

Pulling Fence Posts

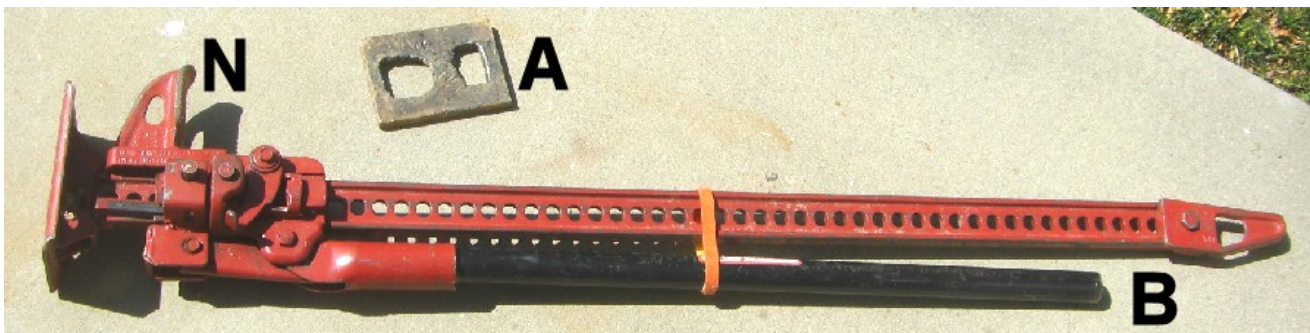
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I like to use the steel tee fence posts around the yard. They're easy to pound into the ground and hook wire to them to make fences. One or a few can be pounded in with a sledge hammer, but you'll do yourself a favor if you get a post driver. These are a chunk of steel pipe with handles on them and the end welded shut. Farmers commonly made them from scrap, but you can buy them at the local farm supply store:



Pulling these fence posts out, however, is another matter. For years I used the technique of a metal plate and a hi-lift jack:



The left-hand hole in the metal plate A is slipped around the fence post and the nose N of the hi-lift jack B is inserted in the small right-hand hole of the plate. Then the jack is used to lift the post out of the ground. This method works, but you often wind up with a bent post, things can slip, and it can be frustrating on uneven or impossible on muddy ground.

I've sometimes had to tie point B of the jack to a vehicle to keep the jack from tipping inwards when it is lifting; if no vehicle is available, it can be difficult to keep the jack from tipping -- then you're in for lots more work, as you have to pull the top of the jack back from the post, which pulls it out of the ground, but without the leverage you get from this lever method. If you don't understand what I'm complaining about, then you'll just have to use a jack to pull a few posts out and it'll be clearer.

If you want to spend some money, there's a tool called a "post popper" or tee post jack that will do the job. It's the same technique as what I present below except it uses a class 1 lever instead. Harbor Freight sells one for \$25 and other brands appear to be \$50-\$60. Unfortunately, it's a one-trick pony and unless you need to pull lots of posts or your time is precious, why not use other things you already have around the house? For more ideas, do a web search on "tee post puller". It also can't pull larger diameter round steel posts or 4x4 posts (which the chain mentioned below can do just fine).

The easiest way to to pull such things out is with a chain and a a front end loader or the 3-point hitch of a tractor that can be lifted hydraulically. But most of us don't have such tools.

In the summer of 2012, I had to get a heavy chain link fence post out of the ground that had a cylinder of concrete around it about 0.7 m long and around 30 cm wide (with the cement mass

around the post, it was heavy enough to make it hard to lift). I had installed it the previous summer in anticipation of building a fence (we were reusing an old fence post), but my wife decided she wanted the post somewhere else. I was dreading the task of getting this thing out of the ground, as the tee post pulling plate above wouldn't work and the concrete cylinder had too large of a diameter to use the Hi-lift jack. I figured I would have to dig the post out and this would have been a lot of work in hard, dry ground.

Then it occurred to me to try a lever to pull the fence posts out. I grabbed a saw horse, a chunk of steel pipe, and a chunk of chain. **It was surprisingly effective.** In fact, it's so effective that I've not used the jack method since then. The pipe was a 2.1 m chunk of 1-1/4" [32 mm] galvanized steel pipe I had laying around the house. It has a union on one end and is a chunk of scrap a friend gave me when he moved.

Here's the chain:



This is a chunk of 5/16" [8 mm] chain about 1.5 m long. A slip hook is at A and a grab hook at B. This chain has seen lots of use over the decades in pulling out shrubs, small trees, and posts. The slip hook is important, as it allows you to get a good grip on whatever you're pulling (some folks call such a chain setup a "logging chain" because you can grab and pull logs with it). This chunk of chain came from a 20 foot long piece of chain I bought in 1980. The longer piece has two grab hooks on it and is used where I need a longer piece of chain. But this 1.5 m chain gets used around the house more for various pulling tasks. A grade 30 5/16" chain should have a working load limit of around 8.4 kN (862 kgf or 1900 lbf); breaking strength will be about 3 to 4 times this.

The method I use for grabbing something for pulling is as follows:



Figure 1

When the right-hand end of the chain is pulled to the right and things are snugged up, this grabs whatever you're pulling quite tightly. And it comes loose easily when you're done. This grabbing method allows you to apply a pull parallel to or perpendicular to the pipe's axis or any angle in between. If the thing you're pulling is a chunk of wood, the chain will ding it up, so you may want to wrap it with something to minimize damage. But the wrapped material may mean the chain is more likely to slip.

Here's a diagram of how to pull out a fence post using these tools:

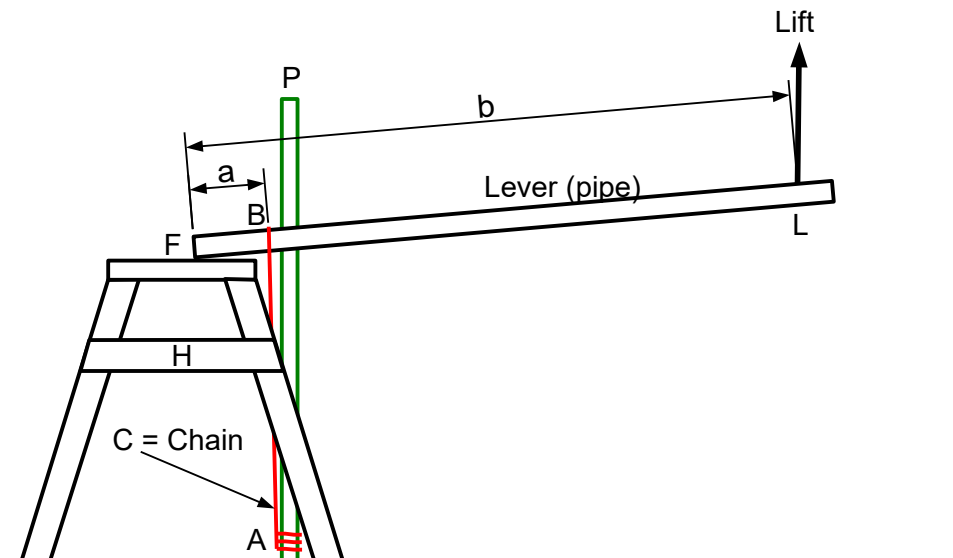


Figure 2

Sawhorse H supports the lever at fulcrum F. The sawhorse is put close to the fence post P to be pulled out (this is needed to make the method effective). Then the chain C is wrapped around the fence post at A as shown in Figure 1. The chain is moved so that point B moves towards point F, **minimizing the dimension a**. The smaller the dimension a is, the more lifting force you can apply

to the post.

Once the chain is in place, you lift the pipe at point L (this is a class 2 lever and operates in the same fashion as a wheelbarrow). The lever multiplies your lifting force by the ratio b/a (calculate the torques about the fulcrum to see this). In my case, since b is 2.1 m and a was 75 to 100 mm, this ratio was around 20 to 30. If you can lift 100 units of weight, you can apply a force of 2000 units of weight or more to lift the post out of the ground. A longer lever can produce larger forces.

This task is easier with two people. One person adjusts the chain and the other person lifts on the lever. As soon as you've lifted the lever as high as you can, lower it, reposition the chain for a new purchase, and lift again. Repeat until the post is out of the ground. It usually only takes two or three purchases to get a post out of the ground.

With a bit of adjustment, you can get the chain within about 50 mm of the fulcrum point. This can let a boy pull out a fence post by lifting the lever on the other end (I just verified this, as our neighbor's boy was helping me move some fence posts and he pulled out some of the posts with no help from me).

I've also used this method to pull steel pipe posts and 4x4 wooden fence posts, both in concrete, out of the ground. One of the method's advantages is that you don't need to put the base of a hi-lift jack next to the post. I've had to try to pull fence posts when the ground was muddy and this hi-lift jack method would never work. A three-legged sawhorse will sit stably on nearly any terrain. You can pick where you put the sawhorse's legs -- stick some plywood under them if the ground is wet.

An 8 or 10 foot [2.4 or 3.0 m] 2x4 could make a good temporary lever. You can use rope instead of chain to pull on the fence post, but you'll have to secure things a little more carefully to avoid slipping and the rope may stretch, making it less effective than a chain. I'd try a Prusik hitch first. But the chain works so well, never slips, and doesn't stretch that I recommend a chain over rope.

If you pull out some hard-to-pull fence posts, you may want to rest the fulcrum on a scrap chunk of wood. A strong lift on the lever can easily put a good 10 mm deep ding into the wood of the sawhorse. Or, keep two or three scrap 2x4 chunks 6" long and you can use these for the fulcrum. Instead of readjusting the chain, slip one or two 2x4s under the lever and lift again.

Around 2015, a couple of college-age boys were helping me pull some fence posts out with this method. Two of them lifted on my piece of $1\frac{1}{4}$ pipe and the end of the pipe cut into one of my sawhorses so deeply that it split and ruined the sawhorse. The boys were mortified, but the break was my fault for not putting a sacrificial piece of wood under the pipe. As they were young and strong, I'd estimate they applied at least 4000 lbf to that fence post (it was a large round pole fence post about 8 or 10 inches in diameter, but they were able to get it out of the ground). In 1987 when we bought the house, I took out 10 to 20 of these posts (the previous owner had constructed a horse corral) and the construction guy next door came over with his old front-end loader to help me pull the posts out. The pull to get these out of the ground was strong enough to flatten the tractor's front tires. About 8 years later a construction crew was putting a new sewer in our street and some six-packs of beer got one of the guys to bring their large and new front-end loader in to pull the remaining posts. It pulled them out without even breaking a sweat.

This pulling method can be used on rebar that has been pounded into the ground as a stake to secure something. Concrete forms are often secured with $\frac{3}{4}$ inch steel posts that have cross holes for nails and these (like rebar) can sometimes tough to get out. The usual technique is to hit them with a sledge hammer sideways at ground level to knock them sideways, widening the hole. But if the post is in deep, this may not work. If you can wrap something around the rebar like some wire rope or nylon rope, you may be able to pull it out. It's generally too small for the chain to get a grip on it, though try the chain first.

Around 1988, my wife and I decided we wanted to remove the large juniper bushes from our front yard, as neither of us like juniper. These bushes were pretty large, with some of the limbs around 2 inches in diameter. We pulled them out of the ground using my 1984 Toyota Land Cruiser in 4 wheel drive low. I made an A frame device from 4x4 material:

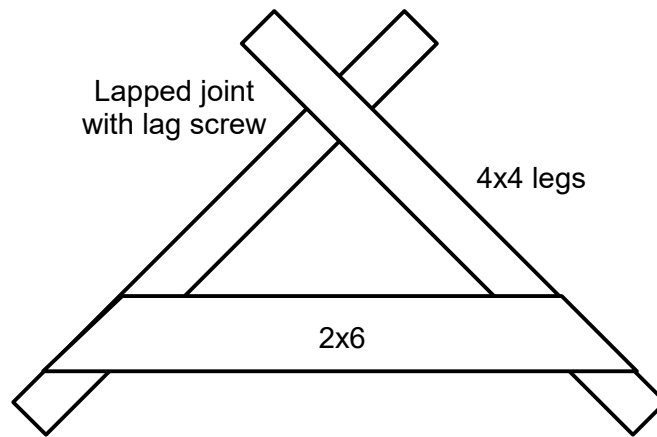


Figure 3

This A-frame was used with the 5/16 inch chain by securing the chain around the base of the bush, running the chain over the crotch of the A-frame, then hitching to the Land Cruiser's trailer hitch. The A-frame was leaned over to about 45° and the pull was applied by the Land Cruiser. This resulted in a pulling force upwards on the bush roots. I would often get a running start and make a kinetic pull to increase the pulling force. This was pretty rough duty for the A-frame and I wound up making two or three of them over the years. But we got all those bushes out, though sometimes I needed to dig down opposite the side of pull and cut a root or two. I've also pulled numerous trees over in the same fashion.