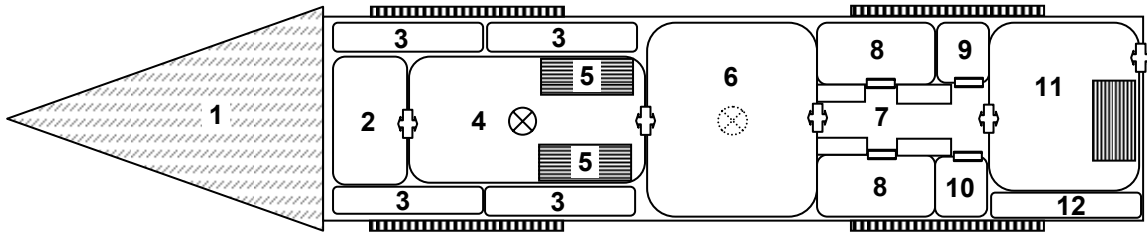


Doctor Harkness' Amazing Drilling Machine!



Inside the Drilling Machine

- 1) **Drill Head** – An impressive array comprised of rows of nasty metal teeth made from some alloy unfamiliar to the group (a very, very tough hardened nickel-steel – 5+ Successes on Engineering or similar check to identify). A unique high-voltage arc system in the nose creates a pulsating high-intensity plasma that acts as an energy-based jackhammer, cracking the rock so that the drill teeth can grind it up and carry it away. It's hot, noisy, and power-hungry – but it works quite well. There is an inspection panel under the main control board in the cockpit that allows very cramped access to the internal workings of the head for maintenance and repair.
- 2) **Cockpit** – Control station for the drilling machine. There are solid, uncomfortable chairs (w/ seat belts!) for two operators with a large and imposing control panel across the front. Two cabinets to either side display an imposing array of gages, neon bulbs, and secondary switches; a pair of levers at the primary operator's station control direction much like a tank or bulldozer (driving the tracks forward or reverse as needed). A large (and blatantly obvious) red lever in the center of the panel engages the drive system; at that point, the drill head will begin to spin and the machine will start rumbling forward. Unfortunately, all the controls, gages, etc. are labeled in Harkness's incomprehensible cipher, and will take some time to decode if neither he nor his faithful assistant Li Feng are available (a total of 30 cumulative successes on Decipher checks, roll once per day; synergy dice allowed for mechanical, electrical, or pilot skills).

There are no windows in the cockpit – a periscope provides a limited view forward (90° arc) to the primary operator (-2 Perception forward; -4 Perception in other directions). The periscope retracts automatically when the drill head starts, which can be dangerous to an unsuspecting operator (2N damage). The cockpit is very noisy and not air-conditioned, and in operation temperatures over 130 °F are common after fifteen minutes or so with the drill head running. Idiots trying to run on manual will have to resist the heat w/ Body checks – initial Difficulty 2, +1 per 15 minutes in the cab, [Difficulty]N damage if failed (check manual). To deal with that, Dr. Harkness developed an autopilot system that will hold the drilling machine on course indefinitely; that system is active, and will engage automatically when the drive system is turned on. The autopilot and drive will disengage automatically if the drill head encounters low resistance; otherwise, it can only be disengaged with two keys (held only by Harkness and his assistant).

- 3) **Pressurized Gas Tanks** – These pressurized bottles hold the hydrogen and oxygen supplies for the drilling machine's fuel cell; each cabinet contains a number of individual bottles, all connected to a central manifold. Dr. Harkness's calculations show that when all bottles are full there is enough to run the drilling machine at full power for 300 hrs; however, the rate of travel during that time might vary greatly depending on the composition of the surrounding rock. Of the total power load the drill head consumes 80% and the drive mechanism another 15%, so 1 hr of full operation = 20 hrs of power for just the environmental controls. Note that the bottles cannot be refilled in place with

- the portable "hydrogen distiller" (see **11**), but have to be manhandled to a port at the rear of the rig (Strength check, 3 Successes – two people can help). Changing from an empty to full bottle is a quick but manual task, requiring opening and closing valves in the Engine Room; a bell (like the one used at a boxing match) alerts the operators in the Engine Room a few minutes before the current tank bleeds dry. Physical access to the cabinets can only be accomplished from outside the drilling machine; these hatches are normally locked, opened only by another of Harkness's keys.
- 4) **Engine Room** – This compartment holds the power generation equipment that runs the drilling machine, plus the handling systems (pipes, valves, etc.) required for the reaction gases and byproducts (water vapor) for the fuel cell and the air conditioning system. This compartment runs a little cooler than the cockpit and is usually substantially quieter, although the air can get a bit foul from time to time. Two imposing racks of lead-acid batteries in the floor (accessed via the floor hatch shown) provide start-up power and load balancing; they require continued monitoring of water and acid levels for best efficiency (daily check, Difficulty 2 Craft/Electrical). A second hatch in the floor of the battery bay allows egress to the outside under the drilling machine for maintenance of the drive systems; typically there's just enough room to lie down, not enough to crawl on hands and knees. A cabinet on one wall holds a nice selection of tools for "adjustments" and repairs during operation.
 - 5) **Fuel Cells** – There are two of these squat, ugly monsters. The 'stacks' are wide open, with lots of projections and tubes and things that get hot (thermally and electrically). Someone making accidental contact with one could get badly shocked or burned; the cells could also be easily damaged by bullets, hard blows, etc. People with Clumsy or Primitive flaws should avoid these areas! Typical damage from an accident here would be 1L – 4L; the Difficulty to repair the damage to the fuel cell should be 2X the damage to the person(s) involved. The drilling machine could be run on one fuel cell, but only in short bursts; the plasma 'hammer' draws a lot of juice from the batteries, which would need frequent stops to recharge. Sustained use in this manner is likely to fail both the batteries and the second fuel cell...
 - 6) **Common Room** – This compartment is the main living area for the crew of the drilling machine. The air here is conditioned to a tolerable temperature, although it still gets a little warm when the drill head is running (80 °F); the room is relatively quiet, allowing conversation in normal voices. There are several reasonably comfortable chairs (and a wooden bench) for relaxing or reading; a small kitchenette and small fold-down table for meals; and a desk for writing, drawing, drafting, etc. A small Victrola and a collection of 78 rpm classical recordings provide the meager entertainment; a bookcase holds mostly texts on the sciences, especially biology and natural history (which Dr. Harkness considers himself somewhat weak in). A folding ladder in the ceiling allows egress through a roof hatch to the top of the machine. Two large window panels can be opened (one on either side) when the unit is parked, allowing fresh air to circulate freely; the heavy panels must be locked back in place before the drill head will engage.

One drawer of the desk is locked (again, Harkness and Li Feng have keys – 2 Successes on a Lockpicking check to open otherwise); inside is a maintenance log, partial blueprints and schematics, and some of Dr. Harkness's notes on his initial operating trials with the drilling machine. Reading these will give a small (+1 die) bonus to the character's chance to run or repair the rig... An unlocked drawer holds a supply of paper, pens, ink, etc.

- 7) **Corridor** – This provides access to the bunk rooms and the rear of the drilling machine. There are also four storage cabinets – two hold foodstuffs (enough for six people for a month, if not abused), one holds weapons (4 rifles, two shotguns, a monster .600 Nitro Express elephant gun, 4 revolvers, six knives, six machetes, and a bunch of ammo and other accessories), and the last holds other useful expeditionary supplies, including a fully stocked medical kit. These cabinets are all locked (1 Success on a Lockpicking check

- to open); again, Harkness and Li Feng have the keys. There is also a case of 5-yr-old single-malt Scotch in one of the food lockers – Dr. Harkness was rather fond of it from time to time...
- 8) **Bunk Rooms (2)** – Each of these very cramped rooms has two fixed bunks at floor level and two folding bunks above, allowing four people to sleep (uncomfortably) in each room. There is a little room for each person for toiletries and other personal items; one room has a pair of shaving kits tossed in on one of the bunks (gifts from family that Dr. Harkness never got around to using for himself). The bunks have mattresses, but are lacking blankets, sheets, and pillows – Li Feng hadn't gotten that far in stocking the machine....
 - 9) **Bathroom** – There is one bathroom on the drilling machine, and this is it. The fixtures are neat and clean and there is plenty of water (and a good supply of toilet paper under the sink), but the plumbing is a bit unreliable and prone to stoppages, burps, etc. Unfortunately neither Dr. Harkness nor Li Feng have realized this yet...
 - 10) **Shower** – There is one shower on the drilling machine, and this is it. Like the bathroom, the fixtures are neat and clean and there's plenty of hot water; unlike the bathroom, the plumbing works fine. The only problem? Li Feng remembered the soap, but hasn't yet stocked the room with towels...
 - 11) **Auxiliary Compartment**- This area contains a number of useful secondary systems and stowed equipment for the drilling machine – water and air purifiers (the latter requires daily maintenance – Difficulty 2, Craft/Mechanic), a small drill motor and other metalworking tools, a grinder (for grinding coffee or other beans), a bicycle-driven motor-generator set (requiring some assembly), three large tents, a pair of fair-sized two-man hand pumps, a small acetylene torch set, and other odds and ends.

It also contains the "hydrogen distiller" and oxygen purifier – the unit the doctor planned to use to replenish the drilling machine's fuel supply in the Hollow Earth. The distiller uses a small furnace (burning coal, wood, or oil) to extract hydrogen and oxygen from steam using a variation of Professor Lowe's "water gas" process. It requires fuel for the boiler, water for steam, and coal (as the catalyst for the chemical reactions involved) to operate, and produces copious amounts of carbon dioxide as a by-product. Efficiencies for this small reformer unit aren't great – it will take at least five hours of distiller operation to produce enough hydrogen gas for an hour of drilling machine operation at full output. Careful attention from someone with high Craft or Science skills (4+ Successes) could improve the output; no attention (i.e., no Successes) will result in rapid degradation of the various elements. The distiller can only be operated outside the drilling machine, but can use either power from the machine's batteries or the bicycle generator set for power of its systems.