United States Patent

[11] 3,604,403

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[54] **TWO-STROKE ENGINE PISTON STUFFER**
13 Claims, 17 Drawing Figs.

[52] **U.S. Cl.** ..... **123/73,** 123/73 A
[51] **Int. Cl.** **F02b 33/04**
[50] **Field of Search** ..... 123/73, 73 A, 73 AA, 73 S 73 A2, 73 A5

[56] **References Cited**

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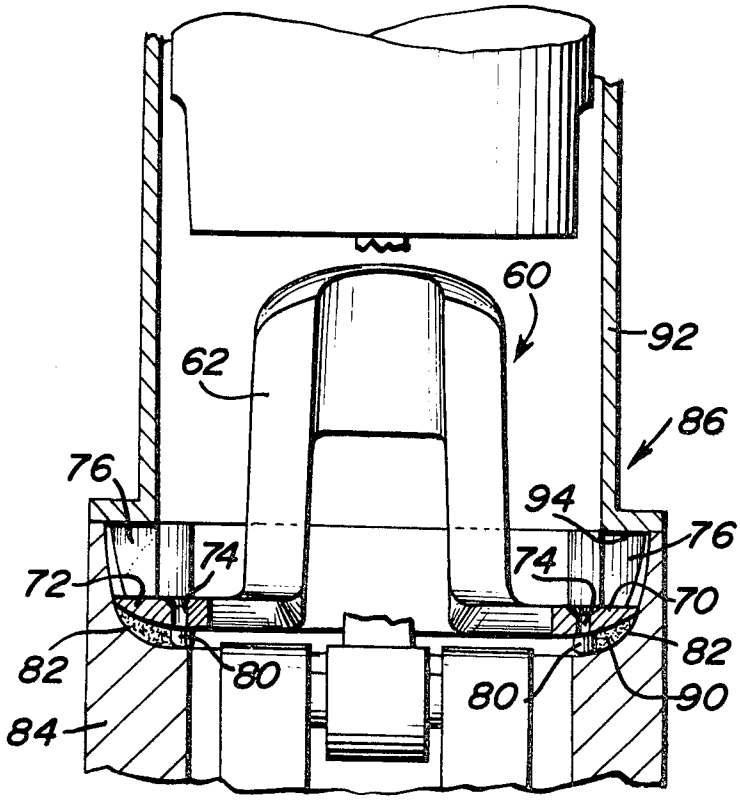
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Primary Examiner—Wendell E. Burns
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ABSTRACT: A crankcase mounted body projecting upwardly into the cylinder bore of a two-cycle internal combustion engine of the type utilizing crankcase air and fuel induction and bypass passages for ducting the air and fuel mixture from the crankcase into the cylinder above the piston therein as the piston approaches its lowermost position in the cylinder. The body is specifically shaped to have the piston telescoped downwardly thereover as the piston approaches its lower limit in the cylinder and the body, by its volume, reduces the total volume of the associated crankcase and lower cylinder bore whereby crankcase back pressure on the downstroke of the piston is increased for a greater discharge of air and fuel mixture into the cylinder above the piston. In addition, the body includes portions thereof which project substantially upwardly into the associated piston when the latter is at its lowermost position and which therefore serve to pump normally static air and fuel mixtures from within the piston each time the latter is telescoped downwardly over the body to thereby facilitate internal cooling of the piston.



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SHEET 1 OF 4

Fig . 1

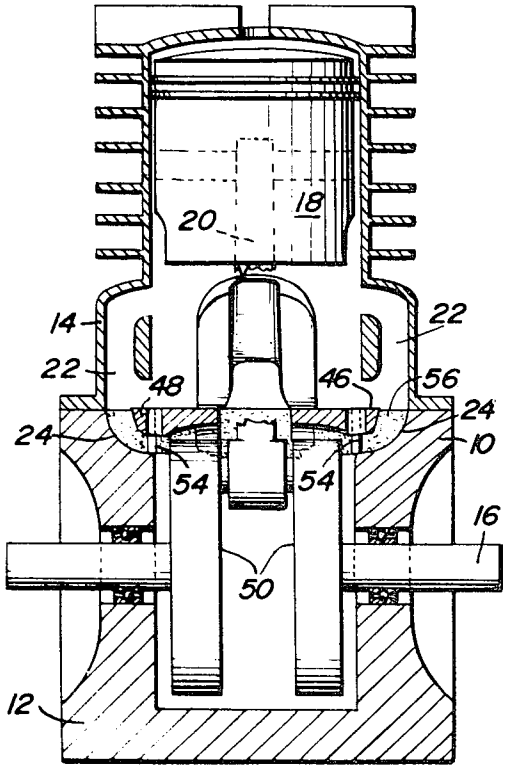


Fig . 2

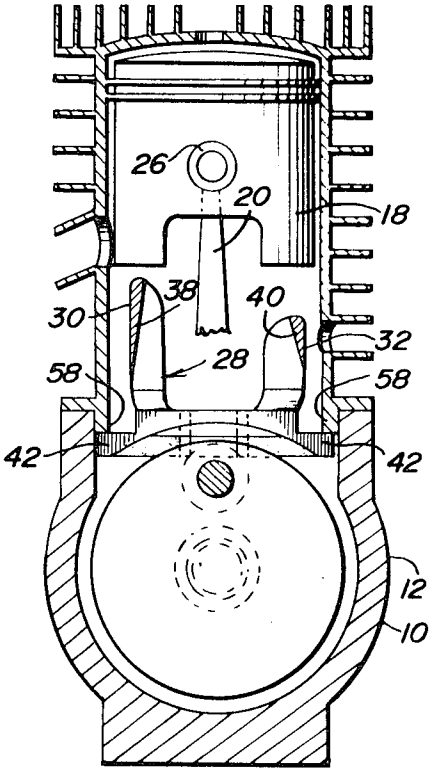
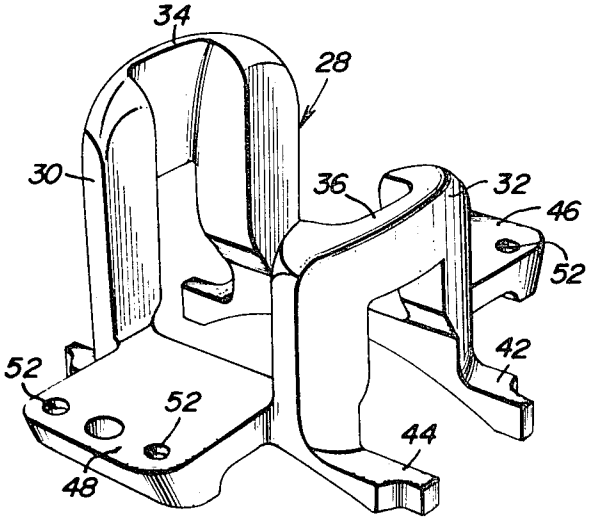


Fig . 3



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Fig. 4

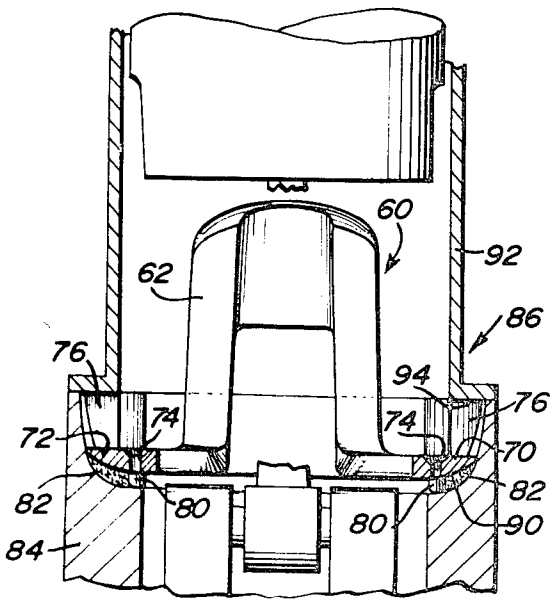


Fig. 5

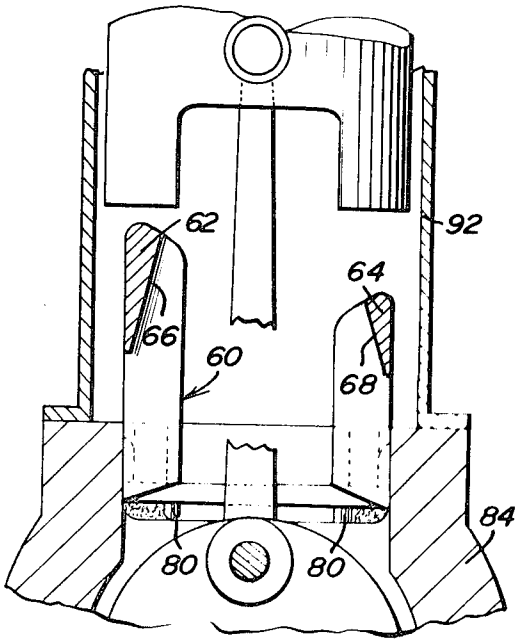


Fig. 7

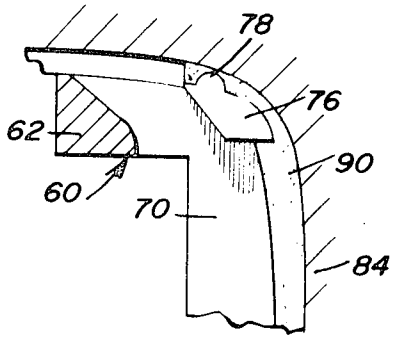
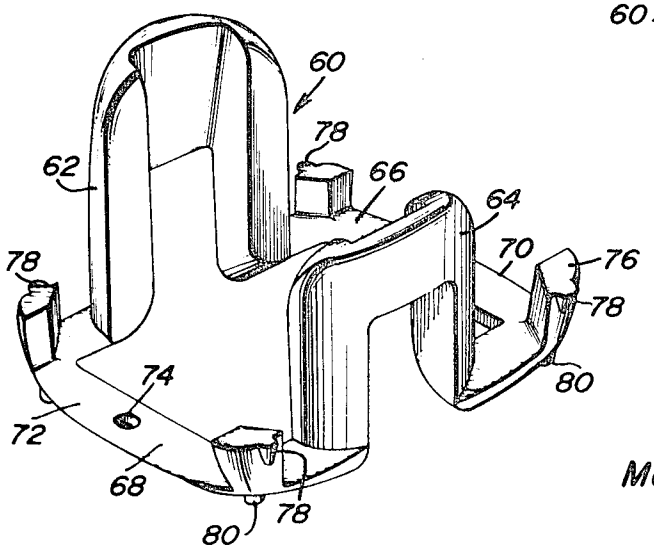


Fig. 6



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Fig. 8

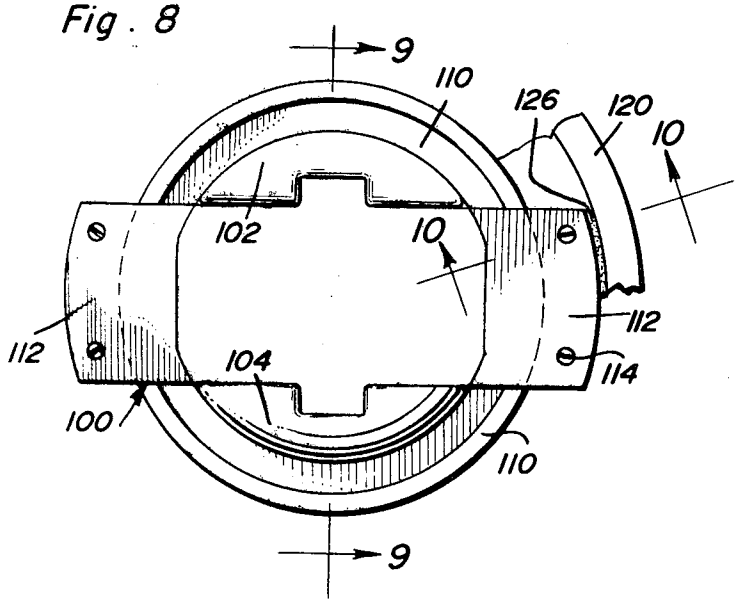


Fig. 10

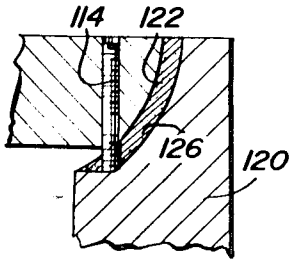


Fig. 9

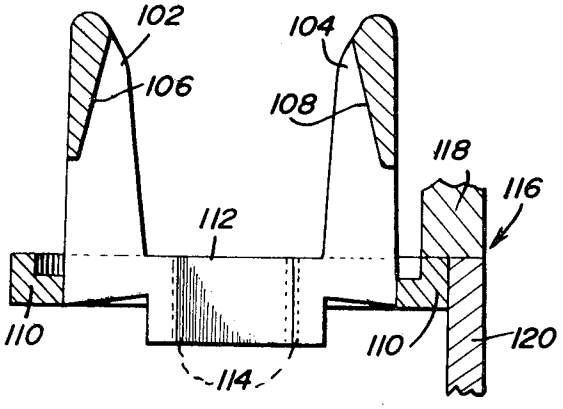


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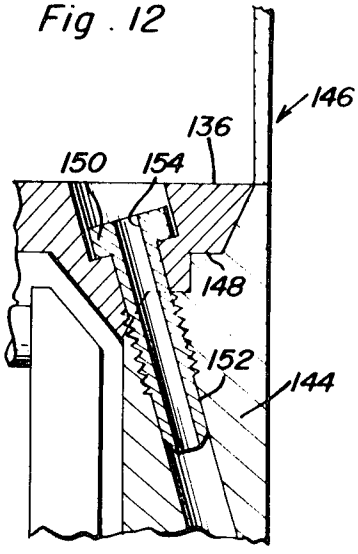
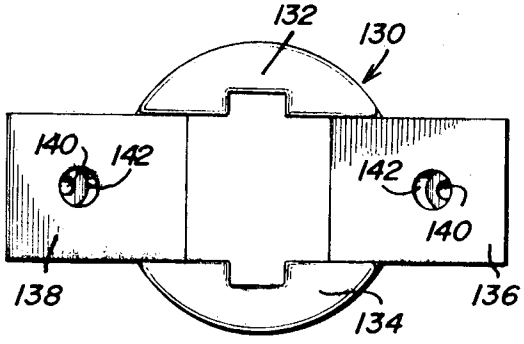


Fig. 11



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Fig. 13

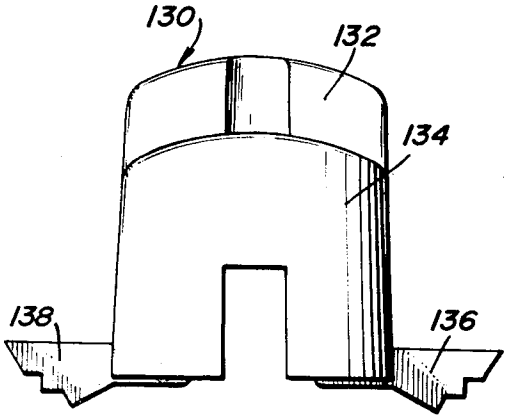


Fig. 14

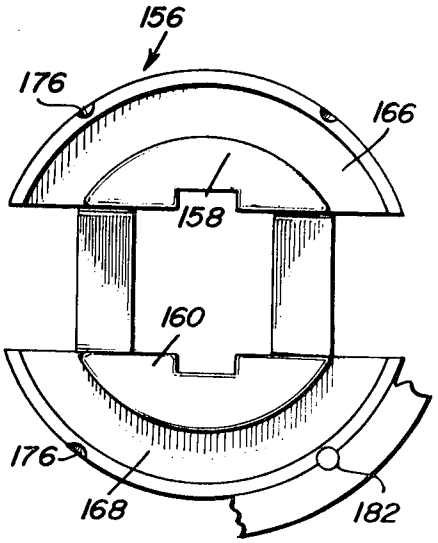


Fig. 15

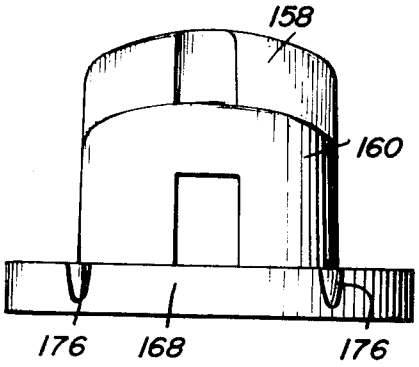


Fig. 16

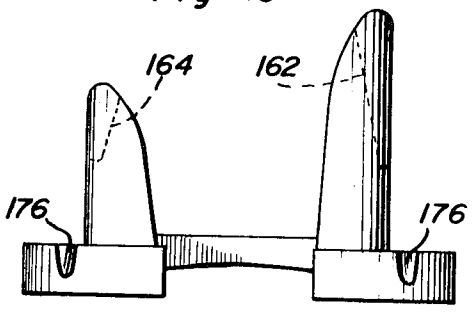
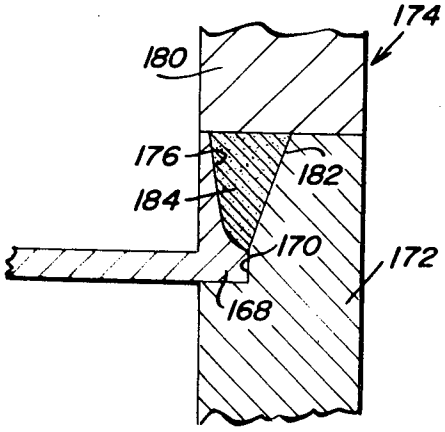


Fig. 17



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TWO-STROKE ENGINE PISTON STUFFER

The piston stuffer is stationarily mounted in the associated engine and functions to increase horsepower by causing greater amounts of air and fuel mixture to be ducted through bypass passages into the upper portion of the cylinder above the piston during the intake of fuel and air mixture in the cylinder and by greatly facilitating cooling of the associated piston from the interior thereof so as to enable greater compression ratios to be utilized without predetonation or "spark knock."

The piston stuffer may be made of metal or heat resistant plastic and is stationarily mounted in the associated internal combustion engine. The stuffer may be used in single cylinder engines or may be also utilized in multicylinder engines with a stuffer mounted in each cylinder of such multicylinder engines. Further, the upper end portions of the stuffer may have one or more distinct protrusions for fitting into a specific piston cavity and the total volume of the stuffer may be varied in order to control the amount of crankcase back pressure desired for charging the associated cylinder with additional air and fuel mixture.

While the stuffer can be utilized in substantially any reciprocating piston two-cycle internal combustion engine, the specific configuration of its upper portions will vary according to the type of piston used in the associated engine and its lower end configuration, by which the stuffer is supported from the crankcase of the associated combustion engine, will also vary according to the specific crankcase from which the piston stuffer is to be supported.

Although the piston stuffer has been designed for use in substantially all reciprocating piston two-stroke cycle internal combustion engines, particular benefit from use of the piston stuffer has been realized in the snowmobile industry. Snowmobile racing is becoming increasingly popular and the piston stuffer of the instant invention has, by actual usage, shown that increases of over 20 percent in performance may be gained by utilizing the piston stuffer of the instant invention.

The main object of this invention is to provide a means for increasing the power output of a two-stroke cycle internal combustion engine of the reciprocating piston type with a minimum of modifications being required to the engine.

Another object of this invention is to provide a performance increasing attachment for a two-stroke cycle internal combustion engine which may be readily removed from and reapplied in a two-stroke cycle internal combustion engine after the attachment has once been properly installed in the engine.

Still another object of this invention is to provide a piston stuffer in accordance with the preceding objects and which may be installed in substantially any two-cycle engine merely by the removal of the associated cylinder barrel and piston pin and piston.

A final object of this invention is to be specifically enumerated herein is to provide a piston stuffer in accordance with the preceding objects which will conform to conventional forms of manufacture, be of simple construction and easy to install so as to provide a device that will be economically feasible, long lasting and relatively trouble free in operation.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a schematic view representing a conventional form of two-stroke cycle single cylinder internal combustion engine in vertical section taken substantially upon a plane passing through the center of the crankshaft of the engine;

FIG. 2 is a further schematic view in vertical section of the assemblage illustrated in FIG. 1 but taken upon a plane disposed at right angles to the axis of rotation of the crankshaft;

FIG. 3 is a perspective view of the piston stuffer mounted within the engine illustrated in FIGS. 1 and 2;

FIG. 4 is a fragmentary schematic view similar to FIG. 1 illustrating a slightly different form of piston stuffer installed within the combustion engine;

FIG. 5 is a further schematic view in vertical section of the assemblage in FIG. 4 and taken substantially upon a plane disposed at right angles to the axis of crankshaft rotation;

FIG. 6 is a perspective view of the piston stuffer illustrated in FIGS. 4 and 5;

FIG. 7 is a fragmentary enlarged horizontal sectional view illustrating the manner in which the piston stuffer illustrated in FIGS. 4 through 6 seats in the transfer port seats;

FIG. 8 is a top plan view of a third form of piston stuffer similar to the piston stuffer illustrated in FIGS. 1 through 3, but which is mounted in the associated combustion engine in a slightly different manner;

FIG. 9 is a vertical sectional view taken substantially upon the plane indicated by the section line 9—9 of FIG. 8;

FIG. 10 is a fragmentary enlarged vertical sectional view taken substantially upon the plane indicated by the section line 10—10 of FIG. 8;

FIG. 11 is a top plan view of a fourth form of piston stuffer;

FIG. 12 is a fragmentary vertical sectional view illustrating the manner in which the opposite side portions of the piston stuffer illustrated in FIG. 11 are mounted within an associated internal combustion engine;

FIG. 13 is a side elevational view of the piston stuffer illustrated in FIGS. 11 and 12;

FIG. 14 is a top plan view of a fifth form of piston stuffer;

FIG. 15 is a side elevational view of the piston stuffer illustrated in FIG. 14;

FIG. 16 is an end elevational view of the piston stuffer illustrated in FIGS. 14 and 15 as seen from the right-hand side of FIG. 15; and

FIG. 17 is a fragmentary vertical sectional view illustrating the manner in which the crankcase stuffer illustrated in FIGS. 14–16 is supported from an associated two-stroke cycle internal combustion engine.

Referring now more specifically to the drawings, the numeral 10 generally designates a conventional form of two-stroke cycle internal combustion engine which includes a crankcase 12 and a cylinder 14. A crankshaft 16 is journaled in the crankcase 12 and a piston 18 is reciprocal in the cylinder 14 and connected to the crankshaft 16 by means of a connecting rod 20.

The cylinder 14 includes a pair of opposite side transfer ports or passages 22 and the crankcase 10 includes indentations or recesses 24 formed in the crankcase 16.

Although not shown, the cylinder 14 is secured to the upper face of the crankcase 12 by means of suitable threaded bolts or studs and the piston 18 is connected to the upper end of the connecting rod 20 by means of a removable piston pin 26.

The foregoing may be considered as a description of certain conventional types of two-stroke cycle internal combustion engines.

With attention now invited more specifically to FIG. 3 of the drawings there may be seen a first form of piston stuffer referred to in general by the reference numeral 28. The stuffer 28 includes a pair of opposite side generally inverted U-shaped standard portions 30 and 32 and it will be noted that the standard portion 30 is taller than the standard portion 32. The portions 30 and 32 includes upper bight portions 34 and 36, respectively, interconnecting the upper ends of the legs thereof and it will be noted that the bight portions 34 and 36 are beveled or tapered as at 38 and 40, respectively. The tapering of the bight portions 34 and 36 provides clearance for the connecting rod 20 as the lower end of the latter is inclined toward opposite sides of the engine 10 during rotation of the crankshaft 16.

It will be further noted that opposite sides of the piston stuffer 28 include front and rear laterally outwardly projecting feet 42 and 44. Further, the front and rear sides of the stuffer 28 include front and rear wings 46 and 48, respectively.

The undersurface portions of the feet 42 and 44 are arcuate so as to provide clearance for the circular throws 50 of the

crankshaft 16 and the front and rear wings each include opposite side threaded bores 52 in which axially short leveling screws 54 are threadedly engaged.

When installing the stuffer 28 in the engine 10, the cylinder 14 and piston 18 are removed after the engine 10 has been placed on the workbench. Thereafter, the front and rear sides of the connecting rod 28 are checked to see if the casting edge is ground smooth and flush with the rod. Thereafter, the crankshaft 16 is rotated so that the lower end of the rod 20 is in the bottom of the crankcase 12. Thereafter, the stuffer 28 is inserted downwardly over the upper end of the rod 20 and the outer surfaces of the front and rear feet 42 and 44 are marked with a sharp instrument to indicate the amount of material which is to be removed for the feet 42 and 44 to be received within the upper end of the crankcase when the stuffer 28 is centered as illustrated in FIG. 2 of the drawings. Then, the amount of material to be removed from the feet 42 ad 44 is removed with a file or a grinding tool with small amounts of material being removed at a time. Each time small amounts of material are removed the fit of the stuffer 28 within the upper end of the crankcase 10 is checked before additional material is removed. As soon as the feet 42 and 44 have had the proper amount of material removed therefrom, the stuffer 28 will be receivable in the upper end of the crankcase 10 with no forward and backward movement in the crankcase. Thereafter, the adjusting or leveling screws 54 are screwed downwardly so as to be exposed beneath the wings 46 and 48 with the stuffer 28 receivable in the upper end of the crankcase 12 with the upper surfaces of the feet 42 and 44 disposed at the predetermined level thereof illustrated in FIG. 2, whereby when the cylinder 14 is reinstalled the lower end portions 58 thereof will abut against the upper surfaces of the feet 42 and 44 to retain the stuffer 28 in position.

Then, with the piston stuffer 28 in place the piston 18 may be reinstalled on the rod 20 and the cylinder 14 is placed on the crankcase 12 with the piston 18 disposed therein. Then, with the piston stuffer 28 properly centered and clamped between the cylinder 14 and crankcase 12 the crankshaft 16 may be turned to determine if there is any interference between the stuffer 28 and the piston 18 or rod 20. If desired, any suitable material such as putty may be utilized on portions of the rod and piston in which it is thought interference may result and interference between the flywheels or circular throws 50 and the arcuate undersurfaces of the feet 42 and 44 must also be checked.

If any interference results during rotation of the crankshaft 16, the interfering portions of the stuffer 28 may be sanded or filed away. Further, if there is interference between the circular crank throws 50 and the arcuate undersurfaces of the feet 42 and 44, the upper surfaces of the four feet 42 and 44 may be slightly sanded or filed and the leveling screws 54 may be screwed downwardly whereby the entire piston stuffer 28 is elevated to increase clearance between the circular throws 50 and the undersurfaces of the feet 42 and 44.

After the piston stuffer 28 has been accurately positioned within the crankcase 12 so that the stuffer 28 does not interfere with any moving component of the engine 10, the cylinder 14 and piston 18 are again removed after which a mix of a good plastic epoxy metal such as Duro Plastic Epoxe Metal is placed in the indentations or recesses 24 and allowed to partially set. Heavy grease may be utilized on the adjacent components of the engine to protect the same and to retain the epoxy metal in place. Also, the lower exposed ends of the leveling screws 54 may be covered with grease to prevent the epoxy metal from adhering thereto. As may be seen from FIG. 1 of the drawings the epoxy metal 56 is placed in the indentations or recesses 24 until the metal 56 is flush with the upper surface of the crankcase 12. Of course, after the epoxy 56 has been put in place, the piston stuffer 28 is reinserted in the upper end of the crankcase 12 and pressed firmly downwardly to seat the adjusting screws 54 against the lower portions of the indentations or recesses 24.

After the epoxy metal 56 has further hardened, the piston and cylinder are reinstalled and the cylinder is drawn down tightly against the upper end of the crankcase 12 by the aforementioned bolts or studs. This will cause the lower end portions 58 of the cylinder 14 which project into the crankcase 12 to bear downwardly on the upper surfaces of the feet 42 and 44 and to tightly seat the adjusting screws 54 in the indentations or recesses 24. After the cylinder 14 has been reinstalled, the epoxy metal 56 is allowed to harden completely before the cylinder is again removed and the grease previously used to contain the epoxy metal 56 and to protect various portions of the engine 10 is removed. Thereafter, the cylinder 14 is reinstalled and the engine is started and run at slow speeds to determine if there is any interference between the stuffer 28 and the movable components of the engine 10. If any interference is heard, the cylinder 14 must again be removed and the interference corrected. However, when the stuffer 28 is properly installed, the engine 10 may be operated without interference. After once being installed, the seats formed by the epoxy metal 56 will automatically center the piston stuffer 28 back in the upper end of the crankcase 12 if it should be desirable to remove the stuffer 28.

With attention now invited more specifically to FIGS. 4–7 of the drawings there may be seen a second form of piston stuffer referred to in general by the reference numeral 60. The stuffer 60 is similar to the stuffer 28 in that it includes opposite side standard portions 62 and 64 beveled as at 66 and 68, respectively. However, the stuffer 60 does not include feet corresponding to the feet 42 and 44 but front and rear wings 66 and 68 are provided. The wings 66 and 68 define generally horizontally disposed U-shaped members including bight portions 70 and 72. The bight portions 70 and 72 have oil passages 74 formed therethrough which may register with oil passages formed in the associated internal combustion engine if such engine oil passages are present and the opposite ends of the front and rear bight portions 70 and 72 include vertically short posts or upwardly projecting blocks 76.

The blocks 76 include laterally outwardly projecting positioning points 78 and the undersurface portions of the opposite ends of the bight portions 70 and 72 include further positioning points 80.

The method of installation of the stuffer 60 is similar to the method of installation of the stuffer 28. However, the positioning points 78 and 80 are gradually filed or sanded until the wings 66 and 68 are properly centered in the recesses or indentations 82 corresponding to the indentations or recesses 24 but formed in the crankcase 84 of a slightly differently constructed two-stroke cycle internal combustion engine referred to in general by the reference numeral 86. After the positioning points 78 and 80 have been properly filed or sanded to provide the desired fit of the stuffer 60 within the recesses 82 and the cylinder of the engine 86 has been reinstalled so as to ensure that there is no interference between the stuffer 60 and the moving parts of the engine 86, the cylinder of the engine 86 is again removed and epoxy material 90 corresponding to the material 56 is placed within the recesses or indentations 82. Thereafter, the stuffer 60 is reinserted in the recesses or indentations 82 and pressed tightly downwardly to fully seat the positioning points 78 and 80 within the recesses or indentations 82 after protective grease has been applied to adjacent components of the engine 86 and the surfaces of the stuffer 60 which will contact the material 90. Of course, the lower end of the cylinder 92 of the engine 86 includes portions 94 which will overlie the upper ends of the blocks 76 and thereby serve to clampingly retain the stuffer 60 in position within the engine 10 after the epoxy material 90 has once formed the proper seat for receiving the stuffer 60.

With attention now directed more specifically to FIGS. 8 through 10 of the drawings there will be seen a third form of piston stuffer referred to in general by the reference numeral 100 and which includes opposite side standard portions 102 and 104 including bight portions beveled as at 106 and 108, respectively, as well as opposite side outwardly projecting ar-

cuate feet **110**. Further, the stuffer **100** includes front and rear wings **112** provided with adjusting or leveling screws **114** corresponding to the screws **54**. The stuffer **100** is adapted to be utilized in conjunction with an internal combustion engine referred to in general by the reference numeral **116** including a cylinder **118** and a crankcase **120**. The feet **110** are received downwardly into the upper end of the crankcase **120** and the wings **112** are received in indentations or recesses **122** formed in the crankcase **120**. Accordingly, the stuffer **100** is similar to the stuffer **28** and it may be seen from FIG. **10** of the drawings that the stuffer **100** is properly positioned relative to the recesses or indentations **122** by means of the adjusting screws or leveling screws **114** with a shape-conforming seat being formed in the indentations or recesses **122** by means of hardened epoxy material **126** similar to the material **56**. Accordingly, the steps in installing the stuffer **100** are substantially identical to those steps followed in installing the stuffer **28** except that very little or no filing or sanding of the feet **110** may be required.

With attention now invited more specifically to FIGS. **11–13** of the drawings there will be seen a fourth form of stuffer referred to in general by the reference numeral **130** and which also includes a pair of opposite side upstanding standard portions **132** and **134**. In addition, the stuffer **130** includes front and rear wings **136** and **138** having downwardly and outwardly inclined bores **140** formed therethrough including counterbores **142** at their upper ends. The undersurfaces of the free ends of the wings **136** and **138** have a cross-sectional configuration which is best seen in FIG. **12** of the drawings and which is adapted to conform to portions of the crankcase **144** of a particular-type of internal combustion engine referred to in general by the reference numeral **146** defining stepped seats **148** for the wings **136** and **138**.

A pair of headed bolts **150** are utilized to secure the wings **136** and **138** in the recesses **148** by threadedly engaging the bolts **150** in bores **152** formed in the crankcase **144**. The crankcase **144** may be provided with the bores **152** for oiling purposes and if such bores are provided and utilized for oiling purposes, the bolt **150** is provided with a longitudinal bore **154** whereby the oiling function of the bore **152** will be retained. However, if the bore **152** is not required for oiling purposes, the bolt **150** need not be provided with the bore **154**. Further, the bolt **150** is of the self-tapping type.

Inasmuch as the stuffer **130** is secured in position by means of the bolts **150** and the recesses **148** are machined, there is no need to utilize positioning screws or seat forming epoxy material when installing the stuffer **130**.

With attention now invited more specifically to FIGS. **14–17** of the drawings there will be seen a final form of piston stuffer to be specifically illustrated and described herein and which is referred to in general by the reference numeral **156**. The stuffer **156** includes different height opposite side standard portions **158** and **160** relieved as at **162** and **164**, respectively, and the stuffer further includes opposite side arcuate feet **166** and **168** similar to the feet **110**. However, the feet **166** and **168** are receivable in semicylindrical recess portions **170** formed in the crankcase **172** of an internal combustion engine referred to in general by the reference numeral **174** and accordingly, there is no need for adjusting screws such as screws **114**. However, while the stuffer **156** may be snugly received in the recess portions **170** and thus prevented from shifting from side to side or to the front or rear, it is possible that the piston stuffer **156** could rotate about a vertical axis. Accordingly, the outer peripheral portions of the feet **166** and **168** are provided with notches **176**. Upon initial insertion and positioning of the stuffer **156** within the crankcase **172** the cylinder **180** of the engine **174** is reinstalled after which the crankshaft (not shown) of the motor **174** may be turned to check for interference between the stuffer **156** and any moving portion of the engine or motor **174**. If there is no interference, the cylinder **180** is removed and the portions of the crankcase **172** opposing the notches **176** are marked. Thereafter, the stuffer **156** is removed and the marked portions of the crankcase **172** are filed so as to form grooves **182** therein. Thereafter, the stuffer **156** is reinserted and epoxy material **184** similar to the material **56** is placed in the registered notches **176** and **182** and the cylinder **180** is reinstalled and tightened down on the crankcase **172** whereby the material **184** may harden with the stuffer **156** fully installed. However, as in the case with the previous stuffers utilizing epoxy material for forming seats therefor, the portions of the stuffer **156** contacting the epoxy **184** may be covered with a light film of grease. In addition, the surfaces of the crankcase **172** defining the notches **182** may also be covered with a light film of grease to prevent adherence of the epoxy **184**. In this manner, the epoxy material **184** will harden into keys which may be readily removed and thereby enable the stuffer **156** to be readily removed whenever desired.

From the foregoing it will be appreciated that the installation of the various piston stuffers is similar, especially with regard to the various steps which are followed in initially properly positioning the stuffers in their respective crankcases and testing for interference between the stuffers and movable components of the associated engines.

The various standard portions of the stuffers are constructed of different height so as to create a more complete pumping action on the air-and-fuel mixtures within the various pistons as the latter move to their lowermost positions. This pumping action ensures that air-and-fuel mixtures will not remain static within the pistons. In fact, the pumping action is so effective as to greatly increase the internal cooling of the associated pistons. Of course, because of the volume of space occupied by the various stuffers, the effective internal volume of the associated crankcases is reduced and thus there are greater crankcase pressures developed for bypassing fuel-and-air mixtures into the associated cylinders above the pistons therein as the pistons reach their lowermost positions. This of course results in higher pressures of the air-and-fuel mixture in the combustion chambers of the various engines at the time the associated spark plugs (not shown) fire. This increase in air-and-fuel mixture pressures results in greater horsepower and thus the addition of power-robbing accessories and loads on the associated snowmobiles is greatly offset or fully compensated for. When a piston stuffer is used the resultant increase in horsepower allows not only the addition of power robbing accessories but also the utilization of more efficient mufflers on the engine without a net loss in power. In fact, the power increase realized by the utilization of the piston stuffer is sufficiently great to more than offset any power loss resulting from more efficient mufflers and other power robbing accessories.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What I claim is:

1. A one-piece piston stuffer for disposition in the lower end of a two-stroke cycle internal combustion engine cylinder bore, said stuffer including base means adapted to be seated in the upwardly opening portion of the crankcase of said engine over which a cylinder barrel is supported with first portions of the base means overlying upwardly facing surface portions of said crankcase disposed outwardly of the cylinder bore and second portions of said base means underlying downwardly facing surface portions disposed outwardly of said bore for clamping in position between said upward and downwardly facing surfaces when said barrel is mounted over said upwardly opening portion of said crankcase, said stuffer including a pair of upstanding opposite side standard portions adapted to project upwardly into the lower end of said barrel, said standard portions being generally inverted U-shaped in configuration and lying in generally parallel upright planes extending along opposite sides of said stuffer, said U-shaped

standard portions each including upstanding legs interconnected at their upper ends by means of a bight portion extending therebetween, said stuffer being free of portions extending between the lower ends of corresponding legs of its standard portions inwardly of the surfaces of the lower ends of each pair of corresponding legs facing the other pair of corresponding legs of said standard portions.

2. The combination of claim 1 wherein the opposing surfaces of said bight portions are downwardly and outwardly beveled.

3. The combination of claim 1 wherein said stuffer includes opposite end outwardly projecting wings extending between said opposite side standard portions, said wings including lower surfaces defining said first portions.

4. The combination of claim 3 wherein said stuffer includes opposite side outwardly projecting feet, said feet including upper surfaces defining said second portions.

5. The combination of claim 4 wherein said stuffer includes opposite end outwardly projecting wings extending between said opposite side standard portions, said wings including lower surfaces defining said first portions.

6. The combination of claim 3 wherein said stuffer includes opposite side outwardly projecting feet, said feet including upper surfaces defining said second portions, said feet equaling four in number and being carried by the lower ends of said legs.

7. The combination of claim 1 wherein the lower ends of corresponding legs of said standard portions are interconnected by opposite end generally C-shaped and horizontally disposed wings opening inwardly toward the center of said stuffer, said first second portions being defined by upper and lower surfaces of said wings.

8. The combination of claim 1 wherein said stuffer includes opposite side outwardly projecting feet, said feet including upper and lower surfaces defining said second and first portions, respectively.

9. The combination of claim 8 wherein said feet include arcuate outer peripheral edges whose centers of curvature coincide with each other and the vertical center axis of said stuffer.

10. The combination of claim 9 wherein said outer peripheral edges of said feet include circumferentially spaced outwardly and upwardly opening notches formed therein adapted to be registered with corresponding notches formed in said crankcase for the utilization of downwardly insertable key members in said registered notches to prevent rotation of said stuffer about said vertical center axis relative to said crankcase.

11. In combination, a two-stroke cycle internal combustion engine of the type including a crankcase having a cylinder barrel mounting surface thereon through which an opening is formed and upon which the inner end of a cylinder barrel is removably seated, said engine further including upwardly facing stepped crankcase surfaces disposed within said opening below said mounting surface, a piston stuffer comprising a body defining upstanding opposite side body members interconnected at their corresponding lower ends by body portions extending therebetween and projecting endwise outwardly in opposite directions from the opposite ends of said body members, said stuffer being disposed within the lower end of said barrel and said body portions including stepped undersurfaces mating with and seated downwardly upon said upwardly facing stepped crankcase surfaces, said engine including a piston reciprocal in said barrel, a crankshaft journaled in said crankcase and a connecting rod connecting said piston to said crankshaft, the upper portions of said upstanding opposite side body members being contoured to be free of contact with said connecting rod during rotation of said crankshaft and receivable upwardly into the lower end of said piston independent of contact therewith upon downward movement of said piston in said barrel to its lowermost limit position therein, and pairs of aligned bores formed through said body portions and in said crankcase, said bores in said crankcase being threaded, and threaded elongated fasteners secured through said body portions and in said threaded bores.

12. The combination of claim 11 wherein said side body members comprise U-shaped standard portions each including upstanding legs interconnected at their upper ends by means of a bight portion extending therebetween, the opposing surfaces of said bight portions being downwardly and outwardly beveled.

13. The combination of claim 12 wherein said bores are downwardly and outwardly inclined bores and said crankcase bores comprise through oil passages, said fastener having axial bores formed therethrough.