

Gridless DC Power Distro

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Providing power and appliances to individuals and communities without direct access to the electrical grid system.

Background

An estimated 553,742 people living in America are experiencing houselessness. Many of them are living in outdoor encampments that lack effective power distribution systems. This leaves these communities without access to many of the necessary functions electricity provides including the abilities to cook, heat water, charge electrical devices, and more. This project aims to explore solutions to this problem utilizing DC power systems disconnected from the grid.

Decentralized systems have significant potential to improve the lives of those living without grid power. Many of the core ideas of this product extend beyond the houseless community. Some of these applications include: delivering power to civilians living in natural disaster or conflict zones, making life easier for those living in extremely rural areas, and generally helping communities pivot away from the inefficient and unreliable grid system.

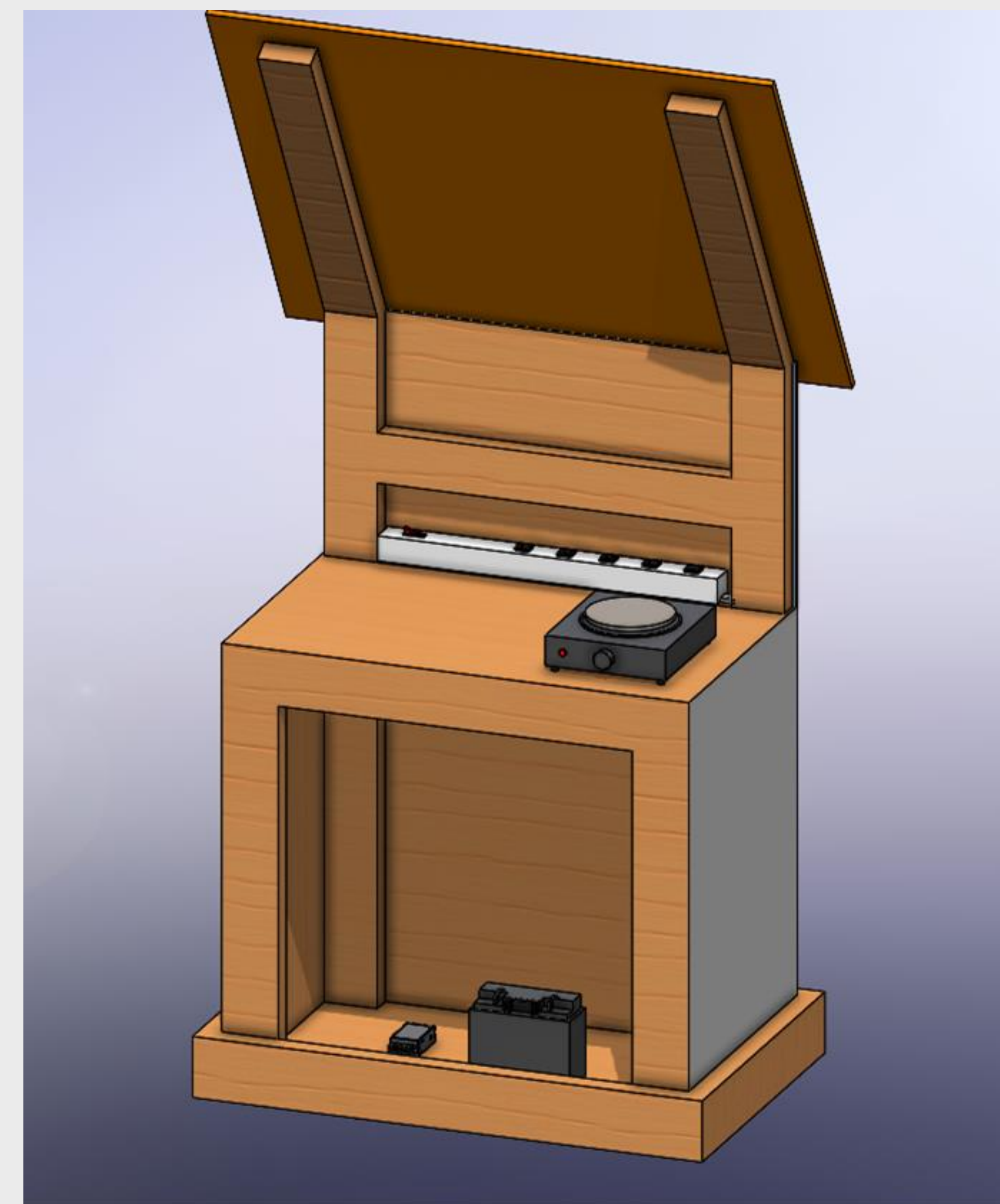
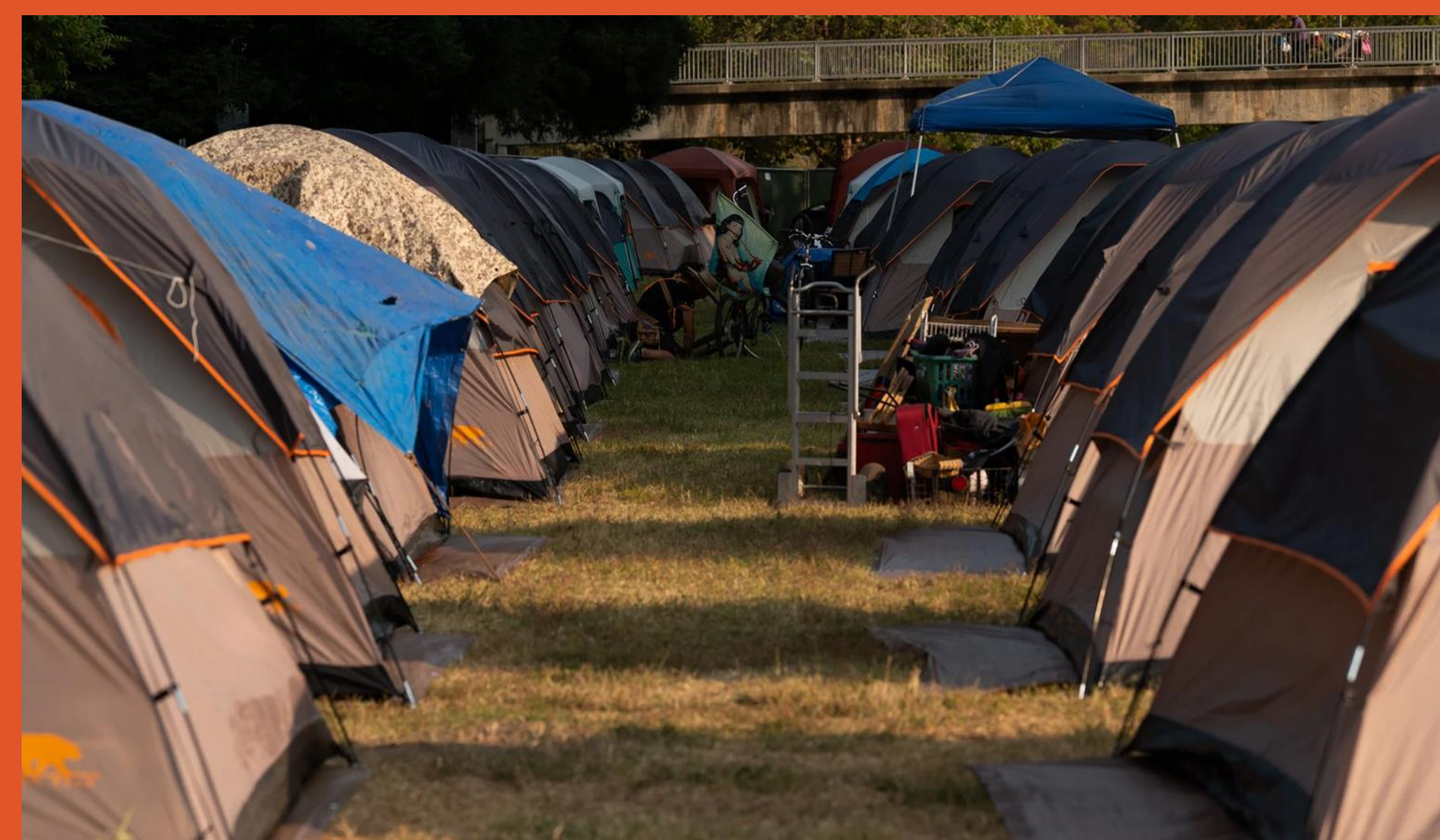


Figure 1: Initial Proposed model of DC Gridless structure.

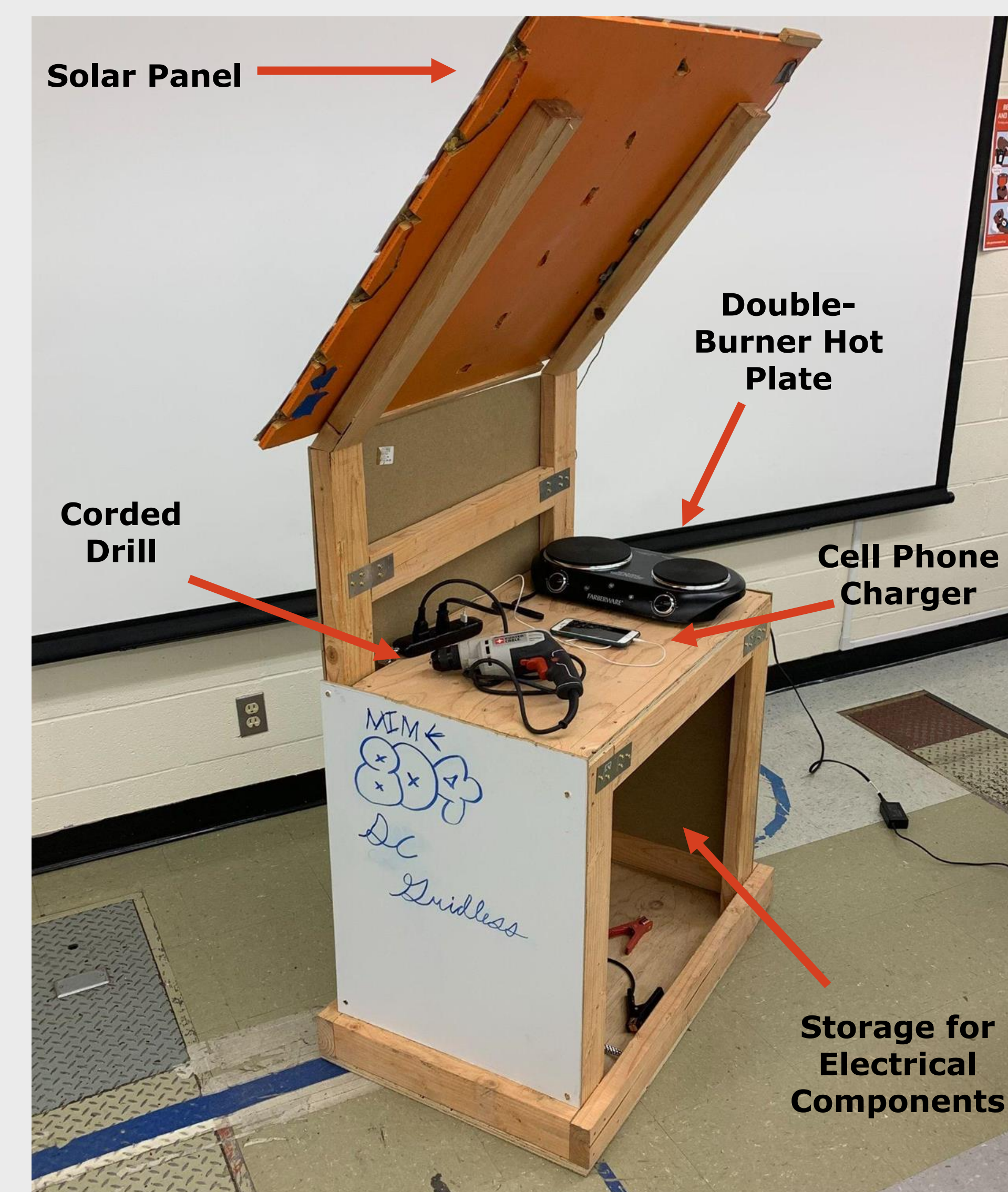


Figure 2: Final Prototype Model of DC Gridless Structure

Present Prototype

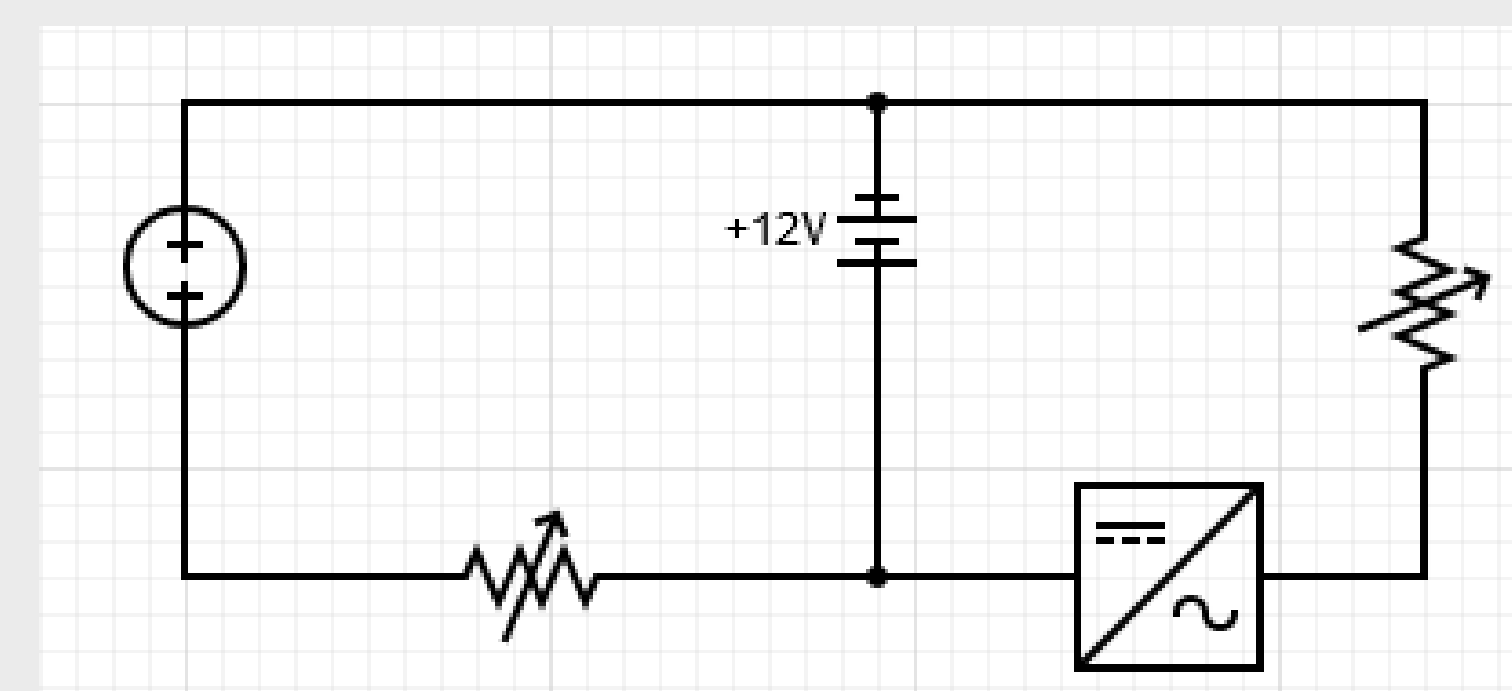
Our team's prototype was created as a scalable model for future Capstone teams to innovate. Our base model includes:

- Absorbent Glass Mat batteries.
- Roof with the potential to integrate solar power.
- Included hotplate and power strip.
- LED strip for nighttime use.



Figure 2: Final Prototype Model of DC Gridless Structure

Electrical Diagram



- Parallel DC & AC systems
- Potential to increase battery capacity

Prototype statistics

- 1000 W Max Output
- 95 Ah Capacity
- 120 Lbs
- Ability to be scaled up to work with higher capacity recycled batteries from electric vehicles.

Future Vision

In the future, we hope other capstone teams will modify and improve this design for real-world applications.

Potential modifications include:

- Use of recycled lithium ion EV batteries.
- Integration of solar power.
- Inclusion of purpose-made / modded DC appliances.