REDNECK ENERGY GENERATION

Christopher de Vidal

BE A JUNKYARD MACGYVER

- Maybe you want to help unprepared neighbors
- Maybe you're a prepper with not enough money/time
- Maybe you're prepared but want a backup plan
- Maybe an EMP took out your nice, expensive solar array
- Maybe you just want more power (Tim Toolman grunt)

ENERGY IS MORE THAN ELECTRICITY

- What is your goal?
  - Keep cool/warm?
  - Hot shower?
  - Cook food?
  - Have light?
  - Charge phone?
  - Keep food from spoiling?
  - Transportation?

How does he do that with his foot?

ENERGY IS MORE THAN ELECTRICITY

- Keeping the goal in mind helps you avoid the rut of the same old solutions, helps you get creative
  - Solar electricity to heat water?
  - No. Heat direct instead.
  - Gasoline to run refrigerator?
  - No. Preserve food other ways.
- Generate, but also conserve energy

How does he do that with his foot?

SOLAR YARD LIGHTS

- Light
  - Unscrew the top, bring inside for a candle
- Charge phone
  - Take the battery out of them to connect to a car USB charger

SOLAR YARD LIGHTS

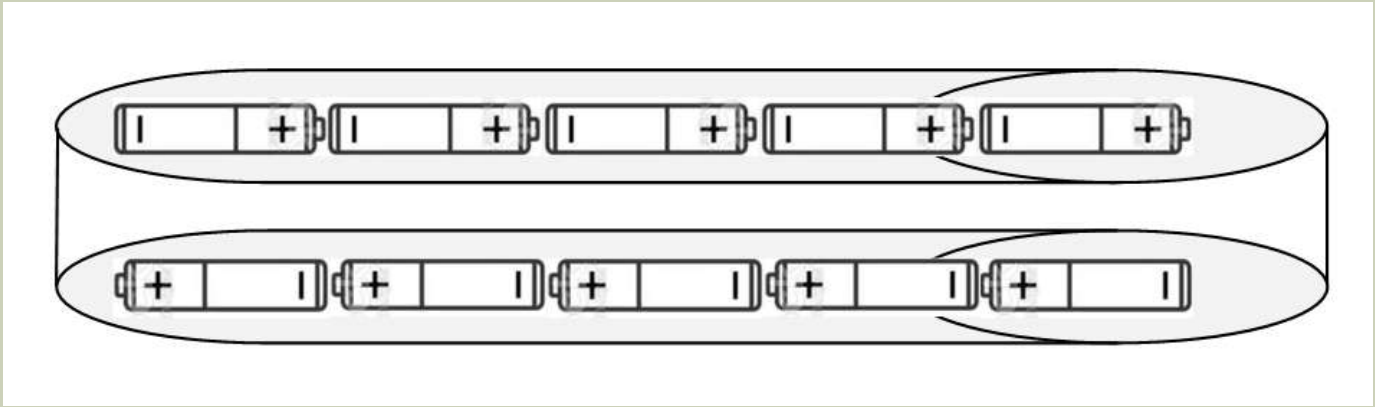
- In almost every yard in America
- Rainproof
- Not obviously prepper
  - Not likely to be stolen
  - Doesn't make you a target to be robbed
- Low power
  - 5-10% charge per day
  - Send a few texts
  - Make a quick call
  - Check email
  - Look up 2-3 websites
  - Read your phone's map
  - Read part of an eBook in airplane mode

SOLAR YARD LIGHTS

- Look for AAA inside, not 2/3 AA
  - Written inside, unscrew top, or on label
  - 2/3 AA can be used but not ideal
- Access battery using tiny screwdriver or knife tip
- Stagger charge times. Some inside being used, more outside recharging.

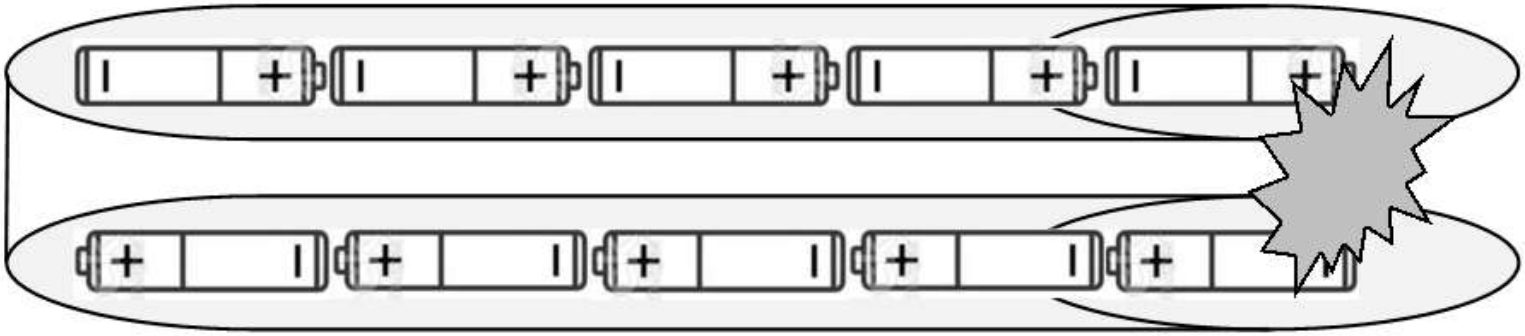
SOLAR YARD LIGHT PHONE CHARGER

- Lay down five AAAs on a sheet of paper, bump side left
- Roll the paper halfway to make a tube and tape
- Repeat on other half with 5 AAAs facing the other way
- Cut paper so batteries are about a half inch inside both ends



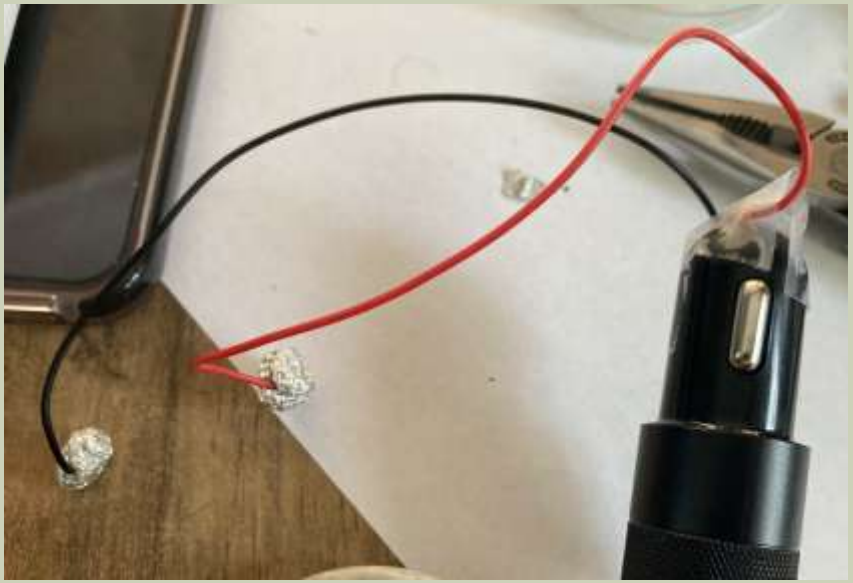
SOLAR YARD LIGHT PHONE CHARGER

- Cram foil in one end to contact both tubes of batteries



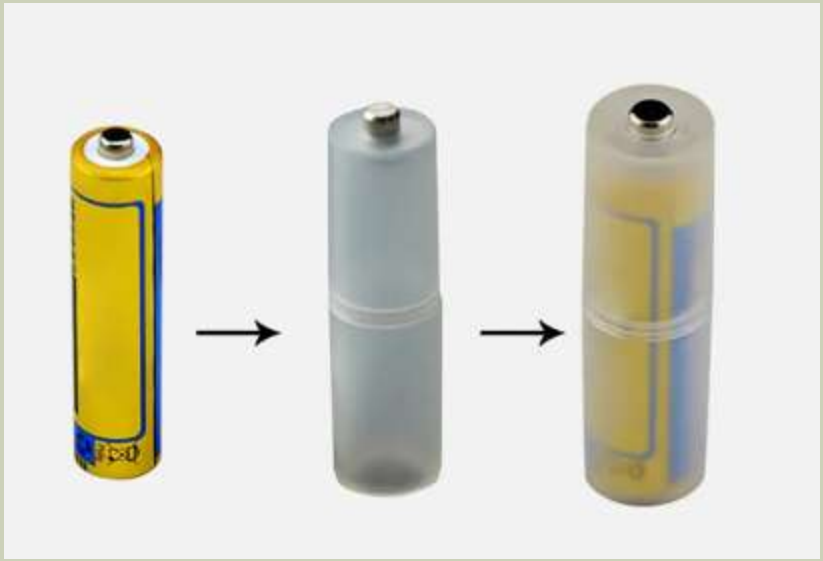
SOLAR YARD LIGHT PHONE CHARGER

- Cut two wires about 12 inches, strip ends with knife or lighter
- Bunch foil around one of the tips of each wire
- Tape one wire to charger tip (positive), one to side (negative)
- Stuff foil and wires into tubes, bump side is positive
- Fold and clamp end with rubber band to keep tight



SOLAR YARD LIGHT PHONE CHARGER

- Buy these for $4.44, no assembly required
  - Need fewer solar lights/batteries
  - But gives even lower power
- USB emergency AA charger
- Two AAA-to-AA adapters



POWER YOUR HOUSE FROM YOUR CAR

- Turn your car into a generator
- Connect inverter to your car battery
- Some cars have one built in, check the junk yard, look for standard power outlet inside the car
- Need 800W+ to power refrigerator, fans, lights, and cell phones

POWER YOUR HOUSE FROM YOUR CAR

- Extension cord to run into house, power strips to distribute to devices
- Tape down wires, trip hazard
- Fridge does not need to run 24/7
- An external refrigerator thermometer such as this can watch temps without letting out cold
- Cover fridge with blankets
- If possible, use a steering wheel lock or don't run unattended

POWER YOUR HOUSE FROM YOUR CAR

- $35.99 on Amazon
  - Ensure it is a 110V 60Hz 12V inverter, double-check stats and confirm it has US or universal power outlets
  - No more than 1000W (2000W peak) recommended to not overload alternator
  - Modified sine is okay for short-term emergencies
  - Pure sine is not much more expensive
- Listen to this and this podcast for many small details and tips

SOLAR OVEN

- Need foil (such as the inside of a potato chip bag)
- Picture frame
- Two boxes
- Newspapers
- Tape
- Glue
- Print these instructions
- More ideas here, here, and here
- Clear plastic bags can be used instead of glass, put pot inside bag

HAYBOX

- Conserve precious cooking fuel
- Start a pot cooking then put in haybox to finish the job
- Can be made from hay or pretty much any insulation. Blankets, fiberglass insulation, newspapers…
- Read more here and here

ROCKET STOVE

- More efficient burn
- Just need small twigs
- Or anything flammable
- Can be made from scrap
- Read this for making one from tin cans

ROCKET STOVE

- Common mistake: Chimney made of rock/concrete/sand/etc.
  - Heat goes into chimney, less into food
  - Insulation inside chimney
  - Several materials to choose from
- Common mistake: Short chimney
  - Total height at least 3x larger than burn chamber
- Common mistake: No grate under unburnt wood
  - Need airflow along all sides
- Read and understand these principles
- More designs here and here

SOLAR SHOWER

- Need a soda bottle, black trash bag, rope, and pulley
- Cut bottle in half
- Push bottle neck through bag
- Drill holes in cap near the top
- Watch this video but tripod is not necessary. Hang from tree.
- Shower in the evening when water is hot, go to bed fresh and cool
- Also warm water from stove

COMPOST WATER HEATER

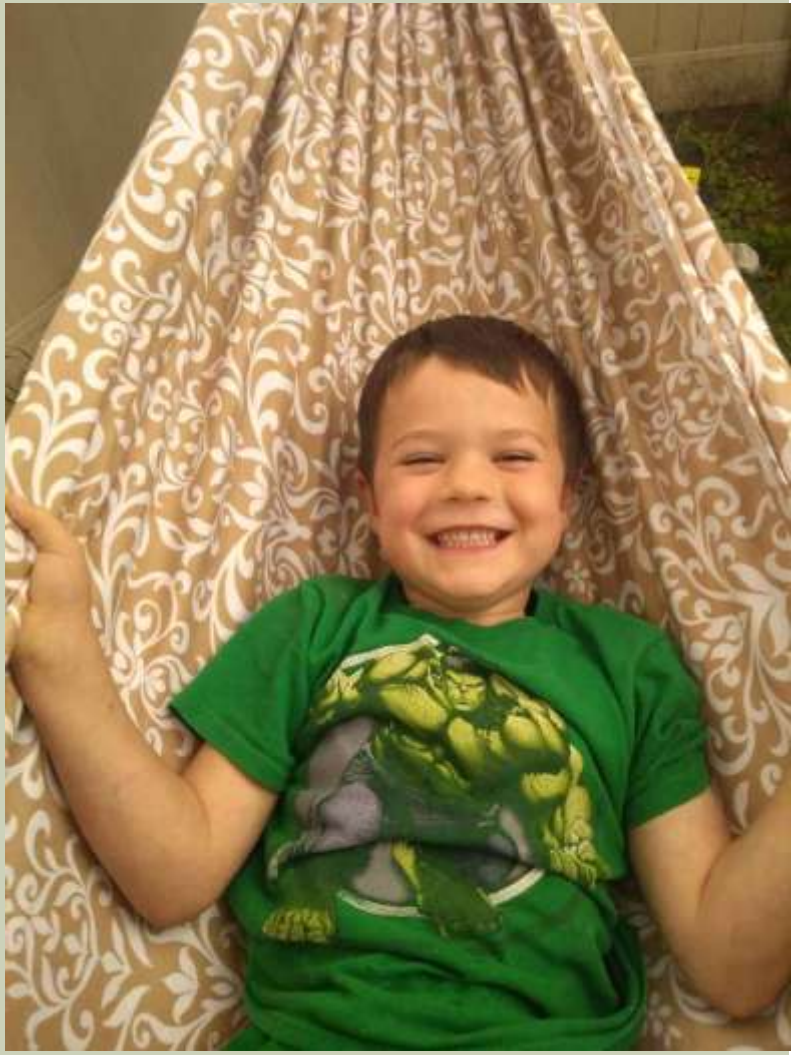
- Build a compost pile for the garden, get free heat
- Compost digests (ideally) between 130-160F
- Use mixing valve to avoid scalding
- Read this for more

COOL THE PERSON, NOT THE ROOM

- Freeze water in soda/water bottles, wrap in towel, keep next to skin
- Personal fans
- Spray water bottles
- Frequent showers
- Build a sleeping porch from scrap lumber and screen
  - If you use cots or hammocks, can put them away to allow daytime use of the porch

COOL THE PERSON, NOT THE ROOM

- Hang out in a basement
  - Floridians can dig a root cellar
- Sleep outside in a camping tent
  - Tarp high over for rain
  - Lots of breeze
- Go swimming
- Make hammocks from sheets
  - Great with a sleeping porch!
- Wet sheets in front of doors and windows



WARM THE PERSON, NOT THE ROOM

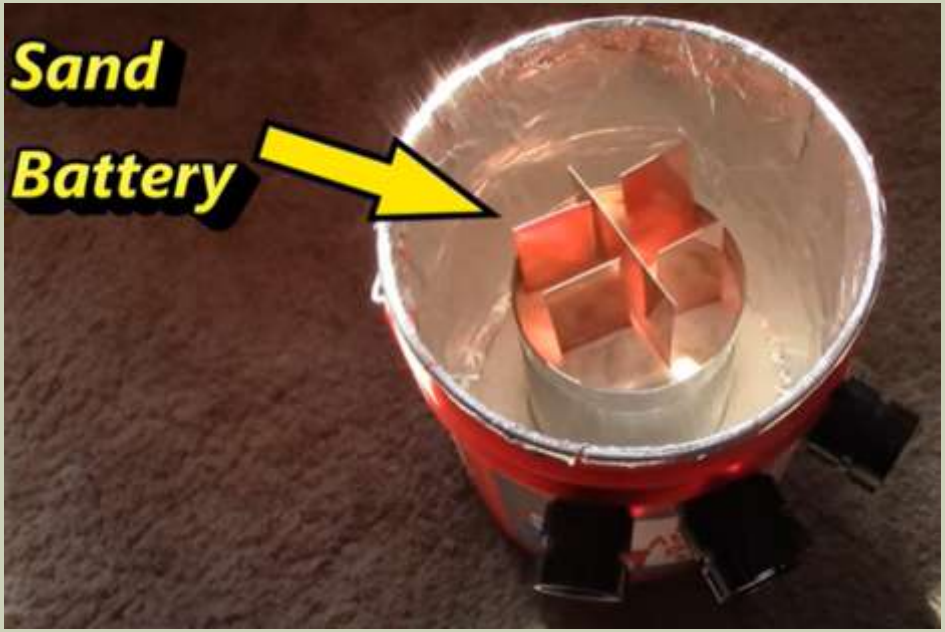
- Sleep in a tent indoors
- Or make a tent from tarps
- Other survival uses for indoor tents
- Sleep inside zipped-up sleeping bags
- Or make bags from blankets
- Sleep with winter hats on
- Sleep in pajamas
- Electric blankets inside bags
- Hot water bottles inside bags

SOLAR ROOM HEATER

- This design uses soda cans painted black
- Requires Plexiglas which may not be available, so use what you can find. Sheets of glass or clear plastic tarps would work, even if less effective.
- He puts a hole in the wall, but you could place against a slightly-opened window and heat would rise up inside.
- Instructions
- More ideas here

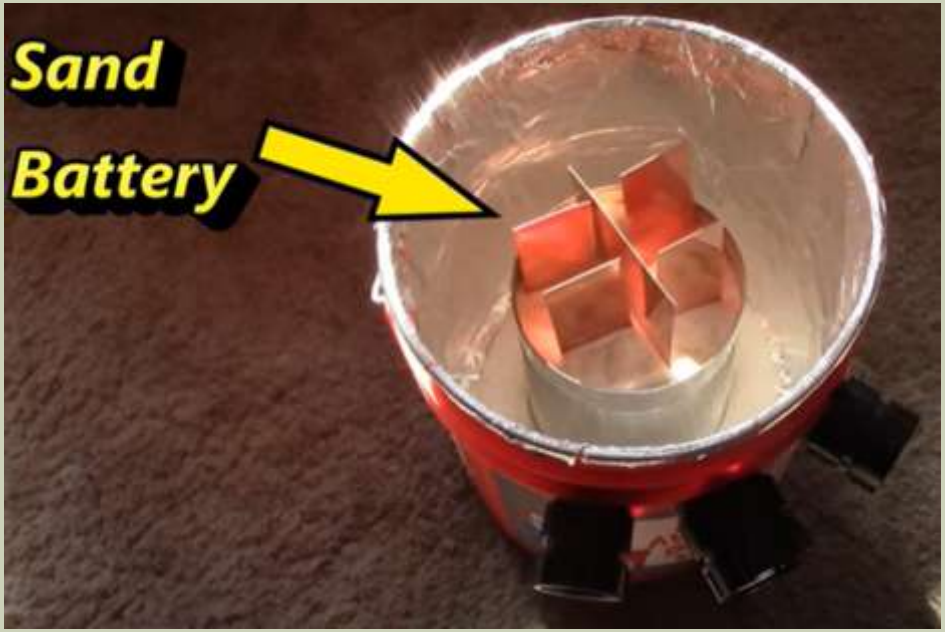
SAND HEAT BATTERY

- Store heat to use later
- Solar or fuel heat
- Capture sunlight, stay warm at night
- Make hot water
- Holds up to 500F
- Releases slowly over time



SAND HEAT BATTERY

- Watch this, this, and this
- Alternatives to copper sheet: Aluminum, steel, iron, any conductive metal, though less effective

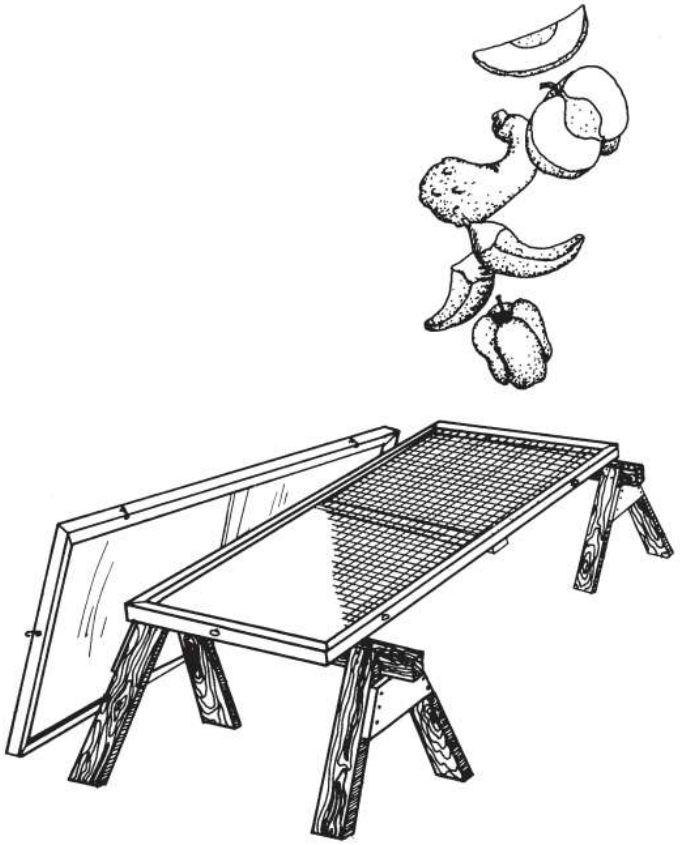


ROCKET MASS HEATER

- Heat your house using a few small sticks
- Like a rocket stove, but you do want to use heavy materials for the chimney
- Make from mud, rock, concrete, etc.
- Read this and watch this
- Can be combined with a rocket cook stove

SOLAR FOOD DRYER

- No refrigerator?
- Dry it, you'll like it ☺
- Help unprepared neighbors preserve food
- Numerous drying recipes online
- Many solar dryer designs here and here



ROOT CELLAR

- Earth is cooler and acts like a weak refrigerator
- Can also use for fallout, tornadoes, or just escaping hot days
- This design uses mostly sand bags

GENERATOR FROM LAWNMOWER

- Connect an alternator to a lawnmower engine with a belt
- Generates 12V DC, add an inverter to get 110V AC power
- Watch this and this

RECONDITION DEAD BATTERIES

- Lead batteries can be reconditioned using distilled water, baking soda, and Epsom salt, or a stick welder
- Make distilled water on a stove, ice cubes not required
- No battery charger? Use an alternator from a running engine.
- Sometimes Epsom works, sometimes it doesn't
- Watch the above, this, and this
- Read this and this
- Shorter life, reduced capacity

ALCOHOL FOR ENGINES

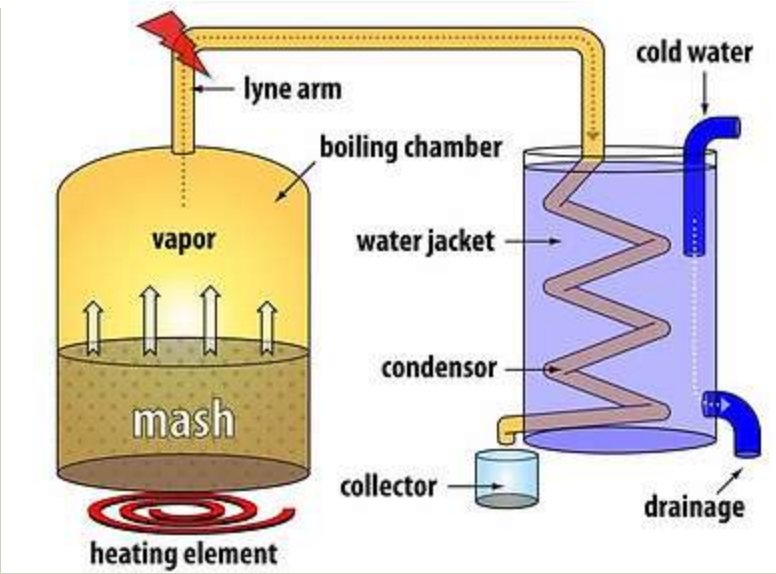
- Moonshine—yes, also for drinking ☺
- 100% legal with a free permit
- Make using junk yard parts
- From corn, sugar, fruit, most anything with calories

Alcohol still made from copper tubing

ALCOHOL FOR ENGINES

Principle of operation

- Make sugary water (mash)
- Put in yeast (can be gathered from air)
- Let ferment for a week
- Heat mash
- Capture and cool vapors
- Cool
- Repeat heat/capture/cool until fully refined

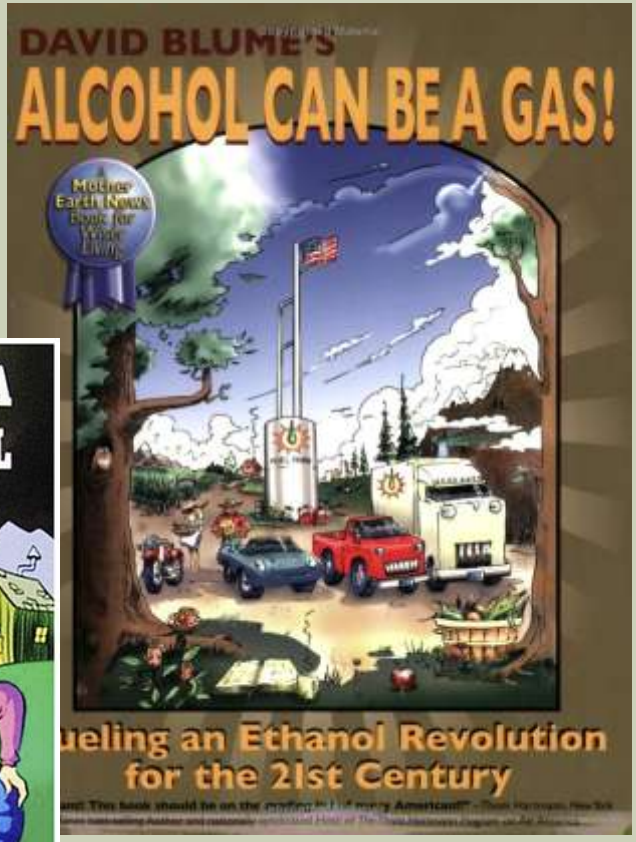


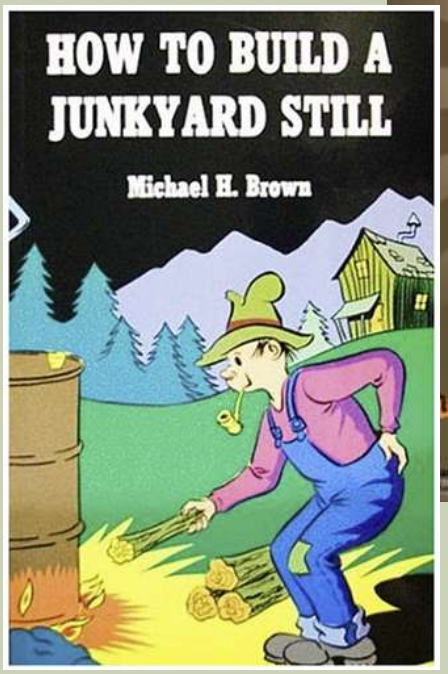
ALCOHOL FOR ENGINES

- Requires engine modifications
  - Unless FlexFuel
- Not a money saver
  - Costs much more than gasoline if you buy inputs, not counting labor

ALCOHOL FOR ENGINES

- Read this and this
- Excellent book: Alcohol Can Be a Gas
- Also: How to Build a Junkyard Still



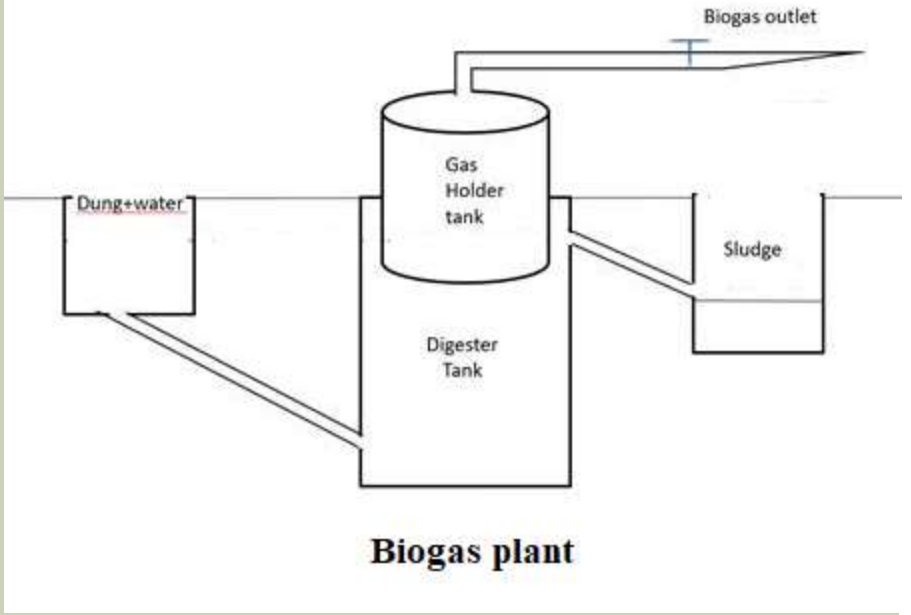


BIODIESEL

- Turn waste cooking oil into fuel for any diesel engine
- Not a great idea today, too much competition for used oil
- But maybe you'll come across used oil in the apocalypse
- Watch this
- Read more here

BIOGAS

- "Bartertown" in Mad Max III
- Poop to biogas and fertilizer
  - Mostly methane
- Use biogas to heat, cook, or run a generator
  - Use a tri-fuel generator
  - Or a conversion kit
  - Or bypass the carburetor



Two turds enter, stove fuel leaves

BIOGAS

- Make one from three barrels
- Read this, watch this, and watch this
- How to modify a propane stove to burn biogas

WOOD GAS

Pros

- Run your car or generator on wood
- Very well-tested. Used often during WWII.
- Fuel everywhere
- Build from junk yard parts
- Great for generators when heat can also be used
- Byproduct is almost pure carbon, good for biochar

WOOD GAS

Cons

- Toxic carbon monoxide fuel
- Explosion risk
- Bulky
- Slow startup/cool down time
- Labor of chopping trees
- 50% less performance
- If gas is not cooled, can melt plastic intake manifolds
- If gas is not cleaned tar can seize engine
- Wood has to be dried first

Ferrari ain't gonna make one any time soon

WOOD GAS

Principle of operation

- Smoke has 2/3rd of wood's energy, mostly flammable carbon monoxide
- Capture smoke
- Filter out contaminants
- (Optional) cool gas
- Use blower to force gas into engine

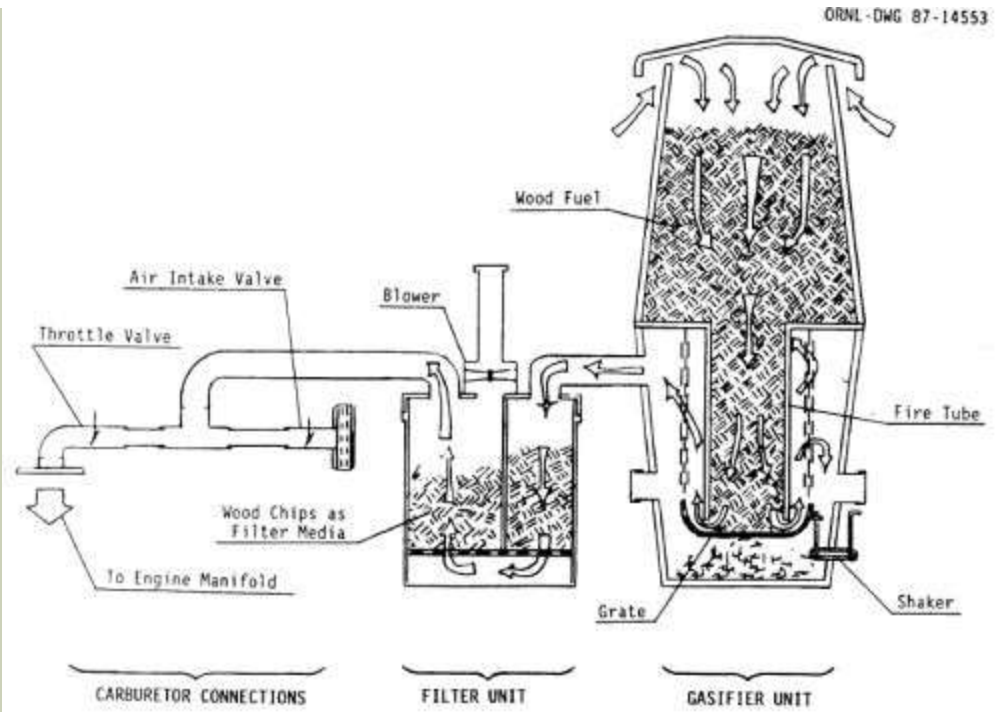
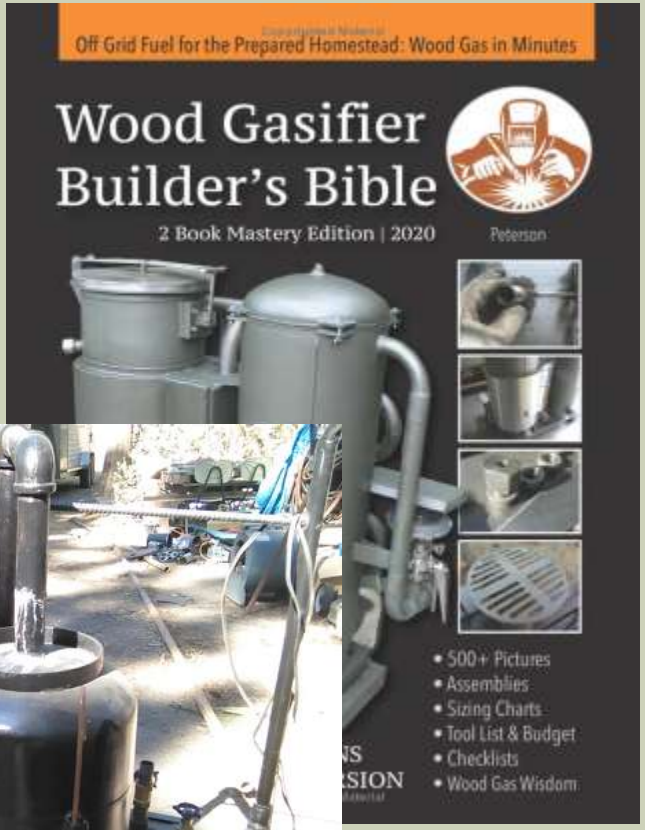


Fig. S-1. Schematic view of the stratified, downdraft gasifier.

WOOD GAS

- **Use the buddy system when working with it**
  - **Learn and watch for carbon monoxide poisoning symptoms**
- Make one from old propane jugs and barrels
- Or build this one without welding (companion article)
- Read more here and here
- Wood Gasifier Builder's Bible is *the* go-to book



CONVERT PLASTIC TO FUEL

- Plastic or anything containing carbon. Plants, poop, anything.
- Like “Mister Fusion” from Back to the Future
- This guy lives on an island and runs his generator from what washes up on the beach

Great Scott!

CONVERT PLASTIC TO FUEL

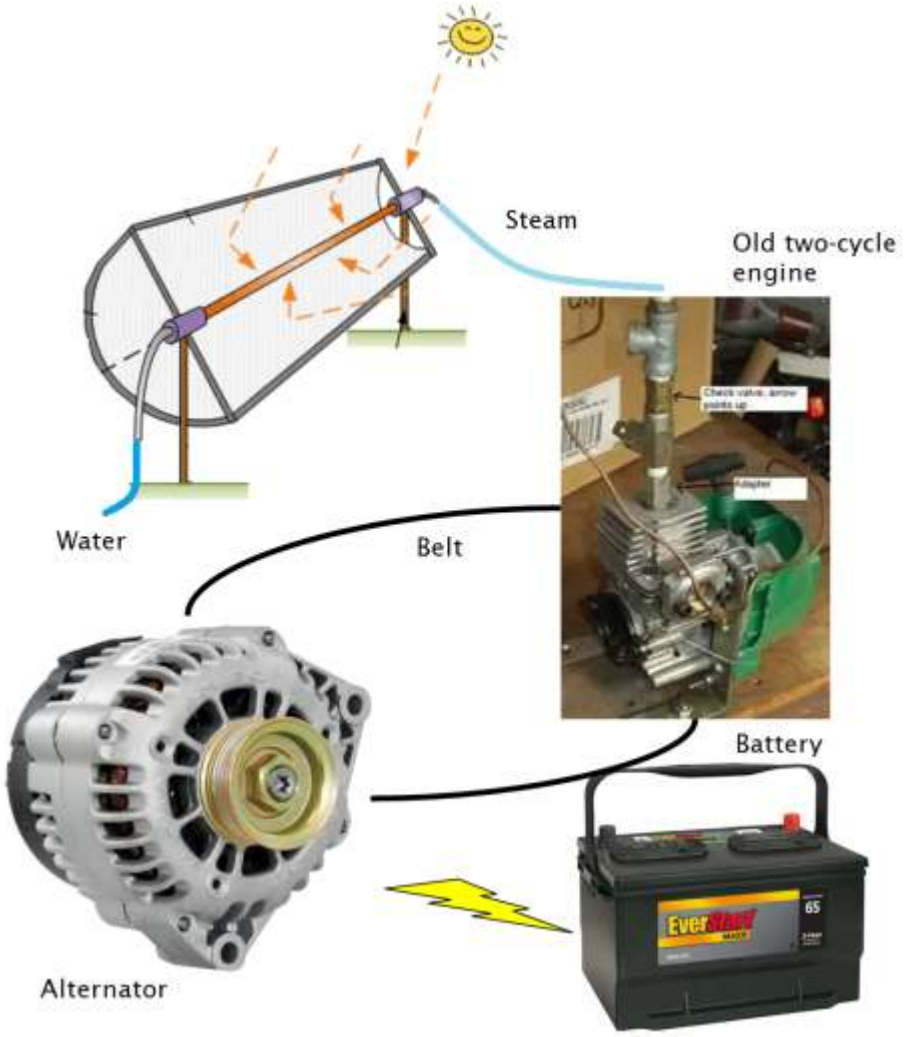
- Similar to how oil is converted to diesel and gas
- Plastic into a sealed metal container
- Heat container to 750F+
- Pressure and heat without oxygen causes pyrolysis
- Capture the escaping vapors
- Cool down vapors, condenses to liquid
- Capture in stages to create gasoline, diesel, and kerosene
- Use the excess heat for other purposes

CONVERT PLASTIC TO FUEL

- Contaminants
  - Only run in engines you can disassemble and clean
- Pollutants such as heavy metals
  - Consider why you're surviving, and the world you want your grandkids to grow up in
- Uses more energy than is obtained
- Byproduct is nasty sludge
- Not a lot of resources teaching DIY
- Watch this, this, and this

SOLAR POWER WITHOUT PANELS

- Experimental
- Make from old weed eater, foil, space blankets or mirrors, tubing, a brass screw, and plumbing fittings
- Use solar or rocket stove to heat water and make steam
- Spin modified two-cycle gas engine
- Engine turns belt
- Belt spins an alternator
- Alternator charges battery



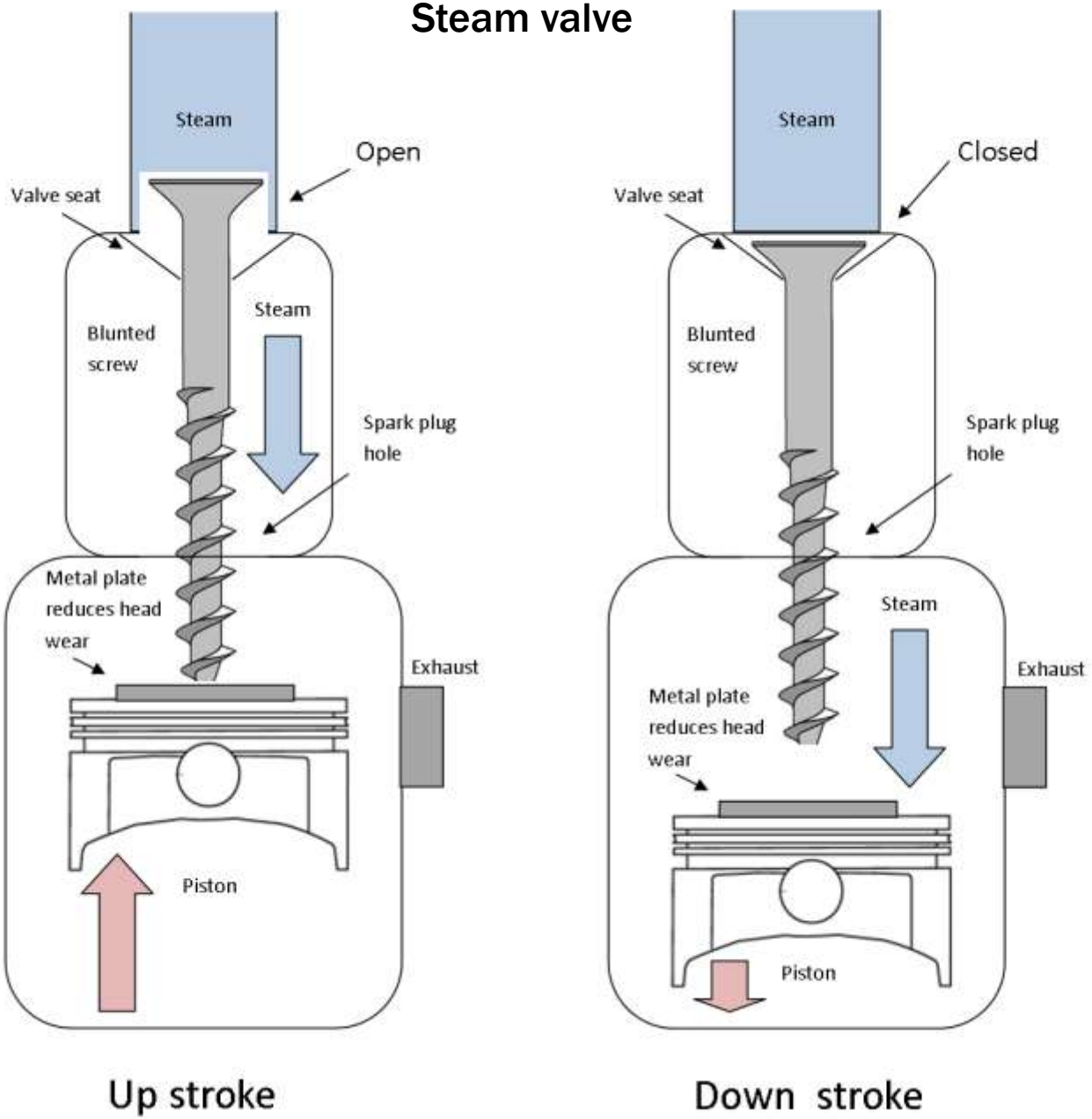
SOLAR POWER WITHOUT PANELS

- **Explosion hazard**
  - **Surround generator with concrete blocks, bricks, sandbags, or piles of dirt**
- This gentleman has done it, but with hard-to-obtain materials such as the mirrored sheet and a purpose-built steam engine

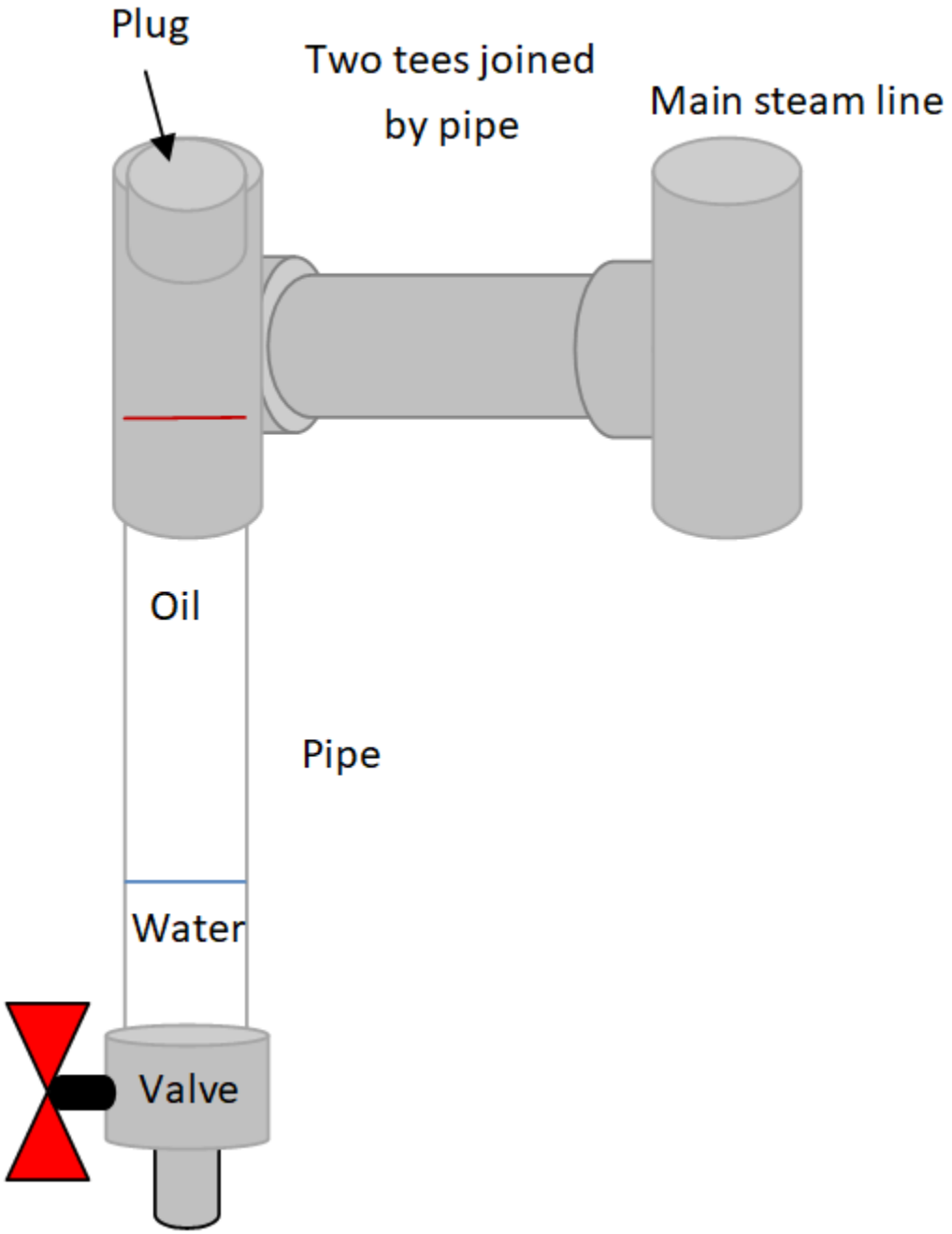
SOLAR POWER WITHOUT PANELS

- Use Mylar space blankets, foil, or mirrors
- Or make a tube magnifier
- Or use a rocket stove
  - Coiled copper tube wrapped around stove chimney heats water
- Convert a broken two-cycle engine to run on steam
  - Even dead two-cycle engines should work, as long as the rings are intact
- Needs lubrication
- Read this forum thread

Steam valve


Steam
Open
Valve seat
Steam
Blunted screw
Spark plug hole
Metal plate reduces head wear
Exhaust
Piston
Up stroke
Steam
Closed
Valve seat
Blunted screw
Spark plug hole
Steam
Exhaust
Metal plate reduces head wear
Piston
Down stroke

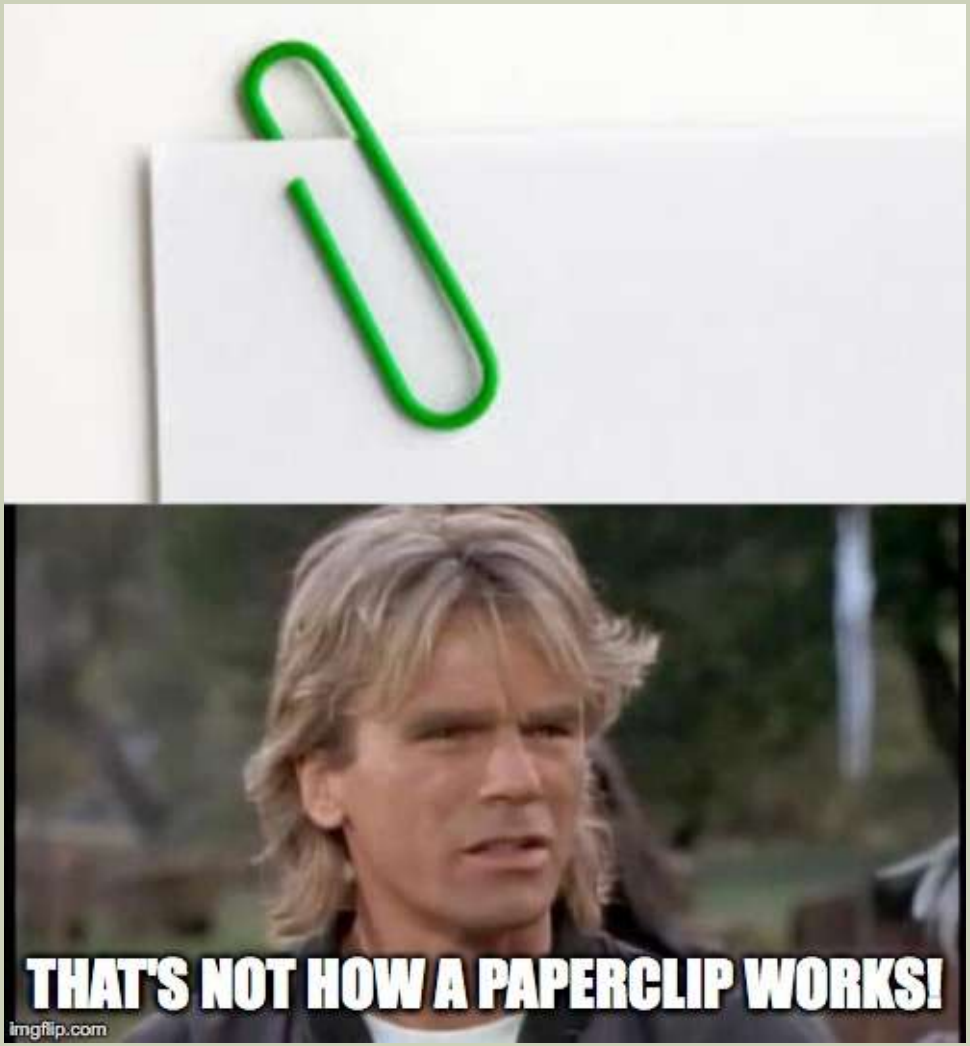
As steam enters the left tee it condenses and becomes water, causing oil to overflow and drip into the main steam line. Every so often, drain the water with the bottom valve. Refill by removing the top plug.



WHAT SHOULD I DO TODAY?

- Download this presentation
- Buy one (or more!) AA emergency chargers and AAA-to-AA adapters, $4.44 each
- Buy one (or more!) $36 inverters
- Download and print articles and ebooks. More resources on the next slide.
- Bookmark the videos
- Watch one video
- Make a paper tube phone charger

RESOURCES



- Paul Wheaton
  - Permies.com
  - RichSoil.com
- Journey to Forever
- Build it Solar
- GREENPOWERSCIENCE
- Robert Murray-Smith
- WayPoint Survival
- Steven Harris' talks here, here, and here
- SolarCooking.org (more than just solar cooking)
- CD3WD (LOTS of cool stuff)