

May 18, 1954

J. BANKS
FLUID STRAINER

2,678,732

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2 Sheets-Sheet 1

FIG. 1.

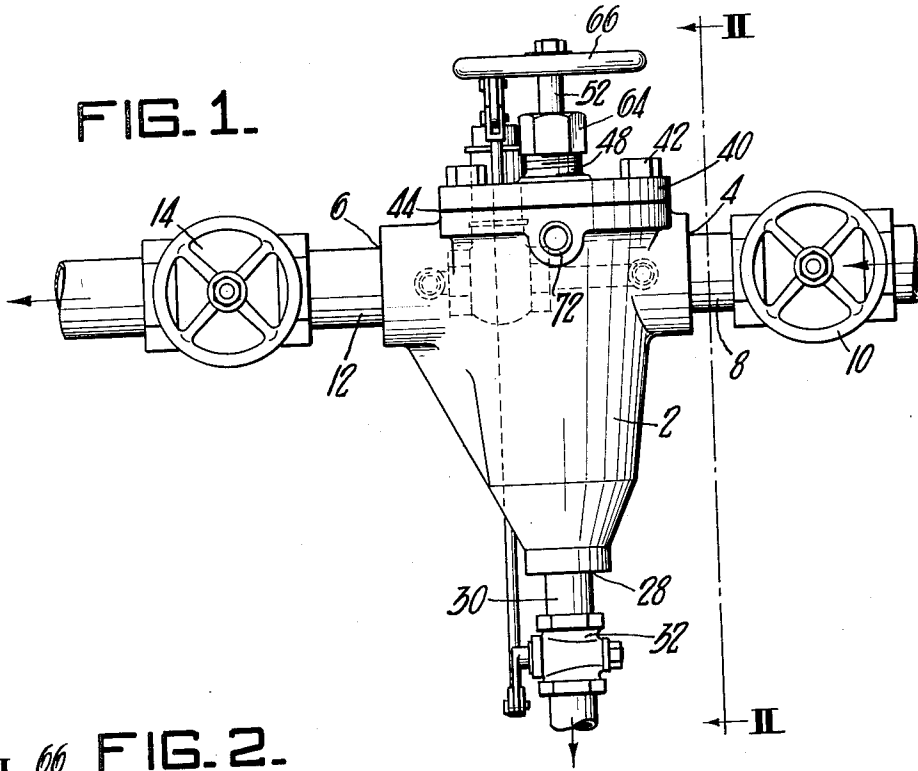
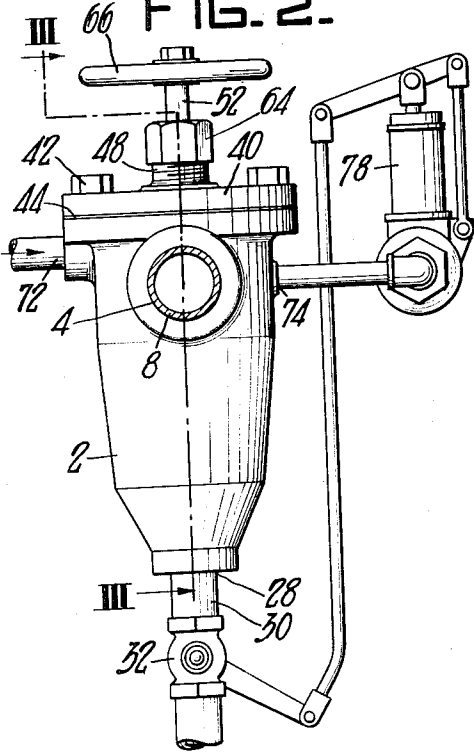


FIG. 2.



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FIG. 3.

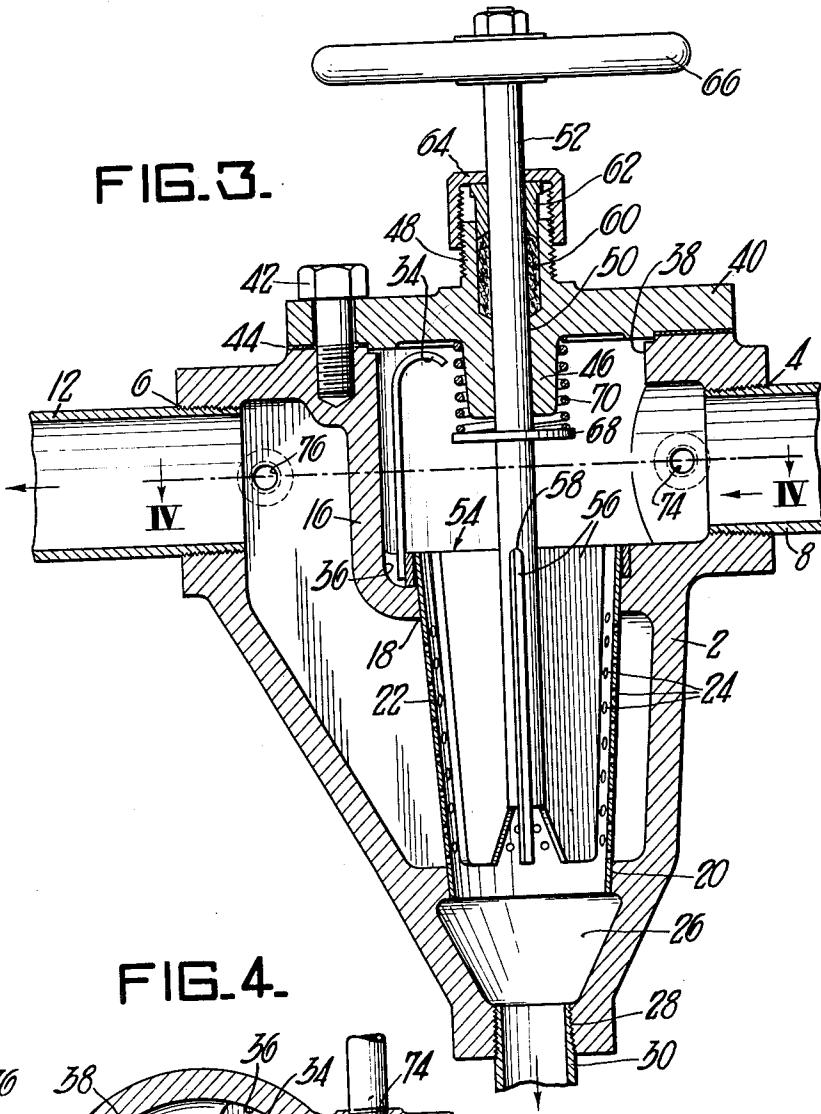
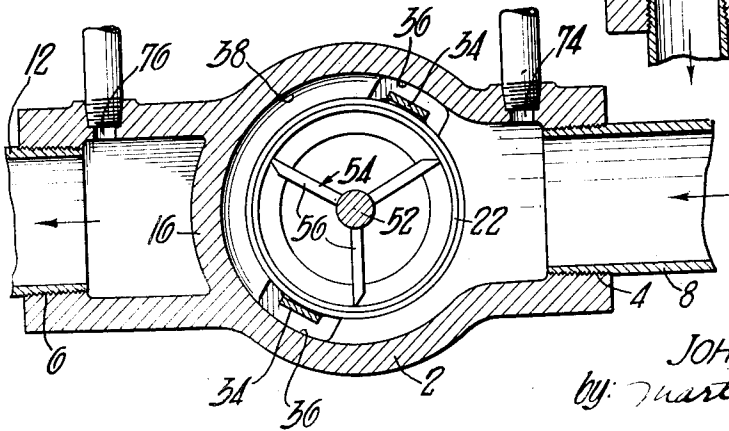


FIG. 4.



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UNITED STATES PATENT OFFICE

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FLUID STRAINER

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8 Claims. (Cl. 210—167)

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This invention relates to a fluid strainer and more particularly to such a strainer for removing undesired material from a fluid. Such strainers are well known, but those in present use have various disadvantages. Some of the strainers are complicated and have a great number of parts while others are difficult to assemble and to clean.

It is therefore an object of my invention to provide a fluid strainer which can be readily assembled and disassembled and which has a minimum of readily removable parts.

Another object is to provide such a strainer which efficiently removes the material from the fluid.

These and other objects will be more apparent after referring to the following specification and attached drawings, in which:

Figure 1 is an elevation of the strainer of my invention;

Figure 2 is a view taken on the line II—II of Figure 1;

Figure 3 is a sectional view taken on the line III—III of Figure 2; and

Figure 4 is a sectional view taken on the line IV—IV of Figure 3.

Referring more particularly to the drawings, the reference numeral 2 indicates the body of the strainer. A threaded opening 4 is provided at one end of the body and a second opening 5 is provided at the opposite end thereof. An inlet pipe 8, provided with a valve 10, is screwed into the threaded opening 4. An outlet pipe 12, having a valve 14 thereon, is screwed into the opening 5. The body 2 has a partition 16 therein which separates the strainer into two compartments with the opening 4 being on one side of the partition and the opening 5 on the other side. Partition 16 has a horizontal portion with an opening 18 therethrough. The lower portion of the body has an opening 20 therein which is aligned with the opening 18. A frusto-conical screen 22 having perforations 24 therein rests in these aligned openings. A pocket 26 in the body 2 below the opening 20 communicates with a threaded opening 28. A drain pipe 30 is threaded into the opening 28 and is provided with a valve 32. A pair of hooks 34 is fastened to the top of the screen 22 and extends upwardly therefrom. A pair of recesses or pockets 36 is provided in the body 2 which receives the hooks 34 and thus prevents the screen 22 from turning.

The top of the body 2 is provided with an opening 38 of sufficient size to permit passage of the screen 22 with the hooks attached thereto.

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A detachable cover 40 is secured to the body by means of the cap screws 42. A gasket 44 is provided between the body 2 and the cover 40. The cover 40 has a downwardly extending hub 46 and an upwardly extending threaded hub 48. A hole 50 extends through the cover 40 and receives the shaft 52 of a scraper 54. The scraper is of substantially frusto-conical shape and has three blades 56 with the edges thereof shaped as shown in Figure 4. The tops of the blades are rounded at 58 to prevent accumulation of the material being separated from the fluid. Leakage through the shaft opening 50 is prevented by means of packing 60 which is held in place and tightened around the shaft 52 by means of a packing gland 62 and packing nut 64. A hand wheel 66 is secured to the top of the shaft 52 but it will be understood that a motor drive (not shown) may be substituted therefor. A collar 68 is secured to the shaft 52 in any suitable manner. A spring 70 which surrounds the hub 46 and bears against the cover 40 and collar 68 is provided to urge the scraper into engagement with the screen 22.

An auxiliary high pressure connection 72 is provided for introducing fluids at high pressure and at high temperatures to force accumulated substances in the bottom of the strainer out of the strainer body through quick opening valve 32. Connections are provided at 74 and 76 for inlet and outlet pressure gages. If desired, these inlet and outlet pressure connections can be connected to a commercial differential control 78 for automatically opening the quick opening valve 32 when the differential pressure rises above a predetermined level and to automatically close the valve when the pressure level drops to a predetermined level.

The operation of the strainer is as follows:

The fluid to be cleaned enters the strainer through inlet 8 and passes through the screen 22. The screen openings 24 are of sufficient size to permit passage of the fluid, but small enough to prevent passage of the substances which are to be separated. The clean fluid passes outwardly through the outlet 6. Part of the material separated will drop into the pocket 26 and the scraper 54 is turned at intervals to remove the portion of the material which is caught on the screen 22. The scraper 54 will shear off any of the material which has only partially passed through the screen. The material accumulated in the pocket 26 is discharged intermittently by means of the quick opening valve 32, the fluid pressure forcing this material out of the strainer.

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If necessary, the valves 10 and 14 can be closed and fluid having a temperature and pressure higher than that of the fluid being cleaned can be provided through the opening 72.

When it becomes necessary to clean or replace the screen 22 and/or scraper 54, it is only necessary to remove the cover 40 which has the scraper 54 attached thereto. The scraper can be separated from the cover by removing the hand wheel 66. After the cover is removed, the screen 22 is easily removed by means of the hooks 34.

While one embodiment of my invention has been shown and described it is apparent that other adaptations and modifications may be made without departing from the scope of the following claims.

I claim:

1. A fluid strainer comprising a body, said body having a pair of openings therein, a partition in said body separating the strainer into two compartments with one of said openings on each side thereof, said partition having a horizontal portion, said horizontal portion having an opening therethrough, said body having an opening in the lower part thereof aligned with the last named opening, a screen resting in said last named opening and extending to the opening in the partition, said screen having a relatively smooth inner surface, a pocket in said body below said screen, a pair of hooks fastened to the top of said screen and extending upwardly therefrom, means in said body for receiving said hooks to prevent the screen from turning, the top of said body having an opening therein of sufficient size to permit passage of said screen, a detachable cover for said last named opening, an elongated scraper resting in said screen in close engagement therewith, a shaft fastened to said scraper and extending through said cover, and means for turning said shaft to rotate said scraper.
2. A fluid strainer comprising a body, said body having a pair of openings therein, a partition in said body separating the strainer into two compartments with one of said openings on each side thereof, said partition having a horizontal portion, said horizontal portion having an opening therethrough, said body having an opening in the lower part thereof aligned with the last named opening, a frusto-conical screen resting in said aligned openings, said screen having a relatively smooth inner surface, a pocket in said body below said screen, the top of said body having an opening therein of sufficient size to permit passage of said screen, a detachable cover for said last named opening, an elongated scraper of substantially frusto-conical shape resting in said screen in close engagement therewith, a shaft fastened to said scraper and extending through said cover, resilient means urging said scraper into engagement with said screen, and means for turning said shaft to rotate said scraper.
3. A fluid strainer comprising a body, said body having a pair of openings therein, a partition in said body separating the strainer into two compartments with one of said openings on each side thereof, said partition having a horizontal portion, said horizontal portion having an opening therethrough, said body having an opening in the lower part thereof aligned with the last named opening, a frusto-conical screen resting in said aligned openings, said screen having a relatively smooth inner surface, a pocket in said body below said screen, the top of said body hav-

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ing an opening therein of sufficient size to permit passage of said screen, a detachable cover for said last named opening, said cover having a downwardly extending hub thereon, an elongated scraper of substantially frusto-conical shape resting in said screen in close engagement therewith, a shaft fastened to said scraper and extending through said cover, a collar on said shaft, a spring surrounding said hub and bearing against said cover and said collar to urge said scraper into engagement with said screen, and means for turning said shaft to rotate said scraper.

4. A fluid strainer comprising a body, said body having a pair of openings therein, a partition in said body separating the strainer into two compartments with one of said openings on each side thereof, said partition having a horizontal portion, said horizontal portion having an opening therethrough, said body having an opening in the lower part thereof aligned with the last named opening, a frusto-conical screen resting in said aligned openings, said screen having a relatively smooth inner surface, a pocket in said body below said screen, a pair of hooks fastened to the top of said screen and extending upwardly therefrom, means in said body for receiving said hooks to prevent the screen from turning, the top of said body having an opening therein of sufficient size to permit passage of said screen, a detachable cover for said last named opening, an elongated scraper of substantially frusto-conical shape resting in said screen in close engagement therewith, a shaft fastened to said scraper and extending through said cover, and means for turning said shaft to rotate said scraper.

5. A fluid strainer comprising a body, said body having a pair of openings therein, a partition in said body separating the strainer into two compartments with one of said openings on each side thereof, said partition having a horizontal portion, said horizontal portion having an opening therethrough, said body having an opening in the lower part thereof aligned with the last named opening, a frusto-conical screen resting in said aligned openings, said screen having a relatively smooth inner surface, a pocket in said body below said screen, a pair of hooks fastened to the top of said screen and extending upwardly therefrom, means in said body for receiving said hooks to prevent the screen from turning, the top of said body having an opening therein of sufficient size to permit passage of said screen, a detachable cover for said last named opening, said cover having a downwardly extending hub thereon, an elongated scraper of substantially frusto-conical shape resting in said screen in close engagement therewith, a shaft fastened to said scraper and extending through said cover, a collar on said shaft, a spring surrounding said hub and bearing against said cover and said collar to urge said scraper into engagement with said screen, and means for turning said shaft to rotate said scraper.

6. A fluid strainer comprising a body, said body having a pair of openings therein, a partition in said body separating the strainer into two compartments with one of said openings on each side thereof, said partition having a horizontal portion, said horizontal portion having an opening therethrough, said body having an opening in the lower part thereof aligned with the last named opening, a frusto-conical screen resting in said aligned openings, said screen having a

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relatively smooth inner surface, a pocket in said body below said screen, a pair of hooks fastened to the top of said screen and extending upwardly therefrom, means in said body for receiving said hooks to prevent the screen from turning, the top of said body having an opening therein of sufficient size to permit passage of said screen, a detachable cover for said first named opening, said cover having a downwardly extending hub thereon, an elongated scraper of substantially frusto-conical shape resting in said screen in close engagement therewith, a plurality of blades for said scraper, the top of said blades being rounded, a shaft fastened to said scraper and extending through said cover, a collar on said shaft, a spring surrounding said hub and bearing against said cover and said collar to urge said scraper into engagement with said screen, and means for turning said shaft to rotate said scraper.

7. A fluid strainer comprising a body, said body having a pair of openings therein, a partition in said body separating the strainer into two compartments with one of said openings on each side thereof, said partition having a horizontal portion at substantially the same level as the bottom of the openings, said horizontal portion having an opening therethrough, said body having an opening in the lower part thereof aligned with the last named opening, a screen resting in said last named opening and extending to the opening in the partition, said screen having a relatively smooth inner surface, a pocket in said body below said screen, a pair of hooks fastened to the top of said screen and extending upwardly therefrom, means in said body for receiving said hooks to prevent the screen from turning, the top of said body having an opening therein of sufficient size to permit passage of said screen, a detachable cover for said last named opening, an elongated scraper resting in said screen in close engagement therewith, a shaft fastened to said scraper and extending through said cover, and means for turning said shaft to rotate said scraper.

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8. A fluid strainer comprising a body, said body having a pair of openings therein, a partition in said body separating the strainer into two compartments with one of said openings on each side thereof, said partition having a horizontal portion at substantially the same level as the bottom of the openings, said horizontal portion having an opening therethrough, said body having an opening in the lower part thereof aligned with the last named opening, a frusto-conical screen resting in said aligned openings, said screen having a relatively smooth inner surface, a pocket in said body below said screen, the top of said body having an opening therein of sufficient size to permit passage of said screen, a detachable cover for said last named opening, said cover having a downwardly extending hub thereon, an elongated scraper of substantially frusto-conical shape resting in said screen in close engagement therewith, a shaft fastened to said scraper and extending through said cover, a collar on said shaft, a spring surrounding said hub and bearing against said cover and said collar to urge said scraper into engagement with said screen, and means for turning said shaft to rotate said scraper.

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