J. E. PIOVESAN.

WATER PROTECTOR FOR OIL BEARINGS.

APPLICATION FILED FEB. 3, 1912.

1,038,953.

Patented Sept. 17, 1912.

2 SHEETS—SHEET 1.

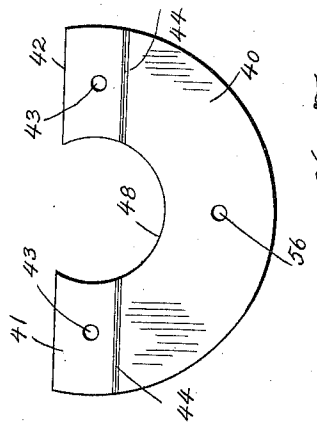

Fig. 7.

Fig. 1.

Fig. 6.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 4.

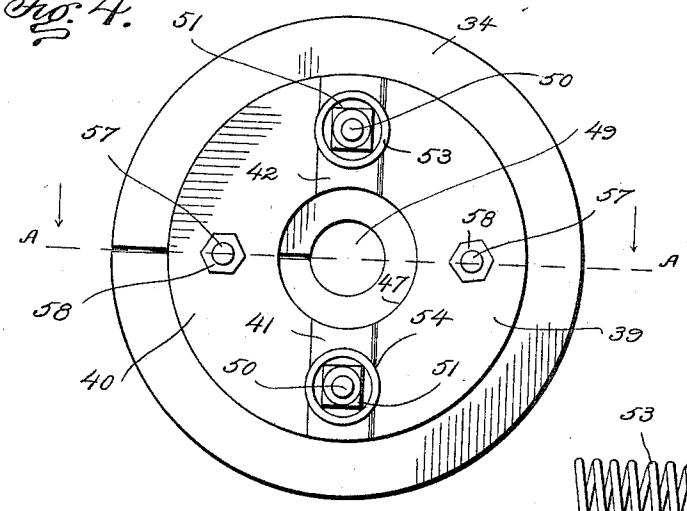
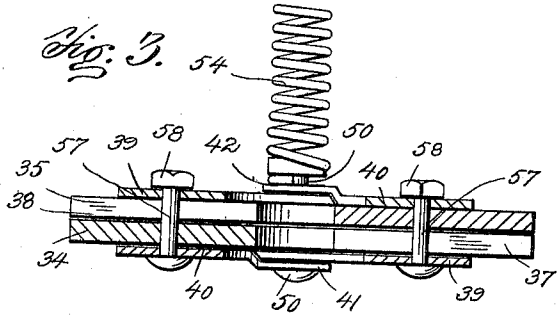


Fig. 3.



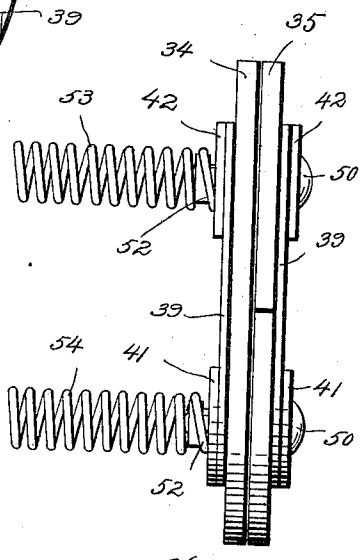


Fig. 2.

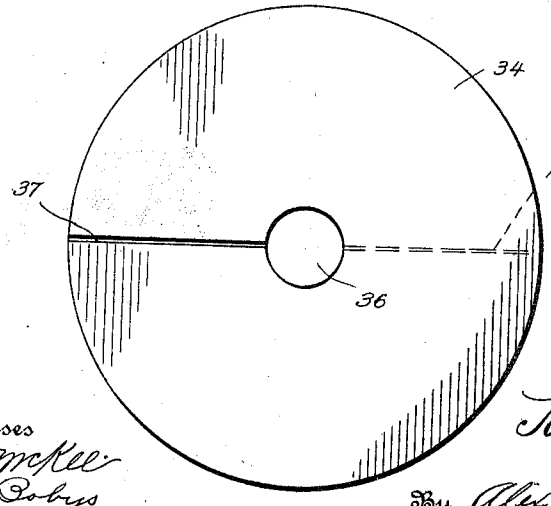


Fig. 5.

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WATER-PROTECTOR FOR OIL-BEARINGS.

1,038,953. Specification of Letters Patent. Patented Sept. 17, 1912.

Application filed February 3, 1912. Serial No. 675,201.

To all whom it may concern:

Be it known that I, JOSEPH E. PIOVESAN, a citizen of the United States, residing at Glassport, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Water-Protectors for Oil-Bearings, of which the following is a specification.

This invention relates to improvements in a water protector for oil bearings and more specifically to means for preventing the access of water into the oil bearings connected to a pump mechanism in which a piston rod or shaft is to be immersed in oil to lessen friction.

In its broadest aspect my invention consists in a suitable device intended to engage the walls of the oil box through which the shaft or piston passes and includes means for holding said device in position, the arrangement described will coöperate in performing the function with the condenser of the pump provided with my invention.

The object of my invention consists in providing a simple, inexpensive and highly efficient protector for oil bearings, which is intended to be a substitute for packing in that it is effective in providing a water tight joint between the oil box, the shaft or piston passing through the oil box, and the water chamber of the pump.

The device may be easily attached to a pump and may be readily removed from operative position.

With the above and other objects in view my invention consists in the combination, arrangement and details of construction shown in the drawing and then more particularly pointed out in the appended claims.

Similar reference characters designate similar parts throughout the respective views of the drawings, wherein,

Figure 1 is a side elevation, partly in section of a vacuum condensing pump in which my protector for oil bearings is vertically disposed, Fig. 2 is a vertical elevation of the protector which I have devised, Fig. 3 is a cross sectional view of the protector taken on the line A—A of Fig. 4, Fig. 4 is a top plan view of the protector, Fig. 5 is a top plan view of the leather disks forming part of the protector, and Figs. 6 and 7 are respectively top plan detail views of brass plates coöperating to clamp the leather disks together.

Referring to the drawings, which are merely illustrative of the invention, a vacuum condensing pump 1 is shown in Fig. 1, as one type of pump to which my protector may be applied, it being understood that my protector may be mounted within pumps of different constructions without departing in principle from the invention to be disclosed.

I will describe the parts of the vacuum condensing pump and will then show the manner in which my protector is attached and mounted therein.

The pump 1 is composed of the condenser 2 at the upper end of which a water conducting pipe 3 is suitably connected, which as clearly shown in Fig. 1, is also connected by an offset branch to a pipe 5 connected by an elbow 6 to a pump 8 in the conventional manner, said pipe 3 leading to a river or any other source of water supply. A rotary fan 7 works in the pump 8 in the manner known to those skilled in the art to force water through the pipe 9 which is also connected at 10 to the upper end of the condenser 2. Said pipes 3 and 9 have vertical downwardly extending offsets 11 and 12 disposed in the condenser 2, and conducting water in such a way that the rotary fan 13, disposed in chamber 14 of the lower end of the condenser 2 may be set in motion to turn the shaft 15 in order that the pump may begin its work. The shaft 15 projects at opposite sides of the condenser 2 and passes through the stuffing boxes designated 16 and 17 respectively, which are mounted in said condenser, as shown in Fig. 1. The glands 18 and 19 are screw-threaded into the stuffing boxes 16 and 17 in the conventional manner to compress the packing 20 and 21 disposed in said stuffing boxes respectively. The stuffing boxes 16 and 17 project downwardly of the condenser 2 into the chambers 22 and 23 respectively in each of which my protector is mounted in operative position, said chambers being fastened to said condenser by any suitable means, such as bolts 24.

Secured by any suitable means such as bolts 25 upon the walls of the chambers 22 and 23 respectively are the horizontally disposed oil boxes 26 and 27 respectively adapted to be filled with oil surrounding the inclosed shaft 15.

Disposed in a suitable compartment 29 at the point where the vacuum pump is con-

nected to the pump 8 is one of the protectors which I have devised, it being understood that said protectors will be disposed at all suitable places in the pump mechanism where it is important to prevent access of water, supplied by a suitable source, into the adjacent oil boxes.

30 designates a suitable water supply pipe to which are connected the valve controlled pipes 31 and 32 respectively, which pipes empty into the stuffing boxes 17 and 16, as clearly shown in Fig. 1.

33 indicates a discharge pipe through which the water pumped by the rotary fan 13 is caused to pass.

Having described the parts of the vaucum condensing pump, I will now describe the protector which consists in two rigid disks 34 and 35 respectively, which may be made out of any suitable material but preferably out of leather and which are formed of equal diameter and with a central opening 36 through which the shaft 15 may snugly pass. The disks 34 and 35 are split respectively at 37 and 38 in order that they may readily be mounted upon the shaft without causing the removal of any parts. It will be understood that the slits 37 and 38 are disposed radially of each disk and that when said disks are clamped the disks will be so disposed in overlying position that the slits 37 and 38 will be in alinement, as clearly shown in Fig. 5, to substantially form a diameter line. Any suitable means may be provided for causing said disks 34 and 35 to readily engage each other so as to form substantially a single solid cylindrical member. By way of illustration I have provided brass bearing plates composed of two sections having their ends overlapped, said plates being substantially cylindrical in contour and arranged to overlie each of the disks 34 and 35. In Figs. 6 and 7 are shown the brass sections 39 and 40 which are shown in the shape of segments of a cylinder, the segment 40 being formed with the stepped portions 41 and 42 formed each with an opening 43 adapted to register each with the openings 44 formed in the brass segment 39. It will be understood that there are two cylindrical brass plates which have segments similar to these shown in said figures, said segments being joined by causing the shoulders 44 formed by the portions 41 and 42 of the segment 40 to engage the edges 45 and 46 of the segment 39, so that the portions 41 and 42 of segment 40 may overlie the ends of the segment 39 having the edges 45 and 46; segments 39 and 40 are formed with the dished concave openings 47 and 48 respectively which will form the opening 49 sufficiently large to admit the shaft 15 to be surrounded by the leather disks 34 and 35. The segments 39 and 40 having been joined in the manner stated, they will be applied centrally against one of the leather disks and the screw bolts 50 will then be passed through the openings 43 and 44 respectively of the segments 40 and 39 and through the leather disks 34 and 35 so as to project through the opposite disk. The similar segments 39 and 40 having been joined will be mounted centrally upon said last named disk and the overlapping stepped portions 41 and 42 of the segments 40 will be disposed in such a position that the projecting ends of the bolts 50 may pass through the openings 44 and 43 respectively of the segments 39 and 40 and said bolts will project through said last named openings to receive the nuts 51 which will be screw-threaded thereupon and against the bottommost convolution 52 of each of the coil springs 53 and 54 respectively, shown clearly in Fig. 2. Through the openings 55 and 56 respectively of the brass segments 39 and 40, which openings are vertically disposed at diametrically opposite points will be passed brass screw bolts 57 which will initially pass through the openings of one of the brass plates, through the two leather disks and through the oppositely arranged brass plate and projecting therefrom will receive the brass nuts 58. The brass nuts 58 and the nuts 51 will be screwed home tightly to cause the brass plates formed by the segments 39 and 40 to rigidly clamp the two leather disks 34 and 35 together. The oppositely arranged coil springs 53 and 54 mounted upon one of the brass plates are intended to engage the glands of the stuffing boxes 16 and 17 mounted in the condenser 2, as shown in Fig. 1.

The protector composed of the leather disks, brass plates and springs 54 and 55 will be placed in operative position by passing the split leather disks and brass plates attached thereto over the shaft 15, the latter fitting the openings 36 in said disks snugly, and by causing one of the brass plates to overlie the wall intervening between the compartment 22 and the oil box 26 and the leather disks will preferably fit snugly in the chamber 22, the opening in which may be cylindrical to accommodate them. The free ends of the coiled springs 53 and 54 will be clamped by the nuts 60 against the bolts 59 mounted upon the glands 18 and 19 screw-threaded respectively into the stuffing boxes 16 and 17. After the glands have been screwed home in their stuffing boxes, as shown in Fig. 1, the end convolutions of the springs will be secured thereto by said nuts 60 and there will be sufficient tension in said springs to hold the protector in contact with the adjacent walls of the oil boxes.

For the purpose of creating a water seal in the stuffing boxes, when the air compressing agency is at work forcing air out of the condenser 2 into and through the pipe 33,

water may be caused to engage the packing 16 and 17 disposed in and compressed by the glands of said stuffing boxes, through the valve controlled pipes 31 and 32 leading from the main water supply pipe 30'. The object of moistening the packing is to prevent air from passing into and through the stuffing boxes and by surrounding shaft 15 as it rotates finding its way into the chamber 14 of the condenser 2, a tendency which would operate to destroy the vacuum in said chamber necessary to admit water thereinto through pipes 3 and 10. Owing to the great speed with which said shaft is rotating when pumping, it has been found in practice that the water in the packing and stuffing boxes, would by centrifugal action be spread out in films upon the shaft and be carried by the rotating shaft into the oil boxes 26 causing said water to mix with the oil with the known deleterious effect. This would be the case were it not for the protectors which I have mounted in the chambers 22 and 23 and surrounding the shaft immediately where the oil boxes are connected to said chambers. The leather disks snugly embracing the shaft will prevent the access of the films of water into the oil-boxes and in this connection it should be noticed that should the glands be partially unscrewed so as to allow the packing slightly to distend, the springs 53 and 54 will only be compressed more firmly and thereby clamp said disks more rigidly against the shaft and said plates against the wall of the oil chamber, at the very moment the water in the oil chamber will engage a larger surface of the rotating shaft. The springs are therefore arranged to prevent the protectors from moving away from the oil bearings. The brass plates will withstand the corrosive action of the water. The protector mounted in the compartment 29 is connected in the manner above described to the gland 61 of the stuffing box 62, and is disposed at the point of connection between the pump and the oil-box 27 which it protects against water entering at the side of the oil-box opposite the protector mounted in the chamber 23. By reason of the arrangement of the protector relatively to the stuffing boxes, the expense of providing packing in the condenser is avoided, a practice which does not result in keeping the oil out of the bearings.

Numerous modifications may be resorted to in practice without departing in principle from the invention disclosed.

I claim and desire to secure by Letters Patent:

1. In combination with a shaft, a water chamber in which said shaft is mounted, and a shaft bearing mounted in said water chamber, a housing surrounding said shaft bearing secured to said chamber, a plurality of flexible members disposed within said housing and snugly embracing said shaft, means for rigidly joining said members, an oil box against a wall of which said members bear, and means connected to said shaft bearing and said joined members for holding the latter against said wall.

2. In combination with a shaft, a water chamber, a stuffing box in said chamber surrounding said shaft and having a water charged packing, a housing mounted upon said water chamber, an oil box for said shaft mounted upon said housing, a plurality of leather disks snugly embracing said shaft, segmental plates disposed in overlapping relation against the sides of the outer disks, means for clamping said plates against said disks and means mounted on the stuffing box engaging said disks to hold them against a wall of said oil-box.

3. In combination with a shaft, a water chamber, a stuffing box in said chamber, surrounding said shaft and having a water charged packing, a housing mounted upon said water chamber, an oil box for said shaft mounted upon said housing, a plurality of leather disks snugly embracing said shaft, segmental brass plates disposed in overlapping relation against the sides of the outer disks, means for clamping said plates against said disks, and means carried by said stuffing box for resiliently holding said disks against the wall of the oil box.

4. In combination with a shaft, a water chamber, a stuffing box in said chamber surrounding said shaft and having a water charged packing, a housing mounted upon said water chamber, an oil box for said shaft mounted upon said housing, a plurality of split leather disks snugly embracing said shaft, a pair of brass segmental plates, one plate of each pair formed with stepped segmental ends arranged to overlie the ends of the other plate to form a cylinder, each cylinder arranged to overlie the surface of an outer leather disk, screw bolts tapped through the opposing plates and through the leather disks to join the latter, and means mounted in said housing for resiliently holding said disks against the wall of an oil box.

5. In combination with a shaft, a water chamber, a stuffing box in said chamber surrounding said shaft and having a water charged packing, a housing mounted upon said water chamber, an oil box for said shaft mounted upon said housing, a plurality of leather disks snugly embracing said shaft, a pair of brass segmental plates, one plate of each pair formed with stepped ends arranged to overlie the ends of the other plate to form a cylinder, each cylinder arranged to overlie the surface of an outer leather disk, brass screw bolts tapped through the opposing

plates and through the leather disks to join the latter, and a plurality of coiled springs secured to one of said cylinders and connected to said stuffing box.

6. In combination with a shaft, a water chamber, a stuffing box in said chamber surrounding said shaft and having a water charged packing, a housing mounted upon said water chamber, an oil box for said shaft mounted upon said housing, a plurality of split leather disks snugly embracing said shaft, a pair of brass segmental plates, one plate of each pair formed with stepped ends arranged to overlie the ends of the other plate to form a cylinder, each cylinder arranged to overlie the surface of an outer leather disk, a plurality of springs connected to said stuffing box, brass bolts passing through said plates and disks to rigidly join the latter, and brass bolts passing through the stepped portions of said overlapping plates, through said disks, and brass nuts upon the last named bolts engaging the free ends of said springs, said springs arranged to hold said disks against a wall of said oil-box.

7. In combination with a shaft, a water chamber, a stuffing box in said chamber surrounding said shaft and having a water charged packing, a housing mounted upon said water chamber, an oil box for said shaft mounted upon said housing, a plurality of leather disks snugly embracing said shaft, a pair of brass segmental plates, one plate of each pair formed with stepped ends arranged to overlie the ends of the other plate to form a cylinder, each cylinder arranged to overlie the surface of an outer leather disk, a plurality of springs connected to said stuffing box, brass bolts passing through said plates and disks to rigidly join the latter, and brass bolts through said overlapping plates, through said disks and having their heads engaging the free ends of said springs, said springs arranged to hold said disks against a wall of said oil-box.

8. In a shaft bearing, a shaft, an oil box and a water chamber, a flexible member embracing said shaft and means for holding said member adjacent the wall dividing said box and chamber, said means consisting of springs, a stuffing box projecting into said chamber, said springs secured to said stuffing box.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH E. PIOVESAN.

Witnesses:
THOMAS CORCORAN,
W. H. SMITH.