[Bonus] AFD Ep 387 Links and Notes - Steam Donkey [Bill/Rachel]

This is our last bonus episode for the foreseeable future, due to scheduling challenges. We've already talked to patrons and we will be shifting to a $3/month tier meant to help support the show, but it no longer made sense to isolate some of our really great content by making it exclusive. We'll be returning to a once a week main-feed-only schedule like we used to do, with episodes generally being released on Sunday or Monday each week.

Some source links:
https://en.wikipedia.org/wiki/Steam_donkey
https://www.oregonencyclopedia.org/articles/donkey_engine/#.YOTg6DZKib8
http://www.clarkemuseum.org/qr-steam-donkey.html
https://cooshistory.org/steam-donkey/
https://www.mendorailhistory.org/1_logging/steam_donkeys.htm
https://www.nps.gov/safr/learn/historyculture/steamdonkeyengine2.htm
https://www.oldoregonphotos.com/closeup-of-double-drum-steam-donkey-c-1898.html
https://mckenziehistoryhwy.org/settlements/vida/steam-donkey/
https://tractors.fandom.com/wiki/Steam_donkey

Bill's writeup, which we can probably alternate on:
Steam engines can be used for all sorts of purposes. The most famous kinds of steam engines in the first industrial revolution served to a) move a vehicle such as a train, mine car, or ship; and b) power stationary machinery like a mill loom or a drainage pump in a mine or ship. But there was also a third major use for steam engines at the end of the first industrial revolution: lifting and pulling objects with winches and pulleys.

[Rachel] This type of stationary steam engine is known as a donkey engine, perhaps in reference to their replacement of actual donkeys in some contexts. They originated in the mid-19th century on ships as a secondary engine, not for turning the screw propeller or paddle wheel but for raising and lowering sails or loading and unloading cargo or supplies. (Donkey engines were also later installed on piers for loading and unloading, too.) They sometimes also powered the bilge pumps (and I assume probably sometimes hauled up and down the ship's anchor). These donkey engines allowed ships to operate with vastly fewer human crew members than older sailing ships had needed. At some point the fishing industry also realized they could use donkey engine cable winches to haul in fishing nets.

The innovation spread in the 1880s to the logging industry, with a patent issued to John Dolbeer of the Dolbeer and Carson Lumber Company of Eureka California in 1882. In logging, the donkey engines could be used to winch long ropes or wire cables to drag massive timber from deep in the forests of the Pacific Northwest to more accessible locations for sawmilling or transport by boat or rail. The engines could operate almost all year round regardless of most weather conditions and operate over much worse terrain than draft animal teams (usually oxen or horses) or human teams could operate in.

[Rachel]*The editor of the May 1892 edition of West Coast Lumberman had this to say about the Dolbeer logging engine. "It weighs 8,000 pounds, and careful loggers state that it will do the work of 90,000 pounds of horse flesh. That is about 70 horses or 80 oxen. It yanks 10,000 or 12,000 feet of logs around apparently as easy as a politician makes promises. There are a goodly number of these engines of which the writer knows, and they are all doing satisfactory work." [https://cooshistory.org/steam-donkey/]*

They became so ubiquitous in logging (and relatively inexpensive for a company to buy) that they were often abandoned in place when a timber harvest area was completed, rather than bother packing them back out, and many of them remain in the backwoods today.

[Rachel] Some donkey engines in logging could actually be moved around by putting them on a sled, hooking the winch cable to a destination point that couldn't move, and then hauling on the cable with the engine winch itself so that it moved instead of pulling something toward it. This was often used to move it further inland or in some cases the sled would be put on a river raft and the engine would winch itself up river against the current.

The winch cables ended up getting so long, as the cable manufacturing technology got better in the late 19th century (which is probably a topic for another episode), that the donkey engine operators had to use steam whistles to communicate with logging crews out of visual or shouting range, much like a tugboat, in an effort to reduce the number of deaths and maimings from the cable pulling taut suddenly. (Today in the logging industry airhorns are used in place of steam whistles.)

[Rachel] Donkey engines were also used along logging railroads to power vertical pulleys to load and unload logs or planed timbers onto trains.

Some of the steam donkeys in the logging industry grew to be quite elaborate in their heyday with entire structures built around them to provide shelter for the engine operating crew, much like the cabin for a locomotive crew, except if you imagine an actual cabin in the woods being installed around the engine.

[Rachel] Steam donkeys were eventually succeeded by internal combustion engines and ultimately by diesel-powered tracked vehicles that could pull logs across difficult terrain and keep pulling to a final location rather than having to hand off the log to another winch cable when it reached the donkey engine. Until the 1920s, steam donkeys were usually wood-fired to generate steam and employers finally pushed to implement oil-fired steam engines for the same reason railroads hoped to switch fuel sources: the ability to eliminate a fireman whose job was shoveling solid fuel into the boiler. But unlike steam locomotives on well-supplied rail lines, another specific problem for logging steam donkey engines in the backwoods was that they were not always near an easy source of re-watering for the boiler to heat up and they tended to pose a wildfire risk in the middle of the valuable resource they were helping to harvest. So, the logging companies pushed past the oil-fired steam phase toward the internal combustion phase as soon as that was considered practical and cost-effective, albeit with some delays in the transition during WWII rationing periods. By the end of the 1950s, steam donkeys were gone from the logging industry.

A side digression -- What about the use of steam donkeys in mining? Apparently some mining companies found a utility for these stationary hoisting engines as well: Unloading heavy mining machinery from truckbeds and rail flatcars.
https://www.theunion.com/news/local-news/restored-steam-donkey-from-birchville-mine-near-graniteville/
https://nla.gov.au/nla.obj-148014586/view

However, mines had long had their own uses of stationary steam engines on site, including for drainage pumping and even elevators, so their technology tended to be off in its own category. They used hydraulics as well for some of these functions, which is a totally unrelated tech.