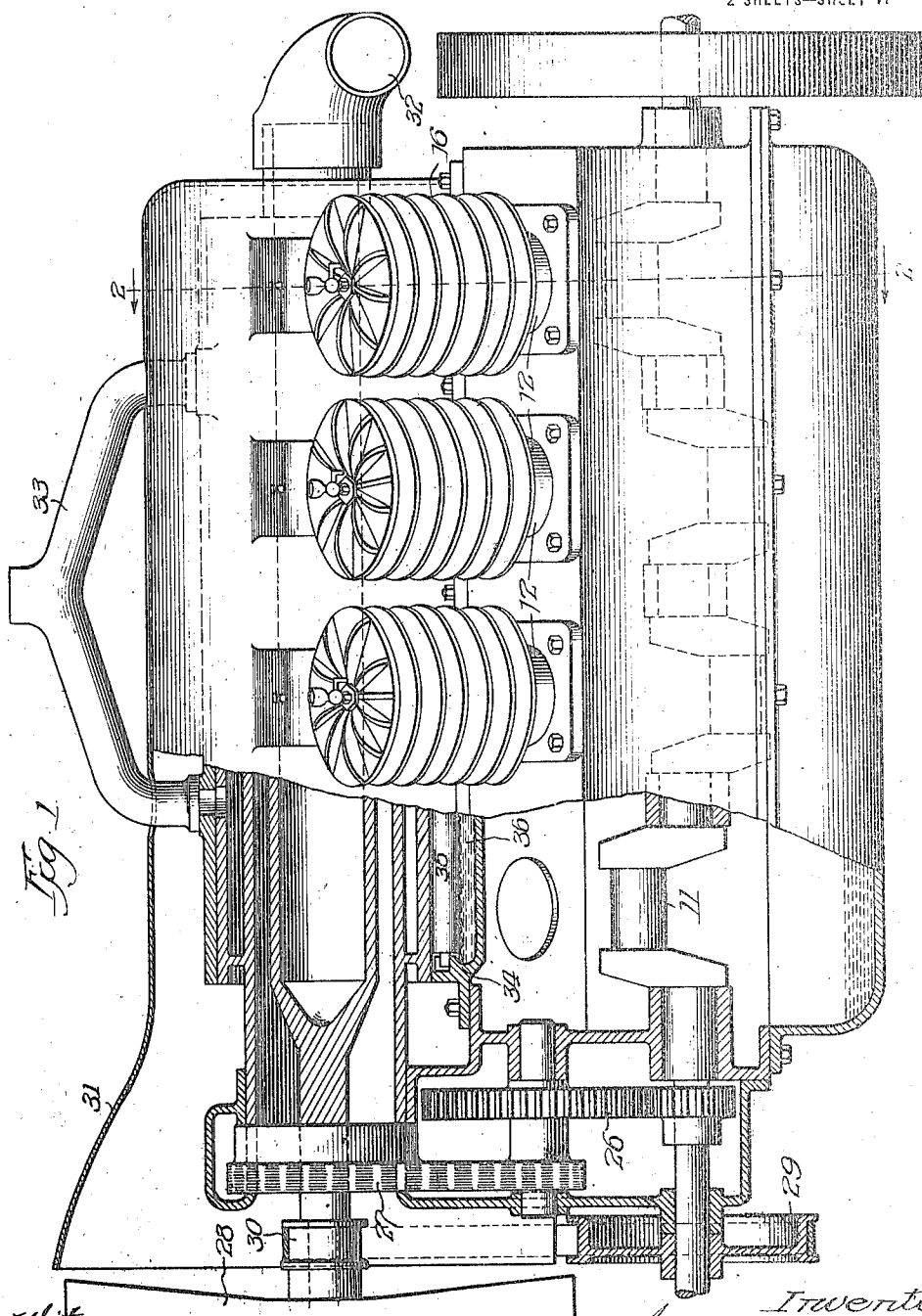


V-TYPE ENGINE.

Patented May 28, 1918.

2 SHEETS—SHEET 1.

1,267,929.



Witnesses:

F. C. Davison
G. F. Hoar

Inventor:

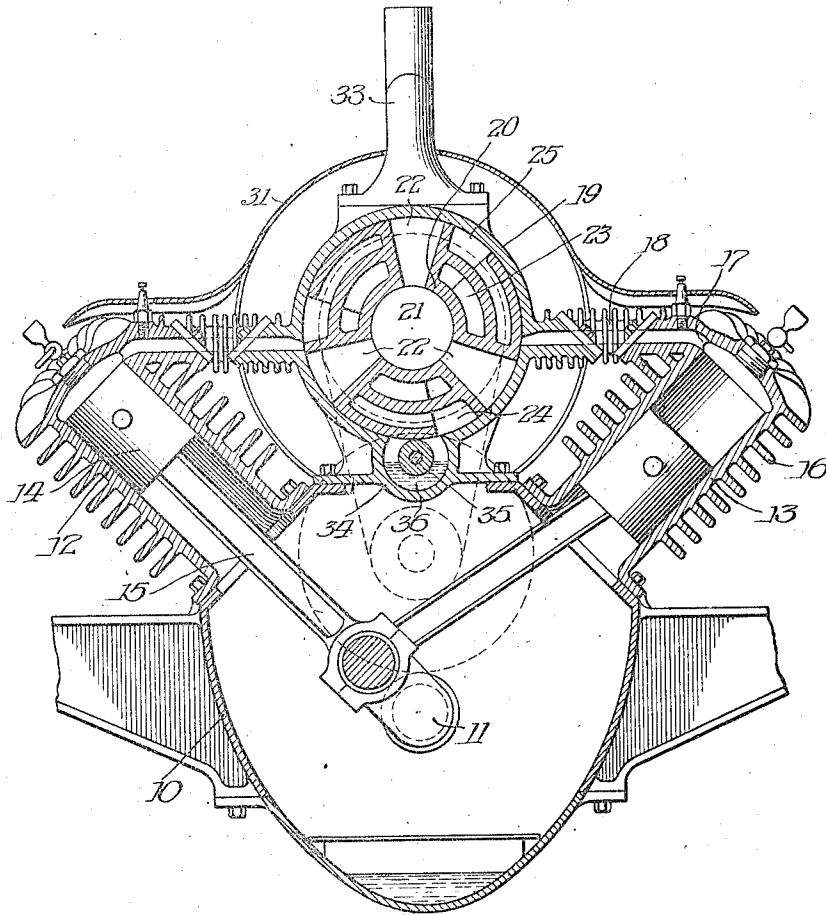
By C. C. Lathrop

B. D. STEVENS.
V-TYPE ENGINE.
APPLICATION FILED JULY 28, 1915.

Patented May 28, 1918
2 SHEETS—SHEET 2.

1,267,929.

Fig. 2



Witnesses:

Ed. G. Davis
Wm. H. Murray

Inventor
B. D. Stevens

By *C. C. Luthers*
Atty.

UNITED STATES PATENT OFFICE.

BURT D. STEVENS, OF EVANSTON, ILLINOIS, ASSIGNOR OF THREE-FOURTHS TO
WILLIAM V. KIMLEY, OF CHICAGO, ILLINOIS.

V-TYPE ENGINE.

1,267,929.

Specification of Letters Patent.

Patented May 28, 1918.

Application filed July 23, 1915. Serial No. 42,328.

To all whom it may concern:

Be it known that I, BURT D. STEVENS, a citizen of the United States, and resident of Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in V-Type Engines, of which the following is a specification.

My invention relates to hydro-carbon engines and has particular reference to an improved engine of the V-type.

I have conceived that one of the principal advantages in increasing the number of cylinders which are attached to a single crank shaft of an engine of the horse power commonly required for automobiles and aeroplanes is in the ability, through the use of smaller cylinders, to air-cool the engine, thereby reducing much weight, cost and complexity. However, if more than four or six cylinders are placed in a single line the possibility of efficient air-cooling is reduced because of the transference of heat from the first cylinders to those in rear thereof. I have, therefore, conceived that efficient air-cooling may be secured even in an eight or twelve cylinder motor by arranging the cylinders in two rows, the rows being disposed in angular relation to each other.

A further advantage in the construction of an engine in this manner is in that it permits of the use of the rotary valve, such as disclosed in my co-pending application, Serial No. 794,559, in which the valve is claimed *per se*. In a multiple-cylinder V-type engine I may locate the cylindrical casing for the valve between the cylinders and the available space permits the use of a relatively large valve, that is, a valve of substantially the size of one of the cylinders. This reduces the heating effect, reduces wear, gives larger bearing area and therefore better sealing effect, permits of even distribution of lubrication and enables the provision of a third passage through the valve through which an air current may be forced. The construction shown provides for scientific balancing of the engine and practically eliminates vibration; the construction provides for perfect lubrication, and because of the large area, heat radiation will be rapid, thus preventing distortion of the valve member. This provision of the air insulation space between the intake and

exhaust passages prevents overheating of the intake gages while providing for the necessary heating thereof.

The use of the rotary valve in V type engines further simplifies the matter of efficient air cooling of the cylinders in that there is no valve chamber directly attached to the cylinders, and thus practically the entire surface of the cylinder walls may be flanged so as to get the maximum of radiating surface.

It is a grave question if, in multi-cylinder engines of the puppet valve type, so commonly in use, the complication due to the large number of valves and their operating mechanism, may not more than offset any advantage secured by an increased number of cylinders, whereas the use of a single rotary valve to serve all cylinders of a V-type engine, and the air cooling of such an engine so reduces the number of parts and the resultant complication that any number of cylinders desired may be used.

The invention will be more readily understood by reference to the accompanying drawings, wherein,

Figure 1 is a side elevation of an eight-cylinder, V-type engine, a portion thereof being broken away to show the parts in section, and,

Fig. 2 is a section on the lines 2-2 of Fig. 1.

Referring more particularly to the drawings, it will be seen that I provide a crank case 10, within which is mounted a crank shaft 11. Secured to the upper portion of the crank case are two rows of cylinders 12, 13, each row being disposed angularly with relation to the other row, the angular disposition in the present instance being 90°. In a twelve cylinder motor the angular disposition would be 60°. Pistons 14, are mounted in the cylinders and connecting rods 15, transmit the impulses to the crank shaft 11. It will be noted that the cylinders are provided with fins 16, at their sides and top, in order to adapt them for air-cooling. A port 17, is provided at the upper end of each cylinder, these ports communicating with conduits 18, which may likewise be provided with fins. A cylindrical casing 19, is secured to the crank case and is located vertically above the crank shaft 11. All of

the cylinders communicate with the cylindrical casing by means of the conduits 18. Mounted within the casing 19, is a rotary valve 20. This valve as minutely described in connection with my co-pending application referred to, is divided into three compartments. The central opening 21, extends from end to end of the valve and acts as an exhaust conduit. Ports or passages 22, equidistantly spaced, provide for communication between the conduits and the exhaust opening. Also extending through the valve member from end to end, but not in a straight line, are the passages 23. These passages have no communication with the cylinders and are intended as conduits for a cooling medium, such as air or water. They serve to insulate the exhaust from the intake passages 24, which are located close to the periphery of the valve and which passages are provided with ports 25, registering at intervals with the openings in the conduit 18. The valve member 20, is caused to rotate in proper timed relation by means of the gearing 26, and chain 27, best shown in Fig. 1. A suction fan 28, is mounted at the axis of the valve member, motion being imparted to the fan by a belt which passes over the pulleys 29, 30. The current of air produced by the fan is directed through the valve member and around the cylinders by means of the housing 31, which may be formed of light sheet metal. The exhaust outlet will be provided by the elbow 32, as best shown in Fig. 1, a rotating joint being provided between this elbow and the valve

member. The intake manifold is indicated at 33, and is located at the top of the valve.

As a means for lubricating the cylinder I provide a trough 34, in the valve casing, and in this trough I mount a roller 35, the periphery of which, at its lower edge, contacts a body of oil 36, held in the trough. The upper edge of the roller engages the surface of the valve member. Thus a constant supply of oil is delivered to the valve member, the degree of lubrication being fixed by the extent of immersion of the roller in the oil.

I claim:

1. In an engine, the combination of a plurality of pairs of angularly disposed cylinders, a valve casing disposed between and independent of the pairs of cylinders, a single rotary valve within said casing, a housing around said casing, and means for inducing a current of air through said valve and between said casing and housing.

2. In an engine the combination of a plurality of pairs of angularly disposed cylinders, a valve casing disposed between and independently of the pairs of cylinders, a single rotary valve within said casing, and means for inducing a current of air through said valve and around the exterior of said casing, substantially as described.

Signed at Chicago, Ill., this 24th day of July, A. D. 1915.

BURT D. STEVENS.

Witnesses:

B. F. DVORAK,
C. W. KRAUS.