A. MAIRE.

MEANS FOR ATTACHING SHEET STEEL JACKETS TO CAST IRON MOTOR CYLINDERS, FOR WATER COOLING AND OTHER PURPOSES.

1,345,684. APPLICATION FILED JULY 14, 1916.

Patented July 6, 1920.

Fig. 2

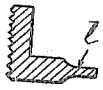


Fig. 1

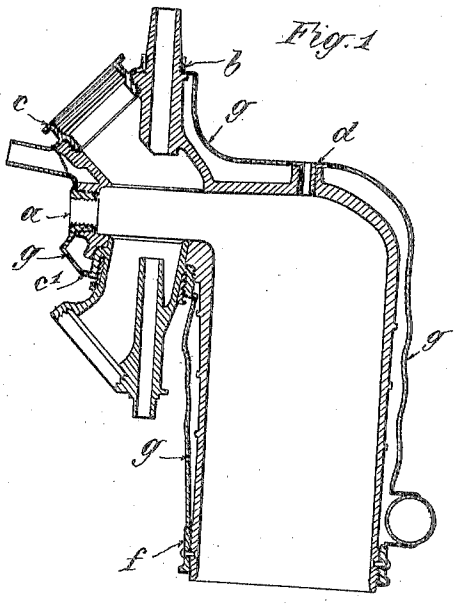


Fig. 3

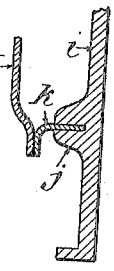


Fig. 4

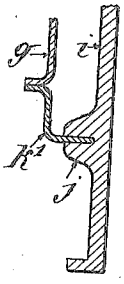
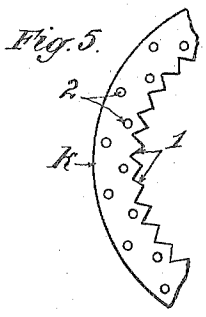


Fig. 5.



Inventor
Auguste Maire
by Attorneys
his Attorneys

UNITED STATES PATENT OFFICE.

AUGUSTE MAIRE, OF ARGENTEUIL, FRANCE, ASSIGNOR TO SOCIETE LORRAINE DES ANCIENS ETABLISSEMENTS DE DIETRICH & CIE. DE LUNEVILLE, OF PARIS, FRANCE.

MEANS FOR ATTACHING SHEET-STEEL JACKETS TO CAST-IRON MOTOR-CYLINDERS, FOR WATER-COOLING AND OTHER PURPOSES.

1,345,684. Specification of Letters Patent. Patented July 6, 1920.

Application filed July 14, 1916. Serial No. 109,231.

To all whom it may concern:

Be it known that I, AUGUSTE MAIRE, citizen of the Republic of France, residing at Route de Bezons, Argenteuil, Seine and Oise, in the Republic of France, have invented new and useful Improvements in Means for Attaching Sheet-Steel Jackets to Cast-Iron Motor-Cylinders, for Water-Cooling and other Purposes, of which the following is a specification.

In the manufacture of light motors such as aviation motors, very great difficulties have been experienced in making light cylinders with water-cooling jackets.

Water-cooled cylinders made with cast iron jackets are very heavy, and the problem of attached jackets has been really solved only in the case of steel cylinders upon which it is a comparatively easy matter to weld a casing of sheet steel.

This invention has now for its object to provide improved means for affixing a sheet steel jacket to cast iron cylinders.

My invention obviates the necessity of welding cast iron to steel which is well known to be a rather difficult operation.

The invention consists substantially in mounting on all the bosses of the motor, which contain the sparking plugs, valves, pipes, etc., and also on the barrel of the cylinder on the side nearest the gear case, steel ferrules, rings or collars screwed very tightly upon surfaces that have been perfectly worked or machined in such a manner as to make a tight joint and in leaving around the circumference of these ferrules or collars a thinned portion to form a lip, and then fixing the water jacket on these lips by welding steel to steel.

In the case of twin cylinders it is more difficult to fix the steel collars upon the barrels of the cylinders, because these collars cannot be screwed on by reason of the flange that serves to fix the cylinders to the gear case. In such cases, then, an annular rib is cast around the circumference of each cylinder barrel, and a steel ring of angle section has one of its flanges fixed in the said cast iron rib by insertion in the mold at the time of casting the cast iron rib. The other flange of this steel ring which projects from the cast iron rib is welded to the steel jacket, as in the preceding case.

The collar f may be additionally secured to the barrel of the cylinder by means of rivets m.

The manner in which this invention is to be performed will now be more particularly described with reference to the accompanying drawings in which;

Figure 1 illustrates an example of the application of the improved process to a motor having separate cylinders.

Fig. 2 is a detail view of one of the ferrules or collars, showing the thin lip which is to be welded to the jacket.

Figs. 3 and 4 show two ways of effecting the fixing of the steel ring upon the barrel of a cylinder in the case of twin cylinders.

Fig. 5 shows a detail of this steel ring which is designed to facilitate the fixing of the latter upon the cylinder.

Referring to Fig. 1, it will be seen that at the upper part of the motor steel ferrules or collars a, b, c, c', d, are mounted upon all the bosses required for the fitting of the sparking plugs, valves, pipes, etc. These ferrules or collars are screwed very tightly upon surfaces which are perfectly worked so that perfectly tight joints will be made between these ferrules or collars and the cylinder. If necessary, the two contacting parts may be oxidized with the object of improving the tightness of the joint.

At the lower part of the motor, if it is a case of separate cylinders, as in Fig. 1, a steel collar f is screwed upon the barrel of the cylinder.

Each of the ferrules or collars has around its circumference a thin portion l in the form of a lip, as shown in Fig. 2, to which the sheet steel jacket g is connected by welding. This welding is thus steel to steel.

In the case of twin cylinders, the flange for fixing the cylinders to the gear case renders it a difficult matter to affix a steel part for receiving the water jacket.

As shown in Figs. 3 and 4, in such cases, an annular rib j is cast around the barrel i of the cylinder, a previously prepared steel ring k or k' of angle section having been placed in the mold so that one of the flanges of this ring is fixed in the rib by the casting operation. In order to improve the union between the cast rib and the steel ring, the flange of this ring that is embedded in the

casting may, as shown in Fig. 5, have its inner edge notched like the teeth of a saw as shown at 1, or it may be formed with holes 2; and both the notches and holes may be employed together. In this manner the surface of contact between the two metals will be increased, and the sharp points of the steel will be more readily melted by the contact of the hot cast metal, so that a perfect rigid union will be secured.

The steel ring will be made preferably in one of the forms *k* or *k'*, in order that the welding with the jacket shall be effected more easily at the edges of the sheet metal ring and the jacket. In both cases, the union between the jacket and the ring is produced by heating the edges of the two parts.

It is to be understood that the forms and dimensions of the various steel ferrules or collars may be varied, as also the details of their attachment to the cylinder without departing from the nature of the invention.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A cylinder construction for aviation explosion engines, comprising a cast iron cylinder having projecting internally screw-threaded bosses, steel ferrules screwed into said bosses so as to make a perfectly tight joint therewith, an annular steel member secured around the lower end of the cylinder and making a tight joint therewith and a steel jacket surrounding said cylinder and having portions welded to the steel ferrules and the annular steel member respectively.

2. A cylinder construction for aviation explosion engines, comprising a cast iron cylinder having projecting internally screw-threaded bosses, steel ferrules screwed into said bosses so as to make a perfectly tight joint therewith, a steel ring angular in cross section having a serrated and perforated flange embedded in the cast iron cylinder in the casting operation and a projecting flange, and a steel jacket surrounding said cylinder and having portions welded to the steel ferrules and to the projecting flange of the steel ring, respectively.

3. A structure of the character described, comprising a cast iron body, a steel ring angular in cross section having a serrated and perforated flange embedded in said body by the casting operation and said ring having a flange projecting from said body and a steel jacket having its edge flush with that of the said flange and welded to the edge of the projecting flange of the ring.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

AUGUSTE MAIRE.

Witnesses:
LOUIS MOSES,
CHAS. P. PRESSLY.