Jan. 10, 1933. P. PIRSCH 1,893,685

PUMP PULSATION REDUCING DEVICE

Filed July 28, 1930

Fig. 1.

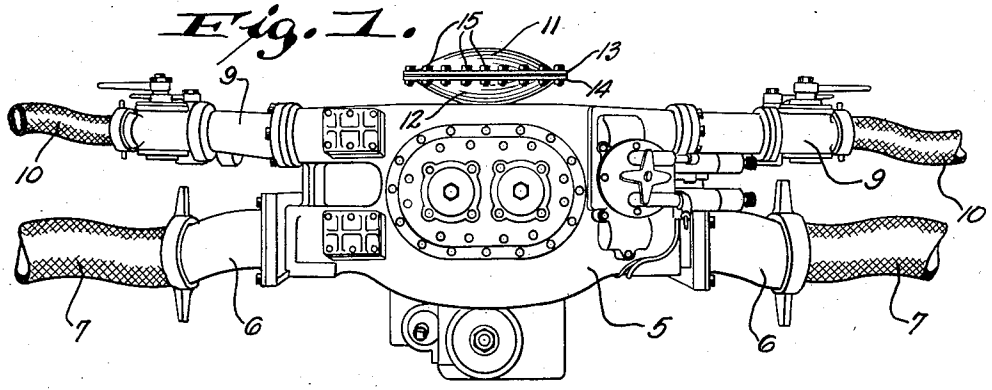


Fig. 2.

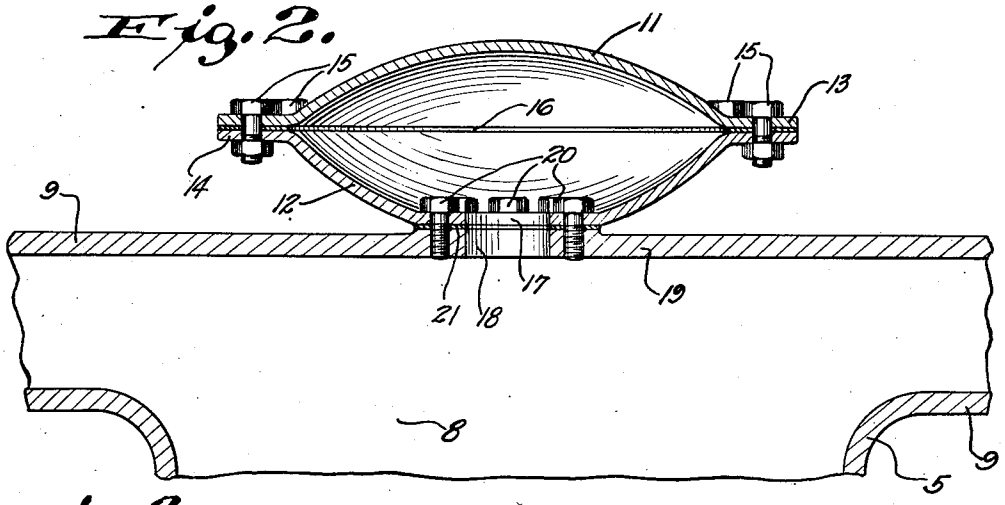
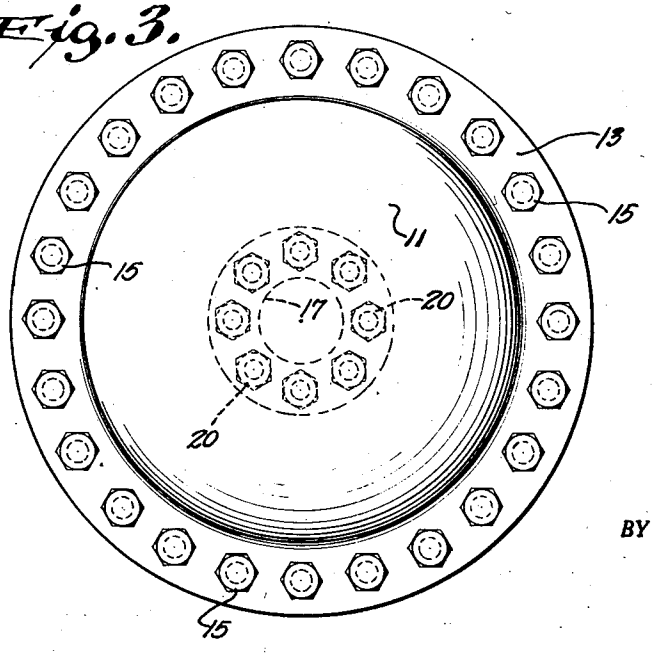


Fig. 3.



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UNITED STATES PATENT OFFICE

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PUMP PULSATION REDUCING DEVICE

Application filed July 28, 1930. Serial No. 471,354.

This invention relates to improvements in pump pulsation reducing devices.

When a rotary pump is used in hose lines, for fire apparatus or analogous uses, it has been found that the pump, when working at high pressures, delivers water from the suction side to the discharge side in "buckets" and each "bucket" or delivery produces a temporary increase in pressure, causing pulsations in the hose extending outwardly of the discharge side of the pump. This is objectionable because not only is it more desirable to have a delivery of water in which the pulsations are not appreciable, but the pulsations cause movements in the hose which subject it to severe wear and materially decrease the life of the hose.

It is, therefore, one of the objects of the present invention to overcome the aforementioned objections by providing a pump pulsation reducing device which will absorb pump pulsations, rendering negligible any tendency toward pulsations in a hose line leading outwardly of the discharge side of a pump.

A further object of the invention is to provide a device of the character described incorporated with a pump and in the form of an air filled flexible dome or shell, changeable in shape to absorb pump impulses, said device being adapted for ready incorporation with the ordinary forms of rotary or all positive displacement fluid pumps.

A further object of the invention is to provide a pump pulsation reducing device which is of very simple construction, is strong and durable, is automatic and efficient in its operation, is inexpensive to manufacture, and is well adapted for the purposes described.

With the above and other objects in view the invention consists of the improved pump pulsation reducing device, and its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawing in which the same reference characters indicate the same parts in all of the views:

Fig. 1 is a side view of a rotary pump equipped with the improved pulsation reducing device;

Fig. 2 is an enlarged longitudinal vertical sectional view of the pulsation reducing device and the pump portion on which it is mounted; and

Fig. 3 is a plan view of the pulsation reducing device.

Referring now more particularly to the drawing it will appear that the numeral 5 indicates a rotary fluid pump in which the suction side is entered by several tubular extensions 6 to which hoses 7 are connected, said hoses leading from a source of supply (not shown) and being adapted to deliver a steady supply of water to the suction side of the pump.

The internal mechanism of the pump is of well-known design and liquid entering the interior of the pump from the lines 7 is transferred to the discharge side of the pump by the rotary pump mechanism (not shown) in "buckets" or distinct deliveries. Extending outwardly of the discharge chamber portion 8 of the pump are tubular extensions 9 to which the inner ends of hoses 10 are attachable, the liquid being pumped at high pressures through one or more of said hoses.

The pulsation reducing device per se comprises a pair of complementary, oppositely curved plates 11 and 12 formed of spring steel, or a similar yieldable or resilient material. Both members 11 and 12 are formed around their peripheries with annular, complementary flanges 13 and 14, which, in the device are in juxtaposition and said plates 11 and 12 are secured together by bolts 15 extended through said flanges. As shown in Figs. 1 and 2 the joined plates 11 and 12 form a hollow body or container, normally of ovate form in vertical section. Air is, of course, housed within said hollow body. To prevent leakage a gasket 16 is interposed between the adjacent faces of the flanges 13 and 14.

The bottom portion of the lower plate 12 is flattened and is provided with a circular opening 17 of a substantial size. When the pulsation reducing device is installed on a pump it is mounted on the medial top portion of the pump casing with the opening 17 in registration with a similar opening 18 formed

in the pump casing portion 19. Bolts 20 extend through the lower flattened portion of the plate 12 and the casing portion 19 to secure the device to the pump. Also, a gasket 21 is interposed between adjacent surfaces of the members 12 and 19.

In the operation of the device the pump functions in the usual manner and water or liquid entering the pump chamber through the suction hoses 7 is delivered by the rotary pump mechanism into the upper chamber portion in "buckets" for discharge through the discharge hoses 10. Ordinarily the flow of water through the hoses 10 is in impulses under high pressure, which causes the hoses to move or vibrate, subjecting them to undue wear. With the installation of the present device on a pump, however, and in connection with the interior of the upper chamber portion of the pump, said impulses, shocks or vibrations are eliminated. A quantity of air is, of course, housed within the plates 11 and 12 and with impulses of the pump the members 11 and 12 expand and contract with respect to each other between impulses. Due to the flexibility of the plates 11 and 12 each impulse causes said hollow body formed by the plates 11 and 12 to attempt to assume a spherical shape. In this manner the pulsations of the pump are absorbed within the body 11—12 and said impulses do not, to any appreciable extent, reach the discharge hoses.

While the improved air dome has been illustrated and described in connection with a rotary pump, it should be understood that its incorporation with any form of positive displacement pump is within the spirit of the invention.

From the foregoing description it will be seen that the improved pump pulsation reducing device is both simple and novel, and is well adapted for the purposes set forth.

What is claimed as the invention is:

1. The combination, with a pump, of an entirely flexible, hollow, air containing metallic body connected thereto and having an opening in communication with the pump chamber to absorb pump pulsations, the interior of said body being unobstructed.

2. In combination with a liquid pump having a chamber with an opening therein, of an air-filled entirely resilient shell of ovate form in longitudinal section secured to said pump, said shell having an opening therein in register with the opening in said pump chamber and the interior of said shell being unobstructed, an impulse of the pump causing a pressure variation within the shell to flex it to a form approaching spherical, said shell being composed of a pair of complementary spring metal, dished plates secured together at their meeting edge portions.

3. A pulsation absorber for a positive displacement liquid pump, comprising a pair of dished, complementary half sections of uniform construction and formed of yieldable metal and secured together at their adjacent edge portions to provide an entirely hollow yielding shell of ovate form, said device being mountable on a pump casing and one of said half sections having an opening therein to communicate with a chamber of the pump.

In testimony whereof I affix my signature.

PETER PIRSCH.