June 5, 1928. 1,672,125

F. J. HEIDEMAN

PUMP ASSEMBLY

Filed June 28, 1926

Fig. 1.

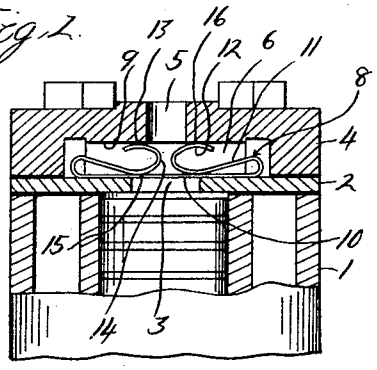


Fig. 2.

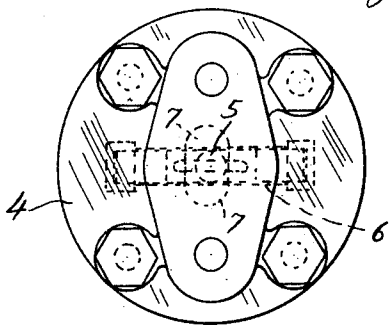


Fig. 4.

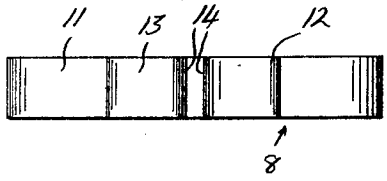


Fig. 3.

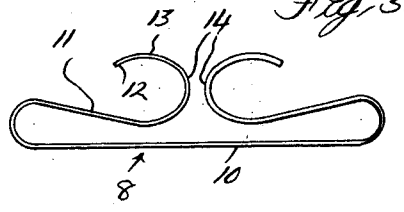


Fig. 5

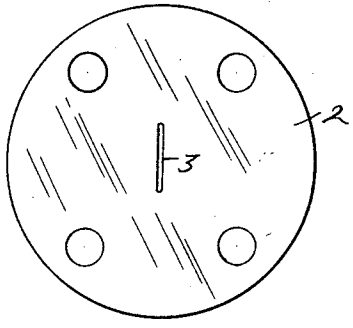
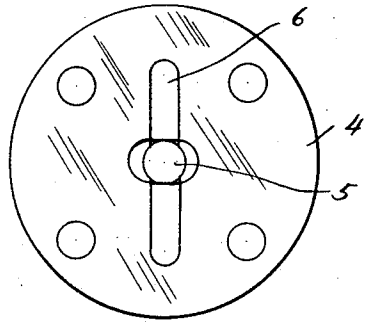


Fig. 6



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UNITED STATES PATENT OFFICE.

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PUMP ASSEMBLY.

Application filed June 28, 1926. Serial No. 119,163.

This invention relates generally to pump assemblies and consists of certain novel features of construction, combinations and arrangements of parts as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a fragmentary vertical sectional view through a pump assembly embodying my invention.

Figure 2 is a top plan view thereof.

Figure 3 is a side elevation of the valve.

Figure 4 is a top plan view of the valve.

Figure 5 is a top plan view of the intermediate plate.

Figure 6 is a bottom plan view of the detachable cylinder head.

Referring now to the drawing, 1 is a pump cylinder in which the gas is adapted to be compressed, 2 is a plate resting on the upper end of the cylinder and having a short narrow slot 3 at the center thereof constituting the outlet port for the cylinder, and 4 is a detachable head having a central passage 5 that constitutes an exhaust for the compressed gas and is preferably disposed in substantial vertical alignment with the slot 3. As shown, this head 4 is preferably bolted to the cylinder 1 and is provided with an elongated transversely extending recess 6 that closes the vertical passage 5 and registers with the slot 3. To provide an efficient construction, this recess 6 has portions of substantial equal length upon opposite sides of the passage 5, and is provided at diametrically opposite sides of the passage 5 with laterally extending segmental extensions 7.

For controlling the passage of the gas from the cylinder through the slot 3 to the passage 5, I have provided a light metal valve 8 that is movable in the recess 6 between the base 9 thereof and the plate 2. As shown, this valve 8 is preferably formed from a single strip of spring metal and comprises an intermediate normally flat body portion 10, inwardly extending arm portions 11 and the outwardly extending finger portions 12. To provide an efficient construction, the body 10 is provided at its opposite ends with the upwardly curved portions 13 that connect into the outer ends of the arms 11, while the latter preferably extend longitudinally of and incline downwardly toward the body 10 and are provided at their inner ends with the upwardly curved portions 14 that connect into the inner ends of the fingers 12. These fingers are preferably arcuate-shape and extend longitudinally of the arms 11 above the body with the rounded portions 13 thereof uppermost. Before assembly the distance between the body 10 and the rounded portions 13 is greater than the depth of the recess 6, hence when the parts are assembled the fingers 12 will be depressed slightly by the base 9 of the cylinder head and the inner ends of the arms 11 will be pressed downwardly by the fingers 12 against the body 10 so that the latter will be normally held seated firmly upon the plate 2 over the slot 3, thereby insuring a tight seal. As shown in Figure 1, the contact points 15 between the arms 11 and the body 10 are adjacent to the ends of the slot 3, while the contact points 16 between the fingers 12 and the base 9 of the recess 6 are adjacent to the passage 5, hence the fingers 12 will be free to yield longitudinally of the base 9, and the arms 11 will be yieldably braced by the fingers so as to afford a constant yieldable backing for the body 10. This will prevent the central portion of the body from bending too far, hence the arms 11 and fingers 12 will also serve as flexible stops for the body 10.

In use, the body 10 of the valve will seat against the plate 2 as described when the piston (not shown) in the cylinder is upon its suction stroke and will remain seated during the reverse or compression stroke until a pressure is reached in the cylinder which is higher than the pressure in the exhaust passage 5, whereupon the pressure in the cylinder will bow the body 10 upwardly so as to permit the compressed gas to pass laterally through the segmental recess 7 to the central exhaust passage 5.

Thus, from the foregoing description, it will be apparent that the valve will operate automatically for controlling the passage of the gas through the slot 3. Inasmuch as the valve is always under compression when the parts are assembled it will also be apparent that the end portions of the body 10 will have a sliding engagement with the plate 2 when the central portion of the body is bowed upwardly, while the arcuate fingers 12 will have a rolling engagement with the base 9 of the recess 6, hence the seating and unseating of the valve will be quiet irrespec-

tive of whether the compressor is operating at a high or low speed. Moreover these arcuate fingers 12 will eliminate undue friction and will permit the valve to align itself automatically within the slot 6 as conditions may warrant.

While it is believed that from the foregoing description, the nature and advantage of my invention will be readily apparent, I desire to have it understood that I do not limit myself to what is herein shown and described and that such changes may be resorted to when desired as fall within the scope of what is claimed.

What I claim as my invention is:

1. A valve formed from a single strip of metal and having a substantially flat body, inclined arms projecting inwardly from the ends of the body, the inner ends of said arms being spaced from each other and arcuate-shaped fingers projecting outwardly from said arms.

2. A valve having a substantially flat body provided at its opposite ends with upwardly curved portions, arms projecting inwardly from said curved portions, and having upwardly curved portions at their inner ends, and fingers projecting outwardly from the last mentioned curved portions.

3. A valve having a substantially flat body, arms projecting inwardly from the ends of said body, arcuate-shaped fingers projecting outwardly from the ends of said arms and arranged with the rounded portions thereof uppermost for engagement with a suitable fixed part to hold the body portion against its seat.

4. A valve having a substantially flat body provided at its opposite ends with upwardly curved portions, arms projecting inwardly from said curved portions and extending longitudinally of said body, said arms having upwardly curved portions at their inner ends, and arcuate shaped fingers projecting outwardly from the last mentioned curved portions and arranged with the rounded portions thereof uppermost.

5. A valve having a substantially flat body, arms projecting inwardly from the ends of the body and extending longitudinally of the body, and fingers projecting upwardly and outwardly from the inner ends of said arms and extending longitudinally of the body at points above the arms.

6. A valve having a substantially flat body engageable with a seat, arms projecting inwardly from the ends of said body, and fingers projecting outwardly from and spaced substantially above said arms and flat body for seating the latter.

7. A valve having a substantially flat body engageable with a seat, arms projecting inwardly from the ends of said body, and curved fingers projecting outwardly from said arms for rolling engagement with a suitable fixed part for holding said body against its seat.

8. A valve having a substantially flat body provided with upwardly and inwardly curved ends, arms projecting inwardly over the body from said curved ends and having their inner ends spaced apart and provided with upwardly curved open return bent portions, and fingers projecting from said upwardly curved portions and extending longitudinally of the body above the arms aforesaid.

9. A spring metal valve having a substantially flat body provided with open return bent ends, inclined arms projecting from said ends inwardly toward the center of said body and having their inner ends spaced apart and provided with open return bent portions, and fingers projecting from said last mentioned return bent portions and extending over said arms.

10. A valve formed of spring metal and comprising a substantially flat body provided at its end with open return bent portions, arms projecting from said return bent portions longitudinally of the body and having their inner ends spaced apart and provided with open return bent portions, and fingers projecting from said last mentioned return bent portions and extending longitudinally of and above said arms.

11. A valve formed of spring metal and having a substantially flat body, arms projecting from the ends of said body inwardly longitudinally of and above said body, and having their inner ends spaced apart, and fingers projecting upwardly from the inner spaced ends of said arms and extending longitudinally of and above said arms, said body, arms and fingers being in superposed relation in the order named.

In testimony whereof I affix my signature.

FRED J. HEIDEMAN.