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2,459,534

MAGNETIC SEPARATOR FOR FLUID SYSTEMS

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FIG. 1.

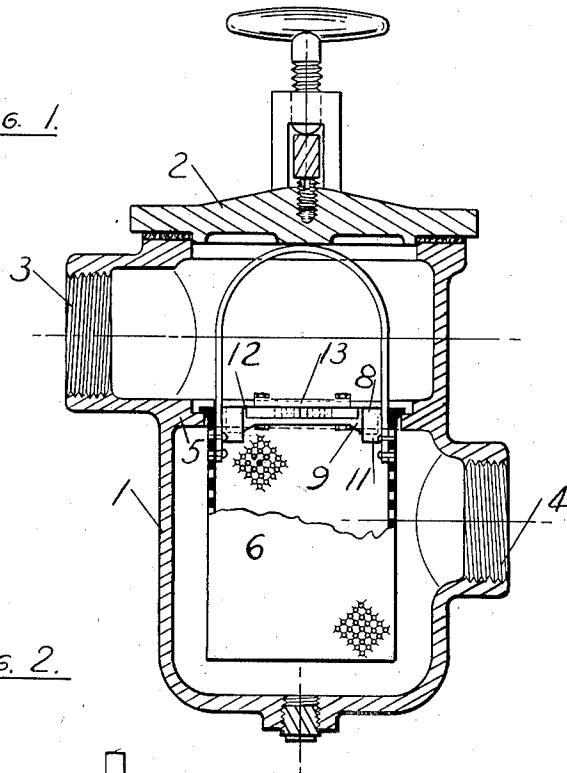


FIG. 2.

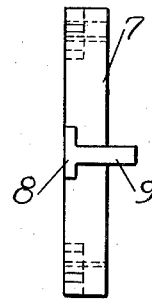
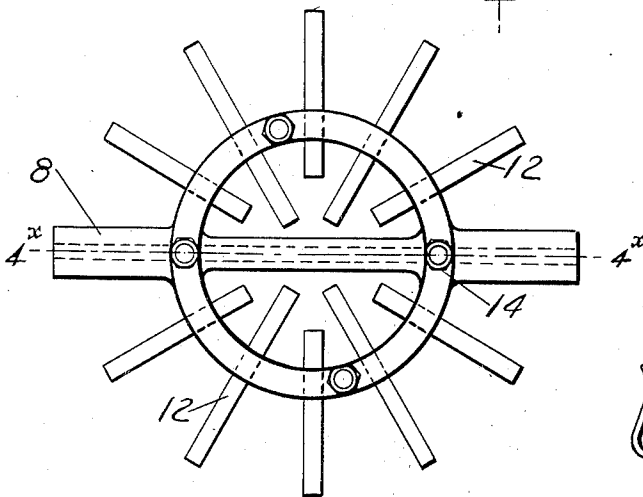


FIG. 3.

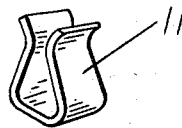


FIG. 5.

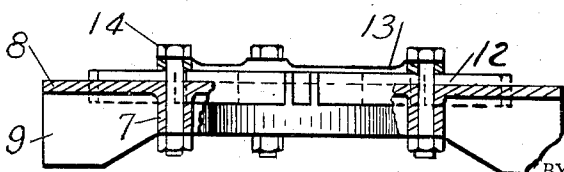


FIG. 4.

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MAGNETIC SEPARATOR FOR FLUID SYSTEMS

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4 Claims. (Cl. 210-1.5)

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The present invention has for its object to provide a magnetic separator for use in fluid circulating systems for collecting various sized particles of ferrous materials that may be either held in suspension or which are caused to circulate through the conduits by reason of the fluid pressure therein.

A practical adaptation of my invention is found in connection with either pressure or suction line strainers and my invention has for its further object to provide a magnetic separator which is readily adaptable to the strainers per se without requiring substantial changes in their construction or in the boxes or housings in which they are employed.

To these and other ends the invention embraces further improvements and arrangement of parts all of which will be further described in the following specification, the novel feature thereof being set forth in the accompanying claims.

In the drawings:

Fig. 1 is a cross sectional view of a pressure or suction line box showing the general arrangement of the strainer and illustrating the adaptation of one embodiment of my invention in such an assembly.

Fig. 2 is a top plan view of a magnetic separator embodying my invention.

Fig. 3 is a side view of the supporting ring, and Fig. 4 is a cross sectional view taken on the line 4x-4x of Fig. 2.

Fig. 5 is a perspective view of one of the saddle pieces for removably supporting the magnetic element.

In certain industries various types of fluids are circulated and often recirculated under such circumstances that foreign bodies are picked up and carried by the stream which must be removed before the final point of discharge is reached. In some instances such as the recirculating of lubricants employed in certain machine operations fairly large metal chips find their way into the stream. In other cases the particles are of much smaller dimensions, often microscopic in size, which if not removed may prove to have a deleterious effect in the subsequent use of the lubricant. My invention is directed to the removal of such ferrous particles by locating at one or more points in the fluid stream a magnetic spider so arranged that it will not materially impede the flow of the stream but will act to entrain or capture the ferrous particles. Where this spider is employed with a strainer it is so mounted in relation thereto that it entrains said particles

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ahead of the screen leaving the latter free to strain out lint, dirt and other foreign material.

In illustrating the practical adaptation of my invention I have shown in Fig. 1 a hollow box or housing 1, closed at the top by a removable cover 2 beneath which is an inlet 3 at one side opposite which and at a lower level in an outlet 4. To the inlet and outlet are connected the piping of the fluid circulating system, as will be understood. In line with the bottom of the inlet 3 there is an annular shelf 5 which marks the location of my magnetic element and on which it may rest directly. In the drawings I have shown the element employed in conjunction with a strainer basket 6 and when this is to be used I suspend it within the annular shelf and mount the magnet unit within the mouth of the basket.

The magnetic unit is made of a bottom ring 7 of bronze or other non-magnetic substance, having at diametrically opposite points outwardly extending arms 8 by means of which it is supported horizontally and to insure its being maintained in this position these are provided on the lower sides of the arms vertical webs 9 adapted to enter slots (as shown in dotted lines Fig. 1) formed in saddle pieces 11 secured within the top of the basket. These are preferably made in the form of spring clips. If the basket is to be omitted equivalent slots will be cut in opposite sides of the supporting rim 5.

In the upper edge of the ring 7 I form equidistantly spaced radial slots each of which accommodates a rectangular bar magnetic 12. The inner ends of these magnets projects a given distance toward the center of the ring and their over all length is such that their outer free ends are spaced somewhat away from the rim of the basket. The permanent magnets are preferably removable to facilitate their replacement or cleaning and are held in position by an overlying locking ring 13 which may be secured to the ring 7 by a series of bolts 14.

The supporting arms 8 of the ring 7 and the positions of the saddles 11 are such that the spider is located so that the top edges of the magnet bars are substantially in line with or only slightly below the lower edge of the inlet 3, thus assuring that inflowing fluid will circulate over and thence between said magnets. To this end, if desired there may extend across the center of one of the rings a bar 15 to aid in the lateral distribution of the fluid and the spaces between the bolt bosses is cut away as shown in Fig. 4.

In the construction shown the magnetic spider,

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whether used in conjunction with a refuse basket or not, may be easily removed from the vessel and the collected ferrous particles readily brushed or wiped off the magnets.

I claim as my invention:

1. The combination with a fluid circulating system collection chamber having an upper inlet, a lower outlet and a screen basket suspended in the chamber below said inlet, of a magnetic spider removably mounted in the mouth of the basket and composed of a concentric non-magnetic insulating and supporting ring and a series of radially and horizontally disposed bar magnets mounted thereon.

2. The combination with a fluid circulating system embodying a vertically extending collection chamber having an upper inlet port and a lower outlet port, of a supporting ring of non-magnetic material located crosswise of the chamber below the inlet port and provided with radial notches in its upper face, an overlying clamping ring on said supporting ring and a series of radially extending bar magnets mounted in said notches and secured between the rings.

3. The combination with a fluid circulating system embodying a chamber having an upper inlet port and a lower disposed outlet port, of a ring supported in a transverse plane between said ports and of lesser diameter than the chamber, and a series of bar magnets supported in

spaced relation on the ring and extending across it to position their opposite ends within and without the ring.

4. The combination with a fluid circulating system embodying a vertically extending collection chamber having an upper inlet port and a lower outlet port, of a frame of non-magnetic material located crosswise of the chamber below the inlet port and above the outlet port, and a plurality of bar magnets each supported at an intermediate point on the ring, said several magnets being radially disposed in spaced relation.

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