DIY Arc Gas Lighter Using TP4056 and High Voltage

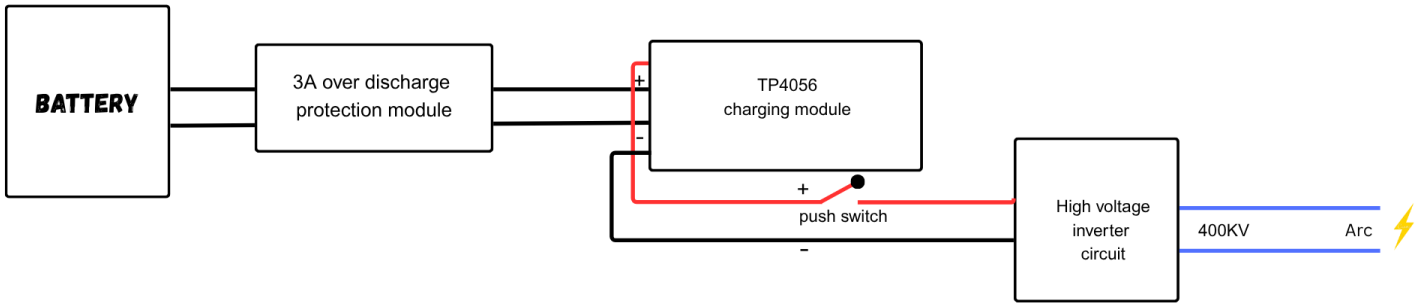
Objective

To design and build a rechargeable arc gas lighter using a lithium-ion battery, a TP4056 charging module, and a high-voltage inverter circuit that generates an arc for ignition.

Components Used

- TP4056 Battery Charging Module x1
- (with overcharge/overdischarge protection)
- 18650 Li-ion Battery x1
- Push Button (Press Switch) x1
- High Voltage Inverter Circuit x1
- Wires & Connectors, as needed For making connections
- Insulating Material, as needed Safety and casing

Circuit Diagram



Working Principle

1. The TP4056 module charges the 18650 Li-ion battery via USB.

2. Pressing the switch connects battery power to the high-voltage inverter.

3. The inverter steps up the 3.7V from the battery to approximately 4,000 volts, which is discharged as a visible arc across the electrode gap.

4. This arc is hot enough to ignite gas instantly (useful in lighters, igniters, etc.).

Safety Precautions

1. Always insulate high-voltage parts.
2. Keep the inverter away from flammable materials.
3. Never touch the arc area during operation.
4. Use heat-shrink or plastic casing to prevent shorts.

Applications

Kitchen gas lighters

Portable igniters for camping

Advantages

Rechargeable and eco-friendly (no gas needed)

Compact and efficient

Low-cost components

Safer than open-flame lighters (if insulated properly)

Limitations

Battery must be recharged frequently

Arc may not work well in very windy conditions

Output strength depends on battery charge level

Images