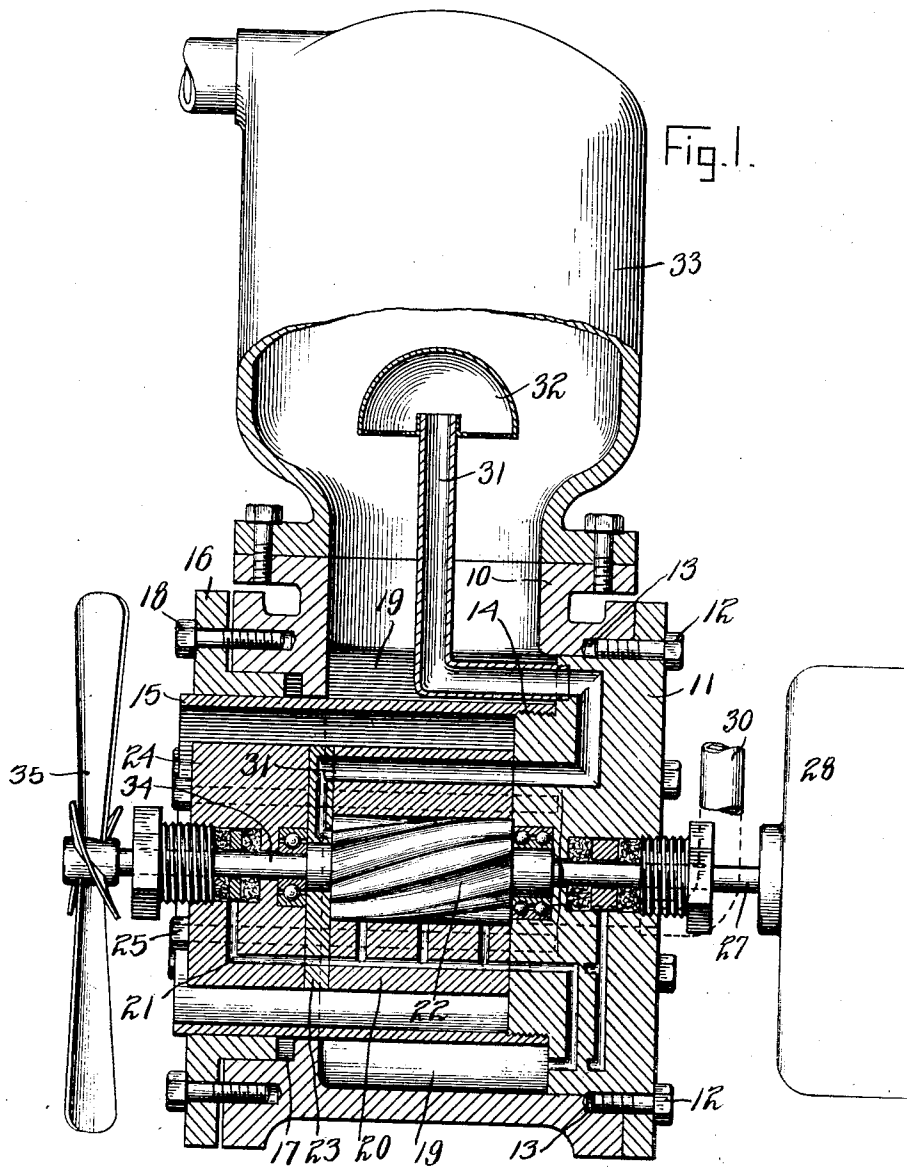


E. T. KIEN.
PUMP.
APPLICATION FILED AUG. 5, 1920.

1,409,868.

Patented Mar. 14, 1922.
2 SHEETS—SHEET 1.



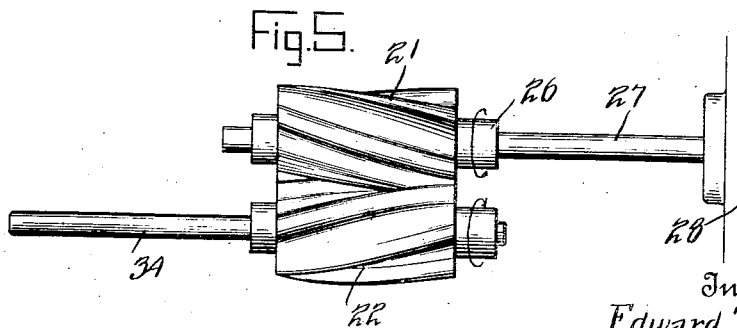
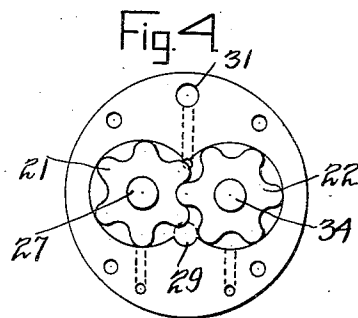
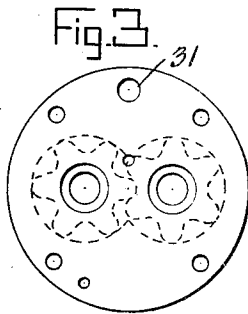
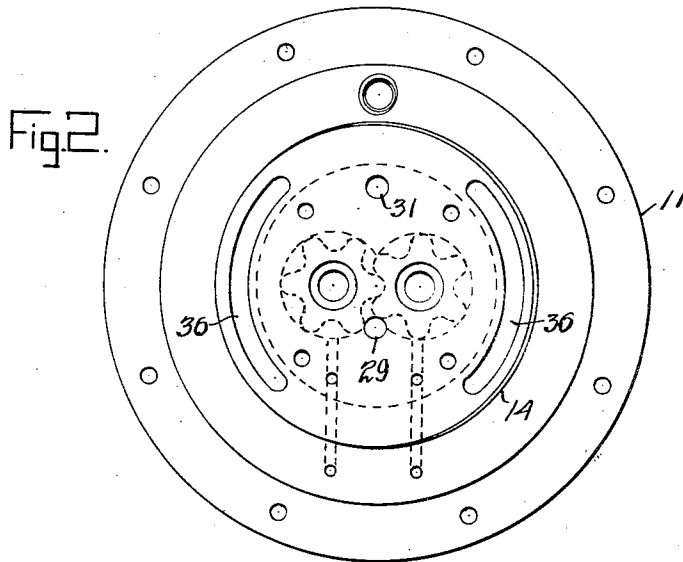
Inventor
Edward T. Kien.

By

Edward T. Kien
Attorney

1,409,868.

Patented Mar. 14, 1922.
2 SHEETS—SHEET 2.



Inventor
Edward T. Kien.

By

Edward T. Kien
Attorney

UNITED STATES PATENT OFFICE.

EDWARD T. KIEN, OF CHATTANOOGA, TENNESSEE, ASSIGNOR OF ONE-FOURTH TO
W. M. HARDWICK AND ONE-FOURTH TO EMMETT S. NEWTON, BOTH OF CHAT-
TANOOGA, TENNESSEE.

PUMP.

1,409,868.

Specification of Letters Patent.

Patented Mar. 14, 1922.

Application filed August 5, 1920. Serial No. 401,322.

To all whom it may concern:

Be it known that I, EDWARD T. KIEN, a citizen of the United States, residing at Chattanooga, in the county of Hamilton and State of Tennessee, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

My said invention consists in an improved or modified form of my invention in pumps which forms the subject matter of my application No. 345,788, filed December 18, 1918, whereby a positive and improved action of such pumping mechanism is secured, all as will be hereinafter more fully described and claimed.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts,

Figure 1 is a view of a pump of said improved form, largely in vertical section,

Figure 2 a view in elevation of the interior of the pump head,

Figure 3 a view in elevation of the interior of the head at the opposite end of the piston chamber,

Figure 4 a view in elevation of the piston housing and pistons therein, and

Figure 5 a view showing the piston members separately, but in the position they occupy when assembled for operation.

The pump structure comprises a base 10 having a pump-head 11 rigidly secured in one open end thereof by bolts 12 which pass through perforations in said pump-head and into perforations 13 in said base. Said head 11 has a reduced threaded annulus 14 on which a cylindrical casing 15 is mounted by means of a threaded joint. Said cylindrical casing 15 extends through to the other side of the base where it is further centered and supported by means of a follower member 16, packing ring 17 and bolts 18. A chamber 19 is thus provided in the base entirely surrounding said cylinder 15.

Within the cylinder 15 is mounted a piston housing 20 within which the rotary pistons or rotors 21 and 22 are mounted. The piston housing 20 has a tail-block 23 mounted over the outer end thereof and a bearing block 24 is mounted against the outer end of said tail-block. The several parts being secured together and in posi-

tion by a series of bolts 25 extending through perforations in said cylinder housing, 20, tail-block 24 and head 11, rigidly bolting said parts together. The journal 26 of piston member 21, as well as the other several journals of said piston members, are mounted in ball bearings. The stem 27 of member 21 is connected to be directly driven by the motor 28.

Each of said piston members are formed with spiral vanes or ribs which intermesh, as shown. A gas intake port 29 is connected to a source of supply by a pipe 30 and leads into the piston housing at a point just between said pistons. A gas exhaust pipe 31 leads from an exhaust port at the opposite end of the piston housing and is adapted to discharge the compressed gas under an oil deflector or baffle 32 into a gas and oil separating chamber 33. Shaft 34 of piston member 22 has a fan 35 on its outer end positioned to draw air through a radiator, condensing the gas as it leaves the separating chamber and also to force air into the annular chamber between cylinder 15 and piston housing 20 and parts attached thereto, thus serving to keep said parts and oil air-cooled.

Oil contained in chamber 19 serves, through the medium of the ports leading therefrom to the various bearings and to the piston chamber to keep all parts thoroughly lubricated, and oil commingled with the gas and passing through the pipe 31 strikes the deflector or baffle 32 and is returned into the chamber 19 and used for lubricating purposes, as in the application before referred to.

Head 11 is formed with segmental openings 36 to afford an outlet for the air driven through the chamber within cylinder 15 to maintain a circulation, as will be readily understood.

In operation the gas is drawn through pipe 30 from a source of supply by the pistons 21 and 22 and positively drawn into the piston chamber, the vanes or ribs of the pistons or rotors serving as they come together at the intake port to draw in the charge and then as they rotate and intermesh to compress the gas and force the charge forward and out of the exit port through pipe 31 into the gas and oil separator. By maintaining the pressure in the separating chamber 33 the lubricant con-

tained in the chamber 19 is forced through the several parts to lubricate the various bearings, as will be readily understood.

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

1. In a gas compressor, a casing, a housing in said casing, an oil chamber surrounding the casing, a pair of rotors in said housing, horizontally spaced shafts carrying said rotors, means for admitting gas at one end of the housing between said rotors, a plurality of conduits leading upwardly from the bottom of the oil chamber, a pair of conduits extending horizontally through the housing and branches leading therefrom for admitting sealing liquid at a plurality of points underneath each rotor and also communicating with the bearings of the shafts, and means at the end opposite the inlet providing an outlet for the gas and sealing liquid, substantially as set forth.

2. In an air compressor, a casing providing an upper chamber completely surrounding the casing for gas and a lower chamber for lubricant, a housing in said casing, rotors in the housing having intermeshing vanes, a driving shaft carrying one of said rotors, a fan shaft carrying the other, an inlet for gas at one end of the rotors, an outlet at the other end communicating with the chamber, passages leading from the bottom of the

lubricant chamber and extending through the housing between the chamber and the underside of each rotor and branch passages extending to the bearings of said shafts whereby lubricant under pressure is supplied to said rotors and said bearings, substantially as set forth.

3. In an air compressor, a casing providing an upper chamber for gas and a lower chamber for lubricant, a housing in said casing, rotors in the housing having intermeshing vanes, a driving shaft carrying one of said rotors, a fan shaft carrying the other, an inlet for gas at one end of the rotors, an outlet at the other end communicating with the chamber, passages between the chamber and the underside of each rotor, branch passages extending to the bearings of said shafts whereby lubricant under pressure is supplied to said rotors and said bearings, and passages intermediate said housing and said lubricant containing chamber whereby said fan may cool said lubricant and said rotors, substantially as set forth.

In witness whereof, I have hereunto set my hand and seal at Chattanooga, Tennessee, this 23rd day of July, A. D. nineteen hundred and twenty.

EDWARD T. KIEN. [L. s.]

Witnesses:

L. S. BAKER,

Mrs. J. C. CHOATE.