

Refurbing a Scroll Saw by JPG

I acquired a ss mount Scroll Saw in 2011 and have decided to take Y'all on the journey to restoring it. It is not in bad condition, but is in need of 'cleaning' up and some TLC and a few parts replaced. The PO had a sick spell and he had not used it recently. He was acquiring 🤪 Stand alone:EEK: replacements. Real nice Guy!!! Never met him b4.



This is an older gray model that I believe is late 80's genre.



Before from the bottom



Before rear trunion



Before rear trunion pin



After evaporust wire brushing and JPW(original)

The evaporust removed the black oxide as well as the 'red'. I will retain the 'natural' finish and hope the wax does its thing.

Not sure it is significant, but the rear trunion pin was loose. I do not know if the PO loosened it to make tilting easier. I doubt it and think it just came loose on its own.

I have started with the most accessible stuff and the table is next!

I decided to change the gray color to the Goldie combination. I discovered the original gray paint is impervious to Citrusstrip AND Lacquer thinner. Therefore the original gray is now a primer! The outer edge of the table and the trunions are painted Rustoleum Hammered Coppertone.



Table Before



Table after

Not as evenly colored as I would have liked. Discoloration removed by light wire brushing. The original finish is quite rough so polishing is out of the question.



Rear Trunion Mounting hole Before



Rear Trunion Mounting hole Before



Front Trunion After

The upper arc(lower in the upside down pix) was masked off. The degree scale was painted over, then after the paint set slightly, masking tape was pressed onto the areas where I wanted the paint removed. Once the paint was nearly dry, light rubbing with a cloth and citrustrip removed the remaining undesired paint between the lettering.

As I mentioned earlier, the pin was loose on the rear trunion. The reason it was 'loose' is that the trunion bracket does not provide adequate clearance for the segment to rotate in the bracket.



Rear Trunion Pin shimmed

EDIT I have since 'discovered' this was intentional so it could act as a clamp.

The pin needs to be shimmed about .060". The washer is about .050 and the paper under the washer is about .010. I will fabricate something close to .060 thick prior to reassembly.

I scavenged a piece of steel about .060" thick, and made a shim for the rear trunion pin.



The material was originally a cheap stamped faucet wrench in a box of garage sale junk.

Continuing with the easily accessible stuff, I removed the holddown etc.



The rust was light and scattered on the black oxidized parts so I spared them the Evaporust soak. Gentle sanding with 800 grit paper flattened the rust with minimal black oxide removal.



The casting was fine wire brushed as best I could. Deep interior areas were left as is. The mounting post was chucked in a drill chuck and first 220 grit then 800 grit was used to remove the grunge.

Everything(including screw threads) received a JPW(original) coating.

Time to dig into the bigger stuff. Separating upper section from bottom section next! Gonna get more 'interesting'!;)

Very little effort required to separate the major assemblies.



Overnite with a drop of 'TC-11' in each end made the 1/8" tension pin come out easy. TC-11 is a penetrating/rust preventative that is near impossible to locate today. The connecting rod attaches to the lower arm with a shouldered screw through a ball bearing.



Four screws attach the upper arms assembly to the base.



The air tube slips off(both ends).



PRESTO!

Lower base gutting comes next(still doing the easy stuff first).

FWIW The light was added by the PO! It is not OEM from SS! I think he did an excellent job! He said on CL that it made the saw cut better!:(

Yes the sky is still falling! Clouds/rain/chilly for almost a week now!:(
Remind me to never relocate to 'London(England)'

Now the fun begins. Taking it apart. The first pix shows all the parts removed from the lower base assembly. The pix following are details encountered as it was disassembled. The sheet metal cover(s) removal was uneventful so no pix were taken of removing them. Neither were the removal of the front trunion clamp nor the blade alignment jig. I assume it was the PO who attached it to the base.



Once the flat plate was removed, the air pump was free to be removed. Simple pump with no valves. The piston leather seal allows air in when it is 'retracted' and forces air out the bottom when pushed into the bore.



Not expected was the one tooth offset of the counterbalanced gears. Not sure that was intentional.(?) I'll decide at reassembly whether to keep them that way.



The shafts were retained by a small retaining ring. The outer bearings have a larger retaining clip also, but they did not need to be removed since once the shaft was free to move(in), the shaft and bearings were pushed out the back. The spacers on the shaft maintained the spacing between the inner and outer bearing on each shaft.



A surprise was what appears to be a shim washer behind the left rear bearing. **EDIT** I need to mention that there was a shim washer on the back of the right rear bearing also!

An additional surprise was that all the bearings are NOT metric!

The six drive shaft/cam/counterbalance bearings are all 1/2" id x 1 1/8" od x 3/8" wide. 1616ZZ

The two connecting rod bearings are 3/8" id x 7/8" od x 1 1/32" wide. 16042RS **EDIT (2RS) not (ZZ) Sealed not shielded.**

All the bearings are rubber sealed. **EDIT The six drive shaft(s) bearings were 'shielded', not sealed.**

They all appear to be in good condition so I may reuse them. Only the connecting rod bearings seem to have a slight amount of 'play';.

After a couple days soaking in almost depleted Evaporust(it is reusable but definitely loses 'potency') the what I concluded to be badly rusted cast iron parts were taken out. One was put back in for further 'treatment'. The other one was removed and cleaned up. It is interesting to note that the cast iron acquired a blackish 'patina' while the originally black oxidized shaft became 'unoxidized'. All parts were waxed prior to reassembly(actual final assembly awaiting arrival of new bearings).



The counter weight and shaft were reattached to the gear in their original locations. The gear is secured to the counter weight by three screws with split tooth lock washers. These need to be tightened **securely!**



This pix shows the assembly sequence of parts on the shaft. The pix following show the sequence I followed. The large retaining clip fits into a groove in the base casting bore. It prevents the bearing(and shaft etc.) from coming out the front of the bore. The small retaining clip fits in a groove in the shaft. It prevents the shaft from moving out the back of the rear bearing.



The rear bearing is inserted into its bore. The bearing is inserted from the front as the back of the bore has a lip which prevents the bearing from moving out the rear. The shim washer is placed on the shaft, and the shaft is inserted into the bearing from the rear. We shall see whether this is possible with new bearings!



The front bearing is inserted into the front bore from the rear(the presence of paint or the retaining ring makes that necessary). Originally the area between the retaining ring groove and the front was unpainted - tis now(intentionally). We shall see with new bearings if that will remain!



The spacer is slipped onto the shaft and the shaft is pushed through the front bearing. Both retaining rings should now be installed.

The simple reassembly stuff(things which are secured by a couple of screws/washers are not detailed here.

I would mention that there was a plastic 'tube seal' that covered the top of the air pump. The center hole of that plastic seal had worn to an elongated slot shape. I added a sheet of mylar(folded to cover both top and bottom of the original seal) with a hole that barely(almost) cleared the pump piston shaft. The pump sits in a depression in the base and a sheet metal cover placed over it that holds it in place.

While the counter weight were 'soaking' the base was prepped for 'recoloration'. Only the outer surfaces were painted over the original gray 'undissolvable' original splattered gray paint. Various other parts were painted to match.



If you do not know already, the paint being used is Rustoleum Hammered Coppertone. The upper assembly will be painted Rustoleum Hammered Gold.



The label was initially masked off prior to painting. When I peeled the masking tape off, the label came with it leaving a very pretty gray area where the label once was. 😞 Had to repaint over that! :eek: The label may or may not stay put, but I am hoping an afternoon in the sun will make the adhesive stick. If not, more effort required.

All parts will be adjusted for fit and alignment as a final step.
Next is tearing down the upper assembly.

Tore into the upper assembly today. Discovered a couple of surprises. A few wear problems also.



Got a surprise damage! This is under the lower arm.

Apparently the PO allowed a loose screw to get trapped.



Badly worn roll pin. Attached tensioning rod to lower arm.



Broken spring.



Extra washer. I think PO added it because the threads are jammed in the arm preventing full tightening.



I think the PO added a 'silencer'.



Exploded parts collection.



Shade tree bushing press.

I decided to replace the bronze bushings and 'shafts' since the arms had side to side play. The wear was mostly to the bushings. They are 5/8" x 13/16" x 1" flanged bushings. Found some at 'MSC'.

The roll pin that connected the air pump shaft to the lower arm will be replaced also. No where near as worn as the tensioning rod pin.

The tensioning rod is worn at the roll pin bore and is also bent. Apparently that part is no longer 'available'. I do hope that upgrading to the newer blade tensioning will be an option. I assume I will need a different(new version) tensioning rod.

Last but not least is a 'shopsmith' logo 'decal' that is long gone. Will call Mon AM to see what my options are. Gold painting comes next while waiting on 'parts'.

I decided to not describe goldie parts painting and will let following pix show them instead.



Well the bushings arrived and SURPRISE!!! Although all other dimensions are 'correct', the flange thickness is twice the original.



Bushing 'Arbor'. The sawdust gremlins who reside on the floor stole the keyed washer which I DID use when modifying the bushings.



I first roughed out the flange with a 1/2" skew then filed(while turning) and finished up with a small jewelers file. I got very close to the dimensions of the originals(so close I will not say since I do not believe it myself).



A little more accurate press than the shade tree one.



Finally the flange was seated fully since the other end of the bushings is proud of the opposite side of the arm.

The bearings arrived and replacing them was still easy in spite of their newer condition. The looseness is I am sure due to the original bearings slipping both on the shafts and the bearing bores.



Notice the inner end where the shaft rode on the bearing. Due to both the wear and looseness, I decided to use locktite blue sparingly as I installed them(all 6)(inner and outer races) into the lower assembly. Since this was done as previously described, I will not repeat it here. However I did align the two counter weight gears with no tooth offset. I decided I probably allowed them to slip while disassembling since I did push in on the left shaft prior to the 'off tooth' pix.



The smaller connecting rod bearings were a tight fit. The inner race is tight against the arm/cam when the shouldered screw is tightened(no locktite needed).



I used a nickel to position the bearings close to the center of the rod casting.



Sneak preview



And again! Both pix taken prior to bearing installed in base.

Top one is the same same casting although it is machined differently. It is mounted inverted so the 'bow' is concave downward.

P.S. This project is currently on hold. Awaiting shafts and tensioning rod, spring and roll pins from Dayton.

Decided to get the n

ew version of the tensioning rod. Dave did not know how they differed, but I figured if it wouldn't work, I could always get the update kit. Turns out I could 'make' it work.



The old and new tension rods are almost the same. The old one has a relief on the knob end and a 6-32 tapped hole to secure the center part of the knob. The larger portion(3/8") is longer, but is not 'functional'.



The new tension rod is slightly longer than the old one and is threaded all the way to the end and does not have a tapered hole in the end. As I will show later, adding 1/4" between the tensioning sleeve and the bottom of the adjustment knob compensates for the different positioning of the knob further out on the tension rod end.



The original roll pin was severely worn so I measured the pin and the hole(both **new** parts) and found the hole to be .212 that a .187 roll pin goes into. I decided to do two things differently. 1) use a hardened dowel pin(.187) rather than a roll pin. 2) Shim the hole. I added 3 layers of aluminum pop can between the pin and the outside of the hole in the tension rod. That decreased the hole diameter by about 0.018. Since the rod needs to rotate on the pin, that is all I dared shim it.



The pin hole was packed with grease to provide lubrication. I believe the original was also. I believe the extreme wear to both the tension rod hole and the roll pin was due to the amount of play between them. The roll pin hammered the tension rod hole as the saw was operated. The creased side of the roll pin increased that 'slop' as it wore down. The opposite side suffered little similar wear.



Since the dowel pin was shorter(.750) than the roll pin(.875), the pin does not extend to the outer ends on the hole in the lower arm. I centered the pin in the arm hole and used blue locktight on both ends. Strange lighting used so the arm though gold, looks 'coppery'.

The old parts were used with the new tension rod. 5 3/16" flat washers(1/4" hole) were added as a spacer.



The knob on the new tension rod is about 1/4" further away from the pivot end than the old tension rod as shown by the mark on the paper.



5 3/16" flat washers provided about 1/4". This places the outer knob in the proper position relative to the center knob. The center knob is a detent for the outer knob. The outer knob applies pressure against the tension sleeve and spring.



The PO had marked one of the knob 'lines' with red nail polish. I kept that, but also whitened up the remaining 15 'lines'.

By tightening the center knob against the end of the tension rod, I think it will stay put. If not, there is that blue stuff! The center and outer knob must be kept close to the original positioning relative to each other since a ball bearing and spring inside the outer knob that presses against the detent grooves on the inner knob. If the outer knob is screwed down too far, the ball bearing drops into the outer knob.

The lamp added by PO was included. I added a Heyco grommet where the power cord entered the top of the right side. The grommet effectively grips the power cord so an additional strain relief is not needed. I decided to mount a magnet that the po used to hold the blade spacer and allen wrench that one needs to use the scroll saw in the hole he had drilled for a cord clamp. Pix of magnet is a couple posts down.



The small boss near the top had a hole in it and I tapped it to 6-32 so as to provide a grounding point for the power cord. External tooth lock washer both above and below the terminal. The paint was scraped off the boss so the lock washer did not have to penetrate that. The outer sheath of the power cord was removed since there is precious little room for it and the air tube.



The lamp wires and the air tube were snaked through the right side. Keeping them in position while attaching the arm cover was a PITA, but it eventually got done. Too many potential pinch points to ignore!



The web that the wires and air tube must pass through in the arm cover was deepened to make room for them.



Not easy to see, but I inserted a short piece of the power cord outer sheath over the wires as they entered the arm cover. The wires and air tube were routed as shown. I added disconnect terminals to the lamp wires.



The arm cover with the wires covered and the air tube passing through the cover.

Continue by inserting the upper arm, spring and center shaft(spacer).



This is out of sequence, as the single screw securing the arm cover to the right side has to be done before routing and covering the wires and air tube in the cover as shown in the previous post.



Slip the upper arm into the arm cover and into the right side.



Install the upper arm shaft and secure it from the outside end with the flat washer, lock washer and screw. It must be inserted through the arm bushing and into the bore in the right side. The second screw securing the upper arm cover can be installed and tightened through the hole in the arm. I aligned the cover mounting tab to square it with the top of the right cover, and pushed the cover firmly against the right cover while tightening the two screws.



The tension spring was attached to the upper arm. Note the positioning of the loop on the end of the spring.

The center shaft(actually all it is is a spacer) is inserted and secured as the upper arm shaft was.

Continue by attaching spring to lower arm, shimming upper arm cover and positioning spring washers.



Place shaft in lower arm bushing, place into right side bore, and secure with flat washer, lock washer and screw. Attach free end of spring to lower arm.



Not clear from this pix, but the rocker assembly is secured to the upper arm by a screw.



A spring washer is placed over the upper and lower arm shafts. The upper one is raised so better 'see' it. They are positioned so the shafts are centered in them.



Position the left side onto the three shafts then, shims are inserted between the left side and the upper arm cover and secured with the screw, flat washer and lock washer. The ss parts diagram shows one shim. but there were two when I disassembled it.



Finally secure the left side with three screws/flat washers/lock washers.

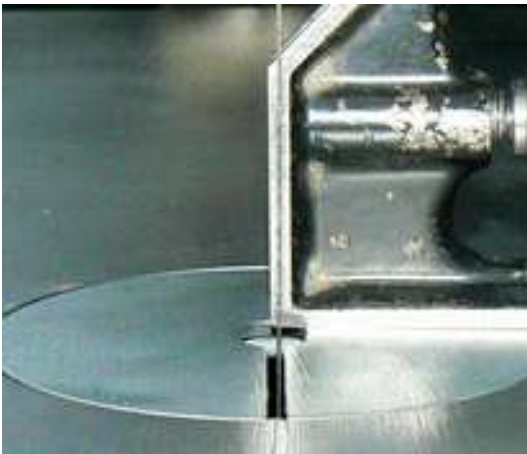
Almost done!!!!



Air tube is attached to the air pump outlet and slipped under a tab on 'counterbalance cover'.



As promised, here is the 'tool' holder mounted using the po original power cord strain relief hole.



Left to right blade alignment(table tilt). No zero stop, so accuracy requires setting properly when using.



Front to rear blade alignment. This is adjusted by moving the rear trunion arc up/down. Although the 'shimmed' rear trunion is a bit 'sloppy/loose' I am keeping it as is. IMHO it is does not move enough to affect cutting accuracy, and eliminates the need to loosen it when adjusting table tilt.

She's done!

This has been a bit of a journey.

I did not pay much for her and did not expect her to be perfect. I did not expect to have replace all the bearings etc. Fortunately it was possible to do so(not always the easiest thing[arm bushings], but still achievable). Parts acquisition (bearings, bushings, broken/bent parts, lost(by me) parts and altered(by me) parts more than doubled the 'cost'. Still a bargain!!!

And she is now part of a 'matched set'(goldie) which will soon expand to include more 'matching' gizmos.

The 'new' tensioning rod will work if I decide to upgrade to the new blade mounting scheme. In the mean time, I will try 'the old way'!

Oh! BTW Here she be!:D





Scroll Saw Arm 'play' after refurbishing.

The upper arm has less than 1/16" side play. The lower arm has even less, but the connecting rod etc. is probably limiting the play.

The sleeves were quite snug on the posts and press fitted to the arm.