

Feb. 7, 1933.

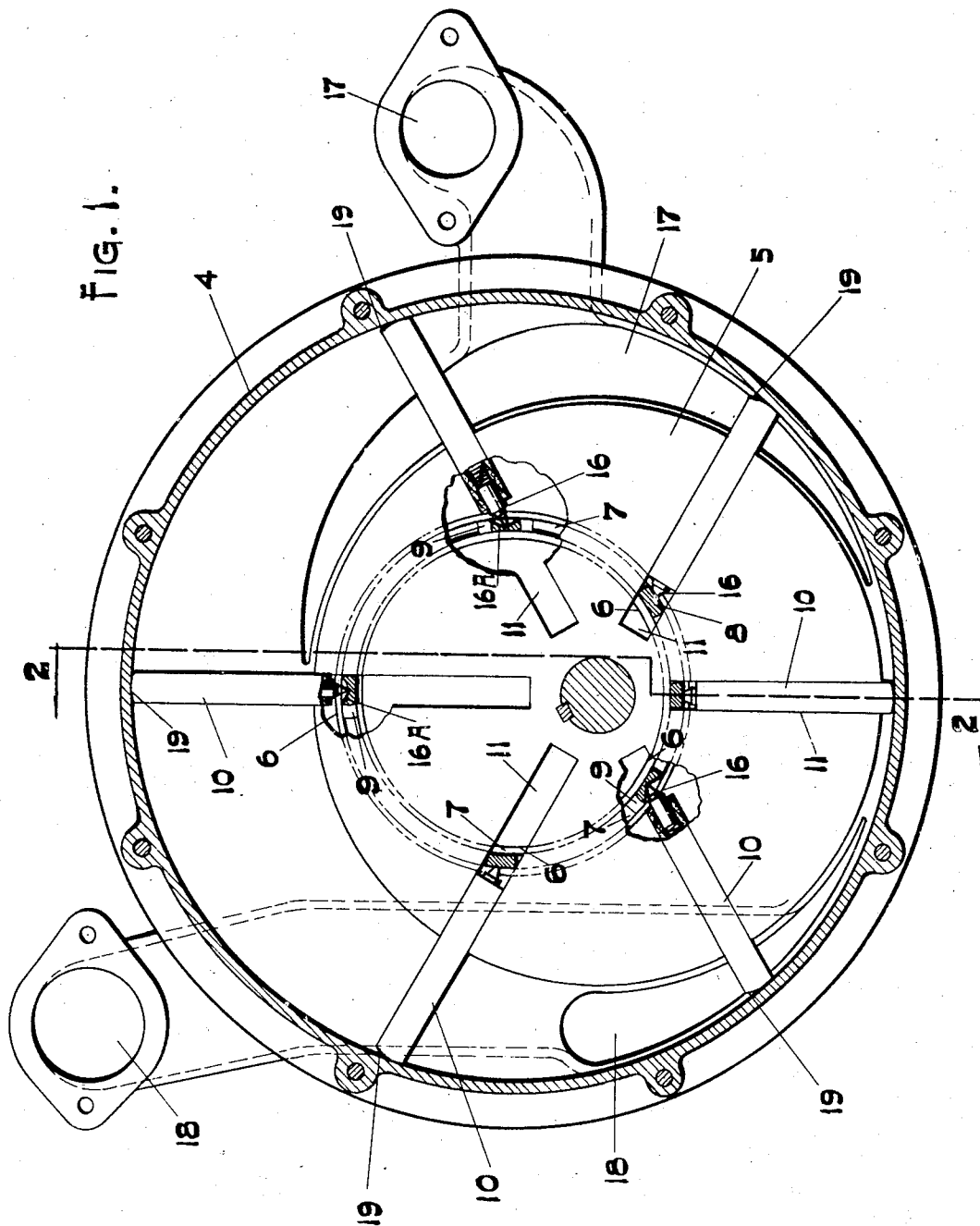
O. H. SPENCER

1,896,256

ENGINE CHARGER.

Filed March 9, 1929

2 Sheets-Sheet 1



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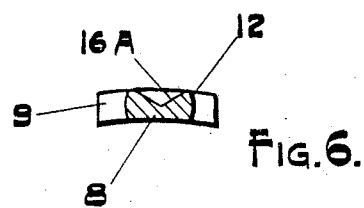
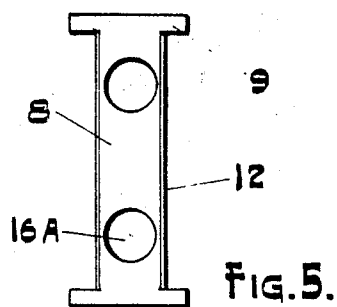
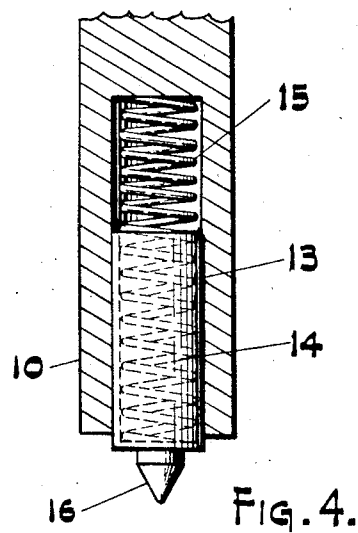
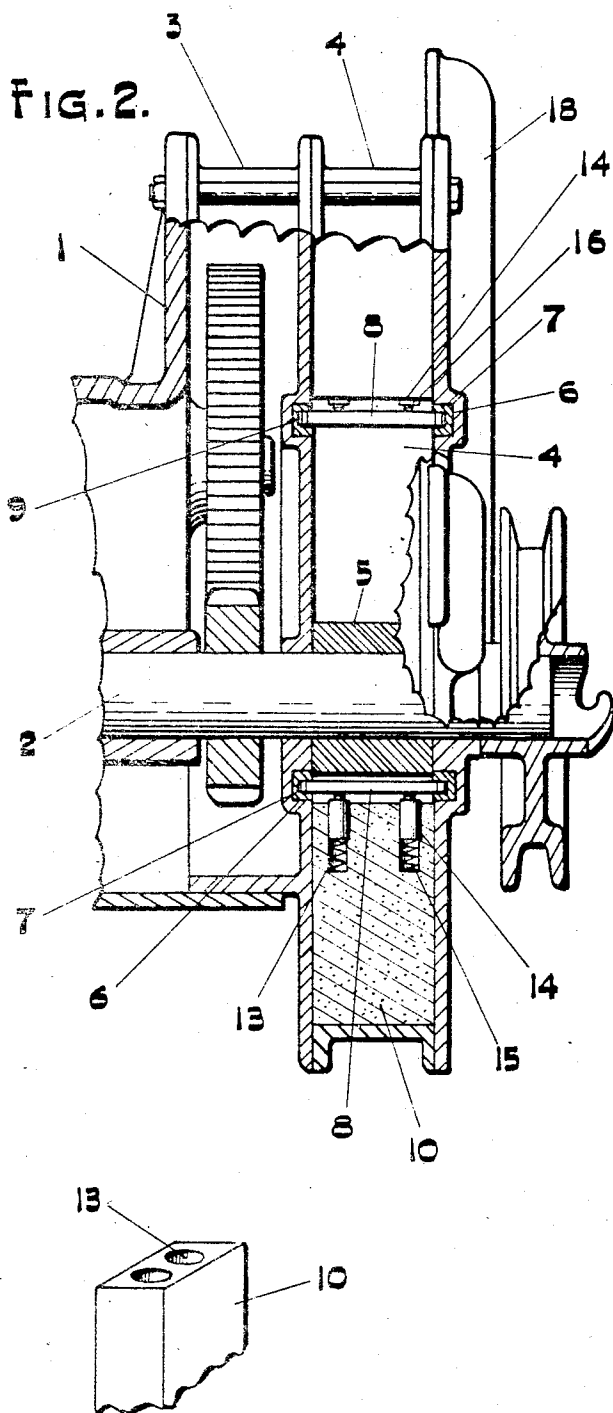
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UNITED STATES PATENT OFFICE

OWEN H. SPENCER, OF INDIANAPOLIS, INDIANA

ENGINE CHARGER

Application filed March 9, 1929. Serial No. 345,811.

This invention relates to an engine supercharger and is particularly adapted for use in connection with internal combustion engines and the prime feature of the invention is the provision of means for directing a blast of air over parts of an engine for cooling the same or into the cylinders of the engine for cooling purposes and supplying an increased amount of oxygen to the fuel mixture for enriching the same, as well as for introducing a gaseous or liquid fuel to an explosive engine.

A feature of the invention is the provision of a spider and a housing therefor, the spider being eccentrically mounted within the housing and having a plurality of radiating slots transversely therethru.

A further feature of the invention is the provision of a blade for each slot, said blades being preferably constructed of fabric, reinforced bakelite or similar material the pores of which are impregnated with graphite or the like.

A further feature of the invention is the provision of means for causing said blades to positively travel lengthwise of said slots whereby the outer ends of the blades will constantly contact with the inner peripheral wall of the housing.

A further feature of the invention is in so constructing the blade shifting means that the bearing face thereof may readily assume a position at an angle to the base of the blades, due to the difference between the path of radial travel of the shifting means and that of the spider.

A further feature of the invention is the provision of spring controlled means for retaining a constant contact between the blades and the shifting means therefor and in a manner to direct outer pressure against one member and inward pressure against the other.

Other objects and advantages will be hereinafter more fully set forth and pointed out in the accompanying specifications.

In the accompanying drawings which are made a part of this application,

Figure 1 is a transverse vertical section of the supercharger with parts broken out.

Figure 2 is a sectional view as seen in the proximity of line 2—2, Fig. 1.

Figure 3 is a detail perspective view of one of the blades removed from the spider.

Figure 4 is an enlarged sectional view thru a portion of one of the blades.

Figure 5 is a plan view of one of the blade shifting members, and,

Figure 6 is a cross sectional view thereof.

Referring to the drawings in which similar reference numerals designate corresponding parts thruout the several views, 1 indicates the forward end of a crank case of an engine, thru which extends a driving shaft 2, and to the end of which is attached a gear casing 3, as is usual.

Mounted forwardly of the gear casing 3 and forming the forward wall thereof, is a housing 4, in which is rotatably mounted a spider 5, said spider being concentrically mounted on the shaft 2, while the housing 4 is eccentrically mounted with respect to said shaft and spider. The face walls of the housings 4 and 3 have circular channels 6 therein, in which are placed races 7 of relatively harder material than that of the housing, said races being concentric with the housing 4.

Cooperating with the races 7 are cross bars 8, said bars having integral shoes 9 at the ends thereof, which fit and slide in said races and are curved coincident to the curvature of the races. Fitting between the cross bars 8 and the peripheral wall of the housing 4 are a plurality of blades 10, which enter and slide longitudinally in grooves 11 formed transversely thru the spider 5 at intervals, said grooves extending from points adjacent the axis of said spider to the outer edges thereof so that the outer ends of the blades may contact with the inner face of the peripheral wall of the housing 4 and the lateral edges thereof with the face walls of the housing.

The blades 10 are preferably formed of bakelite or similar material, the pores of which are impregnated with graphite or the like, thus producing a surface which will not become worn by frictional contact with the walls of the housing 4.

As the bodies of the cross bars 8 pass thru

the grooves 11 and move inwardly and outwardly therein, and as the travel of the cross bars is eccentric to the axis of the spider 5, the cross bars will be given a slight rocking movement as they travel around the shaft 2, the corner edges 12 of the cross bars are rounded as best shown in Fig. 6, thus permitting a sufficient rotating movement of the cross bars within the grooves 11, to compensate for the change of position of the cross bars. It has been found in actual practice that the cross bars 8 have a tendency to crowd against one face of the grooves 11 due to the drag of the shoes as they travel through the channels and move out of direct alinement with the blades cooperating therewith and it has been found that by rounding the edges of the cross bars 8, so that each side edge will represent the arc of a circle, some portion of each edge of the cross bar will always bear against the walls of the groove 11, thus preventing the drag thrust between the shoes 9 and channels in which they travel, drawing the cross bars out of true alinement with the blades 10.

The inner ends of the blades 10 are provided with one or more bores 13 into each of which is disposed a plunger 14, a spring 15 being also positioned within said bore and exerting constant outward pressure against the plunger. The outer end 16 of the plunger 14 is preferably substantially pointed so that it will engage in the tapered recesses 16A in the cooperating cross bar 8 and press firmly thereagainst at whatever angle the face of the cross bar may be to the trend of the cooperating blade 10. The tapered recesses 16A extend substantially half way thru the cross bars 8 so that the points 16 of the plungers 14 will always rest against the lowermost portion of the tapered recesses 16A at whatever angle the cross bars 8 may be turned to the longitudinal plane of plungers 14. The angle of the walls of the recesses 16A is less acute than the angle of the ends 16 so that at no time will the face of the pointed end 16 contact with the inclined walls of the recesses 16A other than at the extreme points thereof.

The contact point of the recesses 16A with the plungers 14 is substantially coincident to the axial line of the cross bars 8, about which the round edges thereof are developed for contact with the slots 11.

The tension of the spring 15 is such that the blade will be held more or less firmly against the peripheral wall of the housing 4 and making a substantially airtight joint therebetween.

Connected with the forward wall of the housing 4 is an intake port 17 and an exhaust port 18, the opening of the said intake port at its entrance into the housing being substantially crescent shaped or tapered from its central part to more or less finer points at its ends, while the exhaust port at its en-

trance into the housing has a full volume at one end and tapers to a finer point at its lower end. By arranging the intake port 17 in substantially crescent shape, the air is gradually gathered up by the blades 10 and likewise gradually cut off, while the port 18 is so arranged that the enlarged end thereof is first encountered, allowing the accumulated air between the pairs of blades to discharge rapidly and gradually cut off.

The outer or contacting ends 19 of the blades 10 are preferably so chamfered that they will form a positive contact with the peripheral wall of the housing 4 at whatever angle the blades may be resting with respect to said wall, thus insuring a substantially non-leaking joint between these elements.

While the description and drawings illustrate in a general way certain instrumentalities which may be employed in carrying the invention into effect, it is evident that many modifications may be made in the various details, without departing from the scope of the appended claims, it being understood that the invention is not restricted to the particular examples herein described, as it may be used as a positive blower for any required purposes.

I claim as my invention:

1. In a supercharger for motors, a housing having outwardly offset circular channels in its side walls concentric with the housing, a spider eccentrically mounted within said housing, said spider having one or more radiating grooves therein, blades longitudinally movable in said grooves, cross bars extending transversely thru said grooves at the inner ends of said blades, each side edge of which describes an arc of a circle and arcuate shoes at the ends of said cross bars adapted to enter and travel in said channels, whereby said cross bars will be moved inwardly and outwardly as the spider is rotated.

2. In a supercharger for motors, a housing, a pair of races set into the side walls of the housing and concentrically therewith, a spider rotatably mounted within said housing and eccentrically to said races, said spider having radiating grooves, a cross bar extending transversely thru each groove, elongated arcuate shoes integral with each end of said cross bars fitting and travelling in said races, said shoes imparting slight rotating action to said cross bars as said shoes travel through said races, blades slidable in said grooves, and means for forming yielding contact between said blades and cross bars.

3. In a supercharger for motors, a rotating spider having radial grooves therein, cross bars extending transversely thru said grooves, the edge corners of said cross bars being rounded whereby said cross bars may have slight rotation in said grooves, shoes integral with the ends of said bars, and means engaging said shoes for moving said cross

bars inwardly and outwardly in said grooves.

4. In a supercharger for motors, a rotating spider having radial grooves therein, a blade in each groove, a cross bar extending transversely thru each groove beneath the blade therein, means for moving said cross bars inwardly or outwardly in said grooves, one or more plungers carried by each blade, the inner ends of which are pointed, and tapered recesses in the cross bars for receiving said pointed ends, and yielding means for maintaining contact between said plungers and cross bars.

5. In a supercharger for motors, a housing having circular channels in the side walls thereof and concentric therewith, a spider mounted within said housing and eccentrically to said channels, said spider having radial grooves transversely therethrough, a longitudinally movable blade in each groove, a bar passing transversely through each groove between the inner end of the groove and the inner end of the blade, the side edges of said bar being curved and of such extent that some portion of said side surfaces will always contact with some portions of the walls of said groove for receiving the drag stress against said bar and prevent the bar moving out of alignment with its cooperating blade, and shoes at the ends of said bar adapted to enter and travel in said channels and move the cooperating blade outwardly, said shoes imparting rotating action to said bar incident to their travel through said channels.

35 In testimony whereof, I have hereunto set my hand on this the 5th day of March, 1929,
A. D.

OWEN H. SPENCER.

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