

Bob Neal

patent application correspondence file

about his invention US Patent 2030759

**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

101

DATE: December 6, 1988

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

Luther Rangely
P.O. Box 1574
Grass Valley, CA 95945

DATE OF ORDER 10-18-88
SERIAL/PATENT NUMBER 2,030,759
FILING/ISSUE DATE 02-11-36

NOTICE OF INCOMPLETE ORDER

This is in reference to your order which we are unable to complete. The paragraph(s) checked indicate(s) the reason(s) and suggests any action on your part which might be necessary.

1. ☐ Order lacks the signature of one authorized to obtain copies.
2. ☐ The information given does not correspond with our records. An error was made relative to the following checked item(s):

☐ name ☐ serial/patent number ☐ filing/issue date ☐ title
3. ☒ The file cannot be located at this time. An Official Search is being made and as soon as it is found, copies will be furnished.
4. ☐ The file has been destroyed.
5. ☐ Application filed incomplete. Reorder after all requirements have been met and a filing date has been assigned.
6. ☐ Case has not yet been placed on security film and the file is not available for photocopying. Reorder three (3) weeks after receipt of your Official Filing Receipt.
7. ☐ Not entitled. Copies of pending applications may be obtained only by, or with written consent of, the applicant, attorney of record, or the assignee, if any.
8. ☐ Page ____ was not filed along with the other application papers. This page along with an amendment should be forwarded to the Examiner in charge of this case for entry.
- ☐ Other:

**EXAMINATION SERVICES DIVISION, OPTS
CERTIFICATION BRANCH**

(703) 557-1587

1934

DATED FEB 11 1938

DIV.

(EX'R'S BOOK)

J-106-15

Name

BOB NEAL

State of

ARKADELPHIA,
ARKANSAS

Invention

ENGINES Compressor Unit

ORIGINAL

RENEWED

APPLICANT

D COMPLETE

JAN 9

, 1934

Folio

Specification,

Oct

Fee \$30,

JAN 9

, 1934

Drawings,

This is to certify that annexed hereto
is a true copy from the records of the
United States Patent and Trademark Office
of the File Wrapper and Contents of the
file identified above.

By the authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

Assistant Commissioner

Date: MAR 6 1935

1934

DATED FEB 11 1934

DIV. *189*

(EX'R'S BOOK)

J-106-15

Name BOB NEALARKADELPHIA,State of ARKANSASInvention ENGINES Compressor Unit

ORIGINAL

RENEWED

APPLICATION FILED COMPLETE JAN 9, 1934

Petition, Specification,

Oath, First Fee \$50,

3 sheets Drawings,

JAN 9, 1934

This is to certify that annexed hereto
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United States Patent and Trademark Office
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file identified above.

By the authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

H. Phillips
Certifying Officer

Date: NOV - 6 1995

05964

1834

DIV.

(EXR'S BOOK)

J-106-15

Name

BOB NEAL

ARKADELPHIA,

ARKANSAS

Invention

ENGINES

Compressor Unit

ORIGINAL

RENEWED

APPLICATION FILED COMPLETE

JAN 9

1984

Specification,

First Fee \$30,

Drawings,

JAN 9

1984

Examined and passed for Issue

Dec. 17, 1985

By Commissioner

Ext. Div. 9

Notice of Allowance

Dec. 17, 1985

By Commissioner

Final Fee \$30

Jan 16, 1986

Attorney

FRANK O. PARKER 202 BARRISTER BLDG CITY.

Associate Attorney

No. of Claims Allowed

Print Claims

in O. G. Class 230-18

Title as Allowed

Compressor Unit

MAIL DIVISION

JAN 9 34

PETITION

705964

JAN - 1934

1026

30.80

To the Commissioner of Patents:

Your petitioner (I) Bob Neal

citizen

of the United States of America,

residing at Arkadelphia

in the county of Clark and State of Arkansas

and whose post-office address

Arkadelphia, Arkansas

prays that Letters Patent may be granted to him for the improvement in

Compressor Unit

ENGINES

set forth in the annexed Specification.

And he hereby appoints (2)

Frank O. Parker

202 Berrister Building

of Washington, D.C.

Register No. 6150 Attorney with full power of substitution and revocation to

prosecute this application, to make alterations and amendments therein, to sign his name

to the drawings, to receive the Letters Patent, and to transact all business in the United States

Patent Office connected therewith.

Signed at Arkadelphia

County of Clark

ARKANSAS this 12th day of December 1933

(SIGN here FIRST name in FULL.) Bob Neal

- (1) In case of assignment of the invention, application and oath must be made by actual inventor, even if patent issue to assignee.
(2) If the power of attorney be given to a firm, the full name of each member of firm must be given, or it will be ignored.

SPECIFICATION.

To All Whom it May Concern:

BE IT KNOWN, That Bob Neal

citizen of the United States of America,

residing at Arkadelphia

in the County of Clark and State of Arkansas,

has invented certain new and useful improvements in

Compressor Unit

10243

JAC

The invention relates to ^{a compressor} ~~an engine~~ construction, and more particularly to a combination fluid operated engine and compressor.

The primary object of the invention is the provision of ^{a compressor} ~~an engine~~ of this character, wherein there is arranged an automatically counter balanced crank shaft and fluid equalizers within a storage tank, which makes it possible for the said engine to operate on constant reserve tank pressure so as to actuate additional equipment, the pistons for the engine being also automatically balanced and suspended when the said engine is in operation.

Another object of the invention is the provision of an engine of this character, wherein the same is operated from air under pressure, the said air being supplied by compressors, these being in bank with the engine construction.

A further object of the invention is the provision of an engine of this character, wherein the same is of novel construction, as the engine proper and the compressors are operated from the same crank shaft which is of the automatically balanced type, so that high efficiency is attained.

A still further object of the invention is the provision of an engine of this character, which is comparatively simple in construction, thoroughly reliable and efficient in its operation, strong, durable, and inexpensive to manufacture.

With these and other objects in view the invention consists in the features of construction, combination and

10244

arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings, which disclose the preferred embodiment of the invention, and pointed out in the claims hereunto appended.

In the accompanying drawings:

Figure 1 is a perspective view of the engine constructed in accordance with the invention.

Figure 2 is a vertical transverse sectional view through the compressor part of the engine.

Figure 3 is a vertical sectional view through the power part of the engine.

Figure 4 is a detail elevation of the cranked shaft of the engine.

Figure 5 is an enlarged sectional view through one of the electric heaters for the engine.

Figure 6 is a vertical longitudinal sectional view through the air storage tank including the equalizer.

10245

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

Referring to the drawings in detail the engine in its entirety comprises a cylinder block 10 having formed therein the series of compressor cylinders 11 and the ~~power~~ ^{both} cylinders 12, respectively, the block 10 being of the V-type and closing the upper ends of said cylinders are the removable heads 13 and 14, respectively, which are secured in place by head bolts 15, as is conventional. Beneath the block 10 is the crank case 16, which at opposite sides carries the detachable plates 17, these being held in place by fasteners 18 and such plates are seated so as to be leak proof. The block 10 is chambered to provide a water jacket 19 about the cylinders, while at the forward end of the said block ^{are} ~~is a~~ water pumps 20 circulating water through the inlet pipe 21 which leads into the jacket and letting said water out therefrom through the outlet pipe 22 leading from said water jacket. Next to the pumps 20 is a fan 23 operated from a belt 24 which also drives the pumps

Working within the cylinders 11 are the reciprocating pistons 25, their ^{rods} stems 26 being slidable through packing glands 27 and ~~are~~ ^{crossheads} fixed to runners 28, which are slidably mounted upon guides 29 secured within the crank case 16 to opposite side walls thereof. These ^{crossheads} runners 28 are fitted with wrist pins 30 pivotally connecting therewith the connecting rods 31 which by the bearings 32 are engaged with their cranks 33 of ^a ~~an~~ automatically counter balanced crank shaft 34, which is mounted in supports

35 arranged in the crank case 16, the shaft being supplied with the required bearings 36.

The inner ends of the cylinders 11 are fitted with inner end heads 37, which are provided with air intake ports 38, these being fitted with spring ball inlet checks 39, the air having admission through passages 40 opening exteriorly of the block 10. *The glands 27 are associated with the heads 37.*

The heads 13 and 37 are provided with the compressed air outlets 41 and 42, respectively, these being fitted with spring ball checks 43, the heads 13 being also provided with the central air inlets 44, which are fitted with spring ~~ball~~ checks 45. By couplings 46 are attached to the air outlets 41 and 42 ~~are~~ ^{the} outlet feed pipes 47 and 48, respectively, these leading to a main conduit 49 located in the center channel 50 in said block 10.

At the rear end of the block 10 and on the shaft 34 is the fly wheel 51, this being of conventional type.

node
Working within the cylinders 12 are pistons 52, their stems 53 sliding through packing glands 54 and ~~are~~ fixed in *crossheads*
~~runners~~ 55 slidably mounted upon guides 56 which are secured within the crank case 16 at opposite side walls thereof. The *crossheads*
~~runners~~ 55 carry wrist pins 57 connecting therewith connecting rods 58, these being engaged by bearings 59 with their respective cranks 60 of the crank shaft 34, the inner ends of the cylinders 12 being also closed by inner heads 61 with which are associated the glands 54.

On the cylinders 12 are slide valve chests 62 in which are the slide valves 63, these ^{being} operated by throw rods 64 actuated by cams 65 and such valves controlling the air admission and

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exhaust of air to and from the cylinders 12 through the ports 66 and 67, ~~respectively~~, and these valves 63 are provided with the ports 68 for the delivery of air under pressure from the inlet passages 69 common to a lead 70 from a compressed air storage tank 71.

The bottom of the crank case 16 is fitted with a removable plate 72 which is secured in place by fasteners 73, and when this plate is removed access can be had to the crank shaft 34 and the bearings for the engine, as well as other parts within said crank case, as should be obvious.

Leading into the cylinders 11 are the passages 74 of a lubricating system (not shown).

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The storage tank 71 for the compressed air includes *a double check discharge nozzle* therein ~~an equalizer~~ 75, this being supported by a member 76 and leading to this equalizer is an air inlet pipe 77 which has the communication 78 with the chamber 79 formed by said tank. In the equalizer 75 are the spaced spring ball checks 80 and 81, respectively, one being for the inlet side and the other for the ~~exhaust~~ or outlet side of said equalizer. This pipe 77 is connected with the main conduit 49, while a pipe 82 is connected with the leads 70, the tank being also fitted with an automatic relief valve 83 of any approved type.

70

About the pipes ⁷⁰ for the passages 69 are the electric heating units 84 which are for the purpose of heating the air under pressure above a freezing temperature when delivered from the tank 71 to the cylinders 12.

Supported on the block 10 is an electric generator 85 which is driven from the shaft 34 through a belt 24 and this generator is included in an electric circuit which also has

10248

the heaters 84 so that these will operate from current furnished by said generator.

The storage tank 71 with the equalizer are so constructed that it is possible to pump air into the said tank with a tank pressure of two hundred pounds, while the compressors are only pumping against fifteen pounds or atmospheric pressure. Outside air pressure source can be coupled with the tank to augment that pressure derived from the cylinders 11 of the engine.

10249

What is claimed is:

Add C'p 1

1. An engine of the character described, comprising a block having cylinders, pistons operating in said cylinders, certain of the cylinders and their pistons forming a fluid compressor unit and the other cylinders and pistons forming a power unit, means for storage of compressed fluid from the compressor unit, and means for delivering compressed fluid from said means to the power unit.
2. An engine of the character described, comprising a block having cylinders, pistons operating in said cylinders, certain of the cylinders and their pistons forming a fluid compressor unit and the other cylinders and their pistons forming a power unit, a storage tank for the compressed fluid from the compressor unit, means for delivery of compressed fluid from the tank to the power unit, and a fluid equalizer within the tank.
3. An engine of the character described, comprising a block having cylinders, pistons operating in said cylinders, certain of the cylinders and their pistons forming a fluid compressor unit and the other cylinders and their pistons forming a power unit, a storage tank, means for delivery of compressed fluid from the compressor unit to the tank, means for feeding compressed fluid from the tank to the power unit, a fluid equalizer within the tank and coacting with the first named means, and a heater connected with the last named means.
4. An engine of the character described, comprising a block having cylinders, pistons operating in said cylinders, certain of the cylinders and their pistons forming a fluid

10250

compressor unit and the other cylinders and their pistons forming a power unit, a storage tank, means for delivery of compressed fluid from the compressor unit to the tank, means for feeding compressed fluid from the tank to the power unit, a fluid equalizer within the tank and coacting with the first named means, a heater connected with the last named means, a balanced crank shaft common to and connected with said pistons, and valve mechanisms for the inlet and outlet fluids to and from said units, one mechanism being controlled by said crank shaft.

Went to
JAC

10254

In Testimony Whereof

I

am

my

signature.

Bob Neal
 (Sign here, First name in full.)

OATH

STATE OF ARKANSAS

COUNTY OF CLARK

ss:

Bob Neal

the above-named petitioner..., being duly sworn, deposes and says that he is a
 citizen... of (1)... the United States of America,
 and resident... of... Arkadelphia,

Arkansas.

that... he... verily believes himself... to be the original, first, and (2)... sole
 inventor... of the improvement... in...

ENGINES.

described and claimed in the annexed specification; that... he... does... not know and does
 not believe that the same was ever known or used before... his... invention or discovery
 thereof, or patented or described in any printed publication in any country before... his
 invention or discovery thereof, or more than two years prior to this application, or in public
 use or on sale in the United States for more than two years prior to this application; that
 said invention has not been patented in any country foreign to the United States on an
 application filed by... him... or... his... legal representatives or assigns more than
 twelve months prior to this application; and that no application for patent on said improvement
 has been filed by... him... or... his... representatives or assigns in any country foreign
 to the United States, ~~except as follows~~: (3)...

(Sign here
 First name in full.)

Bob Neal

Sworn to and subscribed before me this 12th day of December 1932

John O. Lacey
 (Official Signature.)

Notary Public

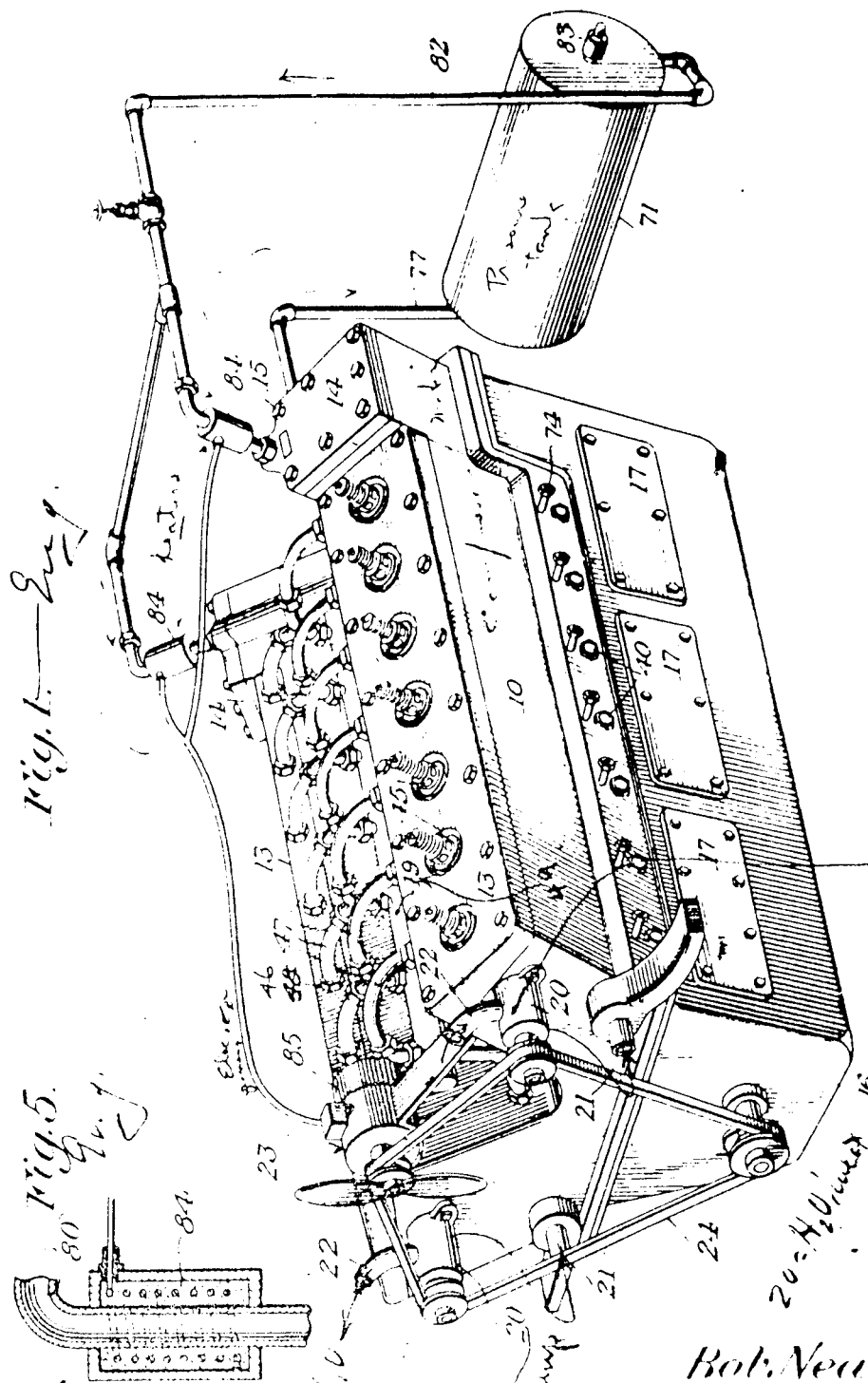
(Official Character.)

[Seal here, to be impressed
 in paper.]

My Commission expires Mar. 10, 1933.

759
2/11

Print of drawing as
originally filed.



INVENTOR.

Rob. Neal

BY

Paul H. Yancey

ATTORNEY.

Print of drawing as
originally filed

Fig. 2.—Compressor

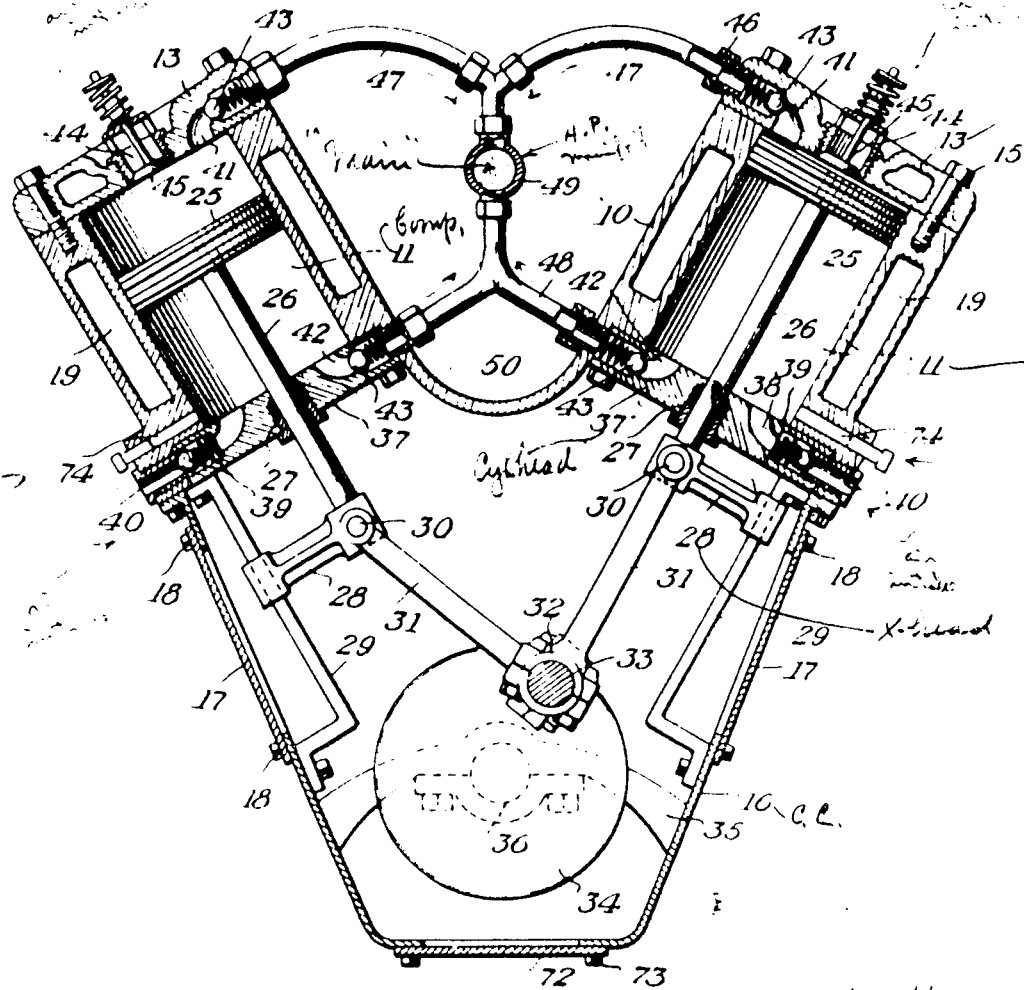
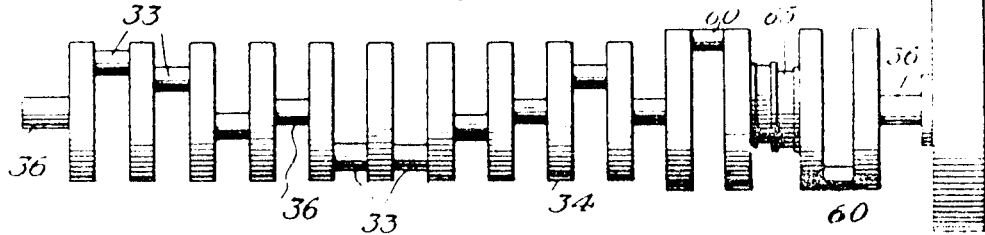


Fig. 4. "Part of engine"



INVENTOR

Bob Neal

BY

[Signature]
ATTORNEY

230
187
174

103
161

Enclose and below a communication from the EXAMINER in
charge of this application.

11-6638

Commissioner of Patents.

Applicant: Bob Neal,

Frank O. Parker,
202 Barrister Bldg.,
City.

Ser. No. 705,964,
Filed Jan. 9, 1934,
For Engines.



This case has been examined.

References made of record:

Kneedler	1,297,303	Mar. 13, 1919	60-59
Flood	662,189	Nov. 20, 1900	60-59
Jenkins	868,441	Oct. 15, 1907	60-59
			(x60-33)

✓ In Fig. 1, numeral 48 has been changed to 46; and, in
Fig. 5, numeral 80 to 70.

✓ In Fig. 6, numeral 75 has been supplied with a lead line.

Applicant's first name appears to be an abbreviation.

R
The petition and preamble are required to be amended to give
his full first name; or, if "Bob" is such full name, a statement
over applicant's signature to that effect is required. See
Order #3140.

✓ Page 3, line 12, "cranked" has been changed to -crank-.

✓ Page 4, line 14, two pumps 20 are shown in Fig. 1;
line 21, "are" before "fixed" has been canceled; lines 20, 21
and 23, "stems" and "runners" should be -rods- and -crossheads-
respectively. Line 25, nothing "automatic" is disclosed in the
balanced crank shaft.

✓ Page 5, line 7, add the sentence -The glands 27 are
associated with the heads 37.-; lines 11-12, the check valves 45-
are not of the "ball" type; line 13, change "are" to -the-;
line 19, "are" has been canceled; lines 19, 20 and 22, "stems"
and "runners" should be changed to -rods- and -crossheads-
respectively; line 25, the term -being- should preferably be
inserted before "operated".

Serial No. 705,964----2

✓ Page 6, line 2, cancel "respectively"; line 21, "lead" has been pluralized; line 23, numeral 70 has been inserted after "pipes".

The "equalizer" 75 appears to be lacking in utility and inoperative to perform the function ascribed thereto. Fuller explanation of its alleged operation is required.

Applicant's system is inoperative and lacking in utility for the purpose set forth. A round robin circuit with no input of energy is disclosed. The air under pressure from a tank is supposed to cause an air engine to operate compressors which latter are connected to return the exhaust air back to the tank under pressure. The engine is also to drive an electric generator which is to supply the energy to heating coils arranged on the engine intake pipes. Because of inevitable losses (friction, heat radiation, slip, etc.) applicant's device cannot maintain itself in operation under no load, and much less can it supply energy for any useful purpose.

Accordingly, claims 1, 2, 3 and 4 are rejected as being drawn to a device which is inoperative and lacking in utility for the purpose described.

✓ Claims 1, 2, 3, and 4, insofar as they define structure having utility, are further rejected as fully met in each of the patents to Kneedler, Flood and Jenkins.

All the claims are rejected.

McPorter
Examiner.

ja.k.



#4

IN THE UNITED STATES PATENT OFFICE.

In re: application of

Bob Neal,

ENGINES,

Filed January 9, 1934,

A M E N D M E N T .

Ser. No. 705,964.

Div. 18. Room 4612.

PATENT OFFICE

SEP 1 - 1934

DIVISION 18

Hon. Commissioner of Patents,

Washington, D.C.

S I R : -

In response to the office action of March 12, 1934 in the above entitled application I hereby amend the same as follows:

✓ In the specification, page 4, line 14 after "block" cancel "is a" and insert "are"

✓ Same line, cancel "pump" and insert "pumps"

✓ Line 18 and also line 19 change "pump" to "pumps"

✓ Line 20 cancel "stems" and insert "rods"

✓ Lines 21 and 23 change "runners" to "crossheads"

✓ Line 25 cancel "an automatically" and insert "a"

✓ Page 5, line 7 after the period (.) insert "The glands 27 are associated with the heads 37."

✓ Line 11 cancel "ball"

✓ Line 13 cancel "are" and insert "the"

✓ Line 19 cancel "stems" and insert "rods"

✓ Lines 20 and 22 cancel "runners" and insert "crossheads"

✓ Line 26 before "operated" insert "being"

✓ Page 6, line 2 cancel "respectively"

✓ Line 14 cancel "an equalizer" and insert "a double check discharge nozzle"

Cancel the claims and insert:-

8. ³⁷ ¹³ An engine of the kind described, comprising a V-shaped cylinder block providing cylinders, inner and outer end heads closing opposite ends of the cylinders and having air ⁴⁰ intakes, a crank ¹⁶ case fitted with the inner end heads of the cylinders, a counterbalanced crank ^{fig 4} shaft ²⁵ journaled in said case, pistons working in the cylinders and having rods ²⁶ extended into said case, crosshead ²⁹ guides fitted to the sides of the case, crossheads connecting the rods with the guides, connecting rods operated by the crank shaft and pivoted to the rods of the pistons, and a system of pipes ^{37, 48, 49} arranged at the crotch of the V-shaped block and having lateral communication with the cylinders at opposite sides of the pistons therein for delivering fluid under pressure from said cylinders.

REMARKS.

Applicant has corrected the specification as has been suggested and required by the Examiner. It is believed that all objections to this specification have been overcome and particularly that part questioned.

Now with respect to the operativeness of this engine the applicant holds that he can demonstrate such working and if the Examiner insists thereon a time will be set for so doing. It is possible that the Examiner has overlooked the fact that outside energy is supplied to this engine and this fact is brought out in the specification

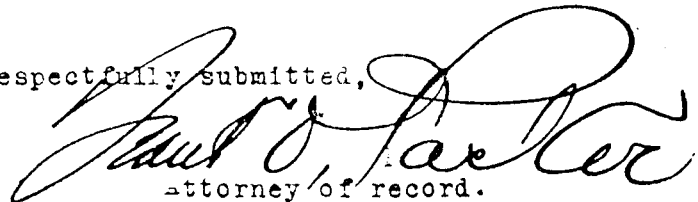
The oath in this case certifies that the applicant's first name is as signed thereto and thus that the first name is Bob.

In lieu of the original claims applicant presents herein a newly drafted claim and this calls for structure not taught by

the references and therefore such references cannot be held as anticipatory thereof. In this the Examiner's attention is directed to the construction of the block with the crank case attached thereto and the sides of this case are supplied with crosshead guides/which are carried by the rods of the pistons working within the cylinders formed by the block. These crossheads have pivoted thereto the connecting rods operated by the crank shaft which is journaled in the case. Furthermore, attention is called to the system of piping arranged at the crotch of the V-shaped block and the manner of communication with the cylinders of said block. These structural features are not shown or suggested by the references.

It is thought that this application is now in condition for allowance and an action to this end is respectfully requested at an early date.

Respectfully submitted,


attorney of record.

Washington, D.C.

August 31, 1934.

Oct. 30, 1934.

Please find below a communication from the EXAMINER in
charge of this application.

Commissioner of Patents

11-8023

Frank O. Parker
202 Barrister Building
Washington, D.C.

Applicant: B. Neal

Ser. No. 705 964
Filed Jan. 9, 1934
For Engines

Responsive to amendment of Aug. 31, 1934.

References added:

✓ Shimpf	1144 437	June 9, 1915	230-187 x-r
✓ Adenot	1398 355	Nov. 29, 1921	230-187 x-r
✓ Christensen	1369 618	Feb. 22, 1921	230-58 x-r
Reall	1230 219	June 19, 1917	230-56
Pettee et al.	637 661	Nov. 21, 1899	230-56
✓ Rayfield	1846 656	Feb. 23, 1932	230-187

It is now not clear whether applicant is claiming
an engine or a motor compressor unit in which the patent-
able novelty, if any, resides in compressor structure as
disclosed in Fig. 2.

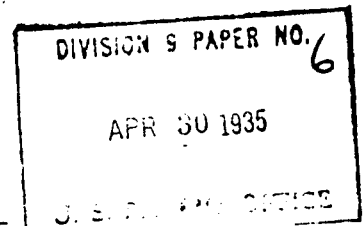
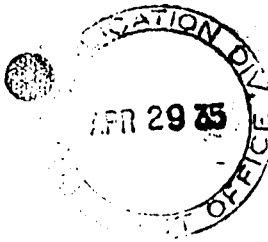
In the former view, the claim now presented must
again be rejected on the grounds and for the reasons fully
set forth on the second page of the former Office letter,
i.e., as for an inoperative system.

In the latter view, the claim now presented is re-
jected as failing to set forth the invention with the par-
ticularity and distinctness required by section 4888 R.S.

Accordingly, claim 5 is rejected.

References are made of record as further showing the
state of the art.

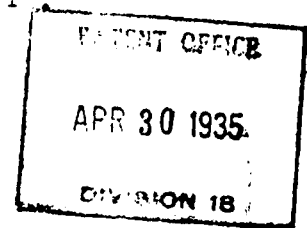
R. E. Adams
Examiner.



IN THE UNITED STATES PATENT OFFICE.

In re: application of
 Bob Neal,
 Engines,
 Filed January 9, 1934,
 Ser. No. 705,964.
 Div. 18. Room 4624.

AMENDMENT



Hon. Commissioner of Patents,
 Washington, D.C.

S I R : -

In response to the office action of October 30, 1934
 in the above entitled application I hereby amend the same as
 follows:

Rewrite claim 5 as follows:

in comb.
 5. *formed* In a motor compressor unit, a V-shaped cylinder block,
 provided with upwardly divergent cylinders, inner and outer
 end heads fitted to said cylinders at opposite ends thereof,
 slide valve chests formed in the block at the inner sides of the
 cylinders, slide valves working in the chests for controlling
 the admission and exhaust of fluid to and from the cylinders
 and having ports for the delivery of fluid under pressure
 from the admission points to a storage tank, a substantially
 Y-shaped crank case fitted to the block beneath the cylinders,
 a counterbalanced crank shaft journaled in the crank case,
 pistons operating in the cylinders and having rods extended into
 the crank case, crosshead guides fitted to the sides of said case
 interiorly thereof, crossheads connecting the rods with the guides
 and slidable on the guides, rods operated by the crank

and a system of piping having communication with the chests and the storage tank and having heating means close to the said cylinders.

REMARKS.

Applicant has complied with the requirements in the last office action in this case by redrafting the claim to have the same cover the compressor unit. This new claim 6 is directed to the structure disclosed in Figure 2 of the drawings and covers the specific features shown therein. It goes without saying that the references are lacking the specific construction now claimed in this case and this will be apparent on comparing the showing in these references with the disclosure in said Figure 2.

Attention will be called to the construction of the cylinder block and the mounting of the guides and crossheads with the rods connecting the pistons operating in the cylinders with the crank shaft.

In view of this new claim it is thought that the application should now be allowed and an action to this end is respectfully requested at an early date.

Respectfully submitted,

Paul J. Parker
Attorney of record.

Washington, D.C.

April 29, 1935.

Address only
 "The Commissioner of Patents,
 Washington, D. C.,"
 and not any official by name

DEPARTMENT OF COMMERCE
 UNITED STATES PATENT OFFICE
 WASHINGTON

All communications respecting this
 application should give the serial number,
 date of filing, and name of
 the applicant

May 10, 1935.

Please read below a communication from the EXAMINER in
 charge of this application.

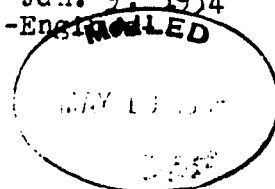
... 11-8434

Commissioner of Patents

Applicant: B. Neal

Frank O. Parker
 202 Barrister Building
 Washington, D.C.

Ser. No. 705 964
 Filed Jan. 9, 1934
 For - Engine



Responsive to amendment of April 29, 1935.

Claim 6 now presented is again not free from
 a confusion of features of both of the structures dis-
 closed in Figs. 2 and 3, one of which discloses a com-
 pressor and the other a motor, the two being of separate,
 distinct and independent status in the art and Office
 classification. The structure shown in Fig. 2 does not
 have "slide valve chests" --- and "slide valves" working
 therein. No combination of the elements enumerated is
 stated.

The claim is rejected as failing to define the
 invention with the particularity and distinctness required
 by Sec. 4888 R. S. to support a patent.

R. E. Adams
 Examiner.

MAIL DIVISION

NOV 7 1935

U.S. PATENT OFFICE

IN THE UNITED STATES PATENT OFFICE

DIVISION 9 PAPER NO. 8

NOV 8 1935

U S PAT

AMENDMENT.

In re: application of

B. Neal,

ENGINES,

Filed January 9, 1934,

Ser. No. 705,964.

Div. 9. Room 4624.

Hon. Commissioner of Patents,

Washington, D.C.

S I R : -

In response to the office action of May 10, 1935 I hereby amend the above entitled application as follows:

Rewrite claim 6 as follows:

In a structure of the kind described, a V-shaped cylinder block provided with upwardly divergent cylinders, end heads fitted to said cylinders at opposite ends thereof, each head having valved inlets and outlets, a main outlet lead between the cylinders of the block for a storage tank and having lateral branches to the outlets at the inner sides of said heads, one inlet being located at the center of each head at the outer ends of said cylinders while the remaining inlets are at the outer sides of the heads at the inner ends of said cylinders, a substantially V-shaped crank case fitted to the block beneath the cylinders, a counterbalanced crank shaft journaled in the crank case, pistons operating in the cylinders and having rods extended into the crank case, crosshead guides fitted to the sides of said case interiorly thereof, crossheads connecting the rods with the guides and slidable on the same and connecting rods operated by the crank shaft and pivoted to the crossheads for reciprocation of the pistons.

C

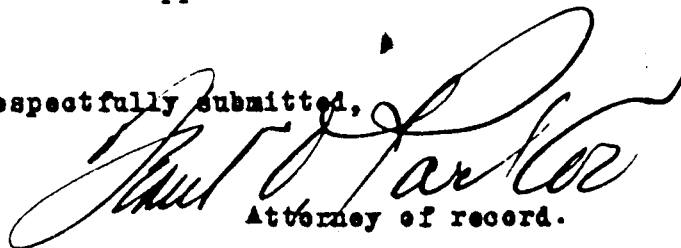
Lester Quaker

10252

Applicant has substituted a new claim for the one previously presented and it is believed that this claim herein is relieved from the objections noted in the last office action and defines the invention with particularity and distinctness required by Sec. 4666 R. S.

Action on the merits of this claim is respectfully requested and an allowance of the application is asked at an early date.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Paul J. Parker".

Attorney of record.

Washington, D.C.

November 7, 1935.

Serial No. 705 964

Ms-9

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON

Bob Neal

December 17th, 1935.

Your APPLICATION for a patent for an IMPROVEMENT in
Compressor Unit

filed Jan. 9, 1934 has been examined and ALLOWED with 1 claims.

The final fee, THIRTY DOLLARS, WITH \$1 ADDITIONAL FOR EACH CLAIM ALLOWED IN EXCESS OF 20, must be paid not later than SIX MONTHS from the date of this present notice of allowance. If the final fee be not paid within that period, the patent will be withheld, but the application may be renewed within one year after the date of the original notice with a renewal fee of \$30 and \$1 additional for each claim in excess of 20.

The office delivers patents upon the day of their date, on which date their term begins to run. The preparation of the patent for final signing and sealing will require about four weeks, and such work will not be begun until after payment of the necessary final fee.

When the final fee is paid, there should also be sent, DISTINCTLY AND PLAINLY WRITTEN, the name of the INVENTOR, TITLE OF THE INVENTION, AND SERIAL NUMBER AS ABOVE GIVEN, DATE OF ALLOWANCE (which is the date of this circular), DATE OF FILING, and, if assigned, the NAMES OF THE ASSIGNEES.

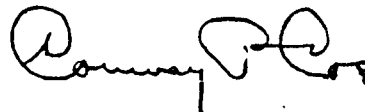
If it is desired to have the patent issue to an ASSIGNEE OR ASSIGNEES, an assignment containing a REQUEST to that effect, together with the FEE for recording the same, must be filed in this office on or before the date of payment of the final fee.

After issue of the patent, uncertified copies of the drawings and specifications may be purchased at the price of TEN CENTS EACH. The money should accompany the order. Postage stamps will not be received.

The final fee will NOT be received from other than the applicant, his assignee or attorney, or a party in interest as shown by the records of the Patent Office.

NOTICE.—WHEN THE NUMBER OF CLAIMS ALLOWED IS IN EXCESS OF 20, NO SUM LESS THAN \$30 PLUS \$1 ADDITIONAL FOR EACH CLAIM IN EXCESS OF TWENTY CAN BE ACCEPTED AS THE FINAL FEE.

Respectfully,



Commissioner of Patents.

Frank O. Parker
202 Barrister Bld'g.,
Washington, D. C.

IN REMITTING THE FINAL FEE GIVE THE SERIAL NUMBER AT THE HEAD OF THIS NOTICE.

UNCERTIFIED CHECKS WILL NOT BE ACCEPTED.

Div. 9 Room 4624

DEPARTMENT OF COMMERCE
UNITED STATES PATENT OFFICE
WASHINGTON

Paper No. 9

All communications respecting this
application should give the serial number,
date of filing, and name of
the applicant

Please find below a communication from the EXAMINER in
charge of this application

Dec. , 1935.

Commy P. G.
Commissioner of Patents.

Applicant Bob Neal

Frank O. Parker
202 Barrister Bld'g.,
Washington, D. C.

Ser. No. 705 964
Filed Jan. 9, 1934
For - Engines-

DEC 17 1935

In accordance with the provisions of Order No. 2308, dated March 12, 1917, which reads in part as follows:

* * * * *

Obvious informalities in the application may be corrected by the examiner, but said correction must be in the form of an amendment, approved by the Principal Examiner in writing, placed in the file, and made a part of the record. The changes specified in the amendment will be entered by the clerk in the regular way.

* * * * *

the changes, hereinafter specified, are made by the examiner in the application above identified.

Should these changes not be satisfactory to the applicant, appropriate amendment may be proposed under the provisions of Rule 78, provided the specification has not been printed.

O P O 11-2714

The application has been amended as follows:

Change title to Compressor Unit.

Page 2, line 1, change "an engine" to a compressor.

Page 2, line 5, change "an engine" to a compressor.

R. E. Adams
Examiner.

STMS



FINAL FEE PAID TO THE COMMISSIONER OF PATENTS

(Be careful to give correct Serial No.)

Serial No.

705,964

INVENTOR:

Bob Neal

PATENT TO BE ISSUED TO

Bob Neal

NAME OF INVENTION, AS ALLOWED:

Compressor Unit

DATE OF PAYMENT:

Jan 16th 1936

FEE:

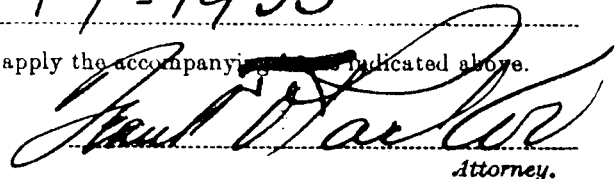
Final

DATE OF FILING:

Jan. 9-1934

DATE OF CIRCULAR OF ALLOWANCE:

Dec. 17-1935

The Commissioner of Patents will please apply the accompanying ~~fees~~ indicated above.
Attorney.

SEND PATENT TO

Frank O. Parker
202 Barrister Bldg.
Wash. D.C.

Final fees will not be received from other than the applicant, his assignee or attorney, or a party in interest as shown by the records of the Patent Office, NOR WILL THEY BE APPLIED IN PENDING APPLICATIONS.

Feb. 11, 1936.

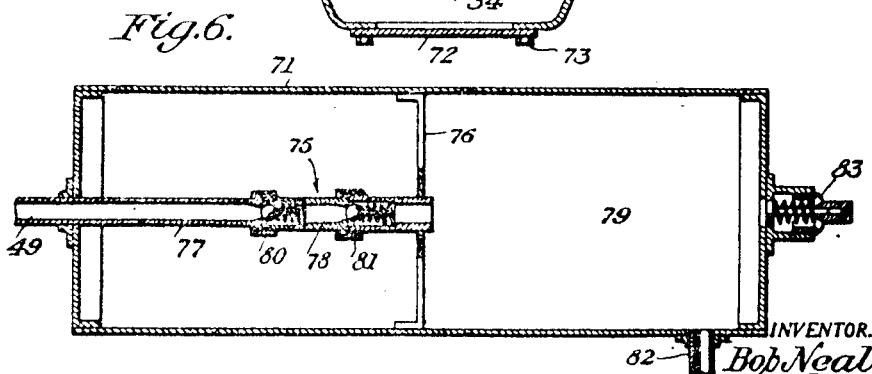
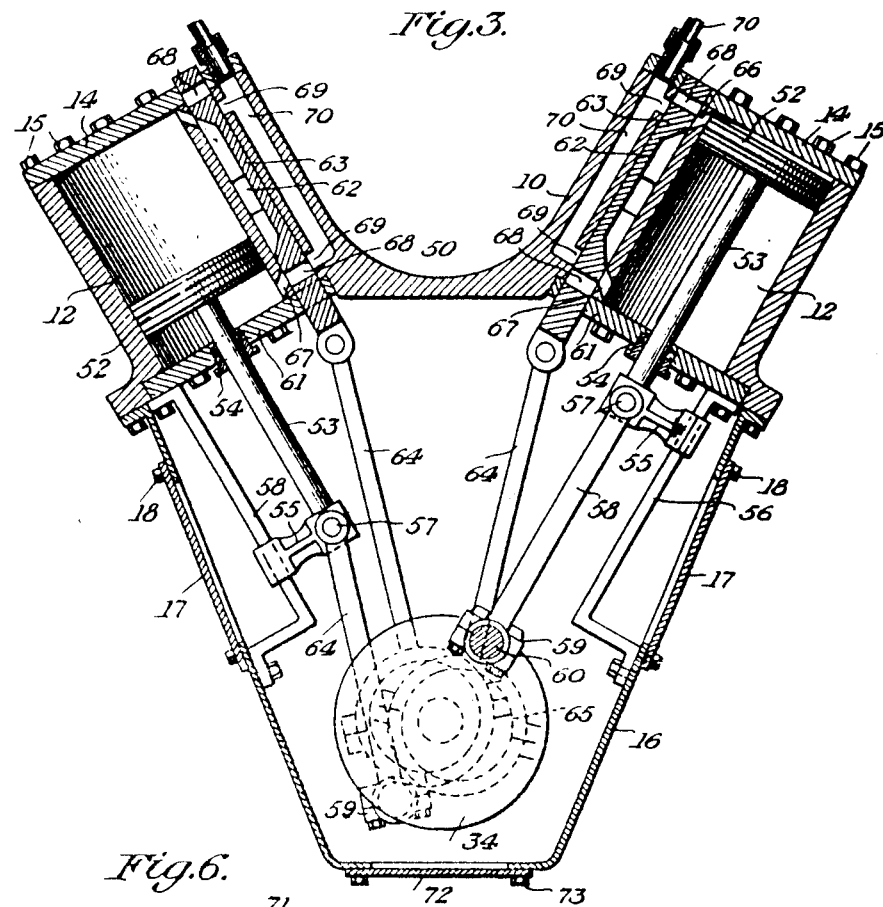
B. NEAL

2,030,759

COMPRESSOR UNIT

Filed Jan. 9, 1934

3 Sheets-Sheet 3



INVENTOR.

Bob Neal

BY

ATTORNEY.

Property of the U. S. Patent Office
Not to be taken from the files

Feb. 11, 1936.

B. NEAL

2,030,759

COMPRESSOR UNIT

Filed Jan. 9, 1934

3 Sheets-Sheet 2

Fig. 2.

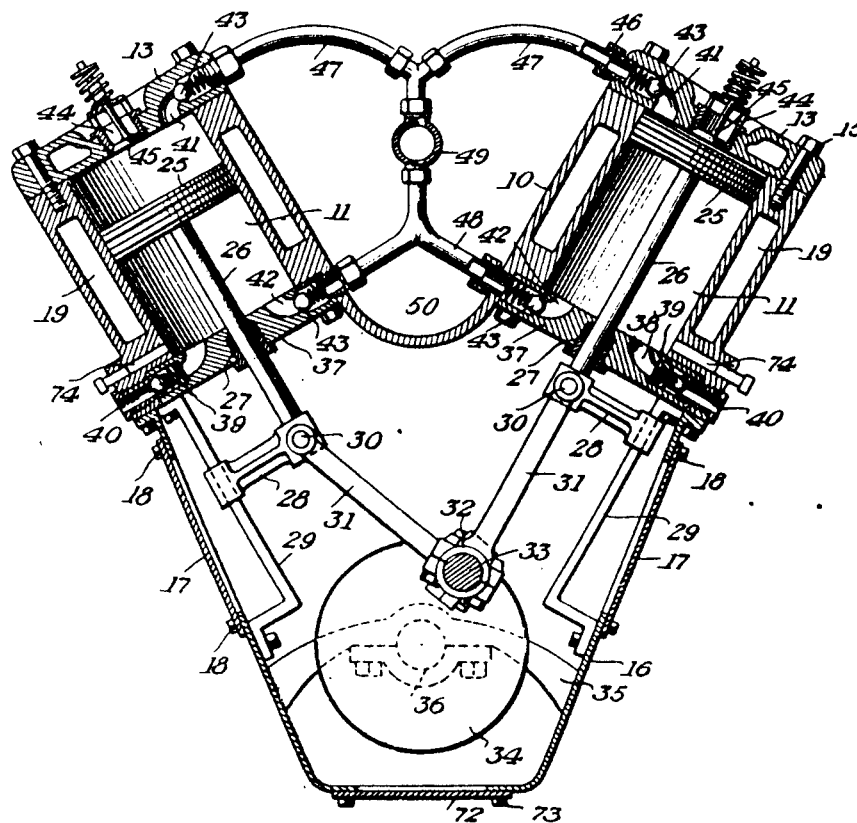
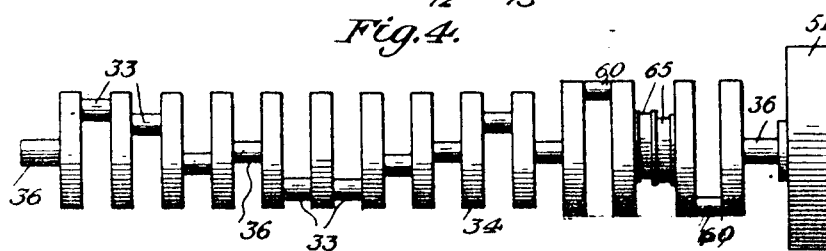


Fig. 4.



INVENTOR.

Bob Neal
BY *Shirley J. Farris*
ATTORNEY.

Feb. 11, 1936.

B. NEAL

2,030,759

COMPRESSOR UNIT

Filed Jan. 9, 1934

3 Sheets-Sheet 1

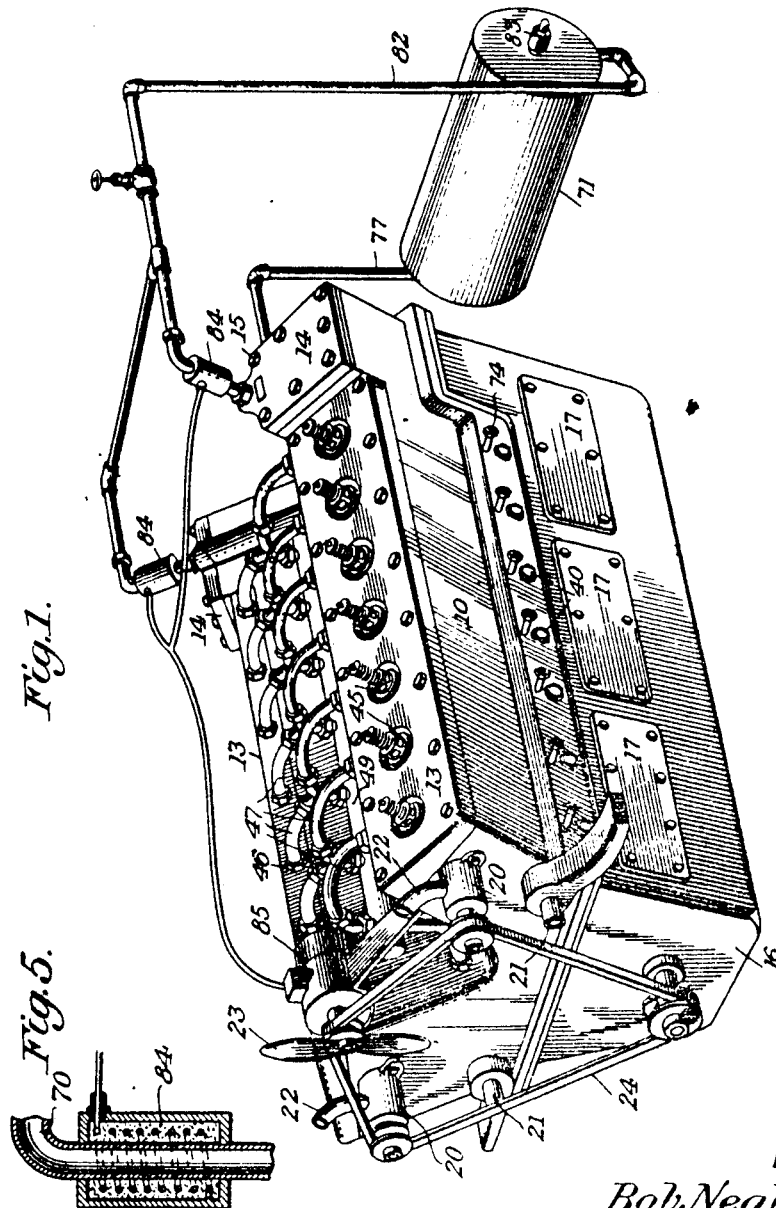


Fig. 1.

Fig. 5.

INVENTOR.

Bob Neal

BY

J. O. Foster

ATTORNEY.

Patented Feb. 11, 1936

2,030,759

UNITED STATES PATENT OFFICE

2,030,759

COMPRESSOR UNIT

Bob Neal, Arkadelphia, Ark.

Application January 9, 1934, Serial No. 705,964

1 Claim. (Cl. 230—187)

The invention relates to a compressor construction, and more particularly to a combination fluid operated engine and compressor.

The primary object of the invention is the provision of a compressor of this character, wherein there is arranged an automatically counter balanced crank shaft and fluid equalizers within a storage tank, which makes it possible for the said engine to operate on constant reserve tank pressure so as to actuate additional equipment, the pistons for the engine being also automatically balanced and suspended when the said engine is in operation.

Another object of the invention is the provision of an engine of this character, wherein the same is operated from air under pressure, the said air being supplied by compressors, these being in bank with the engine construction.

A further object of the invention is the provision of an engine of this character, wherein the same is of novel construction, as the engine proper and the compressors are operated from the same crank shaft which is of the automatically balanced type, so that high efficiency is attained.

A still further object of the invention is the provision of an engine of this character, which is comparatively simple in construction, thoroughly reliable and efficient in its operation, strong, durable, and inexpensive to manufacture.

With these and other objects in view the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described, illustrated in the accompanying drawings, which disclose the preferred embodiment of the invention, and pointed out in the claim hereunto appended.

In the accompanying drawings:

Figure 1 is a perspective view of the engine constructed in accordance with the invention.

Figure 2 is a vertical transverse sectional view through the compressor part of the engine.

Figure 3 is a vertical sectional view through the power part of the engine.

Figure 4 is a detail elevation of the crank shaft of the engine.

Figure 5 is an enlarged sectional view through one of the electric heaters for the engine.

Figure 6 is a vertical longitudinal sectional view through the air storage tank including the equalizer.

Similar reference characters, indicate corresponding parts throughout the several views in the drawings.

Referring to the drawings in detail the engine in its entirety comprises a cylinder block 10 hav-

ing formed therein the series of compressor cylinders 11 and the power cylinders 12, respectively, the block 10 being of the V-type and closing the upper ends of said cylinders are the removable heads 13 and 14, respectively, which are secured in place by head bolts 15, as is conventional. Beneath the block 10 is the crank case 16, which at opposite sides carries the detachable plates 17, these being held in place by fasteners 18 and such plates are seated so as to be leak proof. The block 10 is chambered to provide a water jacket 19 about the cylinders, while at the forward end of the said block are water pumps 20 circulating water through the inlet pipe 21 which leads into the jacket and letting said water out therefrom through the outlet pipe 22 leading from said water jacket. Next to the pumps 20 is a fan 23 operated from a belt 24 which also drives the pumps.

Working within the cylinders 11 are the reciprocating pistons 25, their rods 26 being slidable through packing glands 27 and fixed to crossheads 28, which are slidably mounted upon guides 29 secured within the crank case 16 to opposite side walls thereof. These crossheads 28 are fitted with wrist pins 30 pivotally connecting therewith the connecting rods 31 which by the bearings 32 are engaged with their cranks 33 of a counter balanced crank shaft 34, which is mounted in supports 35 arranged in the crank case 16, the shaft being supplied with the required bearings 36.

The inner ends of the cylinders 11 are fitted with inner end heads 37, which are provided with air intake ports 38, these being fitted with spring ball inlet checks 39, the air having admission through passages 40 opening exteriorly of the block 10. The glands 27 are associated with the heads 37.

The heads 13 and 37 are provided with the compressed air outlets 41 and 42, respectively, these being fitted with spring ball checks 43, the heads 13 being also provided with the central air inlets 44, which are fitted with spring checks 45. By couplings 46 are attached to the air outlets 41 and 42 the outlet feed pipes 47 and 48, respectively, these leading to a main conduit 49 located in the center channel 50 in said block 10.

At the rear end of the block 10 and on the shaft 34 is the fly wheel 51, this being of conventional type.

Working within the cylinders 12 are pistons 52, their rods 53 sliding through packing glands 54 and fixed in crossheads 55 slidably mounted upon guides 56 which are secured within the crank

31 6/22

case 16 at opposite side walls thereof. The cross-heads 55 carry wrist pins 57 connecting therewith connecting rods 58, these being engaged by bearings 59 with their respective cranks 60 of the crank shaft 34, the inner ends of the cylinders 12 being also closed by inner heads 61 with which are associated the glands 54.

On the cylinders 12 are slide valve chests 62 in which are the slide valves 63, these being operated by throw rods 64 actuated by cams 65 and such valves controlling the air admission and exhaust of air to and from the cylinders 12 through the ports 66 and 67, and these valves 63 are provided with the ports 68 for the delivery of air under pressure from the inlet passages 69 common to a lead 70 from a compressed air storage tank 71.

The bottom of the crank case 16 is fitted with a removable plate 72 which is secured in place by fasteners 73, and when this plate is removed access can be had to the crank shaft 34 and the bearings for the engine, as well as other parts within said crank case, as should be obvious.

Leading into the cylinders 11 are the passages 74 of a lubricating system (not shown).

The storage tank 71 for the compressed air includes therein a double check discharge nozzle 75, this being supported by a member 76 and leading to this equalizer is an air inlet pipe 77 which has the communication 78 with the chamber 79 formed by said tank. In the equalizer 75 are the spaced spring ball checks 80 and 81, respectively, one being for the inlet side and the other for the exhaust or outlet side of said equalizer. This pipe 77 is connected with the main conduit 49, while a pipe 82 is connected with the leads 70, the tank being also fitted with an automatic relief valve 83 of any approved type.

About the pipes 70 for the passages 69 are the electric heating units 84 which are for the purpose of heating the air under pressure above a

freezing temperature when delivered from the tank 71 to the cylinders 12.

Supported on the block 10 is an electric generator 85 which is driven from the shaft 34 through a belt 24 and this generator is included in an electric circuit which also has the heaters 84 so that these will operate from current furnished by said generator.

The storage tank 71 with the equalizer is so constructed that it is possible to pump air into the said tank with a tank pressure of two hundred pounds, while the compressors are only pumping against fifteen pounds or atmospheric pressure. Outside air pressure source can be coupled with the tank to augment that pressure derived from the cylinders 11 of the engine.

What is claimed is:

In a structure of the kind described, a V-shaped cylinder block provided with upwardly divergent cylinders, end heads fitted to said cylinders at opposite ends thereof, each head having valved inlets and outlets, a main outlet lead between the cylinders of the block for a storage tank and having lateral branches to the outlets at the inner sides of said heads, one inlet being located at the center of each head at the outer ends of said cylinders while the remaining inlets are at the outer sides of the heads at the inner ends of said cylinders, a substantially V-shaped crank case fitted to the block beneath the cylinders, a counterbalanced crank shaft journaled in the crank case, pistons operating in the cylinders and having rods extended into the crank case, crosshead guides fitted to the sides of said case interiorly thereof, crossheads connecting the rods with the guides and slidable on the same and connecting rods operated by the crank shaft and pivoted to the crossheads for reciprocation of the pistons.

BOB NEAL.

REFERENCE REQUEST—FEDERAL RECORDS CENTERS		NOTE: Use a separate form for each request.
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NAME OF REQUESTER

Cartrell

TELEPHONE NO.

477
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 50 CFR 1215.162

INDEX OF CLAIMS

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2. Prints Jan. 13/34.

3. REJECTED MAR 12 1934

4. Amult A Aug. 31 1934

5. Rej. Oct. 30, 1934

6. Amult B April 29, 1935

7. Rej. May 10, 1935

8. Amult C Nov. 7, 1935

9. Exis Amult D Dec. 17, 1935

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