

J. MILBURN.

PUMP.

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1,005,270.

Patented Oct. 10, 1911.

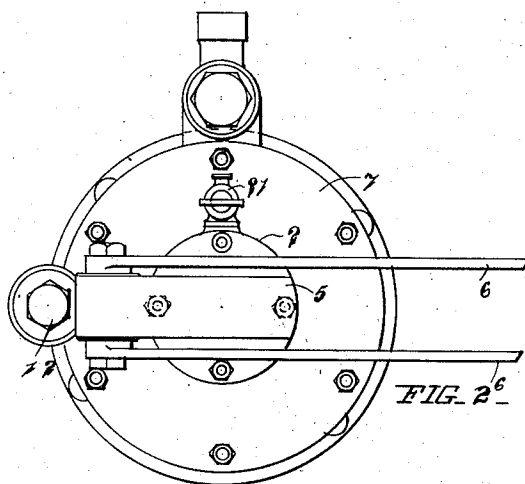


FIG. 2-

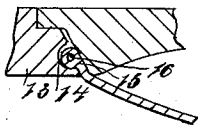


FIG. 3-

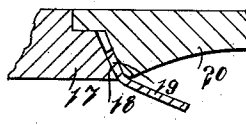


FIG. 4-

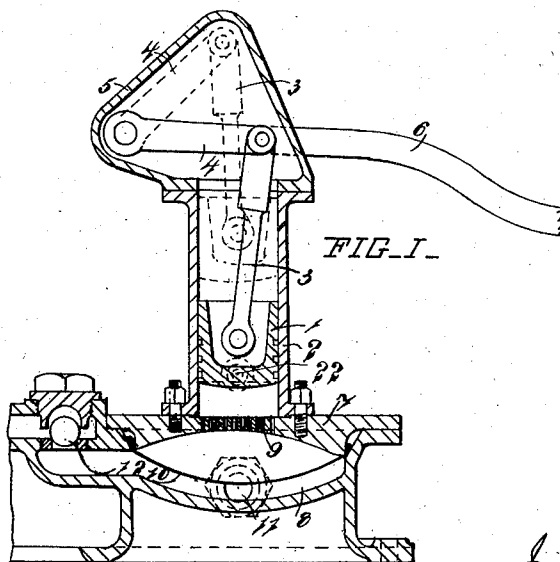


FIG. 1-

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UNITED STATES PATENT OFFICE.

JOSEPH MILBURN, OF HAVELOCK NORTH, NEW ZEALAND.

PUMP.

1,005,270.

Specification of Letters Patent.

Patented Oct. 10, 1911.

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To all whom it may concern:

Be it known that I, JOSEPH MILBURN, a citizen of the Dominion of New Zealand, and residing at Havelock North, in the Provincial District of Hawkes Bay, in the Dominion of New Zealand, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

10 The invention relates to the class of pumps used especially for pumping chemicals and the like, or water containing grit and other impurities, the special object to be attained being to prevent the liquid being pumped
15 from coming in contact with the pump cylinder and piston.

According to my present invention, a pump cylinder having a piston reciprocable within it, is in communication with a chamber in which is a partition or diaphragm of flexible material dividing the chamber into two compartments. Liquid is employed in the cylinder below the piston, and when the piston is reciprocated, the flexing of the diaphragm causes the fluid it is desired to pump to be alternately drawn into and expelled from the chamber upon the side of the diaphragm opposite the piston.

My invention is illustrated in the accompanying drawing wherein:—

Figure 1, is a front sectional elevation, Fig. 2, a plan, and Figs. 3 and 4 part sectional elevations.

The piston 1 is reciprocated within the pump cylinder 2 by the rod 3 connected to the lever 4 working within the casing 5 and operated by a hand lever 6.

The pump cylinder is fixed upon the cover 7 of a chamber 8 with which it communicates through ports or passages 9 in the cover.

A circular diaphragm 10 of flexible material, preferably canvas coated with rubber, is clamped around its circumferential edge between the cover and the top of the chamber and forms a flexible partition entirely dividing the upper from the lower part of the chamber. The chamber below the diaphragm communicates with an inlet valve 11 and discharge valve 12.

Fig. 3 illustrates another method of clamping the circumferential edge of the diaphragm between the top of the chamber and the cover. The chamber 13 has a recess 14 which receives the circumferential edge

15 of the diaphragm, which is turned over a continuous wire ring 16.

In Fig. 4 the top of the chamber 17 has a flat inclined face 18, and the edge of the diaphragm 19 is clamped between it and the cover 20.

It is obvious that there are many ways in which the edge of the diaphragm may be clamped between the top of the chamber and the cover.

In operation, in starting the pump, a cock 21 which is fitted to a port 22 on the side of the pump cylinder is opened. The piston is then removed and the cylinder charged with water up to the level of the port 22. The piston is then replaced and depressed to the limit of its stroke, which is the lower edge of port 22, water and air being expelled through the cock 21, which is then closed. Upon the piston being raised, the diaphragm is drawn up in the recess of the cover and the partial vacuum created beneath it causes the liquid it is desired to pump to enter through the inlet valve 11, and when the piston is returned, to be discharged through the discharge valve 12. The cover and chamber are preferably so shaped that the circumferential edge of part of the diaphragm is higher on the side nearest the discharge valve than upon the opposite side, so that there is no liability for air to accumulate and thus form an air lock in the part of the chamber opposite the valve. This is clearly shown in Fig. 1 referring to which it will be seen that the inlet port, controlled by the valve 12, communicates with the lower chamber of the casing directly below the highest portion of the flexible diaphragm. The upper surface of such port is in line with the diaphragm where the latter springs away from the beveled surface of the casing.

What I do claim and desire to secure by Letters Patent of the United States is:—

1. In a pump of the character described, the combination of a casing having a removable top or cover, a flexible diaphragm dividing the interior of the casing into two chambers and having its edge secured between the body of the casing and the said cover, a portion of said edge being higher than other portions thereof, an inlet communicating with the chamber beneath the diaphragm, an outlet communicating with the chamber below the diaphragm adjacent the elevated portion of the edge of the lat-

ter, a cylinder communicating with the chamber in the casing above the diaphragm, and a piston in said cylinder.

2. In a pump of the character described,
5 the combination of a casing provided with inlet and outlet ports, the latter being in a plane above that of the inlet port, a flexible diaphragm extending across the interior of the casing and inclined upwardly adjacent
10 the outlet port, both of said ports communi-

cating with the chamber beneath the diaphragm, a cylinder communicating with the chamber above the diaphragm, and a piston within the cylinder.

In testimony whereof I have affixed my 15 signature in presence of two witnesses.

JOSEPH MILBURN.

Witnesses:

ANNIE DOROTHY MCKENZIE,
ALEX ROSS.