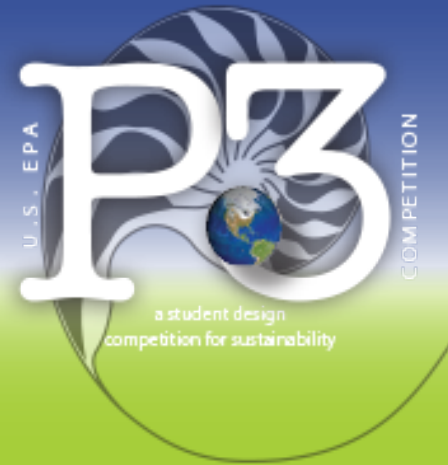


Rocket stoves & LED Solar Lights for four countries in Africa



Ken Ekegren

Grant Partners

- KONGNYALIL AFRICAN INLAND CHURCH – KENYA
- Aid Africa – UGANDA
- Kanyenyeva Ministries – MALAWI
- WODSTA (Women Development for Science and Technology) - TANZANIA



*Kanyenyeva
Ministries*

*Religion that God our Father accepts as
pure and faultless is this: to look after
orphans and widows in their distress and to
keep oneself from being polluted by the world.
James 1:27*

*Private Bag 52, Lilongwe Malawi
Cell: +265 999420058*



Phase 1 – 2016

- Build bucket type rocket stoves in Malawi using locally available materials



Phase 2 - 2019

- Demonstrate rocket stoves and solar charged LED lights including phone charging in Malawi, Kenya, Uganda & Tanzania
- Original plan was to add thermoelectric generators to stoves for phone charging.
- Power generated was intermittent and minimal.
- Adjusted deliverables by using solar power



Home Lighting System

- Solar panels and LED lighting prices keep dropping
- LED lamps with 1 watt panels provide lighting for villagers as a permanent solution.
- Eliminates need to buy and burn kerosene.
- Eliminates the respiratory ailments that affected children due to smoke and soot.



Solar
charged
LED bulbs

5000 mAH solar power banks



Augmented solar power bank



Capabilities

- LED Lamps
 - One day charge provides 4-6 hours of use
- Power Banks
 - Using LED solar panel: 2 days for full charge
 - Using built in solar panel only: 5 days
 - Power banks can charge two smart phones or multiple flip phones
- Each of the 4 partners received 50 lamps

Lower cost but difficult to ship

- Solar LED Lamps - \$4 range
- Power Bank – \$12 range
- LED Lamps with Lithium Ion batteries
 - OK to ship via USPS to Africa
- Lithium Ion Power Banks
 - No air shipments over two packs
 - Ocean forward freight only

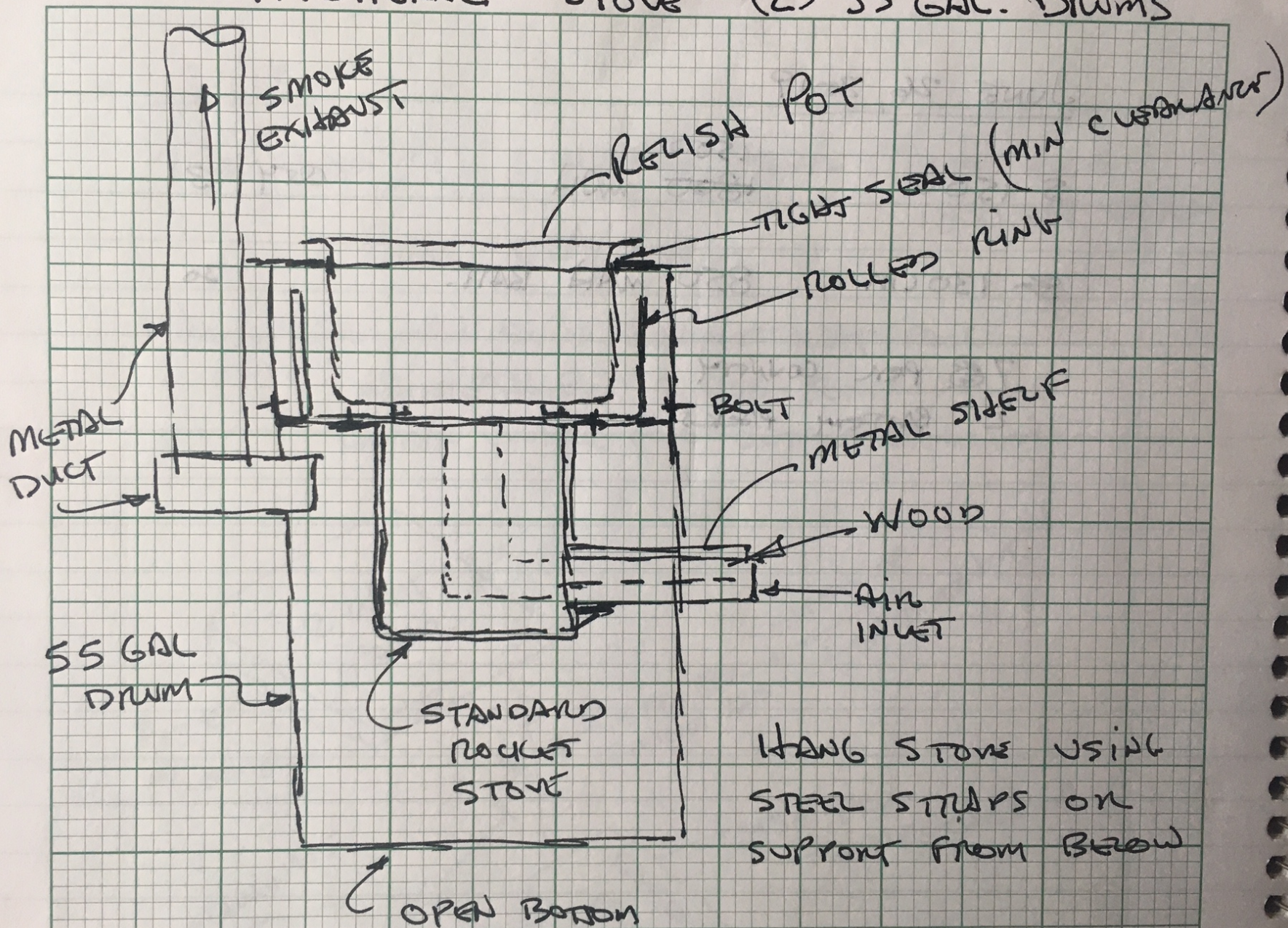
Unexpected Bonus in Uganda



Institutional Stove

- Low cost cook stove using a 55-gallon drum
- Saw a model while in Uganda
- Built a prototype next in Kenya
- Refined design and built a better one in Malawi
- 19-inch diameter cook pot: 40 liters
- Uses our standard rocket stove

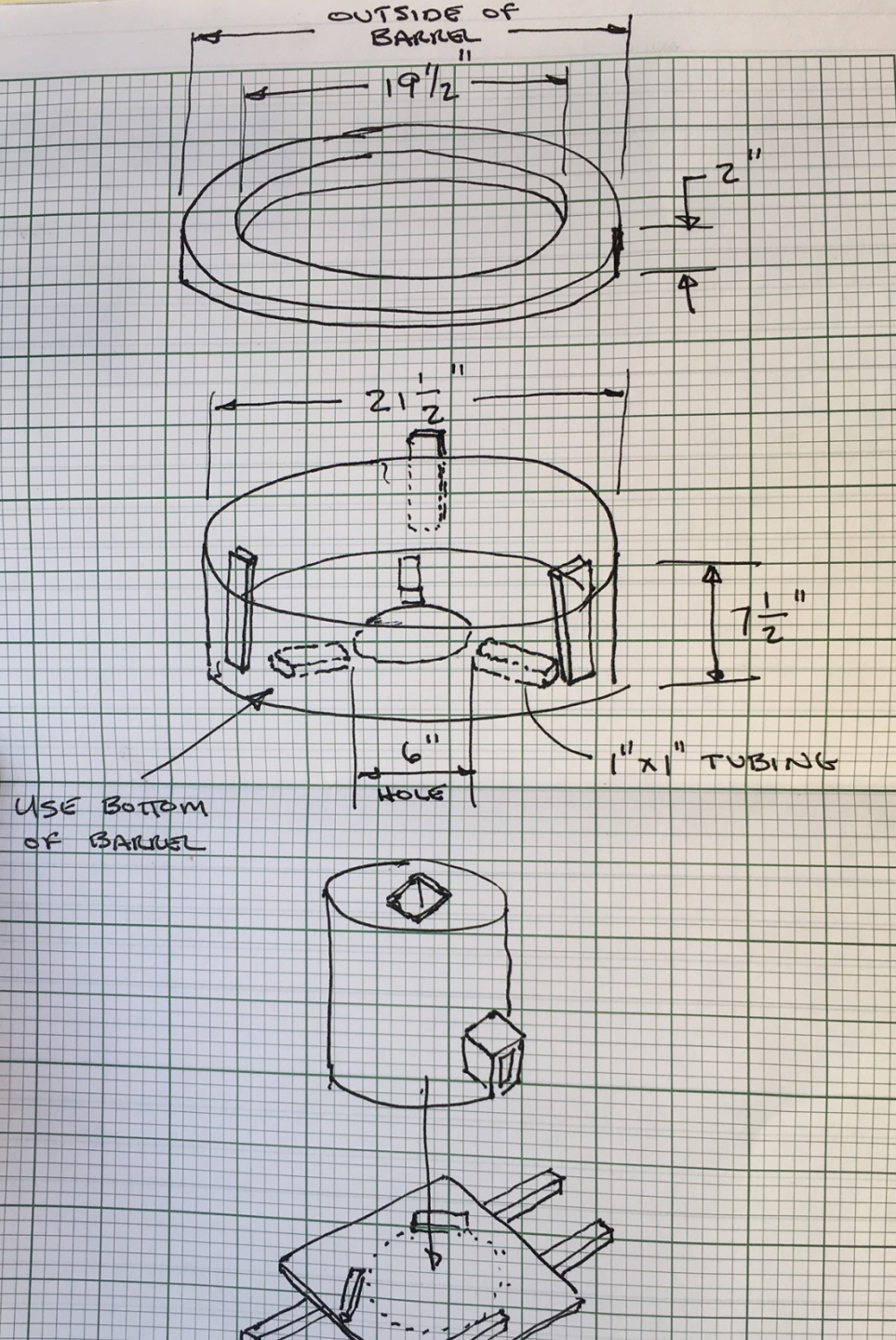
INSTITUTIONAL STOVE ~ (2) 55 GAL. DRUMS





Malawi stove

- One 55-gallon drum
- Sized for a 19-inch pot
- 40-liter capacity
- Sheet metal rings
- Standard rocket stove
- 1-inch steel tubing
- Cost < \$100









Contact information:

- Ken Ekegren
- North Central State College
 - kekegren@icloud.com
- Malawi Orphan Care Project, Inc.
 - kekegren@malawiorphanproject.org
- Cell/text: 419-512-1155