

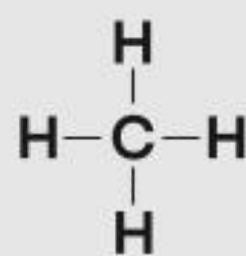


# Canary

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## Problem Statement

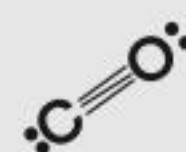
### Problem Statement:



Gas stoves release pollutants into the air which can be toxic at high concentrations. We hope to create a device to mitigate the amount of pollutants released and make using gas stoves safer (Nicole, 2014).



Fig. 1



## Justification

### Justification of Problem:

As seen through our surveys our problem affects a majority of people.

Gas stovetops in homes can leak methane and potent greenhouse gases (Zhong, 2022).

Our problem affects the majority of homes/homeowners in the United States (*STUDY: Gas Stoves Emit Greenhouse Gases, Even When Not in Use*, 2022).

### Justification of Solution:

As seen through our surveys this is a product people want in their households. Moreover one that should be common among any and all sold gas stovetops.

## Group Members



Luca Trevellin



Sebastian Soja



Dylan Neumeyer

## Final Product

### Arduino Nano



Fig. 21

### Power Supply



Fig. 22

### Signal Relay



Fig. 23



Fig. 24



Fig. 26

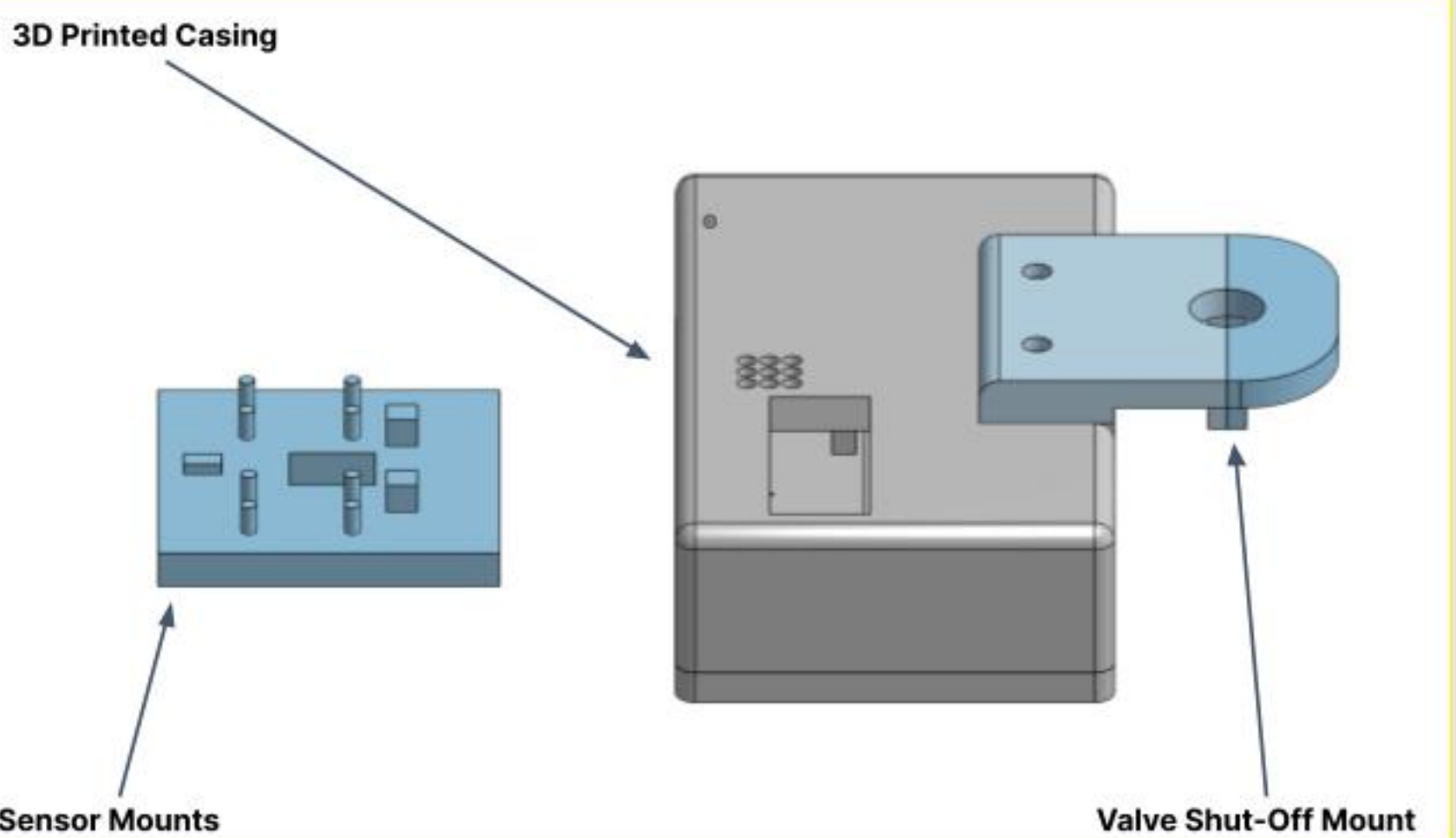


Fig. 25

## Current Solutions



### CO Detector

- Pros:**
- Easy to instal
  - Cheap
  - Alert and track amount of CO
- Cons:**
- Must be close to the ground
  - Placed far away from areas of emission

This product does not solve our problem because it only detects CO and does not prevent CO concentration in the air.



### Four Type Gas Detector

- Pros:**
- Monitors multiple gases
  - Can be portable or stationary
- Cons:**
- Only good for two years
  - Batteries need to be changed often

This product does not solve our problem because it does not prevent gas concentration in the air.



### Portable Gas Detector

- Pros:**
- Cheap
  - Compact
  - Detects natural gas
- Cons:**
- Handheld
  - Needs to be consciously turned on

This product does not solve our problem because it is not always active and it does not prevent gas concentration in the air.

## Conclusion & Next Steps

### Modifications:

Modifications we would make would be to make the device more compact and have a longer battery life for constant use.

### Next Steps:

The next steps for our group would be to patent our design and work with a gas company or stove company to assist in promotion and getting our product distributed.

### Interpreting Results:

Based on our testing results we can conclude that our device will function as intended. The safety features of the product (valve shut-off, alarm, and LEDs) all work with regard to their programming and the power supply is stable and functioning.

### Experts:

The experts who helped us along the way were Corrigan Johnson Senior Software Engineer at Chesapeake Technology International (CTI) and Vijay Dhir Professor of Aerospace and Mechanical Engineering at UCLA.

## Prototype Construction



Fig. 12



Fig. 14



Fig. 15

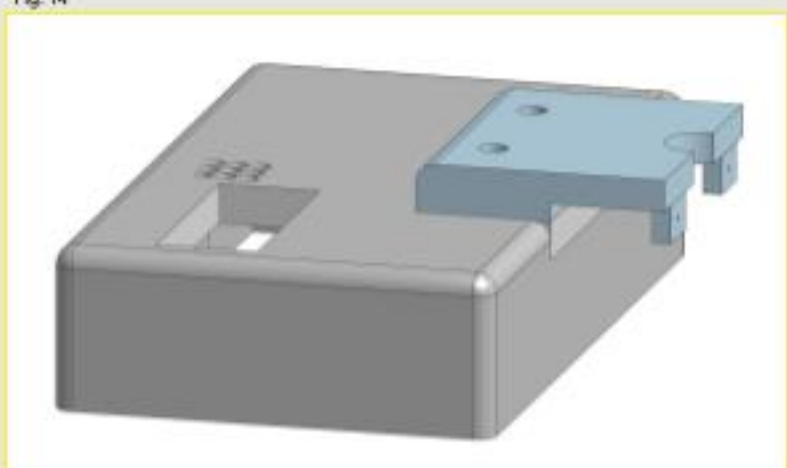


Fig. 16

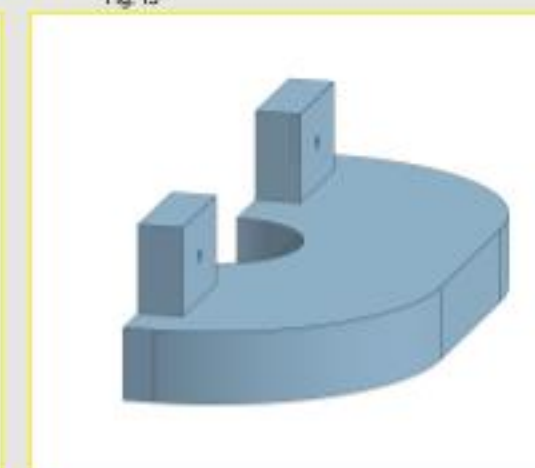


Fig. 17



Fig. 18

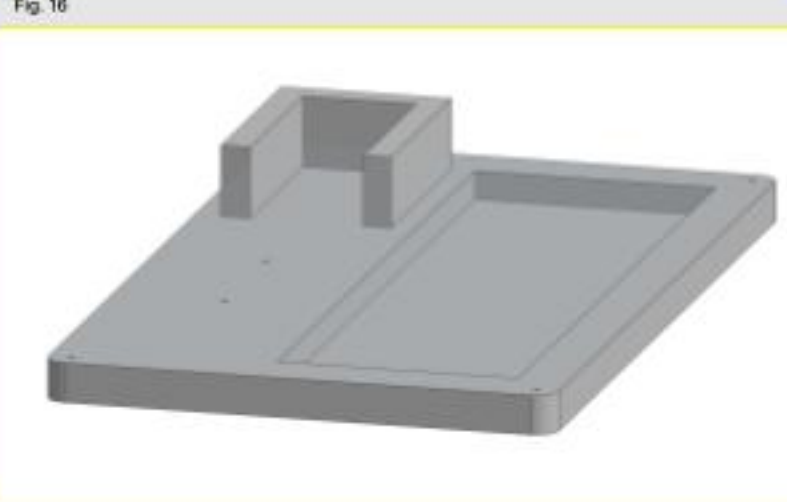


Fig. 19

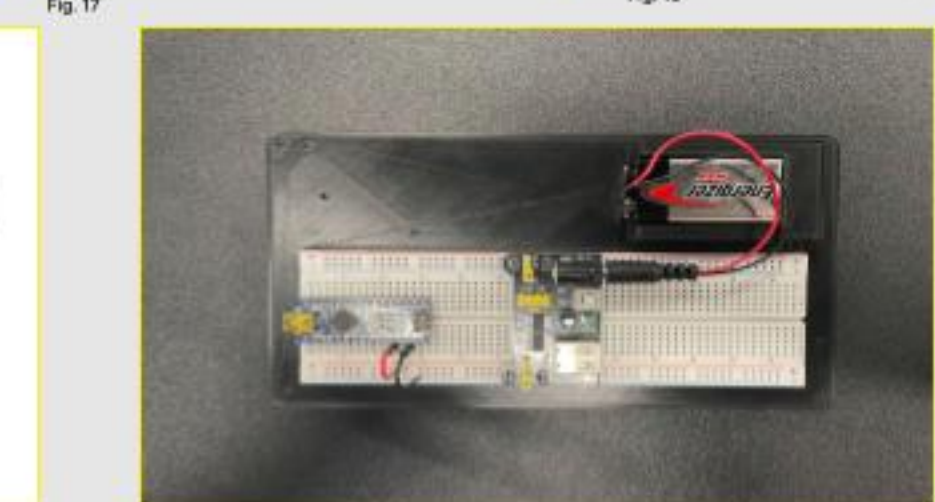


Fig. 20

## Testing & Results

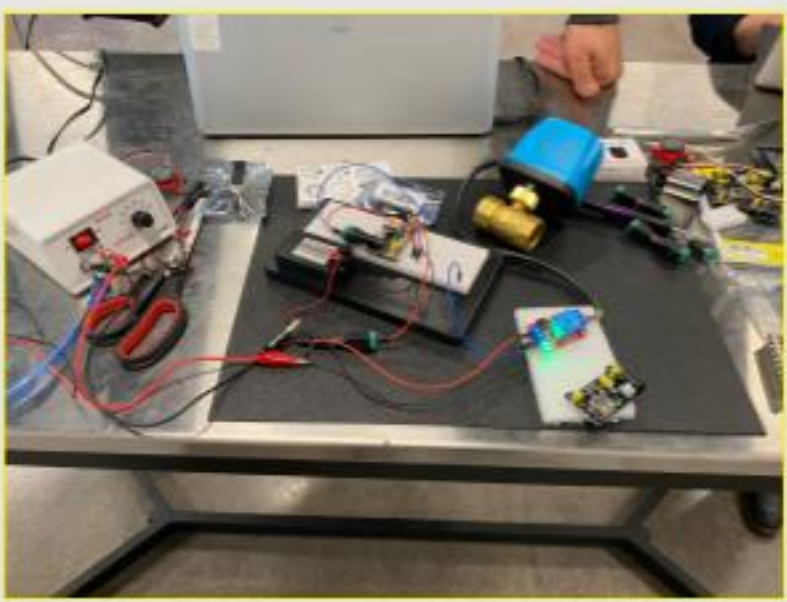


Fig. 10

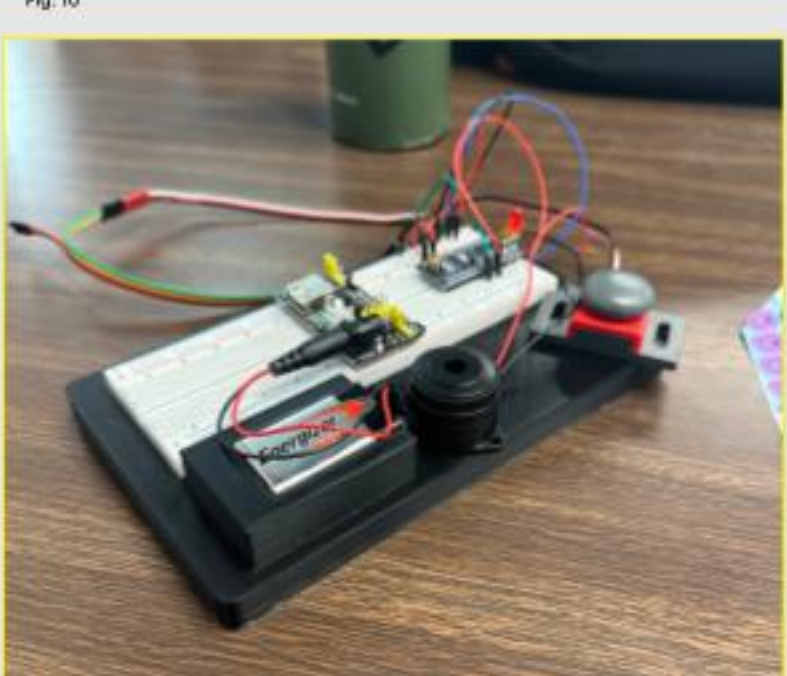


Fig. 11

Test	Pass/Fail
Power Supply 12V Wall	Fail
Power Supply 9V Battery	Pass
Code: Alarm, LEDs, Motor, Buttons	Pass