

E. A. HALBLEIB.
SPACER.

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1,290,180.

Patented Jan. 7, 1919.

Fig. 1.

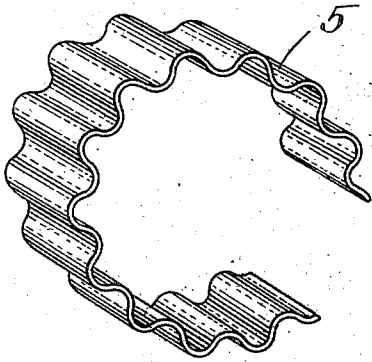


Fig. 2.

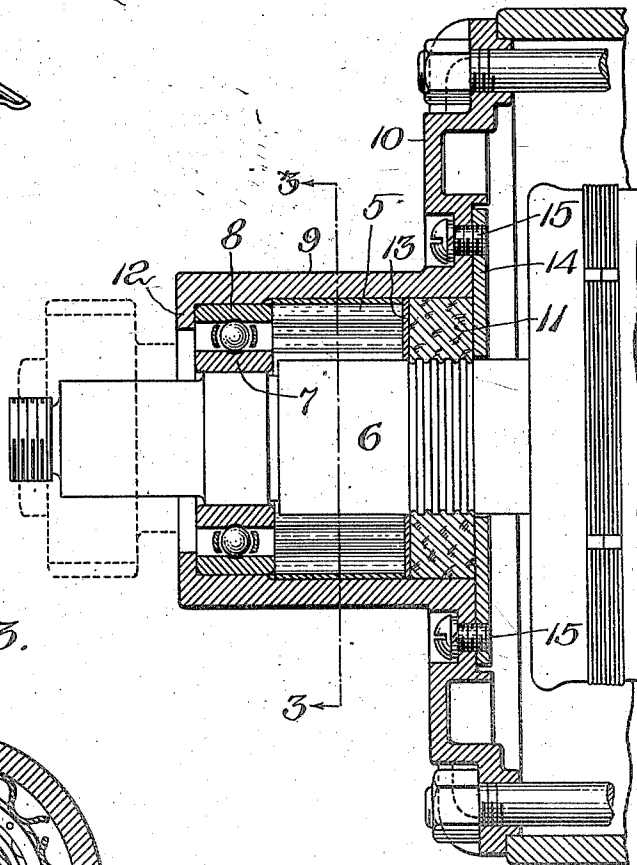
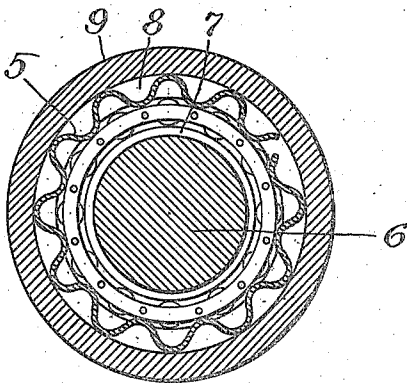


Fig. 3.



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SPACER.

1,290,180.

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To all whom it may concern:

Be it known that I, EDWARD A. HALBLEIB, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Spacers; and I 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.

This invention relates to a spacer for use in separating and spacing annular members such, for example, as ball-bearing races or oil-packings used in connection with rotary shafts.

The object of the invention is to produce a spacer, adapted to be used as a substitute for the washers or sleeves commonly used for the purposes aforesaid, which shall be light and inexpensive, but at the same time sufficiently rigid against transverse pressure, and which, while made of thin sheet-metal, shall still present lateral surfaces of sufficient extent for firm and accurate engagement with the part or parts retained or spaced by the spacer.

To the foregoing ends the invention comprises a spacer formed of a strip of sheet-metal or other sufficiently rigid, and preferably resilient material, this strip being corrugated transversely and being bent, when in use, into a generally-circular form with its ends adjacent.

When the spacer is introduced within a sleeve or chamber, in which a shaft is mounted, the spacer assumes a circular form surrounding the shaft, and its lateral edges engage the part or parts to be separated. The corrugation of the strip not only stiffens it against the transverse pressure to which it may be subjected by engagement with these parts, but it also gives the operative edges of the spacer a wavy form such as to cause them to engage the separated parts over a substantial radial space. By making the spacer of a normal form other than the circular form in which it is held when in use, and by the use of resilient material in the spacer, it may also be caused, when in use, to spring either inwardly or outwardly, as may be convenient, against the surface of one of the co-action members between which it is introduced, so

that the spacer retains itself securely in position without rattling or displacement.

In the accompanying drawings Figure 1 is a perspective view of a spacer constructed in accordance with the present invention; Fig. 2 is an axial section of a part of an electric motor showing the spacer of Fig. 1 as used in connection with the ball-bearing and the oil-packing of the armature-shaft of the motor; and Fig. 3 is a vertical section on the line 3—3 of Fig. 2.

As shown in Fig. 1, the spacer consists of a strip of resilient sheet-metal which is corrugated from end to end and is also curved longitudinally, but not sufficiently to form a complete circle. In Figs. 2 and 3, this spacer is shown in use in connection with an electric motor. This motor has the usual armature-shaft 6, which is mounted in a ball-bearing comprising inner and outer ball-races 7 and 8 respectively. The shaft passes through a sleeve 9 projecting from the end-piece 10 of the frame or casing of the motor, and this sleeve incloses the ball-bearing and supports the outer race 8, which is slipped loosely into the sleeve against a flange 12 at the outer end thereof. The sleeve also incloses and supports an oil-packing ring 11, of cork or other material, which fits closely within the sleeve and also against a portion of the shaft 6.

The spacer 5 is used to retain the ball-race 8 in place against the flange 12, and also to retain the packing-ring in position. As shown in Fig. 2, one lateral edge of the spacer engages directly the lateral surface of the ball-race 8, while the other lateral edge of the spacer engages a thin metal washer 13, which, in turn, is in contact with the packing-ring 11. The parts are all held in position by a disk 14, which engages the inner surface of the packing-ring and is fixed to the head 10 by screws 15.

The above described arrangement is such that the packing-ring may, if desired, be compressed between the disk 14 and the washer 13, since the washer is firmly supported against such pressure by the spacer; and this, in turn, by its engagement with the ball-race 8. Although the spacer is made of thin and light sheet-material, it will effectually resist a considerable transverse pressure, owing to the stiffness imparted to it by corrugation. This corruga-

tion has, however, other and more important functions. In the first place, it affords a radial extent of engagement between the spacer and the ball-race 8 which is of value, particularly by reason of the fact that it permits the sleeve to be counterbored and the outer angle of the ball-race to be rounded off without any danger of the edge of the spacer failing to engage the ball-race properly. The corrugation also affords an increased resiliency to a spacer of a given size, when made of sheet-material of given thickness. Accordingly, it is not necessary, in making the spacer, to curve it exactly, or even approximately, to the diameter of the space in which it is to be used, but the spacers may be made and kept on hand as generally straight, or only slightly curved, corrugated strips of the proper length, and one of these strips, when required for use, may be easily bent into circular form by hand and slipped into the sleeve 9.

When the spacer is used as last described, if it be made of resilient material it will constantly spring outwardly against the inner surface of the sleeve, so as to retain itself in the proper operative position and so as also to prevent any rattling within the sleeve. It will be apparent, however, that, if the spacer, before its introduction

in the sleeve, be given a much more pronounced curve, it will tend to spring inwardly against the surface of the shaft when in use, and this may, in some cases, though not in the illustrated motor, be the preferable arrangement.

I claim:

1. In combination with a sleeve, a shaft co-axial with the sleeve, and annular members surrounding the shaft and inclosed within the sleeve, a spacer for the annular members comprising a strip of sheet-metal corrugated transversely and surrounding the shaft between the annular members, and with its lateral edges in engagement with said members.

2. In combination with a sleeve, a shaft co-axial with the sleeve, and annular members surrounding the shaft and inclosed within the sleeve, a spacer for the annular members comprising a strip of sheet-metal corrugated transversely and surrounding the shaft between the annular members and with its lateral edges in engagement with said members, the spacer being of resilient material and of a normal form such that when confined in the sleeve it springs outwardly into close contact with the sleeve.

EDWARD A. HALBLEIB.