

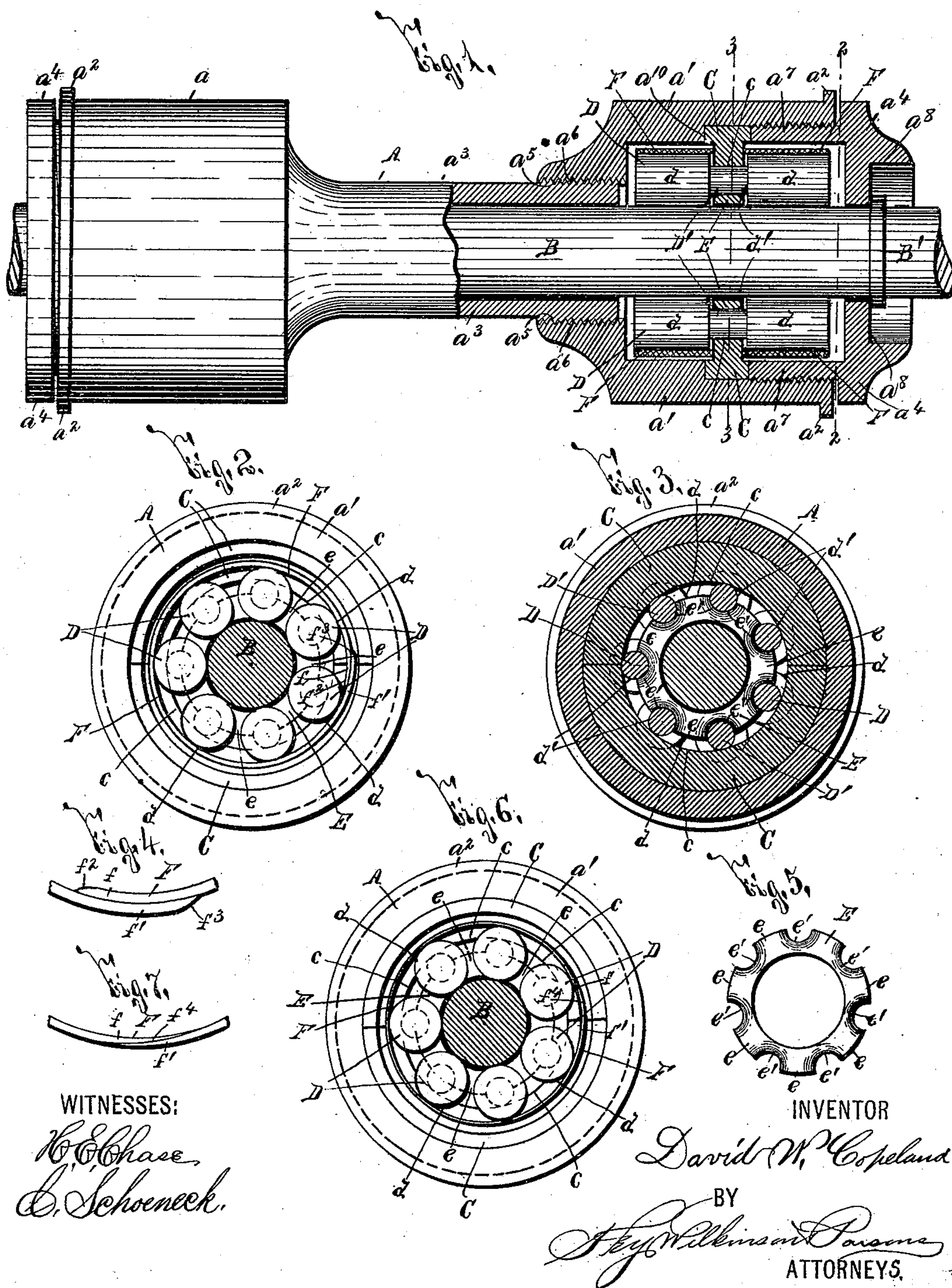
(No Model.)

2 Sheets—Sheet 1.

D. W. COPELAND.
ROLLER BEARING.

No. 496,348.

Patented Apr. 25, 1893.



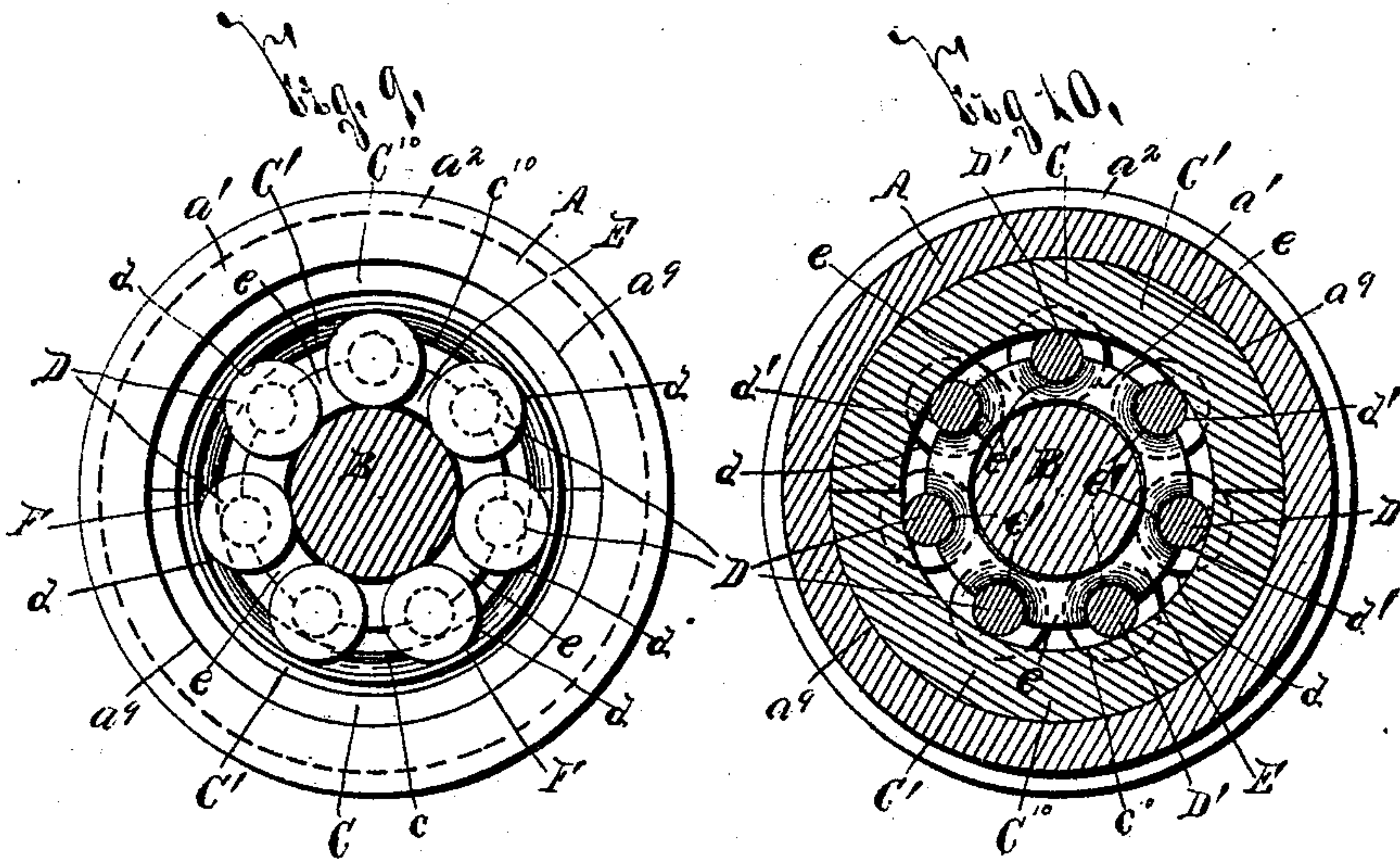
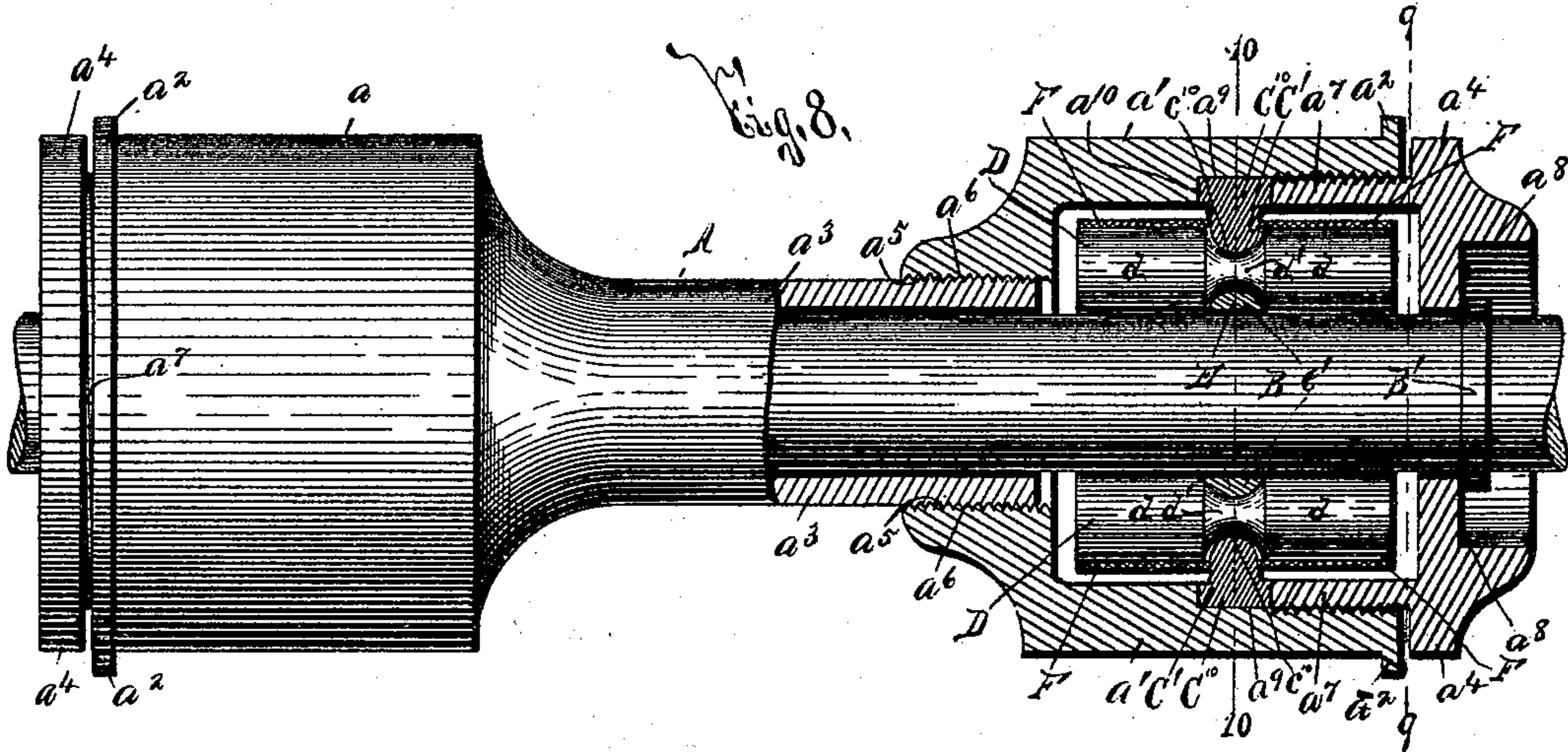
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WITNESSES:

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DAVID W. COPELAND, OF SYRACUSE, NEW YORK.

ROLLER-BEARING.

SPECIFICATION forming part of Letters Patent No. 496,348, dated April 25, 1893.

Application filed November 5, 1892. Serial No. 451,086. (No model.)

To all whom it may concern:

Be it known that I, DAVID W. COPELAND, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Roller-Bearings, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in journal bearings or boxes of the class set forth in my application, Serial No. 436,416, filed June 13, 1892, and it has for its object the production of a simple, practical, durable, and efficient construction, in which the amount of slip and rattle of the rollers is greatly reduced; and to this end it consists, essentially, in an outer casing provided with an annular rib projecting from its inner face, anti friction rollers having bearing faces of greater width than the bearing face of said rib, the roller bearing faces being normally separated from the inner face of the casing, and being each provided with a groove for receiving the bearing rib, and bands encircling the corresponding ends of said rollers.

The invention furthermore consists in the detail construction and arrangement of the parts, all as hereinafter more particularly described and pointed out in the claims.

In describing this invention, reference is had to the accompanying drawings, forming a part of this specification, in which, like letters indicate corresponding parts in all the views.

Figure 1 is an elevation, partly in section, of my improved bearing or box, a portion of an axle being shown in operative position therein. Fig. 2 is a transverse vertical sectional view, taken on line —2—2—, Fig. 1, the bearing end wall shown in section at Fig. 1 being removed for the purpose of more clearly illustrating the adjacent bearing rib of the casing. Fig. 3 is a transverse vertical sectional view, taken on line —3—3—, Fig. 1, the divider being shown in elevation. Fig. 4 is an elevation of an enlarged portion of the band for encircling the outer ends of the anti-friction rollers of my improved bearing or box. Fig. 5 is an elevation of the detached divider for separating the contiguous faces of the anti-friction rollers. Fig. 6 is a transverse vertical sectional view similar to Fig. 2, a

slightly modified form of encircling band for the rollers being illustrated. Fig. 7 is an elevation of an enlarged portion of the encircling band shown at Fig. 6. Fig. 8 is a similar view to Fig. 1, illustrating the annular rib of the bearing casing as formed of rounding cross section and the groove in the rollers as formed of corresponding cross section. Fig. 9 is a transverse vertical sectional view, taken on line —9—9—, Fig. 8, the adjacent end wall of the casing being removed; and Fig. 10 is a vertical sectional view, taken on line —10—10—, Fig. 8, the divider being shown in elevation.

My improved bearing or box consists of an outer casing —A— composed of enlarged end heads — a — a' — having annular shoulders — a^2 — a^2 — at their outer edges, a contracted central portion — a^3 —, and removable end walls — a^4 — a^4 — for the heads — a — a' —. One extremity of the contracted central portion — a^3 — of the casing —A— is fixed to the adjacent head — a — and the other extremity thereof is formed with screw-threads — a^5 — which engage a screw-threaded socket — a^6 — in the inner wall of the head — a' —. The end walls — a^4 — a^4 — are each formed with a screw-threaded flange — a^7 —, which enters the screw-threaded outer ends of the casing heads — a — a' —, and by turning said end walls, they are readily disengaged from the casing for permitting access to its interior, or are quickly replaced in operative position.

The construction of my improved bearing, here illustrated, is particularly designed for use in carriage hubs which are formed in the usual manner with a suitable opening there-through for receiving the bearing. It will, therefore, without the aid of an illustration of a carriage hub, be readily understood, by one skilled in the art, that one section of the bearing is forced to its operative position from one side of the hub until its shoulder — a^2 — bears against the outer face of said hub, and that the other section is caused to enter the opposite end of the opening in the hub and is then screwed upon the adjacent end of the contracted central portion of the bearing until its shoulder — a^2 — bears against the outer face of the opposite end of the hub.

—B— is an axle having a portion thereof journaled in my improved bearing, and, as is

evident, this axle may be of the ordinary or any other suitable form, size, and construction. The axle —B— is, however, preferably provided with a shoulder —B'— for bearing
5 against the depressed outer face — a^8 — of the inner end wall — a^4 — of the casing —A—.

—C— is a bearing rib projecting from the inner face — a^9 — of each of the enlarged heads — a — a' — of my improved bearing casing
10 —A—, but, as but one-half of this bearing is shown in section, only one of said ribs is illustrated. These ribs are preferably formed with a bearing face — c — of angular cross section, and are each provided upon a ring —C'—
15 within the corresponding head of the bearing, in order that when the rib is worn, the ring may be readily removed and replaced with a new one. It is evident, however, that this ring, which is prevented, as presently de-
20 scribed, from revolution within the casing, forms essentially a portion of said outer casing, and that its inner face is essentially the inner face of the corresponding casing head and consequently I have, throughout the
25 specification and claims, described the ribs —C— as projecting from the inner face of the outer casing.

The inner face of each of the rings —C'— bears against an annular shoulder — a^{10} —
30 provided upon the inner face — a^9 — of the corresponding enlarged casing heads, and its outer face is engaged by the inner face of the flange — a^7 —, which is formed upon the corresponding end wall — a^4 — and serves to
35 clamp the ring —C'— against the shoulder — a^{10} — and prevent the revolution of said ring —C'—.

—D— represents anti-friction rollers, which encircle the adjacent portions of the axle
40 —B— and are each formed with a bearing face — d — of greater width than the bearing face — c — of the corresponding bearing rib —C— and are provided with the groove — d' — of slightly greater width than the rib —C—
45 for receiving said rib.

The rib —C— projects from the inner face of the casing —A— a greater distance than the depth of the groove — d' —, and, as said rib bears against the face of the contracted
50 portion —D'— of the rollers —D—, the bearing face — d — of said rollers is separated from the face of the adjacent portion of the casing —A—. Consequently, the amount of slip of the rollers is reduced to a minimum as
55 the contracted bearing face D' of the rollers engaged with the rib —C—, is considerably nearer the axis of the axle —B— than the outer portion of the bearing face — d — of said rollers, which would otherwise be engaged
60 with the casing. Moreover, the axle —B— bears against a bearing face of the rollers —D— of greater diameter than the faces of said rollers against which bears the face — c — of the corresponding rib —C—.

65 The contiguous faces of adjacent rollers —D—D— are separated by a suitable divider —E—, Figs. 2, 3, 4, and 5, which is provided

with a series of arms — e — formed with contracted central portions — e' — and adapted to enter the grooves in the rollers.

Rattling of the rollers —D— is prevented
70 by a band —F—, which encircles said rollers and holds them in engagement with the axle —B—. I preferably use two bands for each series of rollers, and, as illustrated, arrange
75 them on opposite sides of the rib —C— upon the corresponding opposite ends of the rollers —D—. This preferable form of band consists of a metallic strip bent into substantially a
80 circular form, and having its opposite ends — f — f' — lapped one upon the other, and formed, respectively, with a rounded inner face — f^2 — and a rounded outer face — f^3 —, whereby catching of said ends by the rollers
85 encircled thereby, or by the adjacent faces of the casing is entirely prevented. Since the band —F— is formed of spring metal, its ends are free to move upon each other as the rollers become worn, or as they move slightly
90 from their normal position to prevent cramping of the axle. This slight adjustable movement of the rollers is permissible for the reason that the grooves — d' — are slightly wider than the width of the bearing face — c — of the
95 ribs —C—. It will be understood, however, that the band —F— may be formed of any suitable material, and that if desired, it may be composed of rawhide, leather, or rubber capable or more or less expansion, and consequently, I have, at Fig. 6, shown a modified
100 form of said band formed of an expansible strip having its adjacent ends firmly secured together at — f^4 —.

In cases where it is desired that the rollers —D— may be capable of automatically ad-
105 justing themselves to a greater degree than permitted when the bearing face — c — of the rib —C— is angular in cross section, and the grooves — d' — of the rollers —D— for receiving said rib is correspondingly formed
110 and but slightly wider than the bearing face of the rib, I form the bearing face — c^{10} — of the said rib C¹⁰ of rounding cross section and also form the grooves of the rollers —D— of
115 rounding cross section as best seen at Figs. 8, 9, and 10.

The parts of my invention are simple in construction, easily assembled, and replaced, and the entire device is a highly efficient and
120 durable journal box in which the slip and rattling of the rollers are reduced to a minimum. It will be understood, however, that the detail construction and arrangement of the parts of my invention may be somewhat
125 changed from that shown and described without departing from the spirit thereof.

It will be understood that I do not herein claim specifically the structure set forth in my application Serial No. 436,416 filed June
13, 1892.

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

1. The herein described roller bearing, the

same comprising an outer casing provided with an annular rib projecting from its inner face, and anti-friction rollers having bearing faces of greater width than the bearing face of said rib, the roller bearing faces being normally separated from the inner face of the casing and being each provided with a groove for receiving the bearing rib, substantially as and for the purpose set forth.

2. The herein described roller bearing, the same comprising an outer casing provided with an annular rib projecting from its inner face, anti-friction rollers having bearing faces of greater width than the bearing face of said rib, the roller bearing faces being normally separated from the inner face of the casing and being each provided with a groove for receiving the bearing rib, and a divider for separating the adjacent faces of said rollers substantially as and for the purpose specified.

3. The herein described roller bearing, the same comprising an outer casing provided with an annular rib projecting from its inner face, anti-friction rollers having bearing faces of greater width than the bearing face of said rib, the roller bearing faces being normally separated from the inner face of the casing and being each provided with a groove for receiving the bearing rib, and a band encircling the corresponding ends of said rollers, substantially as and for the purpose set forth.

4. The herein described roller bearing, the same comprising an outer casing provided with an annular rib projecting from its inner face, anti-friction rollers having bearing faces of greater width than the bearing face of said rib, the roller bearing faces being normally separated from the inner face of the casing and being each provided with a groove for receiving the bearing rib, and a band encircling the corresponding ends of said rollers, consisting of a strip of spring material having its adjacent ends lapped one upon the other, substantially as and for the purpose specified.

5. The herein described roller bearing, the same comprising an outer casing provided with an annular rib projecting from its inner face and formed of angular cross section, anti-friction rollers having bearing faces of greater width than the bearing face of said rib, the roller bearing faces being normally separated from the inner face of the casing and being each provided with a groove for receiving the bearing rib, a divider for separating the adjacent faces of said rollers, and a band encircling the corresponding ends of said rollers, substantially as and for the purpose set forth.

6. The herein described roller bearing, the same comprising an outer casing formed with an annular shoulder on its inner face, a ring at one side of said shoulder formed with a bearing rib projecting inwardly, anti-friction rollers having bearing faces of greater width than the bearing face of said rib, the roller bearing faces being normally separated from the inner face of the casing and being each provided with a groove for receiving the bear-

ing rib, and an end wall for said casing having an inwardly extending flange for clamping the rib carrying ring against said annular shoulder of the casing, substantially as and for the purpose described.

7. The herein described roller bearing, the same comprising an outer casing formed with an annular shoulder on its inner face, a ring at one side of said shoulder formed with a bearing rib projecting inwardly, anti-friction rollers having bearing faces of greater width than the bearing face of said rib, the roller bearing faces being normally separated from the inner face of the casing and being each provided with a groove for receiving the bearing rib, an end wall for said casing having an inwardly extending flange for clamping the rib carrying ring against said annular shoulder of the casing, and bands upon opposite sides of the bearing rib encircling the opposite ends of said rollers, substantially as specified.

8. The herein described roller bearing, the same comprising a casing-head, the contracted central portion of a casing projecting from said casing-head, an opposite casing-head removably engaged with the projecting end of said contracted central portion, an annular rib projecting from the inner face of each of said heads, anti-friction rollers within said casing heads having their bearing faces of greater width than the bearing faces of said projecting ribs, the roller bearing faces being normally separated from the inner faces of said enlarged heads and being each provided with a groove for receiving the bearing rib, substantially as and for the purpose specified.

9. The herein described roller bearing, the same comprising a casing-head, the contracted central portion of a casing projecting from said casing-head, an opposite casing-head removably engaged with the projecting end of said contracted central portion, an annular rib projecting from the inner face of each of said heads, anti-friction rollers within said casing heads having their bearing faces of greater width than the bearing faces of said projecting ribs, the roller bearing faces being normally separated from the inner faces of said heads and being each provided with a groove for receiving the bearing ribs, and dividers for separating the adjacent faces of said rollers, substantially as and for the purpose set forth.

10. The herein described roller bearing, the same comprising a casing-head the contracted central portion of a casing projecting from said casing-head, an opposite casing-head removably engaged with the projecting end of said contracted central portion, an annular rib projecting from the inner face of each of said heads, anti-friction rollers within said casing heads having their bearing faces of greater width than the bearing faces of said projecting ribs, the roller bearing faces being normally separated from the inner faces of said heads and being each provided with a

groove for receiving the bearing ribs, and bands within said casing heads encircling corresponding ends of said rollers, substantially as and for the purpose specified.

5 11. The herein described roller bearing, the same comprising a casing-head, the contracted central portion of a casing projecting from said casing-head, an opposite casing-head removably engaged with the projecting end of
10 said contracted central portion, an annular rib projecting from the inner face of each of said heads, anti-friction rollers within said casing heads having their bearing faces of greater width than the bearing faces of said
15 projecting ribs, the roller bearing faces being normally separated from the inner faces of

said heads and being each provided with a groove for receiving the bearing ribs, bands within said casing heads encircling corresponding ends of said rollers, and removable 20 end walls for said heads of the casing, substantially as and for the purpose set forth.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Syracuse, in the county 25 of Onondaga, in the State of New York, this 1st day of November, 1892.

DAVID W. COPELAND.

Witnesses:

CLARK H. NORTON,
M. BAXTER.