

July 30, 1929.

F. SCHÜRMANN
SEALING PISTON FOR RESERVOIRS FOR THE STORAGE
OF GAS, STEAM, OR EASILY EVAPORATING LIQUIDS
Filed Nov. 12, 1927

1,722,863

2 Sheets-Sheet 1

Fig. 1

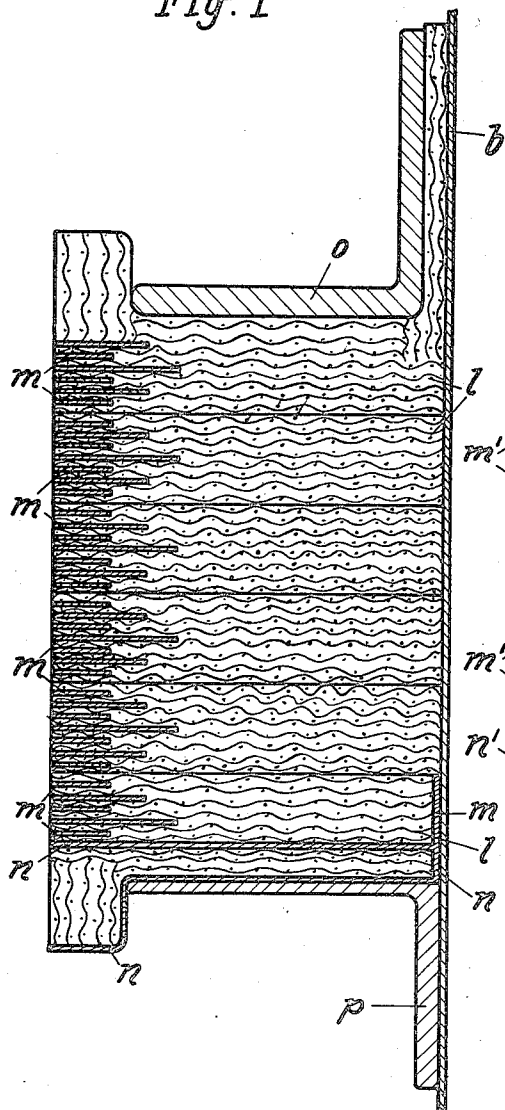
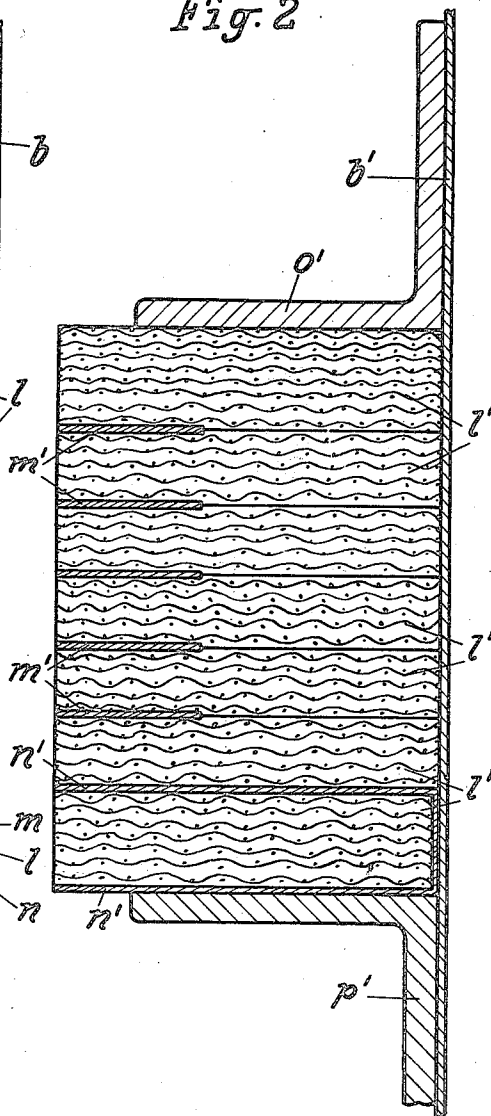


Fig. 2



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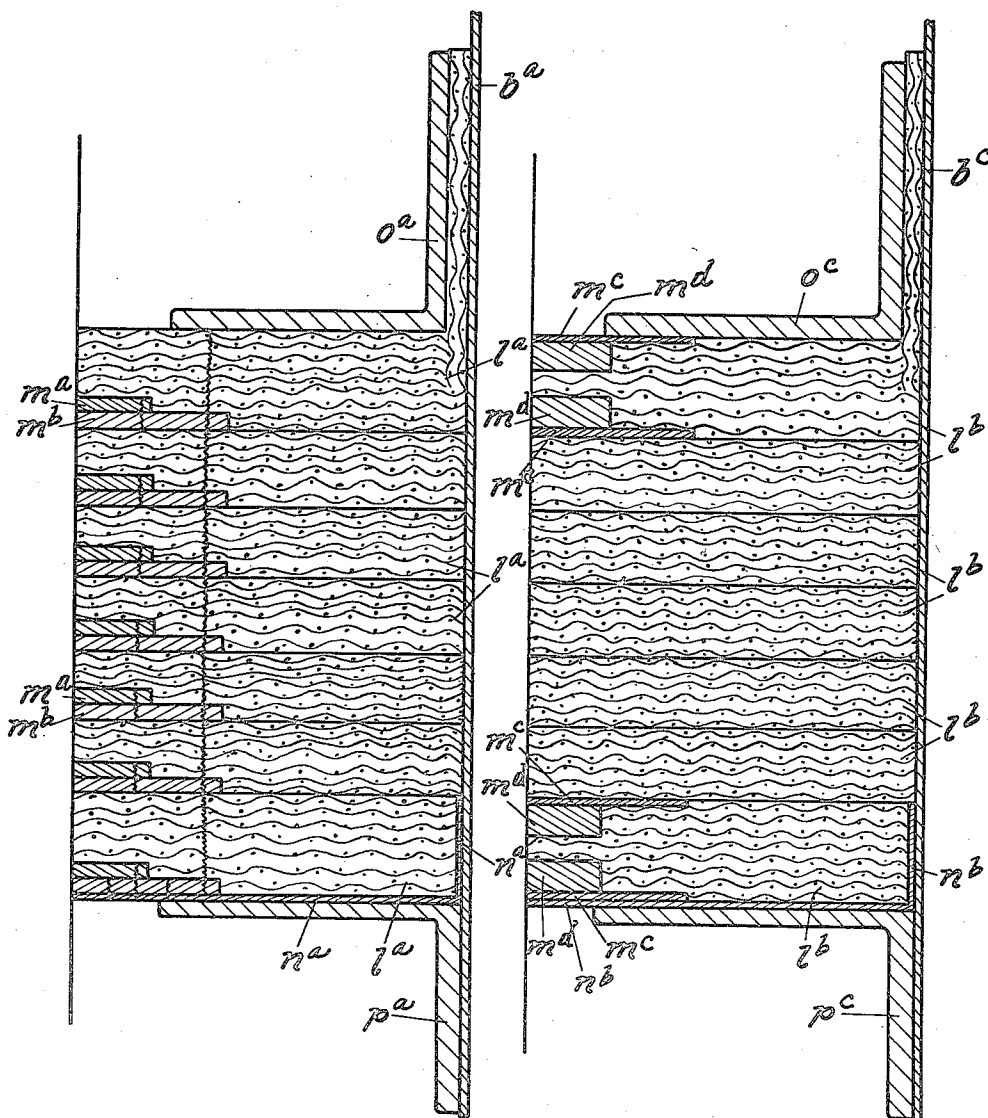
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Fig. 3

Fig. 4



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UNITED STATES PATENT OFFICE.

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SEALING PISTON FOR RESERVOIRS FOR THE STORAGE OF GAS, STEAM, OR EASILY-
EVAPORATING LIQUIDS.

Application filed November 12, 1927, Serial No. 232,874, and in Germany March 9, 1927.

The present invention relates to a further improvement of the sealing-piston disclosed in my patent-application Ser. No. 159,230 the packing-ring of which is supported by a closed, dilatable sheet-metal-ring and forced against the wall of the tank.

According to the present invention, the packing-ring consists of a number of superposed tissue- or fabric-rings, into which leather rings are embedded at least on the outer periphery. The thus produced packing-rings form an extraordinary safe and durable packing, particularly if greased with fish-oil or similar substances.

Compared with liquid-sealing the advantage exists that pumps and electro-motors are not required to pump the liquid, running down on the tank-walls up again. Attendants are furthermore not required to supervise pumps and electro-motors with their supply of current constantly. The packing, according to the present invention, can work without any kind of permanent attendance and it is only necessary to provide the same now and again with lubricating-material.

The novel packing-ring is illustrated in the drawings.

Figs. 1-4 show cross-sections of several modes of embodying the invention.

In the construction according to Fig. 1, the packing-ring provided on the dilatable sheet-metal-ring *b*, consists of six superposed tissue- or fabric-rings *l*. The packing-rings are for example made of cotton-fabric, which may be gummed. Leather rings *m* are embedded into the tissue-rings, which may extend over the entire width of the cross-section, but are preferably only provided on the outer periphery, whereby leather-material is saved. The outside diameter of the leather rings *m* is the same as the outside diameter of the tissue-rings *l*. In the illustrated example according to Fig. 1, every tissue-ring contains five to seven leather rings *m* having together a thickness of about 40 mm.

The lower tissue-ring *l* is on the bottom, the upper surface and inside provided with a protective layer *n* of kid-leather. It has been proved, that kid-leather is extraordinarily capable of resistance against illuminating-gas, offering consequently an excellent protection for the packing. On account of

the protective layer, the gas can not penetrate into the fabric thereby causing an eventual gumming. By means of angle-irons *o, p*, the whole packing ring is retained on the dilatable sheet-metal ring *b*.

The uppermost tissue-ring *l* differs from those disposed below by the fact, that it is designed angular, so that its inner flange can, by means of the upper angle-iron *o*, be screwed together gas-tight with the dilatable sheet-metal-ring *b*. Gas-bubbles, which could penetrate between the lower part of the packing and the dilatable sheet-metal-ring *b*, are retained at the uppermost tissue-ring. The sheet metal ring and the packing form a dilatable unit. The leather rings, embedded into the fabric prevent a premature wear of the fabric. On account of the flexibility of the packing-ring, every wear consequent to the pressure of the elastic sheet-metal-ring described in my patent application Ser. No. 159,230, is immediately automatically compensated.

In the construction according to Fig. 2, every tissue-ring *l'* carries on the upper surface thin leather rings *m'*, which may be pasted to the tissue-rings, having likewise the same outside diameter as the tissue-rings. The lowermost ring is protected by kid-leather *n'*. By means of angle irons *o'* and *p'* the whole packing ring is retained on the dilatable sheet metal ring *b'*.

The embodiment according to Fig. 3 shows the employment of stronger leather rings *m^a* and *m^b* of different inside diameters, but the same outside diameter as the tissue-ring *l^a*.

The leather rings have a total thickness of about 70 mm. and are preferably sewn together with the tissue-rings *l^a*. The lower tissue-ring *l^a* is in this case likewise provided with a perfection *n^a* of kid-leather. The packing is retained in position on a metal ring *b^a* by angle irons *o^a* and *p^a*.

In the construction according to Fig. 4, the uppermost and lowermost tissue-rings *l^b* are provided with embedded leather rings *m^c* only. Each one of these two rings contains two strong rings *m^d* and two thin rings *m^e*. The strong rings *m^d* are of larger inner diameter as the thin rings *m^e*. The leather rings are sewn on the tissue-rings. A protective layer of kid-leather *n^b* is here also

provided on the lowermost tissue-ring *b*^b. By means of angle irons *o*^c and *p*^c the whole packing is retained on the dilatable sheet metal ring *b*^a.

5 In all constructions embodying the invention, the tissue-rings and the leather rings consist of single longitudinal strips running in the peripheral direction of the ring. The joints of the various strips, preferably arranged by stages, are staggered towards one-
10 another.

I claim:—

1. In a sealing-piston for reservoirs for the storage of gas, steam or easily evaporating liquids an endless flexible and dilatable
15 sheet-metal ring and a packing supported by said ring, said packing consisting in a number of superposed tissue-rings and a number of leather rings embedded into said tissue-rings.
20 rings.

2. In a sealing-piston for reservoirs for the storage of gas, steam or easily evaporating liquids an endless flexible and dilatable sheet-metal ring and a packing supported by
25 said ring, said packing consisting in a number of superposed tissue-rings, and leather rings embedded into said tissue-rings, said leather rings having the same outside diameter as said tissue-rings.

3. In a sealing-piston for reservoirs for the storage of gas, steam or easily evaporating liquids an endless flexible and dilatable sheet-metal ring and a packing supported by
30 said ring, said packing consisting in a number of superposed tissue-rings and leather rings embedded into said tissue-rings, said leather rings having a greater inside diameter than said tissue-rings.
35

4. In a sealing-piston for reservoirs for the storage of gas, steam or easily evaporating liquids an endless flexible and dilatable sheet-metal ring and a packing supported by said ring, said packing consisting
40 in a number of superposed tissue-rings and

leather rings embedded into said tissue rings, 45 the lower tissue-ring having a lower protective ring of kid-leather.

5. In a sealing-piston for reservoirs for the storage of gas, steam or easily evaporating liquids an endless flexible and dilatable sheet-metal ring, a packing supported
50 by said ring, said packing consisting in a number of superposed tissue-rings and leather rings being embedded into said tissue-rings, said tissue rings being gummed. 55

6. In a sealing-piston for reservoirs for the storage of gas, steam or easily evaporating liquids an endless flexible and dilatable sheet-metal ring and a packing supported by
60 said ring, said packing consisting in a number of superposed tissue-rings and leather rings embedded into said tissue-rings, said leather rings being sewn together with said tissue-rings.

7. In a sealing-piston for reservoirs for the storage of gas, steam or easily evaporating liquids an endless flexible and dilatable sheet-metal ring and a packing supported by said ring, said packing consisting
70 in a number of superposed tissue-rings and leather rings embedded into said tissue rings, said leather rings being pasted together with said tissue-rings.

8. In a sealing-piston for reservoirs for the storage of gas, steam or easily evaporating liquids an endless flexible and dilatable sheet-metal ring and a packing supported by said ring, said packing consisting
75 in a number of superposed tissue-rings and leather rings embedded into said tissue-rings, the uppermost tissue-ring being of angular cross-section, the inner flange of said tissue-ring being screwed together with said dilatable sheet metal ring.
80

In testimony whereof I have affixed my 85 signature.

FRIEDRICH SCHÜRMANN.