No. 864,818. PATENTED SEPT. 3, 1907.

A. E. WOLCOTT.

EXPLOSIVE ENGINE.

APPLICATION FILED JAN. 27, 1905.

Fig. 1

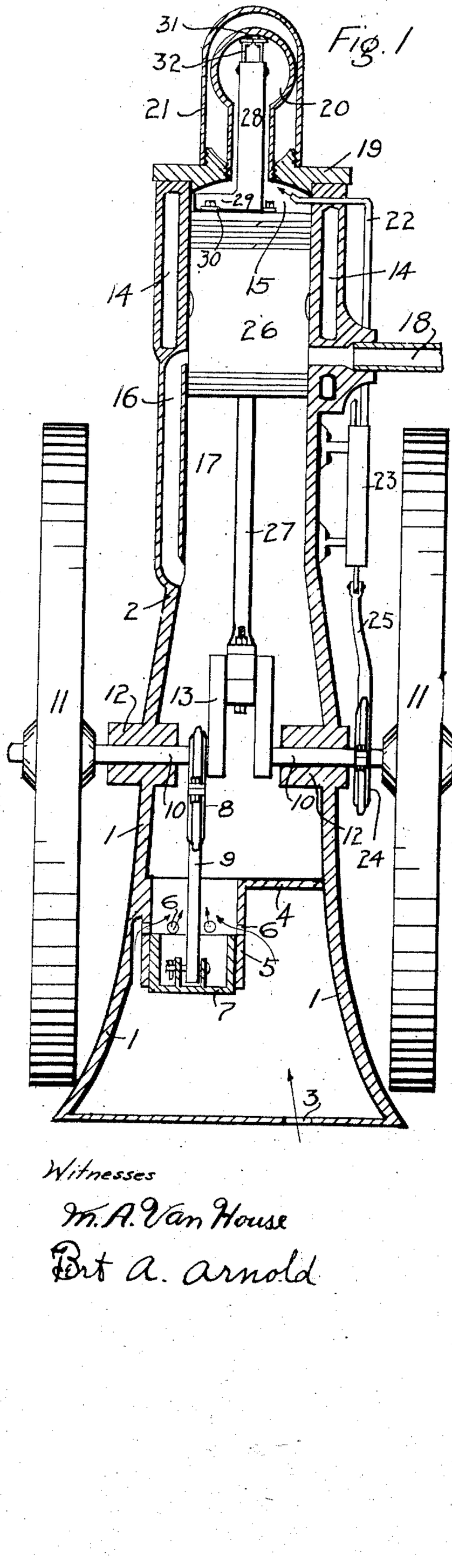
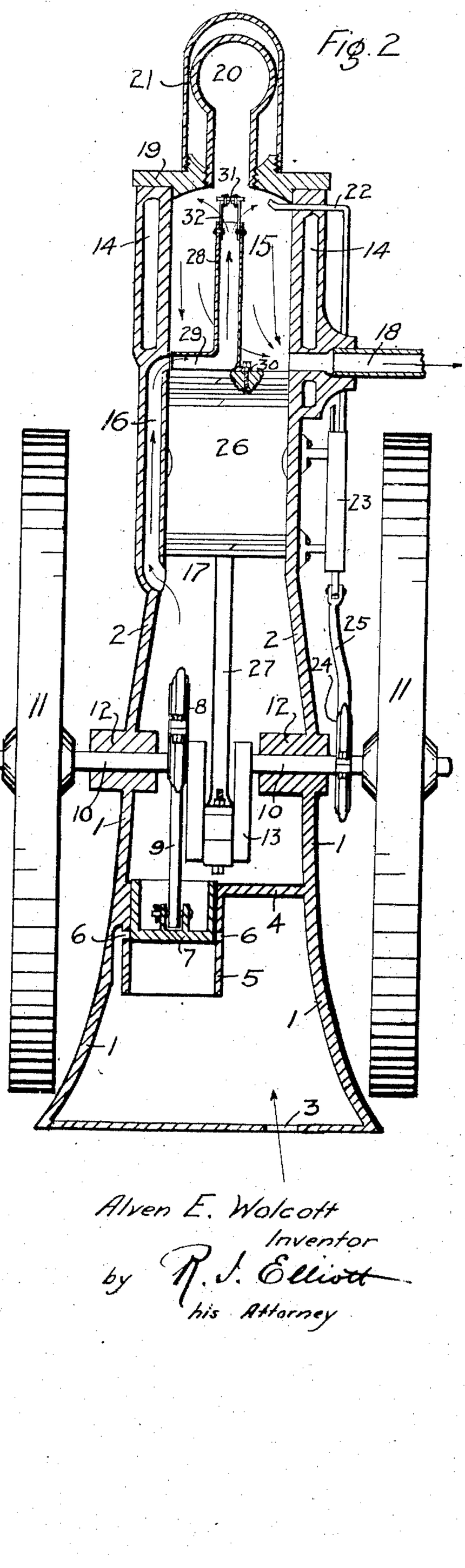


Fig. 2



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ALVEN E. WOLCOTT, OF TACOMA, WASHINGTON.

EXPLOSIVE-ENGINE.

No. 864,818. Specification of Letters Patent. Patented Sept. 3, 1907.

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To all whom it may concern:

Be it known that I, ALVEN E. WOLCOTT, a citizen of the United States of America, residing at Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Explosion-Engines, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to explosion engines and especially to that class known as two-cycle engines, and has for its objects, first, to improve the means of conducting the air from the air chamber to the back of the explosion chamber, and; second, to improve the means of increasing the amount of air admitted into the explosion chamber so as to more thoroughly drive out the exhausted gases therefrom. I attain these objects by the devices illustrated in the accompanying drawing, in which,

Figure 1 is a vertical section through my engine when the piston is at the top of the explosion chamber, and, Fig. 2 is a similar view with the piston at the bottom thereof.

Similar numerals of reference refer to similar parts throughout the several views.

The engine illustrated in the drawing belongs to that type in which the hydro-carbon vapor is sprayed into the cylinder in which air has been compressed; and in which the mixture of air and vapor is exploded by bringing it in contact with a hot bulb. My invention is however applicable to those engines in which the charge is exploded by electric spark or by any other system.

In the drawings the frame consists of a base "1" and an upper portion "2" joined together in the plane of the center of the engine shaft. The base "1" has an air opening "3" which may be located either in the bottom or at any point below the partition "4". This partition "4" extends across the base frame "1" and is provided with a small vertical cylinder "5" having air ports "6" through its walls. A piston "7" reciprocates in the cylinder "5" in such manner as to uncover the ports "6" when it is near the bottom of its stroke. The piston "7" is worked, by means of an eccentric "8" and rod "9", from the main shaft "10" of the engine. The position of the partition "4" in the base frame "1" is such as to allow the main crank plenty of room to work.

The main shaft "10" carries the two fly wheels "11" on the sides of the engine, and passes through the suitable boxes "12" made in the junction of the parts "1" and "2" of the frame, and has a crank "13" in the center between the boxes "12". The eccentric "8" is placed to one side of the crank "13". The joint between the parts "1" and "2" of the frame, and around

e air-tight.

frame is securely fastened to the base part "1" and forms the main part of the engine, being constructed as is usual with two-cycle engines, with a water jacket "14" surrounding the explosion chamber "15" which is the upper part of the frame "2"; with an air passage "16" leading from the air chamber "17" to the lower end of the explosion chamber "15"; and with an exhaust port "18" located at the end of the explosion chamber "15" at a point opposite to the air passage "16" and a little above it. The cylinder head "19" is secured to the upper part of the frame "2" and closes the explosion chamber "15", and has a hot bulb "20" centrally secured thereto and extending therefrom. The hot bulb "20" may be surrounded by the protecting bulb "21" which is removably secured to the cylinder head "19". The hydro-carbon spray is admitted into the upper part of the explosion chamber "15" through the pipe "22" connected to the pump indicated at "23" which is operated by the eccentric "24" and rod "25" from the main shaft "10" just outside of one of the journal boxes "12".

The main piston "26" is of the ordinary plunger type usual on such engines and is connected to the crank "13" by the connecting rod "27" in the usual manner. On the top of the piston "26" I secure my improved deflector which consists of a vertical tube "28" secured to the center of the piston "26" and having a foot "29" extending therefrom to the side of the piston at a point in line with the opening of the air passage "16". This foot and tube I prefer to make open at the bottom and provided with lugs "30" on the side of the bottom, through which bolts or screws pass whereby it is firmly secured to the piston. The end of the foot "29" is open and is adapted to form a connection between the air passage "16" and its continuation through the foot "29" and the tube "28". The upper part of the tube "28" is provided with a baffle plate "31" which is connected to the tube "28", but held above it, by means of the bars "32". The baffle plate "31" is placed so as to direct the current of cold air towards the sides of the explosion chamber "15" so that the cold air will not be blown up into the hot bulb "20" and thus cool it. The length of the tube "28" and the bars "32" is such as to bring the baffle plate "31" just below the upper end of the explosion chamber "15" when the piston is at the bottom of its stroke, and the length of the hot bulb "20" is such that when the piston is at the top of its stroke the baffle plate "31" will not quite touch the end of the bulb.

The operation of my improved engine may be briefly described as follows: When the piston "26" is at the top of its stroke the clearance in the explosion chamber "15" is full of compressed air and as soon as the spray of hydro-carbon vapor is admitted thereto through the pipe "22" and comes in contact with the hot bulb "20", it explodes driving the piston "26" down, and

rotating the shaft "10". Meantime the piston "7" of the small cylinder "5" in the partition "4" of the base "1" is at the lowest point in its stroke when the piston "26" is at its highest point. The air ports "6" are therefore uncovered and air is drawn into the air chamber "17". As the piston "26" moves downward under the impulse of the explosion above it, the piston "7" moves up and closes the air ports. The air in the air chamber "17" is therefore compressed by the pistons "26" and "7" until the top of the piston "26" has reached the opening of the air passage "16" when direct communication is established between the air chamber "17" and the explosion chamber "15" through the air passage "16", the foot "29" and the tube "28". The exhaust port "18" is uncovered by the piston "26" just before the air passage "16" is reached. Thus the air from the chamber "17" drives out the burned out air and gas in the chamber "15" through the port "18" and since the pressure produced by the small piston "7" is added to that produced by the piston "26" the amount of air admitted is sufficient to thoroughly cleanse the chamber "15", and all the clearance space therein, from the exhausted gases. Since the tube "28" conducts this new air to the top of the chamber "15" there is no chance of the new air passing through the exhaust port before all the burned out air is expelled from the chamber.

Having described my invention, what I claim is:

1. An explosion engine comprising a frame with an explosion cylinder formed in one end, a compression chamber formed in the middle, an admission chamber formed in the other end, and an auxiliary compression cylinder formed in the end wall of said compression chamber and having ports from said admission chamber into said auxiliary cylinder; with a reciprocating piston in said explosion cylinder and compressing the air in said compression chamber; an auxiliary piston working in said auxiliary cylinder with said first piston and uncovering the ports to admit air into said compression chamber from said admission chamber and compressing auxiliarly into said compression chamber and drawing air into said admission chamber; a passage leading from said compression chamber to the lower end of said explosion cylinder and adapted to be uncovered by said first piston to admit air to said explosion cylinder; and an exhaust port from said explosion cylinder at a point opposite to said air passage port.

2. In an explosive engine, a tube centrally secured within the explosion chamber to the piston and being open at the top, a baffle plate secured to the end of the tube and adapted to guide the air therefrom to the sides of the explosion chamber, and an open ended lateral extension to the bottom of said tube passing therefrom along the top of the piston to a point adapted to receive the air from the air passage.

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

ALVEN E. WOLCOTT.

Witnesses:
M. H. COREY,
M. A. VAN HOUSE.