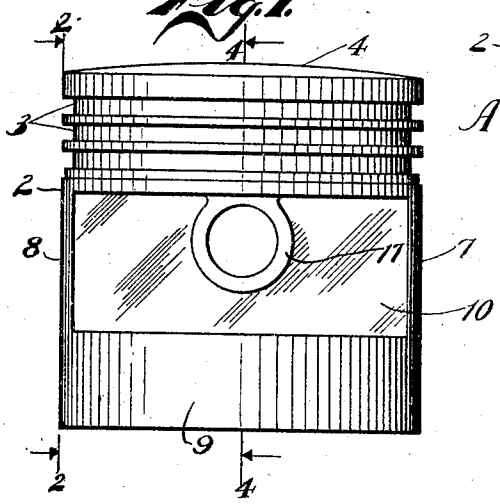
Dec. 14, 1926. 1,610,852

C. D. EVANS

PISTON

Filed July 23, 1925

Fig. 1.



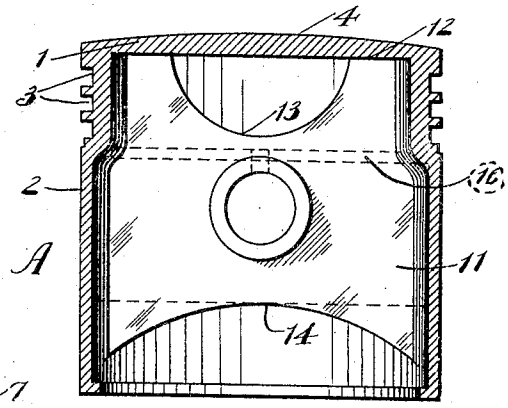


Fig. 2.

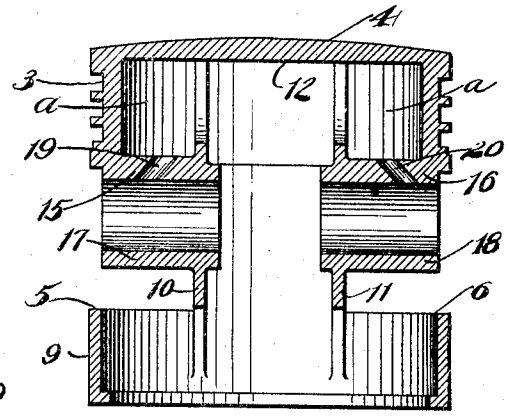
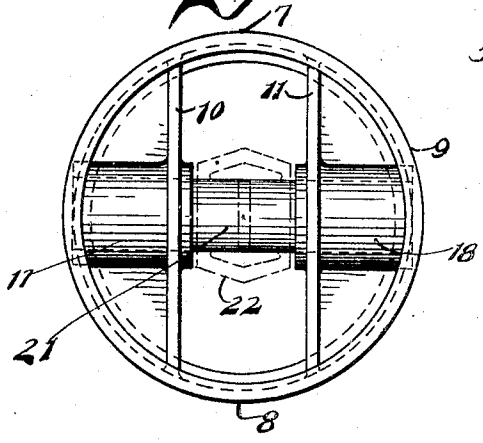


Fig. 4.

Fig. 3.



INVENTOR,
Claud D. Evans;
BY
Blakeslee & Broun,
ATTORNEYS.

Patented Dec. 14, 1926. 1,610,852

UNITED STATES PATENT OFFICE.

CLAUD D. EVANS, OF EAGLE ROCK, CALIFORNIA.

PISTON.

Application filed July 23, 1925. Serial No. 45,639.

This invention relates to pistons, and has for an object the provision of a piston which is so constructed and formed as to prevent, in a large measure, oil pumping past the rings of such piston.

Another object is to provide a piston which is so formed and constructed that proper lubrication of the wrist pin thereof is at all times assured.

A further object is the provision of a piston in which radiation of heat therefrom is very rapid. Another object is the provision of a piston which may be closely fitted within a cylinder, with assurance that the piston will not "freeze" due to high speed reciprocation thereof within the cylinder.

Another object is the provision of a piston which is so constructed and formed that there is no cantilever effect at the wrist pin connection with the connecting rod.

Another object is the provision of a piston in which expansion thereof is reduced to a minimum.

Other objects of the invention will appear as the specification proceeds, and which objects include simplicity of construction, inexpensiveness of use in service, and general superiority.

With the above and other objects in view, the invention consists in the novel and useful provision, formation, construction, association and inter-relation of parts, members and features, all as shown in certain of its embodiments in the accompanying drawing, described generally and more particularly pointed out in the claims.

In the drawing:

Fig. I is an elevation of the piston;

Fig. II is a cross-sectional view of the piston shown in Fig. I, and taken on the line 2—2 of said figure;

Fig. III is a bottom plan view of the piston shown in Fig. I, and showing a wrist pin in position within said piston; and,

Fig. IV is a cross-sectional view on the line 4—4 of Fig. I.

Corresponding parts in all the figures of the several views are designated by the same reference characters.

Referring, now, with particularity to the drawing, the improved piston is designated as an entirety and in one embodiment by "A".

Present pistons, such as are used in high-speed internal combustion engines, must be carefully fitted within an internal combustion engine and properly "run-in", otherwise the said piston, when it gets warm or hot, will expand and freeze. Freezing results in scored cylinder walls, and often times broken bearing and connecting rods.

In forming my piston, I provide the usual crown or head portion 1, having an annular side wall 2 integrally formed therewith, and the side wall 2 is formed with the usual circumferential grooves 3, of which there may be a plurality, and which grooves are adapted to receive and confine the usual piston rings, not shown.

The top of the piston, or the crown portion, is curved as shown at 4, so that the same, when hot, will expand upwardly rather than having a tendency to expand the annular side walls and cause undue pressure of the rings against the cylinder walls. No claim is made to this feature, as it is a common expedient.

That portion of the annular side walls 2 below the ring portion is provided with two segmental cut-away portions, as shown in Figs. I and IV at 5 and 6. These segmental cut-away portions are diametrically opposite and separated by segmental wall portions, 7 and 8. The segmental cut-away portions 5 and 6 form, at the lower portion of the piston, a skirt 9. The skirt is a complete annulus and is directly carried by the segmental wall portions 7 and 8.

A pair of spaced webbings, 10 and 11, lie between the segmental wall portions 7 and 8, and it will be seen on reference to Fig. II, that the webbings join with the cylinder head or crown at the under surface thereof, as shown at 12, and that the said webbings are formed with cut-away portions 13 adjacent the under surface of the crown 1.

It will likewise be noticed that the said webbings are curved as shown at 14 at their base portions and adjacent the skirt 9.

That portion of the piston immediately below the ring portion of the side wall thereof, is provided with two walls, 15 and 16, which walls are joined with the webbings 10 and 11 respectively, and this construction forms what may be termed oil pockets or chambers *a* between the webbings, the undersurface of the piston crown or top, the side wall 2 and the walls 15 and 16. These walls 15 and 16 have integrally formed or otherwise secured thereto, wrist pin bearing

members, 17 and 18, and which wrist pin bearing members are likewise carried by the webbings 10 and 11.

The space included between the skirt 9 and the webbings is not filled or provided with a wall.

As is customary in piston construction, there is no wall spanning the gap in the skirt. The walls 15 and 16 are provided with ports, 19 and 20 respectively, which permit communication between the bearings and the oil pockets *a*.

The operation, uses and advantages of the piston just described are as follows:

If we assume that the said piston has been fitted with rings in the groove portions 3, and is within an engine cylinder, there being a wrist pin 21 between the bearings 17 and 18, with a connecting rod 22 associated with the wrist pin, upon reciprocation of the said piston within the cylinder, it will be found that so-called lash, due to connecting rod reciprocation, is practically overcome for the reason that the connecting rod fits loosely between the webbings 10 and 11, as shown in Fig. III, and furthermore, that the bearings are rigidly connected with the webbings and with the wall members 15 and 16.

It is ordinary practice in most pistons that the inventor is aware of, to connect the bearing members with the annular side wall of the piston, and this construction allows for what may be termed cantilever effect, in that the side wall where the bearings are connected must of necessity bear the chief burden or strain and any shearing movement that may exist. In any event the construction tends to weaken the side walls and this is particularly noticeable in the case of thin-walled cast iron pistons. The actual working surfaces of the present piston would be at the ring portion and at the skirt portion, the segmental portions 7 and 8 are not so important and expansion at this portion is reduced to a minimum for the reason that the webbings are connected therewith so that expansion lies between the said segmental portions rather than circumferentially of the piston side wall, because said side wall is provided with two cut-away segmental portions, 5 and 6. The skirt portion 9 may have a close working fit with the inner wall of the cylinder.

It thus follows from this construction that the said piston may be readily used in high speed internal combustion engines of the racing car type, as the different portions of the piston are so balanced that freezing is practically impossible. The webbing members are constantly cooled because oil is being splashed within the cylinders, as is customary, and which oil, in the present instance, in contact with the webbing members, cools the same. These webbings, therefore, act as radiators for heat.

As the oil is splashed upwardly within the cylinder and within this piston, the oil will be directed between the webbings and some of it will pass through the cut-away portions 13 of such webbings and be trapped in the oil pockets *a*. This oil will flow through the ports 19 and 20 and lubricate the wrist pin within the bearings 17 and 18.

As far as the inventor is aware, this is a new feature, as he has no knowledge of any piston construction which permits lubrication of the wrist pin bearings. In the customary piston in which the side wall is not cut away, as is the case with the present piston, oil, as it is thrown against the inner surface of the cylinder wall, is squeezed between the piston as it reciprocates therein, and if the oil has no means of escape back into the crank case, it is gradually forced above the piston, and what is known as oil pumping results.

To overcome this, certain manufacturers have bored holes in the side walls of the piston or have grooved the side walls. These grooves or holes are unsatisfactory in the majority of cases, for the reason that intense heat within the cylinder will cause the oil, under certain conditions, to burn and fill the holes with carbon, or the grooves with carbon, and prevent such escapage of oil back to the crank case.

With the present piston, the segmental cut-away portion allows the oil to readily escape from the portion of the piston surrounding the rings, back into the crank case, as the oil may pass through such segmental cut-away portions and through the space included between the skirt 9 and the webbing members.

The reduced surface area of the side wall of the piston is an important feature, as it permits the present piston to be more readily "broken in" than most pistons now on the market. This will make driving a new car more enjoyable, or, for that matter, a car in which such pistons have been installed.

It is obvious that various changes, modifications and variations may be made in the present invention on departure from the particular showing of the drawing and description given, and without departing from the true spirit of the invention.

Having thus disclosed my invention, what I claim and desire to secure by Letters Patent is:

1. In a piston having an annular side wall and a crown portion joined therewith, said annual side wall being formed with two segmental cut-away portions and with two segmental wall portions between said segmental cut-away portions, and a pair of spaced webbings spanning the annular gap of the

side wall and joined with the segmental wall portions, said webbings being joined with the crown portion, and bearing members associated with the webbings, said webbings, annular side wall and crown portion and bearings forming oil pockets, said webbings to this end being cut away to permit entrance within said oil pockets.

2. In a piston having an annular side wall and a crown portion joined therewith, said annular side wall being formed with two segmental cut-away portions and with two segmental wall portions between these segmental cut-away portions, and a pair of spaced webbings spanning the annular gap of the side wall and joined with the segmental wall portions, said webbings being joined with the crown portion, and bearing members associated with the webbings, said webbings, annular side wall and crown portion and bearings forming oil pockets, said webbings to this end being cut away to permit entrance within said oil pockets, and port openings permitting communication between the bearings and the oil pockets.

In testimony whereof, I have signed my name to this specification.

CLAUD D. EVANS.