

G. H. M. CANTON, P. G. UNNÉ & E. J. J. SALMSON.
 INTERNAL COMBUSTION ENGINE.
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1,099,424.

Patented June 9, 1914.

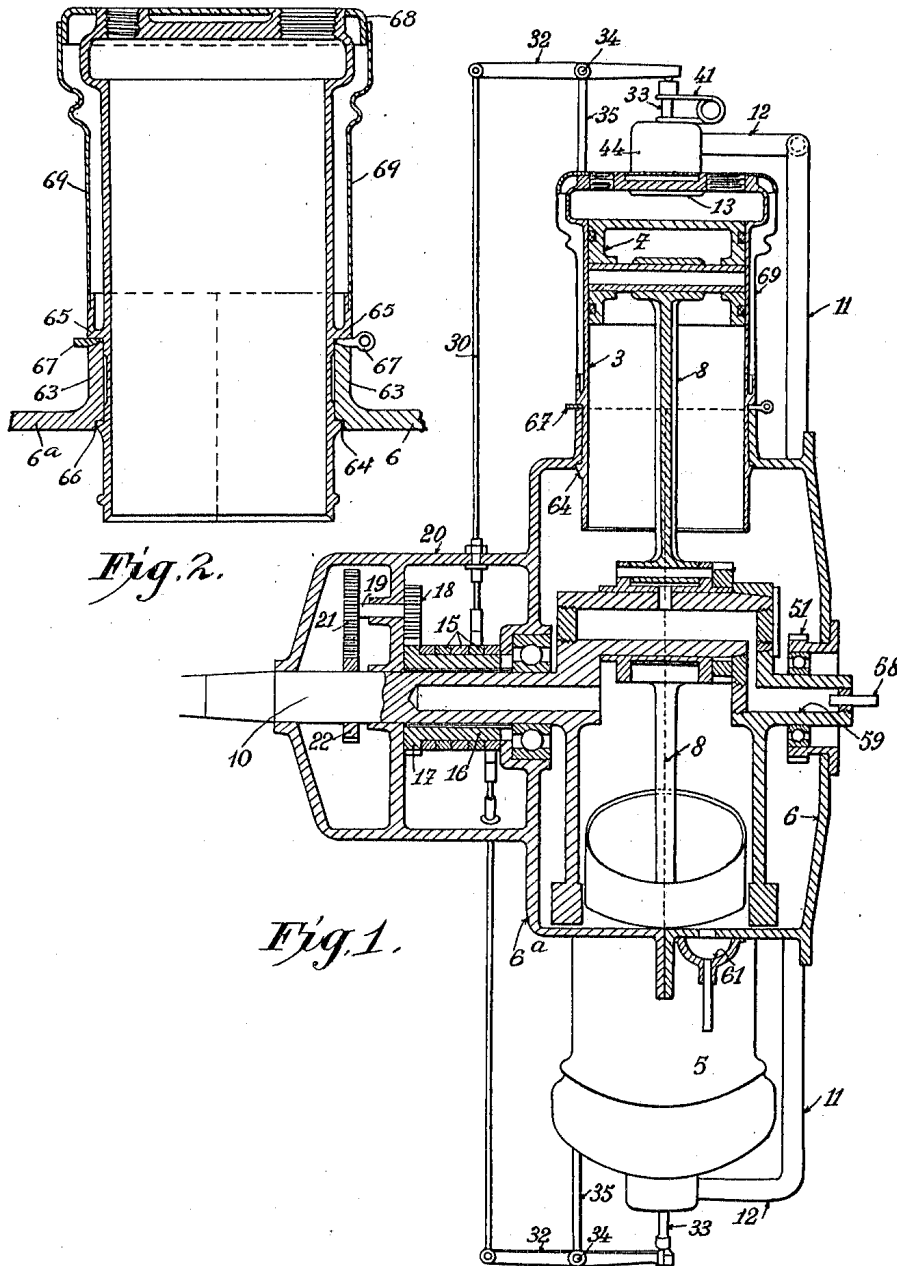


Fig. 2.

Fig. 1.

Witnesses:
 Charles Frank
 Jules Zolenta

Inventors
 Georges Henri Marius Canton
 Pierre Georges Unné
 Emile Jean Jules Salmson
 by *O. M. Moore*
 their Attorney

UNITED STATES PATENT OFFICE.

GEORGES HENRI MARIUS CANTON, PIERRE GEORGES UNNÉ, AND EMILE JEAN JULES SALMSON, OF PARIS, FRANCE.

INTERNAL-COMBUSTION ENGINE.

1,099,424.

Specification of Letters Patent.

Patented June 9, 1914.

Application filed March 29, 1912. Serial No. 687,011.

To all whom it may concern:

Be it known that we, GEORGES HENRI MARIUS CANTON, PIERRE GEORGES UNNÉ, and EMILE JEAN JULES SALMSON, respectively a citizen of France, a subject of the King of Sweden, and a citizen of France, residing at 55 Rue de la Grange aux Belles, Paris, in the Republic of France, have invented new and useful Improvements in Internal-Combustion Engines with Radially-Disposed Cylinders, of which the following is a specification.

The present invention relates generally to internal combustion engines of the type wherein the cylinders are disposed radially about a central crank casing, and the invention refers, more specifically, to the means for securing the cylinders in position.

The principal object of the invention is to provide novel means for securing the cylinders to the central casing in a manner to prevent movement or displacement of the cylinders relatively to the casing.

The embodiment of the invention at present preferred by us is illustratively exemplified in the accompanying drawing, wherein—

Figure 1 is a vertical sectional view through an engine having our invention applied thereto; and Fig. 2 is a similar view of one of the engine cylinders illustrating on an enlarged scale the means for securing the cylinders to the central casing.

Referring to the drawing by reference characters, the numerals 3 and 5 indicate two of a series of five cylinders which are arranged radially in the two part crank case, 6 and 6^a. Operative in each cylinder is a piston 7, connected by means of a connecting rod 8 with the crank shaft 10. Each cylinder is provided with admission and exhaust valves, the admission valve 13 only, in one cylinder being shown, and gas from a suitable source (not shown) is supplied to the cylinders through the valves 13, by means of a distributor 11 having the feed branches 12 leading to the valves 13. The action of the admission and exhaust valves is suitably controlled by a system of levers 30, 32, 33, 34 and 35, in turn actuated and controlled by cams 15 mounted on a sleeve 16 carried by the crank shaft 10. Motion is imparted to the cams 15 and sleeve 16 from the crank shaft 10, through the medium of the gear wheel 17 on the end of the sleeve 16, meshing with the gear wheel 18 on one end of a stud

19, the other end of the stud carrying a gear wheel 21 in mesh with a gear wheel 22 on the crank shaft 10. A casing 20, formed as an extension of the crank case, serves to inclose the parts 15 to 22 above described. Each of the admission and exhaust valves is partly inclosed by a casing 44, and for the purpose of returning the valves to their seats we provide a suitably formed spring 41, the construction of which forms the subject matter of our copending patent application 733,765, filed November 27, 1912, and which application is a division of the present application.

60 designates a duct through which oil is projected to lubricate the moving parts of the cylinder structure, and 61 is a trap to catch the excess oil.

Referring particularly to Fig. 2, it will be noted that the casing parts 6 and 6^a are formed or provided with substantially cylindrical flanges 63 which serve to firmly retain the cylinders in position, through the instrumentalities about to be described. The upper face of the flange is preferably beveled while the lower face of the flange is preferably provided with a countersunk shoulder as indicated at 64. Each cylinder is provided with oppositely disposed circumferential collars 65 and 66, adapted to be positioned, respectively, in relation to the upper and lower faces of the flange 63. The collar 66 takes into and against the countersunk shoulder 64, while a split ring 67, preferably of wedge shape, is interposed between the collar 65 and the upper face of the flange 63. By tightening the ring 67 the cylinders 1 to 5 are firmly wedged into position between the upper and lower faces of the flange 63.

The cylinders 1 to 5 are preferably water jacketed, each cylinder being partially surrounded by a jacket 69. The lower end of the jacket 69 is suitably secured to the collar 65, while the upper end of the jacket is secured to a cap 68 of sheet steel, this cap being of slightly greater diameter than the external diameter of the cylinder and being secured, by suitable means, to the cylinder head. The jacket 69 is preferably brazed to the cap 68 and to the collar 65, and as the points at which the jacket 69 is brazed to its supports are relatively remote from the wall of the cylinder, excessive heating at these points is prevented, thus obviating deforma-

tion of the jacket and consequent leakage of water.

While we have herein described our invention in considerable detail, we desire it to be understood that we do not wish to be limited to such details, and that the invention may be modified within the scope of the appended claims without departing from the spirit of the invention.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:

1. An internal combustion engine, embodying therein a substantially circular crank case having a plurality of radially arranged substantially cylindrical flanges, a cylinder held by each of said flanges, said cylinders having oppositely disposed circumferential collars thereon, and a wedge member adapted to be inserted between one of said collars and one face of said flange.

2. An internal combustion engine, embodying therein a substantially circular crank case, radially arranged flanges carried by said case and each thereof having one face provided with a countersunk shoulder and its other face beveled, a cylinder supported by each of said flanges, each of said cylinders

having a collar for engaging the countersunk collar in the flange and a second collar adjacent the beveled face of the flange, and a wedge adapted to be interposed between the beveled face of the flange and the collar adjacent the same.

3. In an internal combustion engine with radial cylinders, the combination of a casing in two parts, means for holding said parts together, annular flanges radially arranged on said casing, cylinders in said flanges, two circular collars on the cylinders, one of which rests directly against one end of the flange, and a split collar forming a wedge and forced between the other collar on the cylinder, and the other end of the flange, substantially as described and for the purpose set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEORGES HENRI MARIUS CANTON.
PIERRE GEORGES UNNÉ.
EMILE JEAN JULES SALMSON.

Witnesses:

ANTOINE LAVOIX,
LUCIEN MEMMINGER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."