Aug. 6, 1940. E. E. THOMPSON 2,210,049

ENGINE PREHEATER

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Fig. 1.

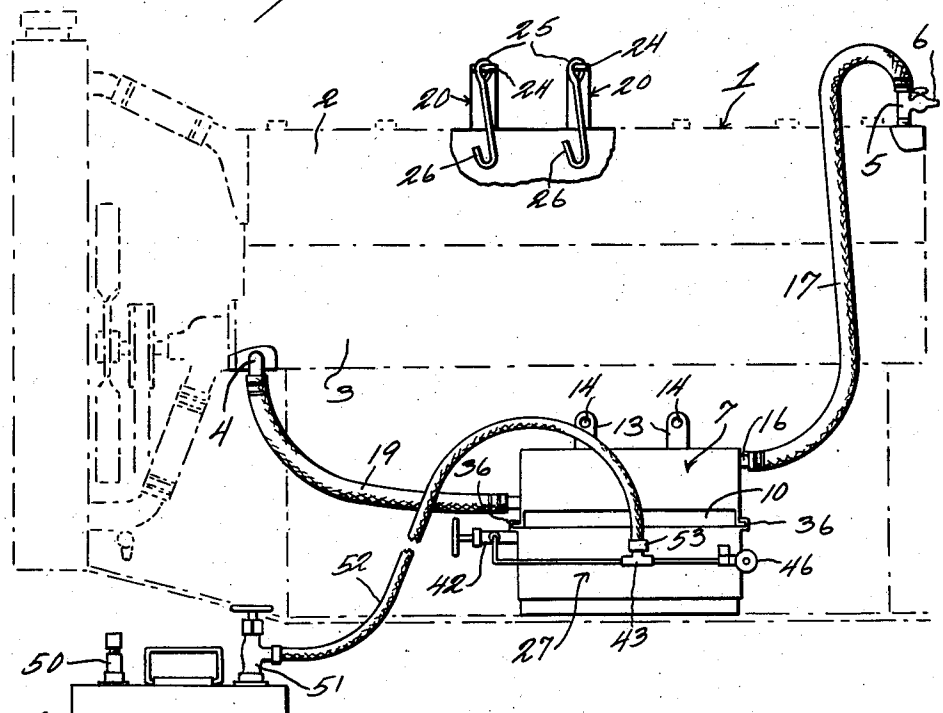


Fig. 2.

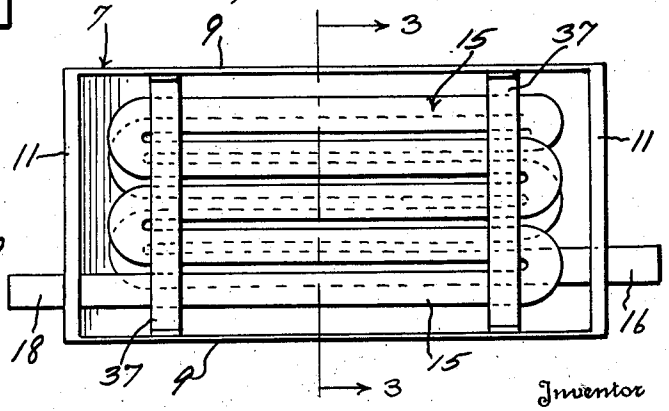
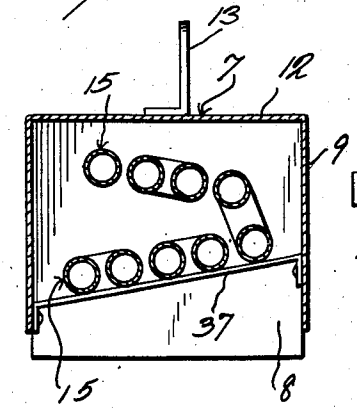


Fig. 3.



Inventor

E. E. Thompson

By Watson E. Coleman

Attorney

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Fig. 4

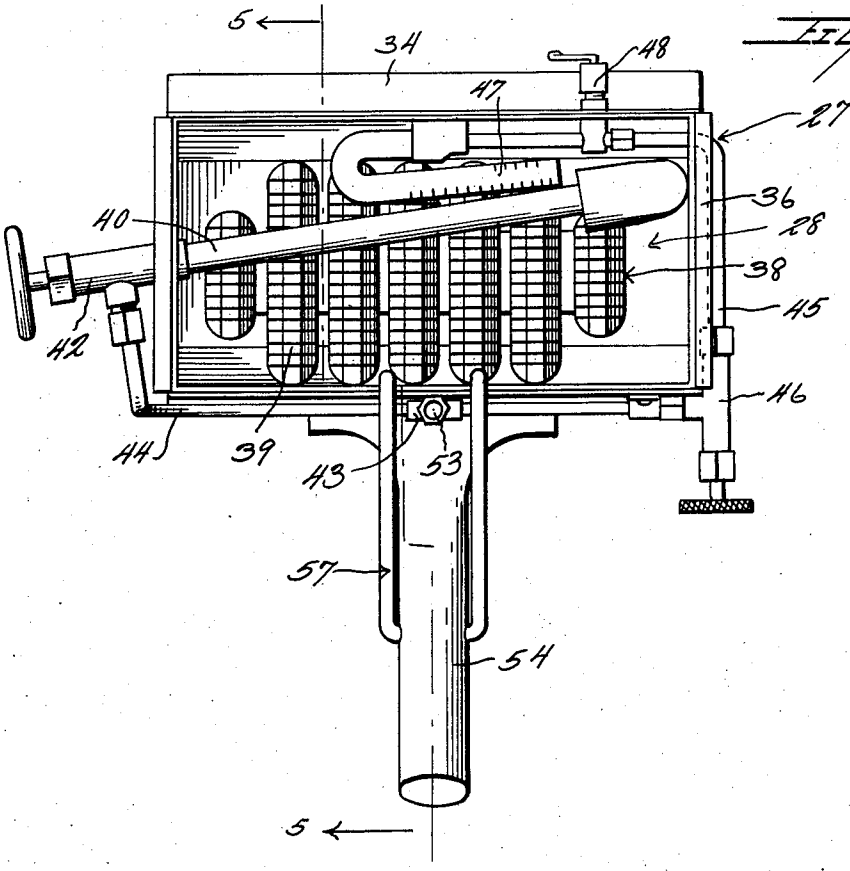


Fig. 5

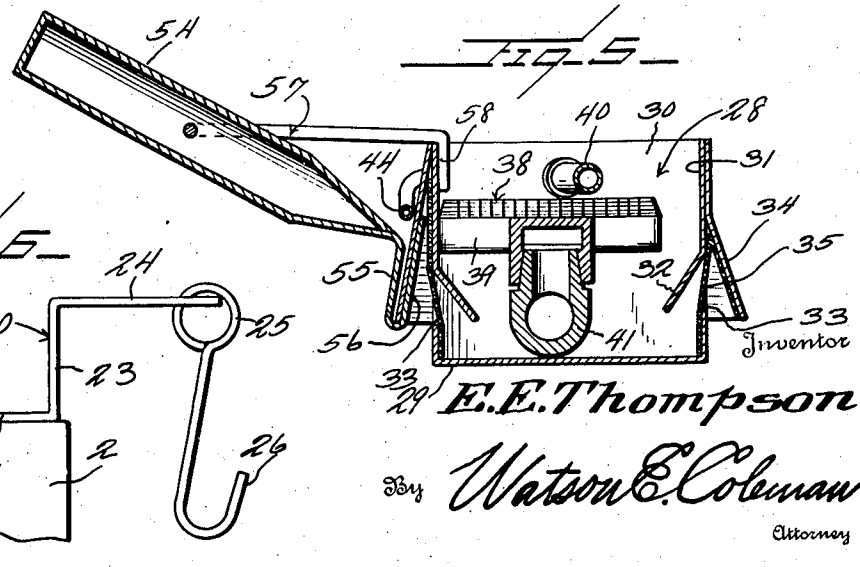


Fig. 6

Inventor

E. E. Thompson

By Watson E. Coleman

Attorney

Patented Aug. 6, 1940 2,210,049

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ENGINE PREHEATER

Earl E. Thompson, Ross, N. Dak.

Application November 26, 1938, Serial No. 242,605

4 Claims. (Cl. 126—350)

This invention relates to a heating device and pertains particularly to an improved and novel means of heating motor vehicle or other similar engines preparatory to starting the same, where such engines have been subjected to low temperatures.

The present invention has for its primary object to provide a novel motor vehicle engine heating means wherein the water of the cooling system will be warmed or heated, particularly the water contained in the chamber surrounding the engine block, so that the engine after being started, will immediately function smoothly and the excessive wear upon the parts resulting from the operation of an engine when it is cold will be avoided.

Another object of the invention is to provide an improved engine heating means, designed primarily for use in association with motor vehicle engines but not, of course, restricted to such use, wherein there is provided a water coil which is kept permanently connected with the engine block water jacket, and a heater which is designed to be detachably connected with the water coil whereby heat may be applied to the coil preparatory to starting the engine and after the desired temperature of the water in the coil and the engine block water jacket has been attained, the heating unit may be removed and stored away until wanted for further use, the heating coil being retained on the engine as a permanent part thereof.

Another object of the invention is to provide in a device of the above described character, a water coil unit which is so constructed that it may be secured to the engine block and supported therefrom when not in use, the supporting means further facilitating the attachment of the heating means to the coil by maintaining the latter in a position which makes it convenient for the attachment of the heating means to the coil.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming part of this specification, with the understanding, however, that the invention is not to be confined to any strict conformity with the showing of the drawings but may be changed or modified so long as such changes or modifications mark no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:

Fig. 1 is a view illustrating in broken lines a side elevation of a motor vehicle engine showing, in full lines, the mechanism embodying the present invention connected with the engine and in working or operative position.

Fig. 2 is a view looking into the water coil housing, this view showing the housing from the underside.

Fig. 3 is a section taken on the line 3—3 of Fig. 2.

Fig. 4 is a view in plan of the heater unit which is detachably coupled with the water coil housing, showing a handling means which is detachably coupled therewith.

Fig. 5 is a sectional view on the line 5—5 of Fig. 4.

Fig. 6 is a view in side elevation of one of the water coil unit supporting elements.

Referring now more particularly to the drawings, the numeral 1 generally designates a motor vehicle engine, the parts 2 and 3 of which represent respectively the upper and lower portions of the block in which the water jacket is formed.

In carrying out the present invention, the lower part of the jacketed portion of the lower block is provided at one end of the engine with a hose coupling or nipple 4 which opens into the water jacket and at the opposite end of the engine the upper half 2 of the block is provided with a hose connection or nipple 5 which opens into the upper part of the water jacket, this nipple being provided with a petcock 6.

The numeral 7 designates a box or casing which is of elongated rectangular design and is open at its bottom and the end walls 8 of this casing extend below the lower or bottom edges of the side walls 9, as shown in Figs. 1 and 3, thus forming the cut out or open longitudinal side areas 10. Each end wall is provided with the outwardly directed flange or lip 11 which extends across the width of the casing.

Secured to the top wall 12 are two upstanding ears 13, each of which is provided with an aperture 14 by which the suspension of the casing is effected, as hereinafter described, when the device is not in use.

Disposed within the casing 7 are two tiers of water coils, each of which is designated by the numeral 15, and these tiers of coils are arranged in intersecting planes extending across the casing, as shown in Fig. 3, and at the high side of the upper tier the end of the coil passes through the casing to provide a nipple 16 to which is attached a water hose 17, the other end of the hose being attached to the water jacket nipple 5 while

the opposite end of the other tier extends through the other end wall of the casing providing the nipple 18 to which is attached one end of a water hose 19, the other end of the hose being connected to the water jacket nipple 4. Thus it will be seen that the outlet side of the two tiers of coils which are coupled together so that water will circulate through the convolutions of one and into and through the convolutions of the other, is at a substantially high point above the inlet nipple 18 and thus as the water in the coils is heated, it will steadily rise from the lowest point of the lower tier to the highest point of the higher tier, thereby insuring the proper circulation of the water from the hose 19 through the convolutions of the heating coil to the hose 17.

When the coil unit is not being used, it is suspended by the ears 13 from supports mounted upon the top of the engine body. These supports comprise two brackets each of which is generally designated by the numeral 20 and consists of a lower arm 21 which is bolted to the top of the engine by a head bolt 22, a vertical arm 23 connected with one end of the lower arm adjacent the side of the block and an upper arm 24 which extends from the upper end of the vertical arm outwardly from the block, and has a suitable aperture for the reception of the high portion 25 of a hook, the bill of which is indicated by the numeral 26. The hooks are spaced apart the proper distance so that the bills thereof may be readily engaged through the apertures 14 of the coil unit ears and the unit thus suspended from the top of the engine when it is not being used.

The numeral 27 generally designates the heater for the water coil, which heater is designed to be coupled with the coil unit as hereinafter described. This heater consists of an upwardly opening receptacle 28 having solid bottom and end walls 29 and 30, respectively, and having the side walls 31 thereof provided with instruck downwardly directed fins 32 whereby there are formed side wall openings 33 which the inwardly and downwardly directed fins 32 partially cover.

Secured to the outer sides of the side walls of the heater receptacle 28 are deflectors 34 which extend downwardly and laterally or outwardly across the openings 33. These openings 33 are covered by perforated plates or shields 35 which serve to diffuse or distribute the air which passes up under the outer shields 34 and is deflected downwardly toward the bottom of the receptacle by the fins 32, when the heater is in connection with the water coil unit.

Extending across each end of the heater unit receptacle 28 at the top edge of the end wall is an inwardly directed guide channel 36. These guide channels are spaced apart the proper distance to receive between them the flanged ends of the water coil casing 7 so that the heater unit receptacle may be slidably engaged with the casing 7 in the manner shown in Fig. 1, when it is desired to heat the tiers of coils 15 and the water flowing therethrough.

As shown in Figs. 2 and 3, the water coils are suspended or supported within the casing 7 by suitable transverse bars 37 which are secured to the opposite side walls of the casing.

Supported within the receptacle 28 is a burner unit 38 which is of a suitable type for burning gasoline, this unit including the burner arms 39 and the generator 40 which extends across the tops of the arms 39 and is connected with the pipe 41 which extends beneath the unit and is coupled with the burner arms in the customary manner common to devices of this kind, this coupling being shown in Fig. 5. The flow of gasoline to the generator 40 is controlled by a valve 42, the gasoline, which is supplied to the burner as hereinafter described, being carried from the coupling 43 through the pipe 44 to the valve 42. Also connected with the coupling 43 is a pipe line 45 which is controlled by a valve 46 and this latter pipe line leads to the pilot generator 47 which is disposed adjacent the main generator 40 and which is employed for starting up the burner. A needle valve control 48 is also connected with the line 45 for regulating the flow of fuel to the pilot generator 47. By the provision of a main valve 46 the fluid fuel line may be kept tightly closed when the device is not in use, the middle valve 48 being employed merely as a control means which would be capable of giving a finer adjustment of the burning unit flame than might be possible to obtain with the main shut off valve 46. No detailed showing has been made of this part of the device as the same is of standard design and common to gasoline burners of the type described.

The numeral 49 designates a liquid fuel receptacle, designed to contain gasoline or other suitable fluid fuel. This receptacle is provided with a valve coupling 50 by means of which an air pressure hose may be coupled with the tank for establishing an air pressure therein and a discharge valve 51 which is connected with a fluid fuel hose 52, the other end of the hose being provided with a suitable swivel connector 53 to facilitate the ready attachment of the hose to and its detachment from the coupling 43.

In order to facilitate handling the heater unit, there is provided a detachable handle which consists of a bar or hand grip 54 having at one end a broad laterally turned blade 55 which is integral with a tongue portion 56 of similar width. The blade 55 and tongue 56 are in slightly spaced relation and the longitudinal edge of the tongue is directed upwardly, as shown in Fig. 5, so that it may be slipped under one of the deflectors 34 in the manner shown in this figure. When the tongue is so engaged under the deflector 34, the hand grip portion is coupled with the top edge of the receptacle by the double hook unit 57 which is pivotally attached to the hand grip and has at its free end the two laterally turned fingers 58 which are engaged over the top edge of the receptacle in the manner shown. Thus the heater receptacle with the burner may be lifted and slidably connected with the flanges of the water coil casing 7 while the burner unit 38 is lighted.

In the operation of the present device, assuming that the motor vehicle engine has become extremely cold so that it is desirable that the engine block and water in the jacket thereof be heated before starting the engine, there is established in the fuel receptacle or tank 29, the hose 52 of which is connected as shown with the coupling 43, a suitable air pressure which will effect the discharge of the fuel from the tank through the hose to the heater burner when the valve 51 is opened. After the desired pressure is set up in the tank, this valve 51 is opened to permit the fuel to be forced into the pipes leading from the coupling 43 to the valves 42 and 46. The next step is to heat the pilot generator 47 and this may be accomplished by holding beneath the bend of the same two or three burning matches. This pilot generator is usually formed of metal such as copper which quickly becomes

heated and, therefore, the use of matches for this purpose is feasible. After the pilot generator has become sufficiently warmed or heated, the valve 46 is opened slightly to permit some of the fuel to pass to the generator 41 and the latter is lighted. This will bring about a heating of the main generator 40 so that the stove unit can be lighted in the usual manner. This lighting of the stove is preferably carried out away from the engine and after the lighting is accomplished, the handle unit 54 is connected with the side of the receptacle and the receptacle is then slidably coupled with the flanges of the water coil casing 7 while the latter is suspended from the hooks 26. The entire unit, consisting of the casing 7 and the heater 27 may then be lifted from the hooks and lowered to the position shown in Fig. 1. It may either be allowed to rest upon the cover pan which usually is disposed across the underside of a motor vehicle engine or it may be allowed to hang between the hoses 17 and 19. It will thus be seen that the lighted burner or stove unit 38 will thus be maintained in close proximity to the water coil tiers 15 and the water in the coils will rapidly become heated and a circulation will be established through the coils and the engine block water jacket, the heated water rising through the tube 17 to the top of the jacket and the colder water dropping from the jacket through the hose 19. By this means, the temperature of the engine body may be quickly raised so that the oil within the engine will become sufficiently warmed to flow freely and thus quickly reach and lubricate all of the moving parts of the engine when the latter is started. Thus the operating efficiency of the engine will be improved due to the fact that the engine can be started up and put into service immediately and also the wear incident to the running of cold engines before the oil therein has become sufficiently fluid to reach all moving parts, will be eliminated.

After the engine has been heated up, the entire device may be lifted again so as to hook the ears 13 onto the suspension hooks 26 and then the heater unit 27 may be detached from the casing 7 and put away until further needed and the water coil until will be suspended from the engine block out of the way while the engine is in operation.

What is claimed is:

1. A preheater for a motor having a water jacket, comprising a water coil having inlet and outlet ends, water conduits connecting said inlet and outlet ends respectively with the lower and upper parts of said water jacket at remotely spaced points, a casing for said coil, flange members integral with opposite walls of the casing and extending outwardly therefrom, a receptacle having an open top, means at opposite ends of the top of the receptable forming guide grooves for slidably receiving said flanges whereby the receptacle and casing may be secured together with the open sides thereof opposed, said receptacle having side wall openings, and deflectors upon the inner and outer sides of the walls having said openings for guiding air into and toward the bottom of the receptacle, the receptacle being designed to house a burner.

2. In a preheater for a motor having a water jacket, including a water heating unit, and a heater separably connected therewith, means for slidably detachably coupling the heater and heating unit together, said heater consisting of a receptacle having an open top, a fuel burner within the receptacle having means connected therewith for conducting fuel thereto, said receptacle having air inlet side wall openings, deflectors upon the inner and outer sides of the walls for guiding air into and toward the bottom of the receptacle beneath the burner, handling means for said receptacle and burner comprising a hand grip having a lip formed across one end and adapted for engagement beneath an outer one of said deflectors, and hook means carried by the hand grip for engagement over the top edge of the receptacle.

3. In a preheater unit for a motor vehicle engine having a water jacket, a pair of receptacles each having an open side, means slidably coupling said receptacles together with one above the other and with the said open sides together in opposed relation, a water coil within the upper one of the receptacles, flexible water conductors connecting opposite ends of the coil with remote high and low points of said jacket, the lower receptacle being designed to house a heater and to support the same in close proximity to the coil to direct heat upwardly into the upper receptacles against the coil, a pair of suspension ears carried by the upper receptacle, and means designed for attachment to the top of said engine for detachably coupling said ears therewith for the suspension of the upper one of the receptacles when the unit is not in use, said flexible water conductors constituting the supporting means for the coupled receptacles when the heater unit is in use.

4. In a preheater for a motor having a water jacket, the pre-heater including an elongated flat casing having therein a water coil which has its ends connected with said jacket and an elongated flat burner casing, said casings being of the same length and width and each open on one of its flat sides, a lateral flange formed along each of two opposite walls of one casing adjacent the open side thereof and extending outwardly therefrom, means forming channels along two opposite sides of the other casing adjacent the open side thereof and disposed in a plane outwardly from the plane of the open side for slidably receiving said flanges for coupling the casings together with their open sides opposed and one of the casings having a side wall provided with an air opening.

EARL E. THOMPSON.