

PATENT SPECIFICATION

Application Date: Feb. 5, 1943. No. 1935/43.

564.554

" " March 31, 1943. No. 5129/43.

One Complete Specification left (under Section 16 of the Patents and Designs Acts, 1907 to 1942): Feb. 4, 1944.

Specification Accepted: Oct. 3, 1944.



PROVISIONAL SPECIFICATION

No. 1935 A.D. 1943

A Cigarette and/or Pipe Lighter for Use on Motor Vehicles, or for Use where a High Tension Electric Current is available

We, THOMAS GILBERT LEIGHTON TUSTIN, of 4, Towers Avenue, Hillingdon, Middlesex, Nationality British, and BERNARD CHARLES WILLIAMS, of 5, Lancaster Road, Overton, Lancaster, Lancs., Nationality British, do hereby declare the nature of this invention to be as follows:—

The apparatus consists of two parts, 10 part A and part B. Part A is a tube made of insulating non-inflammable material. It is attached to any convenient place on the vehicle on where it may be used and serves as a guide or 15 slider for part B. It may be made in any cross-sectional shape, but most suitably in circular or oval cross-section. One end of part A is closed so as to serve as a seal against loss of the fuel contents of part 20 B. The other end of part A is widened or bell mouthed so that part B may be readily inserted. Near the open end of part A and on opposite sides are two electrodes of suitable material which are 25 so arranged, preferably on springs, which may be adjustable, that they move to a fixed position relative to each other when part B is withdrawn from part A. One of these electrodes is attached to the high 30 tension circuit of the vehicle, or where the apparatus may be used, and the other to the earth circuit.

In the barrel of part A are air vent 35 holes to allow air to enter part A when part B is withdrawn from part A, and sufficiently far from the closed end of part A that they do not allow loss of the fuel contents of part B, while part B remains in its normal place in part A.

40 PART B.

Part B is also made of insulating non-inflammable material and consists of a tube of cross-section so that it is a sliding fit into part A. One end of part B is 45 closed by a plug for refuelling. The other

end of part B is closed by a plug made of insulating, heat-resisting material, except for a small hole through the centre of the plug for the insertion of a wick.

A cap made of insulating, heat-resisting material, which is, in effect, a guide to ensure that part B is withdrawn in a line parallel with part A until ignition 50 contact is made is fixed to this end of part B, most conveniently by making it a screw fit, or tight push fit, on to the plug, which is itself a screw fit or tight push fit into part B. 55

This cap is normally fixed to part B, but may be disconnected to allow the 60 insertion of, and attention to, the wick, and for the insertion of, and attention to a third electrode of suitable material which is fastened to the cap in such a position that when the cap is in its fixed 65 position on part B, this electrode is in close proximity to the wick.

This cap has two or more apertures on opposite sides which allow the high tension spark, when part B is withdrawn 70 from part A, to jump between the two electrodes affixed to part A and across this third electrode.

The outside diameter of the cap is of the same cross section as part B and when 75 fixed in its normal place on part B is in line with part B and of sufficient length to ensure that when part B is withdrawn from part A the third electrode passes the other two electrodes at a suitable fixed 80 distance. The end of the cap with projects from part B is pointed or tapered so that part B may be readily inserted into the bell mouth of part A.

ACTION OF LIGHTER. 85

Part B is pushed home into part A so that the wick end of part B is sealed against loss of fuel, and normally remains there.

To operate the lighter part B is with- 90

drawn from part A and the fuel vapour near the wick is ignited by high tension spark which, as soon as the three electrodes are approximately in line, jumps through the apertures and across the three electrodes, the air vent holes in part A allowing air to enter the interior of part A behind part B, so that no explosion may occur. After part B is completely withdrawn from part A the two electrodes affixed to part A remain at such distance apart that the high tension current, is insufficient to break down the air resistance between them and cause a spark.

To ensure, in the case of parts A and B being of circular cross-section, that the electrodes and the apertures come into line, a key and key-way, or similar arrangement may be used; and to ensure that the electrodes are sparking for a period sufficient to ignite the fuel, a spring ball and double socket, or similar arrangement may be used, which would serve the double purpose of holding part B in its normal position in part A and also cause a slight mechanical resistance to the withdrawal of part B from part A at the moment of ignition.

The refuelling end of part B may be so designed that it serves the purpose of (1) an additional fuel container. (2) An easy grip for withdrawal of part B from part A and (3) a guide to assist in the engaging of the key and key-way in parts A and B, or to assist in keeping the apertures and electrodes in line, if a key and key-way or the like may not be used.

Dated this 3rd day of February, 1943.
T. G. L. TUSTIN,
B. C. WILLIAMS.

PROVISIONAL SPECIFICATION

No. 5129 A.D. 1943

A Cigarette and/or Pipe Lighter for Use on Motor Vehicles, or for Use where a High Tension Electric Current is available

We, THOMAS GILBERT LEIGHTON TUSTIN, of 4, Towers Avenue, Hillingdon, Middlesex, British Nationality, and BERNARD CHARLES WILLIAMS, of 5, Lancaster Road, Overton, Lancaster, Lancashire, British Nationality, do hereby declare the nature of this invention to be as follows:—

The apparatus consists of two parts, part A and part B. Part A is a tube made of insulating non-inflammable material. It is attached to any convenient place on the vehicle or where it may be used and serves as a guide or slider for part B.

It may be made in any cross sectional shape but most suitably in circular cross section. One end of part A may be open, closed, or partly closed. The other end of part A is widened or bell mouthed so that part B may be readily inserted. Near the bell mouthed end of part A are one or more electrodes of suitable material so arranged, preferably on springs, that if displaced accidentally or by the insertion of part B, will return to normal position at a suitable fixed radius from the cross sectional centre of tube A. This electrode or electrodes is or are attached to the earth circuit of the vehicle or where the apparatus may be used.

At a suitable distance from the bell mouth of part A is an electrical conductor from the outside to the inside of tube A and this is suitably connected with the

high tension circuit of the vehicle or where the apparatus may be used.

PART B.

Part B is also made of non-inflammable insulating material and consists of a tube of cross section so that it is a sliding fit into part A. The end of part B which is to be inserted in to part A is closed by a plug conveniently made of material conductive to electricity. A short length of this plug is made the same diameter as the outside diameter of tube B and the plug then tapers so that part B may be readily inserted into part A. The other end of part B is closed by a plug for re fuelling. At a suitable distance from the end of part B which is to be inserted into part A are one or more apertures cut from the outside of the barrel of part B to the inside of the barrel of part B. The portion of the tube B between the refuelling plug and the aperture or apertures serves as a fuel container and is closed at the aperture or apertures by a plug, except for a small hole for the insertion of a wick, which is most conveniently inserted and kept in position by means of a small tube of suitable material inserted in this hole, the wick then passing through the tube. A connection made of material conductive to electricity is made between the tube which may serve as an electrode of suitable material, or between an electrode or electrodes of suitable

material near to this tube, and the tapered plug at the end of part B, or between the tube, electrode or electrodes and any "slip ring," "brush," or other device which may be used to collect the high tension current in place of this tapered plug. Round the outside of the barrel of part B and on either side of the aperture or apertures grooves may be cut, into which rings of felt or other suitable material may be fitted.

ACTION OF LIGHTER.

Part B is pushed home into part A and is sealed against loss of fuel by being a close fit into part A, or by means of the rings of felt or other suitable material round part B. To operate the lighter part B is withdrawn from part A.

The tapered plug, "slip ring," or other device makes contact with the electrified conductor in part A at the same time as the tube containing the wick or the electrode or electrodes near to the wick is or are passing close to the earthed electrode or electrodes at the bell mouth of part A. This tube or electrode or electrodes becomes electrified and the fuel vapour near the wick is ignited by a high tension spark which jumps between the electrified tube, electrode, or electrodes and the earthed electrode or electrodes near the bell mouth

of part A. To assure, in the case of parts A and B being of circular cross section, and if only one earthed electrode is used, that this electrode passes near to the electrified tube, electrode or electrodes of part B, a key and keyway or the like may be used, but it is preferable that the refuelling end of part B be so designed that it serves the purpose of (No. 1) an additional fuel container, (No. 2) an easy grip for the withdrawal of part B from part A, (No. 3) a guide to assist in keeping the positive and earthed electrodes in line, in which case several earthed electrodes or some semi-circular or part circular earthed electrode may be used, and a key and keyway or the like or complete circular electrode or circle of earthed electrodes is then unnecessary.

To assure that the electrodes are sparking for a period sufficient to ignite the fuel, a spring ball and double socket or the like may be used which will serve the double purpose of holding part B in its normal position in part A and also cause a slight mechanical resistance to the withdrawal of part B from part A at the moment of ignition.

Dated this 29th day of March, 1943.
T. G. L. TUSTIN,
B. C. WILLIAMS.

COMPLETE SPECIFICATION

A Cigarette and/or Pipe Lighter for Use on Motor Vehicles, or for Use where a High Tension Electric Current is available

We, THOMAS GILBERT LEIGHTON TUSTIN, British Nationality and of 4, Towers Avenue, Hillingdon, Middlesex, and BERNARD CHARLES WILLIAMS, British Nationality, of 39, Pinfold Lane, Skirton, Lancaster, Lancashire, formerly of 5, Lancaster Road, Overton, Nr. Lancaster, 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 electric cigarette and/or pipe lighters.

The aim of the invention is to provide for the driver of a motor vehicle or the like, a means of igniting a pipe or cigarette with a minimum of trouble and without distracting his or her attention.

The present invention consists of an electric cigarette and/or pipe lighter of the kind in which the wick is adapted to

be ignited by the withdrawal of the wick-holder from its housing, wherein the wick-holder and a third electrode electrically connected therewith are carried by a tubular member of insulating material which is adapted to be inserted within a housing of insulating material with which are associated the electrodes of a high tension electrical circuit, in such manner that on withdrawing said tubular member from said housing, a position is reached in which the third electrode comes into contact with one of the electrodes associated with the housing while the wick-holder comes into a position adjacent the other electrode associated with the housing, whereby a spark is caused to pass between said last-mentioned electrode and said wick-holder.

The invention is described below and illustrated in the accompanying drawings.

Figure 1 illustrates the housing which is of a bell-mouthed tubular form and made from non-inflammable insulating material *a*. Penetrating this tube *a* is a live electrode *b* connected with the source of high frequency electrical energy by an insulated cable *c*. At the bell-mouthed end of the tube *a* are one or more earthed electrodes *d* connected with the earth of the electrical circuit and so arranged on spring that if displaced they will return to within a fixed radius of the longitudinal axis of the tube *a*. Also at the bell-mouthed end of the tube *a* are air holes *e* to facilitate the burning of the fuel. At opposite end of the tube *a* is a simple spring and ball catch *f* which engages in the annular groove *g* (Fig. 2) to prevent the wick-holder (Fig. 2) being inadvertently displaced.

Referring to Figure 2, a tube *h* of non-inflammable insulating material fits closely into the tube *a*. This tube *h* is closed at one end by a screw cap *k* and near the middle by a plug *l* through which passes the metal wick tube *m* and wick *n*, to the cut-away *o* around which are provided air holes *p* to facilitate combustion. At the other end of the tube *h* is the third electrode *q* which is connected electrically with the metal wick tube *m*. This electrode projects beyond the tube *h* and has an annular groove *g* which is adapted to engage the catch *f* (Figure 1). The space between the cap *k* and the plug *l* is filled with the wick packed in absorbent material saturated with fuel.

Figure 3 illustrates the wick-holder (Figure 2) partly withdrawn from the housing (Figure 1) and at the position where the third electrode *q* bridges the gap between the live electrode *b* and the earthed electrode *d*.

The action is as follows:

When the wick-holder (Figure 2) is inserted into or withdrawn from the housing (Figure 1) it must pass the position illustrated in Figure 3. At this moment the high frequency current passes from the live electrode *b* through the third electrode *q* to the metal wick tube *m* jumping the reduced air gap to the earthed electrode *d* thus completing the circuit and igniting the fuel. The wick-holder (Figure 2) is fully withdrawn, used and replaced. When this is pressed home until the catch *f* engages with the groove *g* the flame is extinguished by lack of air and the third electrode *q* no longer being between the live electrode *b* and the earthed electrode *d* the gap between them is again widened and the spark cannot jump it.

We are aware that electric lighters are known in which the wick-holder is

adapted to function as a third electrode, but in such prior constructions known to us, the action of the wick-holder is first to close an electric circuit containing the two line electrodes and then to break said circuit, causing a spark to pass between the live electrodes and the wick-holder. In our construction, a spark passes between one of the live electrodes and the wick-holder as soon as the third electrode electrically connected with the wick-holder comes into contact with the other live electrode.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. An electric cigarette and/or pipe lighter of the kind in which the wick is adapted to be ignited by the withdrawal of the wick-holder from its housing, wherein the wick-holder and a third electrode electrically connected therewith are carried by a tubular member of insulating material which is adapted to be inserted within a housing of insulating material with which are associated the electrodes of a high tension electrical circuit, in such manner that on withdrawing said tubular member from said housing, a position is reached in which the third electrode comes into contact with one of the electrodes associated with the housing while the wick-holder comes into a position adjacent the other electrode associated with the housing, whereby a spark is caused to pass between said last-mentioned electrode and said wick-holder.

2. An electric cigarette and/or pipe lighter according to Claim 1, consisting of a tubular housing of insulating material having an outwardly flared end, a live electrode incorporated at an intermediate position in the wall of said tubular housing and a second live electrode extending inwardly from said flared end, a tubular member of insulating material carrying a wick-holder intermediate of its length which extends to an opening in the wall of said tubular member, and carrying a third electrode at its end which is electrically connected with said wick-holder, in such manner that, on withdrawal of the tubular member from the tubular housing, a position is reached in which the third electrode comes into contact with the live electrode in the wall of the tubular housing while at the same time the wick-holder comes into a position adjacent the live electrode extending inwardly from the flared portion of the tubular housing, whereby a spark is caused to pass between said last-

mentioned electrode and said wick-holder.

3. An electric cigarette and/or pipe lighter substantially as hereinbefore described with reference to the accompanying drawings.

Dated the 2nd day of July, 1944.

T. G. L. TUSTIN,
B. C. WILLIAMS.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1944.

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

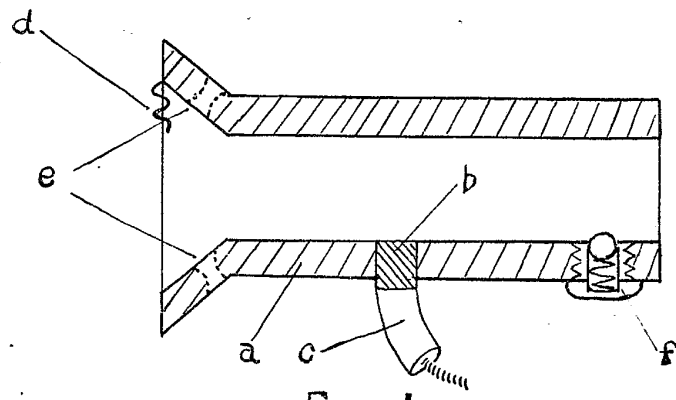


FIG 1.

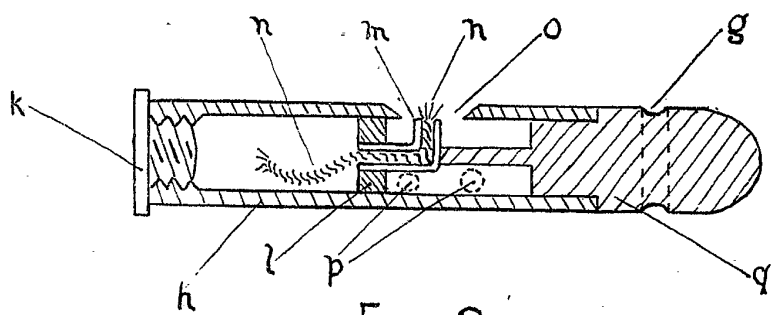


FIG 2.

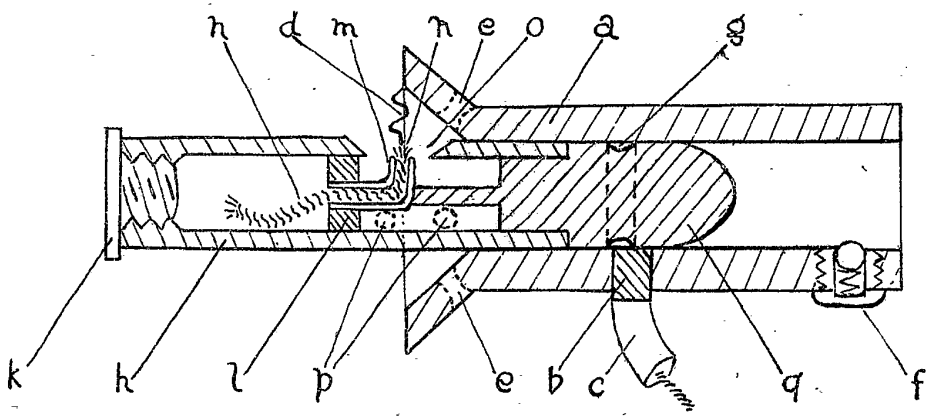


FIG 3.