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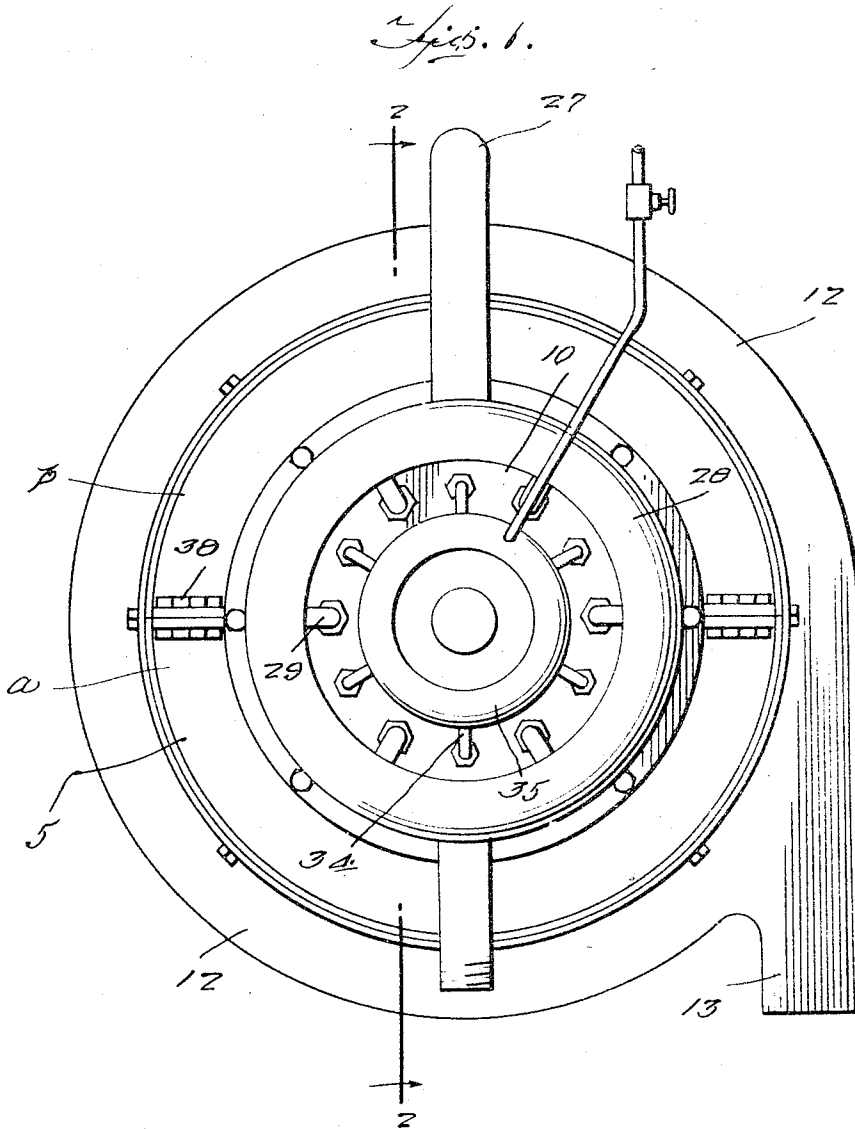
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2,446,847

TURBINE ENGINE

Filed June 9, 1943

4 Sheets-Sheet 1



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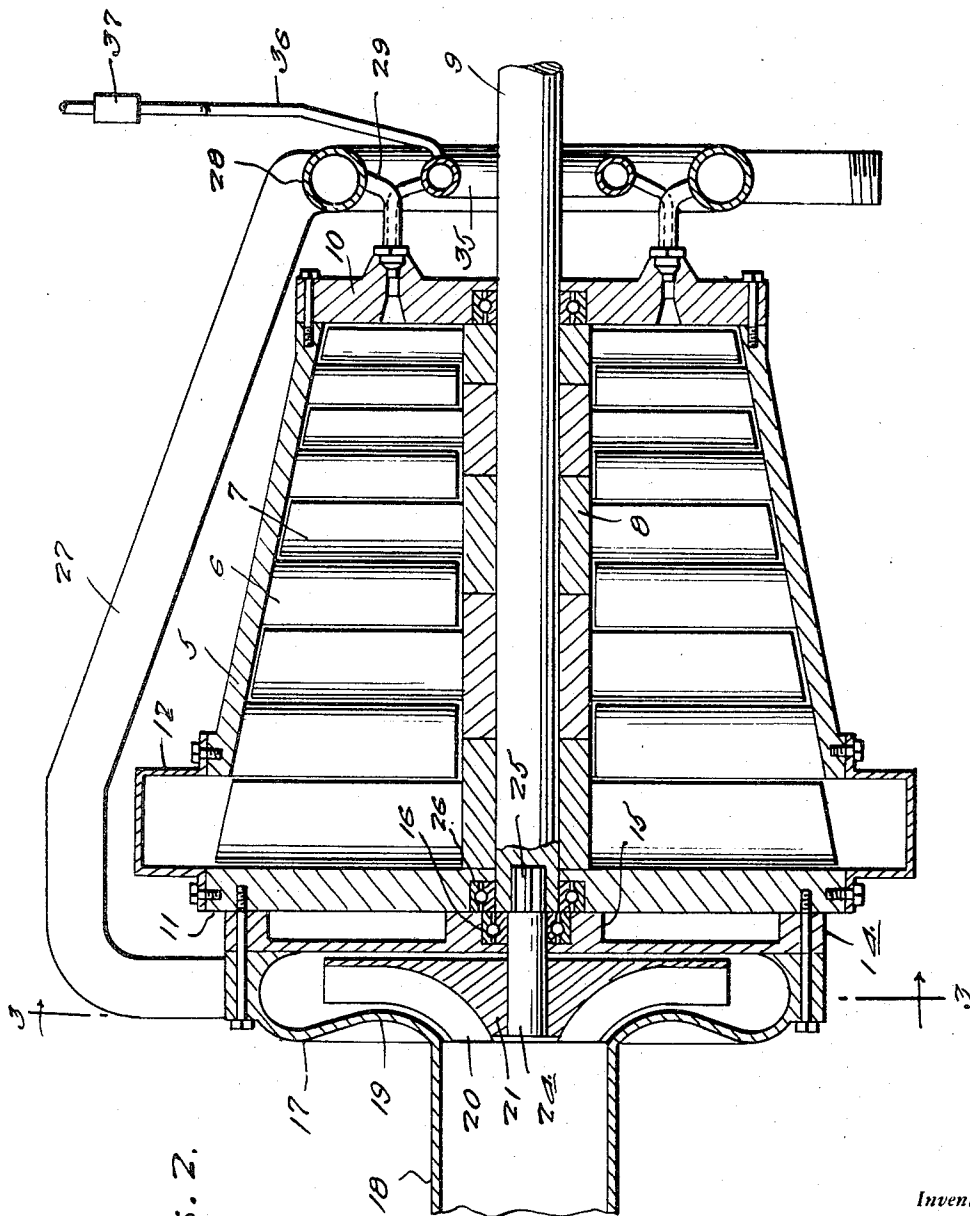
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Fig. 3.

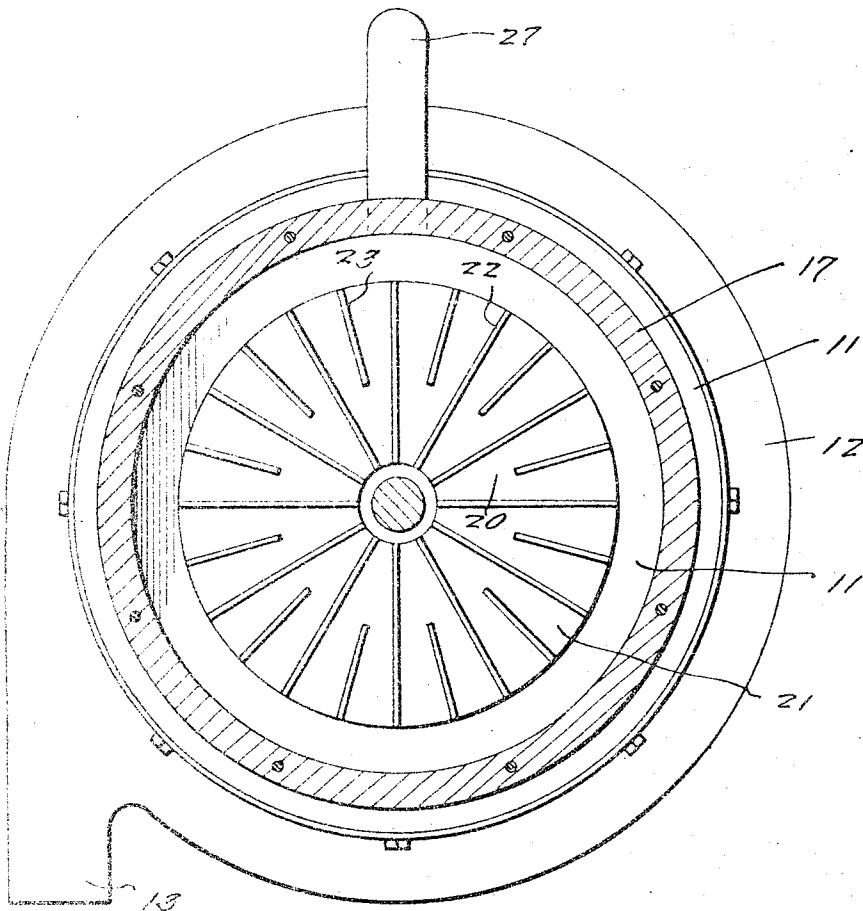
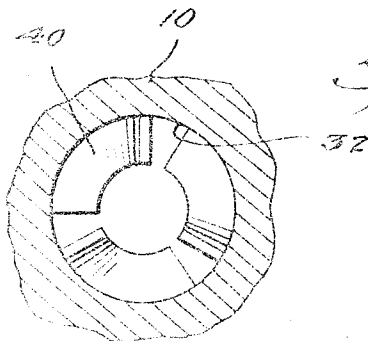


Fig. 6.

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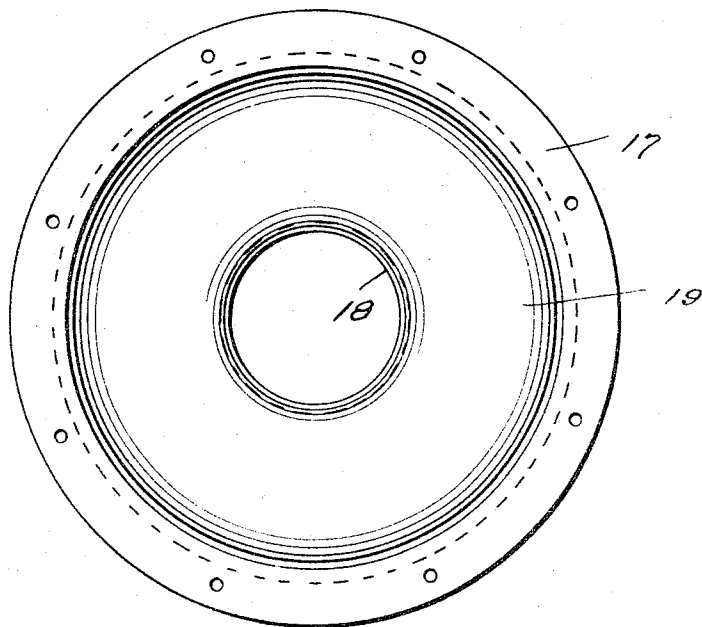
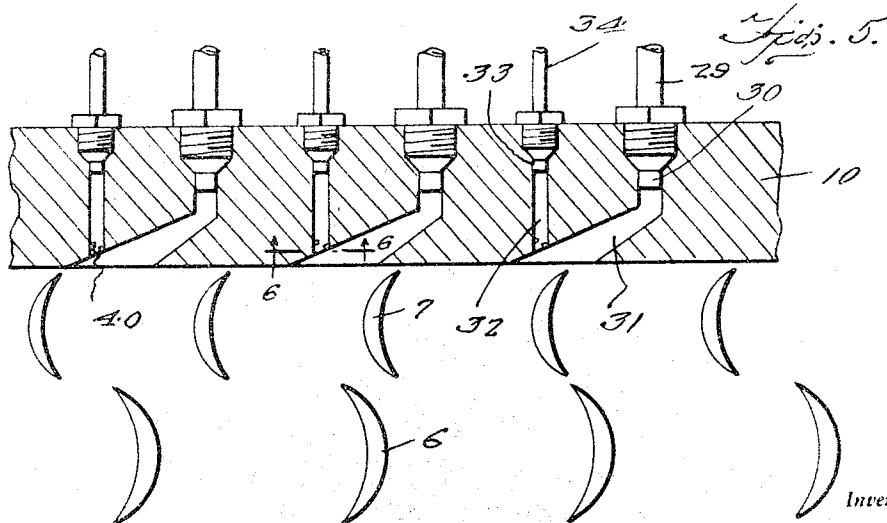
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Fig. 4.



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UNITED STATES PATENT OFFICE

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TURBINE ENGINE

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Application June 9, 1943, Serial No. 490,201

2 Claims. (Cl. 60—41)

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This invention relates to new and useful improvements in power plants such as turbine engines and is an improvement on my co-pending applications Serial Nos. 461,576, filed October 10, 1942, and 479,798, filed March 19, 1943, both for Turbine engines, and now abandoned.

An important object of the present invention is to provide a simplified turbine engine in which working parts are reduced to a minimum.

Another important object of the invention is to provide a simplified turbine engine wherein the parts are readily accessible for the purpose of quick repair or replacement.

The invention is characterized by the features of concentric annular air and fuel manifolds, disposed adjacent an injector plate of the engine; by a plurality of tangentially inclined combustion jets discharging their products of combustion against the rotor blades; by the provision of fuel conduits discharging directly into the jets adjacent their discharge ends; and by the further provision of swirl-producing inclined baffle means disposed in the exit portions of the fuel jets.

Other objects and advantages of the invention will become apparent to the reader of the following description.

In the drawings:

Figure 1 is an end elevational view of the engine.

Figure 2 is a longitudinal sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a transverse sectional view taken substantially on the line 3—3 of Figure 2.

Figure 4 is an inside elevational view of the compressor shell.

Figure 5 is a fragmentary detailed sectional view showing the combustion plate, vane and jets.

Figure 6 is a fragmentary detailed section showing the fuel deflectors, the section being taken on the line 6—6 of Figure 5.

Referring to the drawings wherein like numerals designate like parts, it can be seen in the drawings that numeral 5 denotes a stator of frusto-conical shape, the same having blades 6 projecting inwardly therefrom in rows which alternate with rows of vanes 7 which project outwardly from hubs 8 on an elongated drive shaft 9.

An injector plate 10 is provided at the small end of the stator 5, while an end wall 11 is provided at the large end and this is bridged with the stator proper 5 by an annular exhaust conduit 12 which has its outlet at 13.

At the wall 11 is a bearing plate 14 having a box 15 at its axial portion in which a bearing assembly 16 is located.

A compressor is provided for the engine and

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this is composed of a compressor shell 17, to the axle portion of which an air conduit 18 extends. As denoted by numeral 19, the portion just outwardly of the axle portion of the shell 17 is slightly constricted to conform with the trough-like passageways 20 of a compressor wheel 21, these passageways 20 being defined by long and short blades 22, 23, respectively, on the compressor wheel 21. A stub shaft 24 extends through the wheel 21 and through the bearing 16, this stub shaft projecting as at 25 into the adjacent end of the drive shaft 9. It can be seen that the end plate 11 has a bearing 26 for receiving this same end of the drive shaft 9.

A pipe 27 extends from the compressor shell 17 over the stator 5 to a manifold 28 which is in the form of an annular pipe from which tubes 29 extend to jet members 30, threaded into the injector plate 10. The injector plate 10 is provided with tangentially inclined, outwardly flaring or divergent nozzles 31 arranged in a circle, each adapted to form a jet entering directly into the blades or vanes 7 of the rotor, as seen from Figure 5. Into the discharge end portions of said nozzles 31, discharge the ducts 32 which extend transversely through the plate 10 and into which project fuel jet members 33, connected by means of tubes 34 with an annular fuel manifold 35. A supply line 36 extends to the fuel manifold 35 and has a suitable valve 37 therein. Any suitable ignition means is provided for initiating combustion, it being understood that the rate of combustion is controlled by throttling the fuel supply by means of valve 37.

As can be seen in Figure 1, it is preferable that the stator walls 5 are divided into sections a, b bolted together as at 38 for the purpose of convenience in reaching the interior of the engine.

The ducts 32, adjacent the discharge ends thereof, are provided with small staggered deflectors 40 so as to break up and atomize the fuel as it enters the incoming air from conduits 29 in the nozzles 31. Combustion will be efficient and complete at these points, the force of the combustion acting obliquely, as shown in Figure 5 and against the vanes 6 and 7.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

Having described the invention, what is claimed as new is:

1. In an internal combustion turbine including

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a stator and a rotor each having rows of blades, an injector plate in front of the admission side of the rotor, a plurality of fluid nozzles in said plate, said nozzles being arranged in a circle and having diverging discharge ends directed tangentially of said rotor, a compressed air conduit communicating with each of said fluid nozzles, a fuel nozzle communicating with each of said fluid nozzles adjacent its discharge end, deflector plates in each of said fuel nozzles adjacent the discharge end thereof for breaking up and atomizing the fuel discharged into the divergent fluid nozzle.

2. The combination of claim 1 wherein said

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deflector plates are arranged in staggered formation in each of said fuel nozzles.

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The following references are of record in the file of this patent:

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