CLAIMS:

I claim:

1. A hybrid primer device comprising;

   an electric primer, wherein the electrical primer comprises of a single or plurality of electrode pairs or electrode pins, wherein each electrode pair comprises of at least one anode and one cathode pin, wherein the anode and the cathode in each pair are insulated from each other;

   a chemical primer housed in a percussion cap, wherein the percussion cap is housed in a base;

   wherein, the plurality of anode and cathode are arranged at a predetermined distance from a central axis, wherein a length of each pair of anode and cathode varies to create multiple trigger points across the length of the cartridge.
2. The device as per claim 1, wherein each pair of electrodes of variable lengths simultaneously creates electric arcs or sparks on application of high voltage electric pulses across them, wherein the spark leads to ignition of the propellant at multiple points instantaneously to improve a rate of combustion and reduce a triggering time.
3. The device as per claim 1, wherein the high voltage electric pulses are applied across the electrode pins to generate plasma or spark until the propellant is emptied from a cartridge case or a firing chamber to achieve a complete combustion.
4. The device as per claim 1, wherein the chemical primer housed in a press fitted percussion cap provides ignition of the propellant in absence of the electric primer through a mechanical impact created by a firing pin or a hammer.

5. The device as per claim 1, wherein the base of the primer is composed of a non-conducting material, wherein the electrode pins and the percussion cap is fitted in the non-conducting material, wherein the electrode pins are effectively insulated from each other and also from the cartridge case and a firearm.
6. The device as per claim 1, wherein the variable length of the electrodes is distributed to provide instantaneous combustion at multiple points, wherein the length of the electrode covers an area closer to the percussion cap to the area closer to neck of the cartridge or projectile.
7. The device as per claim 1, wherein the plurality of electrode pairs are fixed at a distance from the central axis in a predetermined manner, wherein the predetermined manner comprises adjustment of a gap between the tips of the longer electrode pair less than a length of the shorter electrode pair, wherein the predetermined manner allows an equal current to pass through the longer and the shorter electrode pair on application of high voltage electric pulses.
8. The device as per claim 7, wherein a gap between the tips of the longer electrode pins is adjusted by changing an angle of inclination of the longer electrode pins with respect to the base.
9. The device as per claim 1, wherein the instantaneous high pressure multiplicatively increases a bullet velocity, wherein the increased bullet velocity increases a target range and accuracy.
10. The device as claimed in claim 1, wherein the base further comprises a plurality of flash hole channels and an anvil.
11. The device as per claim 1, wherein the voltage applied to the plurality of electrode pair ranges from few kilovolt to hundreds of thousand kilovolt.

12. A hybrid primer device comprising;

an electric primer, wherein the electrical primer comprises an electrode, wherein the electrode further comprises two or more interconnected pins of variable length;

a chemical primer housed in a percussion cap, wherein the percussion cap is housed in a base;

wherein, the two or more interconnected pins have a single contact point for applying high voltage power supply, wherein a length of the two pins differs from another pair of pins to create multiple trigger points across the length of the cartridge.

13. The device as per claim 12, wherein the electric primer consists of a single or multiple pins form a homogenous structure acting as electrode with sufficient insulation at base and the cartridge case having the inner walls made of a conducting material acts as a complementing electrode.

14. The device as per claim 13, wherein the electric primer consists of a single pin acting as electrode have multiple spikes or thorn like structure.

15. The device as per claim 12, wherein the electric primer consists of multiple electrode pins, wherein a distance between the tips of the longer electrode pins are adjusted by changing an angle of inclination with respect the base of the hybrid primer device.

16. The device as per claim 12, wherein the electric primer consists of multiple electrode pins, wherein the electrode pins are fixed at a predetermined distance from the center in a manner that a distance between the tips of the longer electrode pins are adjusted to be less than the length of the shorter electrode pins, wherein a current passing through the longer and shorter electrode pins is nearly equal on application of high voltage electric pulses.

17. The device as per claim 15, wherein a distance between the cartridge case and pins is less between the longer electrode pin and the cartridge case as compared to the shorter electrode pins to allow passage of current through the multiple electrode pins to create electric arcs.

18. The device as claimed in claim 12, wherein the base further comprises a plurality of flash hole channels and an anvil.

19. A power supply contact comprising:

a plurality of complementing power supply terminals;

a non-conducting base, wherein the plurality of complementing power supply terminals are fixed on the non-conducting base with the terminals separated by a distance greater than the diameter of an electrode pin contact head to prevent short circuit at the contacts;

a hole at the center is provided for the passage of the firing pin.

CLAIMS:

I claim:

1. A hybrid primer device for use within a cartridge having a longitudinal axis and a propellant charged disposed therein, comprising:

an insulated base;

an electrical primer comprising at least one pair of electrode pins, wherein said at least one pair of electrode pins comprises an anode and a cathode, wherein first ends of said anode and said cathode are fixedly mounted within said insulated base and are spaced apart from each other so as to be electrically insulated from each other and yet are adapted to be connected to a power source, wherein second opposite ends of said anode and said cathode are disposed a predetermined distance from each other so as to generate an arc spark between said anode and said cathode when electrical power is supplied to said anode and said cathode, and wherein said anode and said cathode extend substantially axially away from said insulated base for a predetermined axial distance, substantially parallel to the longitudinal axis of the cartridge, such that the spark can be generated at a predetermined distance along the axial extent of the cartridge and at a predetermined distance from said insulated base;

a chemical percussion primer housed within a percussion cap, wherein said percussion cap is disposed within said insulated base and is adapted to generate another spark as a result of a mechanical strike being imparted to said percussion cap; and

at least one flash hole defined within said percussion cap so as to permit said spark, generated from said chemical percussion primer housed within said percussion cap as a result of the mechanical strike imparted to said percussion cap, to propagate into the cartridge, within which the propellant charge is disposed, such that the propellant charge, disposed within the cartridge, can be ignited by both of the sparks generated by said at least one anode and said at least one cathode of said electrical primer, and said mechanical strike imparted to said percussion cap.

2. The device as per claim 1, wherein:

said at least one pair of electrode pins comprises a plurality of pairs of electrode pins wherein each pair of electrode pins is of a different axial length such that a plurality of arc sparks are simultaneously created at different axial positions along the axial extent of the cartridge upon application of high voltage electric pulses to said plurality of anodes and said plurality of cathodes, wherein the sparks lead to the instantaneous ignition of the propellant at multiple axial locations within the cartridge so as to improve rate of combustion of the propellant and reduce overall triggering time of the propellant.

3. The device as per claim 2, wherein:

high voltage electric pulses are applied across the plurality of pairs of electrode pins so as to generate plasma or sparks until the propellant is emptied from the cartridge in order to achieve complete combustion.

4. The device as per claim 2, wherein:

said plurality of pairs of electrode pins are disposed within a circumferential array around said longitudinal axis of the cartridge and at a predetermined distance from said longitudinal axis of the cartridge.

5. The device as set forth in claim 4, wherein:
said plurality of pairs of electrode pins disposed within said circumferential array extending around the longitudinal axis of the cartridge comprises two pairs of electrodes equiangularly spaced from each other by means of 180°.

6. The device as set forth in claim 4, wherein:
said plurality of pairs of electrode pins disposed within said circumferential array extending around the longitudinal axis of the cartridge comprises four pairs of electrodes equiangularly spaced from each other by means of 90°.

7. The device as set forth in claim 4, wherein:
said plurality of pairs of electrode pins disposed within said circumferential array extending around the longitudinal axis of the cartridge comprises six pairs of electrodes equiangularly spaced from each other by means of 60°.

8. The device as set forth in claim 4, wherein:
said plurality of pairs of electrode pins disposed within said circumferential array extending around the longitudinal axis of the cartridge comprises eight pairs of electrodes equiangularly spaced from each other by means of 45°.

9. The device as set forth in claim 4, wherein:
each pair of said plurality of pairs of electrode pins comprises an anode and a cathode wherein said anode and cathode electrode pins of each pair of said plurality of pairs of electrode pins have different axial lengths, however each one of said pairs of said anode electrode pins and each one of said pairs of cathode electrode pins are of the same length, and wherein said pairs of said anode and cathode electrode are interconnected together at said first ends thereof so as to have a single contact point to which the high voltage power can be supplied.

10. The device as per claim 9, wherein:
said anode and cathode electrode pins are oriented at a predetermined angle of inclination with respect to said base and a gap defined between said second ends of longer ones of said anode and cathode electrode pins having said different axial lengths is adjustable by changing the angle of inclination of said longer ones of said anode and cathode electrode pins with respect to shorter ones of said anode and cathode electrode pins and said base.

11. The device as per claim 2, wherein:

instantaneous high pressure characteristics, created by said plurality of pairs of electrode pins at a plurality of axial positions along the longitudinal axis of the cartridge, multiplies velocity characteristics of a bullet disposed within the cartridge, wherein increased bullet velocity increases target range and accuracy.

12. The device as per claim 2, wherein:
voltage applied to said plurality of pairs of electrode pins ranges from at least one kilovolt to at least one hundred thousand kilovolts.

13. The device as set forth in claim 2, wherein:
each pair of said plurality of pairs of electrode pins comprising said anodes and said cathodes are of different axial lengths with respect to each other such that one pair of said anode and cathode electrode pins is longer than the other pair of said anode and cathode electrode pins.

14. The device as set forth in claim 13, wherein:
said anode and cathode electrode pins are oriented at a predetermined angle of inclination with respect to said base and a gap defined between said second ends of shorter ones of said anode and cathode electrode pins having said different axial lengths is adjustable by changing the angle of inclination of said shorter ones of said anode and cathode electrode pins with respect to longer ones of said anode and cathode electrode pins and said base.

15. The device as set forth in claim 2, wherein:
said anode and cathode electrode pins of a first pair of said plurality of pairs of electrode pins are oriented at a predetermined angle of inclination with respect to said base which is smaller than a predetermined angle of inclination at which said anode and cathode electrode pins of a second pair of said plurality of pairs of electrode pins are inclined with respect to said base such that a first gap defined between said first pair of said plurality of pairs of electrode pins, which are longer than the length of said second pair of said plurality of pairs of electrode pins, is less than a second gap defined between said second pair of said plurality of pairs of electrode pins.

16. The device as per claim 1, wherein:
said insulated base of said hybrid primer is composed of a non-conducting material, wherein said at least one pair of electrode pins and the percussion cap are fitted within the non-conducting material, and wherein the electrode pins are effectively insulated from each other and also from the cartridge and a firearm.

17. The device as claimed in claim 1, wherein:
the base further comprises a plurality of flash hole channels and an anvil.