

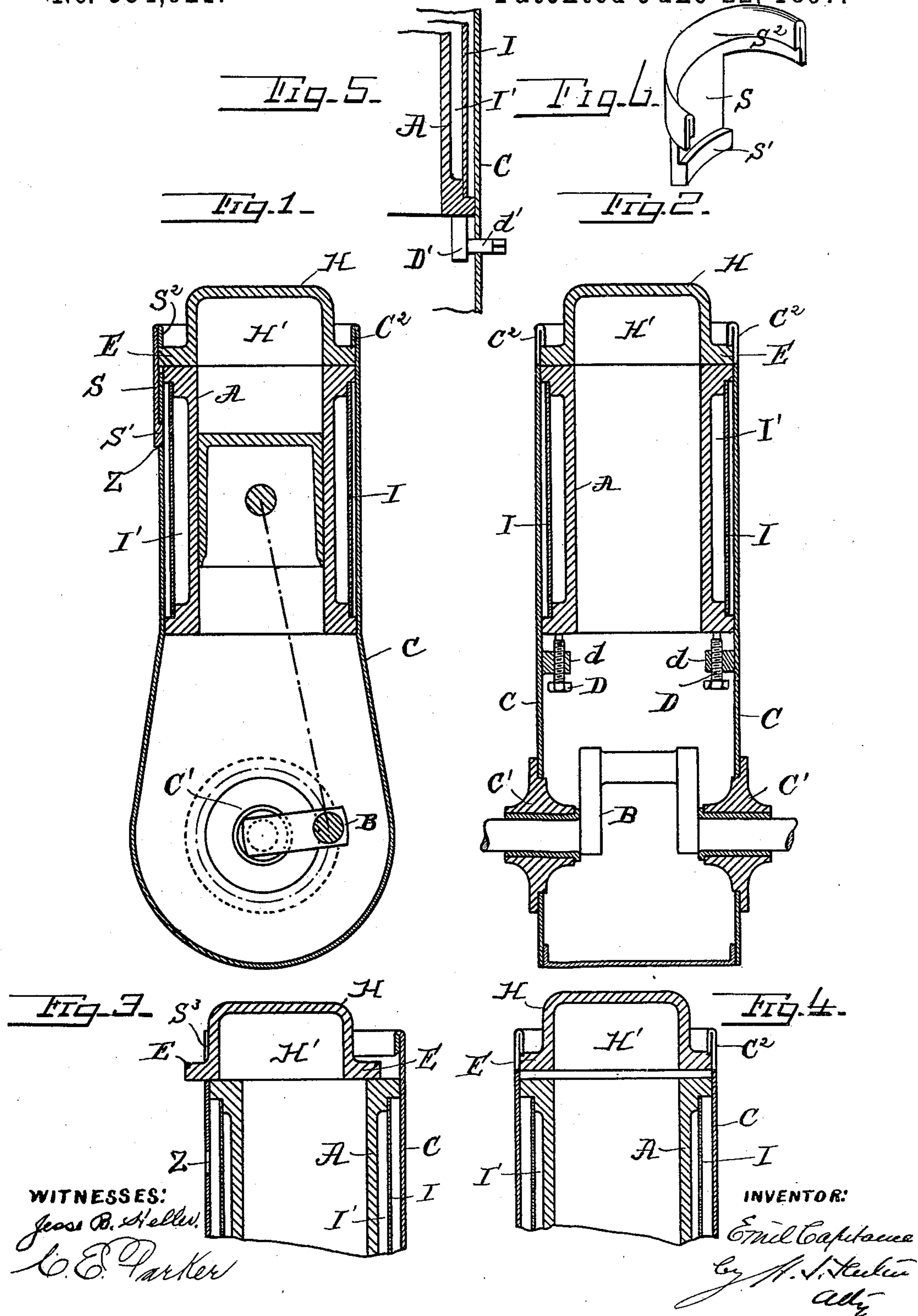
(No Model.)

E. CAPITAINE.

FASTENING FOR CYLINDERS AND EXPLOSION CHAMBERS OF PETROLEUM MOTORS.

No. 584,921.

Patented June 22, 1897.





# UNITED STATES PATENT OFFICE.

EMIL CAPITAINE, OF FRANKFORT-ON-THE-MAIN, GERMANY, ASSIGNOR TO  
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FASTENING FOR CYLINDERS AND EXPLOSION-CHAMBERS OF PETROLEUM MOTORS.

SPECIFICATION forming part of Letters Patent No. 584,921, dated June 22, 1897.

Application filed November 7, 1896. Serial No. 611,329. (No model.)

*To all whom it may concern:*

Be it known that I, EMIL CAPITAINE, a citizen of the German Empire, residing at Frankfort-on-the-Main, Germany, have invented certain new and useful Improvements in Fastenings for Cylinders and Explosion-Chambers of Gas and Petroleum Motors in Frames of Sheet Metal, of which the following is a specification.

My invention relates to mountings or frames for light petroleum-engines, and has for its object to provide means by which the cylinder and cylinder-cover (or as in this case the cylinder and explosion-chamber) can be securely maintained and at the same time be capable of ready and quick removal from the framing, and by which the total weight of the motor can be decreased as well.

To these ends my invention consists in the combination, with a sheet-metal frame or housing, of a power-cylinder and explosion-chamber arranged relatively to form a cooling-chamber between the cylinder and the housing, with means to removably maintain the cylinder and chamber within the housing, as hereinafter described.

In the accompanying drawings, illustrating my invention, Figure 1 is a vertical section, and Fig. 2 is a like view on a different plane. Figs. 3 and 4 are sectional views, broken off, designed to illustrate the mode of connecting the explosion-head with the cylinder. Fig. 5 is a detail sectional view showing means of different character for pressing the cylinder against the explosion head or cover. Fig. 6 is a detail view of the locking-piece.

As will be seen by the accompanying drawing, the cylinder A and the crank-shaft B are fastened and journaled in the sheet-metal case or housing C. The cylinder is not fixedly connected with the housing and the cylinder-cover (or explosion-chamber) nor fastened to it with screws, as described in another pending application for patent, Serial No. 611,327, of even date herewith; but in this case the order is reversed and means are employed by which the explosion-chamber can be held rigidly in place by the iron housing, and the cylinder is then pressed against the explosion-chamber with a comparatively small pressure. By this arrangement it is

not necessary to fasten the cylinder to the housing as formerly, even when working with very high explosion pressures, these pressures act on the piston, and react through the explosion-chamber on the housing, the cylinder performing merely the part of a guide to the piston.

In the drawings, the letter H designates the cylinder-cover or explosion-head, which contains the explosion-chamber H', and has a base-flange E, which seats against the open flanged end of the cylinder A.

C designates the sheet-metal case or housing before referred to, and which is provided with the bearings C' for the crank-shaft B. The upper end portion of this housing is bent or otherwise formed with an inward projection, such as shown at C<sup>2</sup>, which engages the said flange E.

I is an inner jacket between the cylinder and the said housing and arranged to form a cooling-chamber I'.

For the purpose of holding the cylinder against the explosion head or cover various means may be employed. In Fig. 2 of the drawings I have shown for this purpose screws D, seated in lugs d and arranged to bear against the inner or lower end of the cylinder. In Fig. 5 I have shown other means, consisting of eccentrics D', carried by studs d', which are journaled in the housing or case and whose outer end portions are squared for the application of a suitable tool by means of which the eccentrics may be operated.

S is a removable locking-piece. Said piece has a lip or flange S' at one end portion, which engages an opening Z in the housing. At its opposite end it has an inward projection S<sup>2</sup>, which engages the flange E of the explosion-head, the housing being slotted, as shown at S<sup>3</sup>.

The piston-acting pressure is, as before stated, taken up by the crank-shaft on one side and the explosion-chamber on the other side, so that the walls of the housing C are always and entirely in tension, as the engine is single-acting. By the above-described arrangement heavy cylinder-flanges and walls for fastening the explosion-chamber on the cylinder become unnecessary, and the same can altogether be made much lighter, because



the pressure with which the cylinder is pressed against the explosion-chamber need be very small comparatively, and therefore the danger of deformation is little. In order to more fully show the difference between this arrangement and the common way of fastening the cover (explosion-chamber) to the cylinder, let us take as an example a cylinder of an area of fourteen square inches and an initial pressure of three hundred pounds to the square inch. The pressure tending to disrupt the joint between the cylinder and its cover is therefore by the old method of fastening four thousand two hundred pounds. In the method described all of this pressure is taken up entirely by the housing, and the force tending to disrupt the joint between the cylinder and cover is very small, and therefore the pressure with which they are held together need be also very small.

The removing of the explosion-chamber is done by loosening the eccentrics D or screws D'. It is only necessary to drop the cylinder about one-eighth of an inch, while by the old method of fastening by screw it is necessary to completely unscrew and remove the fastenings. After the eccentric D or screw D' has been loosened a little the piece S can be removed.

In Fig. 4 I have shown the cylinder as being slightly dropped in the manner above described, and in Fig. 3 I have shown the explosion-head as being partly removed. The explosion-chamber can now be taken off and then the cylinder withdrawn.

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

1. In engines of the character described,

the combination with a sheet-metal case or housing, a cylinder mounted therein, and a jacket between said case or housing and the cylinder and arranged to form a cooling-chamber around the latter, of an explosion head or cover adapted to register with the open end of the cylinder and held in position in one direction by an inward projection on the case or housing and in the other direction by adjustable means tending to force the cylinder against said head or cover, substantially as described.

2. In engines of the character described, the combination of a piston-cylinder, an explosion head or cover fitted to and registering with the open end of said cylinder, a surrounding case or housing having means which engage said head or cover to hold it in position in one direction, and means for holding said parts in the opposite direction, substantially as specified.

3. In engines of the class described, the combination with the case or housing C, of the piston-cylinder mounted therein, the explosion-head fitted to one end of said cylinder, the removable locking device S which engages the said head and also the case or housing to prevent movement in one direction, and means for adjustably holding said parts to prevent movement in the opposite direction, substantially as specified.

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

EMIL CAPITAINÉ.

Witnesses:

VIGGO V. TORBENSEN,  
JEAN GRUND.