(No Model.)

L. F. GRISWOLD.

PORTABLE COFFEE MILL.

No. 578,560. Patented Mar. 9, 1897.

Fig. 1.

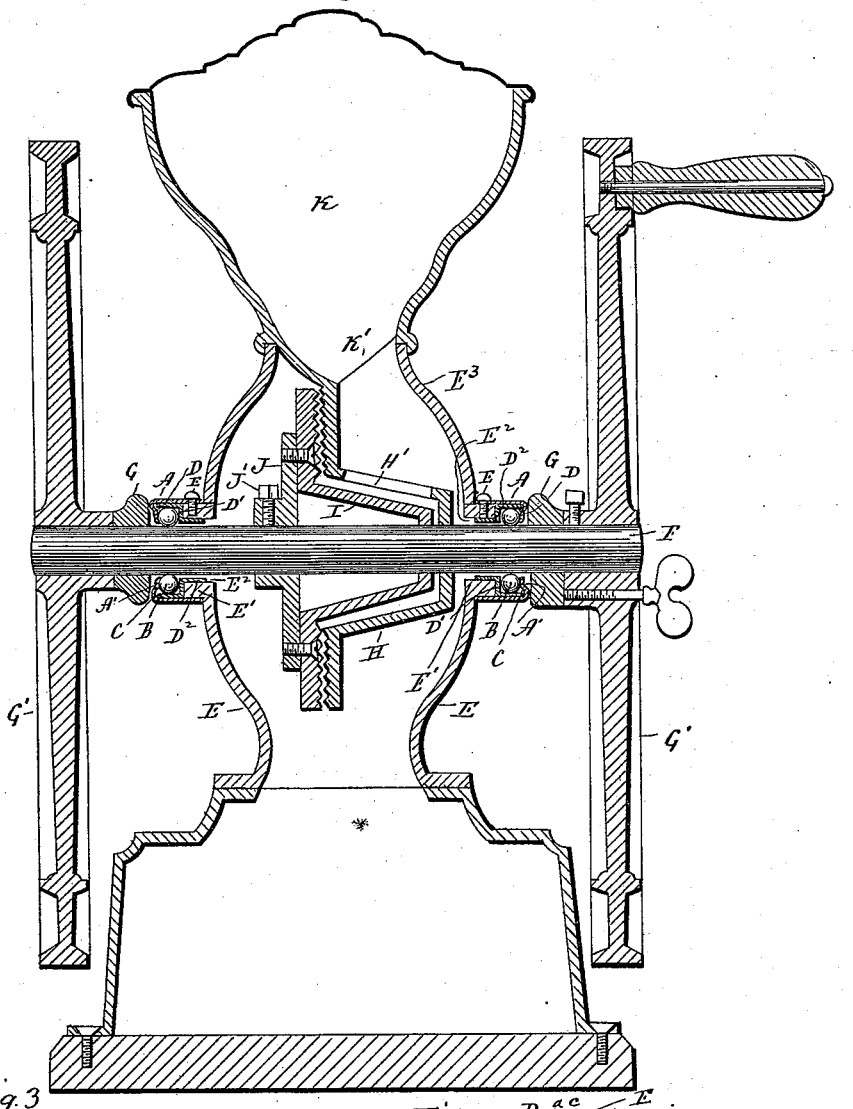


Fig. 3

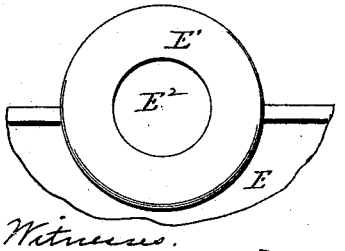


Fig. 4

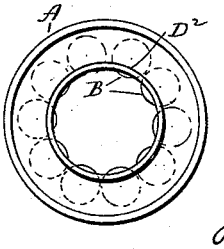
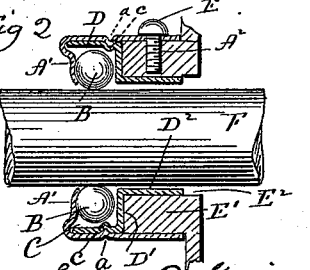


Fig 2



Witnesses.
J. F. Shumway
Lillian D. Kelsey

Lewis F. Griswold.
Inventor.
By atty's Earle & Seymour

UNITED STATES PATENT OFFICE.

LEWIS F. GRISWOLD, OF MERIDEN, CONNECTICUT, ASSIGNOR TO THE CHARLES PARKER COMPANY, OF SAME PLACE.

PORTABLE COFFEE-MILL.

SPECIFICATION forming part of Letters Patent No. 578,560, dated March 9, 1897.

Application filed August 31, 1896. Serial No. 604,414. (No model.)

To all whom it may concern:

Be it known that I, LEWIS F. GRISWOLD, of Meriden, in the county of New Haven and State of Connecticut, have invented a new Improvement in Portable Coffee-Mills; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view, partly in elevation and partly in vertical section, of one form of a portable coffee-mill constructed in accordance with my invention; Fig. 2, a broken view, in vertical section, through one of the ball-bearings; Fig. 3, a broken view, in side elevation, showing one of the ball-bearing supporting-hubs of the body of the mill; Fig. 4, a detached view, in side elevation, of one of the ball-bearings.

My invention relates to an improvement in ball-bearings and in portable coffee-mills adapted to receive the same, the object being to produce a simple, compact, convenient, and effective ball-bearing which may be handled and put into and out of use without endangering the loss of any of its balls and to produce a portable coffee-mill constructed for the convenient application and removal of ball-bearings, as described.

With these ends in view my invention consists in a ball-bearing comprising a cylindrical external shell formed at its outer end with an inwardly-turned retaining-flange and an internal shell having a bearing-flange and a shoulder which coact with the retaining-flange in forming a runway for a circular series of balls, the outward thrust of which is met by two thicknesses of metal, and one of the said shells being utilized for holding the device in place.

My invention further consists in the combination, with a coffee-mill body formed with two outwardly-projecting hubs located opposite each other in vertical planes, and each having a central opening, of two independently-organized ball-bearings removably connected with the said hubs, and a shaft passing through the ball-bearings and hubs and resting upon the balls in the bearings.

My invention further consists in certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

Although my improved independently-organized ball-bearing is not limited to use in connection with coffee-mills, I have preferred to show it in such use. Before, however, proceeding to describe that application of my invention I would like to state that I have spoken of my improved ball-bearing as being independently organized to convey the meaning that it is a complete organization in itself, and that it may be handled as such in being put into or out of use without endangering the loss of any balls or the disturbance of the relation of its bearing-surfaces.

In carrying out my invention, as herein shown, the ball-bearing comprises an external cylindrical shell A, formed at its outer end with an inwardly-turned annular retaining-flange A′, the opening in the center of which is slightly larger than the inner circle which the circular series of antifriction-balls B make. The annular runway C, which receives the said balls, is formed in part by the flange A′ and in part by an internal shell comprising an annular bearing-flange D, a bearing-shoulder D′, standing at a right angle thereto, and an inwardly-extending sleeve D^2, concentric with the said flange D and virtually corresponding in diameter to the diameter of the opening within the flange A′ of the external shell. The flange D aforesaid fits closely within the external shell, with which it coacts to form the inner wall of the runway C, which is thus made of double thickness.

I do not limit myself to any one way of securing the two shells together, but suggest that it may be done by forming an inwardly-projecting annular bead *a* in the external shell in position to lock into a corresponding groove *c*, formed in the bearing-flange D of the internal shell, the bead *a* being sprung into the groove *c*, as it were, when the internal shell is crowded into the external shell. An annular space formed between the inner

end of the external shell A and the sleeve D^2 of the internal shell receives the support, whatever it may be, of the ball-bearing of which the said shells are members. Such a bearing is independently organized in the sense that it does not depend upon extraneous aids for holding the parts in place, but may be handled freely without disturbing them and without endangering the loss of any of the balls. As herein shown, the inner portion of the external shell is formed with a transverse screw-hole A^2 for the reception of a retaining-screw E, which passes through it, as indicated in Fig. 2. By preference the external and internal shells of my improved bearing will be struck up from sheet metal. I would call particular attention to the fact that the outward thrust of the balls is met by two thicknesses of the metal, namely, by the outer portion of the external shell and by the bearing-flange of the internal shell.

In applying my improved ball-bearing to a coffee-mill I form the lower half E of the body of the mill with two outwardly-projecting semi-detached hubs E′ E′, located directly opposite each other in vertical planes and projecting above the upper edge of the said portion E of the body, as clearly shown in Fig. 3. These hubs correspond in external diameter to the internal diameter of the external shells A of the ball-bearings, while their transverse openings E^2 are adapted in diameter to receive the sleeves D^2 of the internal shells of the ball-bearings, whereby the bearings are correctly centered and maintained at a right angle to the hubs and in a plane parallel with the plane of the base of the body of the mill, for it will be understood, of course, that the openings E^2 of the hubs are carefully bored, so as to lie in a plane exactly parallel with the plane of the said base.

In applying my improved ball-bearings to the coffee-mill it is only necessary, therefore, to slip the bearings over the said hubs and secure them thereto by means of screws *e*, which are very readily removed for the removal of the ball-bearings, as required. The main shaft F of the mill passes through the hubs and ball-bearings and is supported by the balls of the latter, as shown in Fig. 1. Collars G G, mounted upon the shaft and interposed between the ball-bearings and the fly-wheels G′ G′ of the mill, bear against the flanges A′ of the ball-bearings and hold the shaft against endwise displacement. As herein shown, the mill is provided with a stationary shell H, coacting with a grinder I, which is secured to a back or supporting plate J, connected, by means of a screw J′, with the shaft F. The upper portion E^3 of the body of the mill is hinged to the lower member E′ thereof in the usual manner. The hopper K is secured to the upper member E^3 of the body and opens downward thereinto through an opening K′, through which the coffee pours upon the shell H, passing through an opening H′ therein to the action of the grinder; but I need not devote further time to describing the detailed construction of the mill, which may be of any approved construction and which may be varied, as desired.

In view of the changes suggested and of other changes which may be made I would have it understood that I do not limit myself to the exact construction described, but hold myself at liberty to make such alterations as fairly fall within the spirit and scope of my invention.

I am aware that a ball-bearing comprising sheet-metal shells suitably differentiated in diameter is not broadly new.

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

1. In a ball-bearing for coffee-mills, &c., the combination with a cylindrical sheet-metal external shell, formed at its outer end with an integral inwardly-turned retaining-flange, of a sheet-metal internal shell having a sleeve of smaller diameter than the said external shell, an integral shoulder located at a right angle to and extending outward from the outer end of the said sleeve, and a bearing-flange formed integral with the said shoulder, fitting closely within the outer end of the external shell, and coacting with the said flange and shoulder in forming a runway for a circle of balls the outward thrust of which is met by the said flange and the outer end of the external shell, the annular space between the inner end of the external shell and the sleeve receiving the support for the ball-bearing.

2. In an independently-organized ball-bearing for portable coffee-mills, the combination with a cylindrical external sheet-metal shell, having an integral inwardly-turned retaining-flange which is located at its outer end, of a sheet-metal internal shell having at its inner end a sleeve of smaller diameter than and concentric with the external shell, an integral outwardly-extending shoulder located at a right angle to the said sleeve, and an outwardly-projecting bearing-flange formed integral with the outer end of said shoulder, fitting closely within the outer end of the external shell, and coacting with the said shoulder and retaining-flange to form a runway for the circle of balls, the outward thrust of which is met by the said flange, and the outer end of the external shell the said flange of the internal shell and a portion of the external shell being adapted by the formation of an annular bead in one shell and the formation of a corresponding annular groove in the other shell to take into each other for holding the two shells together, and the outer shell being utilized for holding the ball-bearing in place upon its support, which occupies the annular space between the inner end of the external shell and the said sleeve.

3. In a portable coffee-mill, the combination with a body comprising an upper and

lower portion, of which the lower portion is formed with two outwardly-projecting semi-detached hubs located opposite each other in vertical planes, and in part projecting above the upper edge of the said lower portion of the body; of two independently-organized ball-bearings removably applied to the respective hubs, a shaft passing through the said hubs and bearings and running upon the balls of the latter, fly-wheels applied to the ends of the shaft, collars interposed between the fly-wheels and the ball-bearings for preventing the endwise play of the shaft, and coffee-grinding devices actuated by the shaft.

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

LEWIS F. GRISWOLD.

Witnesses:
CHARLES C. POWERS,
O. W. GAINES.