

Feb. 14, 1933.

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1,897,912

EXHAUST GAS PURIFIER

Filed Sept. 18, 1931

2 Sheets-Sheet 1

Fig. 1.

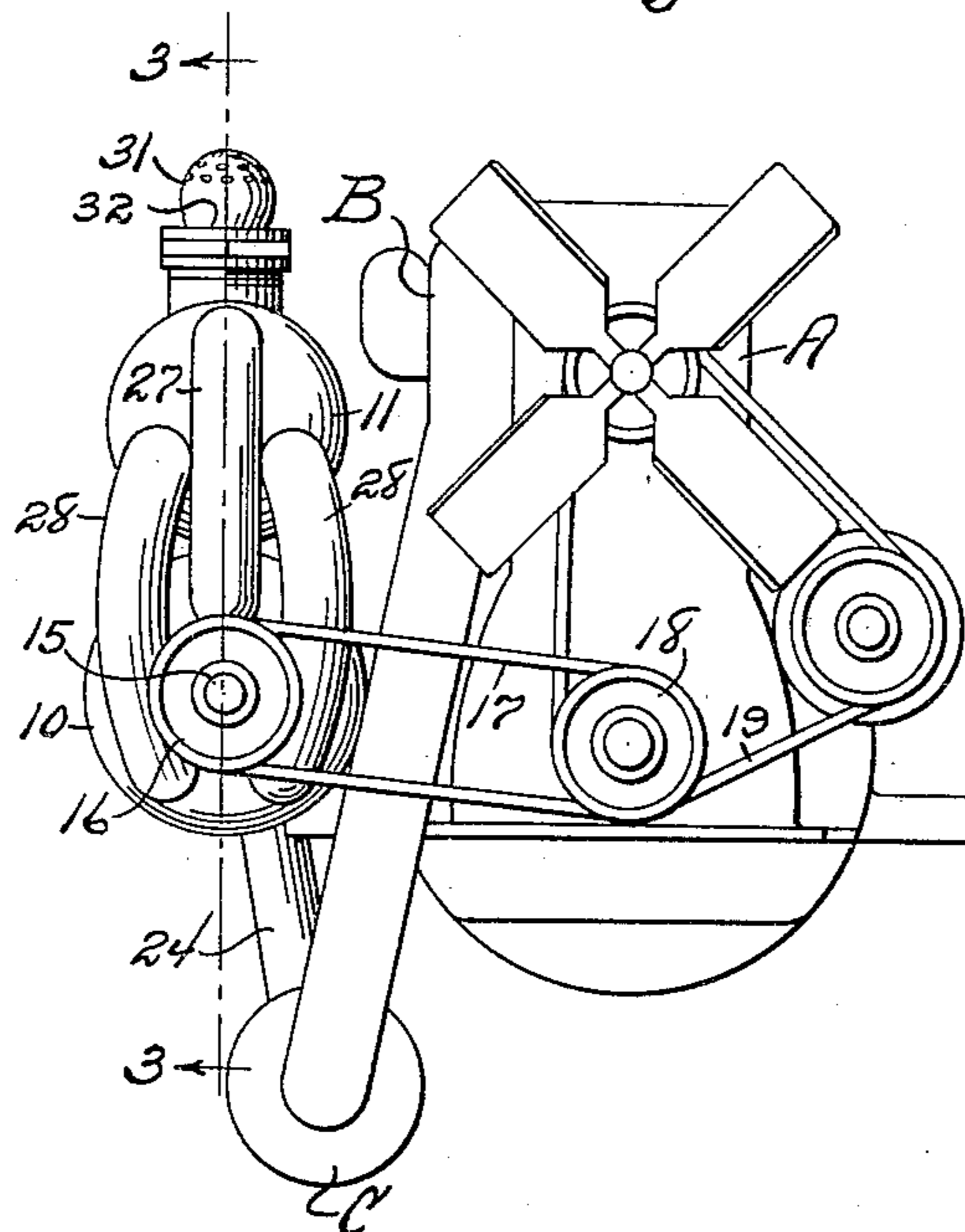
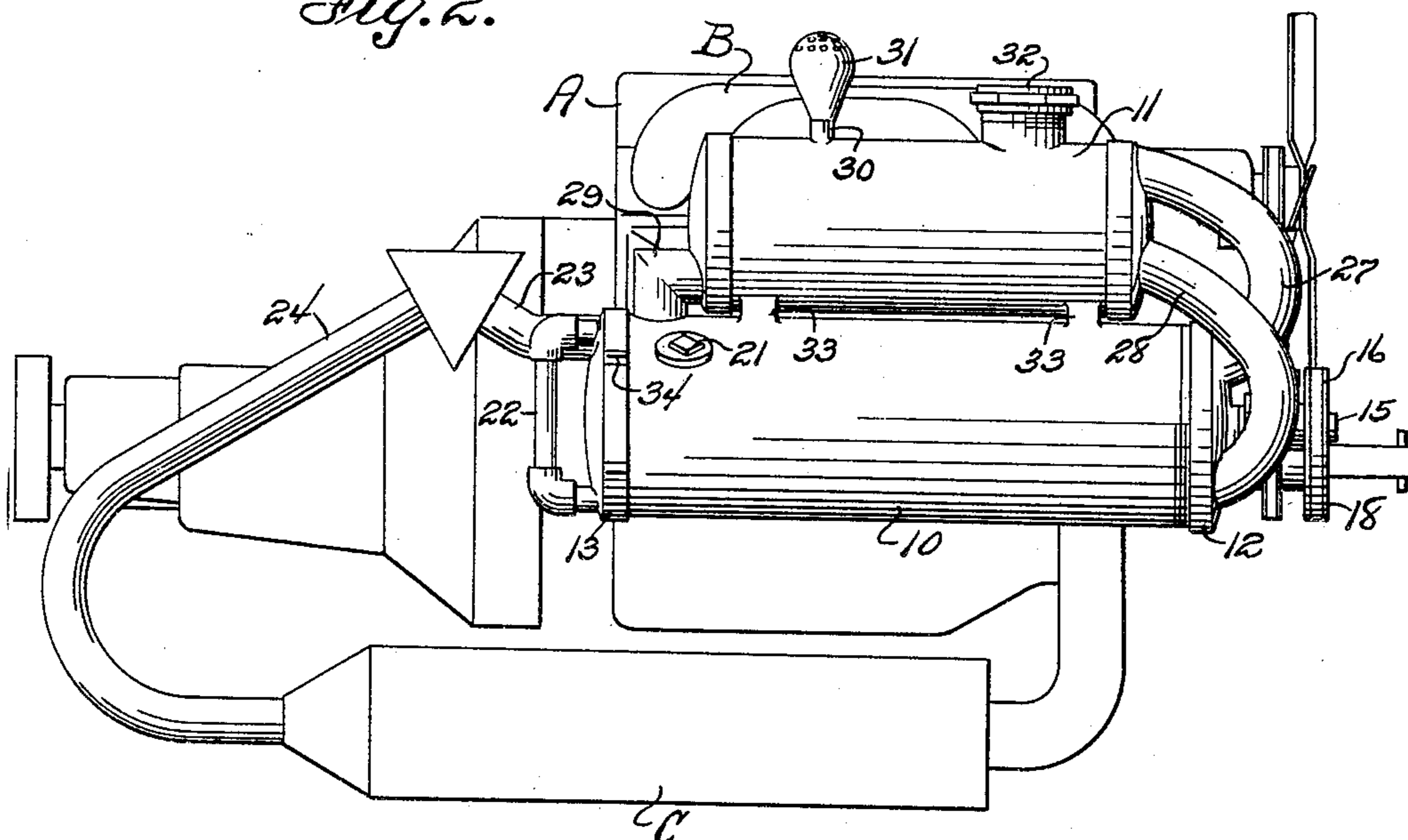


Fig. 2.



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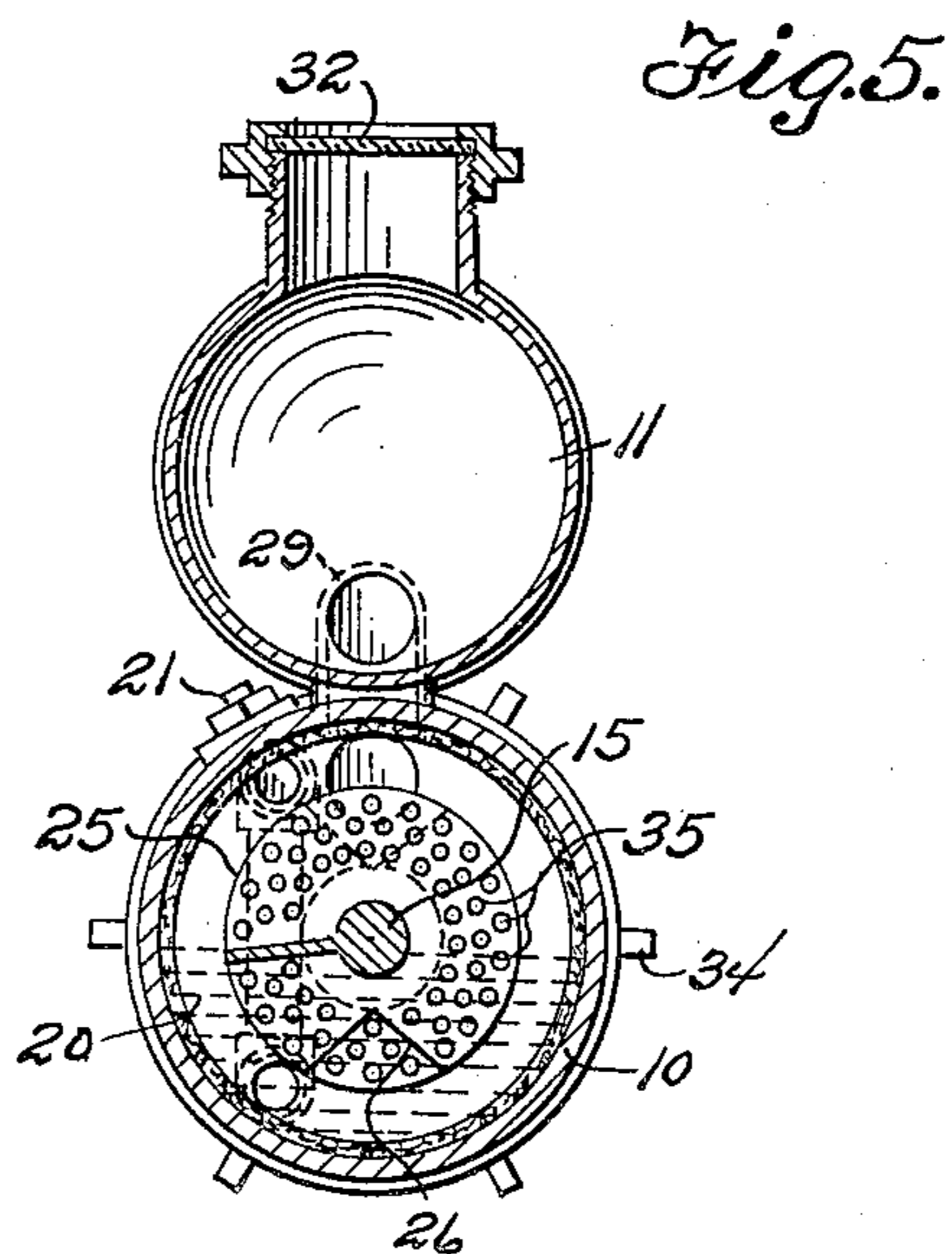
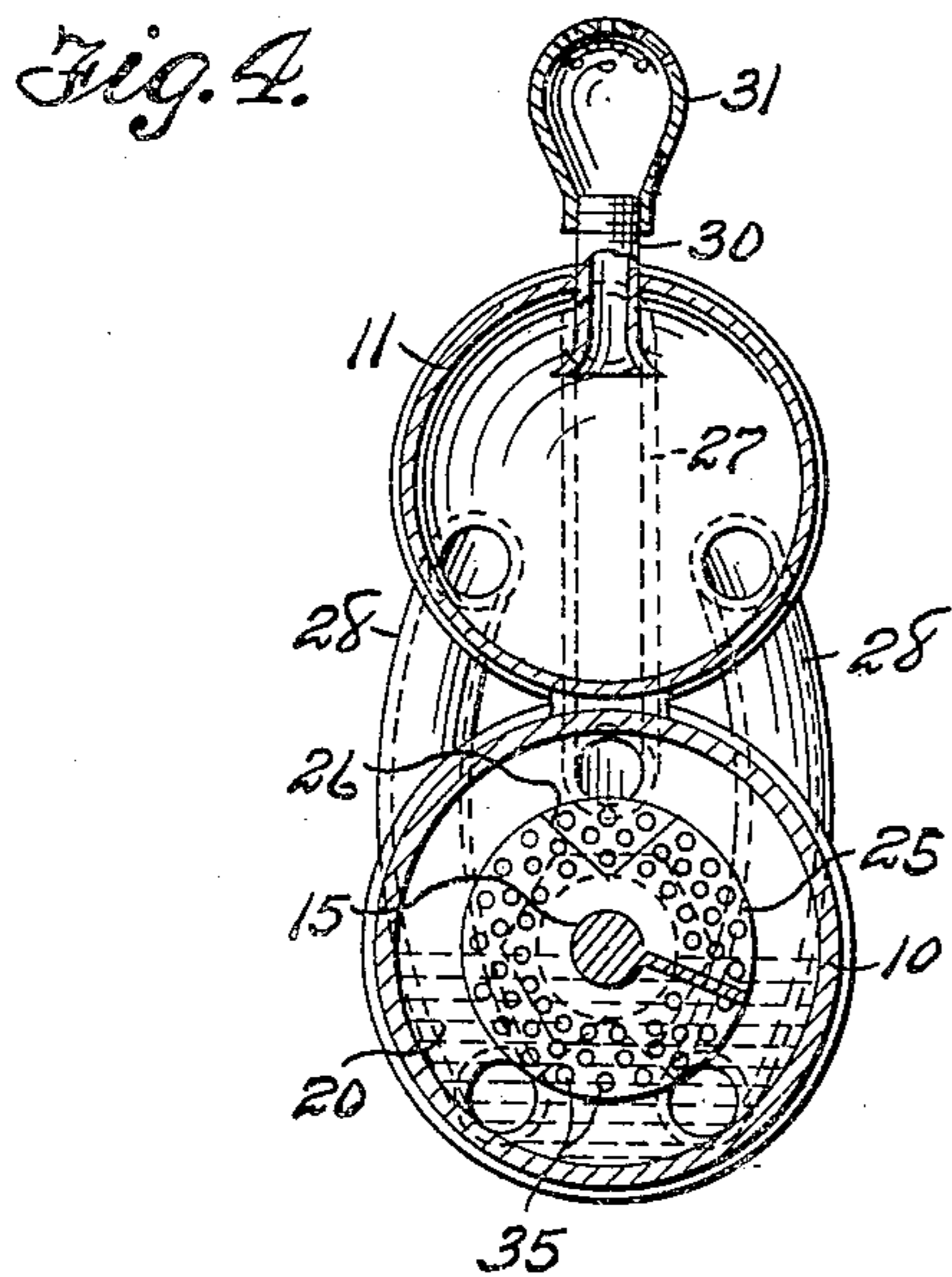
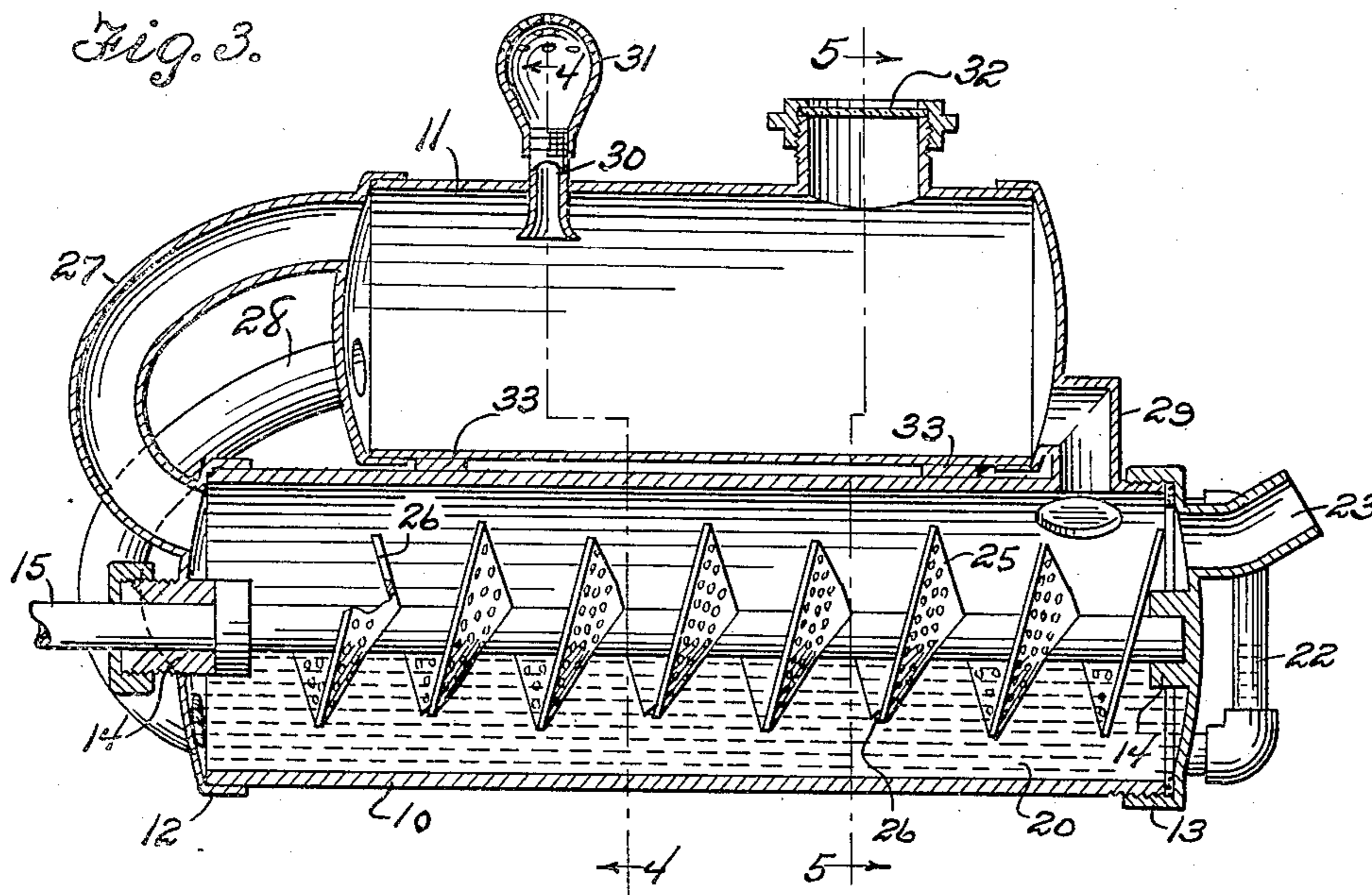
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UNITED STATES PATENT OFFICE

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EXHAUST GAS PURIFIER

Application filed September 18, 1931. Serial No. 563,591.

The invention relates to a device for purifying exhaust gases and more especially to an attachment for the exhaust manifold of an internal combustion engine for the purification of the exhaust therefrom.

The primary object of the invention is the provision of a device of this character, wherein the exhaust gases flowing through the exhaust manifold of an internal combustion engine will be subjected to a liquid within a container so that obnoxious fumes, smoke and injurious qualities of the exhaust gases will be eliminated therefrom, for example, carbon monoxide, so that the exhaust to the atmosphere will be purified and devoid of injurious or obnoxious fumes.

Another object of the invention is the provision of a device of this character wherein the construction thereof is novel in form and is readily applicable to the exhaust manifold of an internal combustion engine so that the exhaust fumes from the engine will be treated to purify the same before the exhaust thereof to the atmosphere, the device being equipped with a liquid gauge and a sight window whereby it can be determined with dispatch the quantity of liquid therein and also the character of flow of the exhaust therethrough or the working operation of the device.

A further object of the invention is the provision of a device of this character which is comparatively simple in construction, thoroughly reliable and efficient in its operation, readily and easily applied in working position, and inexpensive to manufacture and install.

With these and other objects in view, the invention consists in the features of construction, combination and arrangement of parts as will be hereinafter more fully described in detail, illustrated in the accompanying drawings, which disclose the preferred embodiment of the invention, and pointed out in the claims hereunto appended.

In the accompanying drawings:—

Figure 1 is a front elevation of an internal combustion engine of standard type showing the device constructed in accordance with

the invention applied to the exhaust manifold of the engine.

Figure 2 is a side elevation thereof.

Figure 3 is an enlarged sectional view on the line 3—3 of Figure 1 looking in the direction of the arrows.

Figure 4 is a sectional view on the line 4—4 of Figure 3 looking in the direction of the arrows.

Figure 5 is a sectional view on the line 5—5 of Figure 3 looking in the direction of the arrows.

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

Referring to the drawings in detail, A designates generally an internal combustion engine of standard type having as usual the exhaust manifold B including a muffler C and adapted to be connected with said exhaust manifold is the device constituting the present invention as hereinafter fully described.

The device comprises superposed cylinders 10 and 11, these constituting drums, the lowermost drum 10 is of greater length than the upper drum 11 and is provided with a permanent end head 12 and a removable opposite end head 13. These heads 12 and 13 are provided with center bearings 14 for a shaft 15, one end being countersunk in the bearing 14 on the head 13 while the other end extends outwardly of the bearing 14 on the head 12 and carries a belt wheel 16 over which is trained an endless belt 17, the latter being also trained over the driving belt wheel 18 for the fan belt 19 of the motor A so that in this manner said shaft will be driven from the motor on the working thereof.

Adapted to be introduced into the tank 10 is a liquid 20 of water and glycerine preferably during winter months or water and peroxide preferably during summer months for use in the tank and such liquid 20 can be of a quantity to rise to a determined level within the tank, this liquid serving to relieve obnoxious or dangerous fumes from the exhaust gases when delivered into the tank, such as carbon monoxide, as well as to elimi-

nate smoke from such exhaust in a manner presently described.

The liquid is introduced through a suitable filling hole into the tank 10 and this hole being closed by a removable plug 21. Also the end head 13 for the tank 10 carries a glass liquid gauge tube 22 so that it can be determined at a glance the height of the liquid level within the tank 10.

The end head 13 at an uppermost point thereof is provided with an inlet nipple 23 with which is coupled the pipe 24 leading from the muffler C attached to the exhaust manifold B of the engine so that exhaust gases will flow from the exhaust manifold B thence to the muffler C and through the pipe 24 into the tank 10 for subjection to the liquid 20 therein in a manner presently described. Formed on the shaft 15 within the tank 10 is a spiral-like turning screw or agitator spiral 25 which operates on the rotation of the shaft 15 to turn the liquid 20 within the tank and also to cause the exhaust gases to intermingle with the agitated liquid for elimination of obnoxious and dangerous fumes therefrom and thus purify such exhaust as the same passes through the tank. The screw or spiral 25 has at certain points thereof mutilations providing gaps 26 therein so that at these points the turning action will be interrupted and in this fashion a back flow will be created for the liquid and gases under the turning action of the screw or spiral and in this way a complete commingling action of the gases and liquid will be had for the purposes stated.

Leading from the permanent end head 12 at upper and lower points thereof are separate by-passes 27 and 28 respectively, the by-pass 27 opening into the adjacent end of the upper tank 11 near its top, while the other by-pass 28 opens into the adjacent end of said upper tank 11 at the lower portion thereof and these by-passes permit the flow of excess liquid under agitation or turning action into the tank 11 and also the exhaust gases after treatment by the liquid for purification thereof into said tank 11. Any liquid admitted into the tank 11 from the tank 10 will drain back into said tank 10 through a return elbow 29 leading thereinto from the end of the tank 11 opposite the end having connected therewith the by-passes 27 and 28 and adapted to be fitted with any suitable nonreturn valve to prevent gases entering tank 10 and flowing directly to tank 11 and thus a repetition of turning action or agitation of the return liquid can be had as well as any gases commingled therewith.

The tank 11 at its top is equipped with an outlet 30 having a perforated removable cap 31 through which is discharged the freed purified exhaust gases to the atmosphere and such freed gases will be devoid of obnoxious

or injurious fumes and likewise smoke eliminated therefrom.

Detachably mounted upon the tank 11 at the uppermost point thereof is a sight panel or glass 32 so that a person can view the interior of the tank 11 through said panel or glass for inspection purposes.

The tanks 10 and 11 in their superposed relation are joined together preferably at 33 in any suitable manner to provide a unitary rigid assembly.

The end head 13 has formed externally at its rim thereon spaced finger lugs 34 so that the end head 13 can be readily removed from the tank 10 by hand.

It will be obvious that in the working of the device the exhaust from the engine A passing through the pipe 23 will be delivered into the tank 10 and under the turning action of the spiral or screw 25 the liquid 20 therein will cause an intermingling and a mixture of the liquid and gases so that under such turning action the gases will be treated by the liquid to eliminate obnoxious and dangerous fumes, such as carbon monoxide, etc., from the exhaust whence the purified exhaust will be conveyed or transferred through the by-pass 27 into the tank 11 whence the exhaust will be discharged to the atmosphere through the tube 30 and its cap 31 and the freed exhaust gases when issuing into the atmosphere will be devoid of injurious or obnoxious fumes and also smoke will be eliminated therefrom.

The screw or spiral 25 is provided with reticulations or apertures 35 for the circulation of the fluid under turning action thereby.

What is claimed is:—

1. A device of the character described comprising a pair of tanks arranged superposed relative to each other, the lowermost tank being provided with a removable head, bearings formed at opposite ends of the lowermost tank, a power shaft journaled in said bearings and having an agitator spiral, a liquid within the lowermost tank and of a depth to submerge a portion of said spiral, conveyor tubes establishing communication between the tanks, one tube providing communication between the portions of the tanks adjacent the tops thereof and another tube providing communication between the portions of the tanks adjacent the bottoms thereof, means on the lowermost tank for establishing communication with an exhaust pipe of an internal combustion engine, and a reticulated outlet cap leading from the uppermost tank.

2. A device of the character described comprising a pair of tanks arranged superposed relative to each other, the lowermost tank being provided with a removable head, bearings formed at opposite ends of the lowermost tank, a power shaft journaled in said bearings and having an agitator spiral, a liq-

uid within the lowermost tank and of a
depth to submerge a portion of said spiral,
conveyor tubes establishing communication
between the tanks, one tube providing com-
5 munication between the portions of the tanks
adjacent the tops thereof and another tube
providing communication between the por-
tions of the tanks adjacent the bottoms there-
of, means on the lowermost tank for estab-
10 lishing communication with an exhaust pipe
of an internal combustion engine, a reticu-
lated outlet cap leading from the upper-
most tank, and a return lead from the upper-
most tank close to its bottom and through
15 the top of the lowermost tank.

In testimony whereof I affix my signature.

STEVE F. PLACKO, JR.

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