Aug. 5, 1952 E. C. KIEKHAEFER 2,605,787

PRESSURIZED CHAIN SAW OILING SYSTEM

Filed Dec. 17, 1948 2 SHEETS—SHEET 1

Fig. 1

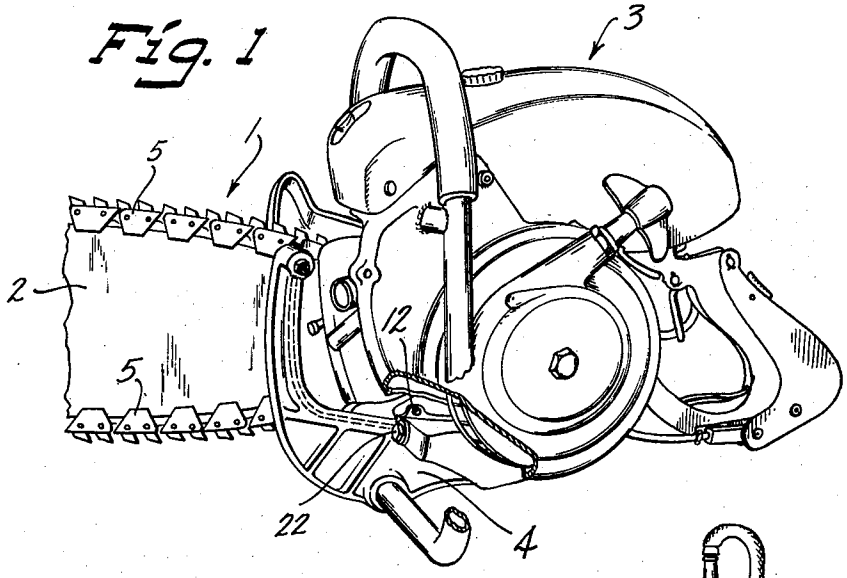
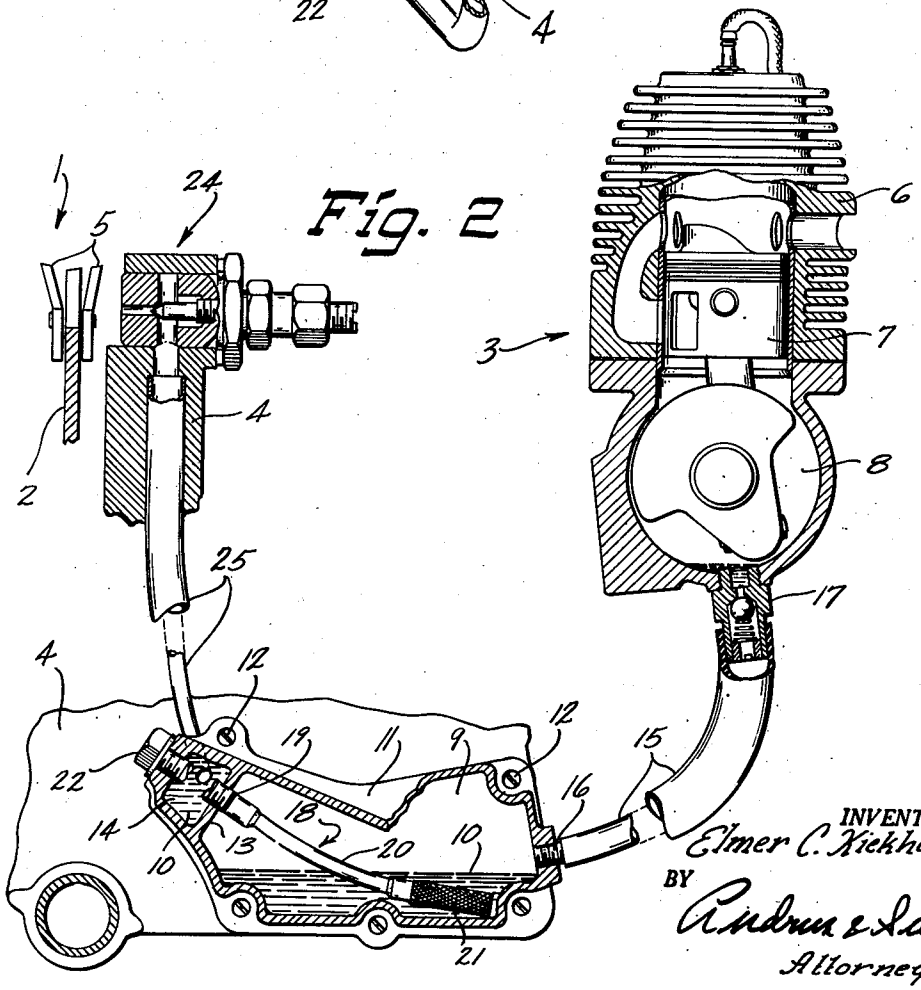


Fig. 2



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Fig. 3

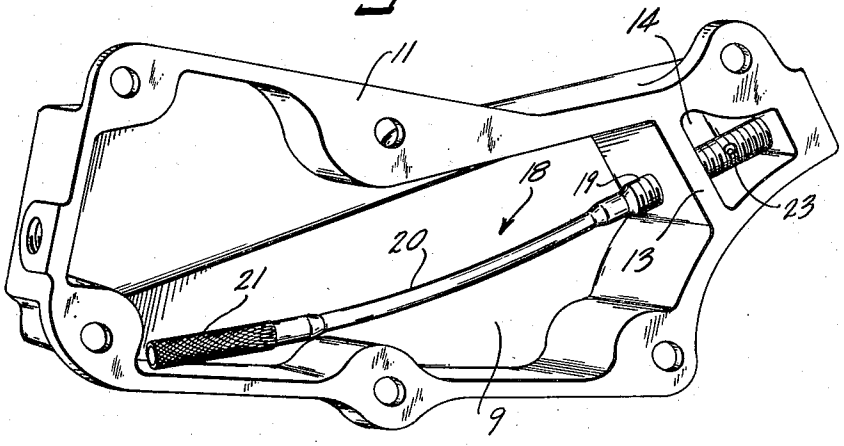


Fig. 4

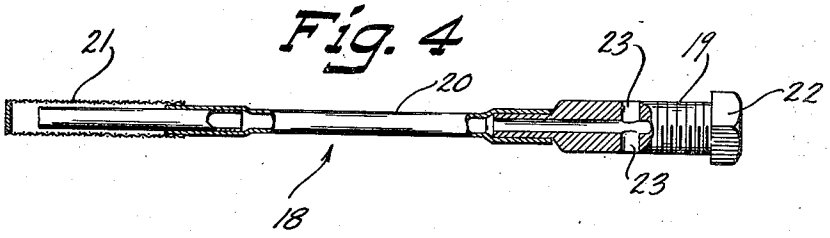
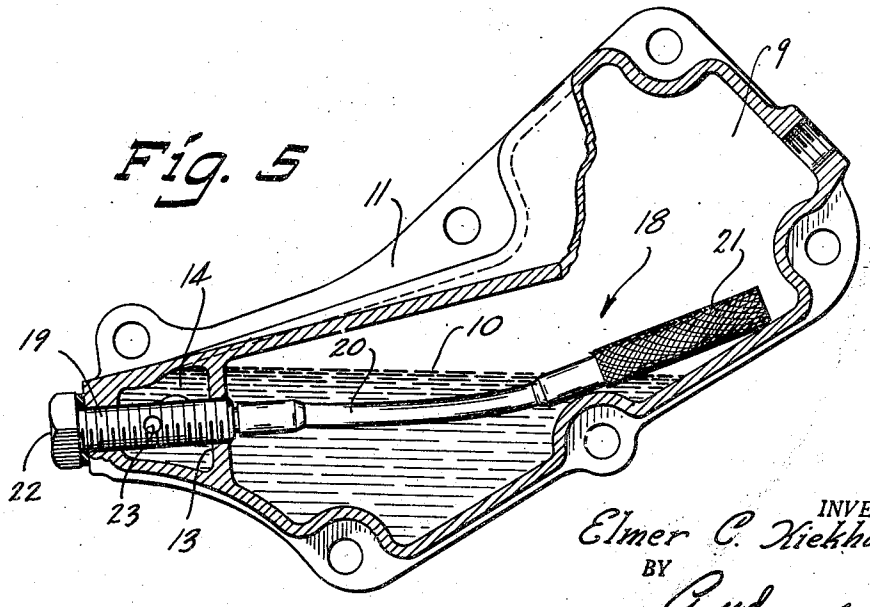


Fig. 5



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PRESSURIZED CHAIN SAW OILING SYSTEM

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3 Claims. (Cl. 143—32)

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This invention relates to pressure lubricating systems for engine-driven chain saws for delivery of oil to the saw chain during operation of the engine.

A principal object of the invention is to provide for the positive and efficient delivery of oil from a reservoir to the saw chain.

Another object is to eliminate the discharge of excess oil from the engine and utilize the oil in the saw chain lubricating system.

Another object is to provide for the positive flow of oil under pressure from the reservoir carried by the saw to the chain to lubricate the same at all times during the operation of the saw in any cutting position.

These and other objects and advantages will be more fully set forth in the following description of a preferred embodiment of the invention illustrated in the accompanying drawings.

In the drawings:

Figure 1 is a perspective view of a chain saw with parts broken away to show the oil reservoir and conduit;

Fig. 2 is a diagrammatic view of the reservoir with one wall thereof broken away and showing the operation of the oiling means;

Fig. 3 is a perspective view of the reverse side of the reservoir;

Fig. 4 is a detailed view partly in section of the oil pick-up to show the construction thereof; and

Fig. 5 is a detailed view showing the reservoir tilted in one direction.

The chain saw shown in the drawings is similar to that disclosed and claimed in the application of the present inventor filed October 7, 1948, Serial No. 53,201, for Engine-Driven Chain Saw, and includes the chain 1 carried by the guide rail 2, the engine 3 having a transmission case 4 to which guide rail 2 is attached.

The saw chain 1 comprising a series of links 5 is engaged by a sprocket, not shown, driven by engine 3 which moves the chain around rail 2 at high speed for cutting of wood.

Engine 3, shown diagrammatically in Fig. 2, includes the cylinder 6 and piston 7 and is a conventional type of two-cycle operation in which the air and fuel mixture is first drawn from the carburetor, not shown, into the crankcase 8. During the downward power stroke of piston 7 within cylinder 6 the mixture is compressed within chamber 8 prior to transfer to the upper end of cylinder 6 for the next cycle of operation.

The invention contemplates the utilization of the intermittent compression obtained in the crankcase 8 of engine 3 to deliver lubricant to the saw chain.

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The reservoir 9 containing the oil 10 is disposed near the chain beneath engine 3 and comprises a cast member 11 removably secured to one side of transmission case 4 by means of bolts 12. The wall 13 cast integrally within member 11 near one end thereof forms a small reserve chamber 14 as will be described.

The flexible conduit 15 connects the fitting 16 at the other end of member 11 with the check valve fitting 17 on crankcase 8 to allow the gas under the pressure developed in the crankcase during one cycle of engine operation to partly pass into reservoir 9. The pressure within reservoir 9 is retained during the opposite cycle of the engine by the check valve fitting 17. In the continued operation of engine 3 a pressure substantially equivalent to the maximum pressure obtained within crankcase 8 is maintained in reservoir 9.

The oil pick-up assembly 18 includes the threaded tube 19 extending through chamber 14 into reservoir 9. The flexible conduit 20 carries the oil strainer 21 at one end and is connected at its opposite end to the inner end of tube 19. The outer end of tube 19 is closed and carries the head 22 by which the assembly 18 may be removed for draining or filling of the reservoir and cleaning of strainer 21. The drilled holes 23 in either side of tube 19 provides for the passage of oil 10 from reservoir 9 through the pick-up assembly to the reserve chamber 14. Other means, not shown, may also be provided for convenience in filling of the reservoir.

Assembly 18 is arranged within reservoir 9 relative to the chain saw so that the strainer 21 and the free end of conduit 20 can move gravitationally within the reservoir and with the oil contained therein to any of the normal cutting positions of the saw to assure the flow of oil therethrough from reservoir 9 at all times during normal operation. The reserve chamber 14 is maintained full of oil at all times when in normal position by the oil pick-up assembly until the oil in reservoir 9 is completely exhausted so that during temporary periods of changing the position of operation of the saw the continuous uninterrupted supply of oil to the nozzle and the chain is assured.

The nozzle 24 is carried by the transmission case 4 to direct a stream of oil to the chain. The passage 25 may be provided, as shown, by casting the same within the body of the transmission case 4 to connect chamber 14 and nozzle 24 for delivery of the oil to the nozzle and chain as described.

The flow of oil 10 to nozzle 24 from reservoir 9

begins automatically with the starting of engine 3 and the developing of the pressure within the reservoir. When the engine is stopped the pressure returns to normal shortly thereafter so that the flow of oil to the chain is discontinued automatically when not required.

The device is easy to install and maintain and is not subject to mechanical failure. The device employs no moving parts to wear out or require replacement and is simple and inexpensive to manufacture as a part of or as an accessory to any two-cycle engine-driven chain saw of the type described.

Transmission case 4 forms one side of reservoir 9 closing the same. By removing bolts 22, member 11 is easily removed and completely open on one side for inspection.

The fuel employed in the type of engine described includes the engine lubricant which is mixed with the combustion fuel and passes through the engine to lubricate the same. The excess fuel accumulating in crankcase 8 is in greater part the lubricant which is not passed into cylinder 6 for combustion.

By locating check valve fitting 17 near the bottom of crankcase 8 as shown in Fig. 2, as for the normal position shown in Fig. 1, the chain lubricating system described, further serves to drain the crankcase of excess accumulated fuel and the excess fuel serves to supplement the supply carried in reservoir 9 so that no oil is wasted and the saw may be operated for longer periods without refilling the reservoir.

Various embodiments of the invention may be carried out within the scope of the accompanying claims.

I claim:

1. In a lightweight, portable chain saw unit including a saw chain and an engine driving said chain, said engine having a crankcase for induction and precompression of the lubricant and carbureted fuel; a tank for mixed liquid fuel and lubricant connected to the engine for induction of the fuel for combustion and the lubricant in excess supply to assure full lubrication of the working parts of the engine, said crankcase being disposed to receive and collect the excess supply of lubricant from the fuel-lubricant mixture delivered to the engine from said tank, a lubricant reservoir, a discharge nozzle connected to said reservoir and directed toward the chain for applying lubricant thereto, and passage means connecting said crankcase and said reservoir disposed to effect transfer of said excess supply of lubricant to said reservoir and maintain in said reservoir pressure substantially equivalent to the maximum pressure conditions within said crankcase for delivery of the lubricant from said reservoir to the chain.

2. In a lightweight, portable chain saw unit operable in several positions and including a saw chain and an engine driving said chain, said engine having a crankcase for induction and precompression of the lubricant and carbureted fuel, a tank for mixed fuel and lubricant connected to the engine for delivery thereto of fuel for combustion and lubricant in excess supply to assure full lubrication of the working parts of the engine, said crankcase being disposed to receive and collect an excess supply of lubricant from the fuel-lubricant mixture delivered to the engine from said tank, a reserve chamber, a discharge nozzle connected to said chamber and directed toward the chain for applying lubricant thereto, a lubricant reservoir, a flexible conduit having a free open end movable within parts of said reservoir and communicating at the other end with said reserve chamber, said discharge nozzle and the part of said reservoir beyond the range of the free end of said conduit being relatively disposed whereby delivery of lubricant to said nozzle and the chain is provided from said reserve chamber while the lubricant within said reservoir is outside the range of said conduit, and passage means connecting said crankcase and said reservoir disposed to effect transfer of the excess lubricant to said reservoir and maintain in said reservoir and reserve chamber pressure substantially equivalent to the maximum pressure conditions within said crankcase for delivery of the lubricants from said reservoir to the chain.

3. In a lightweight, portable chain saw unit adapted for use in all positions and including a saw chain and an engine driving said chain, said engine having a crankcase for induction and pre-compression of the lubricant and carbureted fuel; a tank for mixed liquid fuel and lubricant connected to the engine for induction of the fuel for combustion and the lubricant in excess supply to assure full lubrication of the working parts of the engine, said crankcase being disposed to receive and collect the excess supply of lubricant from the fuel-lubricant mixture delivered to the engine from said tank, a lubricant reservoir, a discharge nozzle connected to an outlet for said reservoir and directed toward the chain for applying lubricant thereto; a flexible conduit within said reservoir and connected at one end to the outlet therefor and having its other end free to move within said reservoir and submerged in the lubricant therein for the principal operating positions of the saw, and passage means connecting said crankcase and said reservoir disposed to effect transfer of said excess supply of lubricant to said reservoir and maintain in said reservoir pressure substantially equivalent to the maximum pressure conditions within said crankcase during operation of said engine for delivery of the lubricant from said reservoir to the chain.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
821,915	Altham	May 29, 1906
904,132	Johnston	Nov. 17, 1908
1,385,250	Gernandt	July 19, 1921
1,791,045	Stevens	Feb. 3, 1931
1,903,571	Meyer	Apr. 11, 1933
2,184,461	Mall	Dec. 26, 1939
2,391,730	Melvin et al.	Dec. 25, 1945
2,409,775	Mall et al.	Oct. 22, 1946

FOREIGN PATENTS

Number	Country	Date
256,067	Great Britain	Aug. 5, 1926