CLAIMS

1. A system for connecting batteries in an electrical circuit, comprising:

a first energy storage unit with a positive terminal and a negative terminal,

a second energy storage unit with a positive terminal and a negative terminal,

a series configuration output and a parallel configuration output, and

a control unit that regulates a cycle comprising a first phase and a second phase,

wherein during the first phase, the negative terminal of the first energy storage unit is connected to the positive terminal of the second energy storage unit, while the positive terminal of the first energy storage unit and the negative terminal of the second energy storage unit are connected to the series configuration output, such that the first energy storage unit, second energy storage unit, and series configuration output are connected in a series connection; and

wherein during the second phase, the positive terminal of the first energy storage unit is connected to the positive terminal of the second energy storage unit while the negative terminal of the first energy storage unit is connected to the negative terminal of the second energy storage unit and both the positive terminals are connected to the parallel configuration output and the negative terminals are connected to the parallel configuration output, such that the first energy storage unit, second energy storage unit, and parallel configuration output are connected in parallel; and

a plurality of switches connected to the positive and negative terminals of the energy storage units, such that the switches configure the circuit in a series configuration during the first phase, and then in a parallel configuration during the second phase;

wherein the control unit sets the relative duration of the first phase and the relative duration of the second phase, such that the first phase comprises 0% to 100% of the duration of the cycle, and the second phase comprises the remainder of the cycle, such that the control unit alters the relative duration of the series configuration output and the parallel configuration output, and

wherein an output of the output terminal is determined as a weighted average between the series configuration output and the parallel configuration output, wherein the weighted average is weighted based on the relative duration of the first phase and the relative duration of the second phase.

2. The system of claim 1, wherein the control unit is one of a programable mechanical, electronic, PCB or integrated circuit chip.

3. The system of claim 1, wherein the series configuration output comprises a load and the parallel configuration output comprises an energy source.

4. The system of claim 1, wherein the first energy storage unit and the second energy storage unit each comprise a plurality of batteries.

5. The system of claim 1, wherein the duration of the first phase is equal to the duration of the second phase.

6. The system of claim 1, wherein the first energy storage unit and the second energy storage unit are capacitors.

7. The system of claim 1, further comprising a rechargeable power source connected to the output, wherein during the second phase the control unit further connects the positive terminals of the first and second energy storage units to a positive terminal on the rechargeable power source and the negative terminals of the energy storage units to a negative terminal on the rechargeable power source, such that the rechargeable power source is connected to and receiving charge from the circuit using a parallel connection.

8. The system of claim 7, wherein during the first phase the rechargeable power source is disconnected from the circuit and is instead configured to drive a load.

9. The system of claim 8, wherein an amount of energy is lost from the first energy storage unit and second energy storage unit to the load during the first phase, and then recharged to the rechargeable power source from the electric circuit during the second phase.

10. The system of claim 1, wherein the plurality of switches are connected to one another such that they are all activated simultaneously.

11. The system of claim 1, wherein the control unit controls the plurality of switches.

12. The system of claim 1, wherein the first energy storage unit and the second energy storage unit are initially fully charged.

13. The system of claim 1, wherein the control unit operates more than one cycle per second.

14. A circuit for connecting batteries, comprising:

a first energy storage unit with a positive terminal and a negative terminal,

a second energy storage unit with a positive terminal and a negative terminal,

a series configuration output and a parallel configuration output, and an output terminal,

a plurality of switches connected to the terminals of the energy storage units and the output terminal, and

a control unit that controls the plurality of switches to regulate a cycle comprising a first phase and a second phase,

wherein during the first phase, the negative terminal of the first energy storage unit is connected to the positive terminal of the second energy storage unit, while the positive terminal of the first energy storage unit and the negative terminal of the second energy storage unit are connected to the output terminal, such that the first energy storage unit, second energy storage unit, and output terminal are connected in a series connection; and

wherein during the second phase, the positive terminal of the first energy storage unit is connected to the positive terminal of the second energy storage unit while the negative terminal of the first energy storage unit is connected to the negative terminal of the second energy storage unit and both the positive terminals are connected to the output terminal and the negative terminals are connected to the output terminal, such that the first energy storage unit, second energy storage unit, and output terminal are connected in parallel;

and a plurality of switches connected to the positive and negative terminals of the energy storage units, such that the switches configure the circuit in a series

configuration during the first phase, and then in a parallel configuration during the second phase;

wherein the control unit alters the relative duration of the first phase and the relative duration of the second phase, such that the first phase comprises 0% to 100% of the duration of the cycle, and the second phase comprises the remainder of the cycle, such that the control unit alters the relative duration of the series configuration output and the parallel configuration output, and

wherein an output of the output terminal is determined as a weighted average between the series configuration output and the parallel configuration output, wherein the weighted average is weighted based on the relative duration of the first phase and the relative duration of the second phase.

15. The circuit of claim 14, wherein the plurality of switches are interconnected such that they are flipped or change position simultaneously.

16. The circuit of claim 14, wherein the output terminal further comprises a switch that switches between two or more output devices every phase.

17. The circuit of claim 14, wherein the control unit alters the durations of the first phase and the second phase to produce a specific output voltage and current.

18. The circuit of claim 14, wherein the switches are transistors.