

Sept. 13, 1932.

A. B. BUTTERWORTH

1,876,607

CLEANING MACHINE

Filed Jan. 5, 1931

2 Sheets-Sheet 1

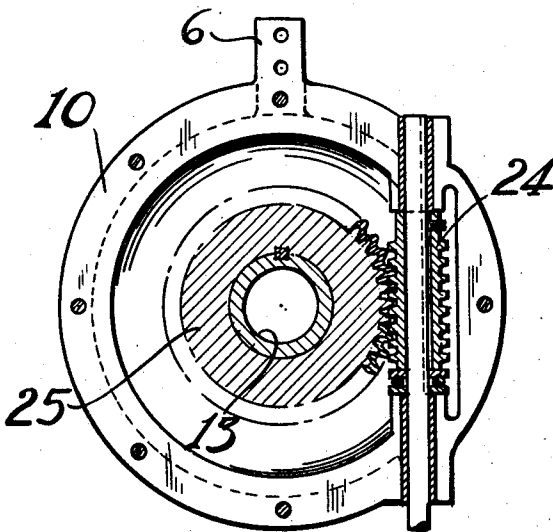
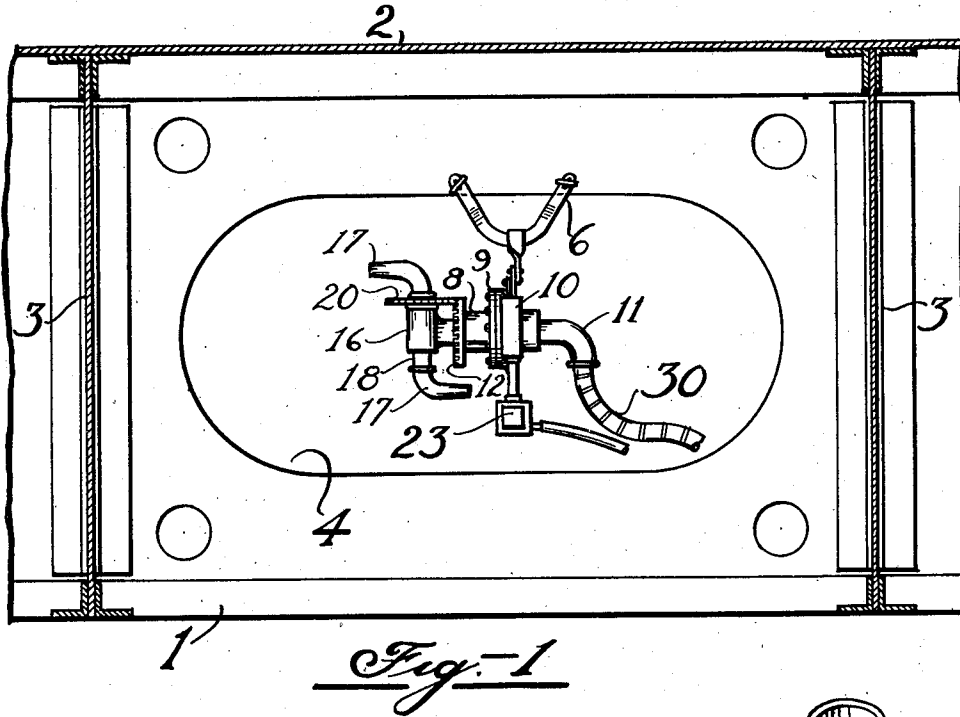


Fig. 3

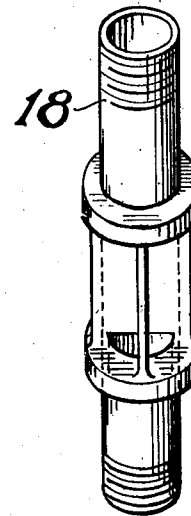


Fig. 4

Inventor
Arthur B Butterworth
by *W. E. Currie* Attorney

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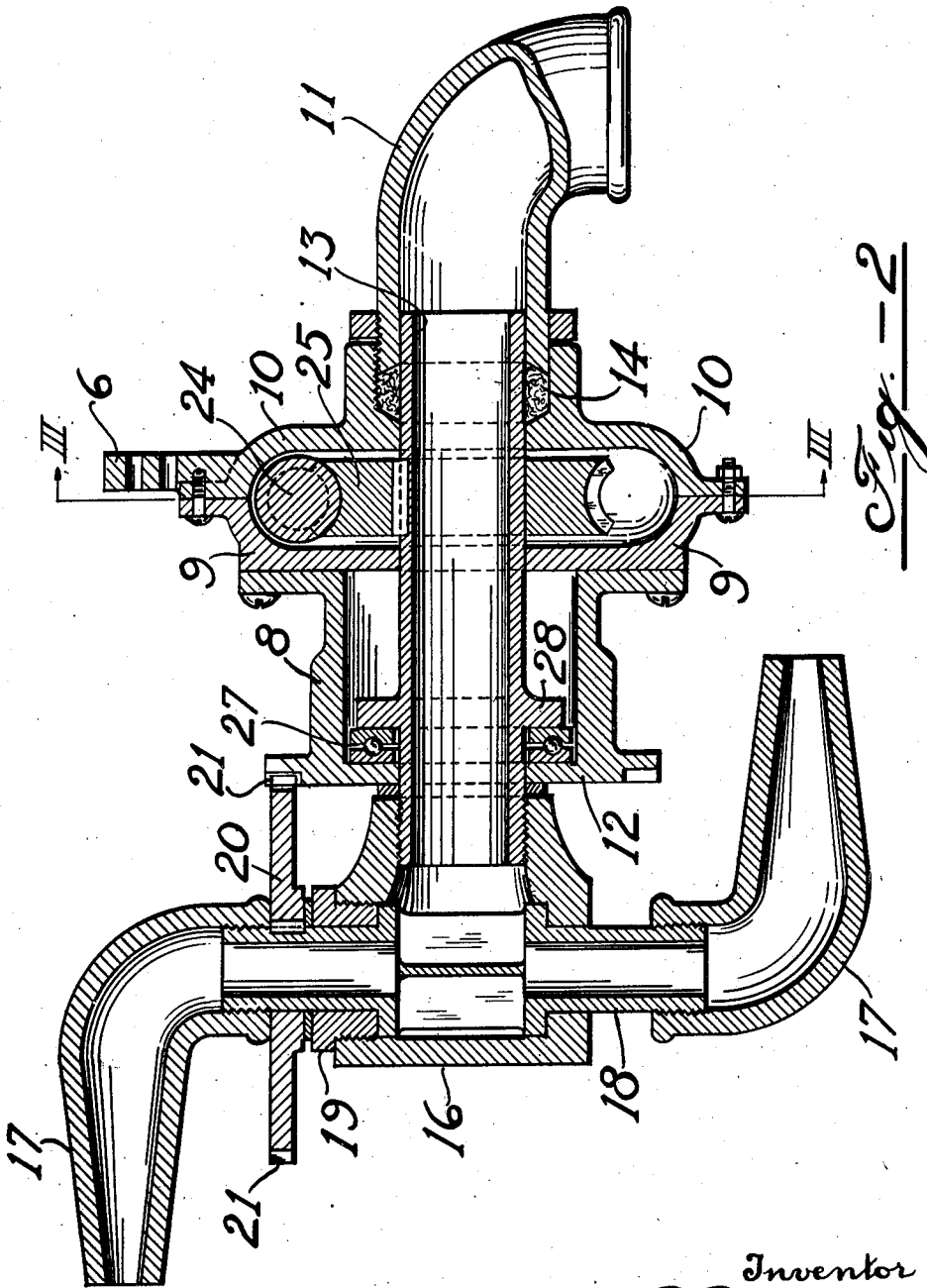
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2 Sheets-Sheet 2



Inventor
Arthur B. Butterworth
by W. E. Currie Attorney

UNITED STATES PATENT OFFICE

ARTHUR B. BUTTERWORTH, OF BROOKLYN, NEW YORK, ASSIGNOR TO BUTTERWORTH SYSTEM, INC., A CORPORATION OF DELAWARE

CLEANING MACHINE

Application filed January 5, 1931. Serial No. 506,514.

This invention relates to an improved device for injecting liquid under pressure against the interior of a tank to be cleaned.

The invention will be fully understood from the following description taken in connection with the accompanying drawings in which latter—

Fig. 1 is a transverse section through a tank showing in side elevation a partition with the cleaning device mounted to operate through a lightening hole in the partition;

Fig. 2 is a longitudinal sectional view of the cleaning device;

Fig. 3 is a transverse sectional view taken along the line III—III of Fig. 2; and

Fig. 4 is a perspective view of the core of the nozzle structure.

Referring to the drawings, the device is illustrated as applied to the cleaning of a ship's inner bottom, or tank, of which reference numeral 1 designates the base and numeral 2 designates the top. The tank is divided into a plurality of laterally disposed compartments by means of partitions or walls 3. The walls are provided with lightening holes 4. Means are provided for mechanically cleaning a plurality of the compartments simultaneously. The means comprises a washing device which is so constructed that it can be supported in the small space of the lightening hole. A bracket 6 of suitable construction supports the washing device.

The washing device comprises a housing formed of sections 8, 9, 10 and 11 which are rigidly secured together to form a unit. The discharge end of the housing is provided with a flange 12 affixed to section 8. A headed tube 13 is provided with a shank which extends through an opening in flange 12 into the housing. The tube is supported rotatably within the housing by a bearing constituted by flange 12 and sections 9, 10 and 11. Section 11 is a tubular elbow or coupling member the inlet end of which faces laterally of the housing. Packing 14 is interposed between section 11, section 10 and the shank 13 in order to prevent leakage of the cleaning liquid into the housing. The headed portion of the tube designated 16 is provided with

laterally facing openings through which the nozzle structure extends.

The nozzle structure comprises the oppositely facing nozzles 17 which are secured rigidly to and open into a hollow core 18. The core 18 is adapted to revolve freely in the head of the tube and is secured in position by means of a gland 19. The core carries non-rotatably a gear 20 which meshes with annularly disposed teeth 21 formed in the flange of the housing. At least one more tooth is formed in flange 12 than there are in gear 20 so that the position of the nozzles during rotation becomes changed, whereby the liquid delivered from the nozzles sweeps different paths and covers all sections of the article being cleaned.

The nozzle structure is driven in rotation by means of an air motor, or the like, 23 which drives a worm 24 extending through the portion of the housing formed by sections 9 and 10. Worm 24 drives a worm gear 25 which is non-rotatably affixed to the tube 13. The force of the liquid passing through the device causes a longitudinal thrust of the tube 13 with respect to the housing. This thrust is resisted by means of an anti-friction device 27 which is disposed between the flange 12 and an annular flange 28 which projects laterally from tube 13.

In its operation the cleaning device is positioned in the lightening hole of the partition between two compartments to be cleaned and liquid is injected under pressure through a hose 30 into the inlet of the device. The air motor is actuated to cause the laterally disposed nozzles to be rotated whereby the liquid issuing therefrom is caused to sweep all portions of both compartments. The nozzles are preferably revolved relatively slowly.

The device described is constructed compactly for use in openings of relatively small size such as the lightening holes of a ship's inner bottom and can be actuated at relatively great distances from the source of power. While the device has been described for use in cleaning a ship's inner bottom, it will be understood that it can be used for cleaning cofferdams, sump tanks, settling tanks, bilges, shorestorage tanks, or other vessels which

have obstructions therein and in which it is desirable to fasten the cleaning machine on the beams or the like and within the tank.

Various changes may be made within the scope of the appended claim in which it is
5 desired to claim all novelty inherent in the invention as broadly as the prior art permits.

I claim:

A cleaning device, comprising a tubular
10 housing having an annularly toothed end, an inlet pipe secured to the opposite end of the housing, a headed tube having a shank extending rotatably through the toothed end and along the longitudinal axis of the housing into the inlet pipe, a packing ring seal-
15 ing the shank with respect to the pipe and housing, nozzles projecting rotatably laterally from the head of the tube, a gear rigidly affixed to the nozzles and engaging the
20 toothed end, a gear encircling and non-rotatably secured to the shank within the housing, and driving means for the gear extending into the housing.

ARTHUR B. BUTTERWORTH.

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