

needle and turbine

Results in EPODOC 666

[SS 8] needle and injector and turbine

Results in EPODOC 23

[SS 9] hydroturbine and needle

Results in EPODOC 4

[SS 10] ..li
¡Error! Nombre de archivo no especificado.

1/4	© EPODOC / EPO
PN	- CN204003260U U 20141210
PR	- CN20142446478U 20140808
AP	- CN20142446478U 20140808
DT	- I
CCA	- Y02E10/226
PA	- YICHANG JUNENG ELECTRIC CO LTD
TI	- Programmable hydroturbine governor based on hydraulic motor
AB	-The utility model discloses a programmable hydroturbine governor based on a hydraulic motor. The programmable hydroturbine governor based on the hydraulic motor comprises the hydraulic motor, wherein one end of an oil inlet pipe and one end of an oil outlet pipe are communicated with the hydraulic motor, the other end of the oil inlet pipe and the other end of the oil outlet pipe are communicated with a first pair of one-way throttling valves in the governor respectively, the hydraulic motor serves as a regulation and execution mechanism and is connected with a spray needle , and the rotating speed of a vane of a hydroturbine is regulated through the spray needle . According to the programmable hydroturbine governor based on the hydraulic motor, signals are acquired, analyzed and processed by means of an electrical unit through programmable control, the reliability is high, the stability is high, and the

openness is high; the number of branch oil pipes is reduced through highly-integrated valve blocks, an oil circuit is simple and distinct, and repair and maintenance are facilitated; due to the fact that a high-pressure oil pipe is connected with the hydraulic motor, the workload of on-site steel pipe welding and installing is reduced, and both replacement and maintenance are convenient and fast; due to the fact that a manual operating mechanism is reserved, both the manual regulation function and the automatic regulation function are achieved.

2/4 © EPODOC / EPO

PN - [CN201197678Y](#) Y 20090225

PR - CN2008253131U 20080509

AP - [CN2008253131U](#) 20080509

DT - I

PA - QINGHONG LE [CN]

TI - Multifunctional bathing device

AB - A multifunctional shower device comprises a handle and a rotary working head, the rotary working head is arranged on the handle, and the rotary working head comprises a power wheel, a working wheel, a scrubbing cover, a main shaft, a spray **needle** and a working water pipe. The scrubbing cover can be soft objects such as sponge, towel and the like, the scrubbing cover is sleeved outside the working wheel, the working wheel is fixedly connected with the power wheel, sleeved on the main shaft and connected with the main shaft in a movable way, and the power wheel is provided with an impeller or an impeller-shaped structure. The working water pipe is provided with the spray **needle**, and the spray **needle** and the power wheel constitute a **hydroturbine** system structure. The utility model aims to provide the multifunctional shower device which has simple structure and no waste of electric energy and is capable of rotary scrubbing and direct showering.

3/4 © EPODOC / EPO

PN - [CN101275533](#) A 20081001

PR - CN2008158334 20080428

AP - [CN2008158334](#) 20080428

DT - I

CCA - [Y02E10/223](#) ; [Y02E10/226](#)

PA - YING XIONG [CN]

TI - Afflux adjustable multiple-jet diagonal flow water turbine

AB -The invention relates to a flow-collecting adjustable multi-nozzle inclined-jet **hydroturbine**, comprising a generator supportably connected to the upper surface of a case and a tail water cover connected to the lower surface of the case, the tail water cover is provided with a blade type runner connected with a rotating shaft, a flow collecting chamber formed by the inner wall of the case receives the flow from the outside through water inlets. The invention is characterized in that the bottom of the flow collecting chamber is symmetrically provided with multiple water outlets matching to the nozzle holes of the runner, the water inlet of each nozzle hole is connected with one end of the ogival **needle** stem, the other end of the **needle** stem is supportably connected with the threaded hole on the side wall of the case, each **needle** stem cooperates with the threaded hole on the side wall of the case to control the open and close of the nozzle hole; the major characteristic lies in that the special structure of the flow collecting chamber is used, multiple nozzles can be arranged in the flow collecting chamber, so that the application scope of the inclined-jet **hydroturbine** is enlarged, with the same power being developed by the **hydroturbine**, the volume is reduced, and the cost is lowered.

4/4 © EPODOC / EPO

PN - [CN201080890Y](#) Y 20080702

PR - CN20072104824U 20070724

AP - [CN20072104824U](#) 20070724

DT - I

CCA - [Y02E10/226](#)

PA - KUNMING ELECTRICAL MACHINERY C [CN]

TI - **Hydroturbine** DC jet tube feedback device

AB -The utility model provides a turbine straight flow nozzle feedback device, comprising a **needle** tip, a **needle** stem arranged on the **needle** tip and a piston arranged on the stem. The utility model is characterized in that: the end of the **needle** stem is provided with a trepanning into which a sensor lever is inserted. The other end of the sensor lever is connected with a sensor. A magnetic ring sleeved on the sensor lever is fixed on the piston. A **needle**-displacement signal can be converted into an electric feedback signal conveniently and transmitted to a speed governor, thereby realizing the coordination control of the **needle** stroke and the opening of the speed governor. As a result, the utility model is simplified in structure, improved in reliability, high in feedback accuracy, thereby radically overcoming the drawbacks of complicated structure, low feedback accuracy, poor reliability, difficult maintenance, etc. of the prior feedback device.

[SS 10] ..v

[EPODOC: SS 10] 8

Results in EPODOC 23

[SS 11] ..li

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1/23 © EPODOC / EPO

PN - [CN105829706](#) A 20160803

PR - FR20130058681 20130910; WO2014EP67755 20140820

AP - [CN2014850070](#) 20140820

DT - I

CT - *// STSE (A)*
[US1849350](#) A 19320315 [YX] (HUTCHINSON ELY C)
[Y] 6
* 说明书第1页第68行至第2页第80行及图1-6 *
[X] 1-5、7-10;
[CH660904](#) A5 19870529 [A] (ARMIN MUELLER)
[A] 1-10
* 全文*;
CN2326743Y Y 19990630 [A] (WU TIEMIN [CN])
[A] 1-10
* 全文*;
[CN102947581](#) A 20130227 [A] (VOITH PATENT GMBH)
[A] 1-10
* 全文*

CCI - [F03B1/04](#)

CCA - [Y02E10/223](#)

PA - ALSTOM RENEWABLE TECHNOLOGIES

TI - Hydraulic **injector** of a pelton **turbine** and method for the partial disassembly of such an **injector**

AB	-This hydraulic injector (2) of a Pelton turbine comprises a nozzle (4), centered on a central injection axis (Y2) , a sleeve (8), which is arranged coaxially in the interior of the nozzle, and a needle (10), which is movably mounted in relation to the sleeve along the central injection axis. The needle (10) is pivotable in relation to the sleeve (8) about the central axis (Y2) between a first position, in which it is axially secured to the sleeve, and a second position, in which it may be disengaged axially from the sleeve.
2/23	© EPODOC / EPO
PN	- CN104213975 A 20141217
PR	- CN20141433833 20140829
AP	- CN20141433833 20140829
DT	- I
CT	- // STSE (A) CN201003433Y Y 20080109 [A] (WEIJIAN HE [CN]) [A] 1-6 * 全文*; US5345759 A 19940913 [X] (AWON MAXWELL P [TT]) [X] 1-6 * 说明书第2 栏第35 行- 第3 栏第20 行及图1, 2 *; JPS57176322 A 19821029 [A] (TOYODA CHUO KENKYUSHO KK) [A] 1-6 * 全文*; CN204060915U U 20141231 [R] (LI TAOTAO) [R] 1-6 * 权利要求1-6 *
CCA	- Y02T10/14 ; Y02T10/166
PA	- LI TAOTAO
TI	- Steam-powered internal combustion engine
AB	-The invention discloses a steam-powered internal combustion engine. The steam-powered internal combustion engine comprises a cylinder, a high-pressure steam pump, a water tank, an oil tank and a steam turbine , wherein the cylinder, of which two bottom faces are respectively provided with a steam inlet and a steam outlet, is provided with an oxygen sensor, a fuel injector , an ignition needle , a sensing needle and a water pipe, which extend from the exterior of the cylinder to the interior of the cylinder; a cylindrical groove is formed in the

center of the bottom face, at the internal steam inlet side, of the cylinder, a tubular isolating hood, which is coaxial with the cylinder, and a water inlet are sequentially arranged around the groove, the fuel **injector** is arranged at the center of the groove, a tubular short tube is formed at the edge of the groove, the tail end of the isolating hood closes and forms an opening, the water pipe is arranged at the water inlet, and sprayers are arranged at one side, facing to the isolating hood, of the water pipe in the cylinder. The steam-powered internal combustion engine has the advantages that the overall layout is reasonable, the structure is compact, the full combustion of fuel is guaranteed, and the efficient utilization of steam power is realized.

3/23 © EPODOC / EPO

PN - [WO2015036212](#) A1 20150319

PR - FR20130058681 20130910

AP - [WO2014EP67755](#) 20140820

DT - **

CT - *[EP] ISR (A1)*

[US1849350](#) A 19320315 [XAYI] (HUTCHINSON ELY C)

[X] 1-5,8,9

** page 2, lines 20-29 **

** page 2, lines 38-46 **

** claims 4-5 **

** figures 1-6 **

** page 2, lines 29-33 **

** page 2, lines 55-59 **

[A] 7

[Y] 6

[I] 10;

[SU1116206](#) A1 19840930 [YA] (PROIZV OB TURBOSTROENIYA LE ME [SU])

[Y] 6

** abstract **

[A] 7;

[CH660904](#) A5 19870529 [A] (ARMIN MUELLER)

[A] 7

** abstract **

** page 2, column 2, lines 25-29 **

** figure 1 *;*

[CH670138](#) A5 19890512 [A] (STOODY DELORO STELLITE INC)

[A] 7

* abstract *

* page 2, column 2, line 56 - page 3, column 1, line 11 *

* figures 1-2 *;

[CH333655](#) A 19581031 [A] (VEVEY ATEL CONST MEC [CH])

[A] 7

* page 2, lines 14-17 *

* page 2, lines 37-53 *

* page 2, lines 62-82 *

* page 3, lines 16-36 *

* page 3, line 75 - page 4, line 5 *

* figures 1-3 *

CCI	-	F03B1/04
CCA	-	Y02E10/223
PA	-	ALSTOM RENEWABLE TECHNOLOGIES [FR]
TI	-	HYDRAULIC INJECTOR OF A PELTON TURBINE AND METHOD FOR THE PARTIAL DISASSEMBLY OF SUCH AN INJECTOR
AB	-	This hydraulic injector (2) of a Pelton turbine comprises a nozzle (4), centered on a central injection axis (Y2) , a sleeve (8), which is arranged coaxially in the interior of the nozzle, and a needle (10), which is movably mounted in relation to the sleeve along the central injection axis. The needle (10) is pivotable in relation to the sleeve (8) about the central axis (Y2) between a first position, in which it is axially secured to the sleeve, and a second position, in which it may be disengaged axially from the sleeve.

4/23 © EPODOC / EPO

PN - [WO2005103486](#) A1 20051103

PR - US20040813720 20040331

AP - [WO2005US06048](#) 20050228

DT - *; Rep

CT - |EP| ISR (A1)

[EP1308619](#) A1 20030507 [X] (TURBINENBAU TROYER GMBH S R L [IT])

[X] 1-29

* the whole document *;

JPH1026072 A 00000000 [X];

[GB651114](#) A 19510314 [A] (BOVING AND COMPANY LTD, et al)

[A] 1-29

* the whole document *;

[US4441029](#) A 19840403 [A] (KAO DAVID T [US])

[A] 1-29

* the whole document *;

[FR2137359](#) A1 19721229 [A] (NEYRPIC)

[A] 1-29

* the whole document *

CTNP	- <i>[EP] ISR (A1)</i> [X] - PATENT ABSTRACTS OF JAPAN, (19980430), vol. 1998, no. 05, <i>[X] 1-29</i> * abstract *
CCI	- F03B1/00 ; F03B1/04 ; F03B15/20
CCA	- Y02E10/223 ; Y02E10/226 ; F05B2240/2411 ; Y10T29/49316 ; Y10T29/49318 ; Y10T29/49716
PA	- GEN ELECTRIC [US]; TALYA SHASHISHEKARA SITHARAMAR [US]; ERNO DANIEL JASON [US] ; ROMMETVEIT OLAV [NO]; SUNDSVOLD ELNAR MIKAL [NO]; BJERKE MORTEN [NO]
TI	- PELTON TURBINE SYSTEM AND METHOD
AB	- A Pelton turbine is disclosed that includes at least one needle valve injector assembly and at least one high efficiency injector assembly. The high efficiency injector assembly provides a generally unimpeded flow path for water from a distributor to a runner of the turbine . The high efficiency injector assemblies and needle valve injector assemblies are operated in cooperation to provide the overall desired flow rate through the turbine and to increase the efficiency of the turbine . A high efficiency injector assembly may be retrofitted for a needle valve injector assembly to improve the efficiency of existing turbine systems.

5/23 © EPODOC / EPO

PN - [US2005220605](#) A1 20051006

PNFP - US7927064 B2 20110419

PR - US20040813720 20040331

AP - [US20040813720](#) 20040331

DT - **

CT - *// STSE (B2)*
[US249274](#) A 18811108 []
[US827165](#) A 19060731 [] (MARINER JOSEPH L [US])
[US1776392](#) A 19300923 [] (MOODY LEWIS F)

	US2368033 A 19450123 [] (GREGORY MAKAROFF) EP1308619 A1 20030507 [] (TROYER ERNST [IT]) JPH1026072 A 19980127 [] (NAMIKI HISANORI, et al) - // R141 (A1) US2368033 A []; US6206630 B1 []; US827165 A []; US1776392 A []; US6309179 B1 []; US249274 A []
CCI	- F03B1/00 ; F03B1/04 ; F03B15/20
CCA	- Y02E10/223 ; Y02E10/226 ; F05B2240/2411 ; Y10T29/49316 ; Y10T29/49318 ; Y10T29/49716
PA	- (B2) GEN ELECTRIC [US]
TI	- (A1 B2) Pelton turbine system and method
AB	- (A1 B2) A Pelton turbine is disclosed that includes at least one needle valve injector assembly and at least one high efficiency injector assembly. The high efficiency injector assembly provides a generally unimpeded flow path for water from a distributor to a runner of the turbine . The high efficiency injector assemblies and needle valve injector assemblies are operated in cooperation to provide the overall desired flow rate through the turbine and to increase the efficiency of the turbine . A high efficiency injector assembly may be retrofitted for a needle valve injector assembly to improve the efficiency of existing turbine systems.

6/23	© EPODOC / EPO
PN	- US4331173 A 19820525
PR	- CH19790002898 19790329
AP	- US19800129386 19800311
DT	- **
CT	- // STSE (A) CA656042 A 19630115 [] (CASACCI SEVERIN); DE1140150 B 19621122 [] (BAUMANN DIPL-ING KURT)
CCI	- F03B15/20
CCA	- Y02E10/223 ; Y02E10/226 ; Y10T137/3367

PA	- CHARMILLES SA ATELIERS
TI	- Hydraulic system for feeding an action turbine
AB	-A hydraulic system for feeding an action turbine comprising a rectilinear gate and an injector mounted in series on a conduit through which water is supplied to the turbine wherein the gate has a shut-off which is mounted in an outer body member for the injector , said shut-off having a seat member associated therewith, the injector including a needle valve which has a seat member associated therewith, said seats being located adjacent one another. The needle valve may have a support associated therewith and the shut-off for the gate may be located upstream thereof. The needle valve seat may be displaceable downstream to permit closing of the gate. In such position, the needle valve and its seat may be disassembled without emptying the water supply conduit.

7/23 © EPODOC / EPO

PN	- GB190811728 A 19081231
PR	- GBT190811728 19080529
AP	- GBD190811728 19080529
DT	- I
PA	- SCHRATZ ALOIS [HU] ; WAMOSCHER LASSLO [HU]
TI	- Improvements in Turbines.
AB	- 11,728. Schratz, A., and Wamoscher, L. May 29. Gas turbines. - Relates to improvements in driving-gear and working-fluid supply arrangements in turbines of the screw-motor type. The spiral grooves on the rotor 5 increase in width and depth in a downward direction and may be formed by plates inserted into the rotor. A ring 15 surrounds the lower end, and a plate 13 closes the rotor drum. Power is transmitted from the shaft 7 to shafts 12 by worm gearing 10, 11 running in an oil bath. Fig. 4 shows a modification in which the wheels 11 are provided with rollers 60 mounted on radial pins, the part 10 being tapered to engage with them. The upper end of the shaft 7 has let into it a bush 23 for the reception of a gudgeon 24, Fig. 1. The pin 24 is pierced for lubricant, and is axially adjustable in position by a nut-wheel 26 adapted to be rotated by a worm 27. The lower end of the shaft 7 is formed into a piston 40 working in a cylinder 41 containing oil. The oil-pressure is transmitted through a pipe 42 to a cylinder 38, in which works a piston 37 connected to a pivoted link 34. Steam admitted by a pipe 39 is delivered

to the motor through nozzles 21 controlled by **needle** valves 31. Normally the nozzles are kept open by springs 30. Should the speed however increase, the resistance offered to the worm 10 by the wheels 11 diminishes, and the shaft 7 descends, thus causing the piston 37 to ascend, and close the nozzle openings, through a line 34, a sleeve plate 32, and pins 31. The **turbine** casing is built up in sections as shown. Condensation of the steam is effected in the lower section 3 by water introduced by pipe 16. A pipe 17 leads water to the stuffing-box for the water-seal. The modification shown in Fig. 4 is specially adapted for working with mixed driving - fluids. Steam enters at 50 and passes through perforated injectors 56 to the supply nozzles 19. An explosion chamber 52 is arranged beneath the steam chamber 49. A pipe 51, provided with a non-return valve and coiled in the chamber 49, supplies heated air, and a pipe 53, 54 coiled in both chambers 49, 52 acts as vaporizer for the oil required for combustion. The mixture is ignited in a suitable manner. The products pass through the perforations in the **injector** and the mixed steam and gases are delivered to the nozzles 19. Water is drawn by **injector** action from the third supply chamber 55, and the mixed fluids actuate the **turbine**. Condensing-water is introduced at the base as before, and part of the water is pumped up to the chamber 55, the remainder going to a cooler. -The engine can be worked with steam alone or gas alone, or with steam and water, unnecessary chambers being dispensed with. When gas alone is used, a compressor and valves are provided. The end 9 of the shaft rests on a piston 62, beneath which oil is pumped to take the load off the ball bearing 64 of the worm. A hole in the piston 62 allows oil to pass to the bearing of the shaft. The shaft is in two portions 7, 7<1> jointed together by a disk coupling 67, the upper half of which carries three studs 68. A ball 69 interposed between the ends of the shafts keeps the disks apart, and in the space a known kind of flat centrifugal governor is inserted. The governor weights are pivoted on the studs 68 and act by lever transmission on a throttle valve in the steam inlet as soon as a certain speed is attained. For lubricating the stuffing-box 8, oil is admitted by a pipe 58, and circulates in spiral grooves. It then passes by a pipe 59 to the worm-gear oil-bath. The casing parts are supported on standards 2.

8/23 © EPODOC / EPO

PN - [GB1115138](#) A 19680529

PR - GB19660057582 19661222

AP - [GB19660057582](#) 19661222

DT - **

CCI - [F02K1/15](#)

PA - ROLLS ROYCE

TI - Hydraulic apparatus for controlling at least one hydraulic ram

AB - 1, 115, 138. Hydraulic apparatus; reciprocating pumps; gas **turbine** jet engines. ROLLS ROYCE Ltd. Dec.22, 1966, No.57582/66. Headings F1A, F1J and F1P. In a gas **turbine** engine 10, Fig. 1, a nozzle 34 of variable area is controlled by an axially-movable sleeve 31 coupled to a plurality of hydraulic rams 26, each of which rams is connected by pipes 45, 46, Figs. 3 and 4, to inlet and outlet ports 43, 44 of a swash-plate pump 40 that is driven by a shaft 47 coupled to the engine and has its swash-plate 41 connected by a lever 52 to a piston 96 within a control unit 56, which is responsive to pressure changes in the engine so as to effect adjustment of the attitude of the swash-plate and consequently the area of the nozzle 34 accordingly, a diaphragm 171, Fig. 4, being provided to control by-pass passages 164, 165, 166, 174, 175 associated with the pipes 45, 46 to render the rams static and therefore the area of the nozzle constant when the load on said sleeve is increased during a reheating action. The control unit 56 includes a piston 76 carrying a valve-member 77 controlling a passage 81 containing air at atmospheric pressure, the piston being attached to a hollow shaft or stem 74 that slidingly engages with a sleeve 95 carrying a further piston 96. Pipes 67, 85, 94, 99 communicate with a low-pressure portion of a reheat fuel-supply system 23, Fig. 1, the output end of a high-pressure compressor 12, a jet pipe 16 adjacent re-heating fuel-combustion equipment 20, and a high-pressure portion of the system 23, respectively. The sleeve 95 contains passages 111, 112 on either side of the piston 96, which passages are connected by an annular channel or space 105 to a passage 106 in the shaft 74, one or other of the passages 111, 112 being brought into register with a passage 110 at the adjacent end of the passage 105 in accordance with displacement of the piston 76 whenever the ratio of the pressures in the pipes 85, 94 either increases or decreases. Connection of one or other of the spaces on either side of the piston 96 to a chamber 64, to which chamber the pipe 67 is coupled, causes a reduction of pressure in the space concerned and consequently displacement of the piston 96 to effect appropriate alteration of the attitude of the swash-plate 41. The pressure communicated to the piston 76 through the pipe 85 is regulated by a **needle** valvemember 86 according to the ratio of pressures in spaces 115, 116 on either side of a piston 114, which pressures are one related to the pressure in the pipe 85 and that at the outlet end of a lowpressure compressor 11, Fig. 1, respectively. The piston 114 and an associated piston 121 function in a manner similar to the pistons 76, 96. A linkage system 123, 126, 127, 90 connects the piston 121 to the valve-member 86. Gears 72, 73 that are integral with the shafts 74, 75 mesh with a gear 71 on a rotatable shaft 70, which is driven by the engine, whereby the shafts 74, 75 are rotated to prevent restriction of their axial movement by any foreign matter. The pump 40 includes a backing pump 142 connected to a tank 140 for working fluid, e.g. oil, through a non-return valve 143. Non-return valves 152, 153, 160, 163 are provided between a passage 145 and the pipes 45, 46, as shown, to effect relief of excessive pressures, the passage 145 being connected to said tank through a non-return valve 154. The diaphragm 171 is biased by a spring 173 to a position wherein the passage 165 is open, as shown, pressure being

communicated to either side of the diaphragm from the pipes 45, 46, respectively. The pressure difference across the diaphragm is regulated by a **needle**-valve 181 and reversal of flow from the pipe 46 to the pipe 45, by way of the passage 165, is prevented by a non- return valve 176. A flow-restricting orifice 183 is included in the passage 175 to prevent excessive by-passing of each ram 26. The rate of flow of working fluid through the passage 165 is varied inversely with the output of the pump as a consequence of the deflection of the diaphragm in one direction or the other in response to pressure changes in the pipes 45, 46. Leakage fluid in each ram 26 is returned to the port 43 of the pump 40 through a pipe (190), Fig.5 (not shown), and the tank 140 through a pipe 191, Fig. 4. When the load on the rams 26 is rendered large due to re-heating action, the rate of flow of leakage fluid increases and gives rise to a corresponding increase in the output of the pump 40, which would cause actuation of the rams and an undesirable change in the area of the nozzle 35; but such actuation is prevented by the response of the diaphragm to the change of pressure in the pipes 45, 46 as a consequence of the change in the output of the pump. When the nozzle 35 is adjusted so that its area is minimum, the sleeve 31 moves a valve 205, which controls the rate of flow from the pipe 46 to the pipe 45 through an additional by-pass passage 204, so that said rate of flow is rendered maximum. When the re-heating action is terminated, the pressure of oil in a pipe 132 associated with a piston 133, Fig. 3, is reduced and a further piston 135 attached thereto is displaced by the highpressure in the pipe 99, thereby causing displacement of the shaft 74 by a lever 136 that engages with the gear 72 so as to displace the shaft 74 and effect a change in the attitude of the swashplate 41 in such a manner as to give rise to a reduction in the area of the nozzle 26. A heat-exchanger 193 contains a portion of the pipe 45 so that the working fluid therein is cooled by transference of heat to fuel for the engine passing through ports 195, 196. By-pass passages 200, 201 are controlled by non-return valves 202, 203. The engine includes reheat combustion equipment 20, Fig. 1, which comprises main burners 21 and pilot burners 22 connected to a reheat fuel system 23. A "hot-streak" **injector** 25 is also connected to the system aforesaid. The nozzle 35 comprises a plurality of members 34, each of which carries a roller 36 that engages with a conical portion 33 of the sleeve 31.

9/23 © EPODOC / EPO

PN - [GB892672](#) A 19620328

PR - FRX892672 19591130

AP - [GB19600041049](#) 19601129

DT - *

CCI - [F03B1/04](#)

CCA - [Y02E10/223](#)

PA - NEYRPIC ETS

TI - Improvements in or relating to hydraulic impulse turbines

AB -892,672. Hydraulic turbines. ETABLISSEMENTS NEYRPIC ATELIERS NEYRETBEYLIER ET PICCARD-PICTET. Nov. 29, 1960 [Nov. 30, 1959], No. 41049/60. Class 110 (3). [Also in Group XXIX]
 An **injector** and isolating gate assembly for hydraulic impulse turbines, comprises an **injector** having a nozzle controlled by a **needle** valve, an isolating gate connected to the inlet end of the **injector** and having a hollow central body disposed within and spaced from the gate housing and a closure member movable to close the liquid flow space between the housing and the central gate body and a servomotor housed with the central gate body to actuate the **needle** valve. The supply nozzle 11 is controlled by a **needle** valve 12 carried by a rod 13 supported by a spider member 14. The nozzle is preceded in the supply line by an annular isolating gate comprising an outer body formed in two parts 15, 16. The part 15 is attached to the **turbine** casing 17 and carries the body 10 of the nozzle which in turn supports the cylinder 23 of the servomotor controlling the **needle** valve by fins 24. The part 16 carries a central body 18 by ribs 19. A closure member 20, carried by the central body 18, is actuated by pressure fluid arranged to act on its end surface 21. In a modification, the closure member is carried by means outside the casing on the gate,

10/23 © EPODOC / EPO

PN - [GB1270993](#) A 19720419

PR - US19680750084 19680805

AP - [GB19690036891](#) 19690722

DT - **

CCI - [F02B53/08](#) ; [F01C1/07](#)

CCA - [F02B53/00](#) ; [F02B2075/027](#) ; [F04C2240/807](#) ; [Y02T10/17](#)

PA - BANCROFT CHARLES [US]

TI - ROTARY PISTON DEVICES

AB -1,270,993. Rotary-piston machines. C. BANCROFT. July 22, 1969 [Aug. 5, 1968], No. 36891/69. Heading F1F. A rotary-piston machine of the kind in which pistons alternately accelerate and decelerate while moving in a rotary manner about a single annular chamber contained in a stator housing, comprising four sets of angularly spaced vane pistons successively disposed in the said chamber, each set having at least two vanes secured to a support member, a rotatably mounted crank-shaft in the stator housing having an offset crank-pin, a plurality of connecting members each having its axis offset from the crank-shaft axis, at least one of the connecting members being rotatably mounted with its offset axis concentric with the axis of the offset

crank-pin and engaged for rotation on the crankshaft by gear means inter-connecting the said one connecting member with the stator housing wherein each of the piston sets is connected to at least two of the connecting members by means of radially slidable pivotable bearings, to at least the said one connecting member mounted on a crank-pin and to at least one connecting member common to all the sets of pistons. In one embodiment, an I.C. engine 243, Fig. 1, according to the invention drives an intake blower 241 and also compresses air or generates compressed gas to supply a compressed gas motor 239, which may alternatively be a **turbine**. The blower 241 supplies compressed air through intake ports 229 to the engine wherein it is further compressed and at full compression just prior to or just after the injection of fuel through injectors 233 a portion of the compressed air or combustible gas is delivered through valve controlled conduits 238 to the gas motor 239. Spark-plugs 232 ignite the remaining combustible gas or the remaining compressed air with injected fuel to drive the engine. When compressed air uncontaminated with fuel is delivered to the gas motor a further fuelinjector 246 and a further spark-plug 247 may be provided. The fuel-**injector** being controlled by a bi-metallic or other temperature sensor unit 244 supplemented if desired by a pressure-sensitive device (not shown). The engine 243 comprises a stator housing 221, Fig. 13, having an annular chamber 36 within which four piston sets 31, 32, 33, 34, Fig. 16, each having four vanes are successively arranged and secured to respective ring-shaped support members 41, 42, 43, 44 by which they are connected to the crank-shaft 224 through at least one captive connecting member 220 and to each other by at least one floating connecting member 225. Captive connecting member 220 is supported by **needle** bearings on the crankpin of the crankshaft 224 and is formed with four radial arms each carrying a pivot pin 41i, 42i, 43i, 44i, Fig. 14, which co-operate via pillow blocks 41h, 42h, 43h, 44h with radial guideways 41g, 42g, 43g, 44g formed on members 41c, 42c, 43b, 44b respectively. Members 41c, 42c are bolted to flange portions 41b, 42b of support members 41, 42 for the piston sets 31, 32 and members 43b, 44b co-operate with support members 43, 44 for the piston sets 33, 34. Teeth formed on the connecting member 220 co-operate with teeth formed on a part 226 secured to the housing 221. Floating connecting member 225 is formed on one side with a pair of diametral pivot pins 41f, 42f, Fig. 15, co-operable via pillow blocks 41e, 42e with radial guideways 41d, 42d formed on the flanged portions 41b, 42b of support members 41, 42 and on its other side with a pair of diametral pivot pins 43f, 44f disposed at 90 degrees to the first pair. The pins 43f, 44f are co-operable via pillow blocks, 43e, 44e with radial guideways 43d, 44d formed on the members 43b, 44b. The shaft 224 is formed with a balance weight to the crank-pin. The end faces of the support 43, 44 close one side of the chamber 36 and are of the same cross-sectional area as the end-plate 227 of the housing 221 to ensure that the thrust resulting from the internal pressures within the chamber 36 are balanced out. Sealing rings 41k, 43k, 44k between the support members and between the support member 44 and the internal periphery of the chamber 36

provide sealing between the respective members. In Fig. 16, vane pistons 32 are in minimum velocity position of the operating cycle, vane pistons 33 are decelerating and approaching vane pistons 32, vane pistons 34 have begun their accelerating advance and vane pistons 31 are moving at maximum velocity. The upper right and lower left vane pistons 32, 33 contain between them the compressed charge drawn in previously through intake ports 229. Just prior to these pistons reaching the positions shown in Fig. 16, spring-loaded valves 236 open to discharge compressed air to the motor 239. The remaining compressed air is transferred to firing chambers 232 into which the fuel is injected and the mixture ignited by spark-plugs 234. The mixture expands into the space between vane pistons 32, 34 and drives the latter to exercise the power stroke. Alternatively air mixed with fuel from carburetter system may be admitted to the intakes 229. A compressed gas by-pass 242 may be fitted connecting a conduit 238 to a position ahead of a vane piston 34, whilst heated by its compression the by-pass gas is substantially cooler than the expanding combustion gases and provides cooling of the chamber and supplements the output torque. The motor 239 may have three piston sets with four vane pistons in each set as described in the Specification with reference to Figs. 2 to 7 (not shown) or four piston sets with two vane pistons in each set as described with reference to Figs 8 to 12 (not shown). In this latter embodiment, a control valve controlling the admission and discharge of gas to and from the motor, comprises pairs of spring-loaded pistons 179, 181, Fig. 12, slidable in chambers 174, 176 on opposite sides of a partition 177 and fixed to a rod 178. The pairs of pistons are cross-linked by connecting rods 206 and a rocker shift lever assembly 204 connected to variable ring gear angular shifting mechanism Fig. 10 (not shown) by links attached to the opposite ends of rocking beams, one at each end of a shifting sleeve 203 and to amplifying linkage. Levers 207 connected to rods 206 are connected to a shift plate 211 by pivot pins 209 and pivot about anchor blocks 208. The shift plate 211 is fixed to or forms part of the shift sleeve 203. The variable ring gear angular shifting mechanism controls the accelerating and decelerating movements of the vane pistons so that the control valve controls the flow of gas to and from the motor in correct phase with vane piston movement. The amplifying linkage gives pivoting movement to the sleeve of about 55 degrees for an angular movement of about 20 degrees for the levers 207. In another embodiment, Fig. 8 (not shown) the control mechanism is duplicated on the other side of the annular chamber. Splash lubrication ensures ample lubrication of all the sealing ring assemblies. Lubricant drawn in at regions of low-pressure is forced towards regions of higher pressure to lubricate all sliding surfaces between the support members and the shell. Instead of operating as an I.C. engine the device may be driven by steam. These vane piston engines may serve as power units to provide output torque to drive, e.g., boats, motor vehicles and small aircraft.

PN	-	GB1126809 A 19680911
PR	-	GB19670030817 19670704
AP	-	GB19670030817 19670704
DT	-	**
CCI	-	F02K1/16 ; B41J15/06 ; F02K1/17
IDT	-	46F46B; 46F46F
PA	-	ROLLS ROYCE
TI	-	Gas turbine engine

AB - 1,126,809. Gas **turbine** jet propulsion plant. ROLLS-ROYCE Ltd. July 4, 1967, No. 30817 /67. Heading F1J. [Also in Division G3] A gas **turbine** engine having reheat combustion equipment and a variable area propulsion nozzle actuated by a power operated device includes a pressure responsive device which during reheat operation normally controls the power operated device in functional dependence upon the jet pipe pressure, means for supplying fuel to the reheat combustion equipment under the control of a manually operable member, and control means, effective only during a predetermined period initiated by predetermined movement of the manually operable member, for preventing the pressure responsive device from controlling operation of the power operated device and for ensuring that the latter is controlled by means of the manually operable member. A gas **turbine** jet propulsion engine 10, has a variable area nozzle 35 controlled by an axially movable sleeve 32 actuated by rams 26. A unit 23 controls the supply of fuel to pilot and main reheat burners 22, 21 respectively in response to engine variables and the setting of pilot's lever 92, ignition of the pilot burners being effected by a hot streak **injector** 25. During normal reheat operation, the nozzle actuating rams 26 are controlled by a piston 80 slidable in a cylinder 81 and subjected on side 81A to the compressor outlet pressure P 3 and on the other side 81B to the jet pipe pressure P 6 respectively communicated through lines 82 and 85. The stem 75 of piston 80 slides within a sleeve carrying a slave piston 70 subjected on both sides 71A, 71B to high pressure fuel supplied through lines 72, 86. The piston 80 controls the leak-off of fuel from either side of piston 70 to line 78 such that should P 6 increase, for example, piston 80 moves to the left allowing fuel to leak from side 71A of piston 70 so that the latter moves to the left taking with it rod 59. The latter moves via links 57, 56, 55, 53 a spool valve 44 controlling the flow of high pressure fuel to the rams 26 causing each ram piston 30 to move to the right and increase the opening of the nozzle 35. A mechanical or hydraulic feedback 66 ultimately restores spool valve 44 to its central position. Pressure fuel line 86 communicates with an annular space 87 located within a cylinder 88 between the wall of the cylinder and a sleeve 61 axially slidable therein. The sleeve 61 has radial drillings 61A, 61B communicating respectively with an annular space 89 connected to a fuel supply line 90 and with the space 87. A rod 91 is mounted for axial sliding movement within sleeve 61 under the

control of the manually operable pilot's lever 92. The rod 91 has an axial passage 93 communicating with a cylinder 94 having a drain 95 and with a radial drilling 97. In the relative positions of sleeve 61 and rod 91 shown, a reduced diameter portion 98 of the rod connects drillings 61A, 61B so that any high pressure fuel supplied to the line 90 may pass via the drillings and annular spaces to the line 86 so as to render the slave piston 70 operative, i.e. positionable by the piston 80. However, should parts 61, 91 be displaced in either direction relative to each other from the position shown, then fuel will be prevented from flowing to line 86 and the slave piston will be rendered inoperative. The sleeve 61 carries a servopiston 99 slidable in a cylinder 100 and provided on both sides with high pressure fuel through lines 114, 115, 116. Radial drillings 101, 102, in the sleeve on respective sides of piston 99 permit fuel leak-off to drain 95 when a drilling 101 or 102 communicates with the drilling 97 in rod 91. In the position shown no fuel is being supplied to the reheat burners and slave piston 70 is inoperative since communication between supply lines 90 and 140 is closed off by an axially slidable valve member 121. However an annular recess 125 in slide 121 permits fuel to flow through lines 141, 142 to fill a reservoir 143 by urging a charging piston 147 to the right against a spring 150. Fuel is prevented from leaving the reservoir 143 since outlet line 146 is closed off by slide 121. When reheat is selected by moving pilot's lever 92 clockwise, rod 91 moves to the left allowing fuel to leak-off from the left side of piston 99 so that the piston also moves to the left taking with it sleeve 61. The latter moves links 53 and 62 to respectively operate spool valve 44 to open the nozzle 35 and to cause unit 23 to supply fuel to the reheat burners. Simultaneously a pinion 123 connected to lever 92 and engaging a rack 122 on slide 121 moves the slide to the right to the position illustrated in Fig. 3 (not shown) in which lines 140, 90 connect via recess 124 and lines 141, 142 to the reservoir 143 are placed out of communication. At this stage the relative positions of slide 61 and rod 91 prevent communication between lines 90, 86 so that control of the nozzle area by slave piston 70 is over-ridden and the control is entirely by lever 92. Piston 99 continues to move to the left until a drilling 103 in the piston aligns with a port 106 permitting fuel from the right side of the piston to flow to drain through a line 105 via an open slide valve 107. Thus further increase in the nozzle opening or the reheat fuel supply is temporarily prevented irrespective of the position of lever 92. The simultaneous movement of slide 121 also places outlet line 146 from reservoir 143 in communication via recess 126 with a line 151 leading back to a different part of cylinder 145. A recess 160 is so positioned in the piston 147 that as the piston moves to the left under the action of spring 150 the fuel discharging from reservoir 143 first flows to line 153 and past non-return valves 157, 158 to respectively prime the pilot and main reheat burners 22, 21 and then a fraction of a second later flows via lines 155, 24 to the hot streak igniter 25. When piston 147 nears its full leftward travel a tappet 163 on the piston engages a tappet 112 to close slide valve 107 and shut off drain 105. Thus piston 99 can now continue its leftwards movement to further increase the nozzle area and reheat fuel

supply until the setting determined by lever 92 is reached. At this point slide 61 and rod 91 once again have the relative positions shown so that fuel can flow from line 90 to line 86 and the slave piston 70 resumes control of the nozzle area. In this embodiment the period in which the slave piston 70 is inoperative after selection of reheat by lever 92 is 3 seconds. The linkage 53, 55 &c. is arranged so that during this period the nozzle area selected by the lever 92 is 10% greater than that which would result from automatic control by the pistons 70, 80. A tapered **needle** 84 carried by piston 80 and cooperating with a leak-off 83 from chamber 81A of cylinder 81 assists the piston 80 to move rapidly to the left with any increase in jet pipe pressure P 6, e.g. when reheat is initiated.

12/23 © EPODOC / EPO

PN - [GB387755](#) A 19330216

PR - GB19310027056 19310929

AP - [GB19310027056](#) 19310929

DT - *

CCI - [C02F1/687](#)

PA - BRACKETT & CO LTD F W; REGINALD HUMPHREY LEE PENNELL

TI - Water softening and like processes in which substances are introduced into liquid systems, and apparatus for carrying out such processes

AB - 387,755. Purifying liquids. BRACKETT & CO., Ltd., F. W. and PENNELL, R. H. L., Hythe Bridge Ironworks, Colchester. Sept. 29, 1931, No. 27056. [Class 46.] In water-softening and like plants dry powdered material is passed from a delivery device to the suction side of a pump, **injector** or like forcing device through a trunk or vessel which is in communication with a tank containing liquid in such manner that the inlet to the forcing device is sealed against the entry of air. As water drawn through a pipe r from a well s, Fig. 3, by a pump a is delivered through a pipe o to a filter b, a portion is deflected through a pipe n to a tank e. Powdered reagent from a feeding-device c is received in a trunk d, within the tank e and communicating with it through apertures f. The water and reagent pass to the pipe r through a **needle** valve g controlled by a float q in the tank e. The water entering the tank e from the pipe n may turn a wheel or **turbine** h which drives the feeding-device c. Specifications 8627/88 and 23041/92, [both in Class 46, Filtering &c.], are referred to.

13/23 © EPODOC / EPO

PN - [GB947557](#) A 19640122

PR - GB19620025341 19620702

AP - [GB19620025341](#) 19620702

DT - *

CCI - [F02K1/16](#)

IDT - 46F45C3; 46F45G3; 46F46F; 46F48F

PA - ROLLS ROYCE

TI - Gas **turbine** engine

AB - 947,557. Fluid-pressure servomotor control systems. ROLLS-ROYCE Ltd. July 2, 1962, No. 25341/62. Heading G3P. [Also in Division F1] In a gas **turbine** jet propulsion engine having reheat combustion equipment mounted in the jet pipe, the reheat equipment comprising main and pilot burners, main and pilot fuel supply control units are provided so as to ensure that the reheat fuel/air ratio in the jet pipe does not exceed the stoichiometric ratio. Manually operable means are provided for selecting as desired the amount of fuel supplied to the main burners, the construction being such that throughout the operation of the reheat equipment the pilot burners are supplied with an adequate amount of fuel to keep them alight no matter what quantity of fuel is being supplied to the main reheat burners. The reheat combustion equipment is shown in Fig. 8 and comprises pilot burner manifolds 191 supplied with pilot fuel through line 189 the fuel being injected into combustion stabilizing troughs 194. Main reheat fuel is supplied through lines 242, 243, 244, 245 to manifolds 246, 247, 248, 249 which discharge fuel into the jet pipe 5 upstream of the pilot burner assembly. Fuel supply to the lines 242, 243, 244, 245 is controlled by a staging unit shown in Fig. 5. The jet pipe is provided with a variable area nozzle which is controlled by a series of rams such as 350, Fig. 8. The main reheat fuel supply control unit 73 and the pilot reheat fuel supply control unit 74 are shown in Fig. 4 in which is shown also the reheat fuel supply pump 11 which comprises a centrifugal pump 12 which is driven by the **turbine** 13, the **turbine** being supplied with air under pressure through the line 15. Fuel is supplied to the pump through inlet 10 and discharges therefrom through line 68 in which are disposed a non-return valve 69 and a heat exchanger 70. The fuel then passes into the interior of the control unit. The main reheat fuel control unit comprises a sleeve or throttle valve 88 which is formed with triangular shaped slots 89, the area of which increases axially to the right. The throttle valve is connected to a shaft 84 which is connected by epicyclic gearing to an engine-driven shaft 75, whereby the valve is rotated during operation. The centrifugal governor 85 is also driven by the epicyclic gearing and the governor acts to control the axial position of the throttle valve, the governor arms engaging a collar 87 on the shaft 84. A sleeve 95 is connected to the throttle valve by a shaft 93 which is splined to the sleeve so that the sleeve rotates together with the throttle valve but may move axially independently thereof. The sleeve 95 is formed with triangular-shaped slots 157 the area of which increases axially to the left, the slots co-operating with an annular slot 128 of axially variable width so as to constitute a

metering orifice. The sleeve 95 is connected by a bearing arrangement 96 to a pair of capsules 97 which are disposed within a common chamber 98, the interiors of the capsules being connected by a line 103, chamber 104 and line 105 to air at pressure P_6 within the engine jet pipe 5. The chamber 98 is connected by line 118 chamber 113 and line 115 to air at pressure P_3 , the pressure at the outlet of the high pressure compressor of the engine. An orifice 114 controlled by a **needle** valve 119 is disposed between the chamber 113 and the line 115, and a fixed orifice 112 is provided between the chambers 104 and 113. The capsules act to position the sleeve 95 in dependence on the function $(P_3 / P_2)^{1/3} - P_6$, P_2 being the pressure at the downstream end of the low pressure compressor. The annular slot 128 is provided by a pair of sleeves 126, 127 disposed around the sleeve 95, the sleeve 127 being constituted by a part of the control unit casing and the sleeve 126 being movable towards and away from the sleeve 127 so as to vary the width of the annular gap 128 by a bell-crank lever 137, 139. The bell-crank lever is controlled through linkages 50, 150 by the pilot's throttle lever 51, Fig. 3. The sleeve 126 is biased to the right by a spring 129. The movement of the arm 137 of the bell-crank lever is limited by stops 155, 156. Thus fuel supplied through line 68 into the casing 72 of the control unit passes through the metering orifice 128, 157 into the space within the sleeve 95 and throttle valve 88 and discharges through the orifice afforded by the triangular slots 89 and the cooperating annular recess into the main reheat fuel line 90, through the non-return valve 220 and line 221 to the burner staging unit 224, Fig. 5. The pilot reheat fuel supply control unit 74 is incorporated in the assembly shown in Fig. 4 and comprises a sleeve 166 formed with triangular-shaped slots 182, the sleeve 166 being connected to the sleeve 95 of the main reheat fuel control unit by a pull rod 168 whereby the sleeve 166 has the same rotational and axial movement as the sleeve 95. Fuel passes to the chamber 173 of the pilot control unit from the line 68 by way of a filter 172 and line 171, the fuel passing into the space within the sleeve 166 through a metering orifice afforded by the co-operation of the triangular slots 182 and the annular orifice 183 which is provided by the co-operating sleeves 176, 177 as in the case of the main control unit. An axially movable cup-shaped throttle valve 184 is disposed within the sleeve 166, the valve being in splined connection with a fixed rod 185 so as to prevent rotation but to permit axial movement thereof. The valve 184 defines a chamber 164 with the sleeve 166, the chamber 164 being in communication with the space within the sleeve 95 and throttle valve 88 by way of a duct 163. The pressure within the sleeve 166 at the left and right-hand sides of the piston 184 will be equal, axial movement of the piston ensuring this. Fuel which has passed through the metering orifice 182, 183 into the space within the sleeve 166 discharges therefrom through the triangular-shaped orifices 186 the open area of which is controlled by the throttle valve 184, the fuel discharging through the pilot fuel duct 187, valve device 188 and line 189 to the non-return valve 190, Fig. 5 and thence to the concentric pilot fuel manifolds 191, Fig. 8. The position of the throttle valve 88 of the main control unit is dependent also on the

pressure drop across the metering orifice 128, 157. Main reheat fuel in the line 221 passes to the chamber 222 within the burner staging unit 224, Fig. 5. This unit comprises cylinders 225, 226, 227, 228, 229 within which are disposed piston valves 232, 233, 234, 235, 236, the lower sides of the pistons being acted on by fuel at high pressure supplied through line 253 from line 68, see Fig. 4. The piston valve 232 controls flow of fuel from the chamber 222 to the line 239 which leads through line 241 back to the suction side of the reheat fuel pump 12, see Fig. 4. The burner staging unit comprises also a control valve 270, the axial position of which is controlled through the linkage 50 by the pilot's control lever 51. In the position shown, high pressure fuel from the line 253 is applied to both sides of the piston 232 and the piston is therefore at its lowermost position closing off the outlet to the return line 239. High pressure fuel is also supplied through lines 264, 265 whereby the piston valves 235, 236 are in their lowermost positions closing off the outlets to the lines 244, 245 and so to the manifolds 248, 249. The lines 261, 262 however are connected to the low pressure fuel within the line 239, the piston valves 233, 234 are therefore in their uppermost positions and main reheat fuel can pass from the chamber 222 into the lines 242, 243 and so to the manifolds 246, 247. When in the reheat off position the valve 232 will be open and the remaining valves closed, fuel in the chamber 222 then flowing through line 239 back to the suction side of the pump. As the control valve 270 is moved to the right, the valve 232 is closed and the valves 233, 234, 235 and 236 progressively opened. The reheat fuel system also comprises a hot streak type ignition unit which causes a "shot" of fuel to be injected into the main combustion equipment of the engine the fuel causing a streak of flame to pass through the **turbine** to the reheat combustion equipment in the jet pipe. The unit is shown in Fig. 5 and comprises a casing 291 within which are disposed a piston 304 having an orifice 323 which co-operates with a valve 324; a piston 330 having a bore 331 therethrough and carrying a valve 336; also a diaphragm 297 mounted on a rod 296 which carries a valve 295 which cooperates with a bore 294. The valve 336 cooperates with a duct 334 which leads to the hot streak fuel **injector** in the engine combustion chamber. The left-hand side of the diaphragm 297 is connected to the pressure P 6 in the engine jet pipe, and the right-hand side thereof is connected to the pilot fuel pressure. The unit is also connected through line 289 to the suction side of the reheat fuel pump 12, and through line 311 to a valve body 315, see Fig. 4. When the reheat system is about to be brought into operation the piston 304 will be disposed at the right-hand end of the chamber. At this time, the valve member 316, Fig. 4, will be open so that fuel at the pressure in the main fuel passage 90 will be supplied via the lines 314, 313, 311 so as to fill the hot streak ignition unit. The valve 295 is closed at this time since there is no pressure in the pipe 301. As soon as the reheat system is brought into operation however, fuel will flow through the pilot fuel passage 189 and will pass through the pipe 301 and will act on the diaphragm 297 to open the valve 295. The pressure in the space 306 to the left of the piston

304 will therefore fall since it will be connected to the line 241 which connects to the suction side of the pump 12. The piston 304 will therefore move towards the left to the position shown i

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PN - [GB381145](#) A 19320929

PR - FRX381145 19310723

AP - [GB19320020829](#) 19320723

DT - *

CCI - [B23K37/0205](#)

PA - PIERRE TESSON

TI - Automatic propelling device for welding and cutting blowpipes

AB - 381,145. Uniting or dividing by fusion. TESSON, P., Crouy, Aisne, France. July 23, 1932, No. 20829. Convention date, July 23, 1931. [Class 83 (iv) .] In a gas-propelled carriage for cutting and welding blowpipes, the gas supply is divided into two parts, one of which supplies the blowpipe and the other propels the carriage and is then exhausted into the atmosphere. The cutting oxygen of an oxyacetylene blowpipe 10, which is vertically adjustable in the carriage 17, is supplied to the nozzle through a valvecontrolled pipe 31, having a branch pipe 32 from which oxygen and air is forced by an **injector** 33 to a **turbine** 18. The supply of oxygen and thus the speed of the **turbine** is controlled by a **needle** valve 34, the mixed gas being exhausted through ports in the **turbine** casing. The **turbine** may drive through worm, bevel or other gear an axle carrying a pair of rollers, the one 24 nearest the blowpipe being secured to the axle and the other being loosely mounted thereon. In a modification, the supply to the **injector** may be branched at 29 from the flexible feed pipe.

15/23 © EPODOC / EPO

PN - [GB482692](#) A 19380404

PR - FRT49671 19380811; FRX531944 19380811

AP - [GB19370017004](#) 19370618

DT - *

CCI - [B05B7/203](#)

PA - FRANCOIS PHILIPPE CHARLES BENO

TI - Apparatus for projecting molten metal and metal alloys

AB -482,692. Spraying fusible material; interconnected valves. BENOIT, F. P. C. June 18, 1937, No. 17004. [Classes 69 (iii) and 135] Apparatus for spraying fusible material of the kind in which a **turbine** feeds the material in the form of wire to a nozzle system where it is fused and sprayed is constructed in the form of a pistol in which the burners at the head of the pistol, the driving device in the axis of the burner and at the rear of the latter, the mixing means, which is below the driving means at an inclination, is connected to the passage for the gaseous mixture to the burner, and to the three-way cock at the base of the handle in which is provided the inlet for the gas from the cock to the burner. The wire is fed through a tube 92, Fig. 2, by **turbine** driven rollers 84, 85 to the central passage 10 of a nozzle system to the passage 15 of which mixed combustion gases are fed from an **injector** through a passage 12. Gas such as acetylene is led by a passage 7 to a cone 37 controlled by a **needle** valve 32 and compressed air by a passage 6 to a Venturi passage comprising a cylindrical part 33, in which the cone 37 is situated, leading to a divergent passage 34. Air or inert gas for driving the **turbine** and atomizing the metal is supplied by a passage 8. The three passages are opened in succession by a three passage valve similar to that. described in Specification 425,817 and shown in detail in Fig. 6. The air to the **turbine** is controlled by a cock 54 operated by a handle 57. The stem of the cock is screwed at 58 to engage a bridge piece 59 perforated at 64, 65 to receive the ends of the stems of spring-pressed lift valves 60a, 61a provided with shoulders so arranged that on turning the handle 57 first the valve 61a and then the valve 60a and finally the cock 54 are opened. The **turbine** is mounted in a detachable block 3 on the back of the pistol and drives through reducing gear two gear wheels 84, 85 carrying milled rollers between which the wire is fed. The lower gear wheel is carried by an arm 89 pivoted at 90 and acted on by a spring 91. The wheels may be disengaged for threading the wire by a rod 94. Compressed air is led to the **turbine** from the passage 8 to a chamber 25 regulated by a **needle** valve 97 ; and spraying air passes through a passage 17 to the outer nozzle 16. The exhaust air from the **turbine** is led to the tube 101 through which the wire is fed and excess is discharged through a safety valve 99.

16/23 © EPODOC / EPO

PN - [GB1491561](#) A 19771109

PR - FR19740011011 19740329

AP - [GB19750012800](#) 19750326

DT - **

CCI - [F02B37/166](#) ; [F23R3/26](#)

CCA - [F02B3/06](#) ; [Y02T10/144](#)

PA - FRANCE ARMED FORCES

TI	-POWER PLANT COMPRISING AN INTERNAL COMBUSTION ENGINE INCLUDING A TURBOCOMPRESSOR
AB	-1491561 Turbocharger for IC engine FRANCE ARMED FORCES MINISTER OF 26 March 1975 [29 March 1974] 12800/75 Headings F1B and FIG The invention relates to an I.C. engine having a turbocharger combined therewith, the engine being either of the reciprocating or rotary piston type. The engine shown in Fig. 1 comprises cylinders 6 with reciprocating pistons, and a turbocharger comprising a compressor 2 driven by turbine 3 through shaft 4, the compressor 2 supplying air under pressure to passage 5 from which some air passes through ducts 7 into the cylinders 6 while the remainder of the air passes through the duct 5 to enter the turbine inlet together with engine exhaust gases and combustion gases thereby driving the turbine. The duct 5 is formed with two parts 5a, 5b through which air flows in parallel with the flow into the engine cylinders. The duct 5 is formed at its downstream part with an outer member 30 and an inner member 29 which define there-between an annular passage 31 through which air from the duct part 5a flows entering the inner member 29 finally through openings 32. Air from the duct part 5b enters the primary combustion zone 10 of an auxiliary combustion chamber 9 through openings 20 in the wall 25, fuel being supplied through injector 21. Gases from the primary zone discharge into the secondary zone 12 into which the exhaust gases from the cylinders 6 discharge through ducts 8. The secondary air enters the zone 12 through the openings 32. The gas and air mixture serves to drive the turbine 3. A variable restrictor 13 is provided in the duct part 5a being controlled by a differential piston 15, 16, the space between the pistons being connected to the duct upstream of the restrictor, and the space above the larger piston 16 being connected to the duct downstream of the restrictor; the space above the small piston 15 is open to atmosphere. The restrictor 13 serves to produce a pressure drop which is independent of the ratio of air flow through the passage to the total air delivery from the compressor but which varies in the same sense as the pressure in the passage upstream of the restrictor. The area of the orifices 20 is controlled by a sliding sleeve 23 controlled by a member 22 which also controls the fuel flow to the injector 21 by means of the valve-member 24. In a second embodiment some of the secondary air enters the zone 12 through openings (33) adjacent the discharge from the primary zone. In Fig. 3 the duct 5 is divided into two parts 5a, 5b as shown, air passing into the primary combustion zone 10 through variable area orifices 20 as in the first embodiment, the orifices being formed by axially slidable cylindrical members 25, 38. The restrictor 13 in this embodiment is formed by orifices in the fixed wall 29 and co-operating orifices 39 in the axially-movable member 9. Fuel is supplied to injector 21 through line 27 being controlled by valve needle 24 cooperating with opening 26. A spring 35 acts between control member 22 and partition 47 of the fixed cylinder member 41; air-pressure is supplied to the chamber 48 through line 49. A spring 46 acts between sliding member 42 and partition 47; excess fuel is spilled from chamber 45 through outlet 44. In Fig. 4 the members

37a, 38a are rotatable but otherwise correspond to members 37, 38 of Fig. 3. The member 37a is connected by spoke members 51 to a sleeve 52 which is connected to operating arm 53. The member 38a is connected to sleeve 57 which in turn is connected to operating arm 58; the arm 53 is movable by piston 68 in cylinder 67, and arm 58 is movable by piston 62 in cylinder 61, the piston 62 constituting control member 22. The operation of the piston 68 is described with reference to Fig. 5 (not shown) and of the piston 62 with reference to Fig. 6 (not shown). In a further embodiment Fig. 7 (not shown) the air flow to path 5a is controlled by a valve-member (77).

17/23 © EPODOC / EPO

PN - [GB1299213](#) A 19721213

PR - US19690808073 19690318

AP - [GB19700012791](#) 19700317

DT - **

CCI - [F02G3/02](#) ; [F02B47/02](#) ; [F02B75/02](#)

CCA - [Y02T10/121](#) ; [Y02T10/16](#) ; [F02B1/04](#) ; [F02B3/06](#) ; [F02G2250/03](#)

IDT - 46D6; 46D9

PA - GINTER CORP [US]

TI -IMPROVEMENTS IN AND RELATING TO GENERATORS FOR GENERATING WORKING FLUIDS FOR EXTERNAL COMBUSTION ENGINES AND METHODS OF GENERATING SUCH WORKING FLUIDS

AB -1299213 Gas **turbine** plant and combustion chambers; external combustion engine plant GINTER CORP 17 March 1970 [18 March 1969] 12791/70 Headings F1G F1L and F1S [Also in Division F4] In a combustion chamber for generating combustion products to drive an external combustion engine the supply of fuel to the chamber is controlled in response to working fluid pressure in or adjacent the chamber and a vaporizable non- combustible liquid is injected into the combustion products remote from the point of fuel injection, the liquid injection being controlled by means sensing the temperature of the working fluid. In Fig.1 the combustion chamber 30 is defined by a tube 34 having a fire tube 31 at one end into which fuel is injected by a nozzle 36. A thermally lagged casing 3 surrounds the combustion chamber 30 and also contains the cylinders 20, 21 of a reciprocating engine driven by the combustion products and connected via a crank-shaft 10 to a reciprocating air compressor 22. The latter draws its intake air from atmosphere via pipe 67 and non-return valve 68 and after compressing the air substantially adiabatically delivers via non-return valve 26 and passage 27 to an air reservoir 28 separated from combustion chamber 30 by a wall 29. Holes 32, 35 in wall 29 and holes 33 in fire tube 31 permit compressed air to flow into and around the combustion chamber and fire tube.

Water spray nozzles 40 are directed towards the outlet end of combustion chamber 30. The plant is started by an electric starting motor which rotates crank-shaft 10 until the compressed air in chamber 30 exceeds the self ignition temperature of the fuel, whereupon the starter is automatically cut-out and a crank-shaft driven pump 48 delivers fuel past a throttle valve 38 to **injector** 36 for substantially stoichiometric combustion with the air. Valve 38 is controlled by a solenoid 65 in response to combustion chamber temperature as sensed by thermostat 62 in such manner that fuel injection is prevented unless the temperature exceeds that for self ignition. Valve 38 is also controlled in response to combustion chamber pressure so that fuel injection only takes place when the pressure has fallen below a predetermined minimum. Control of the fuel supply is described below in greater detail with reference to Fig.11. Should the temperature of the combustion products leaving chamber 30 exceed a predetermined maximum as sensed by a thermostat 61 then the latter causes solenoid 63 to open valve 42 so that pump 44 forces water from tank 47 through nozzles 40 into the combustion products which are thus cooled. The water is converted into steam and increases the mass of working fluid occupying casing 3. Admission of working fluid to engine cylinders 20, 21 is controlled by a slide valve 51 formed as a ported tube dimensioned to cover one or other of cylinder head ports 23, 24 in accordance with the position of crank-shaft 10 which is linked to slide valve 51 by a bell-crank 52, push rod 53 and cam 55. Admission of working fluid to the interior of slide valve 51 is controlled by a further slide valve 60 fitting around ports in slide 51. The position of slide 60 is controlled by a bellows type pressure sensor 57 which moves the slide 60 to admit working fluid to slide 51 and cylinders 20, 21 whenever the pressure in casing 3 falls below a predetermined minimum to thus drive compressor 22 to restore the pressure. Sensor 57 can be over-ridden by a manual lever 58. Power is taken off from the crank-shaft 10 at 71. In a modification the engine can have more than two expansion cylinders 20, 21, there being twice as many expansion cylinders as there are compressor cylinders 22. The pistons may be double acting and the compressor may be geared to the crank-shaft 10. In a further modification the combustion chamber may be formed as one of the cylinders of a multi-cylinder engine block by eliminating the piston therefrom and providing air and fuel inlets at one end and water injection at the other end. In this case an auxiliary compressed air storage chamber may be provided. In a further arrangement the reciprocating engine of Fig.1 is replaced by a **turbine**. Fig.2 shows a modified combustion chamber 75 having a cylindrical metallic body 76 surrounded by lagging 80. The fire tube 31 is surrounded by tube 34, as in Fig.1 and by an intermediate tube 31, the air-flow from chamber 28 to the concentric passages defined by the tubes being in specified proportions. Fuel is controlled as described below with reference to Fig.11. Thermostat 61 controls water injection through nozzles 87. A safety valve 113 and rupture disc 114 are provided together with a manually settable valve 91 controlling the flow of working fluid to the expansion engine, the

valve 91 having an over-riding control linked to a pressure sensor 115 so that a drop in pressure in combustion chamber 75 causes an increased opening of valve 91 to increase the flow to the engine. The fuel supply system shown in Fig.11 comprises a pump P supplying fuel through line 82 to an **injector** 79 directed into fire tube 31, control of fuel by-passed back through line 82<SP>1</SP> to the fuel tank being effected by a **needle** valve 98 co-operating with seating 97<SP>1</SP> and forming part of a control unit 100. The latter includes a chamber 96 connected to air reservoir 28 via lines 84, 94 and a further chamber 93 which can be communicated by 3-way valve 85 either to line 108 leading to atmosphere or to air reservoir 28 via pressure reducing valve 91<SP>1</SP>. Prior to the air temperature as sensed by thermostat 62 being sufficient for self ignition of the fuel, actuator 65<SP>1</SP> sets valve 85 to the position in which chamber 93 is vented to atmosphere so that the pressure in chamber 96 holds **needle** 98 away from seat 97<SP>1</SP> against the force of spring 104<SP>1</SP> to permit all the fuel supplied by pump P to be by-passed back to the tank. When the self ignition temperature is reached, actuator 651 turns valve 85 to communicate chamber 93 with the pressure downstream of reducing valve 91<SP>1</SP> thus causing an increase in fuel pressure in line 82 as **needle** 98 moves towards seat 971 and the by-pass is reduced. When the fuel pressure exceeds a minimum determined by the setting of spring 104 **needle** valve 99 of **injector** 79 is forced to the right permitting the fuel to flow to fire tube 31. Any subsequent variation in air-pressure within reservoir 28 causes movement of **needle** valve 98 and consequent variation in the fuel injected.

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PN - [GB296073](#) A 19280927

PR - FRX296073 19270825

AP - [GB19280007171](#) 19280307

DT - *

CCI - [F02M37/04](#) ; [F02M59/14](#)

CCA - [F02M2700/1323](#)

PA - TECALEMIT LTD

TI - Improvements relating to internal combustion or explosion engines

AB -296,073. Tecalemit, Ltd., (Assignees of Soc. Anon. des Etablissements Tecalemit) . Aug. 25, 1927, [Convention date]. Void [Published under Sect. 91 of the Acts]. Actuating by liquid or gaseous pressure; diaphragm and liquid piston pumps. - Pumps for use with internal - combustion engines are actuated by the flow of a fluid which is separated from the fluid to be pumped by a diaphragm 7 or a solid or liquid piston. The actuating fluid may be the lubricating

oil, the engine cooling water, the engine suction, or the engine exhaust gases. The inlet and exhaust of the oil &c. are controlled by valves 14, 15 operated by the movements of the diaphragm through spring-controlled levers 20, 21. The fluid to be pumped enters the space 6 below the diaphragm through a valve 4 and is delivered through a valve 5. In another form, the valves 14, 15 are of rotary form mounted on the shaft of a **turbine** driven by the oil stream. In another form, the oil stream drives a **turbine** the shaft of which carries a cam or eccentric driving the diaphragm 7. In another form, the oil enters an air chamber where it operates a bevelled piston valve controlling the admission of the oil to the upper face of the diaphragm. In a modification of the last form, the admission of oil to the diaphragm is controlled by a lift valve fixed to the diaphragm and the flow of oil is regulated by an adjustable **needle** valve. In another form, the oil stream by **injector** action creates a vacuum in a chamber above the diaphragm, and a valve connected to the diaphragm periodically opens the chamber to atmosphere. A meter may be operated by the valve rod. In another form, the oil inlet valve is closed by the diaphragm on its downstroke, and the pressure of the oil then opens the escape valve. In another form, both inlet and escape valves are controlled by the diaphragm and a pressure-limiting valve is provided on the inlet side. In another form, inlet and outlet for the oil are controlled by a piston valve operated by a bellows diaphragm. In another form, the oil valves are operated by a separate piston exposed on one side to a spring and on the other to inflow oil. In another form, the oil operates the diaphragm by hydraulic ram action.

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PN - [GB1031721](#) A 19660602

PR - GB19620006101 19620216

AP - [GB19620006101](#) 19620216

DT - **

CCI - [F02K7/10](#)

CCA - [Y02T50/671](#)

IDT - 46F45B1P; 46F45G1P; 46F48F

PA - BRISTOL SIDDELEY ENGINES LTD

TI - Improvements in ramjet power plants

AB -1,031,721. Ram jet propulsion units; turbines. BRISTOL SIDDELEY ENGINES Ltd. Feb. 7, 1963 [Feb. 16, 1962], No. 6101/62. Headings F1J and F1T. [Also in Division G3] A ram jet power plant comprises a ram air **turbine** which is arranged to drive a fuel pump having a discharge pipe connected to a fuel **injector** system in the ram jet combustion chamber. The fuel system includes a spring- loaded check valve arranged so that the fuel pressure between the pump and

the check valve will be higher than the pressure of fuel delivered to the injection system, the check valve comprising a valve body fixed in relation to the engine, a spring-loaded closure member which is operable by fuel pump discharge pressure, and a mass which is mounted for movement in a fore and aft direction relative to the engine, the mass being coupled to the closure member or being part of the closure member and so arranged that the force of the mass on the closure member during forward launching acceleration will substantially reduce the opening pressure differential, across the check valve as compared with the opening pressure differential during zero forward acceleration. The ram jet combustion chamber is indicated at 1 and fuel is supplied thereto through a line 24 and manifold 8, a combustion stabilising device 9, 10 being provided. A pilot combustion chamber 2 is mounted within the combustion chamber 1 and fuel is supplied thereto through a line 22 and pilot fuel **injector** 3. The fuel pump 16 is driven by a **turbine** 12 to which ram air is supplied through duct 13, a spill passage 14 controlled by a valve 15 leading from the duct 13 whereby the speed of the **turbine** may be controlled. Fuel is supplied from the pump to the check valve 18 at pressure P 1 and fuel at pressure P 2 passes through line 22 to the pilot **injector** 3 and through line 24 by way of a linearising valve 23 to the main fuel injection manifold 8. The linearising valve 23 comprises a piston 25 which is loaded by a spring 26, the piston controlling the open area of a port 27 through which fuel passes to line 24. Combustion chamber pressure P 3 is communicated to the right hand side of the piston 25 by way of a line 32 and orifice 31. The piston 25 is provided with a small orifice 29 through which fuel may pass, the fuel passing through the orifice 31 and line 32 into the combustion chamber. The orifice 31 is controlled by a **needle** valve 33 whose position is varied by means of a cam 34 which is rotated by a Mach meter so that as the maximum flight Mach number is reached, the **needle** 33 is moved to restrict the orifice 31 so that pressure in the chamber 30 increases and the piston 25 moves to reduce the open area of the port 27 and so also the flow of fuel to the manifold 8. The check valve 20 is formed with a head 60 of large mass so that upon rapid acceleration of the vehicle at launching, the check valve is opened so enabling fuel to be supplied to the combustion chamber earlier than would otherwise be. The spill air valve 15 is controlled by a servo-device 28, the position of the valve being controlled by a rod 37 which is connected to a flexible diaphragm 36. Fuel from the line 17 passes into the space 35 to the right of the diaphragm, the fuel leaking off through an orifice 39 controlled by a half-ball valve 40 mounted on a lever 41 pivotally mounted at 42 and connected to a rod 43. The rod 43 is connected at one end to an evacuated capsule 45 and at the other end to a diaphragm 48, the rod being connected also to diaphragms 46, 47. The chambers 49, 50, 51, 52 so formed are subjected to pressures P 4, P 2, P 3, P R respectively, P 4 being a pressure slightly greater than atmospheric since the chamber 49 is provided with a leak-off to atmosphere through a lightly loaded non-return valve 55, P 2 being the pressure of fuel downstream of the check valve 20, P 3 being the combustion chamber pressure and P R being

Rayleigh pressure sensed by a forward facing probe. The unit 28 ensures that the pressure P 2 - P 3 acting on the linearising valve and on the diaphragm 5 of the pilot fuel **injector** is directly proportional to Rayleigh pressure P R which is the condition required to maintain fuel/air ratio constant. Should the Rayleigh pressure P R increase, the device 28 will act to close the spill valve 15, whereupon the **turbine** speeds up and fuel pump pressure increases. The engine is intended for use on vehicles which are launched by boost rocket.

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PN - [GB1045722](#) A 19661019

PR - FR19633104929 19631127

AP - [GB19640002641](#) 19640121

DT - **

CCI - [F02C7/26](#)

CCA - [F05D2220/50](#)

IDT - 46F45H2PT

PA - GASTON BAYARD

TI - Improvements relating to the starting and operation of power units incorporating gasturbines

AB -1,045,722. Gas **turbine** plant. G. BAYARD. Jan. 21, 1964 [Nov. 27, 1963], No. 2641/64. Heading F1G. A gas **turbine** engine for starting a main engine (not shown) comprises a first-stage **turbine** 2, Fig. 1, driving the air compressor 1, and a second-stage **turbine** 4 which turns the main engine through reduction gearing 5 and a freewheel 6. The gas **turbine** engine is itself started by an electric motor 7 through step-up gearing 8. When a starting button 62, Fig. 3, is depressed, a relay 58 is energized to start an electrically-driven fuel pump 11 and open a solenoid-actuated fuel valve 13; a delayedaction relay 56 is energized; and a relay 55 is energized to hold the circuit after release of the button 62. Fuel injectors 15 are supplied by the fuel pump 11 through the valve 13 and a regulator 14. The fuel pressure at the injectors 15 and the pressure in the combustion chamber 3 are applied through pipes 26, 29 respectively to respective diaphragms 19, 20 in the regulator 14 to control a **needle** valve 18 which by-passes fuel to a drain line 16, whereby the fuel injection pressure is regulated to increase as the combustion pressure increases, the diaphragm 19 being smaller in area than the diaphragm 20 so that the fuel injection pressure increases more rapidly than the combustion pressure. When the fuel injection pressure has risen sufficiently, it actuates a pressure-operated switch 46 to energize a delayed-action relay 57 and a relay 59, and de-energize the delayedaction relay 56. If, however, a fault prevents the fuel injection pressure from rising to the required value during the delay in operation of the relay 56, the latter operates to terminate the starting sequence.

Relay 59 energizes sparking plugs 10 through an ignition coil 9 and energizes the starter motor 7 through a resistance 53 to run at reduced speed. After the resistance 53 has heated a thermostat 52 sufficiently, the thermostat energizes a relay 60 which shorts out the resistance to allow the motor 7 to run at full speed. When the combustion pressure has risen sufficiently, it actuates a pressure-operated switch 50 to de-energize the relay 59 to switch off the starter motor 7 and ignition coil 9; de-energize the delayed-action relay 57; re-energize the delayed-action relay 56; and energize a relay 61 which feeds electrical circuits for the starting of the main engine. If, however, a fault prevents the combustion pressure from rising to the required value during the delay in operation of the relay 57, the latter operates to terminate the starting sequence. When the speed of **turbine** 4 (and therefore of the main engine) reaches a predetermined value, a speed-operated switch 54 opens to de-energize the relay 55 whereby the starting circuits are de-energized. The relay 56 limits the duration of this final stage. If, when the starting sequence was initiated by pressing the button 62, the gas **turbine** engine was still hot from a previous operation, a thermostat 51 operated by the hot exhaust gases remains closed, the initial part of the starting sequence is obviated, and the relay 59 is energized through the thermostat 51 as soon as the button 62 is pressed. The fuel injectors 15 are of the type incorporating a valve which is opened against the action of an adjustable spring force when the fuel injection pressure reaches a predetermined value, this value being different for each **injector** so that the injectors open one after the other as the fuel injection pressure rises.

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PN - [GB412970](#) A 19340706

PR - GB19330000547 19330106

AP - [GB19330000547](#) 19330106

DT - **

CCI - [F02C6/003](#) ; [F02C3/32](#)

PA - BRITISH THOMSON HOUSTON CO LTD; FREDERICK SAMUELSON

TI - Improvements in and relating to gas **turbine** cycles with interstage reheating

AB - 412,970. Gas **turbine** plant. BRITISH THOMSON - HOUSTON CO., Ltd., Crown House, Aldwych, London, and SAMUELSON, F., 44, Hillmorton Road, Rugby. Jan. 6, 1933, No. 547. [Class 110 (iii).] In a gas **turbine** plant comprising a multi-stage **turbine** or two or more turbines, the working gases are reheated between stages by mixing them with gases drawn direct from the combustion chamber. In Fig. 1 a high pressure **turbine** 13 supplied by a combustion chamber 7 drives a generator 14 and its exciter 15, and a low pressure **turbine** 17 drives a compressor 1 for the charge air. This air, which may be preheated by the exhaust gases, is passed in part by a

damper-controlled port 4 to the combustion chamber 7 in which fuel introduced by a pipe 3 is burnt, and in part by a dampercontrolled port 9 to a chamber 11 surrounding the combustion-chamber at the end 8 of which it mixes with part of the combustion-products and passes by a conduit 12 to the **turbine** 13. In their passage through the conduit 16 between the turbines 13, 17, the working gases are reheated by combustion products introduced from the chamber 7 by a pipe 18. These products may be fed in by an **injector** in order to increase the pressure in the pipe, and the supply may be controlled by a damper 19, or by a **needle** valve, which may be actuated automatically by a thermostat. In a modification, four turbines are arranged in series, two of them driving the power generator, and the other two driving series charge compressors at different speeds. Reheaters are arranged between the turbines as described above. The last **turbine** discharges into a chimney in order to reduce the back pressure. Fig. 5 shows an arrangement in which the **turbine** stages are supplied by conduits 31, 35, 39, 43 and in which the injectors 34, 38, 42 for the supply of interstage reheating gases are controlled by interconnected valves 44, 45, 46. The valveoperating cam-shaft 50 is actuated by a thermostat in the gas system, and a manual adjustment 54 is provided for each valve. More than one thermostat may be provided. Interstage combustion chambers for reheating may also be provided.

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PN - [FR2540385](#) A1 19840810

PNFP - FR2540385 B1 19860530

PR - FR19830001744 19830204

AP - [FR19830001744](#) 19830204

DT - *

CT - (A1)
[FR2457105](#) A1 [YD]; [FR2348709](#) A1 [Y];
[FR2131077](#) A5 [Y]; [US2605765](#) A [Y];
[FR2481930](#) A1 [Y]; [US2773500](#) A [A];
[FR2343486](#) A1 [A]; [US3811442](#) A [A];
[US3605745](#) A [A]

CCI - [A61M5/32](#) ; [A61B17/3472](#)

CCA - [A61M2005/3289](#)

PA - (A1 B1)
VILLETTE ALAIN [FR]

TI	- (A1) Intradiploic anaesthetic injector
AB	- (A1) Intradiploic anaesthetic injector of the type making it possible to puncture the cortical and then to inject anaesthetic into the marrow of the bone with a clamp. According to the invention, the needle 16 is driven by the carpule 15 which is linked in rotation with a turbine 11, a rod 24 whose movement is controlled by a cylinder actuator 21, 22 which is regulated 33, 26 and acts on the piston 150 of the carpule 15. Applications: injection, in particular of anaesthetic, through a hard wall. <IMAGE>

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PN	- FR2846056 A1 20040423
PNFP	- FR2846056 B1 20050114
PR	- FR20020012934 20021017
AP	- FR20020012934 20021017
DT	- *, Rep
CT	- // STSE (A1) XP002246131 A[A]; JP2001153019 A 00000000 [A]; CH365040 A 19621015 [A] (VOITH GMBH J M [DE]) [A] 1,5-8,10 * figure - *; US5579999 A 19961203 [A] (SEINER JOHN M [US], et al) [A] 1-3 * figure 1 *
CTNP	- // STSE (A1) [A] - SONIA KVICINSKY, Méthode d'analyse d'écoulements 3D á surface libre: application aux turbine Pelton, LAUSANNE, EPF FACULTÉ SCIENCES ET TECHNIQUES DE L'INGÉNIEUR STI, SECTION DE GÉNIE MÉCANIQUE, (20020327), XP002246131 [A] 1-11 * the whole document * [A] - PATENT ABSTRACTS OF JAPAN, (20010210), vol. 2000, no. 23, [A] 1,5-8,10 * abstract *
CCI	- F03B1/04

CCA - [Y02E10/223](#) ; [F05B2250/14](#) ; [F05B2250/24](#)

PA - (A1 B1)

ALSTOM SWITZERLAND LTD [CH]

TI - (A1)

Pelton **turbine** pressurised water **injector** has aperture with upstream side and **needle** in flattened shape to produce flat water jet

AB - (A1)

The **injector**, comprising a **needle** (12) that moves relative to a aperture (16) in a body (11) to produce a water jet (19), has the upstream side (16a) of the aperture, projected onto the axis (B-B') of the **needle**'s movement, made in a flattened shape to produce a flattened water jet with an elliptical cross-section and having its greatest dimension parallel to the **turbine**'s axis of rotation. The aperture can be elliptical in shape with a cylindrical base and a straight generating surface parallel to the axis of the **needle**'s movement.

[SS 11]