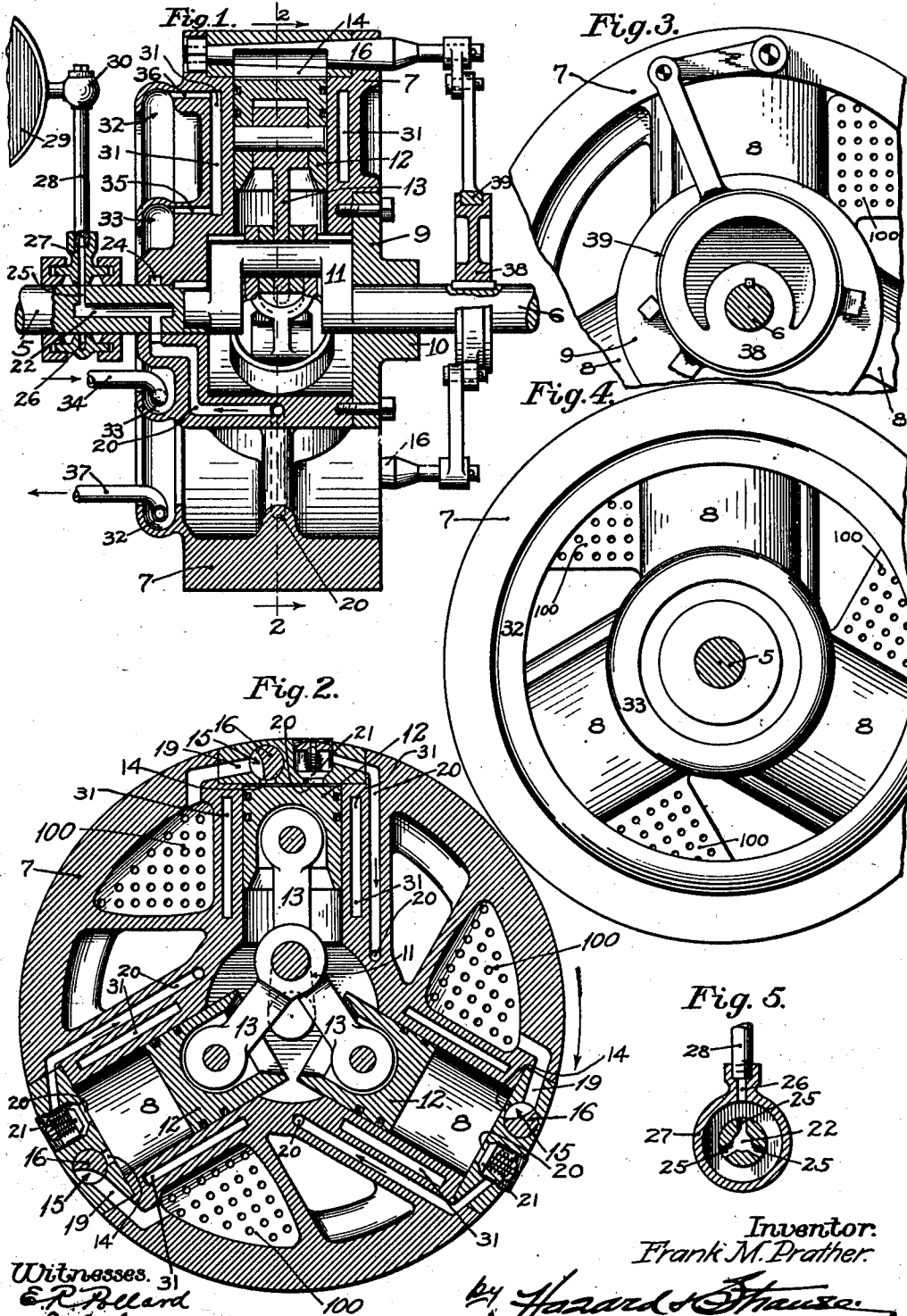


F. M. PRATHER.
AIR COMPRESSOR.
APPLICATION FILED OCT. 12, 1909.

982,632.

Patented Jan. 24, 1911.



Witnesses.
E. R. Bellard
C. Coleman.

Inventor.
Frank M. Prather.

by Hazard & Strauss.
Attorneys.

UNITED STATES PATENT OFFICE.

FRANK M. PRATHER, OF LOS ANGELES, CALIFORNIA.

AIR-COMPRESSOR.

982,632.

Specification of Letters Patent.

Patented Jan. 24, 1911.

Application filed October 12, 1909. Serial No. 522,276.

To all whom it may concern:

Be it known that I, FRANK MONROE PRATHER, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Air-Compressors, of which the following is a specification.

The object of my invention is to provide an air compressor which will rapidly compress large quantities of air owing to rapidity with which it can be operated and which is adapted for ready attachment to any convenient source of power and to provide means to cool the compressor. I accomplish these objects by means of the device herein described and shown in the accompanying drawings, in which:

Figure 1— is a central longitudinal section of my improved compressor. Fig. 2— is a transverse section taken on line 2—2 of Fig. 1. Fig. 3— is an elevation of the end carrying the valve operating mechanism, parts being broken away. Fig. 4— is an end elevation of the opposite end to that shown in Fig. 3 same being partly broken away. Fig. 5— is a central vertical section of the stuffing box, taken transversely through the driving shaft.

In the drawings 5 and 6 designate shafts which are continuations of each other, shaft 5 being ordinarily the driving and 6 the driven shaft. Mounted on shaft 5, and keyed thereto, is a cylindrical compressor frame 7. This frame is provided with a plurality of cylinders 8, preferably three in number and radially spaced around shaft 5. The frame 7 forms a hollow box of general cylindrical shape and is provided on one end with a cover plate 9 having a bearing 10 for the shaft 6. The inner end of shaft 6 projects into the interior of the frame and is provided on its inner end with a crank 11. The pistons 12 are adapted to reciprocate in cylinders 8 and are workably connected to crank 11 by connecting rods 13, and, as the cylinders are concentrically arranged around shaft 5 as shown in Fig. 2 the pistons will be reciprocated in the cylinders upon any relative rotation of shafts 5 and 6. Each of the cylinders is provided with a port 14 leading to valve bore 15 in which a rotary valve 16 is placed. Leading also from valve bore 15 is port 19 which communicates with the at-

mosphere through the air screen 100. A compression port 20 opens outwardly from the head of each cylinder in which is disposed a check valve 21, which will open upon the outward stroke of the pistons and be closed at all other times, permitting the air to pass from the cylinders through the compression ports 20 into the central bore 22 in the shaft 5, as follows: This shaft is provided with a plurality of openings or ports 25 extending radially from the central bore and communicating with the annular chamber 24. This annular chamber is disposed in that part of the frame 7 surrounding the shaft 5. This shaft is also provided at the other end of its central bore with a plurality of radially extending ports 25 which communicate with and discharge into an annular channel 26, disposed in the perimeter of the stuffing box 27 through which the shaft 5 extends. An air pipe 28 connects the channel 26 with the compression tank 29, establishing thereby communication between the compression tank and the revolving cylinders. An ordinary check valve 30 on the air pipe 28 prevents the return of air from the tank to the compressor.

To cool the compressor I provide a water jacket 31 around each cylinder. The water in this jacket is caused to circulate by means of the centrifugal force exerted thereon by the rotation of the cylinders as follows: On the front face of the compressor are disposed an outer and an inner annular water trough 32, 33. The water is held in the troughs as the cylinders revolve, it is fed to the inside trough 33 through the water supply pipe 34 and passes from this trough into the jacket 31 through the port 35 and thence out through port 36 into the outer trough 32, the circulation of the water therethrough being caused by the centrifugal force imparted thereto by the revolving cylinders. The heated water may be taken away from the outer trough 32 through the discharge pipe 37.

Mounted rigidly on the shaft 6 is an eccentric hub 38 upon which the eccentric strap 39 works. Mounted on this eccentric strap are a plurality of arms which are workably connected with the valves 16 in the heads of the various cylinders and by means of which these valves are caused to open and close at the proper time upon the

rotation of the cylinders. As this constitutes no part of the present invention, further description thereof is omitted.

If the shaft 6 is held fixed and shaft 5 rotated the pistons will be caused to reciprocate in the various cylinders. Air will be taken into each cylinder through the screen and pass therefrom into the compression tank on every revolution of one of the shafts relative to the other shaft. The valve 16 being arranged to automatically open on the inward stroke of the piston and when the air will pass into the cylinder and will pass outwardly therefrom through the compression ports 20 on the outward stroke of the piston.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. An air compressor, comprising a circular frame keyed to a driving shaft, cylinders disposed in said frame extending radially from said shaft, pistons in said cylinders workably connected to a crank on a driven shaft and adapted to reciprocate in said cylinders, the driven shaft being in alinement with the driving shaft and the crank thereon carrying the pistons being eccentric thereto, and means to feed air into said cylinders on the relative rotation of said shafts.

2. In an air compressor, having a driving and a stationary shaft, a plurality of air compressing cylinders radially disposed around said shaft pistons in said cylinders workably connected to a crank on a stationary shaft, both shafts being in alinement, means to feed air from the cylinders when rotating to an air tank comprising a compression port communicating with a central bore in the driving shaft, a stuffing box on said driving shaft having an annular air channel thereon, ports in said driving shaft extending from said central bore to said channel, a pipe extending from said channel

to an air tank and a one way check valve in the compression port to permit the air therein to pass into the air tank.

3. A rotary air compressor having compressor cylinders, an inner and an outer circular water trough on the compressor frame, water jackets surrounding the said cylinders, a conduit for water leading from the inner trough to the inner end of the water jacket, and a conduit leading from the outer end of the jacket to the outer water trough.

4. The combination in a device of the character described of two shafts in alinement with each other, one being keyed to the compressor frame, the other shaft having a crank eccentric thereto, pistons on the crank and adapted to reciprocate in cylinders in the compressor frame on the relative rotation of the shafts, means to feed air to the cylinders on the inward stroke of the pistons from the outer air, and means to pass the air into an air tank communicating with the cylinders on the outward stroke of the pistons.

5. An air compressor comprising a substantially circular frame, a driving shaft, carrying the same, cylinders disposed in said frame having their axes arranged radially with respect to said shaft, a driven shaft in alinement with said first shaft and having a plurality of cranks, pistons mounted in said cylinders and connected with said cranks, said frame having water ducts in the wall thereof, adjacent to said cylinders and means for guiding circulating water into said ducts to cool said cylinders.

In witness that I claim the foregoing I have hereunto subscribed my name this 5th day of October, 1909.

FRANK M. PRATHER.

Witnesses:

EDMUND A. STRAUSE,
ETHEL COLEMAN.