

Pump Jacks



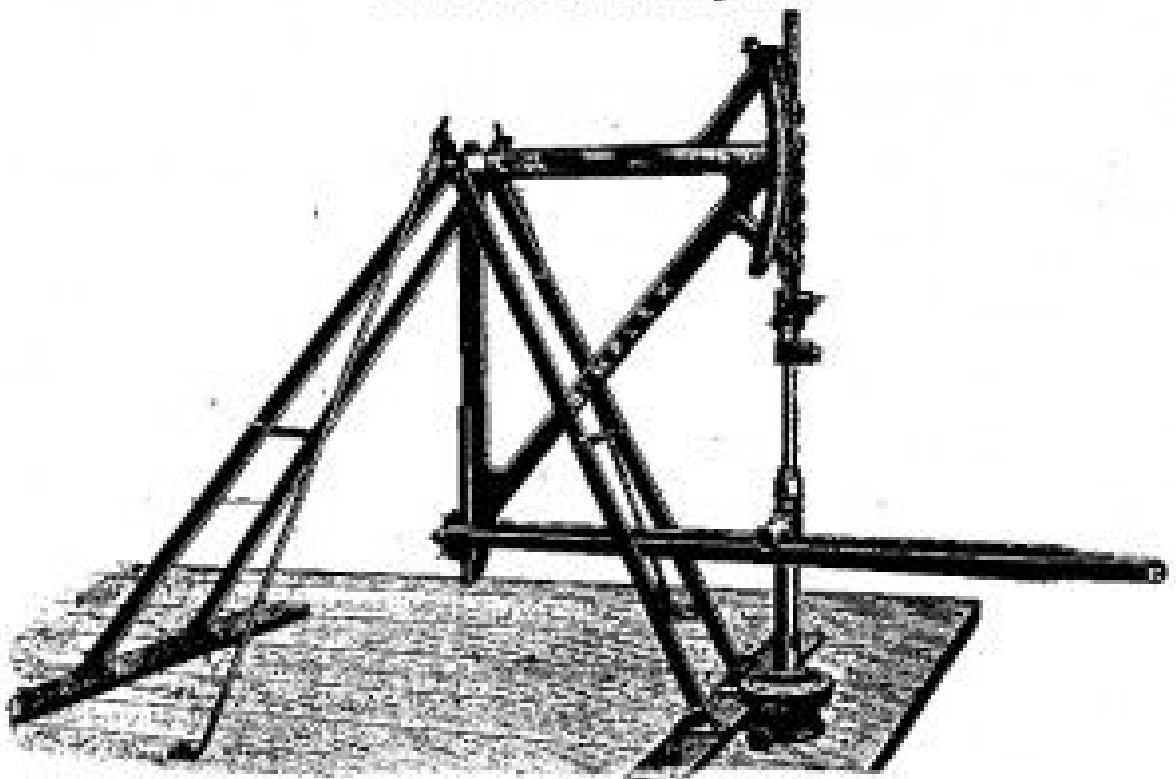
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Pump jacks

Pump jacks are used to pull oil out of the ground to use for many different resources. Oil in its natural state is considered crude until it is processed and refined. Pump jacks were first developed in a valley in northwestern Pennsylvania in 1859, Edwin Drake drilled America's first commercial oil well, launching the U.S. petroleum industry. For his oil well pump, he borrowed a common water well hand pump to retrieve the new resource from 69.5 feet. Once the oil is removed from the ground by the pump jack it is transported to a refinery where it is processed into gas and oil, which can be used to power machinery and to be used as a heat source.

SIMPLEX PUMPING JACK



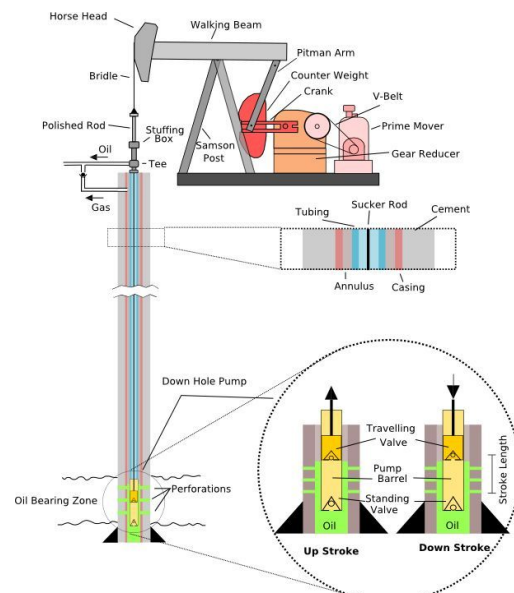
Operation

A pump jack is a device that is used in the petroleum industry to extract crude oil from a oil well, where there is not high enough pressure in the well to force the oil to the surface. Pumpjacks operate by creating an artificial lift. The pressure the artificial lift creates in the oil well is enough to pull the oil out of the well. The beam pumping method utilized by the pump jacks is the most common for creating an artificial lift.

Pump jacks operate on the same basic principles of some hand pumped water wells. Pump jacks are classified as a type of artificial lift pump system, and are most common as a artificial lift system. This type of system uses equipment above and below ground to push oil to the surface.

These devices are composed of a long, heavy beam that is moved by some external power source. The source causes the beam to rise and fall. At the end of the beam are a series of rods known as sucker rods. As the beam rises and falls, the series of sucker rods dip into and out of the well. These rods are connected to a sucker rod pump, which is installed near the bottom of the well. As the system moves up and down, the sucker rod pump works somewhat like a piston increasing pressure within the well and lifts the oil from the ground to the surface.

The other end of the beam is connected to a pulley system which provides the continuous movement of the pump jack.



Oil

Oil is an greasy, slippery feeling, flammable substance. Oil is made up of tiny plants and animal that died in ancient seas between 10 million and 600 million years ago. After the organisms died, they sank into the sand and the mud at the bottom of the sea.

Over years, the organisms decayed in the sedimentary layers. In these layers, there is no oxygen present. The organic materials mixed with the sediments, forming fine grained shale, or a source of rock. The oil flowed from the source of rock and accumulated in thicker, more porous limestone or sand, is called reservoir rock. Movement in the earth traps the oil in the reservoir rock between layers of impermeable rock, or cap rock, such as granite or marble.

Oil is called crude oil, before it is sent to a refiner. A refinery is a building, where it turns crude (raw) oil into refined (clean) oil. When the oil goes through the refinery, crude oil is made up of compounds and when it is getting refined the compounds are getting separated.



Conclusion

In conclusion, a pump jack is an artificial lift system with a pulley attached near the bottom, it was modeled A pump jack is used underground and aboveground to siphon oil to the surface using sucker rods. These devices are composed of a long, heavy beam that is moved by an external power source. The pump jack gets its power from various sources, such as solar power panels, which can power 20 to 30 pump jacks at one time.



Materials

- 3 tubs of black silicone
- Fish tank
- 2 pieces of boards
- Sandpaper spray
- 5 different types of rocks
- Clear tubing
- Landscape materials
- Hot glue
- Black paint
- Motor
- Metal pump jack system
- Glue stick
- Barels
- Cable

Problems

First problem, found pump jack that was metal, but not running or moving, so we had to take it apart then hook the motor up.

Second problem was hooking the motor up to the pump jack, so we got a different motor system and got that one hooked up.

Third problem was trying to get the wire into the silicone level without getting it covered by the rock levels, so we got a tub to put the wire in so it wouldn't move while pumping.

Purpose

The purpose of a pump jack is to retrieve oil from deep within the ground. The oil layer lies is at a depth that does not allow for enough pressure for the oil to make it to the surface on its own. The pump jack system is designed to create the pressure required to draw the oil into pipe systems by using sucker rods at the end of the pump jack.

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