

July 20, 1926.

1,593,265

A. KUNZE

PISTON

Filed Oct. 9, 1924

Fig. 1.

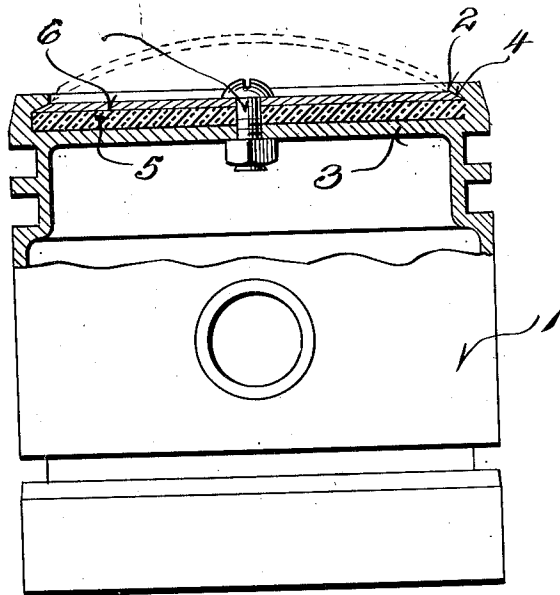


Fig. 2.

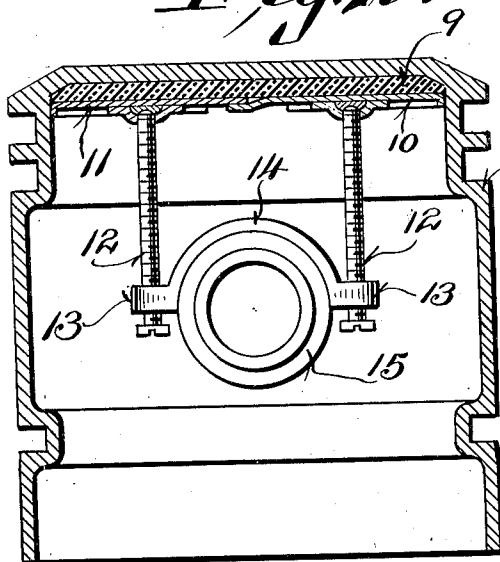
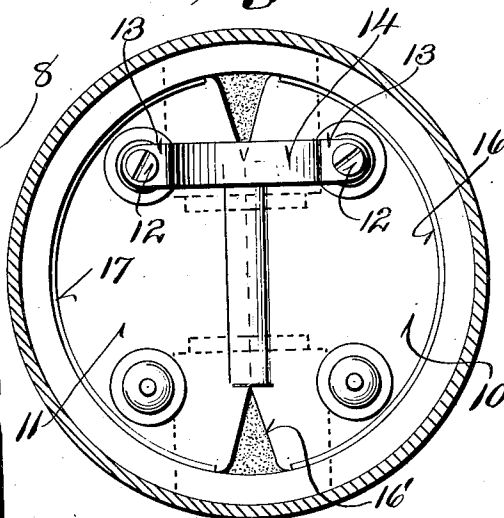


Fig. 3.



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UNITED STATES PATENT OFFICE.

AUGUST KUNZE, OF LAKE BEULAH, WISCONSIN.

PISTON.

Application filed October 9, 1924. Serial No. 742,578.

This invention relates to improvements in pistons for internal combustion engines.

Objects of this invention are to provide a piston construction which will materially lessen the transmission of heat to the crank case or to the main body of the piston, which reduces expansion of the piston, and reduces crystallization of such piston rims by means of this reduction of heat transmission, which keeps the piston rings and cylinder walls in better condition, and which increases the heat in the combustion chamber while at the same time reducing the loss of heat to the smallest possible amount.

Further objects are to provide a piston construction and a device which may be attached to a standard type of piston which will markedly decrease the carbonization on the upper side of the piston, which will decrease the frequency of valve grinding, and which will not be injured even by the highest possible speed of the motor.

Further objects are to provide a piston construction which reduces incrustation and carbonizing of the lubricant on the lower side of the piston, which keeps the lubricant in the crank case free from carbonized particles and in better condition than has heretofore been possible, and which decreases the consumption of oil in the crank case.

Embodiments of the invention are shown in the accompanying drawings, in which:—

Figure 1 is an elevation of a piston with parts in section.

Figure 2 is a vertical sectional view through a piston showing a modified form of construction.

Figure 3 is a transverse sectional view through the piston illustrated in Figure 2 showing one of the retaining straps in position and the other removed.

Referring to the drawings particularly Figure 1, it will be seen that the piston 1 is provided with an overhanging upper flange 2 of annular construction and spaced from the upper piston wall 3. This flange is provided with a slanting bottom surface 4, as clearly shown in such figure. An asbestos or other heat insulating or resisting pad or washer 5 is positioned immediately above the piston head 3. Above this insulating pad a metal plate 6 is provided and is equipped with slanting faces adapted to slide beneath the slanting faces 4 of the flange 2. In positioning this plate 6, it is

preferably bowed upwardly, as shown in dotted lines in Figure 1, and then pressed down into place.

Thereafter, a bolt 7 is passed through the plate 6, the pad 5 and the piston head 3 and thus locks the parts in position at their center,—their peripheral portions being locked in place by the slanting faces 4 of the flange 2. It is preferable to swage the lower end of the bolt to prevent inadvertent detachment, as illustrated in Figure 1.

It has been found that the best metal for the plate 6 is copper and it has been found from actual experimental work that this copper itself does not favor carbonization but materially hinders it.

It is clear that the construction illustrated in Figure 1 could be modified by making the plate 6 integral with the retaining portion of the system and thereafter filling the intervening space between the head and the plate with a temporarily plastic heat insulating compound, and thereafter positioning the bolt, as shown in Figure 1. It is also to be noted that the plate 6 could be made circularly corrugated to provide for expansion and contraction.

The operation of this device will be clearly seen from the detailed description of its construction. It is, however, pointed out that the upper portion of the piston is subjected to the highest temperature and that the heat is conducted through the piston head to the crank case and through the piston walls to the piston rings under normal conditions. However, with this construction, the heat insulating pad 5 very materially reduces the heat transmission and it has been found that it materially reduces the crystallization of the rings and the heating of the crank case. Further than this it reduces the expansion of the piston and permits the engine to run smoothly under all conditions of load.

By this construction it will be seen that carbonization is materially reduced both on the upper side of the piston and on the lower side thereof, and that the crank case oil will remain in good condition for a great length of time and that the surrounding walls and piston rings will be maintained in a better condition than heretofore due to the fact that heat conduction through the piston and through the rings has been very markedly reduced. From actual experience it has been found that heat transmitted

to the crank case has been reduced 75% by this construction.

In the modified form shown in Figures 2 and 3 a standard type of piston 8 has been provided. This piston is equipped with an asbestos of similar pad 9 on the lower side of its head, and the pad is held in place by means of a pair of plates 10 and 11 preferably provided with overlapping portions, as shown in Figures 2 and 3. These plates are held in place tightly against the lower side of the pad 9 by means of adjustable screws 12, such screws passing through ears 13 of supporting curved straps 14. These straps 14 fit over the inwardly projecting bosses 15 of the piston, as clearly shown in the drawings. In Figure 3 a sectional view is shown with one of the straps 14 in place and with the other strap removed, such view omitting the bosses 15 of the piston for the sake of clearness.

It is contemplated providing the plates 10 and 11 with notches 16', if desired, to accommodate reenforcing webs found in certain types of pistons. It is preferable to provide the plates 10 and 11 with marginal, downwardly turned flanges 16 and 17 to increase their stiffness and strength.

It will be seen, therefore, that means have been provided in piston construction which will prevent carbonizing both on top and

below the piston, which will reduce heat loss and heat transmission through the piston, which will increase the time during which the crank case oil may be used without renewal, and which will guard the parts against excessive heating crystallization and other material defects of this nature.

Although the invention has been described in considerable detail, it is to be understood that the invention may be variously embodied and is, therefore, to be limited only as claimed.

I claim:

A piston comprising a body portion, a piston head, an angular flange carried by said body portion and spaced outwardly from said head and having an inwardly located bevelled face, a heat insulating pad located upon the outer face of said piston head, an initially outwardly bowed circular plate having a bevelled peripheral edge fitted below the bevelled face of said flange, and a bolt passing centrally through said plate, pad and piston head and holding said plate flat.

In testimony that I claim the foregoing I have hereunto set my hand at Lake Beulah, in the county of Walworth and State of Wisconsin.

AUGUST KUNZE.