Sept. 17, 1929. E. J. DE VILLE 1,728,788

DIVISION PLATE FOR PUMPS

Filed Dec. 7, 1926

Fig. 1

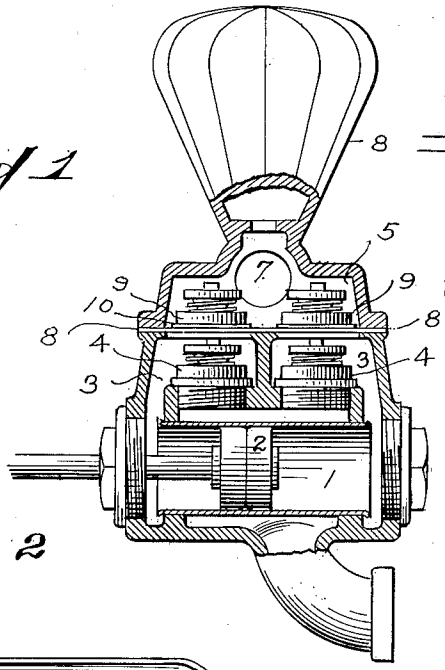


Fig. 5

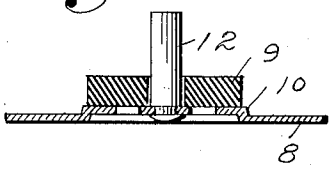


Fig. 2

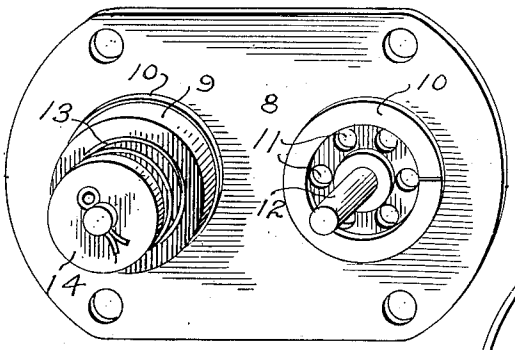


Fig. 3

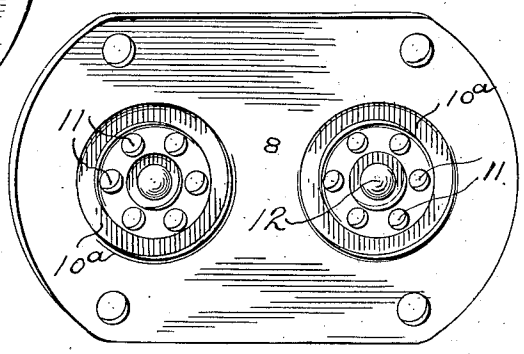
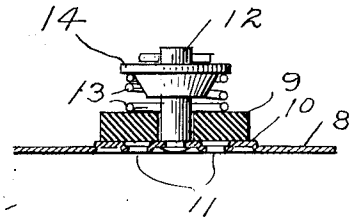


Fig 4.



Inventor

Edward J. De Ville

By L. E. Walker

Attorney

Patented Sept. 17, 1929 1,728,788

UNITED STATES PATENT OFFICE

EDWARD J. DE VILLE, OF DAYTON, OHIO, ASSIGNOR TO THE MONARCH ENGINEERING COMPANY, OF DAYTON, OHIO, A CORPORATION OF OHIO

DIVISION PLATE FOR PUMPS

Application filed December 7, 1926. Serial No. 153,105.

My invention relates to pumps of the horizontal reciprocating type and more particularly to the provision of a division plate between the suction and discharge chambers of such pump, having a valve seat or seats for the discharge valves formed integral with such plate.

It has been customary to provide valve seats, usually of brass, as independent units which are screwed into the division plate. Such valve seats require careful machining in manufacture and involve comparatively expensive production. When the occasion arises for replacement of such valves, they are difficult to remove from the division plate, due to corrosion.

In the present invention there is contemplated the production of a division plate with one or more valve seats formed thereon as a single integral unit. The valve seats are preferably formed by embossing the plate by a stamping or pressing operation, by which the valve seat area is elevated above the plane of the plate. The division plates however may be cast or otherwise formed with an integral valve seat area projecting from one face thereof. Such plates with integral valve seats may be produced sufficiently cheaply to permit the entire plate to be discarded and a new one substituted whenever the valve seats become worn or otherwise require replacement.

One of the primary objects of the present invention is to simplify the structure as well as the manner of replacing valve seats for pumps and the like, whereby they will not only be cheapened in construction, but will be more efficient in use, compact in form, economical in production, facilitate replacement, and unlikely to get out of repair.

A further object of the invention is to provide as an article of manufacture, a division plate and one or more valve seats integral therewith.

With the above primary and other incidental objects in view as will more fully appear in the specification, the invention consists of the features of construction, the parts and combinations thereof and the mode of operation, or their equivalents, as hereinafter described and set forth in the claims.

In the drawings, wherein is shown the preferred, but obviously not necessarily the only form of embodiment of the invention, Fig. 1 is a sectional view of a typical horizontal power pump assembly, embodying the present invention. Fig. 2 is a perspective view of the top of the division plate forming the subject matter hereof. Fig. 3 is a similar view of the under side of the plate. Fig. 4 is a transverse detail sectional view. Fig. 5 is a sectional view of a modification.

Like parts are indicated by similar characters of reference throughout the several views.

Referring to Fig. 1 of the drawing which shows a typical pump construction, 1 is the cylinder, and 2 the reciprocating piston therein. The opposite ends of the cylinder communicate with intake or suction chambers 3—3 having inlet valves 4—4. Above the suction or intake chambers is the discharge chamber 5, with which communicates the air dome 6 and from which leads the discharge conduit 7.

The discharge chamber and suction chambers are separated by a division plate 8 supporting discharge valves 9—9 which forms the subject matter hereof. Ordinarily the valves 9—9 are provided with independently formed valve seats screwed into the plate 8, which is usually quite thick and made of cast iron. The usual valve seats are quite bulky and support the valves in elevated relation above the plate. They become fixedly attached to the plate by rust and corrosion and are difficult to remove for replacement or repairs. Such plate and separately formed valve seats are too expensive in construction to justify discarding the entire plate and both valve seats when only one seat may be defective.

In the present instance the plate 8 is of sheet metal and preferably of brass, although other materials may be employed. The seats 10 for the valves 9 in the preferred construction are embossed in the plate from the under side, and are indented as at 10^a on the under side. They project from the upper face as

an annular flat surface, elevated slightly above the face of the plate, upon which the valves 9 seat.

Within the annular flat seating surfaces 10 are formed a series of perforations 11 for the passage of liquid from the chambers 3 to the chamber 5.

While in the preferred construction the raised seating surface is annular and the perforations 11 are in the enclosed area below the level of the seating surface, obviously the perforated portion and seating surface may be in the same plane as shown in Fig. 5.

Located centrally within the raised seating area is a valve guide stud 12, secured to the plate by riveting or "staking," soldering, brazing or other suitable means. The disc valve 9 is slidingly mounted on the guide stud 12 and is urged toward the valve seat by a helical spring 13 reacting against a collar 14 upon the stem 12 in the usual manner.

A division plate with integral valve seats may be so cheaply manufactured, that the replacement of the entire plate is justified in making repairs, and thus the difficulty of removing valve seats from the plate and regrinding and repairs of valve seats are entirely obviated. Such a replacement of the plate with integral valve seats can be effected by one unskilled in pump mechanics, and without the use of special tools and equipment.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific details shown, but that the means and construction herein disclosed comprises the preferred form of several modes of putting the invention into effect and the invention is, therefore, claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim:

1. A plate forming a division wall between two adjacent chambers of a pump, a valve seat formed integral with said plate by indenting one side of the plate to form a corresponding projecting area on the opposite side thereof having a flat top surface to receive a valve, said plate being perforated within the area forming the valve seat, and a stud secured to the plate within the perforated area forming a support and guide for a valve.

2. A plate of sheet material forming a division wall between adjacent chambers of a pump and adapted to be clamped between separable chambered members, an annular flat topped embossed area on said sheet material plate forming an integral valve seat, the plate being perforated inside said annular embossed area, and a valve guide stud carried by the plate.

3. In a construction of the character described, a division plate of sheet material for pump chambers, and an integral raised valve seat formed thereon by offsetting a portion of the material out of the normal plane of the plate, said plate being perforated within the raised valve seating area and a valve guide stud disposed within said area.

4. In a construction of the character described, a division plate of sheet metal for pump chambers, a valve seat stamped from the sheet metal plate and projecting therefrom, a stud carried by the plate, a series of perforations in the plate surrounding the stud, and a valve member mounted on the stud and seating upon the stamped valve seat over said perforations.

5. In a construction of the character described, a division plate for pump chambers, said plate being indented on its under face, a raised valve seat surface formed on the opposite face of the plate by such indentation, said plate being perforated within the margin of such indentation, and a valve guide stud carried by the plate in centrally disposed relation with the indentation and raised valve seating surface.

6. As an article of manufacture, a division plate for pump chambers, two spaced integral valve seats formed thereon and defined by annular indentations in one face of the plate and corresponding elevated annular surfaces upon the opposite face of the plate, the plate being perforated within the annular indented areas, and fixed studs located within such perforated areas.

7. A division plate for pumps forming a division wall between adjacent chambers, an annular flat topped embossed area in said plate forming an integral valve seat, the plate being perforated interiorly of said embossed area, and a valve guide stud carried by the plate.

In testimony whereof, I have hereunto set my hand this 26th day of November, A. D. 1926.

EDWARD J. DE VILLE.