Jan. 29, 1929.

1,700,486

E. F. CLARK

POCKET LIGHTER

Filed Nov. 10, 1926

Fig. 1.

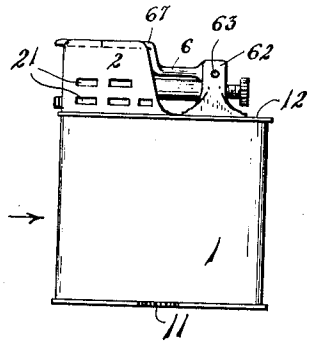


Fig. 2.

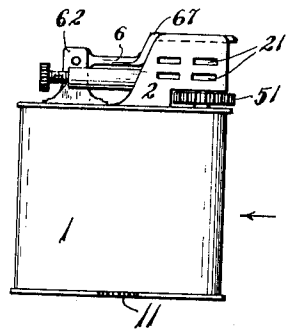


Fig. 3.

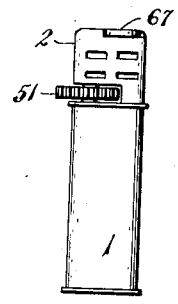


Fig. 4.

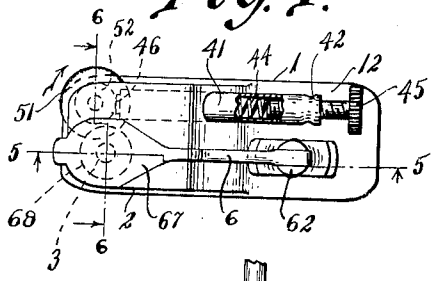
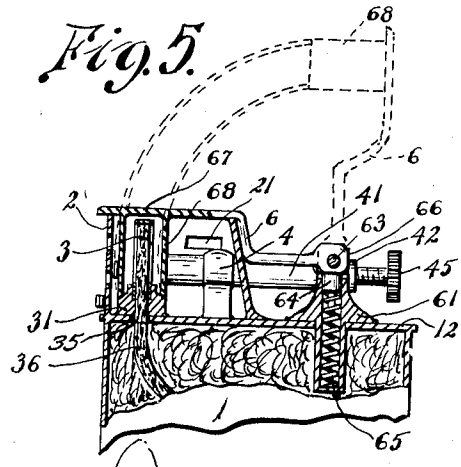


Fig. 5.



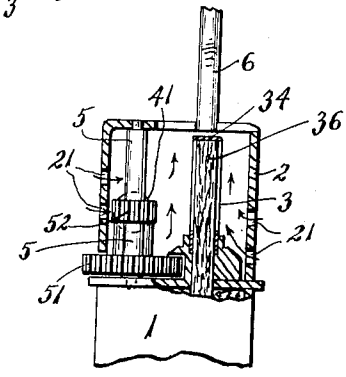


Fig. 6.

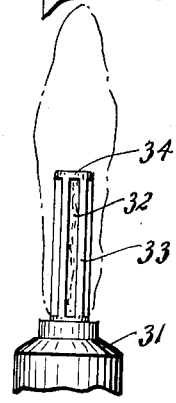


Fig. 7.

INVENTOR

Edward Foster Clark.

By Mitchell, Chadwick & Kent,

ATTORNEYS.

Patented Jan. 29, 1929. 1,700,486

UNITED STATES PATENT OFFICE.

EDWARD FOSTER CLARK, OF NORTH ATTLEBORO, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CLARK LIGHTER CO., INC., OF NORTH ATTLEBORO, MASSACHUSETTS, A CORPORATION OF MARYLAND.

POCKET LIGHTER.

Application filed November 10, 1926. Serial No. 147,454.

My invention is a pocket lighter in which is embodied an improved vaporizing device and a heating and mixing chamber for gas, designed to produce an increased production of gas and to supply at the proper point an adequate amount of oxygen to provide for complete combustion of the gas carbon.

In the drawings:

Figure 1 is a side elevation of my improved lighter;

Figure 2 is a similar view of the opposite side;

Figure 3 is an end elevation, looking in the direction of the arrows in Figures 1 and 2;

Figure 4 is a plan view of Figure 1;

Figure 5 is a sectional elevation on line 5—5 of Figure 4;

Figure 6 is a sectional elevation on line 6—6 of Figure 4, the arm 6 and its associated parts being shown in dotted lines, raised;

Figure 7 is a detail of the vaporizing device;

Figures 4, 5, 6 and 7 are on an enlarged scale, for clearness.

I have shown my device as applied to the lighter shown in United States Patent No. 1,594,047, but it is obvious that my invention may be adapted for use with other forms of lighter.

In the drawings, 1 is a reservoir for liquid fuel, such as gasoline, alcohol, or other volatile liquid. The reservoir is usually filled with cotton fibre, sponge or the like, in the interstices of which the liquid is held. An aperture is formed in the walls of the reservoir through which the liquid fuel may be introduced from time to time and this aperture is closed by a screw plug 11. Upon the top 12 of the reservoir is mounted the sparking mechanism, made up of a standard 4 mounted perpendicularly to the surface of the top 12 and carrying transversely to its upper end a flint tube 41, having at one end an interior screw threaded section, 42. Within the flint tube is mounted a spiral spring 44 and in the threaded section 42 is a screw 45, which may be turned to give any desired tension to the spring.

Mounted upon the top 12, in line with the flint tube is a perpendicular shaft 5, its lower end having a bearing in a recess in the surface of top 12 and its upper end a bearing in a cover wall of the gas chamber 2. Upon this shaft 5 are mounted two wheels, one, 51, being a thumb wheel, preferably with a milled or knurled edge and the other 52, somewhat less in diameter, having a file cutting-edge, and lying close to and in line with the open end of flint tube 41. Between the end of spring 44 and spark wheel 52 is placed a flint 46 which is kept by the spring pressed against the periphery of the spark wheel.

The above elements are all shown and described in Patent No. 1,594,047, and it will be obvious that upon the rapid actuation of thumb wheel 51 in the direction of the arrow in Figure 4, the abrading or spark wheel 52 operating upon the spring pressed flint 46 will remove minute particles of the flint, with the generation of heat sufficient to raise the particles to an incandescent heat, throwing the sparks in a shower in the direction of rotation of the abrading tool 52.

My invention is concerned with the flame elements which are arranged upon the top 12 of the reservoir and consist of three main elements, namely, a mixing chamber 2, a vaporizer 3 and an extinguisher 6. Upon the top 12 of the reservoir is mounted in a suitable base 31 a perpendicular cage 3, formed as a hollow tube, having apertures 32 defined by bars 33 and preferably a cap 34. The apertures 32, as shown, are longitudinal slots, but a multiplicity of openings, in line, will give good results. The hollow of this element 3, communicates, through an aperture 35, with the interior of the reservoir 1. Within the cage 3 is carried a lamp wick 36 preferably loosely wound. Opposite the end 42 of the flint tube is a hollow standard 61, the lower end of which is within the reservoir and is closed. This standard carries at its upper end upstanding ears 62 provided with bearing apertures for the pintle 63 of a swinging arm 6. Within the hollow of standard 61 is a plunger 64, spring pressed by a spring 65. The rear end of arm 6 is formed with flat surfaces 66, which when arm 6 is perpendicular to or parallel with the top 12 are engaged by plunger 64, yieldingly holding the arm 6 in one position or the other but preventing it from remaining in any intermediate position. Upon the free end of arm 6 is a plate 67 shaped to fill the opening in the top of chamber 2 and on the under side of plate 67 is an open ended tube 68 to receive and cover the cage 3 and extinguish the flame and prevent leakage or evaporation of the fluid fuel, when

the device is not in use. It is desirable that the spring 65 should have a considerable number of coils, in order that the necessary pressure may be established and maintained without subjecting any coil to more than a slight distortion in the operation of the device. To provide room for such a spring I have provided a tubular container seat 61 extending through the top of the reservoir into the interior of the reservoir.

The operation is as follows: The reservoir 1 being charged with suitable volatile fluid fuel, the loose wick will draw up a supply to the exposed upper end of the wick. When it is desired to produce a flame the arm 6, with its plate 67 and extinguisher 68, is lifted to a perpendicular position, as shown in dotted lines in Figure 5, the spring pressed plunger 64 yielding and reseating itself on a flat 66 to hold the arm in upright position. The cage 3 is now uncovered. A sharp turn of shaft 5 by means of thumb wheel 51 will cause spark wheel 52 to throw a myriad of incandescent particles of the flint 46, which is pressed against its face, against the cage 3, covered by condensed fuel and the wick 36 which is exposed through apertures 32, igniting the fuel. The heat generated by the initial flame immediately heats the bars 33 and a rapid increase of vaporization ensues. Air to support this combustion is drawn through slots 21 in the walls of gas mixing chamber 2, and impinges upon the burning vapor, passing upward, as indicated by the arrows in Figure 6, between the cage 3 and the walls of the mixing chamber 2.

The flame thus produced is larger than that heretofore produced in pocket-lighters, due to greater quantity of gas produced by the heating of the cage and the supply at the point of gas production of the atmospheric oxygen necessary to consume this increased flow of gas. The point of gas production being within the mixing chamber 2 is not affected by atmospheric movements other than the self induced air currents through the slots 21. The flame therefore is stable, strong and of relatively large size.

When is is desired to quench the flame the arm 6 is returned to horizontal position, at first resisted by the spring 65 and later urged by spring 65, as the corner between two flat surfaces 66 is passed. In horizontal position the plate 67 will fill the opening in the top of mixing chamber 2 and the extinguisher 68 will cover and contain the cage 3. The flame will be instantly quenched.

The mixing chamber should enclose the wick cage 3 and sparking wheel 52 rather closely, as shown in the drawings, in order that the contained air may rise swiftly, as indicated by the arrows in Figure 6, and be replaced by the cooler outside air drawn in through ports 21. The effect is similar to the effect of a chimney around the flame in any lamp, producing a strong, steady, clear and stable flame, uninfluenced by atmospheric movements without the chamber and depositing no carbon within the chamber. The slots or ports 21 are designed and distributed with due regard to these ends, to produce a positive indraft of outer air and an uprush along the sides of cage 3 to feed the flame with the necessary oxygen and carry up and out of the chamber the products of combustion. It will be obvious that the amount of gas produced by my novel wick cage will greatly exceed that commonly had from a wick of equivalent size and the resulting flame, given an adequate supply of oxygen, will be much larger.

I claim:

In a pocket lighter, in combination, a fuel reservoir; a flint tube; a spring within the flint tube; an abutment for the spring at one end of the flint tube; a spark wheel opposite and in line with the other end of the flint tube; a wick-cage adjacent the spark wheel; an open-top mixing chamber, having slotted sides, for air ingress, closely enclosing the cage and spark wheel; a pivoted arm, carrying at its free end a cover plate for the mixing chamber and a cover tube for the wick-cage; means to actuate the spark wheel.

Signed at Boston, Massachusetts, this ninth day of November, 1926.

EDWARD FOSTER CLARK.