June 14, 1966 R. F. FRANKS 3,255,631

TEMPERATURE INDICATING APPARATUS

Filed Jan. 10, 1963

FIG. 1

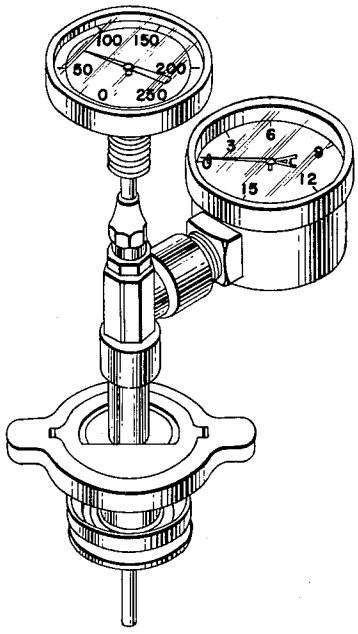
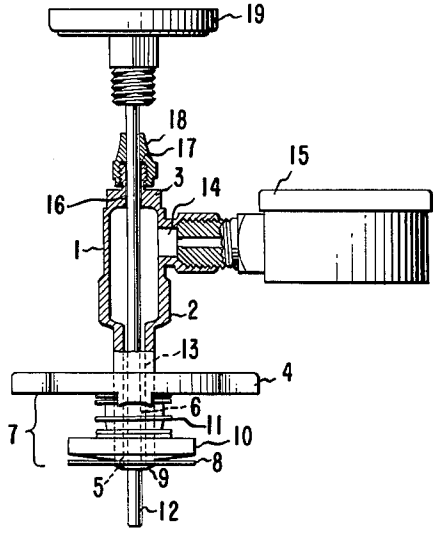


FIG. 2



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United States Patent Office 3,255,631 Patented June 14, 1966

3,255,631

TEMPERATURE INDICATING APPARATUS

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Filed Jan. 10, 1963, Ser. No. 250,652
2 Claims. (Cl. 73—345)

Cleaning of automobile radiators with chemicals is most efficient when carried out at elevated temperatures and pressures, the particular conditions being dependent upon the cleaning material used and the radiator being cleaned. At unduly low temperatures and pressures cleaning is either excessively time consuming or ineffective or both, and at unduly high temperatures and pressures the operation may harm the radiator or even be dangerous. Since modern automobiles generally have no means for accurately indicating cooling system temperatures or pressures and frequently do not produce, in normal operation, high enough temperatures for effective cleaning, there has been a need for a device which would indicate accurately the temperature and pressure within a cooling system without dismantling it in any way and which would also be inexpensive and convenient to use.

FIGURE 1 is a perspective view of the radiator temperature and pressure measuring device of this invention.

FIGURE 2 is a longitudinal view of the apparatus, partially in section.

With reference to FIGURE 2, conduit T 1 has its arms 2 and 3 vertically oriented with respect to radiator cap 4 and connected in a gas tight seal to the periphery of the lower portion 5 of central passageway 6 located in the central area of radiator cap 4 and associated sealing mechanism 7. The latter consists of washer 8 of a resilient material, such as rubber, positioned between retaining ring 9 and back up washer 10 of a non-resilient or hard material such as metal which is held firmly against washer 8 by the spring 11 which bears on the inner surface of cap 4 or on an intermediate flexible disc (usually of thin metal) of a size and configuration to seal the upper throat of a radiator when the cap is attached thereto. The diameter of stem 12 of thermometer 19 is significantly smaller than the diameter of the central passageway 6 and T arms 2 and 3, thereby forming the walls of annulus 13 which annulus is sufficiently large to provide easy passage of gas therethrough. This annulus, of course, communicates with the T foot conduit 14 and thereby with pressure gauge 15. Annulus 16 in the upper T arm 3 is sealed at its upper extremity by an O-ring 17 of resilient material (preferably rubber) which is pressed against the upper mouth of the annulus by its associated collar nut 18 when the latter, which is threaded for engagement with the end of the upper arm 3, is tightened on upper arm 3. Tightening the collar nut also presses O-ring 17 against thermometer stem 12 to hold it motionless.

Thus the thermometer stem is releasable for longitudinal movement within the T arms 2 and 3 and passageway 6 and may be held fast in any desired position. This permits adjustment of the extension of the thermometer stem below the radiator cap to accommodate radiators of varying depths and designs and provide for the proper immersion depth of the thermometer.

Although a bi-metallic bayonet-type thermometer is preferred, other sturdy thermometers are also practical for use in this invention so long as the normal reading portion of the gauge is visible. Similarly any conventional pressure gauge may be used. The materials of construction are not critical but maximum utility suggests those which are resistant to corrosion. Brass or stainless steel or a strong polymeric material are very suitable for the rigid parts of the device and a long life rubber such as neoprene is preferable for the resilient washers and O-ring.

Non-rubber-like polymeric materials such as nylon and polyethylene may also be used.

In use, the device of this invention will first be adjusted to accommodate the radiator to be cleaned by loosening collar nut 18 and adjusting the thermometer stem extension below ring 9 so that it has proper immersion and is positioned slightly above the floor or baffle plate in the upper portion of the radiator when the device is attached to the radiator in place of its conventional cap. Ordinarily the liquid in the cooling system will then be heated to the desired temperature by running the associated engine. The cleaning chemicals are then added by temporarily removing the apparatus from the radiator. Thereafter the device is once more attached to the radiator—sealing it, and the radiator coolant is maintained at the particular temperature and pressure recommended for the particular radiator and cleaning chemicals used. The temperature may be regulated by controlling the cooling air passing through the radiator. Pressure is predetermined by proper selection of spring 11. Customarily temperatures in the range of 180–205° F. at a pressure of 5–15 pounds per square inch are necessary to provide adequate and efficient cleaning.

The device of this invention provides a convenient means for cleaning automobile radiators effectively. With this apparatus recommended cleaning conditions appearing on the labels of radiator cleaning chemicals can be easily achieved with certainty, and guessing about conditions in the cooling system during cleaning is avoided. Harm to radiators caused by unduly high temperatures or pressures is also avoided.

I claim:

1. In an automobile radiator cap fitted with a yieldable sealing mechanism, the improvement in combination therewith comprising a conduit T with its arms perpendicularly oriented relative to said cap, the lower arm sealingly attached to a central passageway through the cap and associated sealing mechanism, a thermometer with its stem releasably positioned for longitudinal sliding movement through the arms of the T and of substantially greater length than the combined lengths of the T arms and central passageway, the diameter of the stem of the thermometer being sufficiently smaller than the interior diameter of the T arms to provide an annulus for passage of gas between the stem and the inner wall of the T, a close fitting resilient O-ring and associated collar nut encircling the upper stem of the thermometer, said collar nut being threadedly connected to the end of the upper arm of the T and adapted to press the O-ring against the upper mouth of the annulus and against the stem of the thermometer, when the collar nut is tightened, to seal the annulus and hold the thermometer stem motionless, and a pressure gauge connected to the foot of the conduit T and communicating with said annulus.

2. The apparatus of claim 1 in which the lower arm of the conduit T is attached to the lower portion of the central passageway through the cap and associated sealing mechanism.

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