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OIL REMOVING APPARATUS

Filed Feb. 21, 1929

2 Sheets-Sheet 1

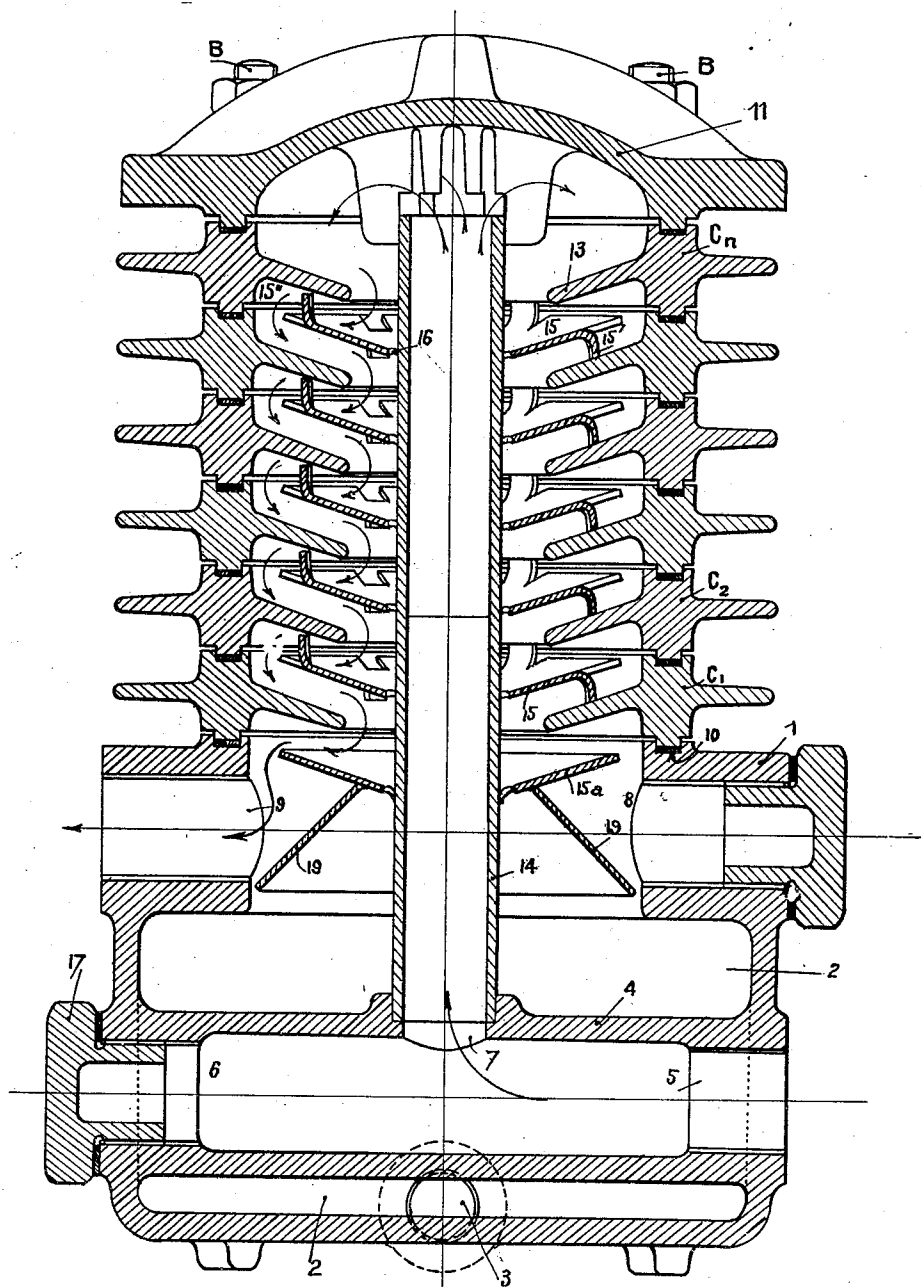


Fig. 1

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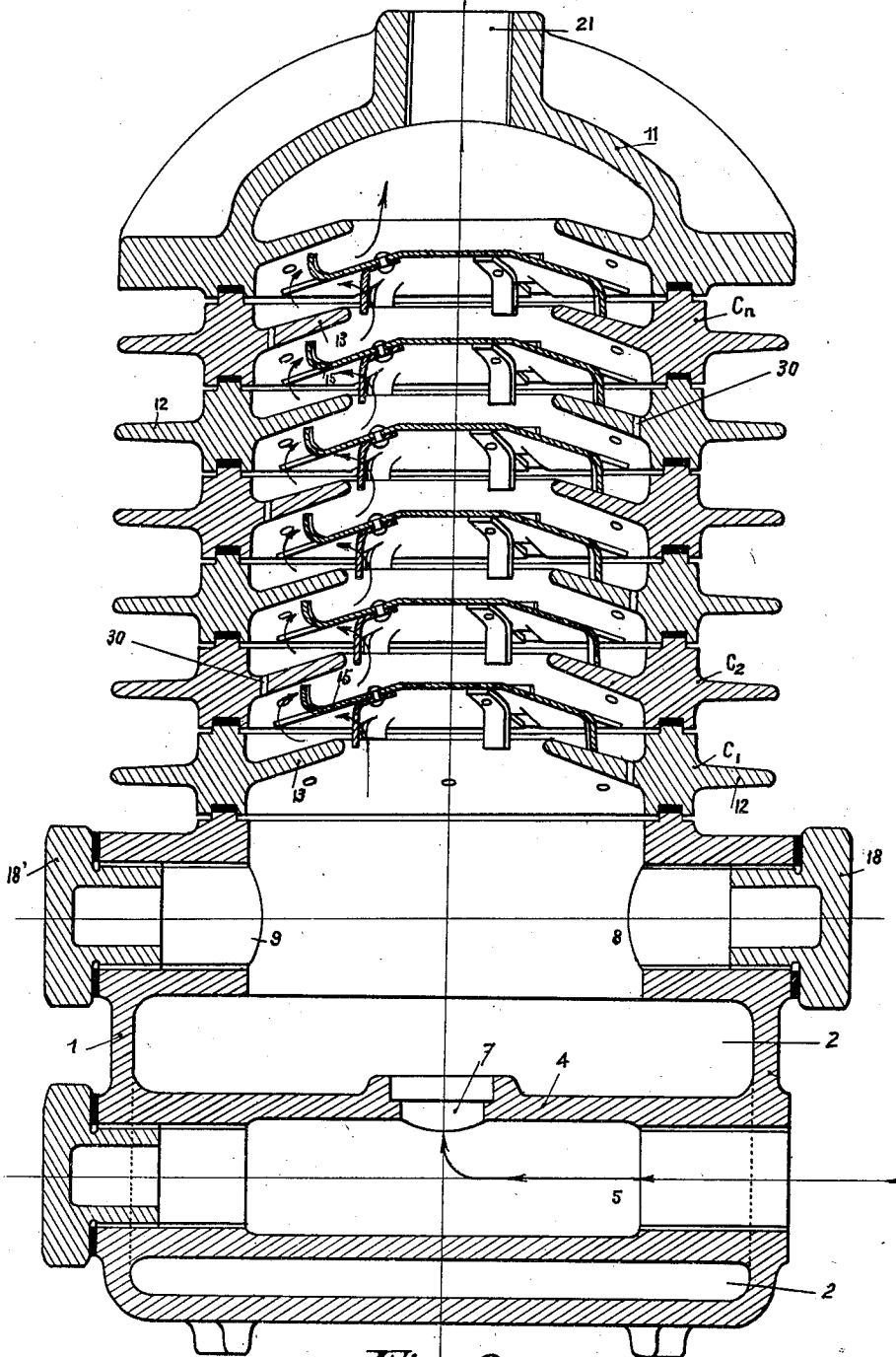


Fig. 2

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OIL REMOVING APPARATUS

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The present invention relates to an apparatus for the removal of oil i. e. for the condensation of the products of lubrication, which is chiefly adapted to collect the particles of oil or grease which are drawn forward with certain gas streams, and particularly with the air delivered by air compressors.

The apparatus according to the invention is chiefly characterized by the fact that it acts at the same time, firstly to cool the volume of air in all parts and thus to properly separate the minute drops of oil or grease whose suspension in the air is furthered by the high temperature to which it is heated when issuing from the compressor cylinders, and secondly to heat the collected oily liquid in order to restore to it, at least partially, the fluidity which it has lost under the effect of the high temperature of the delivery, this fluidity being required for the ready discharge of the liquid, with or without pressure.

An advantageous method consists in cooling the air from which the oil is to be removed, by circulating it in contact with a sufficient number of thin baffle devices which are cooled by external flanges, whilst the oily drops thus deposited thereon are directed, by a suitable slope of the said baffles, to the peripheral walls of the apparatus, or on the contrary, to the central part, so that it will then stream down by gravity along the said peripheral walls or along a central tube.

Another feature of the invention consists in the construction of the apparatus by the use of annular elements or rings in a superposed arrangement, whereby the operating capacity of the apparatus may be modified by simply increasing or diminishing the number of such rings according to the degree of purifying to be obtained.

Figs. 1 and 2 show by way of example two respective embodiments of the invention, in axial section.

In Figure 1 the apparatus comprises a case 1 forming a base, upon which are piled baffle rings in superposed position. The interior 2 of said case forms a collecting cham-

ber for the fatty substances which may be discharged through an outlet provided at the bottom at 3. The case 1 is traversed at its middle part by a conduit 4 which is cast in one therewith, whose ends 5—6 are tapped, and whose lateral wall is pierced at the top with a hole 7. Two other tapped pipe-fittings are provided in the wall of the case 1 above the conduit 4. In the upper face of the base part 1 is an annular groove 10 for the insertion (with packing) of the ring C_1 . The said ring has at the top an annular groove for the insertion (with packing) of the second ring C_2 , and so on. The last ring C_n carries in like manner a cover 11 closing the pile at the top.

The various rings and the cover are held together in a non-leaking manner by a plurality of bolts B spaced around the periphery, outside the main body of the rings C, and passing through corresponding notches in the outer flanges 12 of the said rings. Each ring comprises an internal baffle rib 13 which is inclined from the axis. A vertical axial tube 14 is mounted on a shoulder formed on said conduit 4 around the hole 7 thereof, and it rises to a point above the baffle rib 13 of the last ring C_n , stopping at a certain distance from the cover 11.

Intermediate tapered sheet metal disks 15, through which the tube 14 passes loosely, rest upon the ribs 13 of the rings by means of the curved projections 15'—15'' formed upon the same, thus constituting baffle devices together with the ribs 13, the air being circulated on a zigzag path around the baffles according to the arrows. The said sheet metal disks 15 are pierced with holes 16 in a row surrounding the central tube 14, so that the oil will drop upon the tube 14.

The operation is as follows. One of the orifices 5 or 6 is closed by a screw plug 17, and one of the orifices 8 or 9 is closed by a like plug 18. The air is supplied to the transverse conduit 4, flows in the tube 14, and then returns on a zigzag path around the baffles 13—15, then issuing through the orifice 9. A sheet metal plate 19 secured to the lower baffle 15 directs the air to the

outlet 9 and prevents all violent whirling motion in the oil collecting chamber 2. The oil deposited on the ribs 13 drops upon the intermediate baffles 15 and is thus added to the oil directly deposited upon the latter. This oil drops off and descends along the tube 14, then drops into the collecting chamber 2, whence it may be discharged through the emptying orifice 3 when the latter is opened.

The air will thus be entirely and in all parts cooled by its circulation in contact with the cooling ribs 13, which facilitates the separation of the oil. On the contrary, the oil deposited along the tube 14 is subjected to the heat of the air supplied directly by the compressor to this tube. The collecting chamber 2 is heated by the transverse conduit 4 which is supplied with hot air. Such heating will reduce the viscosity of the oily deposits, and will facilitate their expulsion by the action of the compressed air when the emptying orifice 3 is opened.

The construction shown in Fig. 2 differs from the preceding, due to the fact that the air circulates in the other direction, and that the ribs and intermediate baffles 13-15 are not inclined downwardly towards the centre, but are downwardly inclined towards the periphery. The central tube 14 is eliminated, but the base part 1 is the same as in Figure 1. Herein the two upper orifices 8-9 of the case 1 are both closed by respective screw plugs 18-18'. The air is supplied at 5 and it escapes from the transverse conduit 4 through the hole 7, then rises and circulates in a zigzag path around the ribs 13 and the intermediate baffles 15 (which are herein closed at the middle), and finally issues through a hole 21 formed at the top of the cover 11.

Obviously, the holes are pierced, as shown at 20, at the lower part of the annular concave parts formed by the baffle ribs 13, and thus the oil will flow downwardly along the peripheral walls of the apparatus, descending thence into the collecting chamber 2.

The arrangements and details of construction herein described and represented are given solely by way of example, and are susceptible of all desired variations without departing from the principle of the invention.

Claims:

1. An apparatus for the removal of oil from hot air, comprising in combination a chamber with peripheral walls and an air inlet, a series of heat-conducting ribs formed integrally with the peripheral walls of said chamber and forming with said walls a circulation path of the air, internal elements alternated with the said ribs and forming baffles disposed in the circulation path of the air, adapted for the progressive cooling

of the air and for the depositing of the oil and having perforations for permitting the flow of oil downwardly, a discharge conduit for the cooled air from which the oil has been removed and a chamber for collecting the oil which is thus separated.

2. An apparatus for the removal of oil from hot air, comprising in combination a chamber with peripheral walls and an air inlet, a series of internal heat-conducting ribs formed integrally with the peripheral walls of said chamber and forming with said walls a circulation path of the air, cooling flanges at the exterior of said peripheral walls for radiating the heat, internal elements alternated with said ribs and forming baffles disposed in the circulation path of the air, adapted for the progressive cooling of the air and for the depositing of the oil, and having perforations for permitting the flow of oil downwardly, a discharge conduit for the cooled air from which the oil has been removed and a chamber for collecting the oil which is thus separated.

3. An apparatus for the removal of oil from hot air, comprising in combination a chamber with peripheral walls and an air inlet, a series of annular heat-conducting ribs formed integrally with the peripheral walls of said chamber, inclined from the horizontal plane and forming with said walls a circulation path of the air, internal elements in the inclined position which are alternated with the said ribs forming baffles in the circulation path of the air and having perforations for permitting the flow of oil downwardly, a conduit for the discharge of the cooled air from which the oil has been removed and a collecting chamber adapted to receive the oil which is thus separated.

4. An apparatus for the removal of oil from hot air, comprising a plurality of superposed annular elements provided with internal radiating flanges, which elements are superposed, means whereby the said elements may be assembled to form a circulation path of the air and held together, means forming baffles with the said radiating flanges in the circulation path of the air and having perforations for permitting the flow of oil downwardly, an air intake for the said baffles, a conduit for the discharge of the air from which the oil has been removed, and a collecting chamber adapted to receive the oil which is thus separated.

5. An apparatus for the removal of oil from hot air, comprising a plurality of superposed annular elements provided with internal radiating inclined flanges which elements are superposed, means whereby the said elements may be assembled and held together to form a circulation path of the air, sheet metal members of tapered shape interposed between said internal radiating flanges and having perforations for permit-

ting the flow of oil downwardly which members make contact with said flanges and form baffles with the same in the circulation path of the air, an intake of air for the said baffles, a conduit for the discharge of the air from which the oil has been removed and a collecting chamber adapted to receive the oil which is thus separated.

5 6. An apparatus for the removal of oil from hot air, comprising a set of superposed annular elements provided with internal radiating flanges downwardly inclined towards the centre, a cover above the set of said elements forming a chamber closed at the top, means whereby the said elements and said cover are assembled and held together, tapered sheet annular metal members with perforations at their inner edges for permitting the flow of oil downwardly, interposed between said internal radiating flanges, having the same inclination as said flanges, and so disposed as to make contact with the flanges and to form baffles with the same, a central tube supplying hot air to the chamber formed by said cover and traversing said sheet metal members, the oil flowing through the perforations of said sheet members along said central tube, a conduit for the discharge of air from which the oil has been removed starting from the said chamber disposed below said baffles, and a collecting chamber adapted to receive the oil which is thus separated.

10 15 20 25 30 35 In testimony whereof I have signed this specification.

MARIE PAUL ROBERT JOURDAIN.

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