geo. W. Fackel.
R. Floyd Pelouze.

Inventor.
Hermann Schuppisser
by *G. R. P. R. R.*
Attorneys.

UNITED STATES PATENT OFFICE.

HERMANN SCHUPPISSE, OF ZURICH, SWITZERLAND, ASSIGNOR TO KUGLER & CO., OF SAME PLACE.

BALL-BEARING.

SPECIFICATION forming part of Letters Patent No. 584,296, dated June 8, 1897.

Application filed December 14, 1896. Serial No. 615,579. (No model.)

To all whom it may concern:

Be it known that I, HERMANN SCHUPPISSE, a citizen of the Republic of Switzerland, residing at Zurich, in the Republic of Switzerland, have invented certain new and useful Improvements in Ball-Bearings, of which the following is a specification.

This invention relates to improvements in ball-bearings for the axles of carriages, wagons, &c., in which the radial pressure as well as the axial thrust is taken up by the ball-bearings in such a manner that one series of balls receives the radial pressure and permits a slight axial shifting of the axle, while the axial thrust is immediately taken up by the other series or end balls.

The invention consists of certain features of construction and combinations of parts to be hereinafter described, and then pointed out in the claims.

In the accompanying drawings, Figures 1, 2, and 3 are longitudinal sections of three different forms of my invention. Fig. 4 is a longitudinal section showing my invention applied to a car-axle. Figs. 5 and 6 are vertical transverse sections on lines 5 5 and 6 6, respectively, Fig. 4. Fig. 7 is a vertical longitudinal section of still another form of my invention as applied to a pillow-block, and Fig. 8 is partly an end elevation and partly a vertical transverse section on line 8 8, Fig. 7.

Similar letters of reference indicate corresponding parts.

In the different forms of my invention the series of balls *d* is arranged to run in an annular groove or way *a*⁰ of a sleeve *a*, which is placed on the axle or shaft *x*—that is to say, said sleeve is connected with or shrunk upon the axle, while the groove or way *a*² for the series of balls *b*, that take up the end pressure, is arranged in the face of an annular flange *a'* of the sleeve *a*. The small balls *b*, which run in the groove *a*², are held in position in the groove by the adjacent end of a concentric sleeve or bushing *c*, which is attached to the casing B of the axle-bearing. The larger balls *d*, that take up the lateral pressure of the axle or shaft *x*, are arranged in annular grooves or ways *a*⁰ *c*⁰, formed, respectively, in the sleeve *a*, fixed to the axle, and in the sleeve or bushing *c*, fixed to the

casing or box B, the grooves permitting a slight longitudinal shifting of the axle, which is taken up immediately by the end-pressure balls *b*. This comparatively simple disposition of the described parts permits a large number of modifications of the invention, all containing the same principle, which meet all the requirements of the heretofore-known ball-bearings with end-pressure balls. This construction has also the additional advantage as compared to others that the parts of the ball-bearing can be removed from and transferred onto the axle and into the casing or journal-box.

In the form of the invention shown in Figs. 1 and 2 the same is adapted for street-railway cars. The annular flanges *a'* of the sleeves *a* in Fig. 1 abut at the center of the bearing, so that the lateral thrust of the axle is transferred to the center of the bearing.

In Fig. 2 the flanges *a'* of the sleeves *a* are arranged at the outer ends of the bearing, so that the non-flanged ends of the sleeve abut the balls *b* for taking up the end thrust, being thereby located at the opposite ends of the bearing outside of the casing sleeves or bushings *c*.

In Fig. 3 the ball-bearing for ordinary vehicles is shown, and the same is constructed similarly to that shown in Fig. 2, with this difference, however, that the sleeves *a*, which are shrunk or fixed onto the axle, are separated, so as to form between them an annular chamber *f* for the purpose of distributing the lateral thrust and side pressure over a greater distance.

In Figs. 4, 5, and 6 a ball-bearing for small railway-cars is shown, in which form of the invention the end-pressure balls *b* and the lateral-pressure balls *d* are arranged to run upon one sleeve *a* and its flange *a'* instead of, as in the previously-described form, two sleeves.

The assembling of the parts shown in Fig. 4 is accomplished by first placing the end-pressure balls *b* into the groove of the flange *a'* and then placing the sleeve *c* over the sleeve *a*, the larger balls *d* being then introduced through an opening in the sleeve or bushing *c*, which opening is closed, after all the balls *d* have been placed in position, by

means of a plug *g*, which is formed with a key portion, so as to interlock with the walls of corresponding grooves in the casing and axle-box.

5 In Figs. 1 to 4 nuts *e* are shown screwed onto the axle for holding the parts in position.

In Figs. 7 and 8 the construction and arrangement of the parts of my invention are the same as in Fig. 1, excepting that the invention is there shown as applied to a pillow-
10 block.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

15 1. The combination, with an annularly-flanged axle-sleeve, provided on its circumference and on that side of its flange nearer and adjacent to the main body of the sleeve with annular grooves, of an exterior casing sleeve
20 or bushing provided with an interior annular groove, said casing sleeve or bushing being placed over the axle-sleeve with its groove in register with the circumferential groove of the axle-sleeve, a series of balls arranged in
25 the groove of the flange and running in contact with the end of the casing-sleeve adjacent to said flange, and a series of balls arranged in the registering grooves of the axle-sleeve and the casing-sleeve, substantially as
30 set forth.

2. The combination, with an axle or shaft, and an annularly-flanged sleeve placed thereon, said sleeve being provided on its circumference with an annular groove and on that

side or face of its flange nearer and adjacent 35 to the main body of the sleeve with an annular groove, of a casing, a sleeve or bushing fixed in said casing and provided with an interior annular groove in register with the circumferential groove of the axle-sleeve, a series of balls arranged in the annular groove 40 and running in contact with the end of the casing-sleeve adjacent to the flange, and another series of balls arranged in the registering grooves of the axle-sleeves and the casing-
45 sleeve, substantially as set forth.

3. The combination, with an axle or shaft, and two annularly-flanged sleeves placed on said shaft or axle with the flanges abutting, said sleeves having, in their circumferences, 50 annular grooves, and said flanges having, in their faces, annular grooves, of a casing, and sleeves fixed in the casing, over the axle-sleeves and being provided with annular grooves, and the flanges of the axle-sleeves being arranged between the adjacent ends of the casing-sleeves, balls arranged in the grooves 55 of the flanges, and balls arranged in the registering grooves of the axle and casing sleeves, substantially as set forth. 60

In testimony whereof I hereunto sign my name, in the presence of two subscribing witnesses, this 13th day of November, 1896.

HERMANN SCHUPPISSER.

Witnesses:

MORITZ VEITH,
EUGENE GERMAIN.