Aug. 11, 1931. S. W. LUITWIELER 1,818,413

COMPRESSOR

Filed March 21, 1928 2 Sheets-Sheet 1

Fig. 1

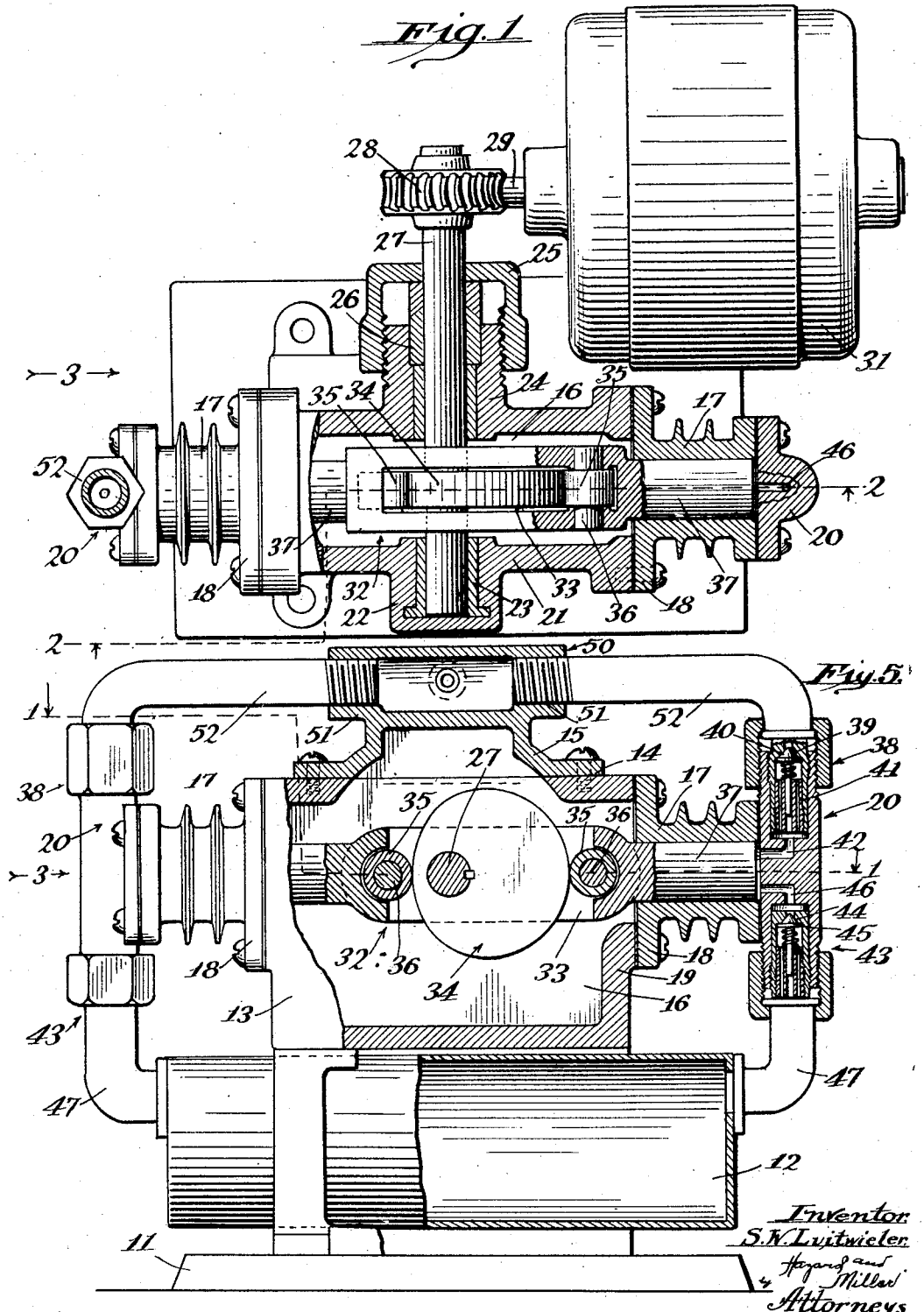


Fig. 5.

Inventor
S. W. Luitwieler
Hyde and Miller
Attorneys

Witness:

Aug. 11, 1931. S. W. LUITWIELER 1,818,413

COMPRESSOR

Filed March 21, 1928 2 Sheets-Sheet 2

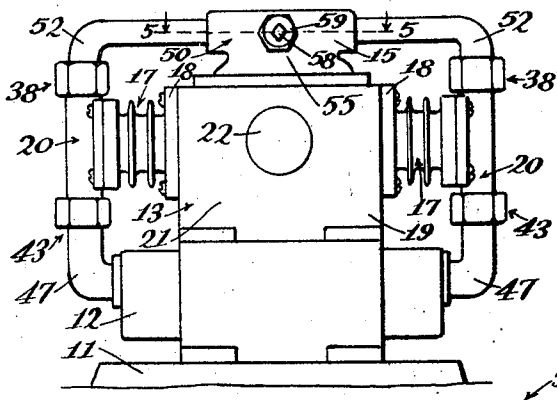


Fig. 4.

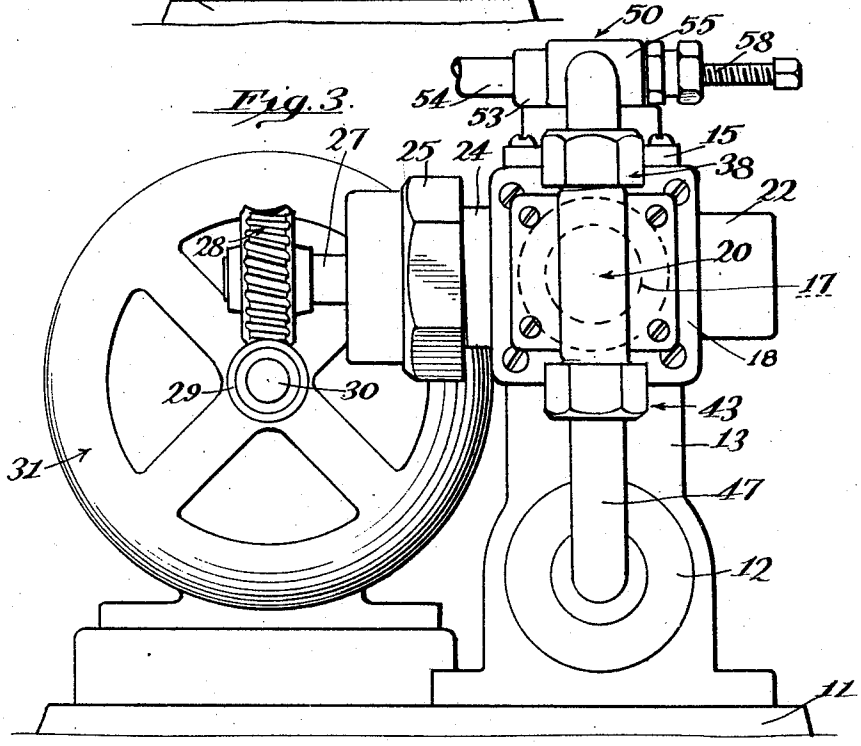


Fig. 3.

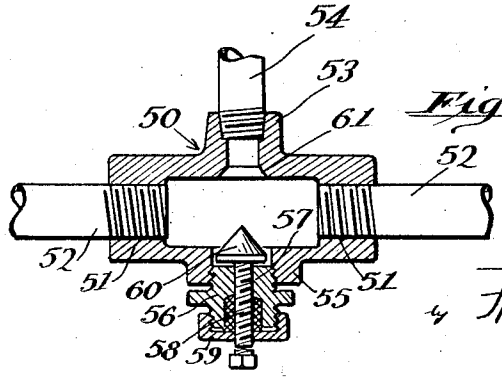


Fig. 5.

Inventor
S. W. Luitwieler
by Hazard and Miller
Attorneys.

Patented Aug. 11, 1931

1,818,413

UNITED STATES PATENT OFFICE

SAMUEL W. LUITWIELER, OF LOS ANGELES, CALIFORNIA

COMPRESSOR

Application filed March 21, 1928. Serial No. 263,351.

My invention is a compressor particularly suitable for use in refrigeration.

An object of my invention is the construction of a compressor of a reciprocating cam-operated type, which operates with practically no vibration.

A further object of my invention is the construction of a double acting reciprocating compressor utilizing a cam to give the reciprocating motion, the compressor having cylinders with solid plungers operating therein, the cylinders at opposite ends of the compressor having suitable intake and discharge valves. The compressed fluid is discharged into a storage tank.

Another object of my invention is completely enclosing the cam construction and having access thereto through the top of the cam chamber.

My invention is illustrated in the accompanying drawings, in which:

Figure 1 is a longitudinal horizontal section taken substantially on the line 1—1 of Fig. 2 in the direction of the arrows.

Fig. 2 is a vertical longitudinal section taken substantially on the line 2—2 of Fig. 1 in the direction of the arrows.

Fig. 3 is an end elevation taken in the direction of the arrow 3 of Figs. 1 and 2.

Fig. 4 is a side elevation of my invention illustrating more completely the cover construction having the piping leading the gas from its source to the intake valves.

Fig. 5 is a detailed horizontal section on the line 5—5 through the gas intake, showing the shutoff valve.

In constructing my invention I have a suitable base structure 11 in which is mounted a storage tank 12 of any suitable character and above the tank there is a body structure 13 having an open top 14 to which is secured a cover 15. This leaves a chamber 16 to accommodate the cam and the pistons.

The pump cylinders 17 have flanges 18 which are bolted or otherwise secured to the ends 19 of the body structure. The cylinders are preferably provided with cooling ribs. The valve housings 20 detailed hereunder are attached to the outer ends of the cylinders.

One of the walls 21 of the body structure is provided with a journal 22, this having a bushing 23 therein. At the opposite side there is an open journal 24 having a suitable bushing therein, and secured to this journal section there is a suitable packing gland 25 with packing 26 held therein. The drive shaft 27 is journaled in the bearings above mentioned.

This shaft is illustrated as being driven by a worm wheel 28 which engages a worm 29 on the motor shaft 30 driven by an electric motor 31.

The piston yoke, designated generally as 32, has a slot 33 therethrough in which operates the cam 34, the cam being secured to the shaft 27 in any suitable manner. Such cam bears against rollers 35 mounted on axles 36 in the piston yoke, thus giving a rolling action between the cam and such rollers. At each end of the piston yoke there is a solid plunger type of piston 37.

The valve construction comprises an intake valve 38 having a valve seat 39 with a plunger 40 spring pressed thereagainst. This valve has a suitable passage 41 therethrough connecting to an intake port 42 leading to the cylinder 17. The discharge valve 43 is of substantially the same construction except that the seat 44 and spring pressed plunger 45 are reversed. This valve 43 connects to a discharge port 46 leading from each of the cylinders and the discharge valves connect by pipes 47 to the storage tank 12.

My present invention may be considered as an improvement over my patent application for a compressor, Serial No. 208,969, filed July 28, 1927, one of the characteristic features of the present invention being that the gases do not enter the cam chamber and that the piston plungers are solid, the inlet and outlet valves of the cylinders being outside of the cylinders.

The cam is designed so that there is a gradual retarding of the movement of the piston yoke with the piston plungers near the ends of their stroke, and immediately a gradual acceleration in the opposite direction after the end of the stroke. The acceleration on

the pressure stroke is at least more gradual than the rate of retardation at the end of the compression stroke; therefore this gives a substantially continuous steady flow of the gases and the condensed liquid into the tank. The pump also operates without substantial vibration.

It will be seen that by having the removable cap or cover plate 15 that access may readily be had to the cam chamber and as the cams are running in an oil bath, there will be a thorough lubrication of the cam, the rollers and the piston plungers. The cover construction 15 is utilized to make the gas piping connection to the intake valves and has a shutoff valve mounted therein, this construction being substantially as follows:

A tubular structure 50 is formed integral with the cover 15 and has threaded ends 51 to which are connected intake pipes 52 leading to the intake valves 38. On one side of the tubular structure 50 there is a boss 53 having a threaded opening in which is secured a gas pipe 54. This is designed to lead from the source of supply of the gas to be compressed and liquefied; that is, if used in a refrigerating machine this pipe may connect to such a machine.

On the opposite side of the tubular structure 50 there is a second boss 55 having a threaded plug 56 mounted therein. This plug has an internally threaded opening 57 in which is mounted an elongated screw 58, there being a packing gland and packing 59 making a tight seal on the screw.

The screw is provided with a valve plug 60 illustrated as tapered, which is tapered to bear on the tapered seat 61 to form a closure for the inlet gas pipe 54 by threading the screw completely in the plug 56. By this construction it is a simple matter to shut off the pipe 54 which leads to the gaseous supply and thus allow making repairs on the valves of the compressor. Also, if desired, the cover may be removed with the pipe 54 shut off and shifted so that access may be had to the cam chamber, this being after disconnecting the pipes 52 from the intake valves and bending of the pipe 54 or other connection.

It will thus be seen that I have by incorporating this shutoff valve construction in the cover construction of the compressor made a convenient arrangement for handling minor adjustments and repairs.

Various changes may be made in the principles of my invention without departing from the spirit thereof, as set forth in the description, drawings and claims.

I claim:

1. A compressor comprising in combination a body structure with a cam chamber therein, said structure having a cover at the top forming a closure for the cam chamber, a cam mounted on a rotatable shaft, said shaft being journaled in the said structure, a pair of cylinders connected to the structure at opposite ends of the said chamber, a piston yoke having piston plungers, the plungers operating in the said cylinders, the yoke extending across the said chamber, means interacting between the cam and the piston yoke, and intake and discharge valves connected to each cylinder remote from the piston chamber.

2. A compressor comprising in combination a body structure having a base, side walls and a top forming a cam chamber therein, the top being open and having a closure cover, a cam shaft journaled in the said walls and having a cam mounted thereon, a pair of cylinders connected to opposite ends of the structure, a piston yoke having piston plungers, the plungers operating in the said cylinders and the yoke extending across the said chamber, means interconnecting the cam and the piston yoke, and an intake and discharge valve connected to each cylinder remote from the said chamber.

3. A compressor comprising in combination a base structure, a body structure thereabove, a storage tank between the base and the body structure, the body structure having a cam chamber therein with an opening at the top having a removable cover, a cylinder connected to each end of the body structure, a piston yoke having piston plungers, the plungers operating in the said cylinders, and the yoke reciprocating across the said chamber, the piston yoke having a longitudinal slot, a cam shaft journaled in the body structure and having a cam operating in the slot, rollers on the piston yoke engaging the cam, and an inlet and a discharge valve connected to each of the cylinders remote from the body structure, the discharge valves each having a connection to the storage tank.

4. A compressor comprising in combination a base, a body structure thereabove, a storage tank mounted between the base and the body structure, said body structure having side and end walls and a top, the top being open and the end walls having openings, a cover forming a closure for the top, a cylinder connected to each end at the said openings, a piston yoke having piston plungers, the plungers operating in the said cylinders, the body structure forming a cam chamber with the yoke reciprocating thereacross, a cam shaft having one end journaled in one side of the body structure and the other end journaled in the opposite side of said structure, one end of the shaft extending beyond the said structure and having means to drive same, a cam mounted on the said shaft, means interengaging the cam and the yoke, and an inlet and discharge valve connected to each cylinder, the discharge valves being connected to the said tank.

5. A compressor comprising in combination a structure, a cam chamber, a cam ro-

tatably mounted therein, a cylinder, a reciprocating piston yoke having a piston plunger in the cylinder, means to actuate the piston yoke with the cam, intake and discharge valves connected to the cylinder, a cover secured to the structure forming a closure for the cam chamber, an inlet pipe from a source of supply connected to said cover structure, a pipe leading from the cover structure to the intake valve, and a closure valve in said cover structure to shut off the inlet from such supply.

6. A compressor comprising in combination a structure, a cam chamber, a cam rotatably mounted therein, a pair of cylinders at opposite ends of said structure, a piston yoke having a pair of piston plungers operating in said cylinders, means interacting between the cam and the piston yoke to reciprocate such yoke, intake and discharge valves connected to each cylinder, a cover mounted on said structure and forming a closure for the cam chamber, said cover having a tubular portion, pipes connecting from said tubular portion to the intake valves, an inlet pipe on one side of the tubular portion connected to a source of supply and operated by a valve screw on the other side of the tubular portion to close the said inlet.

7. A compressor comprising in combination a structure having a chamber, a cover having a tubular portion, cylinders at opposite ends of the said structure, intake and discharge valves connected to said cylinders, pistons in the cylinders, means in the chamber to operate said pistons, piping connected from the tubular portion of the cover to the intake valves, an inlet on one side of the tubular portion from a source of supply and a valve plug mounted on a stem on the opposite side of the said tubular portion, said valve being adapted to close the inlet from the source of supply.

In testimony whereof I have signed my name to this specification.

SAMUEL W. LUITWIELER.