

Dec. 20, 1960

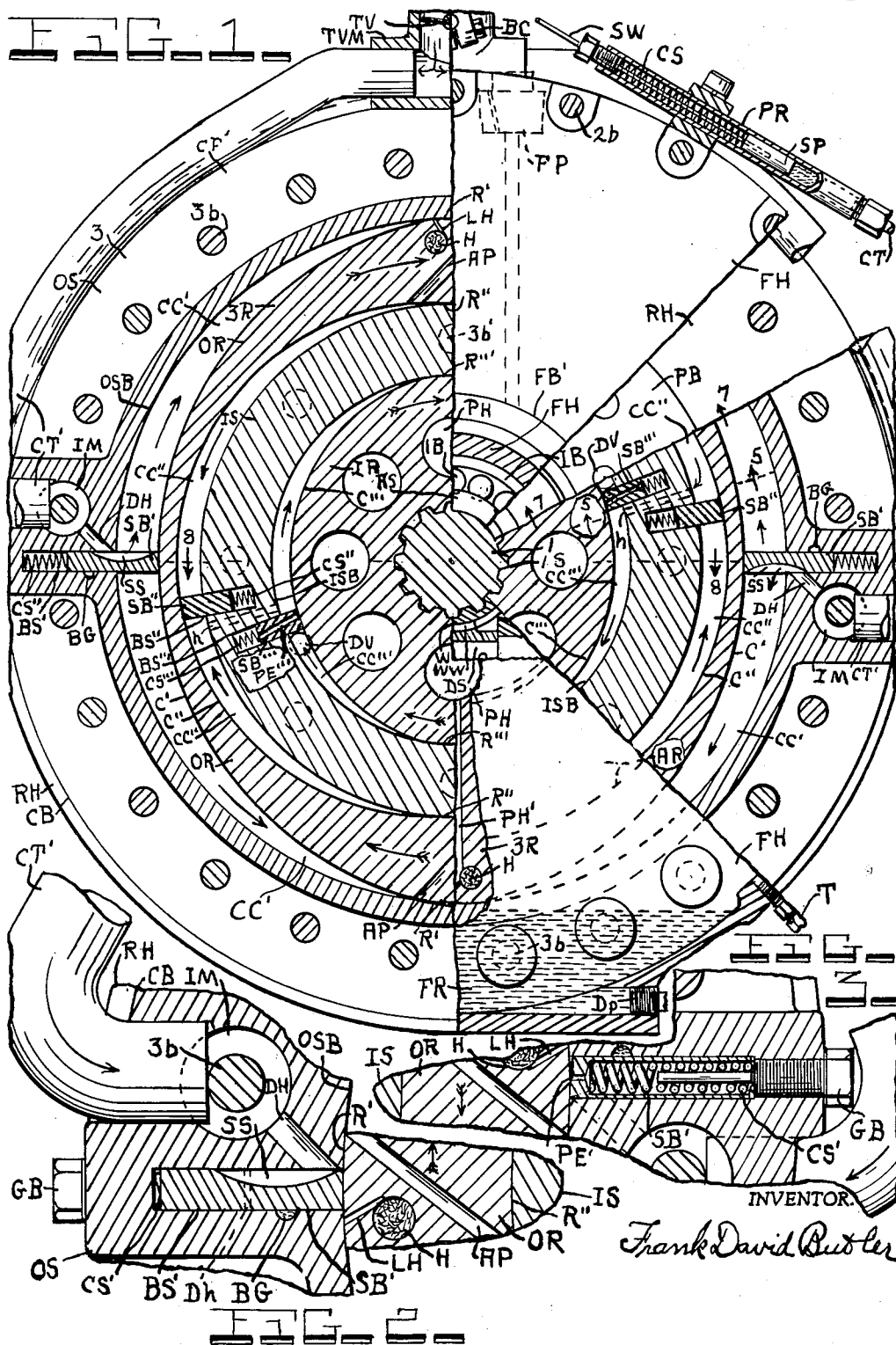
F. D. BUTLER

2,965,288

MULTIPLE STAGE CAMMED, CAM CHAMBERED AND BLADED, MULTIPLE
PRESSURE STAGE COMPOUNDED, ROTARY, ELASTIC
FLUID COMPRESSOR

Filed Oct. 27, 1958

5 Sheets-Sheet 1



Dec. 20, 1960

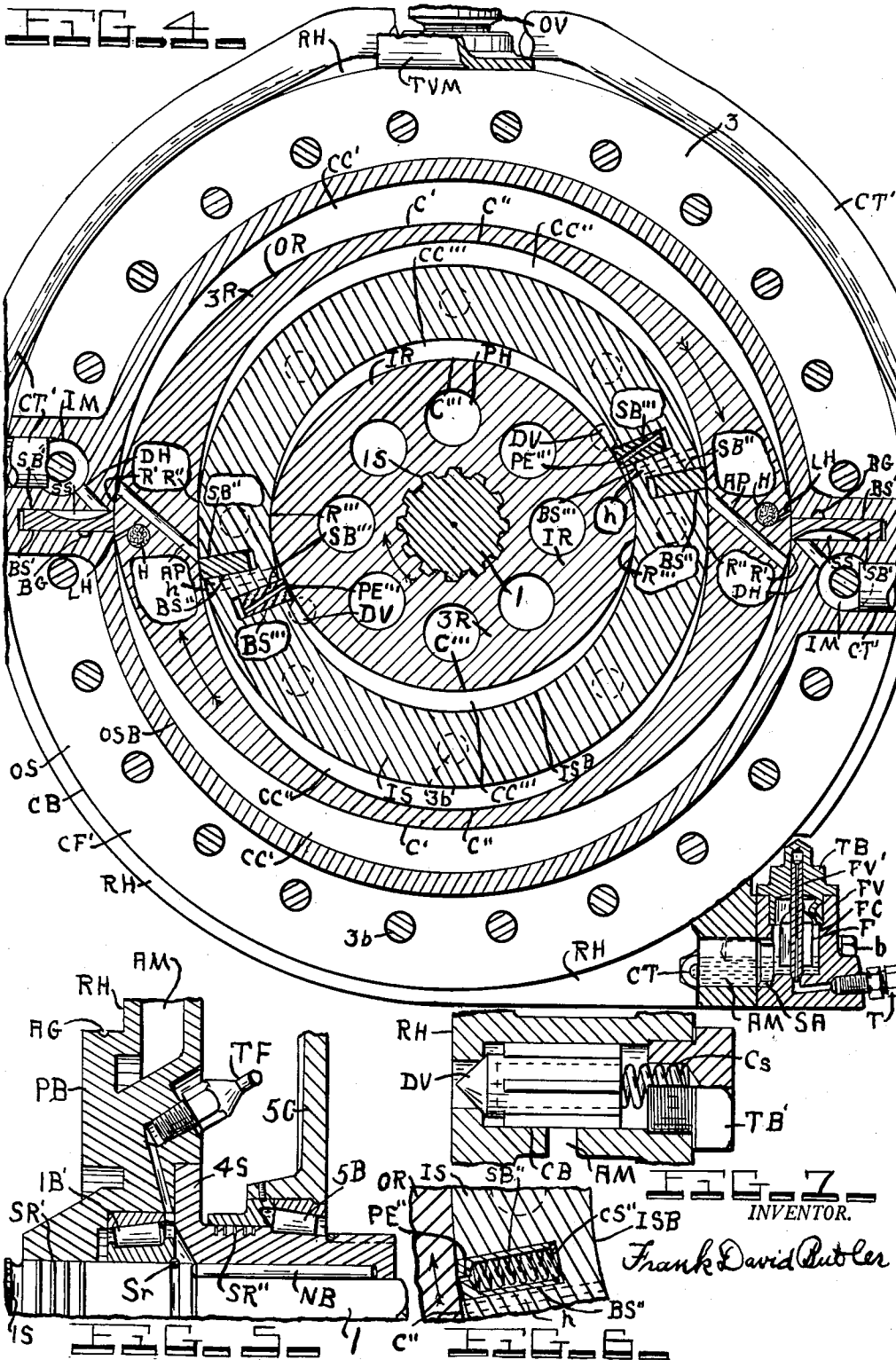
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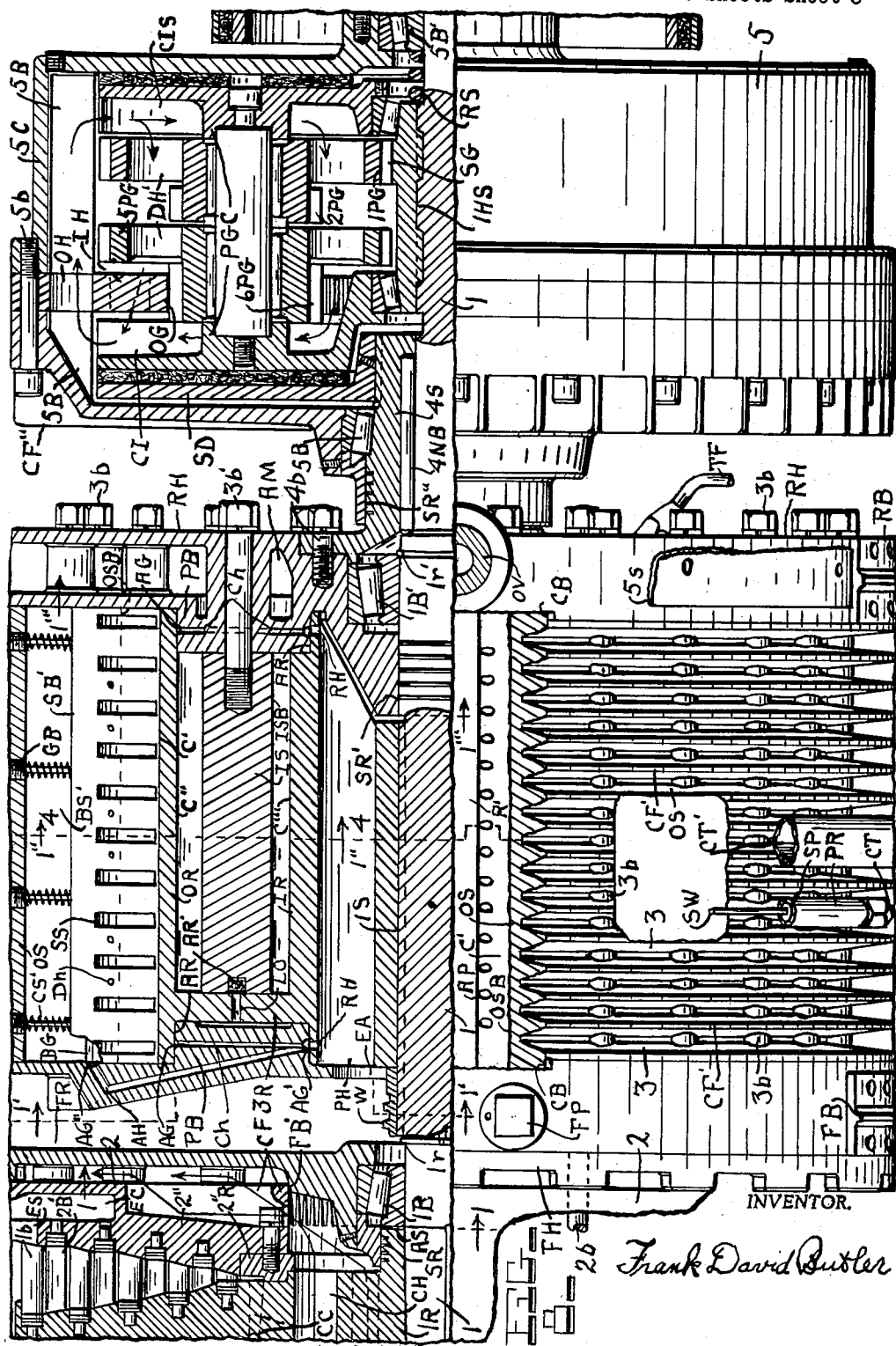
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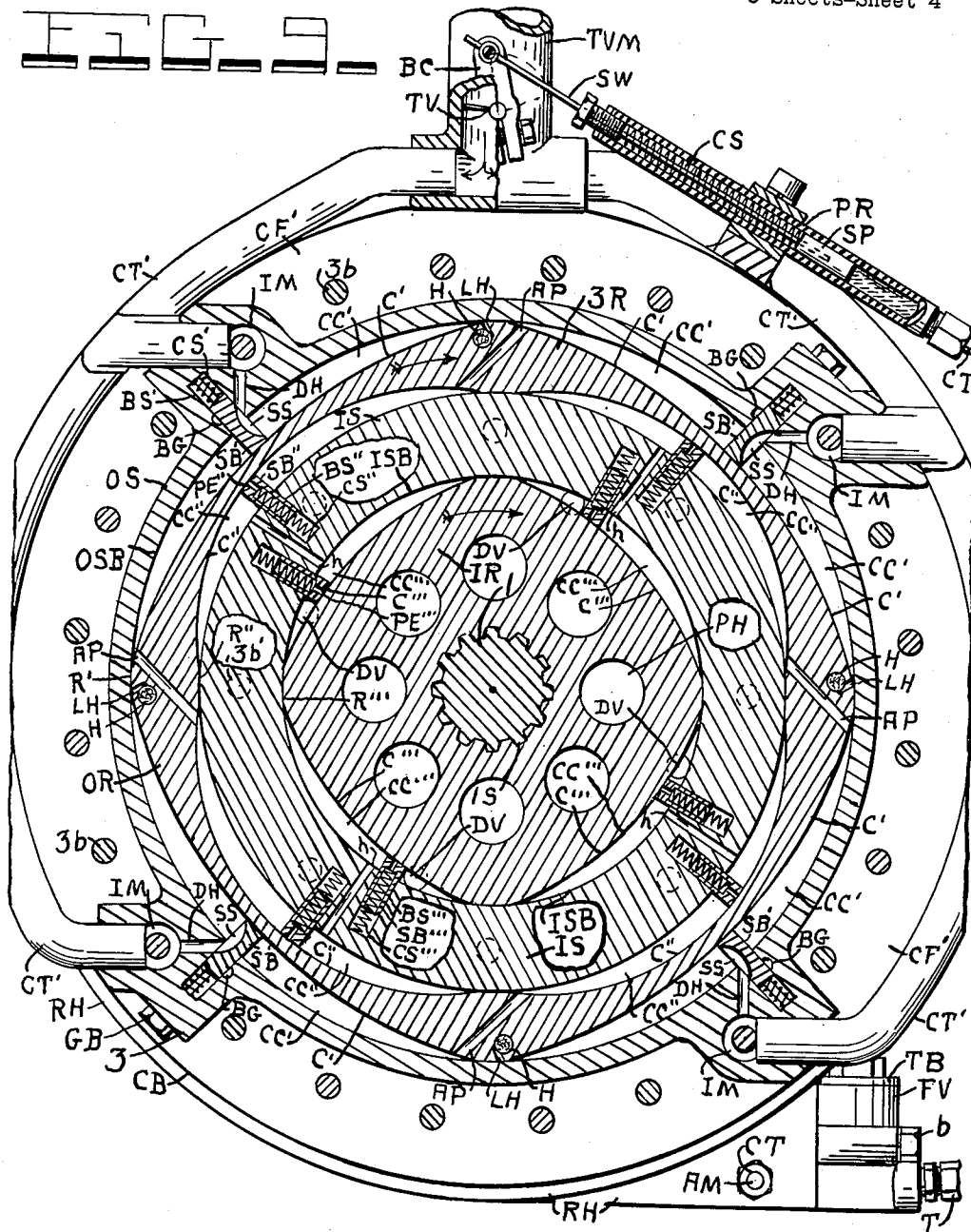
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INVENTOR.

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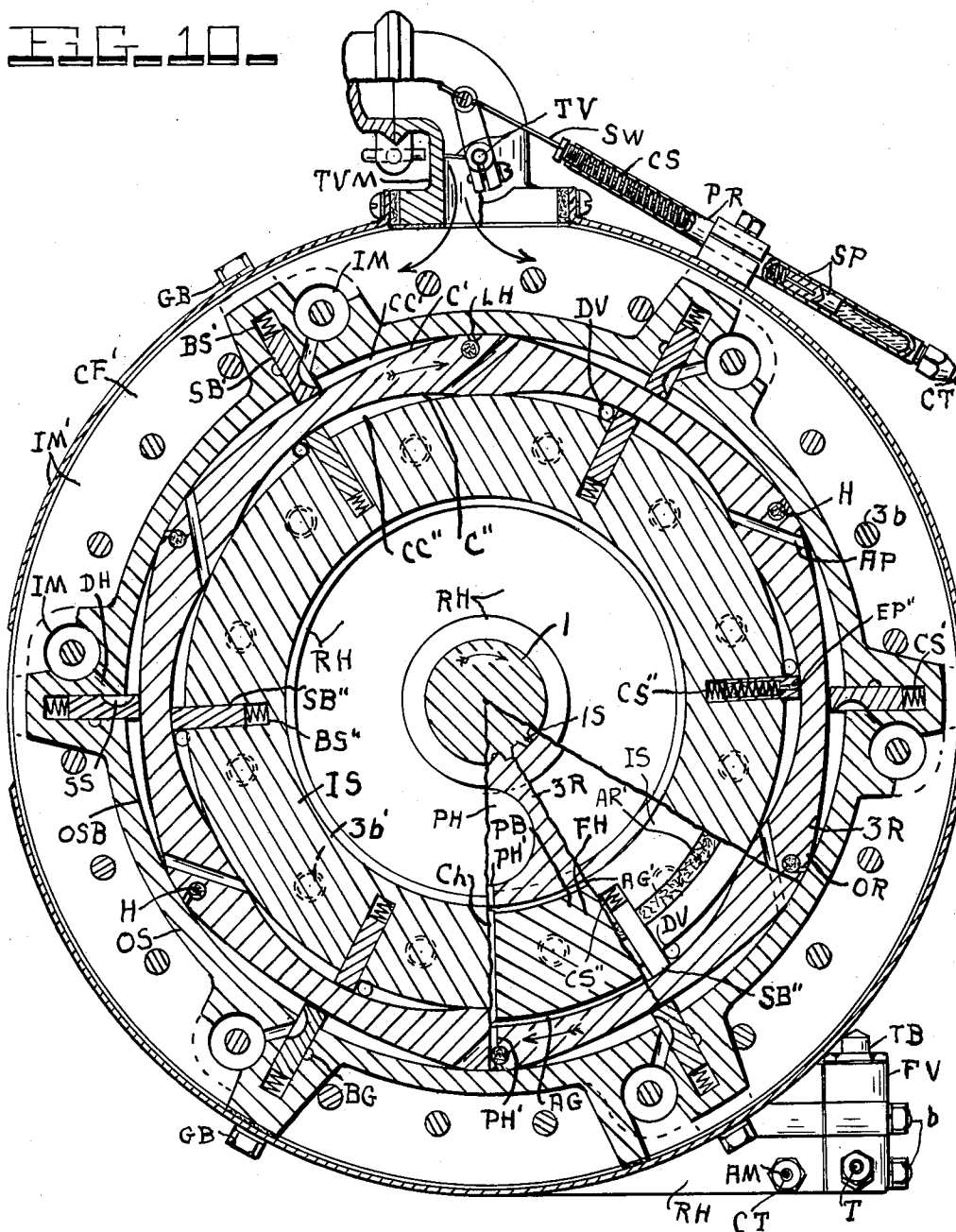
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5 Sheets-Sheet 5

FIG. 10



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1

2,965,288

MULTIPLE STAGE CAMMED, CAM CHAMBERED AND BLADED, MULTIPLE PRESSURE STAGE COMPOUNDED, ROTARY, ELASTIC FLUID COMPRESSOR

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Filed Oct. 27, 1958, Ser. No. 769,775

19 Claims. (Cl. 230—149)

While my invention relates to elastic fluid compressors in general, it applies more specifically to a multiple stage cammed, cam chambered and bladed, pressure stage compounded, rotary cam chambered, elastic fluid compressor, operative in conjunction with an internal combustion turbine unit motive power assembly applicable to an automotive vehicle.

Such an assembly could be similar to that of my recent patent application Serial No. 743,873, filed June 23, 1958, now Patent No. 2,915,876 issued December 8, 1959, wherein my pressure variable ratio reversible transmission coupler, Patent No. 2,799,182, issued July 16, 1957, and my multiple drive and pinion geared, pressure stage compounded compressor Patent No. 2,876,947, issued March 10, 1959, were used, and which latter may be made interchangeable with present invention compressor. Above patents are obtainable from the U.S. Patent Office.

The major improvements contemplated is a compressor of the type and for the purpose specified and which is provided with: An elongated annular shaped rimmed rotor, flanged to a hub portion at one end and provided externally to said rim with a multiple of symmetrically spaced indented 1st pressure stage cams, and internally with a similar multiple of indented 2nd pressure stage cams, wherein adjacent cams, in each respective stage, are separated by a similar multiple of cylindrical lands of equal widths, and equal diameters by stages, wherein the cams and lands by stages are respectively in the same radial plane; an elongated annular shaped outer and similar shaped inner stator each extending parallel with and concentric to the rotor axis, and wherein the lands of the 1st stage cams are a close rotatable fit within a concentric bore of the outer stator while the lands of the 2nd stage cams are a similar fit over a concentric outer surface of the inner stator; a multiple of rectangular shaped packing blades, one for each cam of each stage, of the same length as and slidable radially each in its respective blade slot located in, and extending the length of, its respective stator bore and/or outer surface; wherein each 1st stage cam rotative in the outer stator bore, and each separated by such land, provides a rotative cam chamber, which each are divided into an air inlet leading end and air discharge trailing end by each 1st stage blade during each revolution of said rotor; and, as illustrated and later described herein may be similarly, rotative cam chambered, triple pressure stage compounded, if so desired, and/or in vice versa manner may be reduced to a single pressure stage type of such compressor, in either case, such an increase and/or such a decrease in the number of pressure stages of the compressor would not change the total displacement of the latter. Providing a pair of, axially oppositely located, annular shaped, cored cavity type of compressor stator heads, with one located adjacent either end of, the outer stator member of the compressor, and of the compressor rotor, and forming a front head lubricating fluid reservoir and a rear head compressed elastic fluid accumulator manifold. Providing means for axially pressure balancing said rotor between

2

said stator heads. Providing means for radially pressure balancing, each multiple blade between its respective cam and the bottom of its respective blade slot. Providing means for lubricating each 1st stage blade from a broached groove forming a part of its blade slot. Providing cooperative access means, forming a part of each 1st stage blade for intermittently supplying elastic fluid to the respective adjacent 1st stage cam chamber. Providing a plurality of rows, one row for each 1st stage cam, of access ports with one row initiating adjacent a trailing edge of each 1st stage cam and therefrom extending diagonally through the rim of said rotor, at a location between an outer and an inner cam land, to adjacent the leading edge of the adjacent 2nd stage cam and for simultaneously, with such supplying of such elastic fluid to such respective 1st stage cam chamber, discharging compressed elastic fluid therefrom into the adjacent respective 2nd stage cam chamber, by and through such, self contained short coupled, row of access ports. Providing means, through multiple porting extending radially in and multiple wicking extending axially in said compressor rotor, for dynamically lubricating the compressor's rotative and slidable parts during the rotation of its rotor. Providing an elongated, one direction rotatable in-common driving shaft, which latter extends throughout the entire motive power assembly mentioned, forms the turbine rotor shaft, the compressor rotor driving shaft, a power delivery coupler driving gear driving shaft, and, is adjustably journaled upon an opposed pair of roller bearings, with one of the latter mounted in each of the stator heads. Also providing other minor improvements as will be disclosed hereinafter.

With reference to the figures of the accompanying drawings: Fig. 1 illustrates several transverse sections through an opposed dual cammed type of my compressor, and as the right upper 45° section would appear on the dotted and solid line 1—1 of Fig. 8, as the right lower 45° section would appear on the dotted and solid line 1'—1', as the right intermediate lower 72° section and the left one-half section would appear on the dotted line 1''—1'', and as the right intermediate upper 18° section would appear on the dotted and solid line 1'''—1''' of said Fig. 8; Fig. 2 is an enlarged detail section of the 1st stage blading as on the left side of Fig. 4; Fig. 3 is an enlarged detail section of the 1st stage blading at a point slightly closer than as in the right side of Fig. 4; the latter figure is a transverse section through the opposed dual cammed type of compressor on the dotted line 4—4 of Fig. 8, excepting with the compressor rotor rotated 90° from position it is in Fig. 1; Fig. 5 is a detail section of the coupler fluid supply connection as on the dotted line 5—5 of Fig. 1; Fig. 6 is an enlarged detail illustrating a method of mounting resilient coil springs in and providing pressure equalizing holes in either the 2nd and/or the 3rd pressure stage blades; Fig. 7 is an enlarged detail section of one of the last pressure stage discharge, non-return, check valves as on the broken line 7—7 of Fig. 1, when the 3rd pressure stage is the last pressure stage, otherwise such discharge valves could be in a similar relation location to the 2nd stage blades, if the compressor were two pressure stage compounded and/or could be in a similar relation location to the 1st stage blades, if the compressor was of single stage construction; Fig. 8 is jointly a longitudinal broken away plan and section of the compressor of Fig. 1, and a portion of the adjacent internal combustion turbine, at its left end, and a portion of the power delivery coupler, of the unit motive power assembly, at its right end, and with the section as taken on the broken dotted line 8—8 of Fig. 1; Fig. 9 is similar to Figs. 1 and 4 excepting illustrating my compressor in quadruple stage cammed, cam chambered and bladed form; and, Fig. 10 illustrates my compressor in hexagon

stage cammed, cam chambered and bladed, two pressure stage compounded form.

With reference to the symbols of the drawings, similar symbols represent and indicate similar parts in the several figures: The numeral 1 indicates the elongated, turbine rotor 1R, shaft which extends throughout the unit motive power assembly as the common driving shaft thereof for rotatively driving the compressor rotor 3R, of the compressor 3, and the sun-gear SG of my, previously mentioned patented, combined hydrodynamical and quadruple compounded planetary gearing driven, pressure variable ratio reversible, combined torque convertor and automatically operative power delivery transmission coupler 5. The internal combustion turbine 2 is similar to my previously mentioned turbine Patent No. 2,915,876 and is secured together concentrically, to shaft 1 rotation axis, to and with the compressor 3 by the stud-bolts 2b. This one direction rotatable shaft 1 is rotatively journaled upon the opposed pair of adjustable tapering roller bearings 1B and 1B' (Fig. 8) respectively mounted in the cored forward head FH and rear head RH of the compressor 3, and is shouldered against the shaft snap ring 1r' by the inner race of bearing 1B', and is adjustable axially by the multiple of annular shaped shims AS, adjacent the inner race of bearing 1B, and is further journaled upon the set of needle-bearings 4NB, in the stator 4S of coupler 5 and upon the roller bearing 5B', in the end of the coupler casing 5C. The latter is rotatively journaled upon said stator 4S and the shaft 1 respectively upon the opposed pair of adjustable tapering roller bearings 5B and 5B'. The coupler end of shaft 1 is provided with the external helical spline 1HS which rotatively drives the coupler sun-gear SG and also provides the latter and the coupler planet-gear-carrier PGC with an axial thrust to the right in Fig. 8. The intermediate portion of shaft 1 is provided with an external spline 1S for slidably receiving and rotatively driving the compressor rotor proper 3R and the worm W, which latter rotatively drives a transversely extending pump drive shaft DS through the worm-wheel WW, see Fig. 1.

If the compressor is of triple pressure stage form, Figs. 1, 4, 8 and 9, it is then provided with: an elongated outer rotor OR which is flanged adjacent one end thereof integral with the rotor proper 3R and is provided externally to OR, and extending throughout the length thereof, with a multiple of indented and/or concave shaped 1st pressure stage cams C'; and is provided internally to OR with a similar number, in a similar radial plane, of indented 2nd pressure stage cams C''; and wherein, between adjacent edges of adjacent 1st stage cams C', and similarly between adjacent 2nd stage cams C'' respectively, an outer and an inner cylindrical land ridge R' and R'' is provided in the same radial plane with one another, and which lands R' are a close rotative fit within the outer stator bore OSB, while the lands R'' are a similar fit over the periphery of the inner stator IS; wherein OR is also provided with several rows of access ports AP, with one row extending diagonally, from each trailing edge of each C' into the leading edge of each adjacent C'', through the rim of OR between adjacent lands R' and R''; and wherein OR is further provided with several axial holes H extending therethroughout, with one located between each adjacent land R' and R'' and containing felt wicking, and each provided with a row of semi-radially extending lubricating fluid distributing holes LH and may also be provided with a radially extending fluid pressure supply hole PH', located in the flange of rotor 3R and connecting H with one of the, axially extending, fluid pressure supply holes PH symmetrically spaced within the inner rotor IR; and, wherein the 2nd stage cams C'' are relatively shorter than the 1st stage cams C' and are the same length as stator IS, which latter extends from the flange of 3R to the projecting boss PB on RH.

The inner rotor IR, in such case, is then provided with:

an elongated annular shaped body portion integral with the rotor proper 3R and provided externally thereto with a multiple of elongated 3rd pressure stage cams C''' of equal number to and in the same radial plane with cams C' and C'', and which cams C''' are provided with a multiple of land ridges R''' which are a close rotative fit within the inner stator bore ISB; wherein the fluid pressure supply holes PH are symmetrically spaced within and extend axially in 3R; and, wherein the latter is internally splined axially, and is axially slidable over and rotatively driven by the spline 1S of shaft 1. In such triple pressure staged compressor, the inner stator IS thereof is elongated and of annular shape and extends from the rotor flange to the rear head projecting boss PB and is provided with: a series of elongated body and thread fitting stud-bolts 3b' which may secure it, concentrically to shaft rotation axis with and to the rear stator head RH boss PB; a multiple of rectangular shaped 2nd stage blade slots BS'' each extending throughout the length of the outer surface of IS and each adaptable to slidably receive its respective 2nd pressure stage slidable blade SB'', and a similar multiple of rectangular shaped 3rd pressure stage blade slots BS''' each extending throughout the inner surface of IS and each adaptable to slidably receive its respective 3rd pressure stage slidable blade SB''', and, wherein the rotative degrees of location of each multiple blade slot of each pressure stage is predetermined and is in accordance with the number of blades used in each pressure stage, but wherein such number should normally be equal throughout the pressure stages; wherein IS is also provided with multiple rows of diagonally radially extending therethrough access holes h, located one row between each adjacent pair of 2nd and 3rd pressure stage blade slots, and through which to discharge compressed elastic fluid from adjacent 2nd to adjacent 3rd pressure stage cam chambers respectively CC'' and CC''', which latter are formed between each respective cam C' and the outer surface of IS, and respectively between each respective cam C''' and the inner surface of IS; and wherein the latter is further provided, adjacent the rotor flange end thereof, with an annular shaped rectangular recess AR' which is filled with felt wicking and is in communication, through oppositely located axially extending leak-off holes LO in rotor 3R flange, with an annular shaped pressure balancing recess in the adjacent projecting boss PB of the front stator head FH, see Fig 8, and, which holes LO and balancing recess will be described hereinafter. As the 3rd stage cam chambers CC''' happens to be the last pressure stage cam chambers in this case, then each cam chamber CC''' is provided with a non-return, spring loaded, axially extending discharge check-valve DV, which latter are each located in the rear stator head RH in a predetermined location in respect to each last pressure stage blades and each opens away from its respective cam chamber into the cored cavity accumulator manifold AM in the rear head RH, and is provided with an extremely small, valve closing, compression clearance space in its cam chamber.

The compressor outer stator OS is elongated and annular shaped and consists of: two oppositely located outer end diameters that fit closely within adjacent counterbores CB, one in each stator head FH and RH, for retaining OS concentrically in line axially with and to such heads FH and RH by the series of symmetrically spaced stud-bolts 3b, which latter are shouldered against the outside of RH, extend throughout OS, including its numerous outer cooling fins CF', and are threaded into FH; an inner bore OSB extending throughout OS and adaptable to slidably and rotatively receive the outer rotor OR with its multiple of cam land ridges R'; a multiple of rectangular shaped 1st pressure stage blade slots BS' extending throughout the length of said bore OSB and each slot adaptable to slidably receive its respective 1st pressure stage slidable blade SB' which together are located in a predetermined manner as described hereinafter in

5

accordance with the number of blades to be used in each pressure stage; a multiple of elastic fluid supply inlet manifolds IM each extending axially in OS and located, in a predetermined manner, with one adjacent each 1st pressure stage blade slot BS' and each IM connected via a closed manifold means, which may be a fluid pressure tight annular shaped manifold IM' and/or copper tubing CT', to an in-common throttle valve manifold TVM, having a throttle valve TV, whereby the supply to each IM may be controlled by such TV and the supply of elastic fluid to the latter may be through and an air filter means; and, a multiple of rows of diagonally extending access holes DH, with one row extending between each 1st pressure stage blade slot BS' and the adjacent inlet manifold IM, and which holes DH will be described in detail hereinafter.

Wherein the indented multiple cams C' of the 1st pressure stage in conjunction with the 1st pressure stage multiple blades SB' and with the bore of the outer stator OS form the multiple 1st stage rotatable cam chambers CC', also wherein the total displacement of the 1st pressure stage, of this positive displacement rotary compressor, controls the total output capacity of the compressor during each revolution of its rotor 3R. Therefore the formula for the computed capacity of the compressor would be; an individual displacement of one 1st pressure stage cam chamber CC'X (number of 1st stage indented cams C'X number of 1st stage blades SB'). Therefore, as an example, assuming the individual displacement of CC' to be 6.5 cub.", then X (cams C' to be 6, X blades SB' to be 6)=234 cub." total rated displacement of compressor 3 during each revolution of its rotor 3R. Also as the 1st pressure stage blades SB', were previously mentioned as being located in their respective blade slots BS' in the bore of OS in a predetermined manner in accordance with the number of blades SB' used in such 1st pressure stage, the clockwise degree of location recommended when the multiple of blades SB' used in such 1st pressure stage is: Two blades—90° and 270°; three blades—60°, 180° and 300°; four blades 45°, 135°, 225° and 315°; five blades 36°, 108°, 180°, 252° and 324°; and, six blades—30°, 90°, 150°, 210°, 270° and 330°.

Inasmuch as the last pressure stage discharge valves DV are constructed and located so as to require practically nill compression loss, and as a single and/or a two stage pressure compounded compressor, of this type, will compress air to 11 atmospheres and would obviously be less expensive to build and maintain, the latter type is illustrated in Fig. 10.

The 1st stage blade slots BS' are each provided with: a semi-circular broached groove BG extending throughout and which may each be connected through annular groove AG' and diagonal access hole AH to the annular groove AG', in FH casting, and thereby providing each blade SB' with a closed circuit fluid supply from 3R, which fluid is distributed intermittently through holes Dh through SB', to both sides of latter; a series of diagonally extending access holes DH, in OS, connecting a similar series of radially extending semi-circular slots SS, in each SB', with the adjacent IM for intermittently supplying elastic fluid to leading end of each CC' during the normal radial sliding of each SB'; and, a plurality of elongated threaded guide bolts GB, Fig. 3, one for each blade spring CS' and aligning with latter where threaded through OS, and, through which threaded holes such springs may be conveniently exchanged.

With reference to Figs. 3, 6 and 10, all the compressor blades SB', SB'' and SB''' should be crowned, and should each be provided with a plurality of pressure equalizing holes PE', PE'' and PE''' respectively, extending from such crowns, via a spring chamber bore in each blade, into the blade slot at opposite end from the cam, whereby with air pressure applied at the cam ends of such blades and retainer spring pressure, from springs CS', CS'' and

6

CS''' respectively, applied at the blade slot ends thereof, if air pressure tends to separate blades from cams, then such pressure tends to equalize at cam and slot ends of blades so springs return blades to contact with cams, thereby resulting in a minimum friction bearing of blades against cams.

Inasmuch as any lubricating fluid which is introduced into the 1st stage cam chambers CC', from any source, will lubricate the 1st stage cams C' and blades SB', and will then be carried over into CC'', CC''' and AM, and must be returned to reservoir FR, such return means is provided in the form of an automatically operative trap float valve FV, Figs. 1, 4 and 9, which should be accessible and be provided with: a plurality of stud-bolts b for bolting the body of FV to a projecting boss of RH; a vented throughout float valve stem FV', guided in the threaded bonnet TB and seating towards the outlet to connection tubing T leading to FR in FH; a bell-shaped, closed top open bottom, float F, pressed over and soldered to FV' and floatable within float chamber FC which latter is in communication through slotted access SA with AM; and, whereby whenever fluid rises higher on outside than on inside of F, then the latter will be lifted from its seat and vice versa.

In Figs. 1 and 8, for purposes of axially pressure balancing 3R between the annular projecting bosses PB of FH and RH, the rotor 3R is provided with: a pair of axially opposite annular shaped recesses AR, each a close rotative fit over its respective boss PB; a pair of radially oppositely located leak-off holes LO extending axially through a flange portion of 3R and connecting the annular recess AR', in front end of IS, with the adjacent recess in the face of the front boss PB; whereby when pressure in CC'' and CC''' displaces 3R forward away from IS and against front PB, the latter becomes a thrust bearing which is amply lubricated, and such pressure leaks by front end of IS, thence through holes LO into recess of front boss PB, and, thereby tends to equalize forward thrust of 3R as well as the pressures in recess AR' and front boss recess. When the compressor is of two pressure stage form, as in Fig. 10, then; the inside diameters of both bosses PB and recesses AR as well as IS may all be equal; an annular portion of 3R may then extend to rear, from flange thereof, a close fit inside of IS and may be lubricated from holes PH; and, thereby resulting in front end of IS also becoming a thrust bearing amply lubricated. When the compressor is of single stage form, not illustrated, then; IS complete is eliminated, the outside diameters of both bosses PB and recesses AR may then remain as before but the inside diameters thereof may be increased to old outside diameters of IS; both ends of 3R may then be flanged over such bosses PB and latter may become thrust bearings amply lubricated from front boss PB, with rear PB lubricated through axial holes H; the rear side of 3R flange may extend straight inward to its hub; and, the holes PH need only to extend from front end of 3R to its flange.

Miscellaneous applicable details: In the figures, any complete arrows indicate direction of rotation of parts, while any incomplete arrows indicate direction of fluid flow and/or the direction of sectional views. In Figs. 1 and 8, the helix angle of worm W should cause latter to bear against rotor 3R. In Figs. 1, 4, 7, 9 and 10, the last stage discharge valves DV are each coil spring CS—loaded, are slidable axially in chamber bore CB, discharge into AM, are provided with threaded bonnet TB' and are removeable from RH. In Figs. 1, 4, 8, 9 and 10, the automatically operative pressure regulator PR, consists of; a slidable piston SP, in PR bore, supplied with fluid under pressure at one end thereof from base of AM via connection tubing CT, and opposed at its opposite end, by an adjustable load coil spring CS, and connected at this latter end via a spring wire SW and a swivel pin bell-crank BC to an air supply throttle-

7

valve TV of TVM, and whereby, whenever the fluid pressure is greatest on SP in PR, then TV is closed, and vice versa, and, wherein setting of CS may be above 12 atmospheres. In Figs. 4 and 8: as the cored cavity in RH forms AM, then the outlet valve OV, thereof AM, not illustrated in detail, should be a combined multiple disc strainer and solenoid coil operative check-valve, openable whenever an ignition switch is turned on and vice versa. In Fig. 8; the cored cavity in FH forms a static head lubricating fluid reservoir FR, and is provided with the combined vented filler plug and oil depth rod FP, the drain plug DP, and, two series of non-rotative spring seal rings SR in hub of 1R, and SR' in shaft 1. In Figs. 1, 8 and 10, the compressor 3 is lubricated throughout dynamically by lubricating fluid rotatively carried in the axial pressure supply holes PH in rotor 3R thereof, and wherein the quantity of fluid carried in each PH depends upon the location of the top of the eccentric central access EA, in FH, in respect to top of PH, and, also wherein during rotation of worm wheel WW latter will throw fluid over top of EA bottom into lower holes PH. In Figs. 1, 8 and 10: depending upon the fluid pressure desired in the axial holes H, the latter may each be supplied from one of the holes PH through the relatively long radially extending hole PH, Fig. 1, if a higher pressure is required; and/or, if a lower pressure is required, may each be supplied from two opposite holes PH, each normally provided with a pair of oppositely axially located radial holes RH each extending into the inner annular groove AG', Fig. 8, one in each opposite boss PB, thence radially through the connection holes Ch into the outer annular grooves AG, one of each in each PB; and, thence through relatively short radial holes, similar to PH', Fig. 10, one in each end of 3R into both ends of their respective hole H, and, wherein the opposite recesses AR and bosses PB are simultaneously lubricated from grooves AG' and AG. Whenever it becomes necessary to use over two manifolds IM, then in lieu of using two annular shaped tube manifolds CT', as in Fig. 9, only one annular shaped fluid pressure tight manifold IM' need be used, as in Fig. 10, for connecting manifolds IM to TVM, and, in the latter case IM' encloses four adjacent cooling fins CF. With reference to Figs. 1, 8, 9 and 10, while two oppositely located grooves BG could be supplied with lubricating fluid directly from FR; in normal practice each BG may be connected at one end thereof to the annular groove AG'', on the rear side of FH, Fig. 8, thence via the semi axial and radial access hole AH in FH to the inner annular groove AG' in the front boss PB, thence via two opposite radial holes RH into two radially opposite axial holes PH. With reference to Figs. 1 and 8, the compressor 3 is secured, concentrically with shaft rotation axis, to turbine stator 2 by the multiple of stud-bolts 2b and by the flanged boss FB' of FH bearing radially against adjacent cooling fins CF of 2; and, is secured, concentrically with shaft rotative axis, to coupler 5, of the unit motive power assembly, by being bolted, with multiple of bolts 4b, to the heat treated and ground flanged stator 4S of such coupler 5; also, wherein Figs. 1, 5 and 8 illustrate connection means for supplying fluid to within 5, through tubing TF, for pressure variable ratio reversing of 5; and, furthermore as latter is similar to my previously mentioned Patent No. 2,799,182, and the turbine 2 is similar to my previously mentioned Patent No. 2,915,876, the symbols of neither will be further described herein. With reference to Figs. 1, 8, 9 and 10, any fluid that bleeds into the lower manifolds IM during period 3R is idle, will be induced back into 1st stage through SS of blades SB', thence through 2nd and 3rd stages into AM, and, thence returned to FR via float-valve FV, Fig. 4, so will not be lost.

With reference to Fig. 8; the unit motive power assembly, including the compressor 3, may be supported be-

8

tween the car frames by opposite pairs of front and rear brackets, similar to FB and RB respectively, secured to FH and RH; and, a shield 5s may be secured to latter and extend to rear over the top of coupler 5 for protecting latter.

In order to quickly understand the operation of this type of compressor, it should first be understood that simultaneously with the supply of elastic fluid to one end of any rotatable cam chamber, that compressed elastic fluid is being discharged from the opposite end of this same cam chamber, and this fact applies regardless of the number of cam chambers in each stage and/or the number of pressure stages in the compressor. Starting with the rotative parts in position as in Fig. 1 and assuming the compressor has been operating, then in tracing one side sequence only: filtered air under atmospheric pressure from TVM is induced into left upper CC' through; left CT', IM, DH and SS, in series; simultaneously therewith compressed air is discharged from left lower CC' through lower access ports AP into right lower CC''; simultaneously therewith compressed air is discharged from right upper CC'' into right lower CC''' through adjacent holes h; and, simultaneously therewith compressed air is discharged from right upper CC''' into AM through the adjacent discharge valve DV opening into AM.

While any number of indented cams for each stage, and any number of pressure stages may be used in my compressor, I would recommend either four and/or six cams for each stage, in preferably a two pressure stage compressor of this type, for the usual automotive vehicle internal combustion turbine motive power assembly in conjunction therewith.

Having fully described my compressor invention in its best mode of adaptation in conjunction with an internal combustion turbine unit motive power assembly of an automotive vehicle, I claim:

1. A multiple stage cammed, cam chambered and bladed, multiple pressure stage compounded, rotary type of elastic fluid compressor, comprising: an elongated annular shaped outer rotor provided externally with 1st pressure stage elongated indented multiple outer cams and internally with 2nd pressure stage elongated indented multiple inner cams; an elongated annular shaped inner rotor integral and concentric with said outer rotor, through a flanged portion of the rotor proper, and provided externally with 3rd pressure stage elongated indented multiple cams in the same radial plane as the multiple outer and inner cams, and provided in an internal bore thereof with an elongated spline extending therethrough; an elongated annular shaped outer stator provided with a concentric internal bore throughout, extending concentric to the rotor axis, and a multiple of 1st stage blades radially slidable in a similar number of rectangular shaped blade slots opening into and extending parallel with said concentric bore throughout and wherein such concentric bore in conjunction with the multiple of outer cams form the 1st pressure stage rotatable cam chambers; a pair of elongated annular shaped cored cavity stator heads secured concentrically with, the rotor axis, and to said outer stator and forming a front head lubricating fluid reservoir and a rear head accumulator manifold of and for such compressor; an elongated annular shaped inner stator secured at one end thereof concentrically with, said rotor axis, to the rear head and terminating at its opposite end adjacent said flanged portion of said rotor proper, and provided externally thereto with a multiple of 2nd stage blades radially slidable in a similar number of rectangular shaped blade slots open to and extending parallel with the periphery thereof therethroughout and a similar number of 3rd pressure stage blades radially slidable in a similar number of rectangular shaped blade slots open to and extending parallel to and in an inner bore of said inner stator therethroughout, and wherein such inner bore in

conjunction with the 3rd stage multiple cams form the 3rd stage rotatable cam chambers, and, wherein the periphery of such inner stator in conjunction with the 2nd stage multiple cams form the 2nd stage rotatable cam chambers; an elongated one direction rotatable shaft extending in common as the driving member of a unit motive power assembly and provided to be rotatively journaled upon a pair of adjustable roller bearings with one mounted in each of said annular shaped stator heads concentrically thereto, and provided in its intermediate length with an external spline over which said rotor proper is axially slidably splined; means for supplying air under atmospheric pressure intermittently to within all 1st stage rotatable cam chambers' leading ends through a multiple of inlet manifolds with one located adjacent parallel to and in communication with each 1st stage blade slot; access means extending through said outer rotor for simultaneously discharging compressed air from all 1st stage cam chambers' trailing ends into the 2nd stage cam chambers' leading ends; access means extending through said inner stator for simultaneously discharging compressed air from all 2nd stage cam chambers' trailing ends into all 3rd stage cam chambers' leading ends; check valve means for simultaneously discharging compressed air from each of the last pressure stage cam chambers' trailing ends into said accumulator manifold; means connected with each 1st stage blade slots for lubricating the 1st stage blades; means forming a part of said rotor proper for hydrodynamically lubricating the rotatable and slidable parts of the compressor; means forming a part of said rotor proper and said stator heads for axially pressure balancing the former between the latter; access means extending through each of said pressure stage blades for radially pressure balancing same and including resilient means for retaining such blades in contact with their respective cams; means operative between a supply and a discharge side of said compressor for regulating the pressure within said accumulator manifold; means operative between a base of said accumulator and said lubricating fluid reservoir for automatically returning excess fluid to said reservoir; means for connecting said inlet manifolds to a common throttle-valve manifold; and, means for supporting an internal combustion turbine from the front head, and means for rotatively supporting a fluid coupler from the rear stator head of said compressor.

2. The elastic fluid compressor of claim 1 characterized by: wherein all adjacent multiple outer cams of the 1st pressure stage are separated from one another by external cylindrical lands, of the outer rotor, which are a close rotative fit within the bore of said outer stator; wherein all adjacent multiple inner cams of the 2nd pressure stage are similarly separated from one another by internal cylindrical lands, of the outer rotor, which are a close rotative fit over the outer periphery of said inner stator; and, wherein all adjacent multiple cams of the 3rd pressure stage are similarly separated from one another by external cylindrical lands, of the inner rotor, which are a close rotative fit within the bore of the inner stator.

3. The elastic fluid compressor of claim 1 characterized by, said means for supplying air under atmospheric pressure intermittently to within all 1st stage rotatable cam chambers' leading ends through a multiple of inlet manifolds, to consist of: wherein each 1st stage blade is provided with a series of radially extending semi-circular shaped slots which are in communication with a similar series of diagonally extending holes, in the outer stator, which connect the respective inlet manifold of each such 1st stage blade with its respective blade slot; and, wherein, during the radial sliding of each such 1st stage blade, intermittent communication is established between its respective inlet manifold and the bore of said outer stator, and including the leading ends of the rotatable cam chambers within the latter.

4. The elastic fluid compressor of claim 1 characterized by, said access means extending through said outer rotor for simultaneously discharging compressed air from said 1st stage cam chambers' trailing ends into all 2nd stage cam chambers' leading ends, to consist of; a multiple of rows of series of communication access ports with one row extending from adjacent the trailing edge of each 1st stage cam diagonally radially through the outer rotor to adjacent the leading edge of the adjacent 2nd stage cam.

5. The elastic fluid compressor of claim 1 characterized by, said access means extending through said inner stator, to consist of; a multiple of rows of access holes with one row located on the anti-rotative side of each 2nd stage blade slot and extending radially through the inner stator to the rotative side of the adjacent 3rd stage blade slot in the bore of such inner stator.

6. The elastic fluid compressor of claim 1 characterized by, said check-valve means, to consist of; a pair of oppositely located, multiple of axially extending, removable spring-loaded non-return, discharge valves located within such accumulator manifold and each seating towards its respective last stage cam chamber, and, provided to lift whenever the pressure within the latter exceeds the pressure within the accumulator manifold, and vice versa.

7. The elastic fluid compressor of claim 1 characterized by, said access means extending through each of said pressure stage blades for radially pressure balancing same, to consist of: a plurality of relatively small holes extending through the width of each pressure stage blade from a crowned edge thereof, contacting its respective stage cam, into an adjacent coil spring recess therein, open to a slot-bottom edge thereof; a plurality of coil springs, one for each blade recess, for retaining its respective blade in slight contact with its respective cam; and, wherein the springs of the 1st stage blades are each backed with a guide bolt, which latter are each threaded through said outer stator into the bottom of the slots of the 1st stage blades and are each provided with a cylindrical projection which is a close guide fit into its respective spring, and wherein each such 1st stage blade spring may be removed through the threaded hole for the guide bolt thereof.

8. The elastic fluid compressor of claim 1 characterized by, said means forming a part of said rotor proper for hydrodynamically lubricating the rotatable and slidable parts of the compressor, to consist of: a series of elongated cylindrical fluid containing enlightening holes extending axially within said inner rotor parallel closely adjacent to the elongated internal spline thereof, and which enlightening holes generate a hydrodynamical fluid pressure therein during the rotation of the rotor proper; a multiple of axially extending lubricating fluid circulating holes in the outer rotor, with one located immediately to each of the trailing edges and leading edges of the 1st stage cams, and each provided with a felt wicking extending throughout, a row of series of lubricating distributing holes each extending thereinto, from adjacent 1st stage cam's leading edge diagonally radially, in the direction of rotor rotation, through said outer rotor, and, access means, extending radially in said rotor proper, for supplying fluid under dynamical pressure into each such circulating holes from, one of a series of, radially spaced axially extending, enlightening holes in a hub portion of said rotor proper.

9. The elastic fluid compressor of claim 1 characterized by, said means connected with each 1st stage blade slot for lubricating the 1st stage blades, to consist of: a multiple of broached grooves one located in each 1st stage blade slot and extending throughout its length on opposite side to inlet manifold thereof and each provided with a means of supply of lubricating fluid through an enclosed access means; and, wherein such blades are each provided with a series of distributing holes, each

11

extending through a thickness thereof, and intermittently cooperative with said broached grooves.

10. The elastic fluid compressor of claim 1 characterized by, said means forming a part of said rotor proper and said stator heads for axially pressure balancing the former between the latter, to consist of: an elongated annular shaped recess located adjacent the front flanged end of said rotor proper and provided with a pair of oppositely located leak-off holes extending axially through such flanged portion into such annular recess; a similar elongated annular shaped rear recess located at the opposite end of said rotor proper internally to said outer rotor; an elongated annular shaped projecting boss integral with said front stator head and fitting closely within the first mentioned recess, and provided itself with a slight recess adjacent the rotor flanged portion; a similar elongated annular shaped projecting boss integral with said rear stator head and fitting closely within the rear recess; an annular shaped leak-off recess filled with felt wicking and located in the center of the front end of said inner stator adjacent said flanged portion of said rotor proper, and in communication with said pair of leak-off holes; and, wherein axial and radial rotative clearances, between each adjacent annular recess and annular boss are extremely small, and, are all adequately lubricated.

11. The elastic fluid compressor of claim 1 characterized by, said means operative between a supply and a discharge side of said compressor for regulating the pressure within said accumulator manifold, to consist of: an elongated annular shaped pressure regulator provided with a concentric bore throughout and connected at one end to said accumulator manifold; and, an elongated spring-loaded piston slidable within said bore adjacent the connected end of such regulator and connected at its opposite spring-loaded end through a spring wire to a throttle valve located on the suction side and controlling the suction to said compressor.

12. The elastic fluid compressor of claim 1 characterized by, said means operative between a base boss of said accumulator and said lubricating fluid reservoir for automatically returning excess fluid to said reservoir, to consist of: an elongated cored boss projecting integral from the base of said accumulator; a float-valve provided to be bolted to such boss, and to be connected through a return tubing connection to said fluid reservoir in the front head, also provided with a centrally located vertically extending cylindrical float-valve chamber, connected through a vertical slot with the cored boss, and, closed at its top by a threaded guide bonnet; an elongated cylindrical float-valve proper vented throughout, guided at its top end in said guide bonnet, valve seated at its bottom end towards the return tubing connection, and, pressure balanced vertically therebetween; and, a relatively light weight, belled top open bottom, float pressed over and soldered to the intermediate length of said float-valve proper and provided to float the latter from its seat whenever fluid becomes higher on the outside than on the inside of such float, and vice versa.

13. A multiple pressure stage compounded multiple bladed elastic fluid compressor comprising: an elongated annular shaped rotor within an elongated annular shaped rotor, including an outer rotor provided with a multiple of elongated indented externally located symmetrically spaced 1st stage cams, and a similar number of similarly spaced of elongated indented internally located 2nd stage cams extending only to a front flanged portion of the rotor proper integral therewith, and including an inner rotor provided with a similar number of similarly spaced of elongated indented externally located 3rd pressure stage cams extending only to said flanged portion of said rotor proper integral therewith, and, wherein the adjacent cams of each stage are separated from one another by adjacent cylindrical lands, each of predetermined widths, and wherein the corresponding lands of the multiple of pressure stages are all in the same radial

12

plane; an elongated annular shaped concentric stator within an elongated annular shaped concentric stator, both extending concentric with the rotor axis, including an outer stator provided with a concentric bore extending therethrough, which bore is provided with a similar number of rectangular shaped 1st stage blade slots, corresponding in number with the 1st stage cams, symmetrically spaced therein and extending parallel therewith therethroughout, and is also provided with a similar number of similarly spaced elongated cylindrical inlet air manifolds with one extending, parallel closely adjacent to each 1st stage blade slot, in the direction of rotor rotation from latter, and including an inner stator, extending only to said flanged portion of said rotor proper, provided with a cylindrical external surface and an internal concentric bore both extending concentric with the rotor axis and, wherein such external surface is provided with a similar number of rectangular shaped 2nd stage blade slots, corresponding with the number of 2nd stage cams, symmetrically spaced therein and extending parallel therewith therethroughout, and wherein the concentric bore of such inner stator is provided with a similar number of rectangular shaped 3rd stage blade slots, corresponding with the number of 3rd stage cams, symmetrically spaced therein and extending parallel therewith therethroughout; a pair of elongated annular shaped cored cavity stator heads secured concentrically with and to said outer stator and forming a front head lubricating fluid reservoir and a rear head accumulator manifold of and for said compressor; a pair of elongated annular shaped axially projecting bosses, one integral concentrically with each stator head oppositely axially to one another, and each provided to fit closely within its respective elongated annular shaped recess, of a pair of recesses, one located in each end of said rotor proper concentrically with its axis, and wherein the front recess is provided with a pair of oppositely located leak-off holes extending axially through the flanged portion of said rotor proper; a plurality of radially slidable 1st, 2nd and 3rd stage blades corresponding in number to the number of 1st, 2nd and 3rd stage blade slots and respectively radially slidably therein; wherein the 1st stage cams in conjunction with the bore of the outer stator form the 1st stage rotatable cam chambers, wherein the 2nd stage cams in conjunction with the outer surface of the inner stator form the 2nd stage rotatable cam chambers, and, wherein the 3rd stage cams in conjunction with the bore of the inner stator form the 3rd stage rotatable cam chambers; an elongated one direction rotatable shaft extending in common as the driving member of a unit motive power assembly and provided to be rotatively journaled upon a pair of adjustable roller bearings, with one mounted in each stator head concentrically thereto, and provided in its intermediate length with a spline over which said rotor proper is axially slidably splined; means for supplying air under atmospheric pressure intermittently to within the leading ends of the 1st stage rotatable cam chambers from the inlet manifolds, as combined with, means for simultaneously discharging compressed air from the trailing ends of the 1st stage cam chambers into the leading ends of the 2nd stage rotatable cam chambers through the outer rotor, as further combined with, means for simultaneously discharging compressed air from the trailing ends of the 2nd stage cam chambers into the leading ends of the 3rd stage rotatable cam chambers through said inner stator, and as still further combined with, means for simultaneously discharging compressed air from the trailing ends of the last stage rotatable cam chambers into the accumulator manifold through a similar number of non-return discharge valves extending axially in such accumulator manifold; and, means for connecting each inlet manifold to an in-common throttle-valve manifold of said compressor.

14. The elastic fluid compressor of claim 13 charac-

13

terised by, said means for connecting each inlet manifold to an in-common throttle-valve manifold of said compressor, to consist of; an annular shaped manifold means extending from each inlet manifold to said throttle-valve manifold.

15. The elastic fluid compressor of claim 13 characterised by: the plurality of radially slidable 1st stage blades are each lubricated from an elongated broached groove located in its respective blade slot and in communication with a source of lubricant supply, and, are each adaptable, during its slidable operation, for intermittently supplying air from the adjacent inlet manifold to the outer stator bore on the manifold side of its blade slot; and wherein the 1st, 2nd and 3rd stage blades are each resiliently operative in its respective 1st, 2nd and 3rd stage blade slots, and, are each provided with a plurality of pressure equalizing access holes extending radially through its width from its cam to its slot side thereof.

16. The elastic fluid compressor of claim 13 characterised by: in the means for supplying air intermittently to within the 1st stage rotatable cam chambers from the inlet manifolds, the 1st stage blades are utilized and are each provided with a series of semi-circular shaped slots on the side towards the adjacent inlet manifold and wherein such slots correspond with a similar number of diagonally extending holes connecting each manifold with the adjacent blade slot, thus, during the radial travel of such 1st stage blades, air is intermittently admitted into the outer stator bore on the manifold sides of the 1st stage blade slots; in the means for simultaneously discharging compressed air from the 1st stage rotatable cam chambers into the 2nd stage rotatable cam chambers through the outer rotor, the latter is provided with a row of access ports extending from adjacent the trailing edge of each 1st stage cam diagonally radially through such outer rotor to adjacent the leading edge of the adjacent 2nd stage cam; in the means for simultaneously discharging compressed air from the 2nd stage rotatable cam chambers through the inner stator, the latter is provided with a series of access holes extending from adjacent the anti-rotative side of each 2nd stage blade slot radially through such inner stator to adjacent the rotative side of each 3rd stage blade slot within such inner stator bore; in the means for simultaneously discharging compressed air from the last stage rotatable cam chambers into the accumulator manifold through a similar number of non-return discharge valves extending axially in such manifold, wherein each such discharge valve is spring-loaded and is provided with a removable threaded bonnet through which threaded hole such valve may be removed; and, wherein the entire communication means between the 1st stage rotatable cam chambers and the inlet manifolds, between the 1st and 2nd stage rotatable cam chambers, between the 2nd and 3rd stage cam chambers, and, between the last stage rotatable cam chambers and the accumulator manifold are all self contained within the compressor, are all simultaneously automatically operative, and are all relatively short coupled within a closed system relatively compact in its construction and unique in its operation.

17. In an elastic fluid compressor, means for compactly pressure staging same comprising: an elongated annular shaped, one direction rotatable, flanged rotor proper provided with an integral elongated annular shaped outer rotor, an integral elongated annular shaped inner hub internally splined, and, a pair of elongated annular shaped recesses with one located, between the outer rotor and inner hub, at a rear end of said rotor proper and the other directly opposite thereto at the front flanged end of the latter; a multiple of elongated indented symmetrically spaced 1st pressure stage cams, located in the external surface of and extending throughout the length of the outer rotor, as combined with, a similar number of elongated indented symmetrically spaced 2nd pressure

14

stage cams, located in the internal surface of and extending only to adjacent the flange of said rotor proper; wherein the adjacent cams of each pressure stage are separated from one another by a multiple of cylindrical lands of predetermined widths and wherein the corresponding lands of the two pressure stages are all located in the same radial plane; an elongated annular shaped concentric outer stator, of the same length as, and extending concentrically with the axis of, said outer rotor and provided with an internal concentric bore throughout in which the cylindrical lands of the 1st stage cams are a close rotative fit, and provided also with a multiple of rectangular shaped 1st stage blade slots, corresponding in number with the 1st stage cams, symmetrically spaced therein and extending parallel therewith such bore throughout, and provided further with a similar number of similarly spaced elongated cylindrical inlet air manifolds with one extending parallel closely adjacent each 1st stage blade slot in the direction of rotor rotation therefrom; a pair of elongated annular shaped cored cavity stator heads flange secured concentrically with the rotor axis and to said outer stator and forming a front head lubricating fluid reservoir and a rear head accumulator manifold of and for said compressor; a pair of elongated annular shaped axially projecting bosses one integral with each stator head, concentrically with latter and said rotor axis, and wherein the boss on the front head is a close fit within the recess in the rotor proper adjacent the flange thereof, while the boss on the rear head is a close fit within the opposite recess of such rotor proper; an elongated annular shaped concentric inner stator secured concentrically with said rotor axis and to the boss of the rear head and extending to said flange of said rotor proper, and provided with a cylindrical external surface over which the cylindrical lands of the 2nd stage cams are a close rotative fit and wherein such surface is also provided with a number of rectangular shaped 2nd stage blade slots, corresponding in number to said 2nd stage cams, symmetrically spaced therein and extending parallel therewith throughout; a plurality of 1st and 2nd pressure stage blades, corresponding in number to the 1st and 2nd stage blade slots, radially slidable within their respective blade slots; wherein the 1st stage cams in conjunction with the bore of the outer stator form the 1st stage rotatable cam chambers, and, wherein the 2nd stage cams in conjunction with the outer surface of the inner stator form the 2nd stage rotatable cam chambers; an elongated one direction rotatable shaft extending in common as the driving member of a unit motive power assembly and provided to be rotatively journaled upon an opposed pair of adjustable roller bearings, with one mounted in each stator head concentrically thereto, and provided in its intermediate length with a spline over which said rotor proper is axially slidably splined; and, means for supplying air intermittently to within the leading ends of the 1st stage cam chambers from the inlet manifolds, as combined with, means for simultaneously discharging compressed air from the trailing ends of the 1st to the leading ends of the 2nd stage cam chambers through the outer rotor, as further combined with, means for simultaneously discharging compressed air from the trailing ends of the last stage cam chambers, through a similar number of axially extending non-return spring-loaded discharge valves, into the accumulator manifold.

18. In an elastic fluid compressor, means for compactly pressure staging same comprising: an annular shaped flanged rotor proper provided with an integral annular shaped outer and an integral annular shaped inner rotor, and, a pair of annular shaped recesses one at each end thereof, wherein said outer and inner rotors and recesses extend axially concentric with the rotor axis; a similar number of similarly symmetrically spaced 1st, 2nd and 3rd pressure stage indented cams, with the 1st stage cams extending axially throughout the external sur-

15

face of the outer rotor, the 2nd stage cams extending internally to said outer rotor to the flange of the rotor proper, and, the 3rd stage cams similarly extending to such flange, excepting in the outer surface of the inner rotor; wherein the adjacent cams of each pressure stage are separated from one another by a multiple of cylindrical cam lands of predetermined widths; an annular shaped concentric outer stator, of the same length as, and which extends concentrically with the axis of, the outer rotor, provided with an internal bore throughout which is a close rotative fit over the 1st stage cam lands; an annular shaped concentric inner stator secured, concentrically with the rotor axis, to a boss of a rear stator head and extending to the flange of said rotor proper and provided with its external surface a close rotative fit with the 2nd stage cam lands and its internal surface a close rotative fit with the 3rd stage cam lands; a pair of annular shaped cored cavity stator heads flange secured, concentrically with said rotor axis, to said outer stator and forming a front head lubricating fluid reservoir and a rear head accumulator manifold, and, each head provided with an integral, one of a pair of, annular shaped projecting bosses which extend concentric with said rotor axis and are respectively a rotative fit within the pair of recesses in said rotor proper; a number of 1st, 2nd and 3rd stage elongated rectangular shaped blade slots, corresponding respectively to the number of 1st, 2nd and 3rd stage cams, with the 1st stage blade slots located in and extending throughout the outer stator, the 2nd stage slots located in and extending throughout the outer surface of the inner stator, and, the 3rd stage slots located in and extending throughout the internal surface of the inner stator; a number of elongated rectangular shaped radially resiliently slidable, pressure balanced 1st, 2nd and 3rd stage blades each extending throughout its respective blade slots; one cylindrical inlet air manifold extending axially closely adjacent each 1st stage blade slot, in the direction of rotor rotation therefrom, in the outer stator; wherein the 1st, 2nd and 3rd stage cams in conjunction respectively with the bore of the outer stator, the outer surface of the inner stator, and, the inner surface of the inner stator respectively form the 1st, 2nd and 3rd stage rotatable cam chambers; an elongated one direction rotatable shaft, extends in common as the driving member of a unit motive power assembly and is provided to be rotatively journaled upon an opposed pair of adjustable roller bearings, with one mounted in each stator head concentrically thereto, and provided in its intermediate length with a spline over which said rotor proper is axially slidably splined; means for supplying air intermittently to within the leading ends of the 1st stage cam chambers from the inlet manifolds, as combined with, means for simultaneously discharging compressed air from the trailing ends of the 1st to the leading ends of the 2nd stage cam chambers through the outer rotor, as further combined with, means for simultaneously discharging compressed air from the trailing ends of the 2nd to the leading ends of the 3rd stage cam chambers through the inner stator, and, as still further combined with means for simultaneously discharging compressed air from the trailing ends of the last stage cam chambers, through a similar number of axially extending non-return spring loaded discharge valves, into the accumulator manifold; means for connecting each inlet manifold to an uncommon throttle valve manifold, below the throttle-valve thereof; means forming a part of the 1st stage blade slots which provide an access through which to lubricate the 1st stage blades; means forming a part of said rotor proper for hydrodynamically lubricating the rotatable and slidable parts of the compressor; means forming a part of said rotor proper and said stator heads for axially pressure balancing the former between the latter; means operative between a base of said accumulator manifold and said fluid reservoir for automatically returning ex-

16

cess fluid into said reservoir; and, means operative between a supply and a discharge side of said compressor for automatically regulating pressure upon compressed air in said accumulator manifold.

19. In the type of elastic fluid compressor specified, the provision therein of: an elongated annular shaped rimmed one direction rotative compressor rotor, flanged to a hub portion at one end and provided externally to said rim with a multiple of symmetrically spaced indented 1st pressure stage cams, and internally with a similar multiple of indented 2nd pressure stage cams, wherein adjacent cams, in each respective pressure stage, are separated by a similar multiple of cylindrical lands of equal widths, and equal diameters by stages, wherein the cams and lands by stages are respectively in the same radial plane; an elongated annular shaped outer and similar shaped inner stator each extending parallel with and concentric to the rotor axis, and wherein the lands of the 1st stage cams are a close rotatable fit within a concentric bore of the outer stator while the lands of the 2nd stage cams are a similar fit over a concentric outer surface of the inner stator; a multiple of rectangular shaped packing blades, one for each cam of each stage, of the same length as and each slidable radially in its respective blade slot provided in, and extending the length of, its respective stator bore and/or outer surface; wherein each 1st stage cam, separated by such land and rotative within the outer stator bore, provides a rotative cam chamber, which each are divided into an air inlet leading end and air discharge trailing end by each 1st stage blade during each revolution of the rotor; a pair of axially opposite annular shaped, cored cavity type of compressor stator heads, with one provided adjacent each end of said outer stator and of the compressor rotor, concentrically to the axis of the latter, and forming a front head lubricating fluid reservoir and a rear head compressed elastic fluid accumulator manifold; means for axially pressure balancing said rotor between a pair of annular shaped bosses with one extending, concentrically with said rotor axis, axially integral with each stator head, and matching with its respective one of, a pair of, similar annular shaped recesses one provided at each end of said rotor; access means, for radially pressure balancing each of the multiple packing blades within its respective blade slot, extending between a crowned edge of such blade, contacting its respective cam, and a slot bottom edge thereof; means for lubricating each 1st stage packing blade from said fluid reservoir through access means extending from latter to a broached groove extending axially in the respective blade slot; lubricating fluid access means extending from said reservoir radially through the flange of said rotor into the leading end of each 1st stage cam for hydrodynamically lubricating latter; means operative between a base of said accumulator manifold and said reservoir for automatically returning excess lubricating fluid from said base to said reservoir; a multiple of elongated inlet manifolds, one located adjacent each 1st stage blade slot, in the direction of rotor rotation therefrom and extending axially in said outer stator between said stator heads, and each provided with access to an elastic fluid supply throttle valve manifold and also to each 1st stage packing blade slot, wherethrough each leading end of each 1st stage rotative cam chambers is supplied with elastic fluid under atmospheric pressure consecutively and intermittently; a multiple of rows of access ports, with one row initiating adjacent the trailing end of each 1st stage cam and therefrom extending diagonally inward radially, in opposite to the direction of rotor rotation, through the rim of the rotor between adjacent 1st and 2nd stage cam lands, and terminating in the leading end of the adjacent 2nd stage cam for simultaneously, with such supply of elastic fluid to such respective 1st stage rotative cam chamber's leading end, discharging compressed elastic fluid therefrom the trailing end of such respective 1st stage rotative cam chamber, through such self con-

17

tained relatively short coupled row of access ports, into the leading end of such adjacent 2nd stage respective rotative cam chamber; a multiple of non-return check-valve access means, one for each respective 2nd stage packing blade and provided extending, from an anti-rotative side of latter, axially into said accumulator manifold, and through which to discharge compressed elastic fluid from the trailing end of the respective adjacent 2nd stage rotative cam chamber into such accumulator manifold simultaneously, with the supply of compressed elastic fluid into the leading end of such respective 2nd stage rotative cam chamber, from the adjacent respective 1st stage rotative cam chamber's trailing end; a series of semi-circular shaped radially extending access slots located in the direction of rotor rotation side of each 1st stage packing blade and in communication with said throttle valve manifold, and provided for intermittently forming communication with the adjacent outer stator bore, and the rotative 1st stage rotative cam chambers therein; means operative between a supply and a discharge side of said compressor for automatically regulating pressure within said accumulator manifold; an elongated one direction

18

rotatable shaft extending in-common as the driving member of a combustion turbine unit motive power assembly, and which shaft is provided to be rotatively journaled upon a pair of adjustable roller bearings, with one mounted in each stator head concentrically thereto, and provided in its intermediate length with an external spline over which said compressor rotor is axially slidable; and, means for supporting an internal combustion turbine from the front stator head, and means for supporting a reversible transmission coupler from the rear stator head of said compressor.

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