

Building the Chainsaw Mill Frame



Introduction:

Whatever the reason a person might have to cut their own lumber, the main reason to use a ladder mill is the roller frame. The frame can be made with two things that most people already have, a chainsaw and an extension ladder.

I was given access to a large number of cedar logs. I decided that instead of cutting the wood into firewood, I would cut the logs into boards. So I looked around to see what was available.

The Alaskan type mill looked like more work than I wanted to do and it required a larger saw, the mechanism looked awkward and the cut depended on the smooth surface of the previous cut.

The Band Saw mills looked good, but I was afraid that I would become a slave to expensive blades and I would have one more machine to store when I am not using it. I would have another engine to maintain and I would need to cut a lot of lumber to make it worth the investment.

The track type mill seemed to be the best choice for my use. They are accurate, can be used on the ground or on a stand, there is no awkward setup and it is using something that I already have. The only problem with the Ladder/Track mill is that it would cost over a \$1000.00 for a mass produced type roller frame. I built my own mill roller frame for less than \$300.00. My saw is 42 cc with an 18 inch bar. I feel that I milled some pretty nice lumber.

I am mostly interested in cutting boards from 1 inch to 2 inch in thickness. I used the chainsaw mill for cutting successive boards without turning the log. This will give a rough edge or “live edge”. I have heard this type of cutting referred to as Slabbing or Flitch milling. My experience in lumber is limited to Cedar and Pine. I have made some beautiful lumber with this method.

Now, let's build the mill frame.

List of Materials:

Rollers: I found an inexpensive and high quality roller on a kids skateboard.

Skate board wheels generally have roller bearings and 5/16 or 8mm axle races. I've seen wheel and bearing sets for about \$15.00 (online).

You can also buy a skate board from the local sporting goods store. I went to “Big 5 Sporting Goods.” I found a couple of decent quality boards for \$15.00 each. I took off the wheels and gave the boards to a neighbor kid.

Good quality Wheels and Bearings



Landing Jack:

The Fifth wheel landing leg is made to lift between 4000 to 5000 pounds. They raise and lower the front of trailers that have the hitch in the bed of a pickup truck. They usually have about 20 inches of travel (top to bottom of stroke). With a small amount of welding, they make a great lift frame for the chain saw mill.

The horizontal shaft legs (pictured below) are the least expensive and easiest to modify.

There are 2 different type of legs, the lead and follow leg. The lead leg will have the longer input shaft while the follow leg will have a shorter shaft. Here is a link to a site that has replacement jacks.

<https://www.strombergcarlson.com/fifth-wheel-landing-gear/replacement-landing-gear-legs/>

I have also found some great deals on used legs at my local RV repair place.

Horizontal Shaft Legs



List of materials (Cont.)

15' - 1 1/2" x 1 1/2" x 1/8" Angle Iron (for roller frame.)



8 - Grade 5- 5/16" x 2" Bolts (for roller axles.)

8 - Matching Fiber Nuts



3 - 1/2" x 1 1/2" Bolts (Grade 2 or 5) (for saw holder and sleeve tensioners.)

3 - Matching Nuts



24" - 3/4" Black Iron Pipe (for saw holder bar.)



Materials (Cont.)

1 - 2" x 3" x 1/4" Steel Flat Stock (for mounting roller bar to saw adjuster bolts.)



1 - 5/8" x 1/8" x 6" Flat Stock (gusset for saw mount.)

2 - 1/4" x 1" Bolts (**Grade 2 or 5**) (for attaching two roller halves together.)

2 - Matching Nuts

12" - 3/4" x 3/4" x 1/8" Angle Iron (for mounting the plastic covers to the roller frame.)

There will be 2 flat washers to go between blade adjuster bolts and saw mount .

There will also be 4 - #8 x 3/4" SDS screws to hold the cover on.

The purpose of the plastic cover is to keep the sawdust from getting between the wheels and ladder.

A 24" x 36" piece of 1/8" Polyethylene will work. I would suggest spending the extra time learning to air weld plastic. There are other types of plastic that can be used, I choose to use Polyethylene because it is flexible and it cuts like wood. Here is a link to a local plastics place:

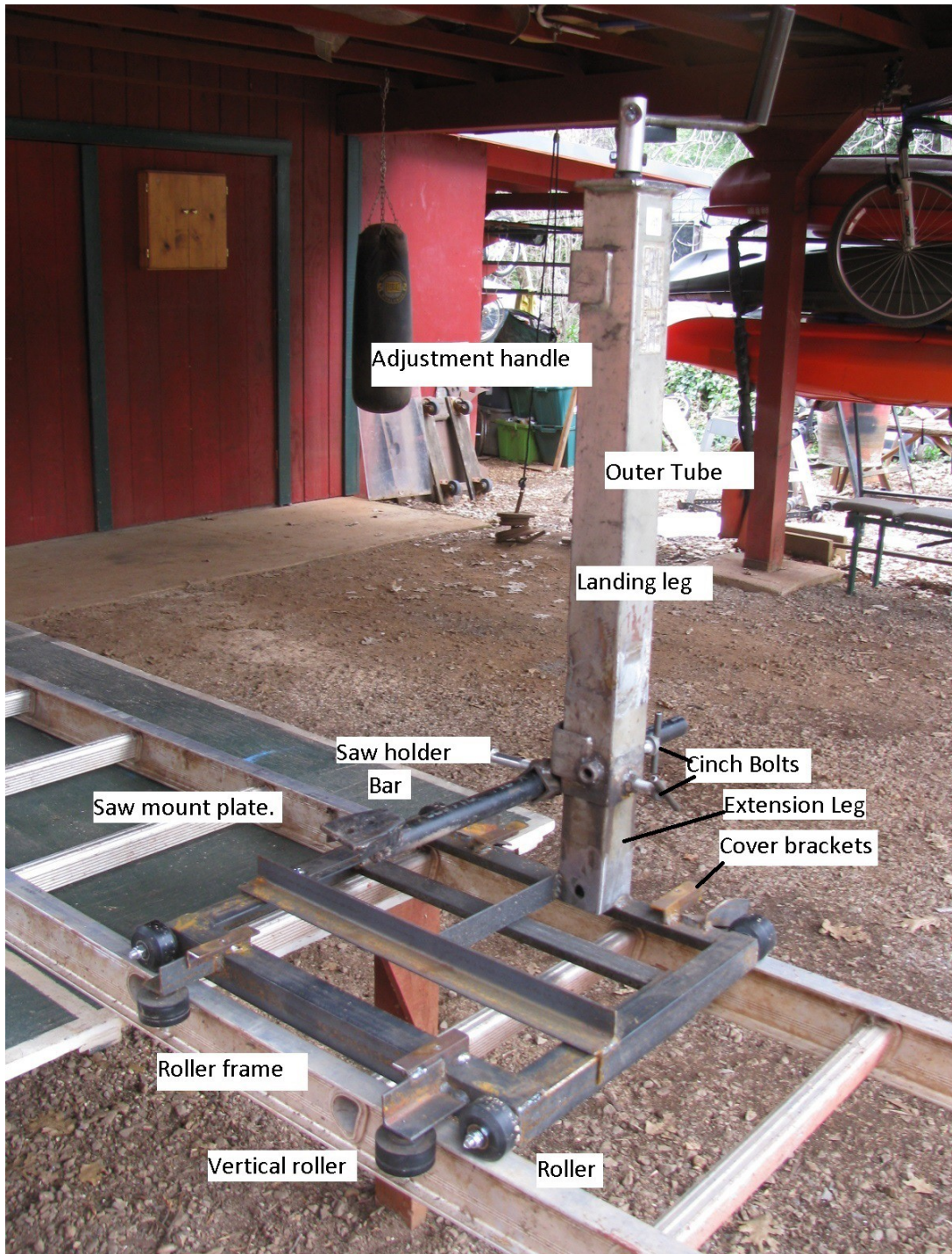
https://www.tapplastics.com/product_info/plastics_information/polyethylene

The plastic sheets can be cut like plywood and it can be bonded with heat or with glue. ABS and Polyethylene.

I prefer to work with Low Density Polyethylene.



I feel that I should name the parts of the roller frame. It should make things simpler as the project goes on.



Roller Fame Build:

There are four main parts to the sawmill frame.

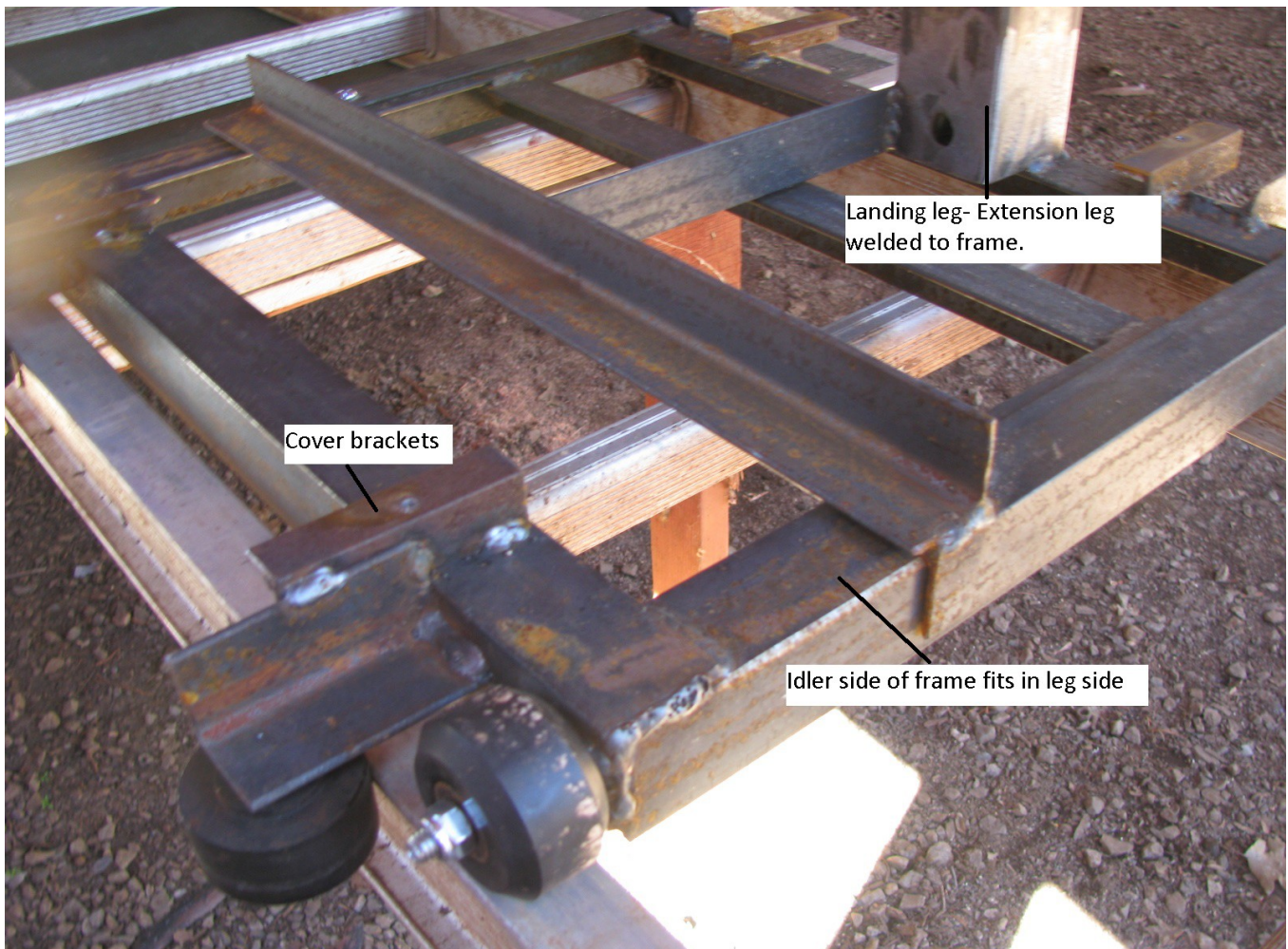
I will divide it into these sections :

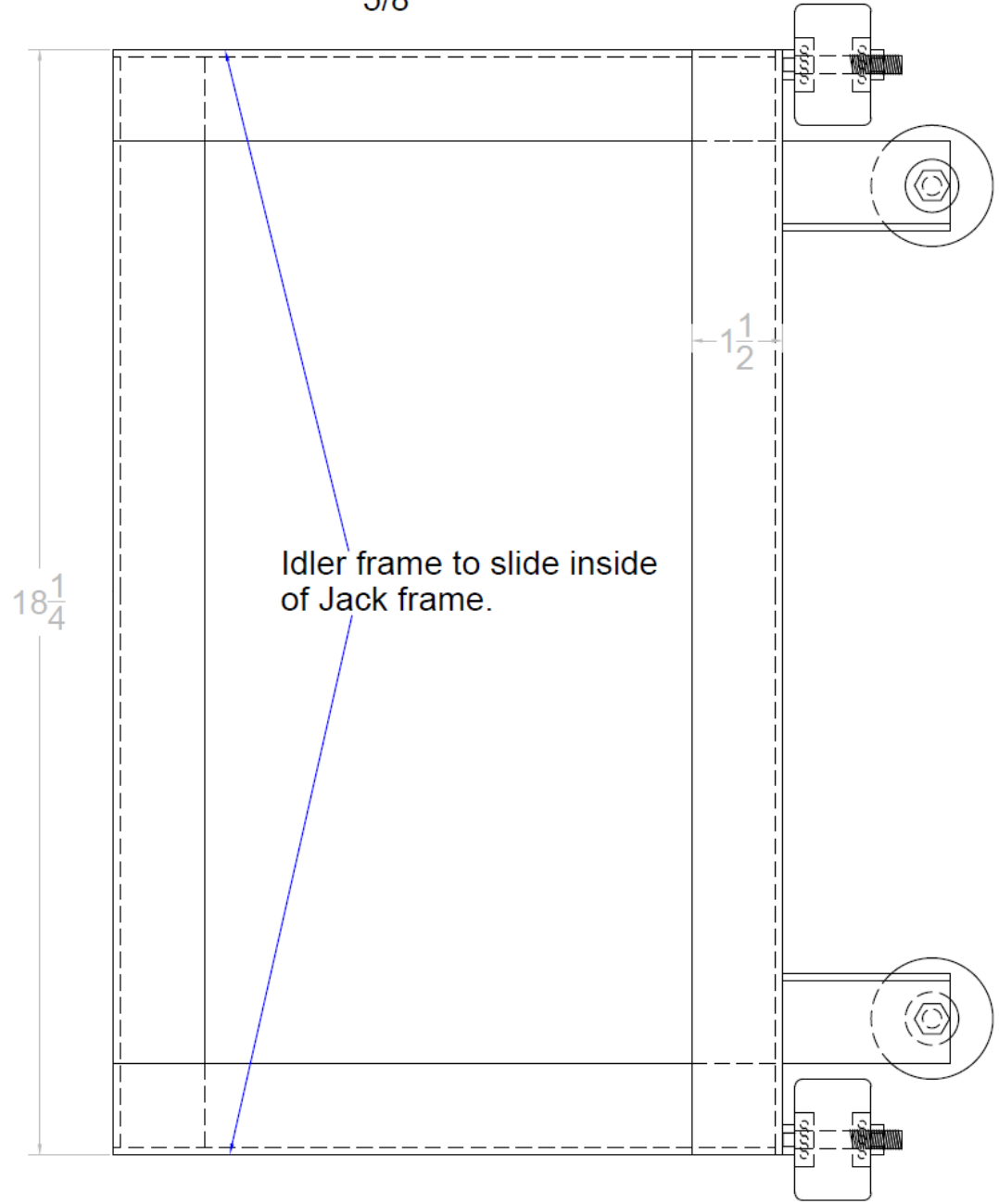
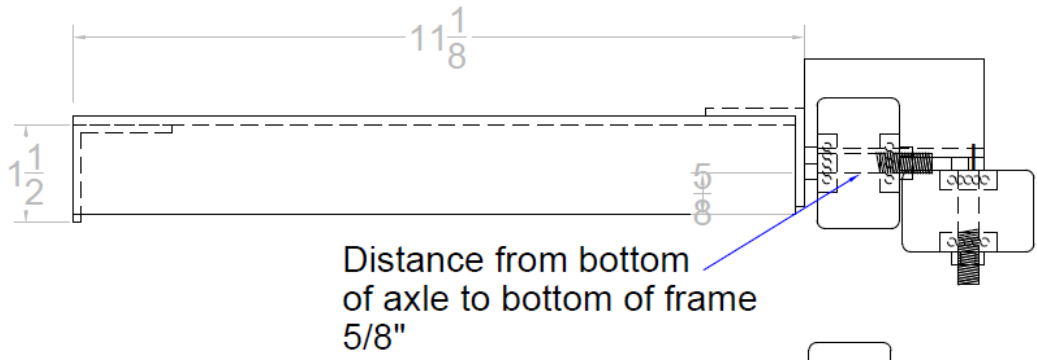
- 1) The Roller Frame
- 2) The Landing Leg
- 3) The Saw Holder Bar
- 4) Plastic Cover

Roller Frame:

The roller frame will be built in two halves. The idler half will fit inside the landing leg half.

It would be best to build the inner frame ,then build the outer frame.





Roller Frame - Jack Side:

Check the fit between the two frame halves. Install the horizontal shaft rollers.

I used a corner magnet to hold axle for tacking.

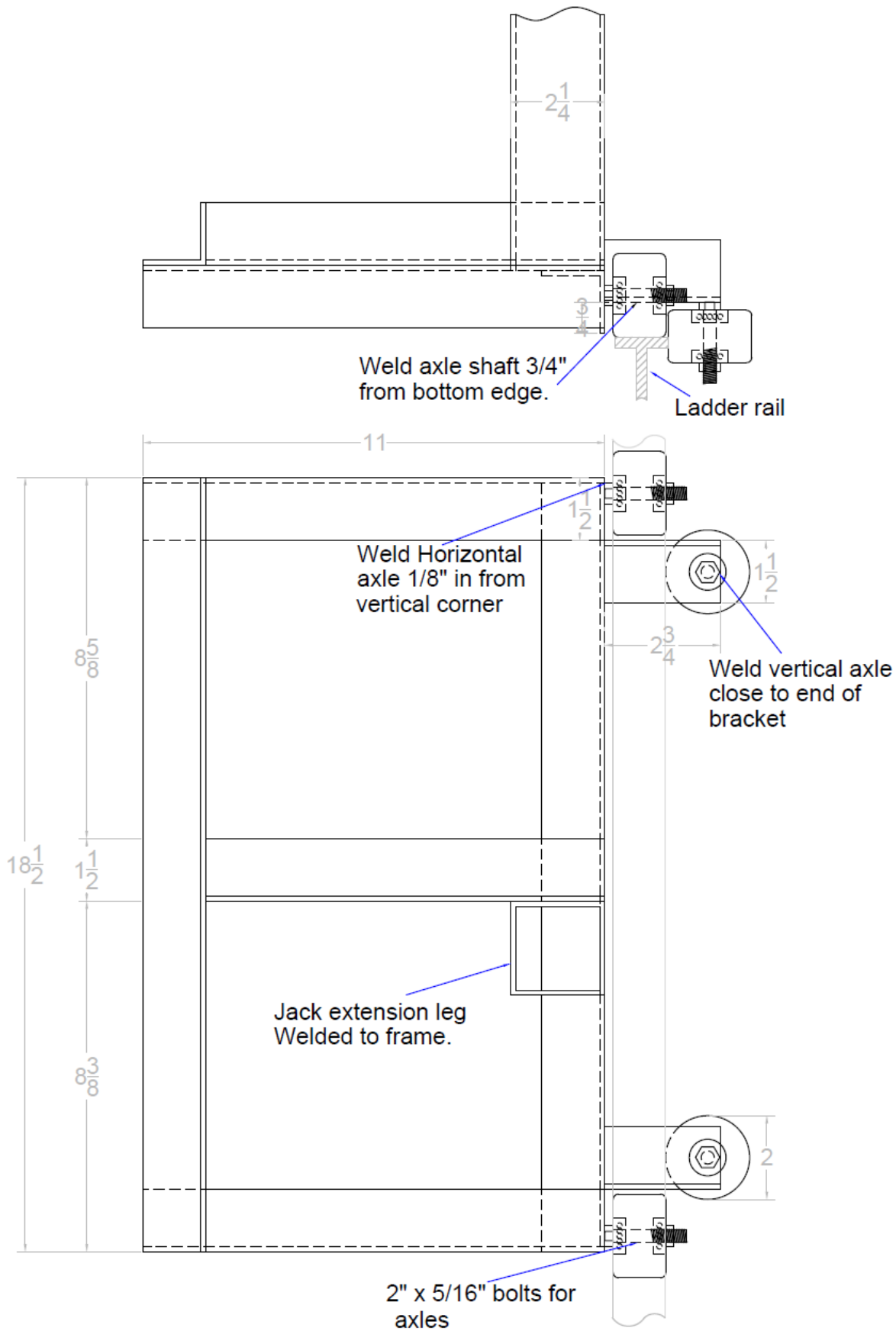


Once the horizontal axle bolts have been welded on, set the wheels in place to make sure that the frame is flat. The builder can then weld the vertical axles on the brackets. If you are angling the rollers on the jack side then set the idler side vertical.

Brackets and Wheels:

Clamp both sides together with the wheels in position. Now install the jack side, vertical rollers.





Removing Extension leg.

Remove the extension leg from the landing leg for drilling and welding the cinch bolts. It will also make it easier to weld on the sleeve that will position the saw bar.



1) Remove cap. The numbers under cap distinguish jack type.



2) Lay down jack. Drive roll pin through horizontal shaft.



3) Remove retaining ring.



4) Slide horizontal shaft out of bushings. This might take some hammering if jack is well used.



5) Remove gear from vertical shaft.



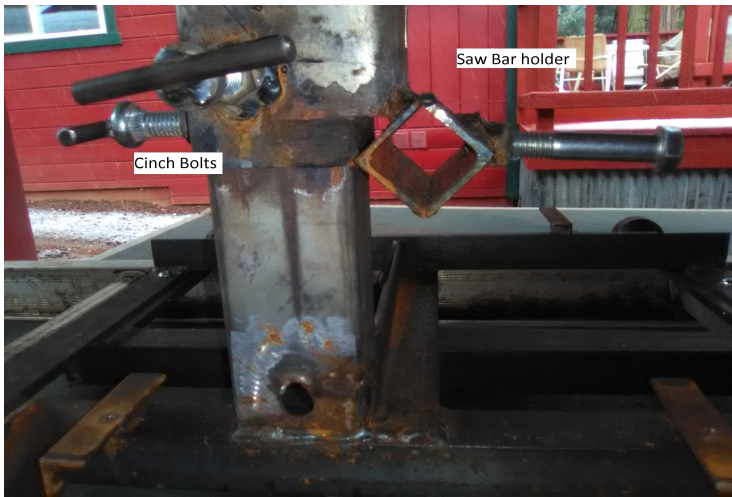
6) Slide pin out of vertical shaft. Remove washer.

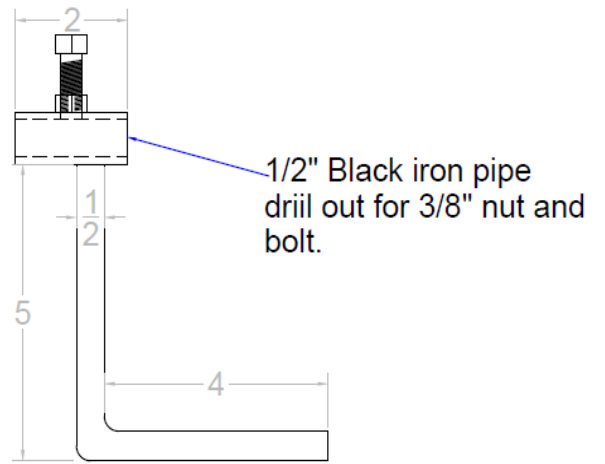


7) Extension leg will slide out the bottom of outer tube. If you are using a used leg then you can thread the rod down to check the threads. This method will work on most horizontal crank landing legs.

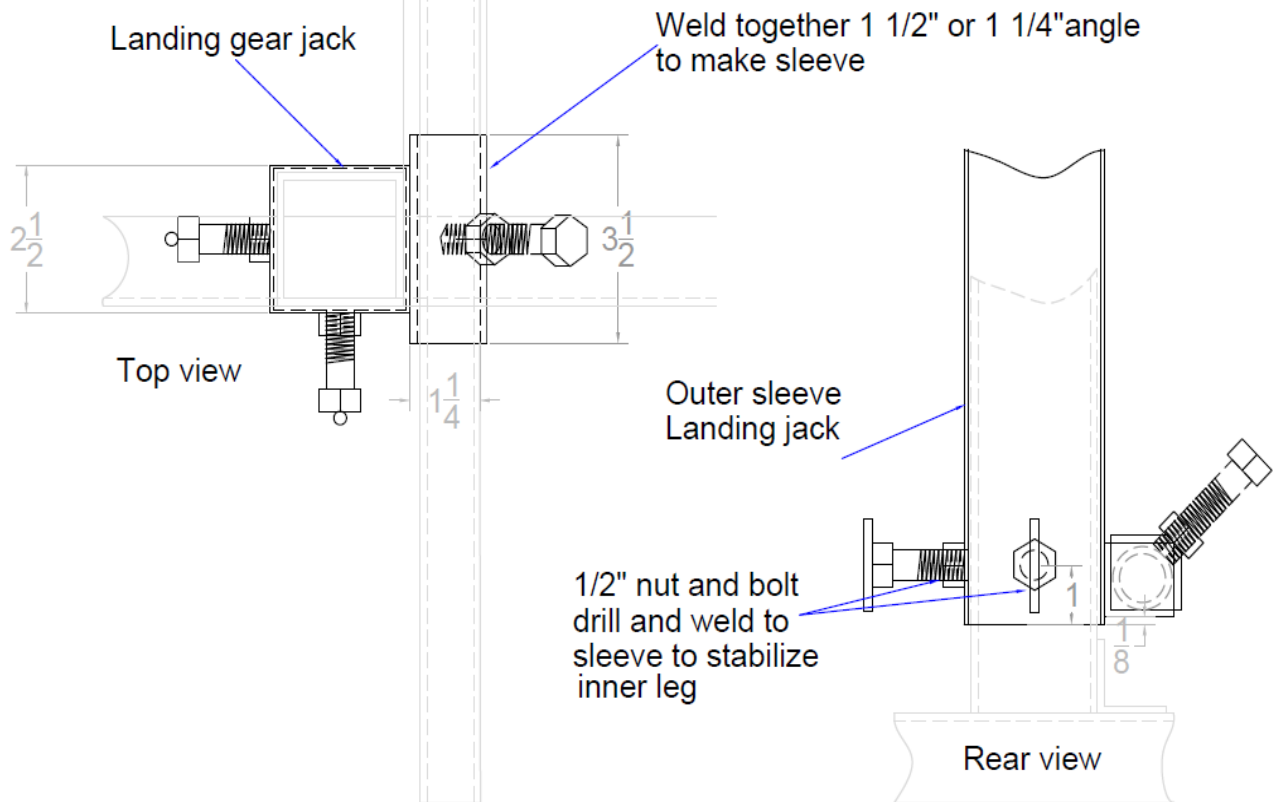
Once the extension leg is removed from the outer leg, You can go ahead and modify the outer leg for the bracket and cinch bolts.

Drill 1/2" holes about an inch from bottom of outer tube. Make sure that the crank handle is pointing away from the saw side. Weld the saw bar holder on the right side. I welded this bar holder at an angle. This landing leg had a bottom mounting bracket. I decided to leave it on. As long as the bar holder is welded on securely and straight. If your jack does not have the bottom bracket then weld Saw bar holder on flat with bolt pointing up.





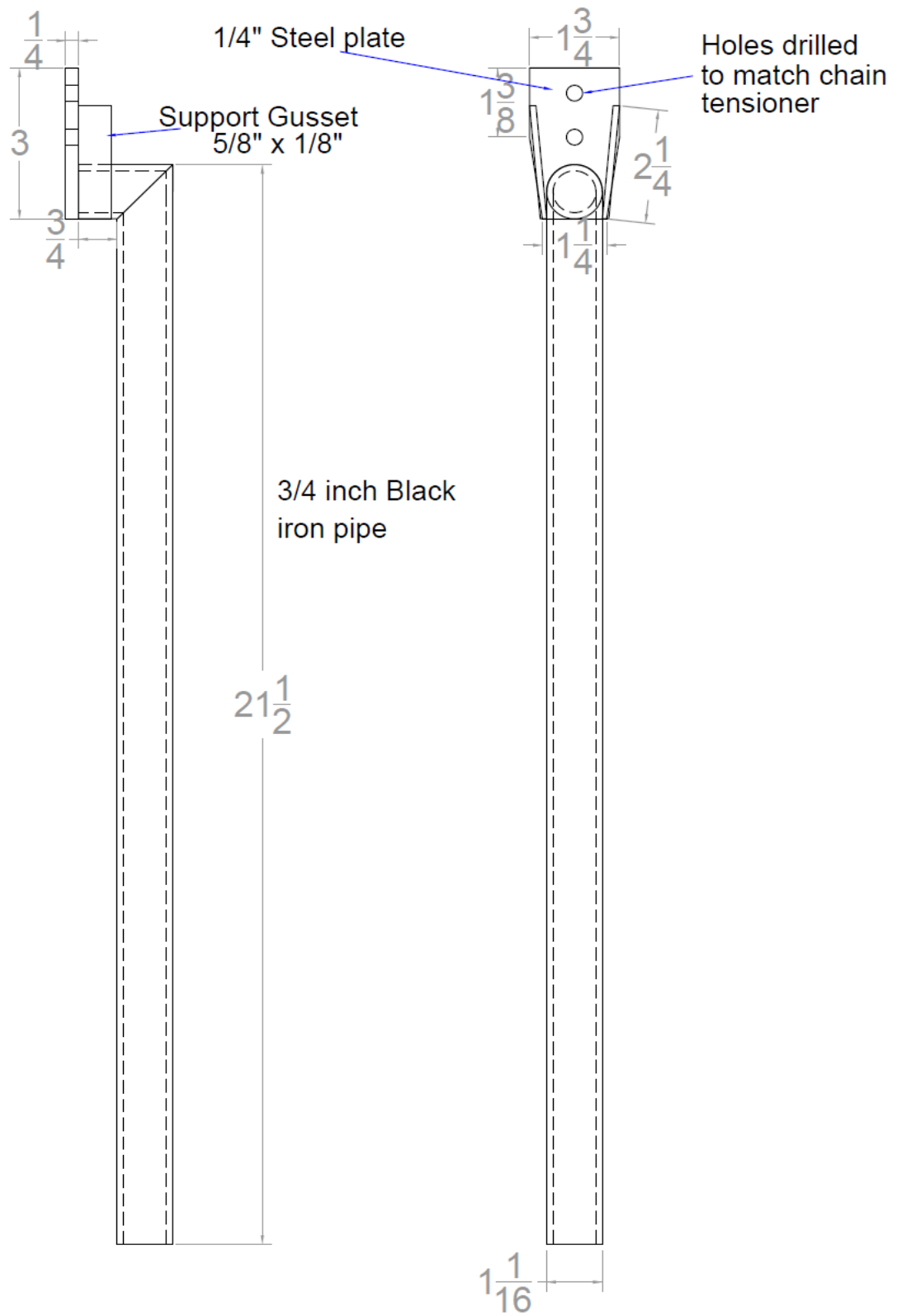
Crank handle to mount on input shaft of leg.



Saw Bar and Saw Holder Plate:

I built my holder to match my chain saw. The best way to get the plate to match the bar holder on the chain saw is to lay the chain tensioner cover over the bar plate and mark the holes. My saw no longer had an automatic oiler, so I used an oil squirt can. There will also be no chain tension adjuster. My chain stayed tight by snugging chain and tightening bar.

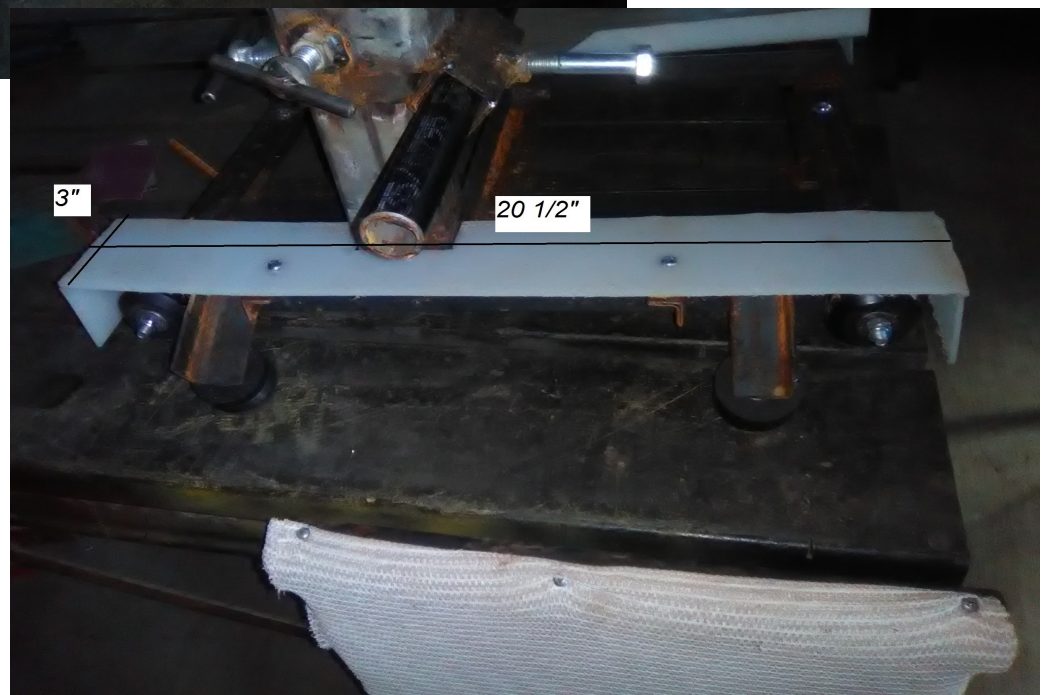




Plastic covers

The roller frame works fine without the Plastic cover. I was cutting some very wet lumber so it was starting to clump on the rolling surface . I built the cover so that the edges will drag on the flat leg surface and knock the Sawdust off. It did help it run a lot smoother. I built the top of the cover and set it on the brackets to get the distance for the wipers. Make them about ¼ inch long to allow for distortion from plastic welding. There are a lot of good Plastic welding videos on Youtube . I even Have a short video on Plastic welding.

<https://www.youtube.com/watch?v=a4DLOt4xwS8>



Things I learned:

Always wash the dirt off the log: I could go much longer with out sharpening the chain when I started washing my logs.

Level the chain saw: I laid a 1x4 over the chainsaw bar when mounted on roller frame. I measured the distance at each end of the 1x4 to get alignment.

Use your first slab ends to build a stand to raise the ladder and log: I found that a 20 inch tall platform made the sawing much easier. My platform was 48 inches wide. 2 will make a big difference.

Oil the bar about every 24 inches: I have sawn about 15 logs, with very little wear on the chain.

Mill Green lumber whenever possible: The only advantage I found in cutting dry logs is that they are lighter. Dry lumber takes longer to cut. My bar gets warmer and the wet log has wet sawdust.

Don't waste the saw dust: I read about the cedar sawdust that I am creating. It makes a good mulch, It is a natural bug repellent. I have spread it around the yard.

I am learning every day.

Sawmill updates

I have been using this sawmill for about 4 years. I started with a gas chainsaw but realized that it is too noisy and wasteful. I built a 120 volt 2 horsepower saw head to go in place of my gas saw. I also added a rope pull crank to the mill. I can go back to a gas chainsaw if needed. A lot of people asked for plans to the electric power head but I realized that the saw I built it from is no longer available.



Building the electric saw head would be more than most people would want to do but I have looked at some electric chainsaws online. There are some 15 and 16 amp saws. This is 2 Horse power. I can see no reason that these electric saws couldn't be put in place of a gas saw.

The rope crank makes a huge difference in the effort needed to push the saw through a log especially when using a slower electric saw.



The rope crank is not a necessity but it made the sawing much easier.

