

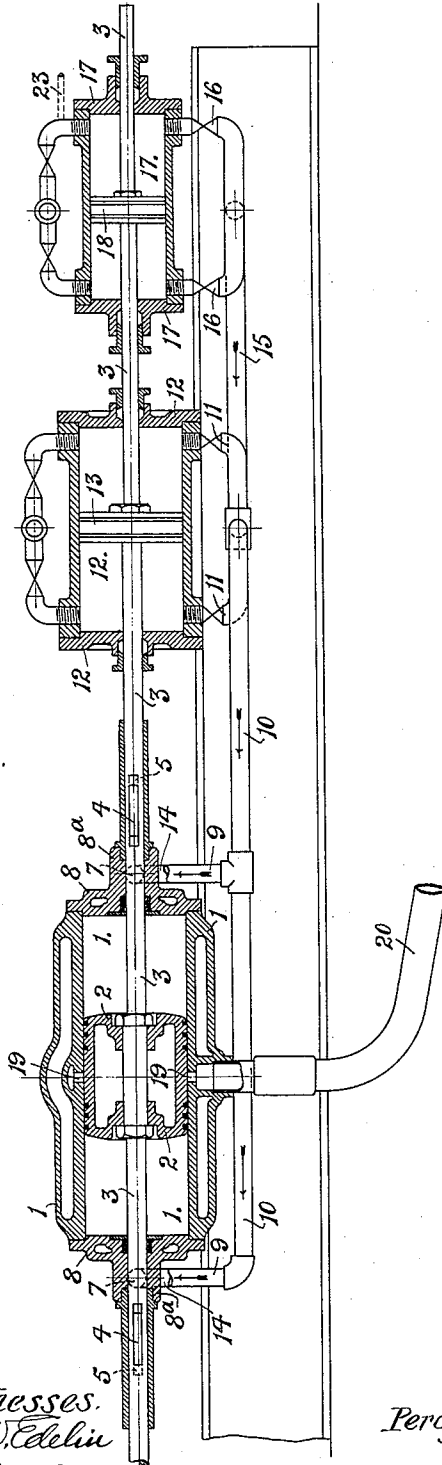
P. HUNTINGTON.
TWO-STROKE CYCLE INTERNAL COMBUSTION ENGINE.
APPLICATION FILED FEB. 24, 1912.

1,065,250.

Patented June 17, 1913.

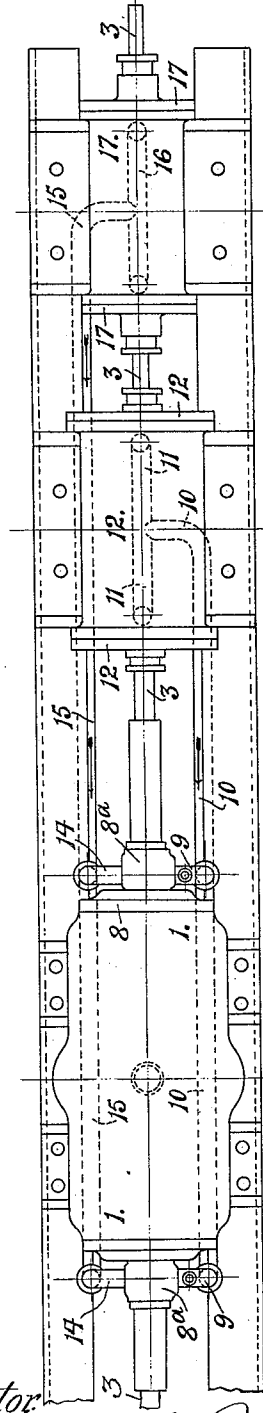
2 SHEETS-SHEET 1.

FIG. 1.



Witnesses.
W. A. Edelin
W. H. Ormand.

FIG. 2.



Inventor
Percy Huntington.
By *Bartholomew*
att'y.

P. HUNTINGTON.
TWO-STROKE CYCLE INTERNAL COMBUSTION ENGINE.
APPLICATION FILED FEB. 24, 1912.

1,065,250.

Patented June 17, 1913.

2 SHEETS—SHEET 2.

FIG. 4.

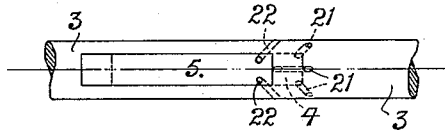
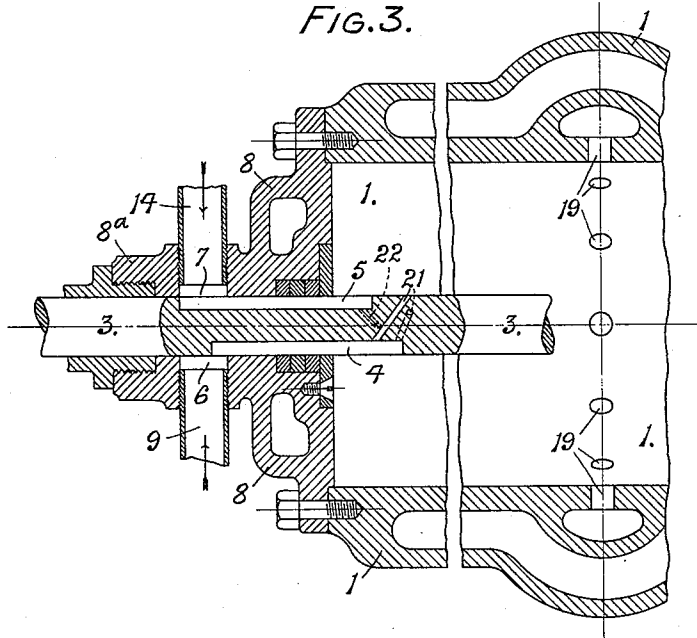


FIG. 3.



Witnesses
John H. Walker
Emily Burnett

Inventor
Percy Huntington

UNITED STATES PATENT OFFICE.

PERCY HUNTINGTON, OF LIVERPOOL, ENGLAND.

TWO-STROKE-CYCLE INTERNAL-COMBUSTION ENGINE.

1,065,250.

Specification of Letters Patent.

Patented June 17, 1913.

Application filed February 24, 1912. Serial No. 679,752.

To all whom it may concern:

Be it known that I, PERCY HUNTINGTON, a subject of the King of England, residing at 13 Cumberland street, Liverpool, in the county of Lancaster, England, have invented certain new and useful Improvements in or Relating to Two-Stroke-Cycle Internal-Combustion Engines, of which the following is a specification.

It has, heretofore, been proposed to construct two-stroke cycle internal-combustion engines in which communication between a mixture compressing cylinder and the working cylinder—in order to admit explosive mixture to the working cylinder—is established by means of a passage formed in the piston rod, during the travel of said rod, the burnt gases being discharged through ports in the working cylinder which are uncovered by the piston in its working stroke.

My invention relates to this type or kind of engine and has for its main object to insure the scavenging of the working cylinder.

I will describe my invention with the aid of the accompanying sheets of explanatory drawings, in which:—

Figure 1 is a longitudinal section, and Fig. 2 a plan view of an engine provided with my improvements, and capable of double acting and reversing. Fig. 3 is a sectional plan view of a portion of the working cylinder and Fig. 4 is a side elevation of the piston rod, drawn to an enlarged scale, as compared with Figs. 1 and 2.

Referring to Figs. 1 to 4 of the drawings, 1 indicates the working cylinder, 2 the piston (which in practice may be water cooled) and 3 the piston rod. At each end of said cylinder 1, there are formed in the piston rod 3 a slot 4 and a slot 5 diametrically opposite each other; said slots 4 and 5 are respectively adapted to communicate or register with ports 6 and 7 provided in an extension 8^a of the cylinder cover 8; said port 6 communicates by means of branches 9, main 10, and branches 11, with a double acting air compressor 12, the plunger or piston 13 whereof is mounted upon an extension of said piston rod 3; and ports 7 communicate by means of branches 14, main 15, and branches 16 with a double acting fuel compressor 17, the plunger or piston 18 whereof is mounted upon an extension of the piston rod 3. A row of exhaust ports 19 are provided in the middle of the cylinder 1. In action, the piston 2 of the working

cylinder 1, in its outward stroke from one end of the cylinder uncovers said row of ports 19, and, in continuing its travel an air slot 4 in piston rod 3 establishes communication between a port 6 (Fig. 3) and the interior of the cylinder, when air from compressor 12 enters the cylinder (by way of a branch 11, main 10, and a branch 9) scavenges it, and passes out through said exhaust ports 19; in the continued travel of the piston communication is established by a fuel slot 5 between a port 7 and the interior of said cylinder, and fuel, or a rich mixture of air and fuel (hereinafter referred to as fuel) enters cylinder from compressor 17 by way of a branch 16, main 15, and a branch 14. The piston rod in the return stroke of the piston first closes the communication between said compressors and the cylinder (through the movement of said slots out of register with their respective ports) and the piston then closes the exhaust ports 19 and compresses the charge of air and fuel, which is fired in well known manner on the next and working stroke of the piston. In order to enhance the diffusion of air and fuel within cylinder 1, there may be provided in the piston rod 3 small passages 21, 22, passages 21 communicating with slot 4 and passages 22 communicating with slot 5, which passages open into the cylinder a little in advance of the respective slots. Obviously, if it be desired that the engine shall be single acting, the slots, ports and passages before described are arranged in connection with one end only of said cylinder 1, and a trunk piston having a piston rod at one end and a connecting rod at the other may be employed.

It will be obvious that the spark timing apparatus for exploding the charges may be so arranged that the engine is capable of reversing; and my invention may be applied to engines of the Diesel type.

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

1. A two stroke cycle internal combustion engine, comprising a working cylinder; air and fuel inlet ports; a piston rod and piston; slots in the piston rod so arranged that air and fuel are admitted separately to said cylinder through the piston rod, the air being admitted in advance of the fuel; and discharge ports in said cylinder adapted to be uncovered by the piston.

2. A two stroke cycle internal combustion engine, comprising a working cylinder; air and fuel inlet ports; a piston rod and piston; slots in the piston rod so arranged that air and fuel are admitted separately to said cylinder at each end thereof through the piston rod, the air being admitted in advance of the fuel; and discharge ports in the middle of said cylinder adapted to be uncovered by the piston toward the end of each stroke.

3. A two stroke cycle internal combustion engine, comprising a working cylinder; air and fuel inlet ports; a piston rod and piston; slots in the piston rod so arranged that air and fuel are admitted separately to said cylinder through the piston rod, the air being admitted in advance of the fuel; discharge ports in said cylinder adapted to be uncovered by the piston; air and fuel compressors operated through the reciprocation of the piston rod; and means whereby said compressed air and fuel are conveyed from said compressors to said working cylinder.

4. A two stroke cycle internal combustion engine, comprising a working cylinder; air and fuel inlet ports; a piston rod and piston; slots in the piston rod so arranged that air and fuel are admitted separately to said cylinder at each end thereof, through the piston rod, the air being admitted in advance of the fuel; discharge ports in the middle of said cylinder adapted to be uncovered by the piston toward the end of each stroke; air and fuel compressors operated through the reciprocation of the piston rod; and means whereby said compressed air and fuel are conveyed from said compressors to said working cylinder.

5. A two stroke cycle internal combustion engine, comprising a working cylinder; air and fuel inlet ports; a piston rod and piston; slots in the piston rod so arranged that air and fuel are admitted separately to said cylinder through the piston rod, the air being admitted in advance of the fuel; a passage through said piston rod which communicates with the air slot therein and a passage through said piston rod which communicates with the gas slot therein; and discharge ports in said cylinder adapted to be uncovered by the piston.

6. A two stroke cycle internal combustion engine comprising a working cylinder; air

and fuel inlet ports; a piston rod and piston; slots in the piston rod so arranged that air and fuel are admitted separately to said cylinder at each end thereof through the piston rod, the air being admitted in advance of the fuel; a passage through said piston rod which communicates with the air slot therein and a passage through said piston rod which communicates with the gas slot therein; and discharge ports in the middle of said cylinder adapted to be uncovered by the piston toward the end of each stroke.

7. A two stroke cycle internal combustion engine, comprising a working cylinder; air and fuel inlet ports; a piston rod and piston; slots in the piston rod so arranged that air and fuel are admitted separately to said cylinder through the piston rod, the air being admitted in advance of the fuel; a passage through said piston rod which communicates with the air slot therein and a passage through said piston rod which communicates with the gas slot therein; discharge ports in said cylinder adapted to be uncovered by the piston; air and fuel compressors operated through the reciprocation of the piston rod; and means whereby said compressed air and fuel are conveyed from said compressors to said working cylinder.

8. A two stroke cycle internal combustion engine, comprising a working cylinder; air and fuel inlet ports; a piston rod and piston; slots in the piston rod so arranged that air and fuel are admitted separately to said cylinder at each end thereof through the piston rod, the air being admitted in advance of the fuel; a passage through said piston rod which communicates with the air slot therein, and a passage through said piston rod, which communicates with the gas slot therein; discharge ports in the middle of said cylinder adapted to be uncovered by the piston toward the end of each stroke; air and fuel compressors operated through the reciprocation of the piston rod; and means whereby said compressed air and fuel are conveyed from said compressors to said working cylinder.

In testimony whereof I affix my signature in presence of two witnesses.

PERCY HUNTINGTON.

Witnesses:

JOHN HINDLEY WALKER,
ISOBEL F. WALKER.