(No Model.)

D. W. COPELAND.

JOURNAL BOX.

No. 496,345. Patented Apr. 25, 1893.

Fig. 1.

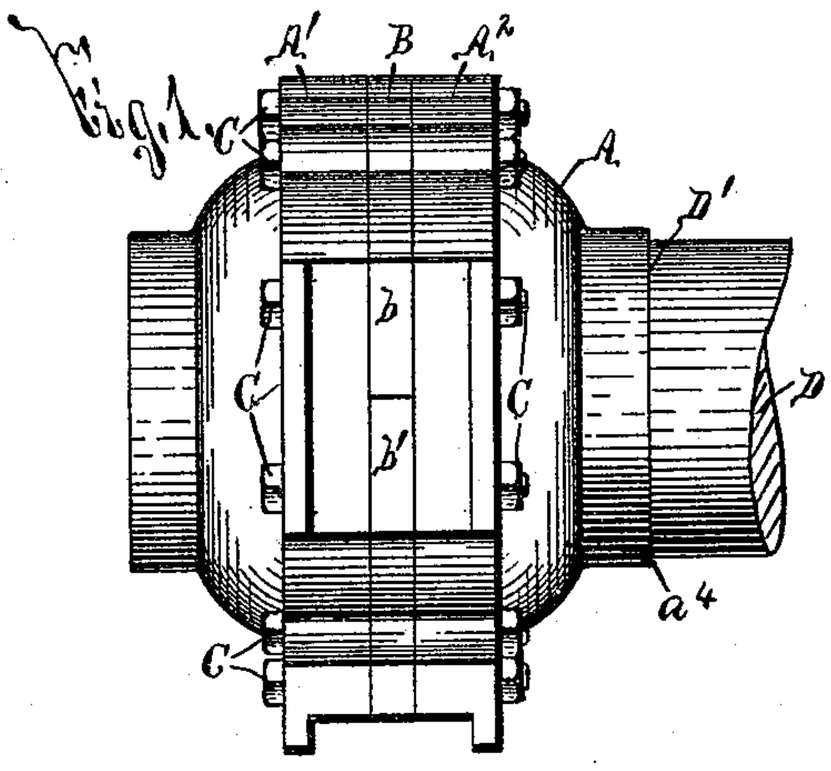


Fig. 2.

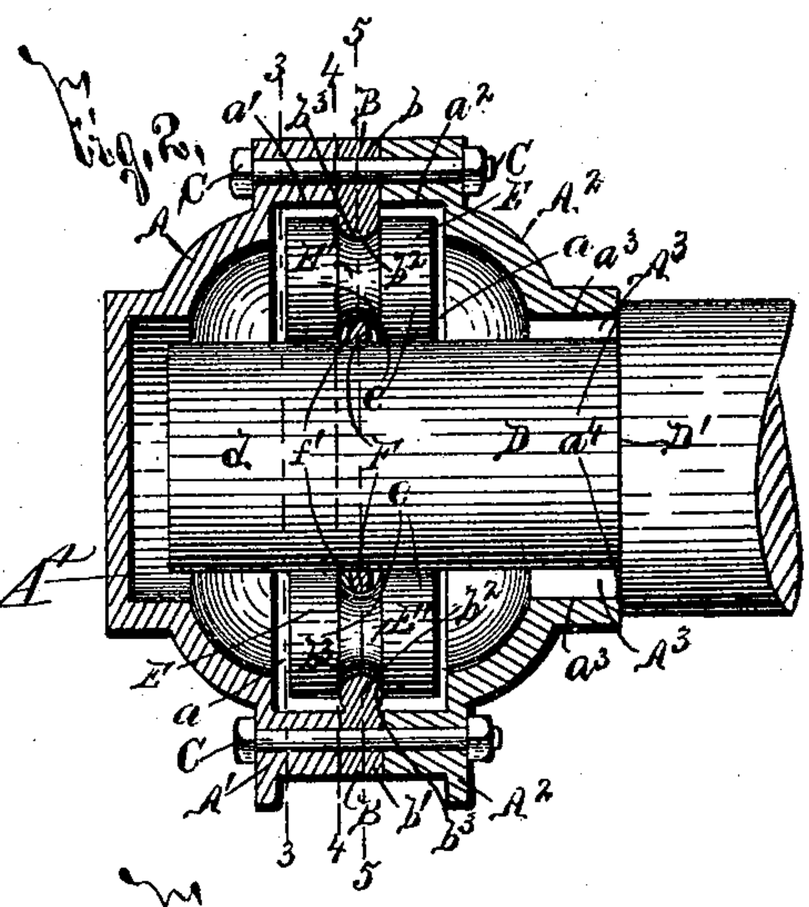


Fig. 3.

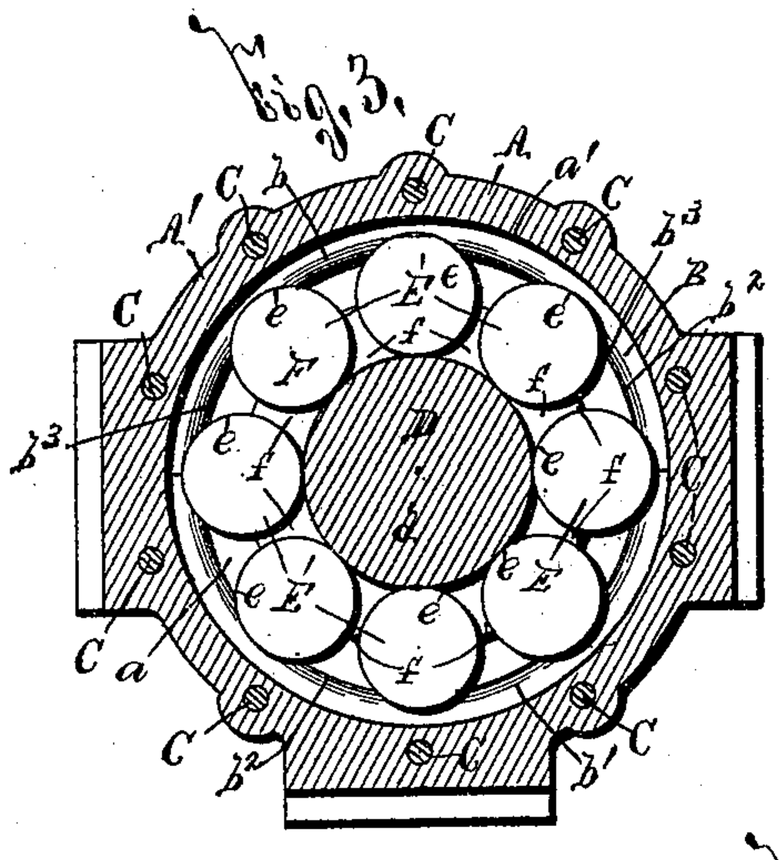


Fig. 4.

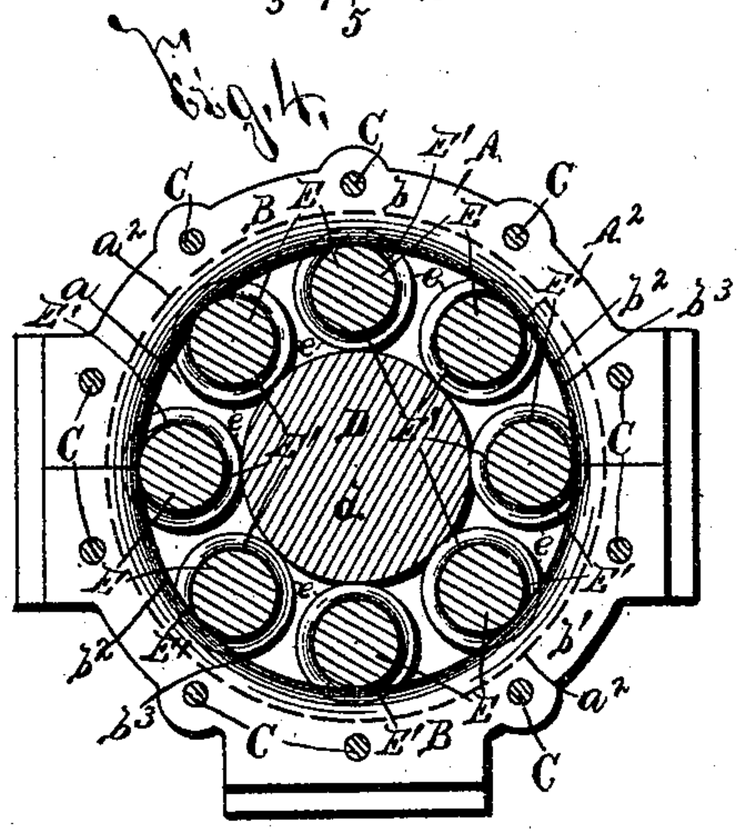


Fig. 6.

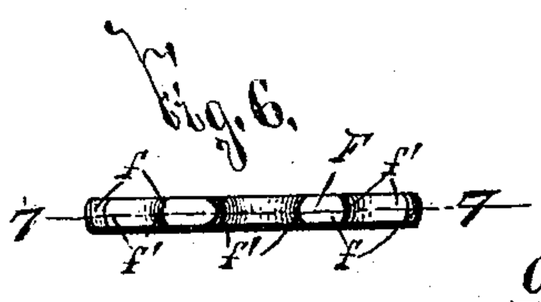


Fig. 5.

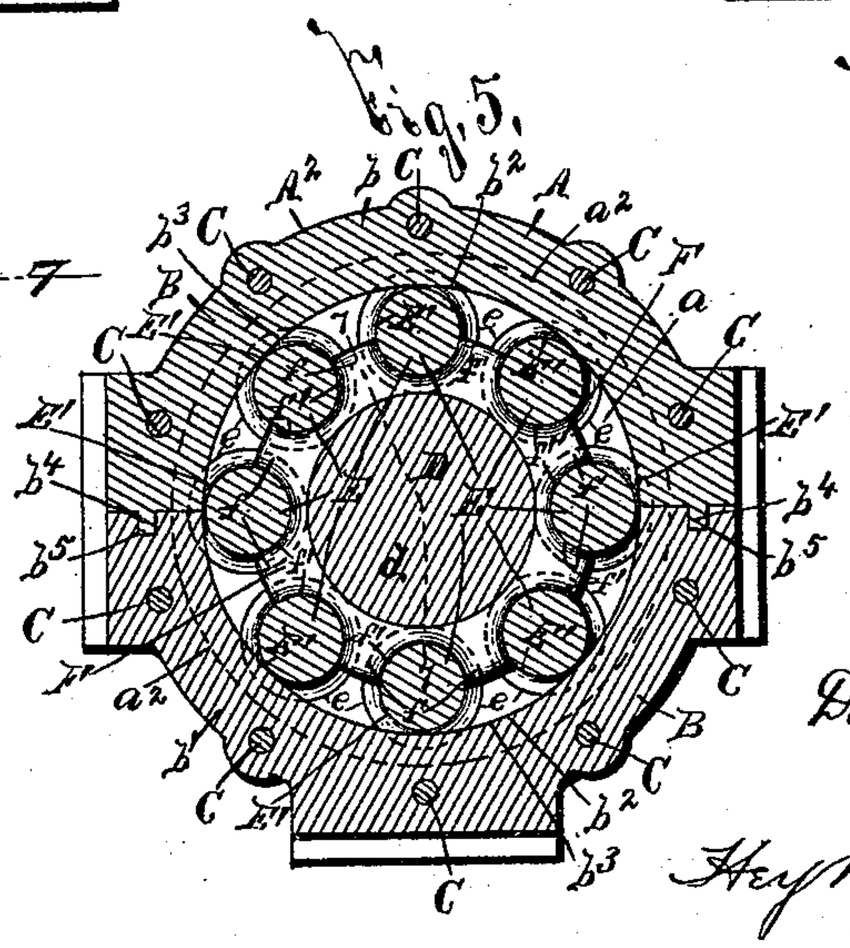
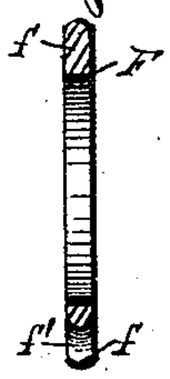


Fig. 7.



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UNITED STATES PATENT OFFICE.

DAVID W. COPELAND, OF SYRACUSE, NEW YORK.

JOURNAL-BOX.

SPECIFICATION forming part of Letters Patent No. 496,345, dated April 25, 1893.

Application filed June 13, 1892. Serial No. 436,416. (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 Journal-Boxes, 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 boxes, and has for its object the production of a simple, practical, and efficient device capable of self adjustment for preventing the usual binding of the axle or journal when one of its ends is caused to assume an abnormal position, as, for instance, when it is elevated or depressed when passing over elevations or depressions, or is advanced or retracted from the plane occupied by the other end, when rounding curves; and to this end it consists, essentially, in an outer casing provided with a rib projecting from its inner face and formed with a bearing face of rounding cross section and anti friction rollers each having their bearing faces normally separated from the inner face of said casing and formed of greater width than the bearing face of said rib and provided with a groove of rounding cross section for engaging the bearing face of said rib.

The invention also 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 a side elevation of my improved journal box and the detached end of an axle mounted therein. Fig. 2 is a longitudinal vertical sectional view of the parts as shown at Fig. 1, the axle being in elevation. Figs. 3, 4 and 5 are transverse vertical sectional views, taken, respectively, on lines 3—3, 4—4 and 5—5 Fig. 2. Fig. 6 is a top plan view of a detached portion of the divider for separating the anti-friction rollers of my invention; and Fig. 7 is a vertical sectional view of said divider, taken on line 7—7, Fig. 6.

It is well known that journals, axles, &c., revolve only with considerable friction, and are extremely liable to bind when rounding a curve, or when one end assumes an abnormal position, and that there have been devised boxes provided with anti-friction rollers encircling the axle and also boxes provided with a sleeve encircling the axle, and with anti-friction rollers encircling the sleeve. All these devices, however, are so constructed that when rounding a curve or passing over an elevation or a depression, the anti-friction rollers are unable to adjust or accommodate themselves to the abnormal position of the axle and consequently bind thereupon, causing wear or flattening of the rollers and of the axle, which soon renders the box and axle practically worthless and necessitates either the replacement of the box, the axle or the rollers. My invention is differentiated from these former types of journal boxes, in that, each of the rollers has an independent adjustable movement which permits the same to operate with the same degree of ease when the axle is in an abnormal position as at any other time, thus obviating all binding or cramping of the axle and reducing to a minimum the friction incidental to its rotation. This desirable result is effected by a rib of rounding cross section, which projects from the inner face of the outer casing of the box, and is provided with a bearing face, and anti friction rollers having their bearing faces normally separated from the inner face of said casing and formed of greater width than the bearing face of said rib and provided with a groove of rounding cross section for engaging the bearing face of said rib, whereby each roller is free to rock independently on said rib as the axle or journal rounds a curve, or as one end assumes an abnormal position.

—A— represents the box, here shown as provided with a central chamber —*a*— and as composed of the outer sections —A′—A²—. Interposed between the sections —A′—A²— is a central section —B— best seen at Fig. 4, which consists of two divisions —*b*—*b*′—, is formed with ribs having their inner faces projecting beyond the corresponding faces —*a*′—*a*²— of the sections —A′—A²—, and formed with an outer bearing face —*b*³— which is preferably curved or rounding.

In order to facilitate securement in position of the sections —*b*—*b'*— of the inner section —B— of the outer casing —A—, the opposite extremities of the section —*b*— are formed with dowels —b^4— adapted to engage sockets —b^5— in the adjacent ends of the section —*b'*—. Suitable clamps, as bolts —C—, firmly secure the separate sections of the casing together and cause the same to form a complete and solid whole.

—D— is the axle having its extremity —*d*— passed within the chamber —*a*— through an opening —A^3— in the upright wall of the casing section —A^2— which is formed of greater diameter than said axle end —*d*— for permitting the axle to adjust itself within the box without bearing against the wall —a^3— of the opening —A^3—. The extreme end of the axle enters a closed chamber —A^4— in the section —A'— formed of greater diameter than said axle for enabling the axle end to move freely within said chamber.

—D'— is a shoulder upon the axle bearing against the upright edge —a^4— of the outer wall of the inner casing section —A^2—.

—E— represents anti-friction rollers arranged in a series surrounding the axle end —*d*—. The bearing faces —*e*— of these rollers are each considerably wider than the bearing face —b^3— of the rib —b^2— and are adapted to bear against the face of the axle end —*d*—. As is clearly seen at Figs. 2 and 3, the rollers —E— do not bear against the inner faces of the outer casing sections —A'— A^2—, but considerable space intervenes between said rollers and inner faces.

The rollers —E— are formed with grooves —E'— arranged between their extremities and formed of rounding cross section for receiving the rib —b^2—. By arranging the grooves —E'— between the opposite extremities of the rollers —E—, these extremities have a bearing upon the axle and their central portions bear upon the rib —b^2—. Consequently, the rollers —E— are prevented from lengthwise movement of the axle end —*d*—, and are free to adjust themselves as the axle end is elevated, depressed, retracted or advanced. This adjustment of the rollers would not be permitted however, if their opposite extremities engaged the adjacent face of the outer casing and also engaged the axle end —*d*— and is effected by mounting and supporting the rollers, as just described.

—F— is a divider for preventing contact of adjacent rollers. As preferably constructed, this divider consists of a ring encircling the axle end —*d*— and formed with projecting peripheral arms —*f*— interposed between the adjacent rollers and registered with the grooves —E'— in said rollers. The sides —*f'*— of the arm —*f*— are curved in cross section and the arms and ring are of insufficient width to retard the accommodative movement of the rollers.

In operation, the end —*d*— of the axle —D— is passed through the inner section —A^2— of the box —A—. The divider —F— is then mounted upon the axle and the rollers —E— placed in relative position around the divider; the sections —*b*—*b'*— of the central casing section —B— are registered with the grooves —E'— in the rollers, the outer section —A'— placed in position and the bolts —C— actuated to draw the sections of the outer casing firmly one against the other. The divider —F— or the central casing section —B— may be readily removed and replaced when worn without necessitating removal of the box and these parts are preferably formed of softer material than the rollers in order that the life of the rollers may be lengthened to the utmost.

The parts of my invention are simple in construction, are readily assembled and replaced and the whole forms a highly efficient and durable journal box, the rollers of which readily adjust themselves to an abnormal position of the axle, and revolve freely in said position, thus obviating any liability of the axle to bind, and unduly wear itself, the rollers, or the journal box.

It will be understood that the detail construction and arrangement of the parts of my invention may be somewhat varied from those shown and described, as for instance, the rib —b^2— may be formed integral with the casing —A— and the said casing may then be composed of two diagonally separable sections or the construction of the divider may be also varied. Hence I do not herein limit my invention to the precise construction and arrangement of its component parts.

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 formed of rounding 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, whereby the rollers have an independent adjustable movement on said rib, substantially as described.

2. The herein described roller bearing, the same comprising an outer casing having a central section arranged between the opposite sides of the casing and formed of separable divisions having inner bearing faces projecting beyond the corresponding face of the remaining portion of said casing and formed of rounding cross section, anti-friction rollers having bearing faces of greater width than the bearing face of said divisions of the central section, the roller bearing faces being normally separated from the inner face of the casing, and being each provided with a groove of rounding cross section arranged midway between their extremities for receiving the bearing face of said central section divis-

ions, whereby the rollers have an independent adjustable movement, substantially as described.

3. The herein described roller bearing, the same comprising an outer casing provided with an annular rib projecting from its inner face and formed of rounding 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, whereby the rollers have an independent adjustable movement on said rib, and a separator for preventing the adjacent rollers from contacting with each other, substantially as and for the purpose specified.

4. The herein described journal box, the same comprising an outer casing formed of separable outer sections, and a central section interposed between the former sections and formed with an inner bearing face of rounding cross section projecting beyond the corresponding faces of the outer sections, and bolts passing through said sections for securing the same together; anti friction rollers having bearing faces of greater width than the inner bearing face of said central section, the roller bearing faces being normally separated from the inner face of the casing and being each provided with a groove of rounding cross section for receiving said bearing face of the central section, whereby the rollers have an independent adjustable movement on said rib, substantially as set forth.

5. The herein described roller bearing, the same comprising an outer casing provided with an annular bearing rib projecting from its inner face, anti-friction rollers having their bearing faces of greater width than the bearing face of said rib, and said roller bearing faces normally separated from the inner face of the casing, and said rollers provided with grooves for receiving the bearing rib, whereby the rollers have an adjustable movement on said rib, and a ring registered with said grooves, surrounding the axle and formed at intervals with projecting arms arranged between adjacent rollers for preventing their contact, substantially as set forth.

6. The combination, with a journal box formed with separable outer sections; of a central section formed with an inner bearing face projecting beyond the corresponding faces of the outer sections, and bolts for securing said sections together; of anti-friction rollers formed with bearing faces of greater width than the projecting face of the central section, said rollers being normally separated from the inner faces of the outer sections and provided with grooves arranged between their opposite extremities for receiving said projecting face of the central section, whereby the rollers have an adjustable movement on said rib, and a ring registered with said grooves, surrounding the axle and formed at intervals with arms arranged between adjacent rollers for preventing their contact, 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 of Onondaga, in the State of New York, this 6th day of June, 1892.

DAVID W. COPELAND.

Witnesses:
CLARK H. NORTON,
L. M. BAXTER.