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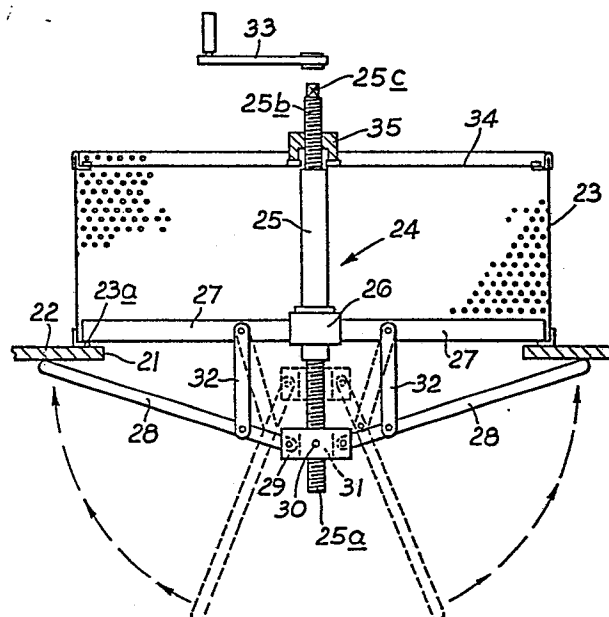
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54 **Device for use in cargo hold cleaning.**

57 A device for cargo hold cleaning, intended to be placed over a bilge well manhole, comprises a sieve member surrounding an axis, and securing means disposed beyond the end, in an axial sense, of the sieve member, the securing means being operable from its side which is nearer to the sieve member. The securing means may, among other forms, comprise one or more clamps or clips; or may be dimensioned to fit through the manhole and be tightened against the decking adjacent the underside thereof; or may comprise fixed arms above the manhole cooperating with retractable arms below the manhole.



DEVICE FOR USE IN CARGO HOLD CLEANING

The present invention is directed to the problems associated with the cleaning of the cargo holds of ships and is a device for use in connection with that operation.

In cleaning cargo holds primarily intended for dry
5 bulk cargoes, or after carrying such cargoes, e.g. coal
or grain, it is normal to replace the manhole covers which
normally cover the bilge wells with flat strainers, before
washing out the hold. It is intended that the strainers
will prevent some at least of any solid matter which
10 remains in the hold from entering the bilges and giving
rise to blockages therein. Unfortunately such strainers
themselves readily become choked with solid matter and the
washing operation is thereby slowed down or interrupted.
The removal of a strainer for cleaning inevitably opens
15 up the bilge to the solid matter which the strainer was
intended to retain.

It will be seen, and is readily appreciated by those
with experience of this problem, that there is a real need
for an improvement to this hold cleaning operation, in order
20 to reduce bilge blockage and minimise down time. The present
invention is intended to provide such an improvement.

My invention is a device for cargo hold cleaning which
comprises a sieve member surrounding an axis and having
securing means disposed beyond the end (in the axial sense)
25 of said sieve member, said securing means being operable
from that side thereof which is axially nearer to said
sieve member.

The sieve member of the device according to my invention surrounds an axis and may therefore be to a greater or lesser extent elongated in form. Thus it may be of symmetrical cross-section, for example
5 cylindrical or of square or hexagonal cross-section, and its length in an axial direction may be greater or less than its maximum transverse dimension, that is its diameter in the case of a cylindrical sieve member. Thus the proportions of such a sieve member
10 may vary between an essentially tubular form at one extreme and a more drum-like (that is, squat) shape at the other.

Two advantageous features in particular of my invention should be readily apparent. First of all,
15 the shape of the sieve member allows it to present a larger sieving surface to the wash water than is normally possible using a flat strainer, whose dimensions are determined by those of the bilge well manhole. Because, in use, it may extend vertically from the
20 bilge top, it is also less liable to uniform deposition of solid matter on its surface and therefore less readily choked by such matter. Secondly, because the securing means is operable from its side which is nearer to the sieve member, then it is possible to mount the sieve
25 member securely upon the deck of the hold without the operator having to enter the bilge or otherwise secure the device from below the deck.

The securing means may take a variety of forms.

At its simplest, it may be one or more clamps or clips which engage the edge of the bilge access manhole to retain the device in position around said manhole. In another form, the securing means may be axially asymmetrical, having a maximum dimension transverse to the axis of the sieve member and a lesser dimension in the same plane (so that the securing means may pass through the bilge well manhole but seat against the underside thereof), and tightening means may be provided for moving the securing means axially towards and away from the sieve member. When the securing means is of this type, the operating requirements are best met, and the flow of wash water into the bilge is least impeded, if the securing means is a transverse member having at least two, but preferably more, projecting arms. Thus the securing means may be essentially at least three arms projecting from a central hub. Typically, it may be a star or spider having three to six arms.

The above-mentioned tightening means, as indicated, has the function of moving the securing means axially towards and away from the sieve member. In this way, the sieve member may be held firmly against the bilge top, which is embraced by, and may be gripped between, the sieve member and the securing means. The tightening means may usefully take the form of an elongated spindle, disposed along the axis of the sieve member and carrying means for locking the sieve member and securing means

fixedly relative to each other. Thus the spindle may be threaded for at least a part of its length and the sieve member and/or securing means may itself be internally threaded or a nut may be provided to fix it relative to
5 the spindle.

If desired, the securing means, for example in the above-mentioned star form, may be collapsible to allow it to pass readily through the bilge well manhole. For example, it may have projecting arms pivoted on a central hub.

10 In a particularly preferred form of my invention, the securing means comprises at least two fixed arms, disposed essentially radially relative to the axis of the sieve member, and at least two retractable arms, mounted so as to be movable between a retracted position of lesser
15 radial extent and an extended position in which they are disposed essentially radially relative to the aforesaid axis and in which they are urged towards said fixed arms. In that extended position of the retractable arms, they are able to cooperate with the fixed arms to grip the adjacent
20 decking and thereby hold the sieve member in position.

As an optional further feature of my invention the sieve member may be sealed at its upper end by a solid or perforated lid. The lid may be removable to allow visual or other access to the bilge well.

25 The dimensions of the device of my invention are largely determined by the location in which it is to be used. Bilge well manholes are designed to meet Lloyd's requirements and tend therefore to conform to a limited number of designs.

Thus a limited range of devices according to my invention may satisfy most needs. In one form of my invention, the sieve member may readily be exchanged for one of different dimensions or different perforation size, thereby significantly increasing the number of locations and situations in which the one device can be used.

The device according to my invention may be made of metal, for example of steel, and will thereby be suitable for use in a wide range of conditions. However for relatively gentle sea conditions or for use in port, the sieve member may be constructed in plastics material, for example in polypropylene or in glass-reinforced plastic.

Even with the use of the improved device according to my invention, it is possible that sooner or later the bilge lines will become at least partly restricted or blocked. It may then be necessary to flush out the bilge lines with a quantity of clean water. By using a mounting method such as I have described above, namely the use of a securing means such as a star-shape on the under side of the bilge top, it is possible to secure in position over the bilge well manhole a further device designed to effect such bilge line flushing. If this device is supplied with water by a line from outside the hold, a head of water corresponding to the depth of the hold may be provided, which greatly assists line clearing. In addition, this arrangement can achieve the removal of a blockage without large quantities of water having to be introduced into the hold itself.

My invention will now be further described with reference to the accompanying drawings, in which:-

Fig. 1 illustrates in perspective view one form of device according to my invention;

5 Fig. 2 illustrates in elevation a further device such as is referred to above, of value for pressurizing, flushing or priming the bilge lines; and

Fig. 3 illustrates in vertical section a second, particularly preferred, form of device according to
10 my invention.

The device shown in Fig. 1 is built around a threaded spindle 1, retained so as to be capable of rotation in a sleeve 2 mounted on a base plate 3, by means of a locking pin 4 which cooperates with an annular groove 5 in the
15 lower end of the spindle 1. A squat cylindrical sieve member 6 is slidably located upon spindle 1. The sieve member 6 incorporates radial rams 7 extending from a hub 8. A lid 9, so sized as to be able to close the upper end of the sieve member 6, is also slidably located on the spindle
20 1.

A star plate 10, having six radial arms 11 extending from an internally threaded hub 12, engages the threads of the spindle 1 between the base plate 3 and the sieve member 6. The upper end of the spindle 1 is provided with a short
25 extension, square in cross-section, by means of which the spindle may be rotated using a handle 13.

The position of the device in use is shown in Fig. 1 by the dotted-line representation of the bilge tank top 14 and the access manhole 15. Before washing out of the hold is begun, the spindle 1, already attached to the base plate 3 by means of the pin 4 and carrying the star plate 10, is inserted through the manhole 15 so that the base plate 3 rests upon the bilge tank floor. The star plate 10 is then held against rotation while the spindle 1 is rotated, using the handle 13, in such a direction that the star plate 10 rises until it firmly abuts the under side of the bilge tank top 14. The spindle is thereby held rigidly in place to receive the sieve member 6 and the lid 9.

In an alternative arrangement, not shown, the base plate 3 is dispensed with, the spindle 1 is secured to the star plate 10 and the hub 8 of the sieve member 6 is internally threaded and/or provided with a locking nut, so that the bilge tank top is positively gripped between the star plate 10 and sieve member 6.

It can be seen that the device shown in Fig. 1 is easily dismantled for thorough cleaning. A further advantage of this form of device is that, by removal of the lid 9, ready access is possible to the bilges without the need to remove the device itself. Thus a hose may be passed into the bilge through the sieve member 6 in order to admit water under pressure to agitate any sediment in the bilge or to allow access to enable a suction pump to remove sediment or oil or other liquid from the bilge.

Fig. 2 shows a device 16 for pressurising, flushing or priming an associated bilge line. The device 16 may be locked in position over a manhole using a star plate such as star plate 10. The extensions 17 from the lower end of
5 the device 16 may interlock with the arms 11 of such a star plate. The device has two water inlets 18 and 19 and is also provided with a gauge 20, by means of which the pressure in the system may be monitored, and, associated with the gauge, a suitable pressure relief valve (not shown).

10 Via one or both of the water inlets 18 and 19, water from a static head and/or water supplied under pressure by a portable pump may be introduced into the device 16 and in turn into the associated bilge line. Thus a head of water may be provided using a water line from the deck
15 above or water may be pumped in from the bilge on the other side of the ship. In another way of operating, water from the deck above may be supplied to supplement the pressure from such a portable pump. A further way of providing a head of water is by using the sounding pipe which
20 normally extends from the deck direct to each bilge for each hold.

It is one particular advantage of the use of a device such as that shown in Fig. 2, whether it is used in conjunction with a pump or simply as a flushing unit, that
25 it enables positive cleaning of one-way valves in the bilge system, which hitherto may have required direct access if they were to be cleaned.

Referring now to Fig. 3 of the drawings, the device there illustrated is shown in position over a bilge access manhole 21 in decking 22. The device comprises a squat sieve member 23, which may be cylindrical or of square or hexagonal cross-section when viewed from above, held in position by a securing means designated generally by the numeral 24. The securing means is built about a vertical spindle 25, having threaded portions 25 a and 25 b and terminating at its upper end in a square-cross-section portion 25c.

From a boss 26 mounted free to rotate on the spindle 25, four radially-extending, square-cross-section, fixed arms 27 project, only two of these arms being visible in the drawings; the remaining two fixed arms extend radially at right angles to the arms shown. In the same vertical plane as the illustrated arms 27, two retractable arms 28 are disposed. The retractable arms 28 are pivoted at their radially innermost ends on a rocker bracket 29, which itself is pivotally mounted at 30 on an internally threaded member 31 engaging the threaded spindle portion 25 a. The arms 28 are spaced from the adjacent arms 27 by struts 32, each strut 32 being pivotally joined to the arms 27 and 28 at its respective ends. As will be seen from the drawings, the angular position of the arms 28 relative to the fixed arms 27 is determined by the linear position of the rocker bracket 29 and threaded member 31 along the length of the threaded spindle portion 25a.

When it is desired to install the device according to Fig 3 in position for a hold cleaning operation, the securing means 24, with the rocker bracket 29 and arms 28 in the position shown in dotted line in the drawing, is placed within
5 the sieve member 23 and then located over the manhole 21. The four fixed arms 27 rest upon a continuous, inwardly-directed flange 23a of the sieve member 23. A winding handle 33 is engaged over the spindle portion 25c and is used to rotate the spindle 25 and thereby cause the threaded
10 member 31 and rocker bracket 29 to move downwards along the threaded spindle portion 25a. This movement causes the arms 28 to swing in the direction of the arrows until they engage the underside of the decking 22 in the position shown in solid line in the drawings. Pivotting of the rocker bracket 29
15 about the pivot 30 allows the device to compensate for local irregularities in the decking. In this position, the decking 22 is gripped between the four fixed arms 28 and the two retractable arms 27 and the device is thereby held firmly in place. A perforated lid 34 is now located around the
20 spindle 25 within the top of the sieve member 23 and is locked in place by a knurled nut 35, which engages the threaded spindle portion 25b.

If, during the cleaning operation, it is desired to wash out or otherwise gain access to the bilges, this is readily
25 achieved, without removing the device according to my invention, by simply unscrewing the nut 35 and removing the lid 34.

CLAIMS

1. A device for cargo hold cleaning comprising a sieve member surrounding an axis and having securing means beyond the end (in the axial sense) of said sieve member, said securing means being operable from
5 that side thereof which is axially nearer to said sieve member.
2. A device according to claim 1, wherein the sieve member is of circular, square or hexagonal cross-section.
3. A device according to claim 1 or claim 2, wherein the
10 length of the sieve member in an axial direction is less than its maximum dimension transverse thereto.
4. A device according to any of the preceding claims, wherein the securing means comprises one or more clamps or clips to engage the hold decking.
- 15 5. A device according to any of claims 1 to 3, wherein the securing means has a maximum dimension transverse to the axis of the sieve member and a lesser dimension in the same plane, and wherein tightening means are provided for moving the securing means axially towards
20 and away from the sieve member.
6. A device according to claim 5, wherein the securing means is a transverse member having at least two projecting arms.
7. A device according to any of claims 1 to 3, wherein
25 the securing means comprises at least two fixed arms, disposed essentially radially relative to the axis of the sieve member, and at least two retractable arms,

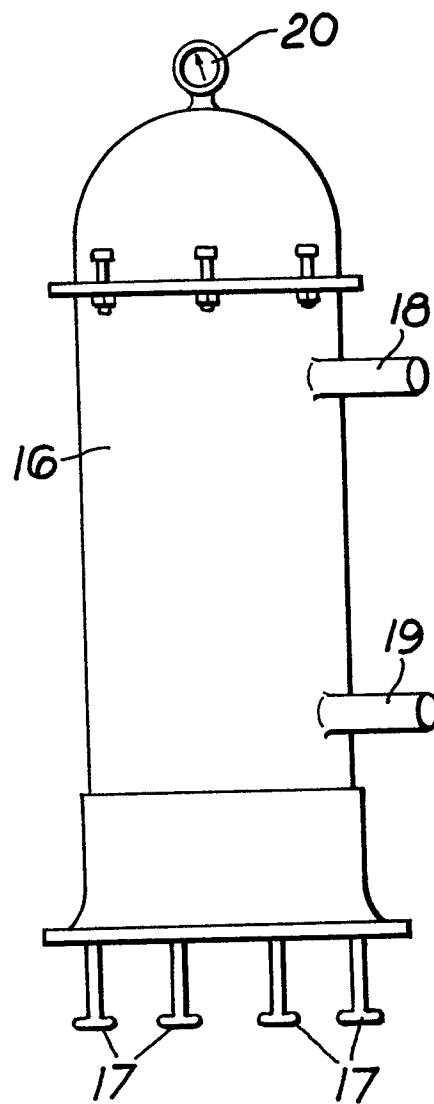
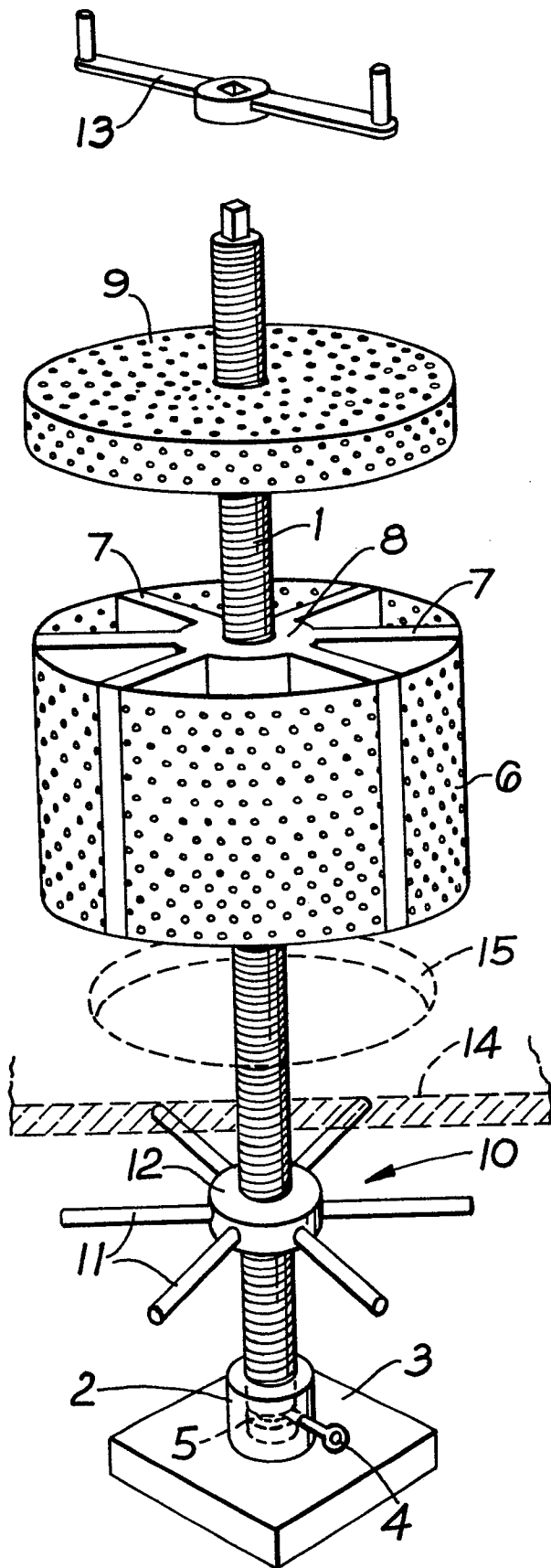
mounted so as to be movable between a retracted position of lesser radial extent and an extended position in which they are disposed essentially radially relative to the aforesaid axis and in which they are urged towards said
5 fixed arms.

8. A device according to claim 7, wherein the retractable arms are each pivoted at their radially innermost ends upon a linearly movable member, movement of which pivots the
retractable arms between the retracted and extended positions.

10 9. A device according to claim 8, wherein the movable member engages a spindle which is axially aligned with the sieve member and pivoting of the retractable arms is effected by movement of said member along the spindle.

15 10. A device according to any of the preceding claims, wherein the sieve member is sealed at its end remote from the securing means by a removable lid.

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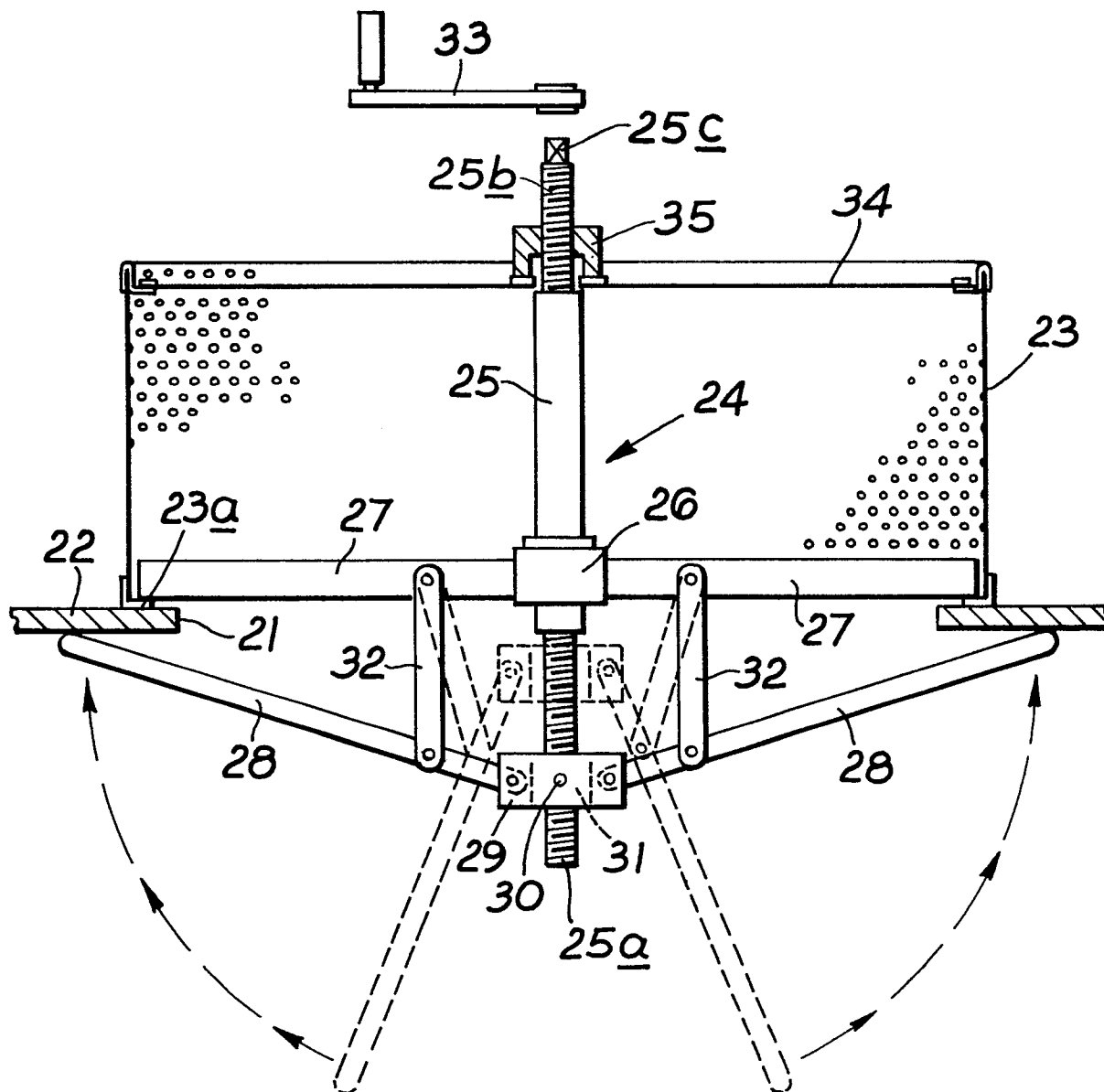


Fig. 3