

(No Model.)

F. M. LECHNER
BALL BEARING.

No. 543,876.

Patented Aug. 6, 1895.

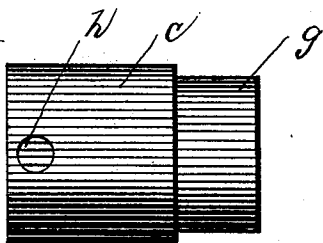
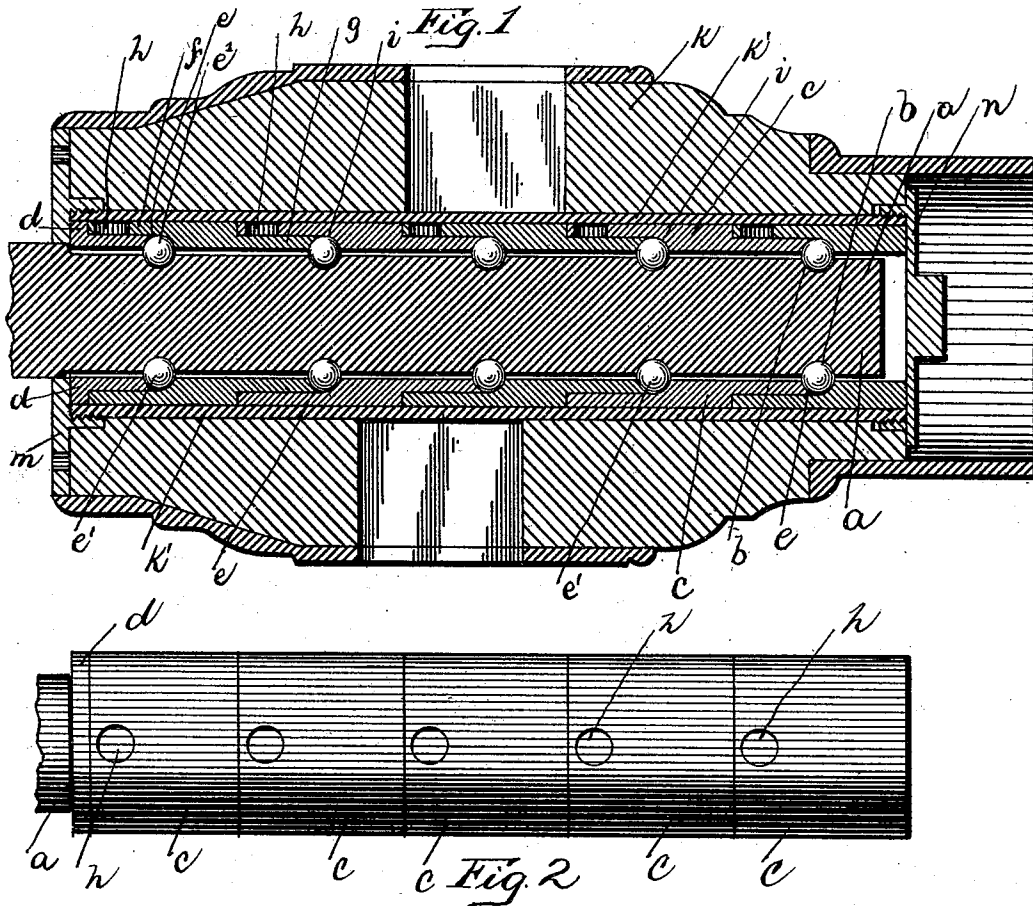


Fig. 3

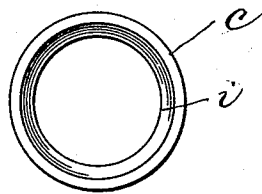


Fig. 4

Witnesses
H. B. Bradshaw
A. L. Phelps

Inventor
Francis M. Lechner.
by *C. C. Shepherd*
Attorney

UNITED STATES PATENT OFFICE.

FRANCIS M. LECHNER, OF COLUMBUS, OHIO.

BALL-BEARING.

SPECIFICATION forming part of Letters Patent No. 543,876, dated August 6, 1895.

Application filed March 9, 1895. Serial No. 541,122. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS M. LECHNER, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Ball-Bearings, of which the following is a specification.

My invention relates to the improvement of ball-bearings for vehicle and other wheels; and the objects of my invention are to provide an improved bearing of this class of superior construction and arrangement of parts and to produce other improvements in details of construction, which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical longitudinal section through a wheel-hub having my improved bearing therein. Fig. 2 is a view in elevation of the boxing. Fig. 3 is a view in elevation of one of the boxing or bearing rings or sections, and Fig. 4 is an end view of the same.

Similar letters refer to similar parts throughout the several views.

a represents the spindle of a wheel-axle, the latter being provided at intervals with peripheral grooves *b*. The spindle thus grooved is adapted to be surrounded by a boxing consisting of a number of ring-sections *c*, which telescope one within the other.

The first ring-section, or that which is employed about the inner end of the spindle, consists, as shown in the drawings, of a collar or short tubular body, which is provided on its inner end with an enlarged head or peripheral flange *d*. The outer end of this inner ring or tube *c* is, as indicated at *e*, concaved to provide a bearing for and conform to the surface curves of a circular row of bearing-balls *e'*, which also bear in the inner one of the spindle-grooves. Each of the remaining ring-sections forming the boxing, with the exception of the outer section, which, as hereinafter described, varies slightly in form, consists of a tubular body, which has formed with its upper portion an inward extension *f* of less thickness than the body of the ring *c*, and which has formed with its lower portion an outward extension *g* corresponding in thickness with the inward exten-

sion *f*. This outward extension has its outer end concaved to conform to the concaved ends of the first or inner ring *c*. As shown in the drawings, the upper ring extension *f* has its upper side flush with the upper side of the ring-body, while the lower ring extension *g* has its under side flush with the under side of said ring-body.

Through each of the extensions *f*, and near the outer end thereof, is formed an opening *h*. The shoulder formed by the junction of the forward extension *f* and the body of each of the rings is, as shown, rounded or concaved, as indicated at *i*. In connecting the ring-sections, formed as above described, to complete my improved boxing, the inner extension *f* of the second ring-section from the inner end is made to fit over the body of the inner end ring or tube *c*, and the outer extensions *g* of the succeeding rings are telescoped within or embraced by the inner extensions *f* of adjoining ring-sections. By thus successively connecting the ring-sections it is obvious that a substantially continuous bearing-tube may be formed of the desired length, which is adapted to loosely surround an axle or shaft-spindle. In order to insert a set of bearing-balls within each of the peripheral grooves of the spindle, one of the sections *c* is first so arranged with reference to the other as to bring its opening *h* immediately over one of the spindle-grooves, thus admitting of the bearing-balls *e'* being dropped downward through said opening into said groove, after which said ring-section is pushed inward until the end of its extension *f* abuts against the body of the ring and the rounded shoulder *i* of said section is in contact with and forms a partial bearing for the bearing-balls thus inserted.

In the construction of the outer one of the rings *c* the outward extension *g* is omitted.

In order to utilize my improved bearing in a wheel-hub *k*, such as shown in the drawings, I provide the bore of said hub with a tubular lining or sleeve *k'*, having external threads on its end portions.

m represents an end washer or cap-plate, the body of which is made to surround the axle at the junction of the latter with its spindle, the inwardly-projecting neck portion of which extends within a recess at the inner

end of the hub and has a screw-threaded engagement with the internal sleeve k' .

The spindle having the sectional boxing thereon, formed as hereinbefore described, is inserted within the hub-sleeve k' until the inner end of said box bears against the cap-plate m , after which a cap-plate n is made to close the outer end of the boxing, said outer-end cap-plate having an internally-threaded neck portion, which, as indicated in the drawings, is adapted to engage with the external threads of the outer end of the sleeve k' .

From the construction and operation which I have herein shown and described it will be seen that the bearing-balls will have their inner surfaces running and bearing within the peripheral grooves of the spindle, while their outer surfaces will bear partially against the concaved ends of the forward extensions of the rings and partially against the shoulders i of said rings. By forming the boxing of the correspondingly-shaped sections c it is evident that the same may be made of any desired length and that a reliable and effective form of ball-bearing is produced which will withstand great wear and which will be inexpensive and easy of construction.

Although the bearing herein described is shown as connected with a vehicle-wheel hub, it is evident that said bearing might be employed for shafting or other spindles.

It will be observed that the end caps m and n will not only serve to hold firmly in place the boxing-sections, but that the heads of said caps, which are of greater diameter than the necks thereof, will bear against the hub ends and operate to retain the hub against any lateral movement on the sleeve k' . In this manner the end caps, in conjunction with the sleeve k' , will serve to bind the hub and its boxing parts together.

Having now fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a ball bearing the combination with a spindle or shaft having a number of peripheral grooves therein, of a boxing surround-

ing said spindle, said boxing consisting of a number of tubular sections or rings telescoped one within the other and bearing balls bearing partially in the spindle grooves and partially within corresponding grooves formed between the telescoped ring sections, substantially as and for the purpose specified.

2. In a ball bearing the combination with a spindle or shaft a having peripheral grooves therein, of a tubular boxing surrounding said spindle, said boxing consisting of a number of ring sections c adapted to fit one within the other, each of said ring sections having an opening therethrough and grooves corresponding to those in the shaft, substantially as and for the purpose specified.

3. In a ball bearing the combination with a spindle or shaft having peripheral grooves therein, of a boxing loosely surrounding said spindle, said boxing consisting of a number of short tubes or ring sections, said sections having grooves corresponding to those in the shaft and inner and outer extensions of less thickness than the bodies of the rings, the inner extensions of said rings having openings therethrough and being adapted to overlap the outer extensions of adjoining rings, substantially as and for the purpose specified.

4. In a ball bearing the combination with a spindle or shaft, having grooves therein, a boxing sleeve having grooves in its inner surface loosely surrounding the same, bearing balls between said sleeve and spindle and bearing in said grooves and a hub body about said sleeve, of end caps m and n each having an inwardly extending internally threaded neck portion, the latter having a threaded engagement with the ends of said sleeve and the heads of said caps having a bearing against the ends of said hub body and the ends of the boxing, substantially as and for the purpose specified.

FRANCIS M. LECHNER.

In presence of—

C. C. SHEPHERD,
A. L. PHELPS.