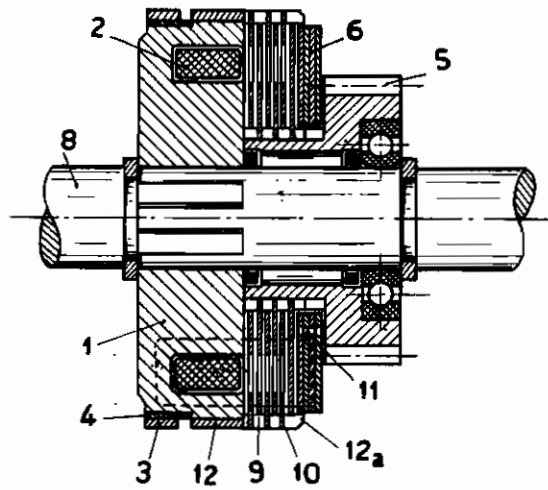


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BY A. P. C.

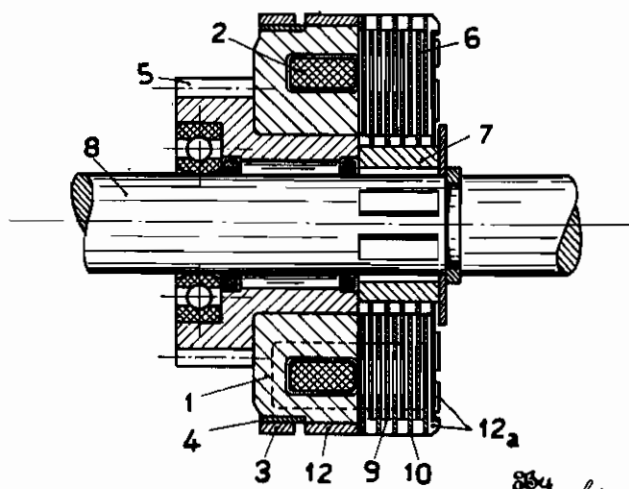
A. RYBA
ELECTROMAGNETIC MULTIPLE-DISC CLUTCH
Filed Nov. 24, 1939

Serial No.
305,991
2 Sheets-Sheet 1

- Fig. 1 -



- Fig. 2 -



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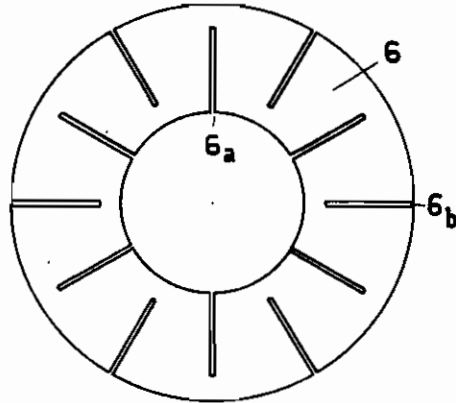
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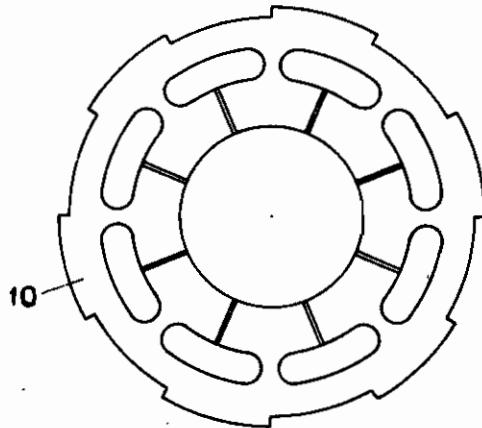
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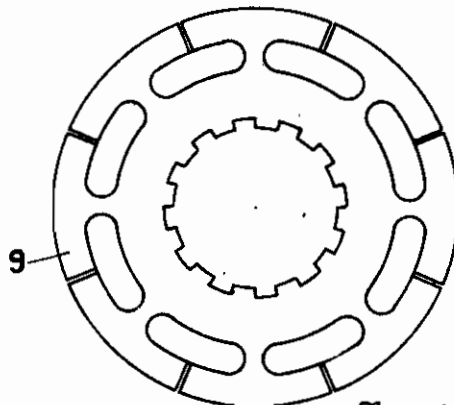
- Fig. 3 -



- Fig. 4 -



- Fig. 5 -



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ALIEN PROPERTY CUSTODIAN

ELECTROMAGNETIC MULTIPLE-DISC CLUTCH

Anton Ryba, Bolzano, Italy; vested in the Alien Property Custodian

Application filed November 24, 1939

The present invention relates to electromagnetic multiple-disc clutches as used in change speed gears of power driven vehicles.

As clutches of this kind must have a very high specific efficiency the friction discs must perfectly bear against each other upon their entire surface and the magnetic circuit must be closed without intervening air spaces.

The object of the invention which is a part continuation of my pending U. S. application Ser. No. 176,339 filed November 24, 1937, for "Electromagnetic multiple-disc clutch" is to provide an electromagnetic multiple-disc clutch which to a high degree fulfills all the above mentioned conditions.

To this purpose the armature serving as the return path for the magnetic flux instead of consisting of a single plate is composed of a plurality of flexible discs which yield upon the action of a magnetic force so that the armature bears with uniform pressure against both pole surfaces, but it is commendable that the friction discs have radial slits in order to prevent tensions in consequence of heat, so that the inner and the outer parts of the discs are able to extend freely, and not arise deformations from the heat, resulting in a uniform loading of the entire friction surface of the discs.

In the accompanying drawings some constructions of clutches according to the invention are shown by way of example.

In these drawings:

Fig. 1 shows a longitudinal section through a clutch in which the magnetic flux twice traverses the set of discs,

Fig. 2 shows a longitudinal section through a clutch in which the armature discs simultaneously serve as friction surfaces,

Fig. 3 shows an elevation of an armature disc having slots to increase the flexibility,

Figs. 4 and 5 show an inner and an outer friction disc with radial slits in order to compensate extensions of heat.

As shown in the drawings a gear wheel 5 is rotatably mounted upon a shaft 8. An electromagnet 1 is according to Figs. 1 and 2 fixed to the shaft 8 and the gear wheel 5 respectively and in its annular space carries the exciting coil 2 the two terminals of which are connected to mass on the one hand and to a slip-ring 3 on the other hand. The latter is pressed upon the electromagnet 1 and an insulating layer 4 is arranged between the ring 3 and the electromagnet 1. Connected to the latter is also a ring 12 provided with claws 12a into which engage the outer discs 10. In Fig. 1 the gear wheel 5 is provided with an elongated hub having notches into which engage the inner discs 9. According to the construction shown in Figs. 2 and 3 the inner discs 9 engage into a notched hard sleeve 7. The armature 6 consists of a plurality of thin flexible discs which, as shown in Fig. 3, may be provided with slots 6a, 6b to increase their flexibility. The armature discs may either all be connected to one and the same clutch member or with none of the clutch members or alternately with both clutch members. With the exception of the last mentioned case the armature discs may be connected at suitable points, for instance as shown in Fig. 1 by rivets 11. Such connection, however, must be as not to impair the flexibility of the discs.

Fig. 4 shows an outer disc with slits in the inner ring.

Fig. 5 shows an inner disc with slits in the outer ring. By this means are prevented tensions of heat, because the parts of the rings are able to extend. The number of the slits is free.

When the circuit is closed a magnetic field is produced in the sense of the dotted line under the action of which the flexible armature discs perfectly uniformly bear against the set of friction discs and thereby warrant a uniform bearing of same at iron closed magnetic circuit.

ANTON RYBA.