

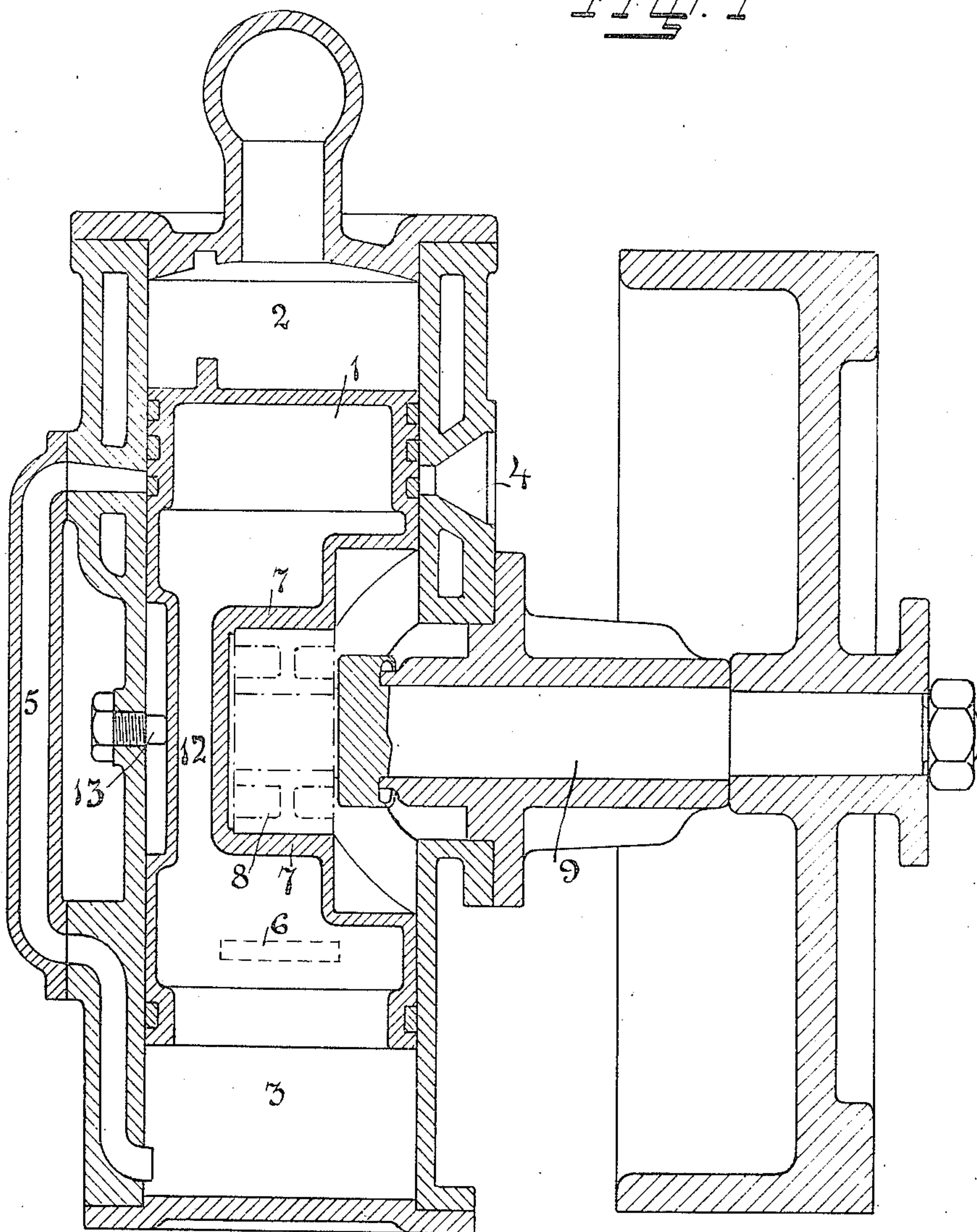
C. A. & O. W. HULT.
EXPLOSION OR COMBUSTION MOTOR OR PUMP.
APPLICATION FILED OCT. 11, 1907.

959,748.

Patented May 31, 1910.

3 SHEETS—SHEET 1.

Fig. 1



Witnesses:-
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Inventors:
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Oscar Walfrid Hult
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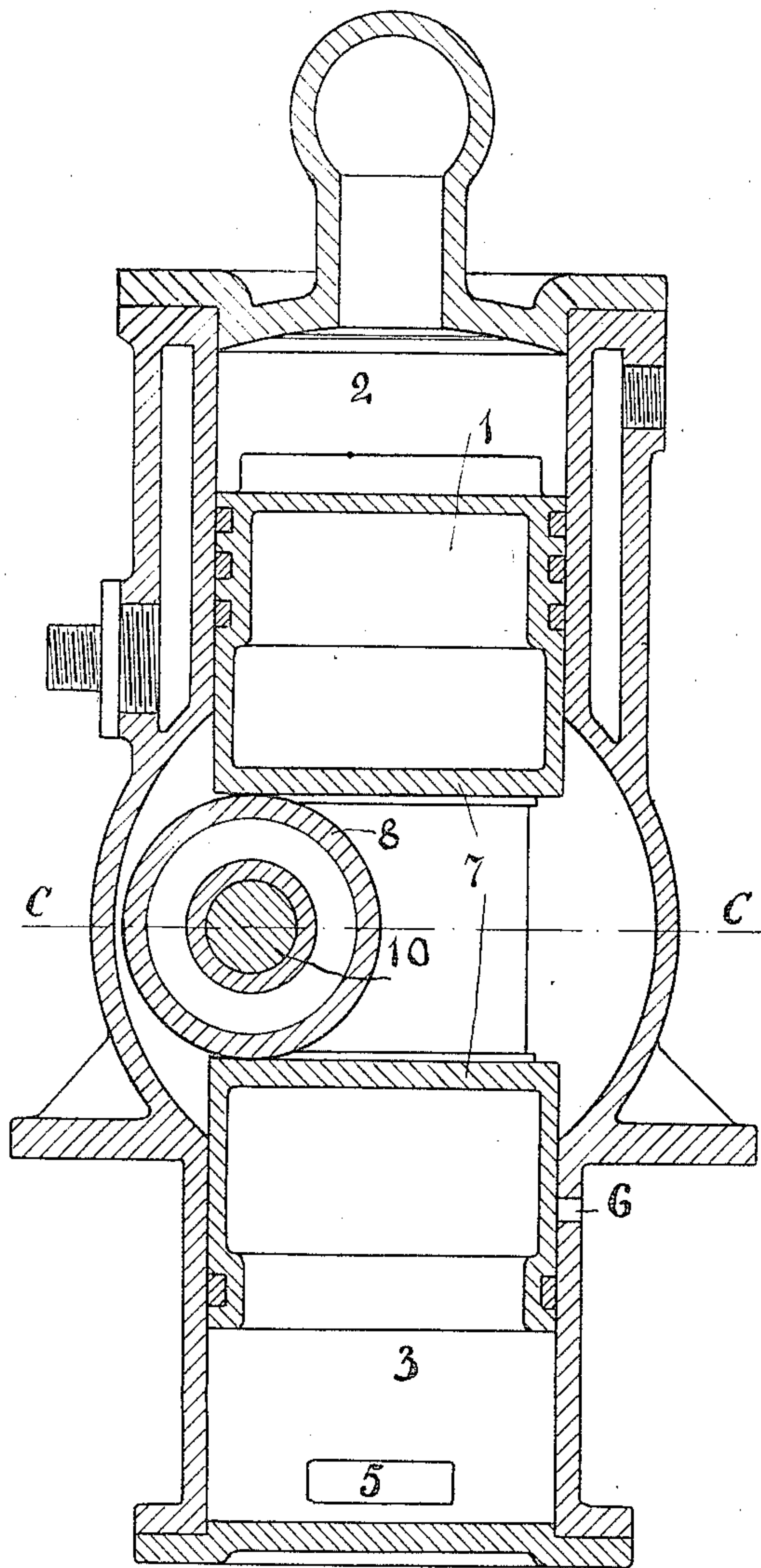
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3 SHEETS—SHEET 2.

Fig. 2



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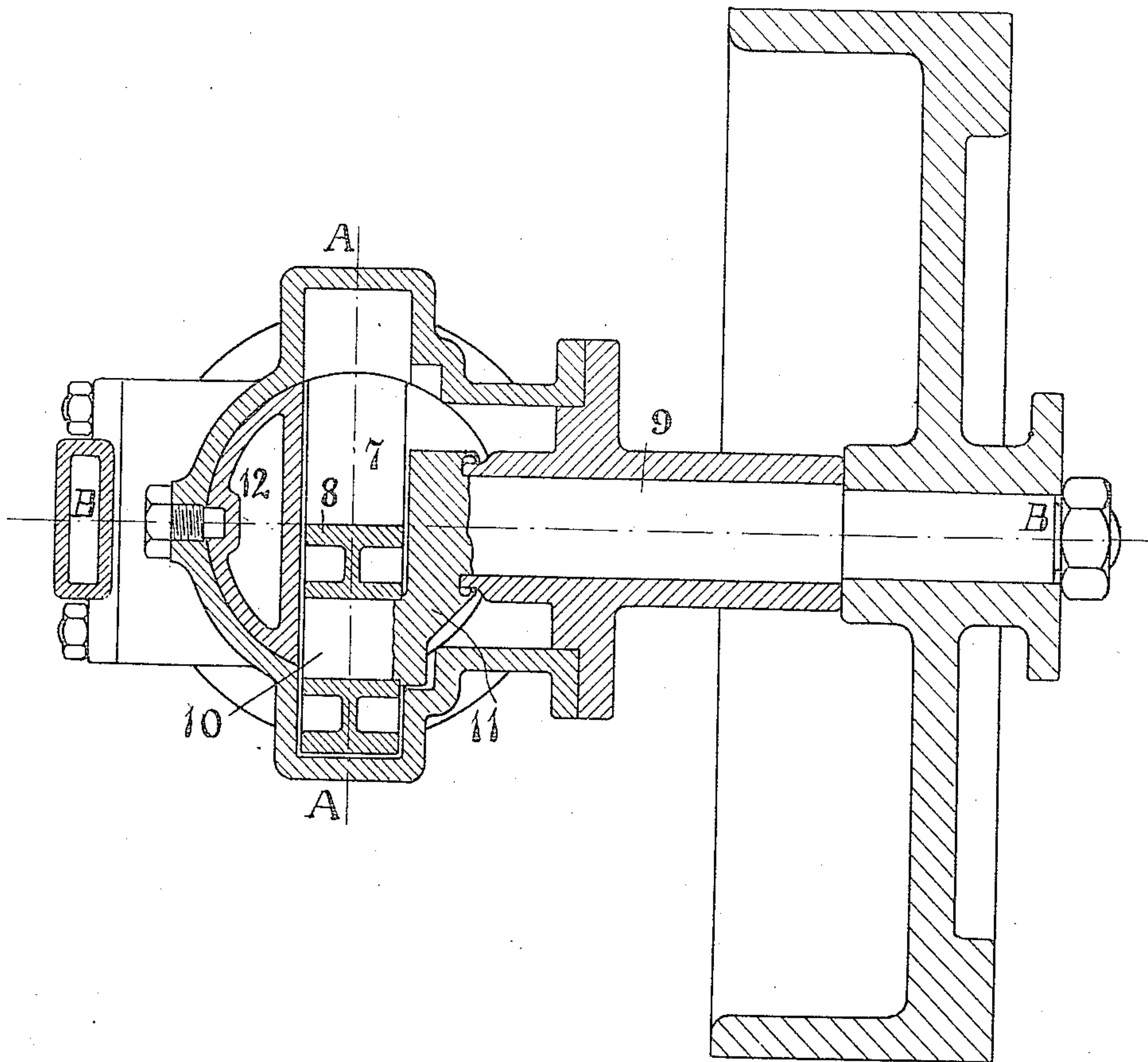
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3 SHEETS—SHEET 3.

Fig. 3



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UNITED STATES PATENT OFFICE.

CARL ALRIK HULT AND OSCAR WALFRID HULT, OF STOCKHOLM, SWEDEN.

EXPLOSION OR COMBUSTION MOTOR OR PUMP.

959,748.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed October 11, 1907 Serial No. 396,964.

To all whom it may concern:

Be it known that we, CARL ALRIK HULT, and OSCAR WALFRID HULT, subjects of the King of Sweden, and residents of 1 Inedals-gatan, Stockholm, in the Kingdom of Sweden, engineers, have invented certain new and useful Improvements in Explosion or Combustion Motors or in Pumps, of which the following is a specification, reference being made to the accompanying drawings.

The present invention relates to an arrangement in explosion or combustion motors or in pumps. The arrangement in question consists chiefly of a recess or an interior construction in the piston or piston wall, said recess or construction forming tracks for the crank pin of the driving shaft or for a part mounted on said pin.

On the accompanying drawings there is shown as an example an explosion motor constructed in accordance with this invention.

Figures 1 and 2 show two vertical sections perpendicular to each other, taken along the lines A—A and B—B in Fig. 3 which shows a horizontal section of the motor, taken along the line C—C in Fig. 2.

The motor shown is a two-cycle motor driven by means of a mixture of a hydrocarbon and previously compressed air. The development of work takes place in the cylinder chamber 2 situated above the piston 1, while the previous compression of the air takes place in a chamber which is formed both by the frame chamber 3 situated under the piston, and by the cavity or chamber in the piston. The work development chamber, from which the products of combustion escape in the usual manner through an opening 4 in the cylinder wall, is connected, by means of a passage 5, with the chamber for previous compression, into which the air enters in the usual manner through an opening 6 in the frame. The passage 5 is opened and closed by the piston 1.

A part of the piston wall forms, according to this invention, an interior construction in the piston, which construction has two horizontal walls 7, the surfaces of which, that are turned toward each other, form tracks for a disk or roller 8, mounted on the crank pin 10 of the driving-shaft 9. In the present case the crank arm 11 is completely housed in the interior construction, although it (the crank arm) can also be situated

partly or entirely outside the said construction or the piston.

It is evident, that the crank pin can receive the pressure from the walls 7 directly or by means of an arrangement other than that of a disk or roller.

As is seen, there exists between the interior construction and the opposite part of the piston wall a passage 12, on account of which the whole of the interior of the piston together with the chamber under the piston forms the chamber for the previous compression of the air.

13 is a guide pin screwed into the frame of the motor, a corresponding groove being arranged in the piston for said pin.

This invention facilitates the building of very simple and compact motors occupying a small space. It is evident, that it can be applied to other motors than two-cycle motors and to pumps. Applied to two-cycle motors in the manner described, the invention has the advantage that no part of the previously compressed air can escape through the bearing of the driving shaft, as is generally the case with two-cycle motors and which causes (in addition to the loss of previously compressed air and thus of work) the lubricant to be driven out of the bearing, so that it is difficult to keep the shaft lubricated.

Both the chambers situated at the ends of the piston can be work development chambers (in which case the piston shown has a bottom in its lower end as well as in the upper one). By this means a double-acting four-cycle motor or a double-acting pump is obtained.

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

1. In a motor of the character described the combination with a motor casing, of a piston in said casing, the lateral wall of said piston being intact and having no parts thereof projecting outwardly beyond its cylindrical surface, said wall being bent inwardly to form a chamber, and a crank pin having a roller rotatably mounted thereon and designed to operate in the chamber formed in the piston.

2. In a motor of the character described, the combination with a motor casing having its body portion formed in a single piece, of a piston reciprocable in said casing, the

lateral wall of said piston being intact and having no part thereof projecting outwardly beyond its cylindrical surface, said wall being bent inwardly to form an inclosed chamber, a crank pin having a part thereof adapted to operate within said chamber, and an air compression chamber formed at one end of the motor casing below one end of said piston.

10 3. In a motor of the character described, the combination with a motor casing, of a cylindrical piston reciprocable therein, the lateral wall of said piston being intact and having no part thereof projecting outwardly
15 beyond its cylindrical surface, said wall being bent inwardly to form an inclosed chamber, a crank pin having a part thereof bearing and operable in said chamber, there being a passage (12) connecting spaces formed
20 at either side of the inwardly bent part of the piston wall.

4. In a motor of the character described, the combination with a motor casing, of a cylindrical piston reciprocable therein, the lateral wall of said piston being intact and
25 having no part thereof projecting outwardly beyond its cylindrical surface, said wall being bent inwardly to form an inclosed chamber, there being a space in the piston wall on either side of said inwardly bent portion,
30 a passage connecting said spaces, means between the piston and the casing for guiding the former in the latter, and a crank pin having a part thereof operable in the said chamber.
35

In witness whereof we have hereunto set our hands in presence of two witnesses.

CARL ALRIK HULT.

OSCAR WALFRID HULT.

Witnesses:

CARL FRIBERG,

H. B. OHLSSON.