UNITED STATES PATENT OFFICE.

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RADIAL ELLIPTICAL SPRING.


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To all whom it may concern:

Be it known that I, CARL OSCAR ANDERSON, a citizen of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Radial Elliptical Springs; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention relates to springs used upon vertical shafts for the purpose of providing a yielding lateral support that will normally center and hold the shaft in a perpendicular position while allowing it to momentarily sway or lean slightly to one side or the other under the action of centrifugal force opposed to the action of the spring which tends to keep the shaft in line.

The object of the invention is to provide a simple and efficient device of the character referred to which may be formed from sheet metal at very little expense in manufacture and which at the same time shall be strong and durable and reliable in practical use.

Figure 1 of the accompanying drawings represents a side elevation of a vertical shaft having a spring thereon embodying my invention, together with parts of a machine with which it may be used, shown partly in full and partly in dotted lines; Fig. 2 is a perspective view of the spring detached; Fig. 3 is an end view of the spring; and Fig. 4 a transverse section thereof.

Referring to said drawings, which form a part of this specification, and in which the same reference letters are used to denote corresponding parts in different views, the letter A may denote a vertical shaft having a sleeve or collar B thereon, which may form one of the shaft bearings, or may rotate on or independently of the shaft, and is preferably formed or provided with end flanges b and b' between which is fitted a radial elliptical spring C embodying my invention; said spring being arranged between and bearing against the shaft or the collar thereon and an adjacent wall or part of an outer casing or shell, as indicated in dotted lines, so as to provide a yielding cushion and adapt the spring to center and hold the shaft in a perpendicular position within the shell or casing, for instance, the bowl or casing of a cream separator, or other machine adapted to rotate about the shaft as a center axis, or within which the shaft may rotate at a high speed. The spring A may be formed from spring metal by cutting from a flat sheet or blank of the required length and width a series of narrow strips leaving between the spaces thus formed a series of strips e springing from and integral with end portions or strips e', which extend transversely of the series of strips e, then bending the series of strips e in opposite directions from each side so that each forms an ellipse, bringing the end portions e' together or nearly so, in parallel planes, and then bending the connected series of elliptical springs into the form of a circle, thus producing a circular series of strips of spring metal each in the form of an ellipse and integral with transverse strips extending around one side of the circular series about midway thereof and adapted to fit around a shaft, as shown in Fig. 1 of the drawings. I thus form what I term a radial elliptical spring, which can be constructed from sheet metal at a very small cost, and when applied to a vertical shaft in the manner indicated will effectually center and keep the shaft normally in line, or in a perpendicular position, during the rapid rotary movements of the shaft or the surrounding shell or casing.

As will be seen, when the spring C is properly fitted upon the sleeve or collar B, as shown in Fig. 1, the series of elliptical springs, which extend radially from said collar, will bear upon or against a relatively stationary part of an outer casing or shell adapted to rotate upon the shaft or within which the shaft may rotate, while the opposite side of the ellipse having the transverse strips arranged on the inner circle formed by the series of elliptical springs will bear against the collar, or vice versa, and thus center and maintain the shaft in a perpendicular position; and under any abnormal pressure sufficient to overcome the force of the spring and cause the shaft to be swayed or inclined slightly toward one side or the other, the spring will immediately restore the shaft to a perpendicular position, in which position it will be maintained by the constant though yielding pressure of
the spring, thus keeping the machine in balance.

In the illustrated embodiment and application of my invention I have shown my improvement applied to one type of machine with which it may be used, but it is not limited in its application to this or any particular type and may be used with various other types and in other positions.

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

1. A circular spring consisting of a series of metal strips each having the form of an ellipse and united at opposite ends thereof with marginal portions which extend transversely of the group.

2. A circular spring consisting of a single piece of sheet metal cut and bent to provide a series of springs each having the form of an ellipse with their end portions integral with marginal portions which extend transversely of the series at one side of the circle concentric with the axis of the spring.

3. A circular spring consisting of a series of narrow metal strips each having the form of an ellipse and integral at opposite ends thereof with narrow marginal portions which extend transversely of the group, said marginal portions being arranged in juxtaposition on the inner side of the circle.

4. In combination, a vertically disposed shaft, a collar on said shaft, an outer casing, and a circular spring cushion interposed between said collar and casing; said cushion consisting of a series of elliptical springs each connected at opposite ends thereof with marginal portions which extend transversely of the series at one side of the circle concentric with the axis of the spring.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

CARL OSCAR ANDERSON.
Witnesses:
CHAS. E. LONG,
H. RAY NISSLY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D.C."