April 9, 1940. W. L. BAUDETTE 2,196,287

COMPRESSOR VALVE

Original Filed Oct. 3, 1936

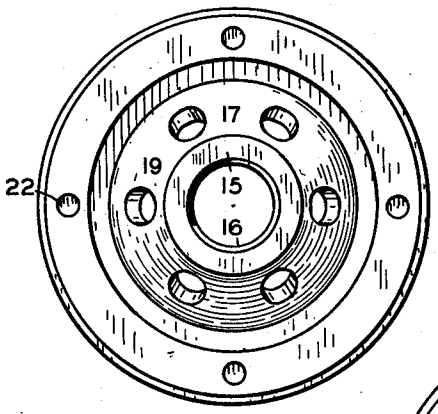


FIGURE 1.

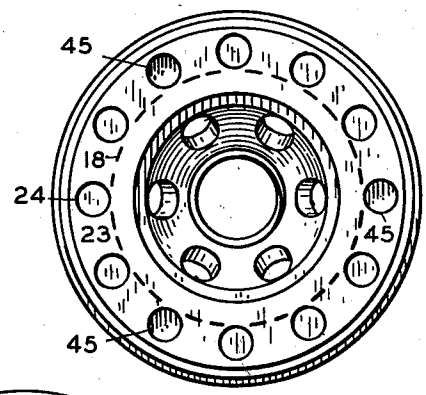


FIGURE 3.

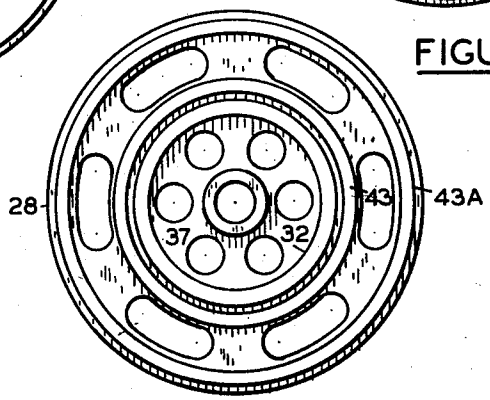


FIGURE 4.

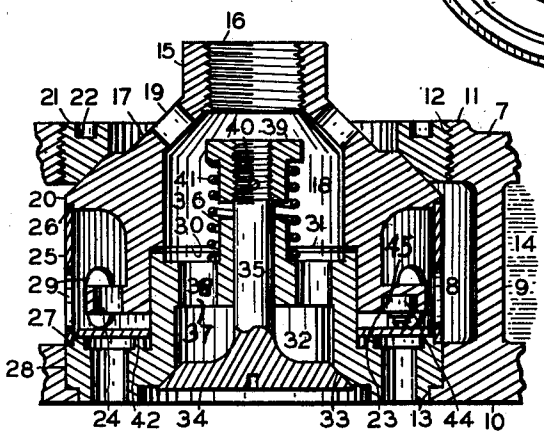


FIGURE 2.

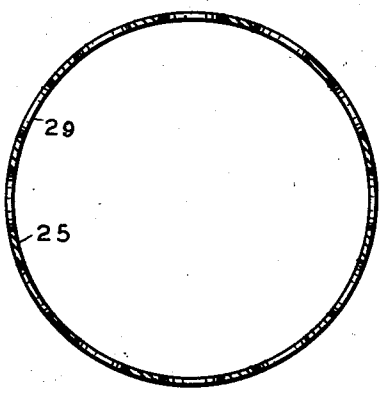


FIGURE 5.

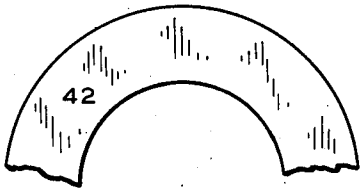


FIGURE 6.

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COMPRESSOR VALVE

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Application October 3, 1936, Serial No. 103,883
Renewed August 25, 1939

2 Claims. (Cl. 277—61)

This invention relates to valves for compressor heads and more particularly to the improved details of an intake and exhaust valve mounted concentrically.

An object of the present invention is to provide an air cushioning effect to the opening of the exhaust valve in addition to the closing spring by means of the location of ports for a certain quantity of air to pass therethrough with a given pressure and an air pocket formed above the exhaust valve to cause the air to bank or whirl before passing through the exhaust ports in the ring housing.

Another object of the present invention is to provide a flat thin ring valve to cover the ground seat exhaust ports and provided with three point compression coiled leaf springs to hold the valve closed until a predetermined pressure is reached.

Another object of the present invention is to provide a thin flat ring type exhaust valve that is easily and inexpensively constructed and at the same time will dissipate the heat generated in the compressed air that passes around the valve ring.

Another object of the present invention is to provide a thin cylindrical shaped exhaust valve cage with the exhaust openings located close to the valve ring to insure immediate delivery of the exhaust air to prevent any undue heating and also to form a cushioning pocket above the valve to prevent undue valve knocking.

Another object of the present invention is to provide a valve having a frustum-shaped end having intake portholes to reduce the high velocity air friction therethrough by an approximate 45 degree port axis as compared to the usual ninety degree port axis in relation to the axis of the valve, and furthermore a boss forming the top of the frustum to receive an unloading valve. The reduced air friction increases the efficiency of the valve by reducing heat and increasing volume.

With these and other objects in view the invention further consists of numerous combinations of the parts illustrated in the accompanying drawing and described in the specification and more particularly pointed out in the appended claims and any claims added thereto before final allowance.

Figure 1 is a plan view of the improved valve.

Figure 2 is a fragmentary view in elevation with certain parts broken away of the improved valve to illustrate the interior construction thereof, and a portion of a compressor head showing the adaption of the valve.

Figure 3 is an inverted plan view of the top cylinder and external flange.

Figure 4 is a plan view of the lower cylinder and the external flange and illustrates the boss, ribs and parts forming the intake and exhaust ports.

Figure 5 is a plan view of the improved exhaust valve shell with a portion of the shell broken away to illustrate the exhaust ports therethrough.

Figure 6 is a fragmentary view of the improved exhaust flat ring shaped valve.

The water cooled compressor head 7 has an exhaust air chamber 8 formed by wall 9, bottom 10, and top 11. Top 11 is threaded at 12 and bottom 10 has a shouldered hole formed by annular ring 13, the water 14 being on the opposite side of the wall 9 from the exhaust air chamber.

The unloading valve boss 15 has a hole therethrough and threaded at 16 to receive any of the standard unloading valves now on the market, the unloading valve not being shown because of well known construction. An inverted frustum shaped hood 17 integral with boss 15 extends to the cylindrical shaped piece 18 and has air intake holes 19 arranged therein at an angle of approximately 45 degrees from the axis of the valve to reduce the air friction therethrough. The cylindrical shaped piece 18 has integral external flange 20 beveled on the top thereof to receive the ground joint screwed ring 21 which fits the threads 12 and holds the valve assembly in the head against the ground joint annular ring 13. The holes 22 in the top of the ring 21 being arranged to receive a tool to screw the ring 21 into the threads 12 of top 11. Another external integral flange 23 is arranged at the lower end of the cylinder 18 and has holes 24 arranged therein to govern a predetermined quantity of air issuing therethrough to a chamber formed by flanges 20, 23, cylinder 18, and cylindrical valve cage ring 25. The annular shoulder 26 on flange 20 receives the top edge of the ring 25 and the annular shoulder 27 of flange 28 receives the lower edge of ring 25. The cylindrical valve cage ring 25 has holes 29 located in the lower portion of the ring to release the air after a portion of it is banked in the air chamber formed by the flanges 20, 23, cylinders 18 and 25 respectively.

The cylinder 18 has a recessed shoulder 30 to receive a gasket 31 and the top of the lower cylinder 32 is adapted to fit cylinder 18 and shoulder against the gasket 31. The cylinder 32 projects downward and has an intake valve seat 33 ground in the lower end thereof to receive the intake valve head 34 shown integral with the valve stem

35. The valve stem projects upwardly extending through the boss 36 supported by ribs 37 integrally secured to the cylinder walls 32 forming portholes 38. A shouldered nut 39 is screwed on the top end of the valve stem, pinned at 40 and the valve head 34 is normally held in a closed position by spring 41 compressed between shouldered nut 39 and ribs 37.

The cylinder 32 has the integral external flange 28 arranged on the bottom thereof to seat on ring 13 of the compressor head, and has a number of exhaust portholes arranged therein with a flat ring shaped valve 42 arranged to seat on the raised and ground annular ribs 43 and 43A.

The flat leaf coiled springs 44 seat in the three recesses 45 and compress against the flat ring exhaust valve 42. There are three springs but only one being illustrated because of the location of the recesses 45 and the like construction of each.

These valves are made for compressor heads and the like and are arranged to seat in a head against an annular ring or the equivalent. The ring 21 is screwed into the head shouldering on the beveled flange 20 and is ready for operation.

An unloading valve (not shown) is screwed into the boss 15 and operates against the intake valve stem 35. It is obvious from the description that free air can be drawn through the holes 19 with less friction than other valves because of the 45 degree angle entrance thereto, thence through cylinders 18 and 32 respectively, and the holes formed by ribs 37 and passed through the intake valve opening formed by valve head 34 and seat 33, the valve being opened by partial vacuum in the compressor cylinder (not shown) acting against the spring 41. Compressed air passing through the exhaust portholes causes the thin exhaust valve ring 42 to compress the three coiled springs 44 against the flange 23. The compressed air rushing through the holes 24 is slightly checked by the predetermined size thereof and the banking chamber located between the flanges 20 and 23 respectively. It can easily be seen that the compressed air will now be forced out through the holes 29 in the valve cage, that the compressed air will have a cushioning effect when suddenly released from the exhaust valve, and that after the air is banked in the chamber the air will freely flow through the holes 29 in cage 25.

What I claim as new and desire to secure by Letters Patent, is:

1. A cylinder having an external flange arranged near each end thereof, an unloading valve boss integral with one end of said cylinder, said boss and end of said cylinder having a frustrum shape, said frustrum shaped end including one of said flanges and having intake portholes therethrough, the other of said flanges having exhaust portholes therethrough, an internal valve arranged to seat in said cylinder, a valve stem boss secured in said cylinder, a stem integral with said valve arranged to slide in said valve stem boss, an exhaust valve arranged to seat on said flange having said exhaust portholes, and a cylindrical cage arranged between said flanges and having exhaust portholes arranged therein.

2. A cylinder having an external flange arranged near each end thereof, an unloading valve boss integral with one end of said cylinder, said boss and end of said cylinder having a frustrum shape, said frustrum shaped end including one of said flanges and having intake portholes therethrough, the other of said flanges having exhaust portholes therethrough, an internal valve arranged to seat in said cylinder, a valve stem boss arranged in said cylinder, a valve stem connected to said valve arranged to slide in said valve stem boss, an exhaust valve arranged to seat on said flange having said exhaust portholes.

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