Feb. 20, 1940. G. A. DE GUIRE 2,191,190

SEPARATOR

Original Filed Dec. 2, 1937

Fig. 1

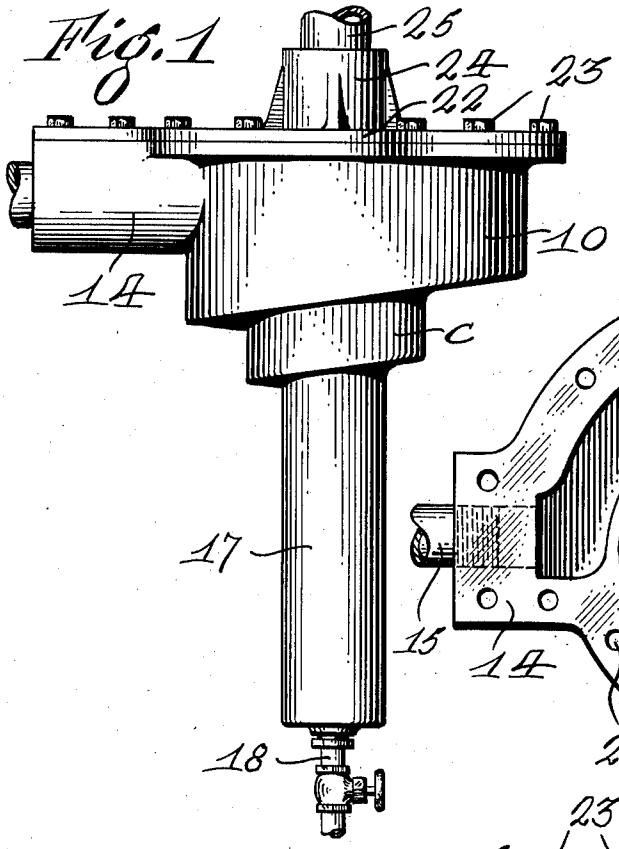


Fig. 4

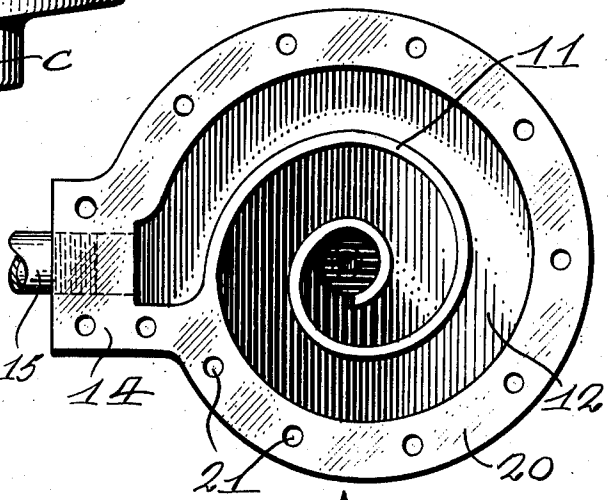


Fig. 3

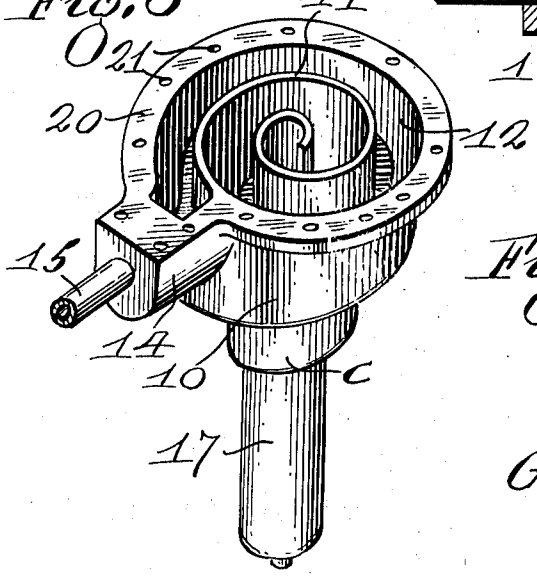
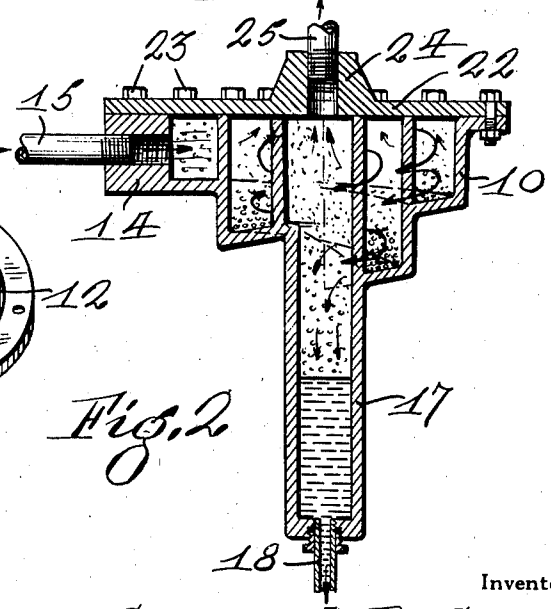


Fig. 2



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Patented Feb. 20, 1940 2,191,190

UNITED STATES PATENT OFFICE

2,191,190

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Application December 2, 1937, Serial No. 177,835
Renewed January 18, 1940

2 Claims. (Cl. 183—79)

The present invention relates to devices for separating relatively heavy matter from fluids and the like, such as separating water and oil from steam.

An object of the invention is the provision of a separator of novel and improved construction.

Another object of the invention is to provide a separator designed to effect very efficient separating action.

A further object of the invention is to provide a separator in which the matter to be subjected to separation is conducted through a chamber or conduit having a gradually increasing area.

Still another object of the invention is the provision of a separator of the aforesaid character which is constructed to effect gradual expansion of the matter supplied thereto.

A still further object of the invention is the provision of a separator of the above character which is relatively simple and inexpensive in construction.

Other objects and advantages of the invention will become apparent as the description progresses.

In the accompanying drawing forming a part of this specification and in which like reference characters are employed to designate corresponding parts throughout the same:

Figure 1 is a side elevational view of the assembled separator,

Figure 2 is a longitudinal section through the same,

Figure 3 is a top perspective view of the device with the cover removed, and

Figure 4 is a top plan view of the same.

Referring to the drawing, wherein for the purpose of illustration is shown a preferred embodiment of the invention, C generally designates the body casing of the device which embodies an upper helical portion 10 provided with an interior helically formed partition 11 forming a helically arranged conduit or chamber 12.

At one side of the upper casing portion 10 is formed a laterally projecting inlet connection 14 communicating with the inlet end of the helical conduit and adapted for connection with a supply pipe 15.

At the bottom of the body C is formed, in the projected line of the axis of the helix, an elongated tubular portion 17 communicating at the top with the axial outlet of the conduit and formed in the bottom portion with a reduced passage adapted for connection with a drain pipe 18.

The top of the body C is, as shown in the drawing, formed to assume a flat horizontal section formed with a peripheral flange 20 provided with spaced apertures 21. On the flanged top edge of the casing is adapted to be fitted a flat cover plate 22 having a contour conforming to the helical top flange 20 and the top portion of the connection 14, and is adapted to be secured in position by bolts 23. At a centre point corresponding to the axis of the body C, the cover 22 is formed with a connection 24 affording a through passage communicating with the axis of the interior conduit and adapted for connection with a fluid outlet pipe 25.

As will be noted, the main spiral portion 10 of the body is shaped so that the top portion is in the form of a flat helix, while the bottom portion assumes the curvature of a conical helix or spiral. This structure is designed so that the spiral interior conduit in which the separation is effected gradually increases in area from the inlet end to the outlet axis, as clearly illustrated at Figures 2 and 4, and which may be effected by the conical regularly progressive increase in the axial dimension of the conduit.

Thus, when the matter to be separated, as for instance steam containing moisture, oil or solids, is directed into the helical chamber, it is conducted through the helical passage 12 and, due to the gradually increasing area of this passage, gradually decreases in velocity so that the matter to be separated from the steam sets in the body where it is swept down the inclined-plane construction and mainly accumulates in the tubular portion 17 which provides a collecting vessel from whence it is discharged through the outlet pipe 18. The fluid, such as the steam, is exhausted from the casing through the axially disposed passage in the connection 24 and the outlet pipe 25.

Due to the gradual reduction of velocity, the moisture, oil or other substances to be removed from the steam are very effectively separated within the casing.

It is to be understood that the form of my invention herein shown and described is to be taken as a preferred example of the same, and that various changes as to the shape, size and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. In a separator of the character described, a substantially circular casing having an inlet at the upper side thereof, a cover secured at the upper part and an outlet at the top centre, a vertical partition helically coiled within the cas-

ing from the inlet to the outlet, said helical partition making at least a complete turn upon itself and being of gradually increasing vertical depth, a bottom wall closing the lower portion of the helical partition, and a drain centrally depending downwardly from the bottom wall, whereby the area of the spiral chamber formed by the partition and the cover and bottom wall gradually expands from the inlet to the outlet.

2. In a separator having a casing and inlet and outlet therefor at the upper side and top respectively, helical means for dividing said casing internally into a spirally wound chamber of uniform width and gradually increasing vertical depth, a cover at the top of the casing, a closing wall at the bottom of the spiral chamber, and a downwardly depending drain at the lower center of the casing, whereby the chamber extends between the outlet and drain in a constantly increasing cross-sectional area from the peripheral inlet to the central outlet.

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