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PROVISIONAL SPECIFICATION

Improvements in or relating to Lighters

We, HOWARD JOHN BETTANY, of British Nationality, of 41, Sutton Court, Brighton Road, Sutton, Surrey, and ROBERT HENRY SIMPSON, of British Nationality, of 32, Riverdale Road, Bexley, Kent, do hereby declare the nature of this invention to be as follows:—

This invention relates to lighters and is concerned with the provision of a lighter which will be robust and effective as a cigarette lighter.

In accordance with the invention the lighter comprises a body housing the usual flint and wick, and also a fuel reservoir, the body being formed from telescopic members and the flint-wheel associated with the usual flint, being arranged for turning movement when the body of the lighter is telescoped. When the lighter is in an inoperative position all the parts thereof are enclosed by the telescopic body members, but when such members are compressed to cause them to telescope into one another, the flint wheel is rotated by the compression movement, and apertures are brought into register to reveal the end of the wick which is to be ignited by the turning of the wheel.

For a better understanding of the nature of the invention a constructional form thereof will now be indicated in greater detail.

In this constructional form, the telescopic body members are two in number and cylindrical in shape. The inner body member which slides within the outer body member, removably carries a fuel container the outer end of which serves to close the outer end of the slidable body member. The fuel container on its inner end carries a nipple through which the wick projects, and, adjacent the nipple, carries also a bracket for support of a flint wheel. There is a flint tube disposed in the container, housing the flint and spring for pressing the same against the periphery of the flint wheel. The outer end of the container has a removable plug for permitting fuel to be introduced therein, and also has a removable plug closing the

outer end of the flint tube.

The fuel container with associated parts occupies only approximately half the length of the inner sliding body member, and adjacent the wick nipple such body member has a cut-away portion. The outer slidable body member carries fixedly a rack. The flint wheel has lateral teeth or serrations formed upon it for lateral engagement with similar teeth formed upon a small pinion whose peripheral teeth engage in the rack just mentioned.

The outer end of the slidable body member which carries the rack, supports a centrally placed rod the free end of which fixedly carries a disc. The disc is of such external diameter as to fit within the hollow of the inner slidable body member. The inner end of the last mentioned slidable body member, has a closing plate fitted within it, such plate having a central aperture through which the rod associated with the outer body member may freely pass. Between the closing plate and the adjacent side of the outer end of the outer body member, a coil spring is arranged.

The outer slidable body member has a cut-out portion of the same shape as that formed in the inner slidable body member.

When the lighter is in an inoperative position, the coil spring referred to above presses the two slidable body members apart and the cut-out portions or apertures therein, are out of register and the lighter appears as a short cylindrical element with closed ends. If now the ends of the lighter are pressed towards one another, the inner slidable body member slides into the outer member against the action of the coil spring. The small pinion associated with the flint wheel is turned by engagement with the rack and causes the flint wheel to produce a spark capable of lighting the vapourised fuel from the wick. The cut-out portions of the two body members come into register as the members are pressed into one another to disclose the wick and wick carrying nipple, whereby ignition may take place.

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When it is required to extinguish the lighter, the body members are allowed to travel apart under the action of the coil spring, and the cut-out portions thereof will no longer be in register and the device will regain the position referred to above as the inoperative position. By extinguishing the lighter in the manner indicated, the chamber bounded between the inner end of the fuel container and the adjacent face of the disc, will contain spent gases and when it is next required to ignite the lighter, it will be necessary to press the body members thereof together in order to expel the spent gases. The expelling action is carried out by the disc which serves then as an exhaust piston. A fresh charge of air will be drawn into the body of the lighter when the two body members are released, the disc then performing a suction stroke, which will serve also to draw fresh fuel from the wick in vapour form. Thereafter the two body members may be pressed together and ignition will follow. Instead of extinguishing the lighter by allowing the cut-out portions of the body members to come out of register, the lighter can be extinguished by blowing out the flame. It will be found that the double operation of the device will be unnecessary for subsequently lighting it.

On the non-working return stroke of the slidable body members it is undesired that the flint wheel shall effectively co-operate with the flint. The lateral teeth of the flint wheel engaging the lateral teeth of the associated pinion, are such that upon the return stroke, there is no effective drive as between the pinion

and the wheel. This is achieved by making the lateral teeth of such profile as to have a ratchet action. The laterally engaging teeth are held against one another with the aid of a spring washer. The constructional example of the invention described above, will be capable of modification without departing from the spirit of the invention. Thus, instead of operating the flint wheel through a rack and pinion mechanism, a cam mechanism might be substituted to achieve a similar result, or alternatively a rod bearing a helically extending tooth or teeth could be used in conjunction with a member seated upon the rod and engaging the tooth or teeth thereof in such manner as to perform rotary movements when the rod is longitudinally moved. In this instance, it might be more convenient to arrange the flint wheel upon an axis parallel with the direction of sliding movement of the body members. Additionally a wick snuffer can be fitted to be actuated through a cam by movement of the body members, or by a spring through the movement of the flint wheel assembly. Furthermore, the lighting aperture formed when the cut-out portions of the body members are in register, could be supplemented by perforations or gauze to make the lighter even more draught proof.

Dated this 14th day of November, 1945.

HASELTINE, LAKE & CO.,
18, Southampton Buildings, London,
England, and
19-25, West 44th Street, New York,
U.S.A.

Agents for the Applicants.

COMPLETE SPECIFICATION

Improvements in or relating to Lighters

We, HOWARD JOHN BETTANY, of British Nationality, of 41, Sutton Court, Brighton Road, Sutton, Surrey, and ROBERT HENRY SIMPSON, of British Nationality, of 32, Riverdale Road, Bexley, Kent, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to lighters and is concerned with the provision of a lighter which will be robust in construction, and effective in its action as a cigarette lighter.

In accordance with the invention the lighter comprises a pair of telescopic body members adapted to be displaced one into the other against opposing spring pressure, one of said members housing a

fuel container on which is carried a wick nipple and a flint wheel with associated flint tube, means being provided to cause the flint wheel to be rotated when the two members are telescoped one into the other, and there being a pair of apertures in said members which register when said members are so telescoped to reveal the wick nipple; and further comprises a piston device within said members so arranged that when the members are thrust one into the other the piston device approaches the wick nipple, and recedes therefrom, when the members move apart under the opposing spring pressure, whereby said piston device may assist in expelling spent gases and may also assist in drawing a fresh charge of air into the lighter body and in drawing fuel vapour from the wick.

For a better understanding of the nature of the invention, a constructional form thereof will now be described by way of example, with reference to the accompanying drawings in which:—

Figure 1 is a side view of a lighter;

Figure 2 is a corresponding plan view showing a different operative position, part of the outer casing being shown broken to indicate parts therebeneath;

Figure 3 is a longitudinal section corresponding to Figure 1, and

Figure 4 is a section on the line IV—IV of Figure 3 to an enlarged scale.

In the illustrated constructional form, two telescopic body members 1 and 2 form the outer casing, such members being cylindrical in shape. The inner body member 1 which slides within the outer body member 2, removably carries a fuel container 3 the outer end 4 of which is formed as a screw cap and serves to close the outer end of the slidable body member 1. The fuel container 3 on its inner end carries a nipple 5 through which the wick 6 projects, and adjacent the nipple 5, carries also a U-bracket 7 for support of a flint wheel 8. There is a flint tube 9 disposed in the container 3, housing the flint 10 and spring 11 for pressing the same against the periphery of the flint wheel 8. The flint tube 9 has a removable plug 12 closing the outer end thereof.

The fuel container 3 with associated parts occupies only approximately half the length of the inner sliding body member 1, and adjacent the wick nipple 5 such body member has a cut-away portion 13. The outer slidable body member 2 carries fixedly a rack 14. The flint wheel 8 has lateral teeth 15 or serrations formed upon it for lateral engagement with similar teeth formed upon the side face of a small pinion 16 whose peripheral teeth engage in the rack 14 just mentioned.

The outer end of the slidable body member 2, supports a centrally placed rod 17 the free end of which fixedly carries a disc 18. The disc is of such external diameter as to fit within the hollow of the inner slidable body member 1. The inner end of the last mentioned slidable body member, has a closing plate 19 fitted within it, such plate having a central aperture through which the rod 17 associated with the outer body member 2 may freely pass. Between the closing plate 19 and the adjacent side of the outer end of the outer body member 2, a coil spring 20 is arranged.

The outer slidable body member 2 has a cut-out portion 21 of the same shape

as the cut-out portion 13 formed in the inner slidable body member 1.

When the lighter is in an inoperative position, as in Figures 1 and 3, the coil spring 20 presses the two slidable body members 1 and 2 apart, and the cut-out portions or apertures 13 and 21, therein, are out of register and the lighter appears as a short cylindrical element with closed ends. If now the ends of the lighter are pressed towards one another, the inner slidable body member 1 slides into the outer member 2 against the action of the coil spring 20. The small pinion 16 associated with the flint wheel 8 is turned by engagement with the rack 14 and causes the flint wheel to produce a spark capable of lighting the vapourised fuel from the wick 6. The cut-out portions of the two body members come into register as the members are pressed into one another to disclose the wick and wick carrying nipple as shown in Figure 2, whereby ignition may take place.

When it is required to extinguish the lighter, the body members 1 and 2 are allowed to travel apart under the action of the coil spring 20, and the cut-out portions 13 and 21 thereof will no longer be in register and the device will regain the position shown in Figures 1 and 3 and referred to above as the inoperative position. By extinguishing the lighter in the manner indicated, the chamber bounded between the inner end of the fuel container 3 and the adjacent face of the disc 18 will contain spent gases and when it is next required to ignite the lighter, it will be necessary to press the body members thereof together in order to expel the spent gases. The expelling action is carried out by the disc 18 which serves then as an exhaust piston. A fresh charge of air will be drawn into the body of the lighter when the two body members are released, the disc 18 then performing a suction stroke, which will serve also to draw fresh fuel from the wick 6 in vapour form. Thereafter the two body members may be pressed together and ignition will follow. Instead of extinguishing the lighter by allowing the cut-out portions 13 and 21 of the body members 1 and 2 to come out of register, the lighter can be extinguished by blowing out the flame. It will then be found that the double operation of the device will be unnecessary for subsequently lighting it, since when the body members move apart to resume the inoperative position, the disc 18 will at once perform an effective suction stroke.

On the non-working return stroke of the slidable body members it is undesired

that the flint wheel 8 shall effectively co-operate with the flint 10. The lateral teeth 15 of the flint wheel engaging the lateral teeth of the associated pinion, are such that upon the return stroke, there is no effective drive as between the pinion and the wheel. This is achieved by making the lateral teeth 15 of such profile as to have a ratchet action. The laterally engaging teeth are held against one another with the aid of a light spring 30 (see Figure 4).

The constructional example of the invention described above, will be capable of modification without departing from the spirit of the invention. Thus, instead of operating the flint wheel 8 through a rack and pinion mechanism, a cam mechanism might be substituted to achieve a similar result, or alternatively a rod bearing a helically extending tooth or teeth could be used in conjunction with a member seated upon the rod and engaging the tooth or teeth thereof in such manner as to perform rotary movements when the rod is longitudinally moved. In this instance, it might be more convenient to arrange the flint wheel upon an axis parallel with the direction of sliding movement of the body members.

The lighter of the invention relies principally upon vapourisation of fuel from the wick and it is found in practice that the wick nipple 5 may with advantage be extended internally into the fuel container 3, so that the part of the wick adjacent the exposed end thereof, does not come into direct contact with the fuel soaked filling of the container 3.

The fuel container 3 may be a push-in fit in the body member 1. If desired, however, it may be a loose fit therein and in this case it may be angularly located by an abutment X (Figs. 1 and 3) engaging in a notch formed in the body member 1. The container 3 will be held against unintentional removal by the co-action of the pinion 16 with the rack 14, since the pinion is carried by the container 3 whilst the rack is upon the body member 2. The loose fit of the fuel container 3 permits the same to be readily withdrawn from the lighter body, and since the fuel container carries the flint wheel and wick, the flint wheel may be hand operated to ignite the wick. The removed fuel container thus constitutes a separate lighter which can be hand operated for lighting a pipe or carrying out other operations which might otherwise be precluded or hindered by the body members 1 and 2 of the lighter proper.

Having now particularly described and ascertained the nature of our said inven-

tion and in what manner the same is to be performed, we declare that what we claim is:—

1. A lighter comprising a pair of telescopic body members adapted to be displaced one into the other against opposing spring pressure, one of said members housing a fuel container on which is carried a wick nipple and a flint wheel with associated flint tube, means being provided to cause the flint wheel to be rotated when the two members are telescoped one into the other, and there being a pair of apertures in said members which register when said members are so telescoped to reveal the wick nipple, and further comprising a piston device within said members so arranged that when the members are thrust one into the other the piston device approaches the wick nipple, and recedes therefrom when the members move apart under the opposing spring pressure, whereby said piston device may assist in expelling spent gases and may also assist in drawing a fresh charge of air into the lighter body and in drawing fuel vapour from the wick.

2. A lighter as claimed in Claim 1, wherein said piston device is fixedly carried by the one of said members which does not house the fuel container.

3. A lighter as claimed in Claim 1 or 2, wherein the one body member which slides within the other body member, houses the fuel container and a spring is disposed between the inner end of such inner body member and the adjacent internal face of the end of the outer body member.

4. A lighter as claimed in Claims 2 and 3, wherein said piston device consists of a disc secured upon a rod which passes freely through the said inner end of the inner body member and is secured in the adjacent internal face of the end of the outer body member.

5. A lighter as claimed in any of the preceding Claims wherein the flint wheel is rotated by rack and pinion mechanism, the pinion driving the flint wheel through the intermediary of means which permit transfer of driving force only in one direction of movement so that the flint wheel rotates only when the body members are thrust one into the other.

6. A lighter as claimed in Claim 5 wherein the rack is fixedly carried by the body member not housing the fuel container, and wherein the uni-directional driving means associated with the flint wheel consists of a set of ratchet teeth formed on the side of the flint wheel and laterally engaging similar teeth formed on the side of the driving pinion, the lateral engagement being maintained by

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spring pressure.

7. A lighter as claimed in any of the preceding Claims wherein the fuel container is a push-in fit in one of the body members and has a removable base which projects outside the receiving body member.

8. A lighter as claimed in any of the preceding Claims, wherein the wick nipple is extended internally within the fuel container in the form of a tubular portion.

9. A lighter as claimed in any of the preceding Claims 1 to 6 wherein the fuel container is a loose fit in one of the body

members and is located against angular displacement therein, the fuel container being readily removable and being then separately useful as a lighter.

10. A lighter constructed, arranged and adapted to operate as hereinbefore described with reference to the accompanying drawings.

Dated this 1st day of March, 1946.

HASELTINE, LAKE & CO.,

28, Southampton Buildings, London,
England, and

19-25, West 44th Street, New York,
U.S.A.,

Agents for the Applicants.

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FIG. 1.

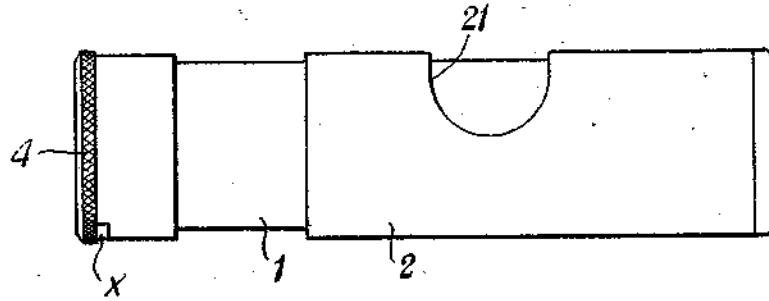


FIG. 2.

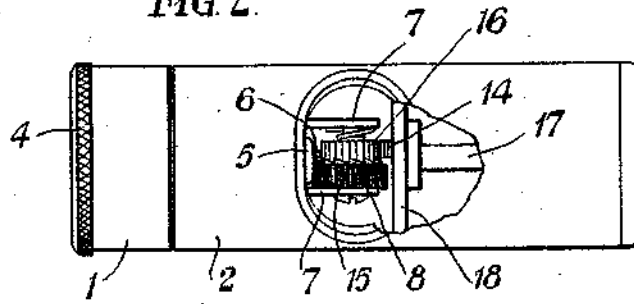


FIG. 3.

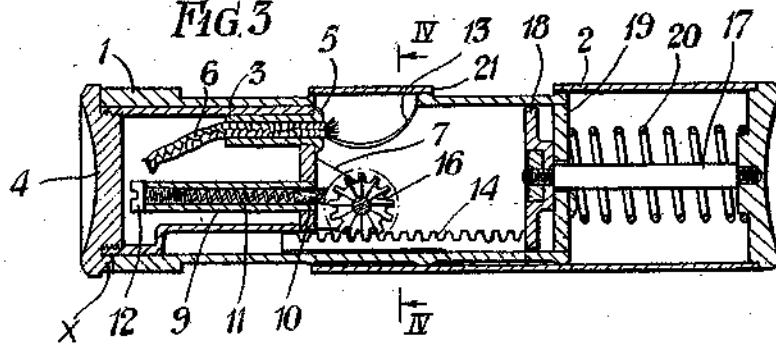
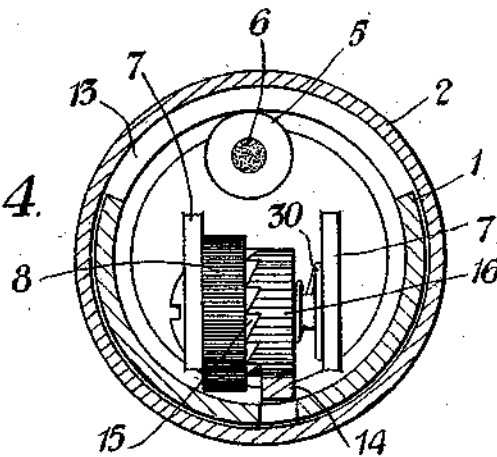


FIG. 4.



[This Drawing is a reproduction of the Original on a reduced scale.]