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J. H. FLEMING & O. ANDERSON.

SPRING NECK BEARING FOR CENTRIFUGAL MACHINES.

APPLICATION FILED FEB. 3, 1900.

NO MODEL.

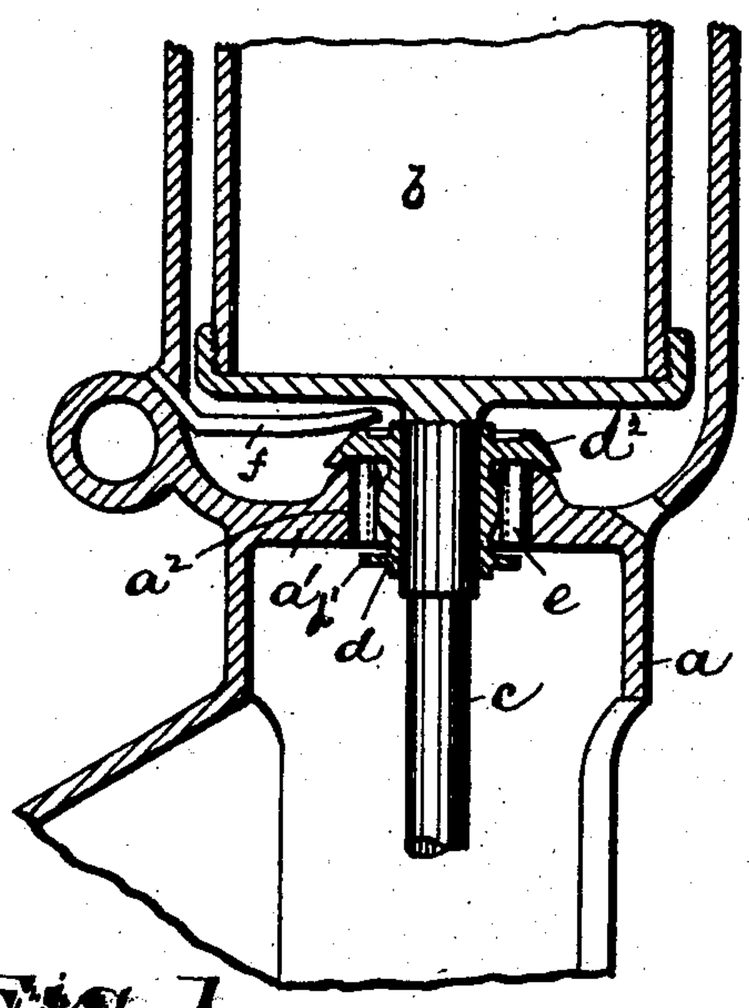

Fig. 1.

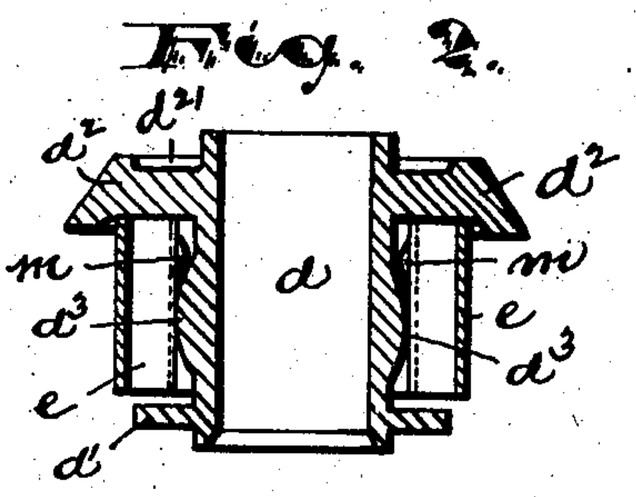

Fig. 2.

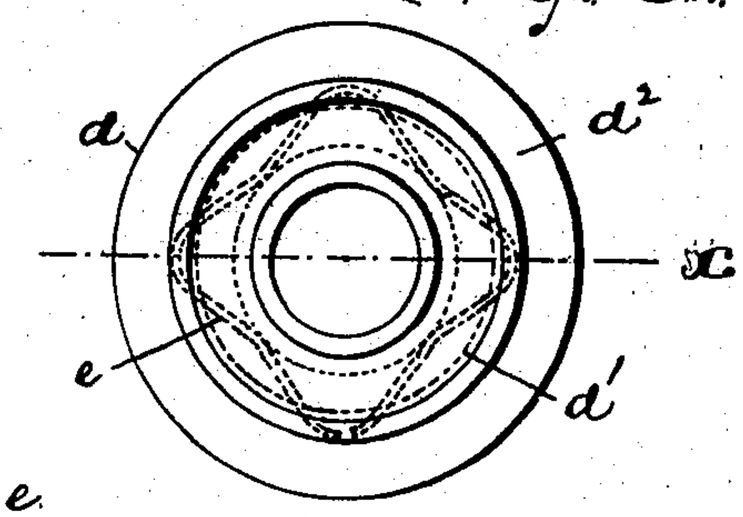

Fig. 3.

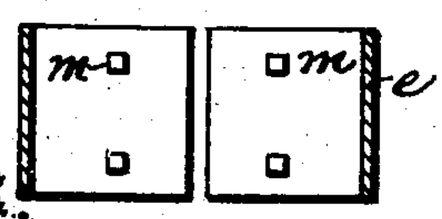

Fig. 5.

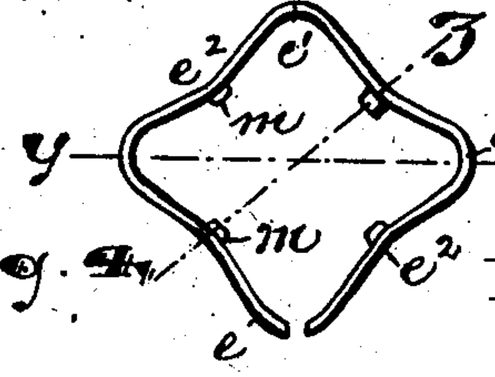

Fig. 4.

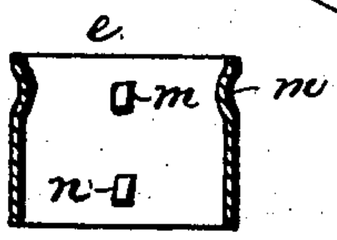

Fig. 6.

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No. 742,178. Patented October 27, 1903.

UNITED STATES PATENT OFFICE.

JAMES H. FLEMING, OF NEWARK, AND OSCAR ANDERSON, OF KEARNEY, NEW JERSEY, ASSIGNORS TO THE NATIONAL DAIRY MACHINE CO., A CORPORATION OF NEW JERSEY.

SPRING NECK-BEARING FOR CENTRIFUGAL MACHINES.

SPECIFICATION forming part of Letters Patent No. 742,178, dated October 27, 1903.

Application filed February 3, 1900. Serial No. 3,813. (No model.)

To all whom it may concern:

Be it known that we, JAMES H. FLEMING, residing at Newark, in the county of Essex, and OSCAR ANDERSON, residing at Kearney, in the county of Hudson, State of New Jersey, citizens of the United States, have invented certain new and useful Improvements in Spring Neck-Bearings for Centrifugal Cream-Separators; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The objects of this invention are to secure a more regular and smooth rotary motion in centrifugal separating-bowls, to avoid the objections due to the use of rubber at the neck-bearings of said bowls, to obtain increased durability, and to secure other advantages and results, some of which may be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved neck-bearing for cream-separating bowls, in the spring employed therein, and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like letters of reference indicate corresponding parts in each of the several figures, Figure 1 is a vertical sectional view of a portion of the improved separator, showing the relation of the neck-bearing and spring to the coöperating parts. Fig. 2 is a sectional view, on an enlarged scale, of the neck-bearing and spring, the section being taken at line x, Fig. 3. Fig. 3 is a plan of the said neck-bearing. Fig. 4 is a plan of a modified form of the neck-bearing spring, and Figs. 5 and 6 are respectively sectional views taken at line y and line z of Fig. 4.

In said drawings, a indicates the bed or frame of a centrifugal creamer. b is the bowl thereof, arranged on a vertical shaft c, the said shaft being rotated at a high rate of speed by any of the means commonly employed for that purpose. At a point beneath the bowl b the frame a is provided with a perforated partition a', adapted to receive the shaft c, the perforation a^2 in said partition being sufficiently large to receive in addition to the said shaft c a neck-bearing piece d and spring e. The said neck-bearing piece d comprises a metal collar adapted to fit around the shaft and support the same in upright vertical position, the said collar having at or near the top an annular flange d^2. This flange d^2 is of a greater diameter than the perforation in the partition a', and therefore rests at its edges upon said partition and serves to support the collar in the perforation with respect to vertical displacement. The upper surface of the flange d^2 is recessed, as at d^{21}, to form an oil-cup, which is supplied by an oil-tube f, as is common in machinery. Near the lower end of the collar is a second annular flange or shoulder d' of small enough diameter to pass through the perforation in the partition a' and lie below said partition when the neck-bearing piece d is inserted to its place. The said lower flange d' serves to support the spring e or as a stop to prevent said spring or broken parts thereof from dropping or falling, and thus, perhaps, injuring or interfering with the other operative parts. The said spring lies around the neck-bearing piece between the top and bottom flanges, and thus within the perforation a^2 in the partition a'. Said spring is adapted to fill the annular space between the collar of the neck-piece and the inner walls of the perforation and to bear against said parts, so that the neck-bearing piece is held in approximately central position relative to the perforation, but with an elastic pressure, which permits the bowl-shaft when rotating at high speed to find its exact center. To secure greater ease of adjustment, the walls of the neck-piece are, between the top and bottom flanges, swelled or rounded outward, as at d^3, so as to form a spherical instead of cylindrical bearing-surface for the spring against the neck-bearing piece. This permits an automatic and more ready twisting of the neck-bearing into alinement with the revolving shaft in case it should be

slightly out of line and aids in securing the nice perfectness of adjustments needed in the extremely rapid rotation of the bowl.

The spring *e* itself is a metal spring, preferably of steel, and thus has the advantage of not being affected by the lubricating-oil used on the neck-bearing and more or less of which finds its way onto the spring. The rubber springs which have been used, for instance, have been open to objection on this score. The spring is formed of a flat strip of steel suitably tempered and being of the proper width to lie between the flanges d^2 d' of the neck-bearing, with enough play at the edges for action, the thickness of the spring being such as will give the proper degree of elasticity. The strip is bent into a band to surround the collar of the neck-bearing, the ends being brought closely adjacent, but preferably left unjoined and slightly separate, as is common in springs. The spring is bent on an irregular sinuous line in edge view, so that the sides of the spring bear against both the neck-bearing and the walls of the perforation a^2 at a plurality of alternating points, thus being distinguished from a circular spring having inward arms at the top and bottom edges. The spring is of an approximately square shape, the rounded corners e' being adapted to engage the interior walls of the perforation a^2 and the sides being pressed inward, as at e^2, to engage the collar *d*, as will be understood upon reference to Fig. 3. Thus constructed the bearings of the spring press diametrically oppositely upon the loose neck-bearing and bear with an easy elastic pressure to accommodate the lateral vibrations of the rotary bowl-carrying shaft, because of the comparatively long extensions of the spring between its points of engagement with the wall of the frame and the open transverse space entirely separating the ends of the spring, permitting said ends a freedom of movement one independent of the other; but notwithstanding the easy resiliency of the spring the same is of one integral piece of stiff and strong metal, such as will not double up should the neck-bearing rotate at rapid rate with the shaft, because of abnormal frictional contact. The improved spring presents to the neck-bearing not only a single integral piece of metal, but it is devoid of edges extending in from its longitudinal transverse edges, said transverse edges being formed by transverse cuts or breaks in its solid continuity where said spring bears on the neck-bearing, and thus under the abnormal rotation of the neck-bearing above referred to there is less liability of the said spring catching upon the neck-bearing and being forced out of normal shape, possibly to the great injury of the machine and its operator, and certainly to the detriment of a continuous operation, and, furthermore, the strength of the spring is not weakened by frequent breaks and cuts in its solid continuity. The sides of the spring may have projections *m* struck up from the surface and serving to lie above the swelled portion d^3 of the collar *d* and prevent the spring from slipping down. Similar projections or lugs may be similarly placed, so as to lie below the swell in the collar, as shown in outline in Figs. 5 and 6, if desired.

Having thus described the invention, what we claim as new is—

1. The combination of a frame having a vertical perforation, a neck-bearing lying loosely in said perforation, and a single, integral, sinuously-bent, leaf-spring presenting a series of rounded corrugations alternately engaging the inner walls of the perforation and outer walls of the neck-bearing, the ends of said spring being free to move independently one of the other.

2. The combination with a perforated frame, a neck-bearing lying loosely in the perforation, of a sinuously-bent four-sided spring arranged between said frame and neck-bearing and presenting at each of its four sides a plurality of rounded, uncut, transverse corrugations to the neck-bearing.

In testimony that we claim the foregoing we have hereunto set our hands this 9th day of September, 1899.

JAMES H. FLEMING.
OSCAR ANDERSON.

Witnesses:
CHARLES H. PELL,
C. B. PITNEY.