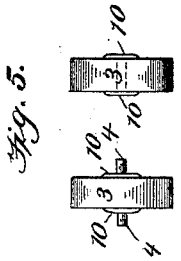
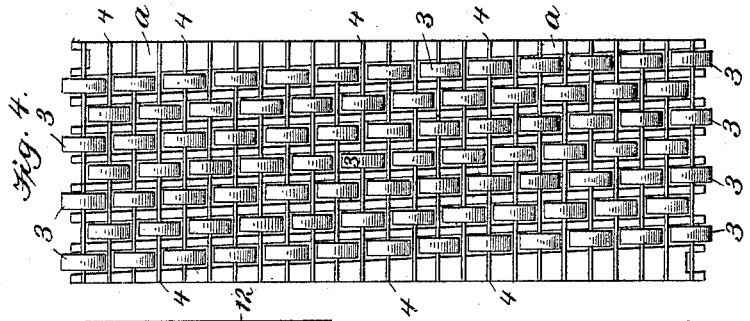
(No Model.) 2 Sheets—Sheet 1.

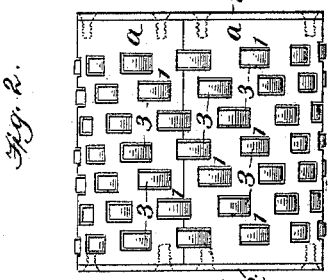
A. PETTERSON.

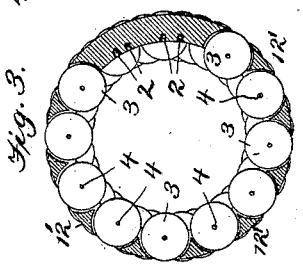
ROLLER BEARING.

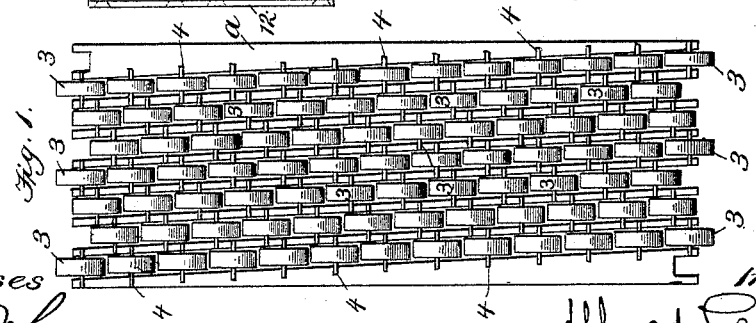
No. 491,585. Patented Feb. 14, 1893.











Witnesses
Augt. Johnson
Edwin L. Bradford

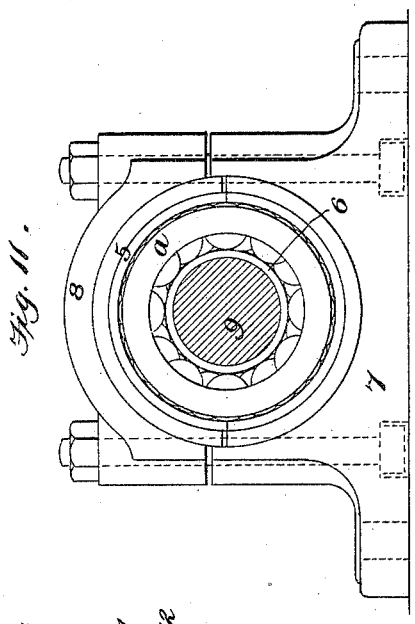
Inventor.
Alfred Petterson
By Johnson and Johnson
his Attorneys

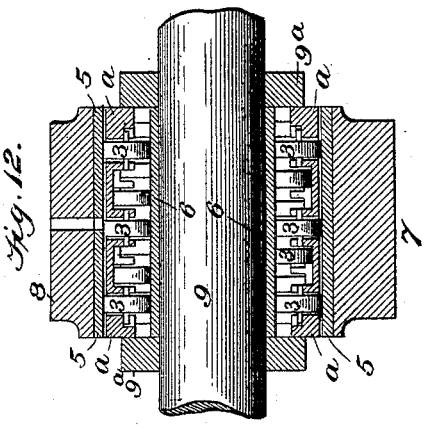
(No Model.) 2 Sheets—Sheet 2.

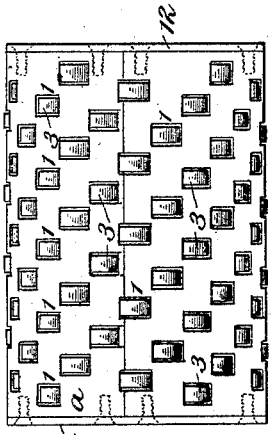
A. PETTERSON.

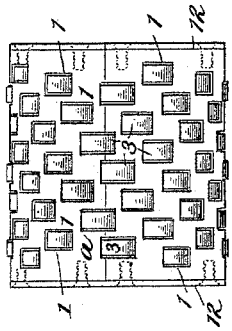
ROLLER BEARING.

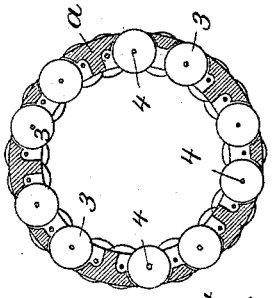
No. 491,585. Patented Feb. 14, 1893.

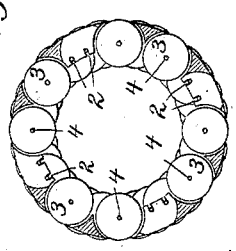


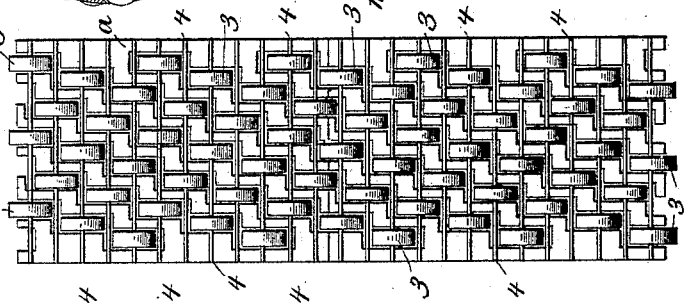


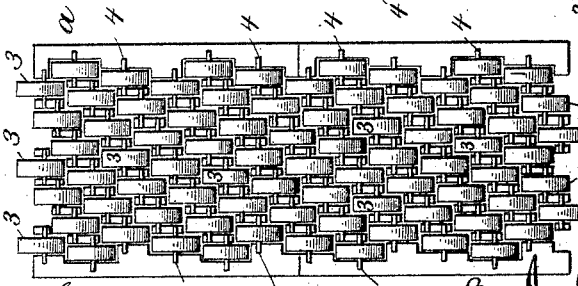












Witnesses
Edwin L. Bradford

Inventor
Alfred Petterson
By Johnson & Johnson
his Attorneys

UNITED STATES PATENT OFFICE.

ALFRED PETTERSON, OF BALTIMORE, MARYLAND.

ROLLER-BEARING.

SPECIFICATION forming part of Letters Patent No. 491,585, dated February 14, 1893.

Application filed May 7, 1892. Serial No. 432,175. (No model.)

To all whom it may concern:

Be it known that I, ALFRED PETTERSON, a subject of the King of Sweden and Norway, formerly of Bergen, Norway, but now of Baltimore city, in the State of Maryland, United States of America, have invented certain new and useful Improvements in Roller-Bearings, of which the following is a specification.

My invention is directed to lessening the friction and wear of bearing surfaces moving upon each other by placing rolls between them to change a rubbing into a rolling action; and my improvements consist of a roller bearing constructed and combined for use as hereinafter specifically set out in the claims concluding this specification, and illustrated in the drawings.

An important feature of my invention is the provision of a continuous shell or sleeve having openings in contiguous relation, and rolls within said openings having axis pins which, while permitting of their free rotation, serve to prevent their cramping or binding and to keep their rolling surfaces in exact paths in a continuous shell and avoid seating the rolls themselves upon the walls of sockets, which would cause more or less friction and binding of the rolls on their rolling surfaces. The rolls confined by pivots in a continuous shell give the advantage of a stiff or rigid shell, not liable to twist or bind the rolls in any direction. The rolls are of greater diameter than length, and this gives the advantage of arranging the rolls close together in lines parallel with the axis of the shell and transversely in spiral lines throughout the surface of the shell, and it is this proportion and disposition of the rolls, which cause their rolling surfaces to lap both transversely and longitudinally of the shell, and bring the diametrically opposite rows in full bearing on the upper and on the under sides of the journal. This prevents any tendency of the shell to twist at either end and causes the pressure to be equal at both ends of the box at every point in the revolution of the journal. I make the shell, the rolls, and their axis pins, capable of independent or separate rotation to give the freest movement and prevent the least binding of the parts.

In the accompanying drawings I have shown several forms of my roller bearings, and for the purpose of informing those skilled in the art to which my invention relates, of the nature of the same and of how it may be advantageously employed, I will now describe the devices illustrated in said drawings and specifically set out my improvements in the claims concluding this specification.

Referring to the drawings:—Figure 1 represents a developed plan of the interior surface of my roller bearing sleeve or continuous shell; Figs. 2 and 3 show such bearing sleeve or shell both in cylindrical elevation and in end view; in this construction each series of rolls are confined, in helical lines, so that their rolling surfaces stand in lapping relation in two directions; Fig. 4 shows a view similar to Fig. 1, but in which a series of rolls are mounted upon the same axis pin in the same disposition and relation; Fig. 5 shows the rolls for short and long axis pins; Fig. 6 shows a plan view similar to Fig. 1, with the same disposition of the rolls upon short axis pins, but in lines that are not helical; Fig. 7 shows a side and end view of the same in its sleeve or shell form; Fig. 8 is a view similar to Fig. 6 but in which a series of rolls are mounted upon the same axis pin; Fig. 9 is an end view of the same in its sleeve or shell form; Fig. 10 is an elevation of the same; Fig. 11 shows in end elevation my improved roller sleeve or shell, applied as a journal bearing in a pedestal; and Fig. 12 is a vertical axial section of the same.

The several views show the disposition and mounting of the rolls to obtain the advantages and rolling double lapping relation stated, and in which the surfaces traversed by the rolls will be evenly and equally worn.

I construct the roller sleeve *a* of a continuous shell with openings 1 disposed quite close together so that their longest sides will be cross wise of the sleeve or shell, and in such relation to each other that no two contiguous openings will be in line longitudinally and transversely in the cylindrical surface. The inner wall of the sleeve is recessed between the openings and at each side of each opening are formed surface grooves 2, at the middle of the length of the openings, so that the grooves stand parallel with the axis of the sleeve. Into these openings I set rolls 3 with their axis pins 4 in the surface grooves, which thereby serve to retain the rolls in their proper

relation to the sleeve and to each other. This confining of the rolls by their axis pins is important in serving to keep the rolls from contact with the walls of the openings and prevent them from twisting or cramping in their rolling action with the sleeve. The length of the sleeve is equal to that of the journal or bearing and the diameter of the rolls is a little greater than the thickness of the sleeve, so that the latter being placed between the journal or shaft and its box or housing, the rolls will form the bearing surfaces at the inner and at the outer sides of the sleeve.

Each roll may be mounted on its own axis pin as in Figs. 1, and 6; or several rolls may be mounted upon the same axis pin as in Figs. 4 and 8, the rolls, however, occupying a position in which no adjacent two will be in line with each other either transversely or longitudinally of the sleeve.

I prefer to so proportion the width of the rolls for a given length of journal that two or more rolls will be in direct line lengthwise of the sleeve and transversely in spiral lines throughout the surface of the sleeve. The axis pins are fitted in their grooves preferably from the inner side of the sleeve so that the pins will have no endwise movement, and are subjected to no strain but serve to retain the rolls in exact paths and free of contact with the sides of the openings. The sleeve may be made of two or more longitudinal sections to permit the placing of the rolls, and the sections may be secured together by rings 12 fastened to the ends of the sleeves. This construction of split sleeve also allows it to be put in places where collars that are cast or forged on the shaft, or other obstacles, as pulleys, gear &c., would prevent the sleeve, in its cylindrical form, from being put in the place endwise. The sleeve, however, may be made entire and the rolls put in place on its outer side and it can be applied wherever journal friction is to be overcome. The recesses in the inner walls of the sleeve are to permit the placing of the rolls in the openings, and the axis pins may be comparatively small and made to fit snugly in the grooves, so that the rolls can have no sliding movement upon the pins, and in this way the rolls have no frictional contact with the sleeve. This is important because if the walls of the openings be made to form seats or pockets for the rolls, the rolling surfaces of the latter would have more or less contact therewith and consequently be subjected to more or less friction and wear upon themselves and upon the sleeve. The rolls disposed in the way I have stated provide a compact relation and rolling surface covering equally every part of the journal so that the pressure and transverse strain of the latter is uniform. The sleeve thus constructed when set in place for use is capable of free rotation within the box so that the rolls may have contact upon the walls thereof and upon the journal. I prefer however to set the roller sleeve between thin sleeves of hard metal as shown in Figs. 11 and 12, in which one of the said sleeves 5, will form a lining for the box and the other of said sleeves 6 is placed upon the journal.

I prefer to arrange the rolls in rows or lines which stand oblique to the axis of the sleeve which carries them, but the confining pins of the rolls stand parallel with the axis of the sleeve so as to maintain the rolling surfaces in line with such axis, while the path of the rolls will be over the entire surface of the journal and box.

It will be understood that the axis pins are either fixed or loose in the rolls, and that the spaces between the sides of the latter are only sufficient for the metal within which to form the retaining grooves or holes for the roll pins.

Referring to Figs. 11 and 12, 7 is the pedestal; 8 is the separable cap; 9 is the journal or shaft; 6 is the wear sleeve fixed on the journal or shaft; 5 is the wear sleeve fixed on the pedestal, both sleeves being preferably of hardened steel; and 9^a are collars fixed on the shaft to keep the sleeve in place, but it is obvious that the hubs or shoulders may take the place of these collars in different constructions. It is also obvious that the thin steel wear sleeves may be dispensed with.

In Fig. 5 I have shown the rolls as constructed for use for short axis pins and as having a bore for long axis pins, and as having slight hub swells 10 which may serve by contact with the sleeve parts to keep the rolls from lateral or sidewise movement when set in place.

The relative proportions of the journal and rolls and also width of the rolling surface and the number of rolls may be varied to suit the speed, and pressure and special use of the roller sleeve. This system of rolls not only provides for their compact disposition, but for a rolling surface that is not broken in any direction and a relation to their carrier which serves merely to retain the rolls in their proper relative positions without being seated upon the walls of such carrier. The disposition of the rolls is such as to give the advantage of compactness, and a rolling surface supporting the journal or shaft at every point on a fixed surface which is traversed by the rolls at every point, and thus equalize both the pressure and wear of the rollers and the strain on the journal.

I have stated that the rolls are put in place from the inner side of the sleeve, and for this purpose the slots are open at the inner wall of the latter to receive the axis pins of the rolls, and to prevent the rolls from dropping out of place in setting the sleeve in its box, pulley, or pedestal, I close or partially close the open ends of the slots by means of a punch to narrow the ends of the grooves over the roll stems; but it is obvious that the rolls may be put in place from the outer side of the sleeve.

I make the sleeve in longitudinal halves to

permit the rolls to be set and confined in place as stated and to facilitate the placing of the sleeve in the box and fastening its halves together afterward.

I make the rolls preferably of greater diameter than length to obtain the advantage of their arrangement in rows having bearings in parallel lines on the upper and on the under sides of the journal, to give equal pressure and support at both ends of the box at every point in the revolution of the journal; and permit them to be arranged in lines close together endwise and sidewise with small rolling surfaces giving an easy smooth and firm bearing.

Having described a roller bearing embodying in preferred form the several features of my present invention in combination, what I separately claim and desire to secure by Letters Patent is:

1. In a roller bearing, a continuous shell or sleeve having openings in contiguous relation and surface grooves intersecting the opposite sides of said openings, in combination, with rolls having axis pins seated and confined within said grooves, substantially as described.

2. In a roller bearing, a continuous shell or sleeve having openings in contiguous relation, and surface grooves in its inner walls intersecting the opposite sides of said openings, in combination, with rolls having axis pins seated and confined within said grooves, substantially as described.

3. In a roller bearing, a cylindrical shell or sleeve having openings in contiguous relation arranged in parallel lines, which lines are diagonal to the ends of the shell and to its axis, in combination with rolls mounted on axis pins within said openings, whereby each two contiguous rolls are caused to lap in paths which are both parallel with and transversely of the axis of the shell, substantially as described.

4. A roller bearing comprising a cylindrical shell having openings in contiguous relation arranged in parallel lines, which lines are diagonal to the ends of the shell and to its axis, rolls within said openings, and axis pins for said rolls, the said shell, the rolls, and the pins, each capable of independent or separate rotation for the purpose stated.

5. A roller bearing comprising a shell of longitudinal sections, each having openings in contiguous relation arranged in parallel lines, which lines are diagonal to the ends of the shell and to its axis, in combination with rolls of greater diameter than length mounted on axis pins within said openings, and rings at each end of said shell for uniting said sections, substantially as described.

6. In a roller bearing, the combination, with a continuous shell or sleeve having surface openings, rolls therein of greater diameter than length, and axis pins equal to the length of said shell, each pin having rolls disposed in lines, substantially as described.

7. As a new article of manufacture a roller bearing constructed substantially as described, that is, of a continuous shell having openings disposed as described, and provided with surface grooves intersecting the opposite sides of said openings, and rolls having axis pins retained within said grooves to render the shell complete for use.

8. In a roller bearing, the combination, with a shaft and a journal box, of a shell having openings in contiguous relation arranged in parallel lines which lines are diagonal to the ends of the shell and to its axis, and rolls within said openings having axis pins retained on the inner wall of said shell, as shown and described.

In testimony whereof I have hereunto signed this specification in the presence of witnesses.

ALFRED PETTERSON.

Witnesses:
E. PHELPS,
G. E. ENTWISLE.