June 24, 1952 C. J. McCORMICK 2,601,311

JET PROPULSION ENGINE

Filed July 22, 1946 2 SHEETS—SHEET 1

Fig. 2.

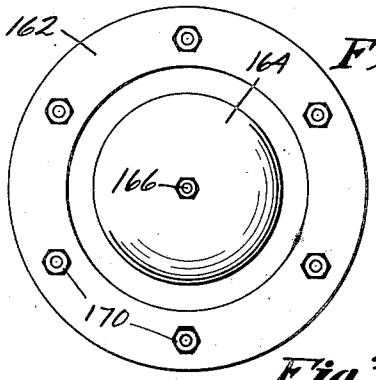


Fig. 1.

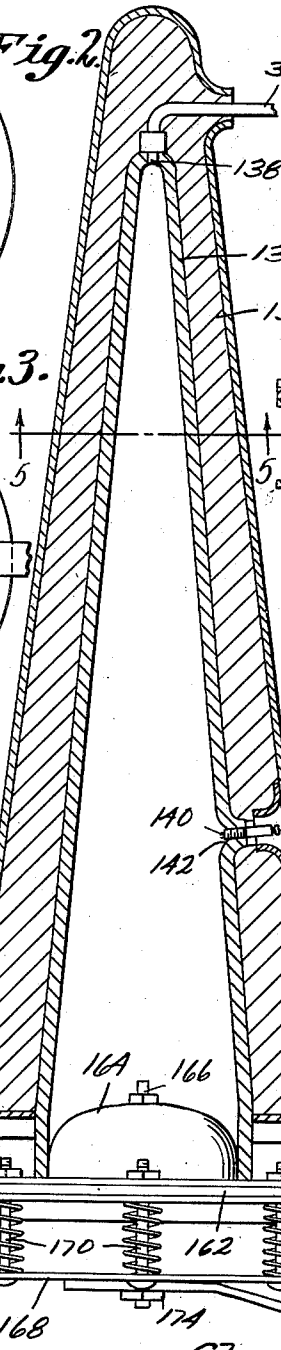


Fig. 4.

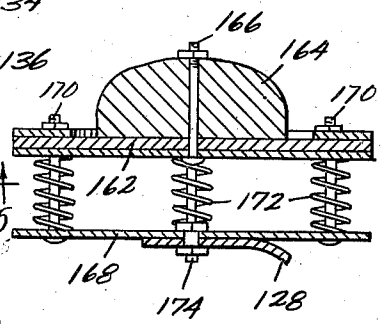


Fig. 3.

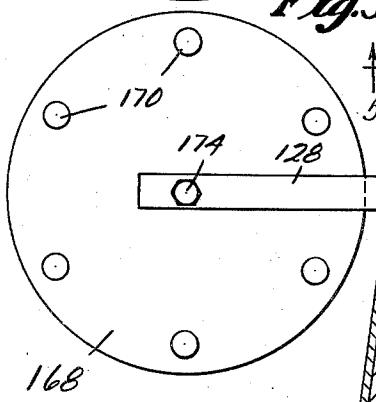
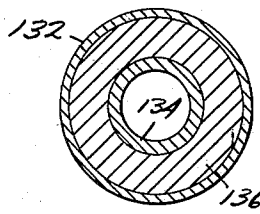


Fig. 5.



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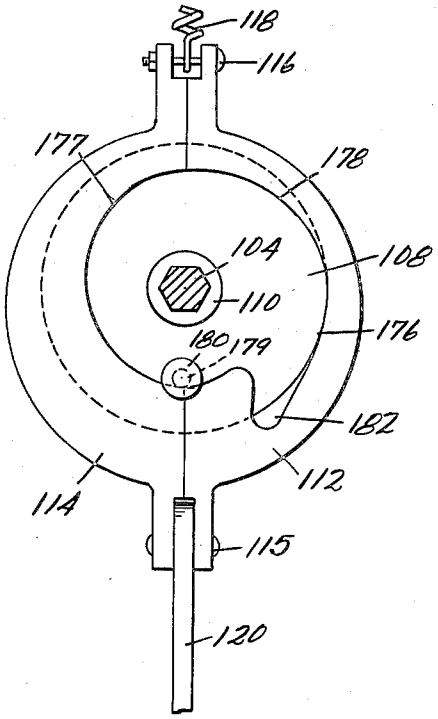

Fig. 6

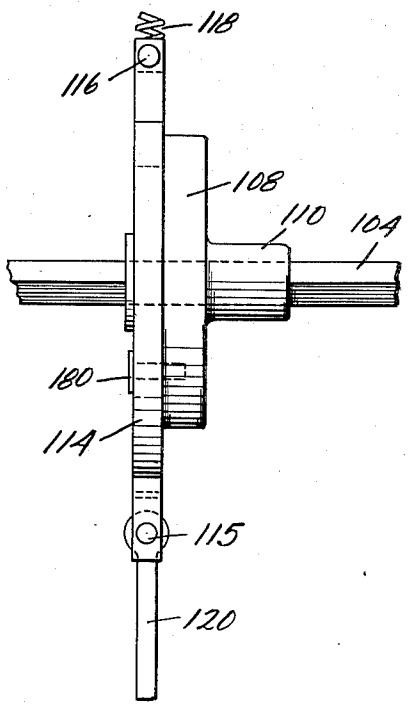

Fig. 7.

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JET PROPULSION ENGINE

Clarence J. McCormick, Chicago, Ill.

Application July 22, 1946, Serial No. 685,290

2 Claims. (Cl. 60—35.6)

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My present invention relates to an improved jet propulsion engine and more particularly to the explosion of a charge of air and gas in a firing chamber, the force of the charge being expelled from the chamber and resulting in a jet or rocket type propulsion.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention according to the best mode I have thus far devised but it will be understood that various changes and alterations may be made in the exemplified structure within the scope of the appended claims.

In the drawings:

Figure 1 is a vertical sectional view of the combustion chamber;

Figure 2 is a top plan view of the chamber closure;

Figure 3 is a bottom plan view thereof;

Figure 4 is a sectional view of the closure;

Figure 5 is a horizontal sectional view of the chamber, the section being taken on the line 5—5 of Figure 1;

Figure 6 is a front elevational view of the timer for operating the closure of the combustion chamber; and

Figure 7 is a side elevational view thereof.

Referring now to the drawing wherein like reference characters denote corresponding parts the improved jet propulsion engine of this invention includes a plurality of conical shaped nozzles or combustion chambers each having an outer shell or wall 132 and an inner shell or wall 134 with the area between the walls filled with asbestos as indicated by the numeral 136, or other suitable material.

An opening 138 is provided in the small end of the nozzle and this is connected to a tube 38 that extends from the nozzle to means of supplying gaseous fuel.

The nozzle is also provided with a spark plug 140, the inner end of which is positioned in a recess 142 in the nozzle and the connections thereto are provided through a boss 144 on the outer wall with a wire 146 connecting the terminal of the spark plug to a terminal 148 of a switch having an arm 150. The arm 150 is pivotally mounted by a pin 152 on a bracket 154 and a projection 156 extends from the arm and is positioned to be engaged by the cam 122 of the rod 120.

The rod 120 is operated by a disc 108 having a hub 110, which is mounted on a shaft 104, and a split cam having sections 112 and 114 and having a cam opening with surfaces indicated by

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the numerals 176, 177, and 178 therein is positioned to coact with an eccentrically mounted roller 180 that is carried by the disc 108 through a pin 179. The upper ends of the cam sections are held by a bolt 116 to a spring 118 and extensions at the lower end are secured by a bolt 115 to the rod 120.

As illustrated in Figure 6 the spring holds the cam upwardly against the pin 179 of the roller or flange 180 and with the roller or head of the pin extended over the cam surface the cam is retained against the face of the disc 108. The shaft 104 is provided with flat sides to definitely locate the disc 108 thereon.

The lower end of the rod 120 is provided with a cam 122 and the rod is pivotally connected by a pin 124 to an arm 126, the outer end of which is attached to a spring arm 128 which is connected by a hinge 130 to the outer wall 132 of the conical shaped nozzle.

An annular ring 158 provides a closure in the outer end of the nozzle between the inner and outer walls and the edge of the outer wall is flared outwardly as indicated by the numeral 160.

A closure plate 162 with a dome shaped guide or locating element 164 thereon is positioned against the outer end of the inner wall with the dome shaped element, which is secured to the plate by a bolt 166 extended into the nozzle. The closure 162 is supported by a disc 168 on the end of the arm 128 by bolts 170 and springs 172 around the bolts provide a flexible connection between the closure and disc. The disc is secured to the arm 128 by a bolt 174.

With the parts arranged in this manner gaseous fuel under pressure is supplied intermittently through the tube 38 to the nozzle or combustion chamber and with the current to the spark plug controlled by the cam 122 the charge is exploded and the force of the explosion is directed outwardly through the larger portion of the nozzle or combustion chamber and the force of the explosion is discharged into the air through which a vehicle in which the device is installed is traveling whereby a jet or rocket-type of propulsion is provided.

After each explosion the closure 162 is immediately returned to a closed position on the end of the nozzle or combustion chamber and another charge is set up in the chamber.

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

1. A nozzle for jet propulsion engines comprising a double wall elongated conical shaped cas-

ing having an inner wall and an outer wall and in which the small end thereof is closed, the large end of said casing being open, a charge inlet connection extended into the small end of the casing and communicating with the interior thereof, a closure plate extended across the large open end of the inner wall of the casing, a disc spaced from the closure plate, bolts connecting the plate to the disc, springs on the bolts urging the disc and plate apart, a centrally disposed dome shaped element mounted on the closure plate and positioned to nest in the large open end of the casing, an arcuate arm hinged to the outer wall of the casing at one end and positioned with the opposite end mounted on the disc of the closure plate, a spark plug positioned in the wall of the nozzle casing, and means opening the closure plate and completing a circuit to the spark plug to produce a spark in the nozzle.

2. In a jet propulsion engine, the combination which comprises an elongated conical shaped nozzle closed at the small end and in which the large end is open, a closure positioned in the open end, an arcuate arm hinged at one end to the wall of the nozzle and positioned with the opposite end extended over and spaced from the closure, resilient means carried by the end of the arm spaced from the closure for urging the closure against the end of the nozzle, igniting means in the nozzle, means actuating the igniting means and opening the closure simultaneously, and control means suppling charges of gas intermittently to a combustion chamber in the nozzle.

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