

PATENT SPECIFICATION

325,425

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PROVISIONAL SPECIFICATION.



Rotary Compressors for Supercharging Internal-combustion Engines.

We, THE ALVIS CAR & ENGINEERING COMPANY LIMITED, a British Company, and GEORGE THOMAS SMITH-CLARKE, a British Subject, both of Holyhead Road, Coventry, Warwickshire, do hereby declare the nature of this invention to be as follows:—

This invention relates to rotors for superchargers of the Roots' blower type, and it has for its object to provide a construction which will stand up to high speeds and long usage.

These rotors have a considerable fly-wheel effect when running at high speeds, and it is essential, therefore, that they should be made as light as possible. Consequently, the blades are usually bored endwise, or otherwise hollowed out, but trouble is very often experienced owing to the "lands" (that is to say, the peripheral portions which sweep the casing) breaking away from fatigue along their edges. It is the object of the present invention to provide a substantial rotor which will not break in this way and yet can be easily machined.

According to this invention, the rotor is of solid metal in each blade of which is machined from one edge to the other a circular bore provided with one or more inwardly projecting ribs transverse to the axis of the bore.

In one construction, each blade is roughly of circular section, the diameter of such circle being at about half the radius of the complete blade. At the extreme periphery the blade is elongated

radially slightly to form a "land". This "land" is the tip of the blade, and its extreme surface forms part of a circle of a diameter practically equal to that of the bore of the casing. Or this surface may be flat and be tangential to the axis of rotation. The blades are formed integrally with a centre which is adapted to be attached to, or is formed with, the rotor spindle, and the whole is formed from solid metal, such as steel.

Each circular blade portion is then machined out hollow, and the machining is so effected that, at each end, and at intermediate intervals, inward circular ribs or flanges are left which extend completely round the bore. If desired a single helical rib may be formed inside the bore instead of a number of circular ones.

In this way a very strong construction is produced, although the walls of the blades can be very thin and the complete blades very light. The circular flanges prevent any "panting" of the sides of the blade, so that the fatigue which occurs along the edges of the "lands" with existing types of rotor blade is absent and consequently the rotor can run at high speeds without fear of failure.

Dated this 6th day of April, 1929.

ERIC W. WALFORD. M.I.A.E.,
Fellow of the Chartered Institute of
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19, Hertford Street, Coventry,
Agent for the Applicants.

COMPLETE SPECIFICATION.

Rotary Compressors for Supercharging Internal-combustion Engines.

We, THE ALVIS CAR & ENGINEERING COMPANY LIMITED, a British Company, and GEORGE THOMAS SMITH-CLARKE, a British Subject, both of Holyhead Road, Coventry, Warwickshire, do hereby declare the nature of this invention and in what manner the same is to be performed,

to be particularly described and ascertained in and by the following statement:—

This invention relates to rotors for superchargers of the Roots' blower type, and it has for its object to provide a construction which will stand up to high speeds and long usage.

These rotors have a considerable fly-wheel effect when running at high speeds, and it is essential, therefore, that they should be made as light as possible.

5 Consequently, the blades are usually bored endwise, or otherwise hollowed out, but trouble is very often experienced owing to the "lands" (that is to say, the peripheral portions which sweep the casing) 10 breaking away from fatigue along their edges. It is the object of the present invention to provide a substantial rotor with hollow blades which will not break in this way.

15 According to this invention, each of the hollow blades has one or more inwardly-extending ribs transverse to the rotor axis and the blades and ribs are formed integrally with the rotor spindle or a 20 centre portion adapted to fit thereon.

Two forms of rotor adapted according to the invention are illustrated in the accompanying drawings, where:—

25 Figure 1 is a longitudinal section of one form of rotor;

Figure 2 an end view thereof;

Figure 3 a longitudinal section of the other form of rotor; and

30 Figure 4 an end view of the rotor of Figure 3.

Like reference numerals are used throughout the drawings to denote similar parts.

In the arrangements illustrated, each 35 hollow blade 2, 2 is roughly of circular section, the diameter of such circle being about half the radius of the complete double blade. At the extreme periphery the blade is elongated radially slightly to 40 form a "land" 3. This "land" is the tip of the blade, and its extreme surface 4 forms part of a circle of a diameter practically equal to that of the bore of the casing, as shown in Figures 1 and 2. Or 45 this surface 4 may be flat and at right-angles to the major axis of the rotor, as shown in Figures 3 and 4. The blades are formed integrally with a centre 5 which is formed with the rotor spindle 6, 50 Figures 1 and 2, or splined for attachment thereto.

The double-bladed rotor is formed from

solid metal, such as steel. In the arrangement of Figures 1 and 2, each 55 circular blade 2 is machined out hollow, and the machining is so effected that, at each end, and at intermediate intervals, inward circular ribs or flanges 7, 7 are left which extend completely round the 60 bore. In Figures 3 and 4 a single helical rib 8 is shown formed inside the bores instead of a number of circular ones.

By this invention a very strong construction is produced, although the walls of the blades can be very thin and the 65 complete blades very light. The circular or helical flanges prevent any "panting" of the sides of the blade, so that the fatigue which occurs along the edges of the "lands" with existing types of rotor 70 blade is absent and consequently the rotor can run at high speeds without fear of failure.

Having now particularly described and 75 ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A rotor, for a supercharger of the Roots' blower type, having hollow blades 80 each with one or more inwardly-extending ribs transverse to the rotor axis, the blades and ribs being formed integrally with the rotor spindle or a centre portion adapted to fit thereon. 85

2. A rotor, for a supercharger of the Roots' blower type, which is formed from a block of metal and in each blade of which a circular bore, provided with one 90 or more inwardly-extending ribs transverse to the axis of the bore, is machined from one end of the blade to the other.

3. The complete rotor, for a supercharger of the Roots' blower type, substantially as hereinbefore described and as 95 illustrated in Figures 1 and 2 or Figures 3 and 4 hereof.

Dated this 26th day of November, 1929.

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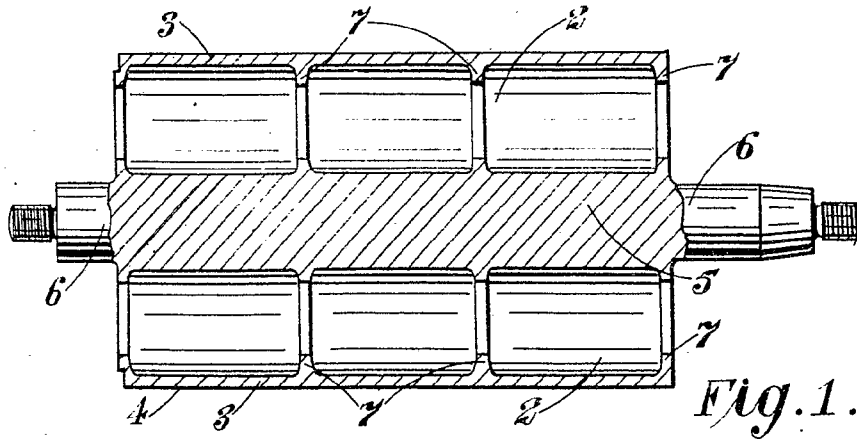


Fig. 1.

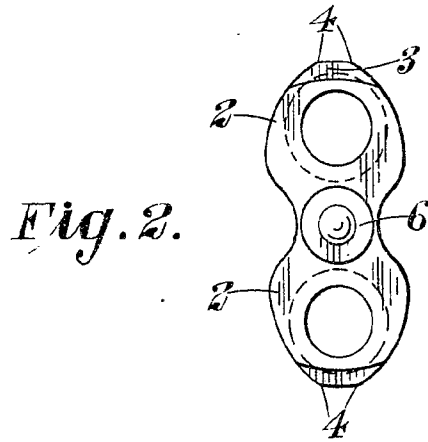


Fig. 2.

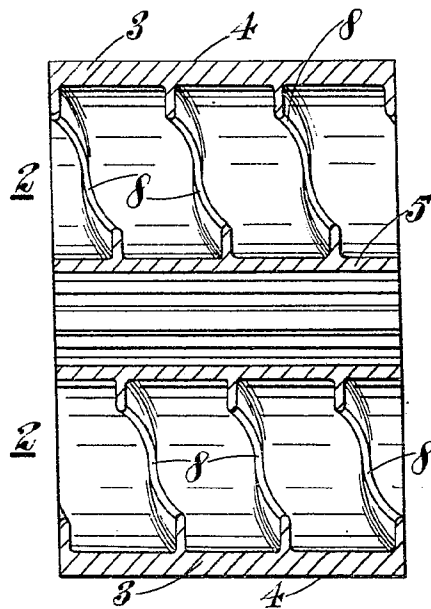


Fig. 3.

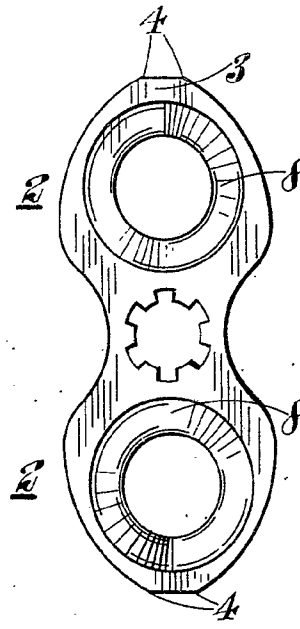


Fig. 4.

[This Drawing is a reproduction of the Original on a reduced scale.]