Sept. 2, 1941. C. L. EKSERGIAN 2,255,023

BRAKE DISK ASSEMBLY

Filed May 31, 1939

Fig. 2.

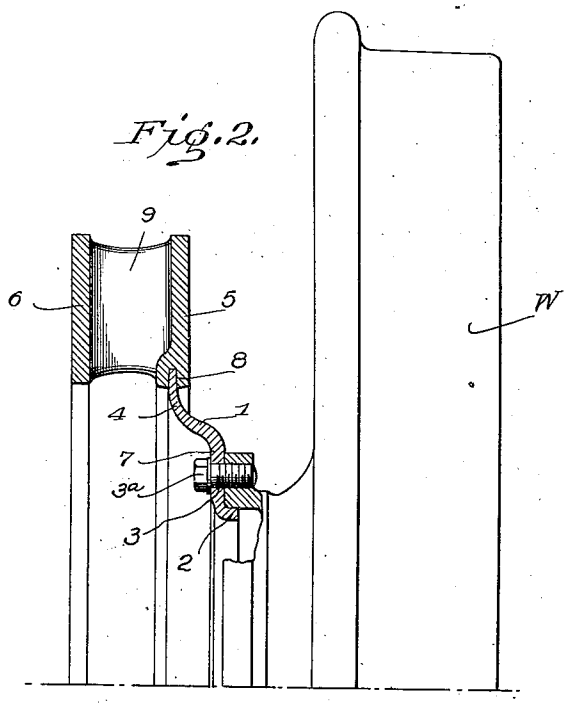


Fig. 3.

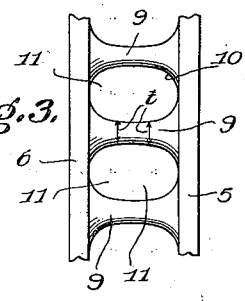


Fig. 4.

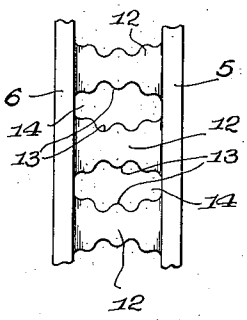


Fig. 1.

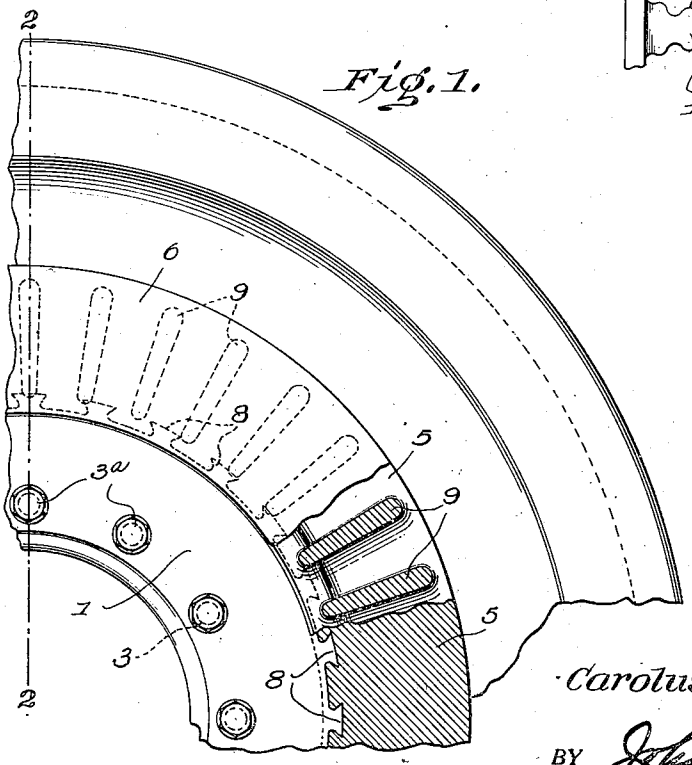
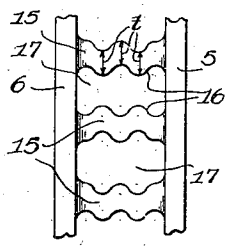


Fig. 5.



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BRAKE DISK ASSEMBLY

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Application May 31, 1939, Serial No. 276,580

4 Claims. (Cl. 188—218)

The present invention relates to a further development of the type of brake disclosed in copending application Serial Number 159,844, filed August 19, 1937, now Patent No. 2,214,762 granted Sept. 17, 1940.

These brakes include rings which cooperate with lateral brake shoes acting against the sides or plane faces thereof, in contrast to the type of brake heretofore common wherein a cylindrical peripheral surface is the active friction surface that receives the brake shoes.

A preferred copending former embodiment of this lateral type of brake employs two rings which are spaced apart, with airblast producing vanes located therebetween, and with braces or ribs rigidly connecting the rings, these usually being made as separate kinds of elements, the ribs being relatively thick and the vanes rather thin. The present invention does away with this difference and provides a single style of heavy rib which serves both purposes.

A clearer understanding of the invention will be had from the present specification and the drawing accompanying the same, disclosing several illustrative forms of the device.

In said drawing:

Fig. 1 is an elevation of a brake disk embodying the invention, applied to a car wheel, parts being shown in section;

Fig. 2 is a fragmentary section of the structure disclosed in Fig. 1, on the plane indicated by the line 2—2;

Fig. 3 is a developed view of a fragment of the periphery of the device shown in Fig. 1;

Fig. 4 is a similar view of a slightly modified form; and

Fig. 5 is a similar view of a still further modification.

Referring first to Figs. 1, 2, and 3, the brake disk is shown as having a supporting web 1 with a flange 2 defining its central edge and forming a hole to make it possible to apply the disk to a wheel and/or axle. A number of holes 3 may be provided in the web 1 to receive the securing bolts 3a, as indicated, for bolting it to the hub of a wheel. The web 1 may also have its outer portion offset, as shown at 4, to bring the rings 5 and 6 out of the plane of the middle portion 7 of the said web.

Preferably a series of keys or lugs, here shown as dovetails 8, is provided at the outermost edge of the web 1, to provide a secure connection with the ring 5 when the ring structure is applied to the web as by casting. The web may have a relatively thin peripheral portion, near the keys 8, and may thence increase in thickness toward the central hole 2, thus providing shear-resisting sectional areas proportioned to the respective moments they must resist. In this way, the material of the web is used to the best mechanical advantage, so that less material will provide sufficient strength than where the entire web is of uniform thickness. It is advantageous to make the web and the rings of different materials, for instance, the rings may be of cast iron, while the web is preferably of wrought steel or similar metal.

The twin ring portion of the assembly consists of the two approximately similar rings 5 and 6 joined by a number of generally radially extending ribs or braces 9. As shown best in Fig. 3, these ribs or braces are provided with generously designed or wide fillets 10, so that they merge very gradually into the rings. The braces or ribs 9 are spaced relatively close together as compared with the spacing of the rings. This provides a very good mechanical construction, that is, it is very strong and rigid, and at the same time it provides also a good heat conduction between the ribs 9 and the rings 5 and 6.

The air passages 11, defined between the adjacent ribs or braces 9, are seen to be large and unobstructed, thus affording free passage to large volumes of cooling air, which are caused to flow by the ribs or braces 9, acting as the propeller blades of a centrifugal blower, when the structure is in rotation while in service. Adequate cooling is thus produced by a very rugged and simple structure, which may readily be cast in a single operation.

Referring now to Fig. 4, the rings 5 and 6 are here shown as connected by ribs or braces 12 which instead of being bounded by the substantially elliptic or circular arcs of Fig. 3, are corrugated to increase the exposed surfaces 13, and thereby also the cooling effect. The passages 14 are therefore of corrugated outline instead of being oval or elliptic, but nevertheless they are of ample area to conduct the cooling air without undue resistance, so that on the whole the cooling effect is increased, without decreasing the mechanical strength or rigidity of the structure.

In order to maintain the ribs of substantially uniform thickness in spite of the corrugations, the form shown in Fig. 5 may be utilized. Here the ribs 15 are bounded by wavy curves 16 so shaped that a convexity on one side of the rib is opposite a corresponding concavity on the other side, so that the thickness dimension t of

the ribs remains substantially uniform throughout most of the length of each rib, but merging at their ends through a wide filleted connection with the rings. The cooling surface of the ribs thus remains substantially the same as in the Fig. 4 form, and the area of the flow passages 17 is approximately the same as in the other forms, but the ribs 15 are made more nearly uniform in strength.

Having thus described a preferred embodiment of the invention and several modifications thereof, it will be understood that the present specification and drawing are to be taken solely in an illustrative sense, and not in any way as a limitation of the invention, which is defined solely in the following claims.

What I claim is:

1. A brake disk comprising a pair of spaced rings, each having a radial braking face, said rings being interconnected by integral circumferentially spaced radially extending braces through substantially the entire radial extent of said braking faces, the braces being spaced relatively close together as compared with the spacing of said rings and having a wide filleted connection with the rings whereby they rigidly connect the rings together and take the braking forces applied to the radial braking faces, the while providing with said rings radial cooling ducts between the braces which act as a centrifugal blower to cause flow of cooling air through said ducts, the rings being relatively thin as compared with the width of said cooling ducts.

2. A brake disk according to claim 1, in which the rings and braces are a unitary casting, and the spacing of the rings, the contour of the braces and their spacing from each other is such as to provide generally oval cross-section ducts between them, said ducts having their major axis at right angles to the rings. the cross-sectional area of the ducts being greater than the cross-sectional area of the braces.

3. A brake disk according to claim 1 in which the braces are of substantially uniform thickness through most of their length and have corrugated side faces, a concave portion on one side being opposite a convex portion on the other side.

4. A brake disk according to claim 1, in which the rings and braces are a unitary casting secured to a member to be braked solely by a web support secured to one only of said rings.

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