

LEE GILBERT DOING

HIS THING

STAGE

III

HANGING ON THE GOODIES



" . . . and for this I turned down a job with Ray Hoy?"

Last month we found ourselves in the middle of some pretty heavy Gilbert Chassis Theory. We lightly hit upon many of the ideas that I've found to be true after more than three years serious study. More than once I had to rely on these ideas to put food on the table the next day, so you can see why I believe in them and have the confidence to pass them on to you. If you were able to comfortably wade through all of last month's article and have come back roaring to go, I suppose I should commend you for your initiative . . . but I won't. If you want to learn anything you'll have to dig, so pick up a shovel and let's go. Stage III concerns itself with the completion of the chassis. It would be wise, as it was last month, to finish reading this text before you start bendin' and cuttin'.

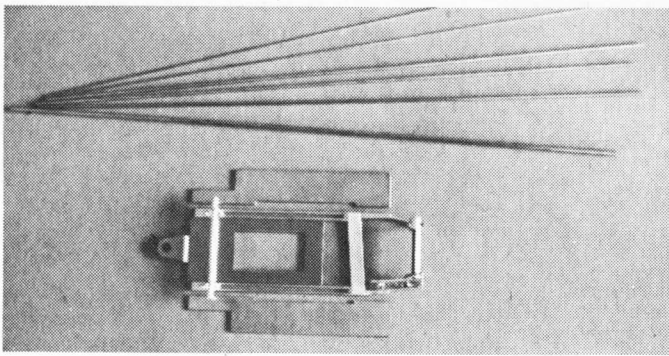
Gather around the fire now with your Girl Friday and we'll get started.

EVEN THOUGH THE center section is the heart of the chassis, and therefore the most important item affecting your car's handling, we will pay considerable attention to the rest of the construction. The placement of the drop arm, the guide lead, the plumber configuration and overall chassis weight all affect a chassis' handling in their own way and if you want to know how . . . read on.

The first thing we will concern ourselves with is the guide lead. This is the distance measured between the centerline of the front axle tube and the center of the drop arm guide hole. If you measure it any other way you're strange. I could make things easy just by telling you to make this distance 7/8" only and leave it at that, but too many of you home grown inquisitors would wake me up in the middle of the

night just to ask; *why?* Since you asked I'll lay it on you. This happens to be the best compromise between too much or too little traction/reactivity/predictability. A general rule to follow when fooling around is that a car will have a little more bite as you shorten the guide-lead. However, this will quicken the car's responsiveness to your driving reactions. Also the car's predictability goes down markedly, so unless you are Superman, don't try it. The lengthening of the measured guide-lead distance will have much the opposite affect on handling. I've tried every measurement possible and 7/8" works best most often, so use it. Fiddle on your own time.

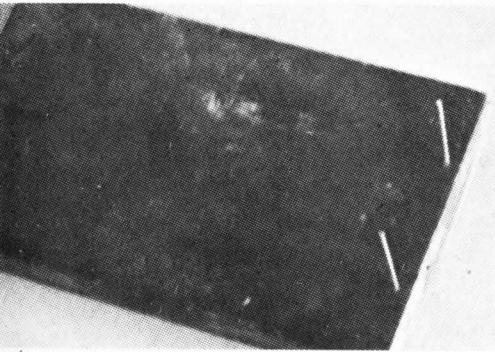
Now that you know where to locate the drop arm in the chassis, we'd better go over its pivot point together. A lot of strange things are still going on in the art of



PARTS LIST:

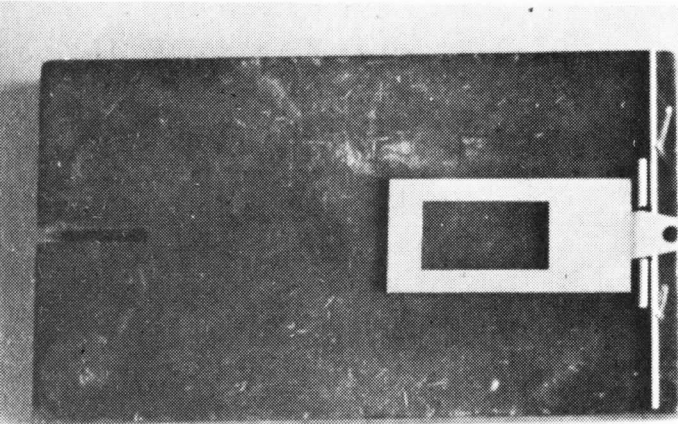
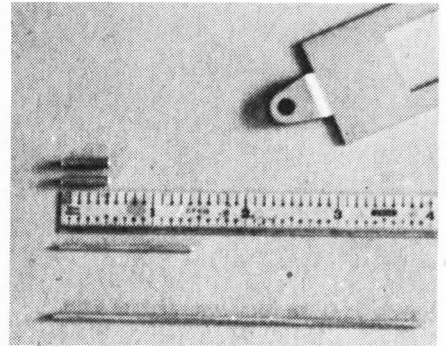
- 1 piece 1/16" K&S brass tubing
- 1 piece 3/32" K&S brass tubing
- 2 pieces 1/16" K&S piano wire
- 3 pieces 0.32" K&S piano wire
- 1 piece 0.47" K&S piano wire
- 1 Camen or Parma 0.40 drop arm with hole
- 1 set Camen or Parma 0.32 pans

Here's the goodies you'll need to finish your missile.

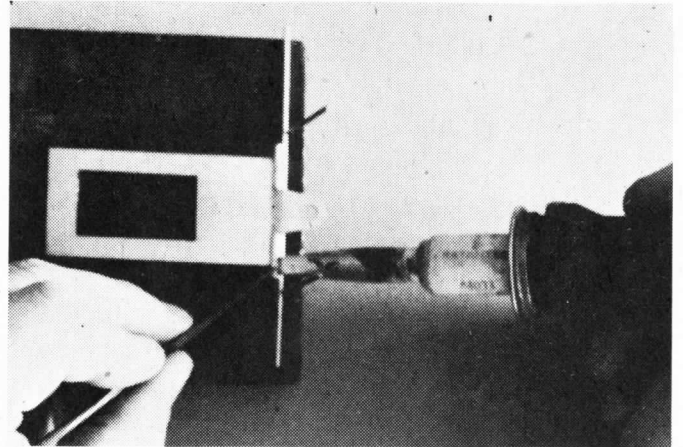


STEP 1 Drill two holes in your slate about 2-1/2" apart for 1/16" wire pegs. Beat the pegs in. If you had fun getting your 1/16" pegs to stay in the 1/4" holes two months ago, don't worry, so did I.

STEP 2 Cut two pieces of 3/32" K&S brass tubing, each 1/2" long. Assemble the rest of the stuff you'll need for the drop arm assembly. Use a Parma or Camen 0.40 drop arm, a 3" piece of 1/16" wire and a piece of 0.47 wire 1-1/2" long.



STEP 3 Place drop arm and parts on pegged slate as shown. Leave the 0.47 wire off for right now.



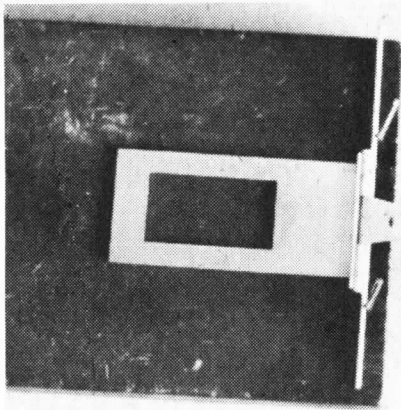
STEP 4 Carefully tack solder the 3/32" tubing to the 1/16" wire as shown. Be certain that the entire drop arm is held securely against the pegs.

hinging a drop arm so pay attention now and you shouldn't be out-psyched later by some babbling egotist (like me). The main reasons for shuffling a drop arm's pivot point are directly related to the track you race on. The type of track surface (generally: smooth or rough) and the configuration (flat or banked, mostly straights or mostly turns) dictate the amount and kind of traction you will need to master the track. Whether you are allowed to use glue will also influence the pivot placement. Smooth no glue tracks hurt for traction. Shorter pivots place less effective weight on the nose (guide) of the car making more traction possible at the rear wheels where it is needed for this type of track. Long pivots have been used to get cars over bumpy high traction courses and they also allow you to drive deeper into

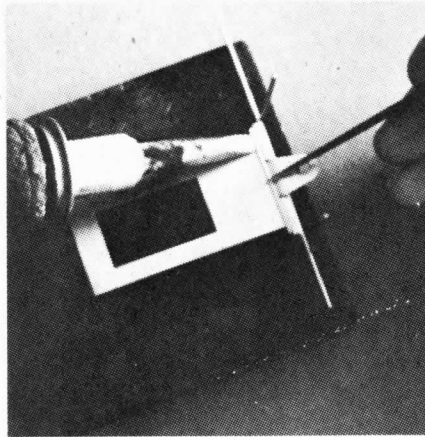
corners than shorter pivots. A good place to start is with the arrangement we're building here. Happy mediums are not always easy to find and they usually take a lot of serious work and study to uncover.

If your mind is becoming tweaked, why don't you take your pizza out of the oven and reflect a bit before going on. Hopefully between you and your buddies and your girl Friday you will be able to learn something this month; or get tired of pizza, trying.

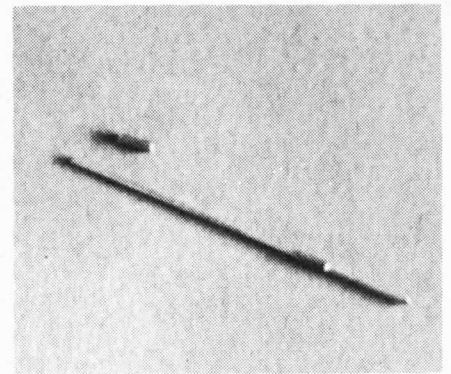
The plumber configuration also has a little to do with traction. The car we are building has a drop arm mounted plumber and this design will put more effective weight on the nose of the car. Once again this takes weight off the rear wheels and reduces traction but at the same time allows the car to be driven much deeper



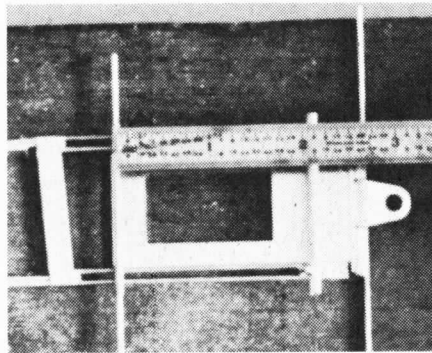
STEP 5 Place the 0.47 wire behind the 3/32 tubes as shown. Center it if you like to be neat.



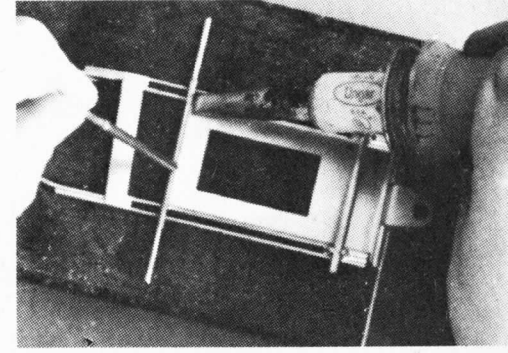
STEP 6 Hold the 0.47 wire down and solder the whole mess up. Don't spare the heat and acid.



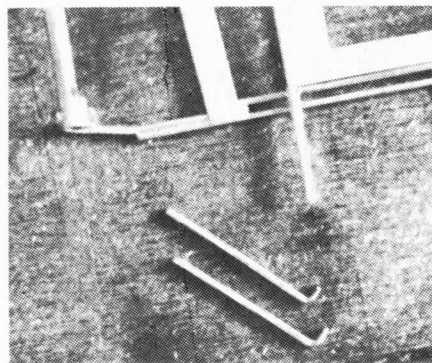
STEP 7 Cut two pieces of 3/32" brass tubing each about 1/4" long to be used as hinge points on the rails for the drop arm. Slip a piece of 1/16" wire through the two pieces of tubing to aid in aligning the hinge points on the rails.



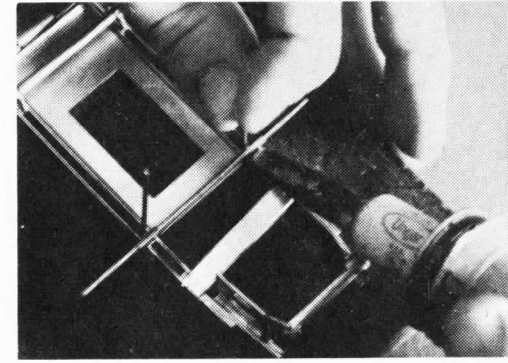
STEP 8 Set drop arm in the center section at 7/8" guide lead (see text). Measure the drop arm pivot points back from the center of the front axle tube 2-1/4". Mark and lay the hinge tubing on the wire across the center section as shown. Are you with me?



STEP 9 Tack solder the 3/32" hinge tubing as shown. Easy on the acid and solder. You might wind up with some crazy hinge tubes if you don't go easy.



STEP 10 Bend two pieces of 0.55" wire for hinge braces as shown.

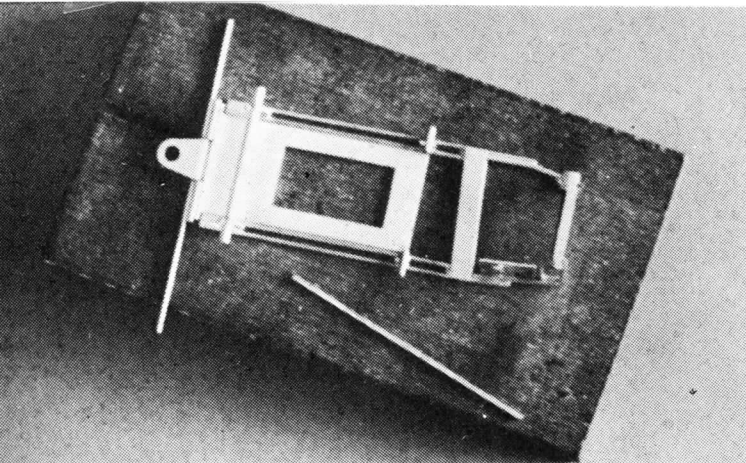


STEP 11 Lay the short end of the braces under the hinge tubes and tack solder as shown.

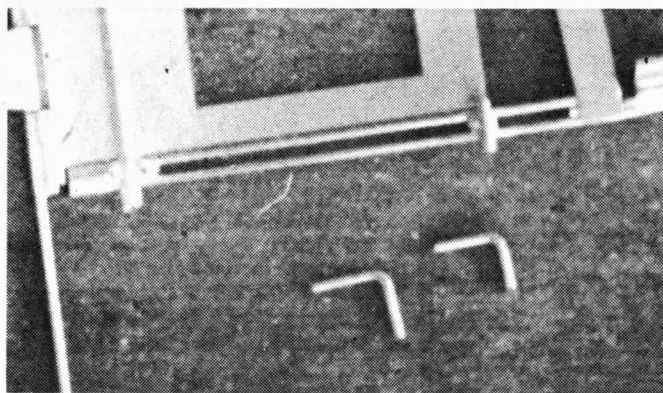
into corners. You've probably seen rail mounted plumbers before but did you know that this design was initiated to give more traction? Usually rail plumbered cars will run better with no glue tracks and sometimes even on glue tracks during the summer months when everyone seems to be hurting for traction. (Though most of these construction points affect traction in a peculiar manner, it will be of your interest to be reminded that the center section still plays the vital role in the production of good bite.) At this time we're ready to move on to the rest of the plumber design. The rear crosspiece and pan hanger bar positioning will affect the stiffness of the plumber and rails and therefore can increase traction or lose it accordingly. The farther to the rear the crosspiece is mounted, the more rear tire

traction can be attained because of more stiffness in the plumber rails. The opposite is true for mounting the crosspiece farther forward. A good trick to try when traction is needed coming out of turns but interferes with handling through esses, is to try a very flexible cross piece mounted far back on the chassis. Where there is a method, there is a compromise.

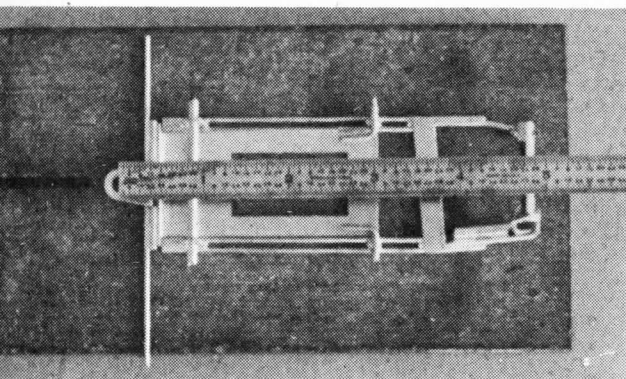
What would you like to know about pans? I've been known to use all sorts of weird things to blow opponents minds but the fact remains that pans do little more than provide a good place for lead to be glued. The hinge placement will affect the plumber stiffness again but the pans themselves just transfer weight and deadens unwanted vibration that raises havoc with traction again. We'll get into lead and how to use it later so don't get excited. Already



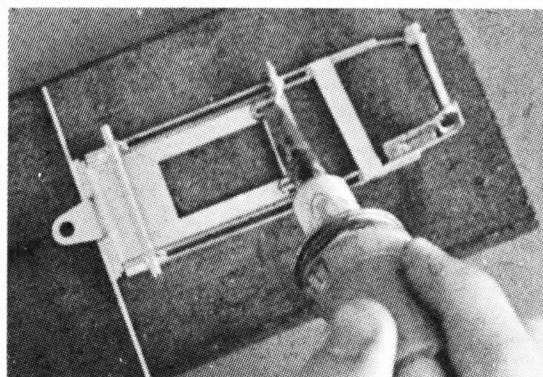
STEP 12 Yank the wire out of the hinge tubes and, if you'd like to have your body fit later, trim the braces.



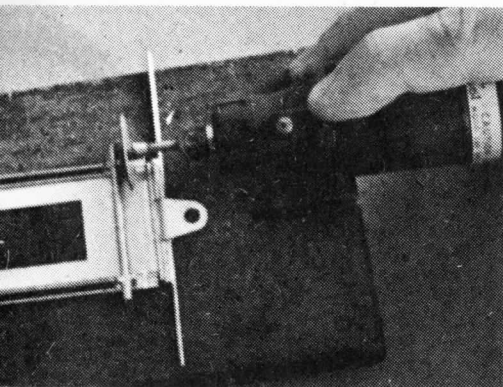
STEP 13 Bend two pieces of 1/16" wire as shown to be used as the other half of the drop arm hinge. An old fashioned right angle works fine.



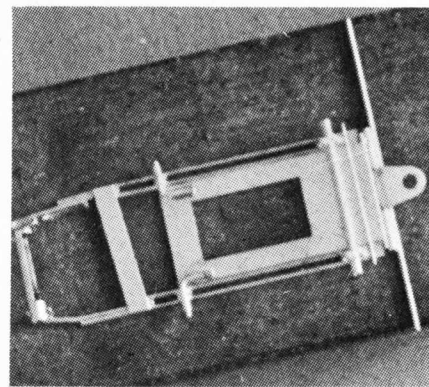
STEP 14 Insert the drop arm hangers into the hinge tubes. Re-check the guide lead.



STEP 15 Solder the hangers to the drop arm.



STEP 16 Using your trusty Dremel Moto-Tool, grind two notches for the drop arm up-stop, one on either side of the drop arm as shown. The notches should be as deep as the drop arm and wide enough to accommodate 0.32" wire.



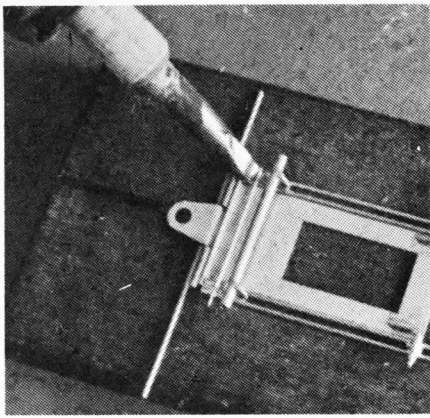
STEP 17 Lay a piece of 0.32" wire, wider than the main rails, across the drop arm and center section as shown.

you know more about chassis' than 90% of our self-proclaimed pro chassis builders.

So far I've failed to mention anything specific about your car's weight. I've found that a medium weight car with 0.40" drop arm and 0.32" pans is the best place to start for most tracks. Anything lighter will stop a little quicker but will invariably be weaker and covered with lead. If you're worried about weight slowing down acceleration, don't. Next month we'll build your motor right and you won't need to worry about it. Again, brakes are the only thing really affected by a car's weight. On the other hand, you don't want to build a tank right off (maybe later). Too much weight can seriously affect the articulated portions of your chass and their effects on your car's handling so stick to the how-to chassis now and build your own load later.

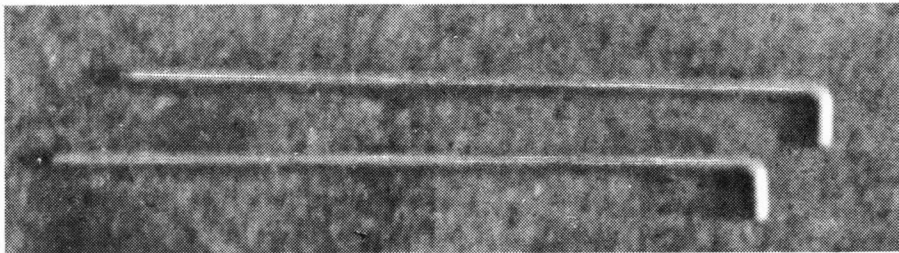
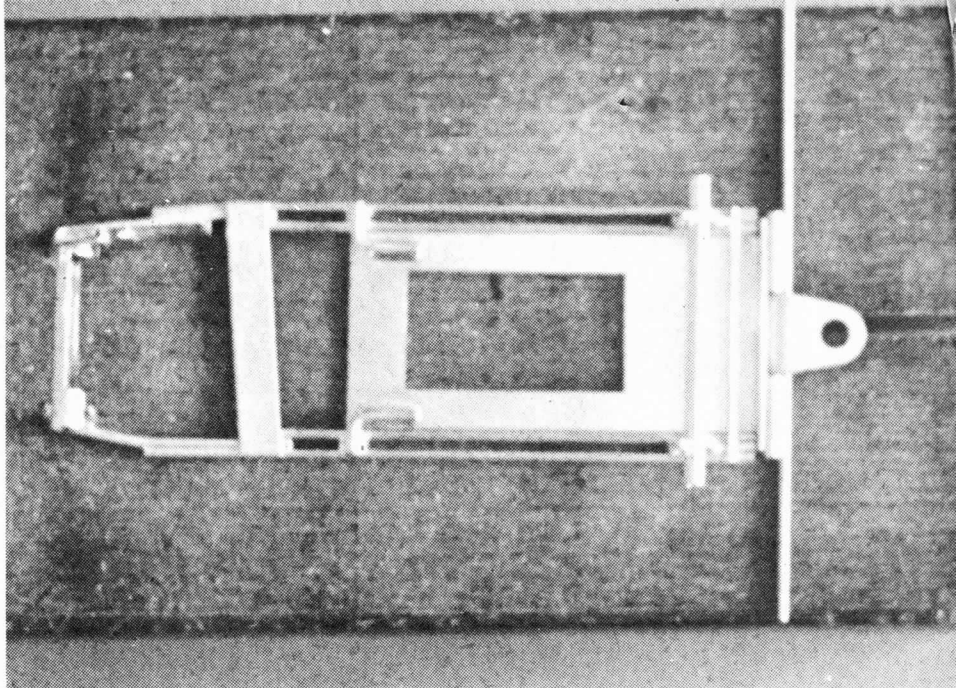
Forget solid drop arms. They waste weight that could be more effectively used elsewhere. If you don't think about that you'll find that this agrees with everything else I've said here and hopefully it will make sense if your mind is a little free and used to thinking.

I suppose many of you will not have the patience to hold off until next month to try your new chassis so let me give you brave people a few hints. If you find that the chassis is a little weird and won't break the track record the first time out, then you might want to try a new center section. This is the quickest and easiest way to make a new chassis out of an old one. I'm always amazed at the difference between two seemingly identical chassis. Each center section seems to take on a personality of its own. You can change rail



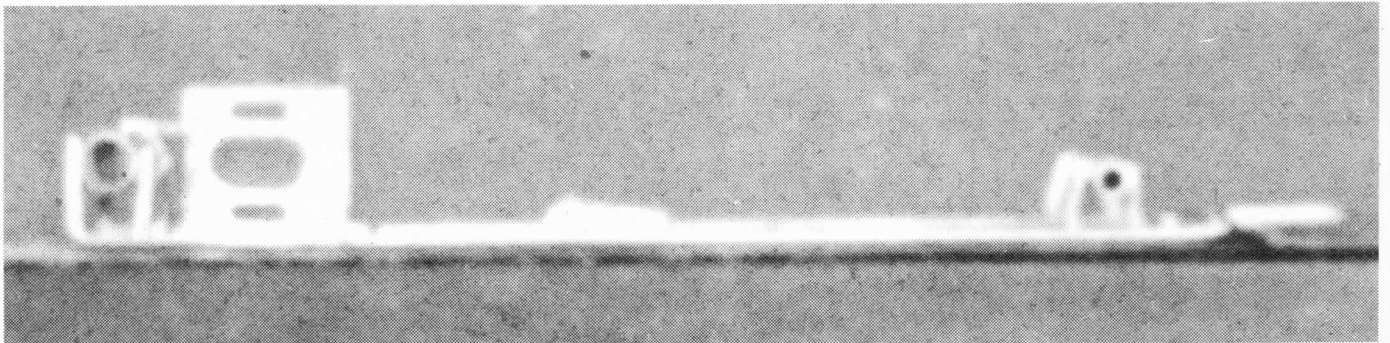
STEP 18 Solder the wire to the center section only. Make sure that everything is flat.

STEP 19 Trim the excess off the up-stop wire and take a look at your work. The drop arm should swing free and everything lay flat before we go on.



STEP 20 Now for the plumber set-up. Bend two pieces of 1/16" wire 3-1/2" long as shown.

STEP 21 Insert the plumber rails into the tubing at the front of the drop arm, one on either side. You will notice that an additional bend is needed to keep the plumber rail flat against the slate. Hope you can see this all right.



combinations if you want but I wouldn't recommend it at first. Any changes you make should be thoroughly thought out and done separately. As much sorting out as possible should be done before anything new is tried. We'll get deeply into this in the last stage of building our race car, so just hang loose.

One last thing on building. Always make certain that all solder joints are solid and perfect. With use, a chassis can weaken and undoubtedly become ill handling if the solder joints are weak. Continually check your work right down to the drop arm spring (it should always keep the drop arm *very* tight against the up stop). If anything even looks bad, fix it. A good chassis will definitely go bad if you don't take care of it. Once in awhile a bad chassis will get better but don't count on it. I've only had

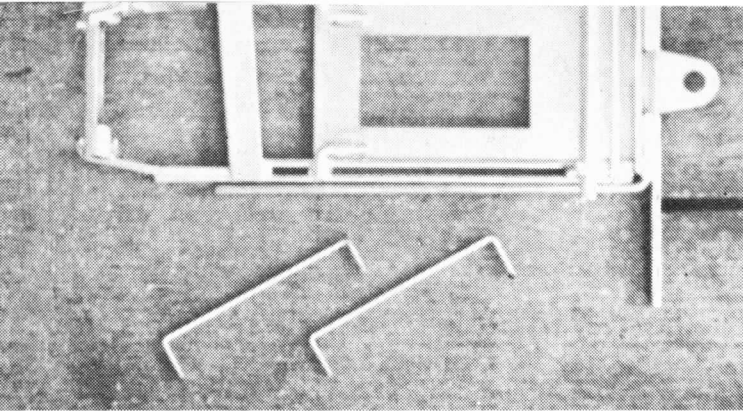
that happen once out of over 3,000 chassis (and that's because I've only had one bad chassis!).

Next month is motor time. If you think that you have been digging into the theory so far, just wait until Stage IV. In the meantime, put away the shovels and take your buddies to lunch because I think your Girl Friday just burnt the heck out of your pizza.

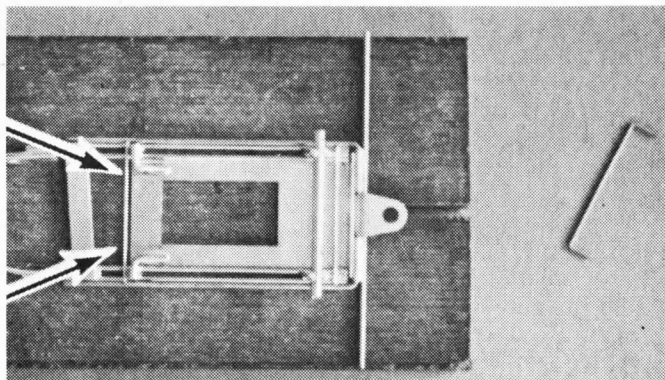
If you missed the start of this excellent article by Lee Gilbert, you can catch up by ordering your copy from our back issue department.

Part I — Building Your Jig — Oct. 1972
Part 2 — The Center Section — Nov. 1972

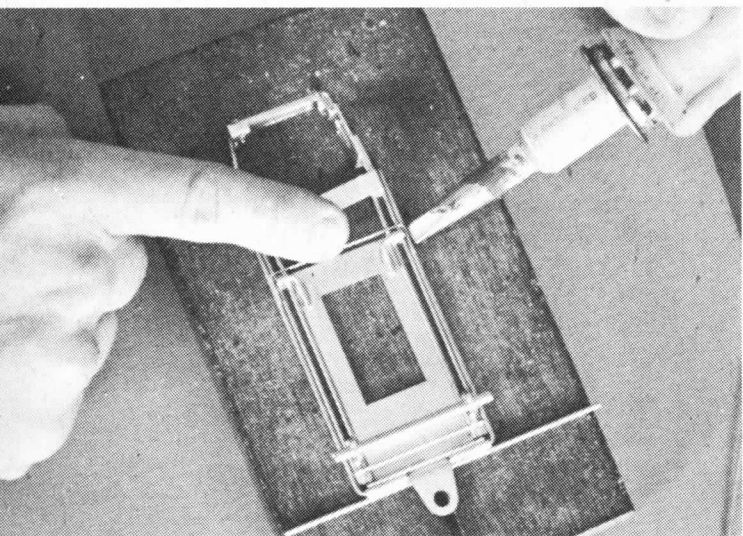
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STEP 22 Bend two pieces of 0.32" wire as shown for plumber rail crosspieces. You may blow a few getting them the right length and flat enough. Don't sweat it, I've blown hundreds.



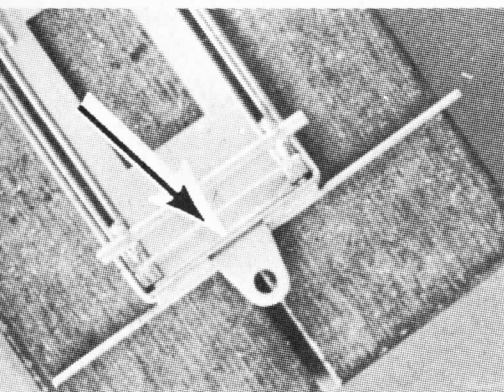
STEP 23 Lay one cross piece across the plumber rails just behind drop arm hinges.



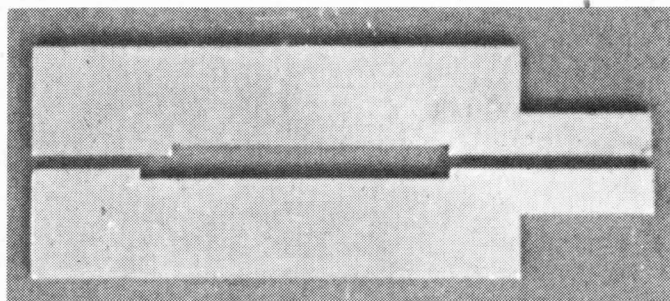
STEP 24 Solder the crosspiece. Don't worry about having the plumber rails in tight against the main rails. Leave them right there.



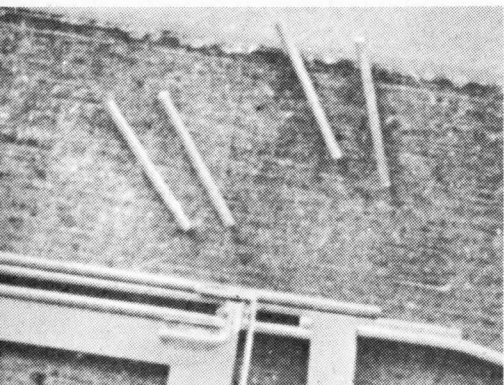
"You don't really think I'd trust her with our masterpiece, do you?"



STEP 25 On to the front crosspiece. Lay it across, in the notch between the plumber hinge tubes and their brace, as shown and solder.

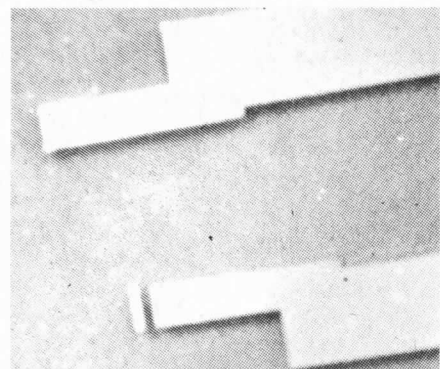


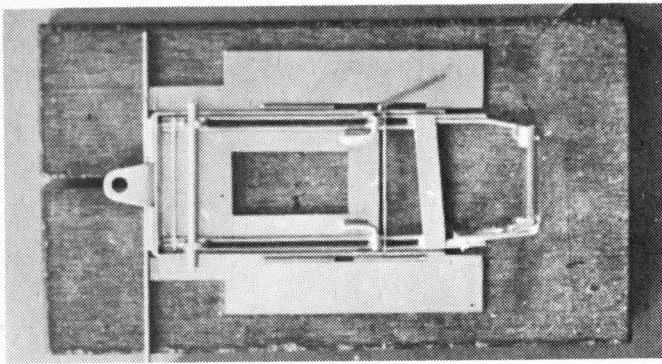
STEP 26 Grab your pans and notch the rear end of the hinge slot an extra 1/4" back. It's too bad the factory can't handle that for us.



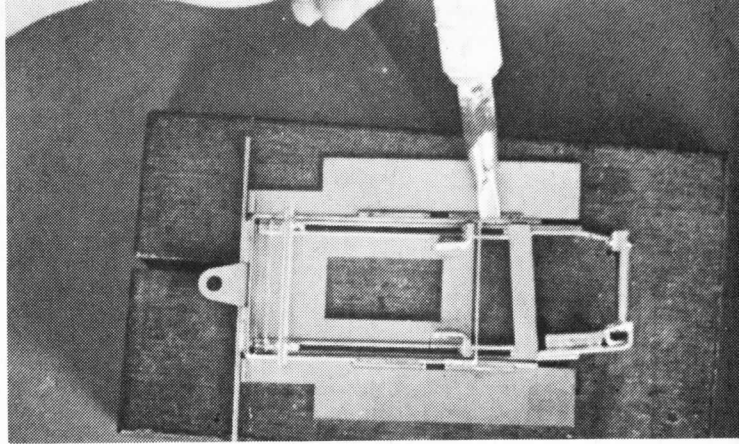
STEP 27 Cut four pieces of 1/16" brass tubing for pan hinge tubes. Make them about 7/8" long each.

STEP 28 A little more work is needed to make the pans right. Add a piece of 0.47 wire to the front of the pans as shown and trim. This makes the chassis go together better, and look neat, while keeping things aligned properly.

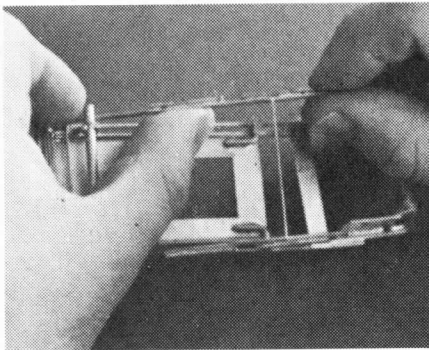




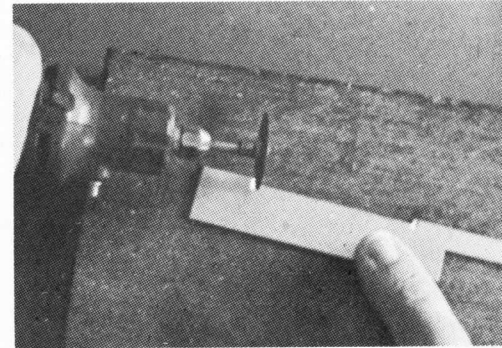
STEP 29 Lay the pans up against the plumber rails on either side, making certain that the forward edge of each pan is resting against pan bumper. You know... the thing you soldered to the drop arm earlier. Now drop in the pan hinge tubes.



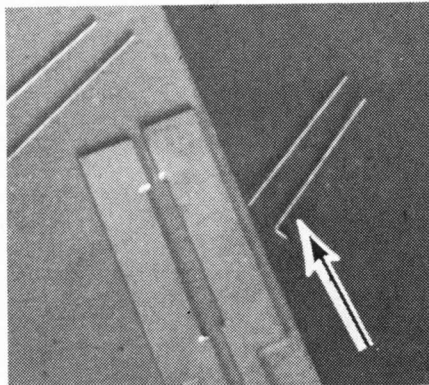
STEP 30 Solder the pan hinge tubes to the plumber rails. Do the rear tubes first. This little hint cuts the probability of rail warpage down a bit.



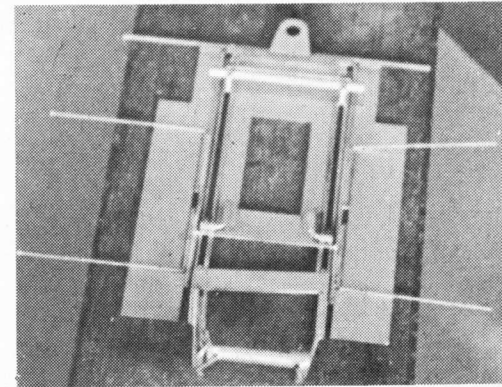
STEP 31 After you solder up all four hingetubes you may find a slight *wow* (warped area) in each plumber rail. The best way to remove the wow is to slightly bend the rails as shown... or you can use any other method that won't totally destroy the work you have done so far.



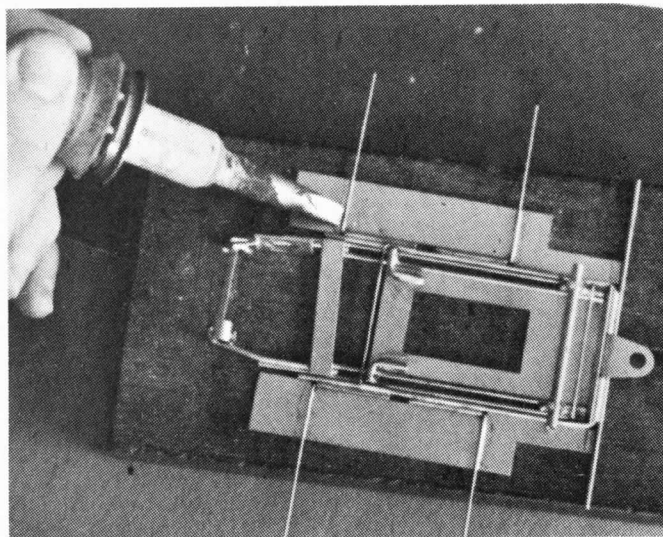
STEP 32 After you've made the plumber rails perfectly straight again, grind both pans as shown. These notches will help the hinge wire to fit better.



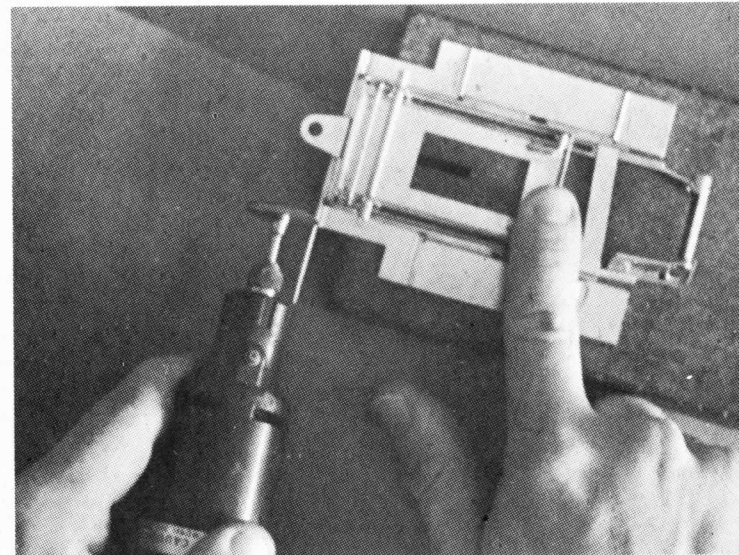
STEP 33 Bend four pieces of 0.32 wire, like the one shown, for pan hinges.



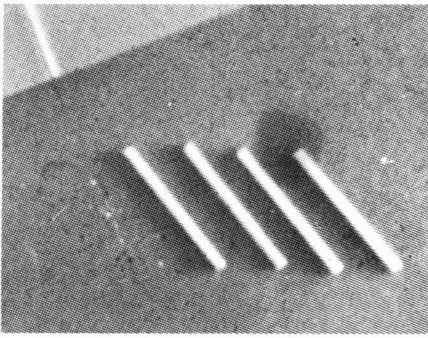
STEP 34 If you've already inserted the hinge wires in the pan hinge tubing you'll note that they don't lay flat on the top of the pans. To make things neat, take your pliers and crank on each wire until it fits. This is similar to the fiddling you've already done with the front of the plumber rails.



STEP 35 Use lots of heat and acid to solder up the hinge wires. Keep the pans in tight to the plumber rail and make sure everything lays flat before you solder.

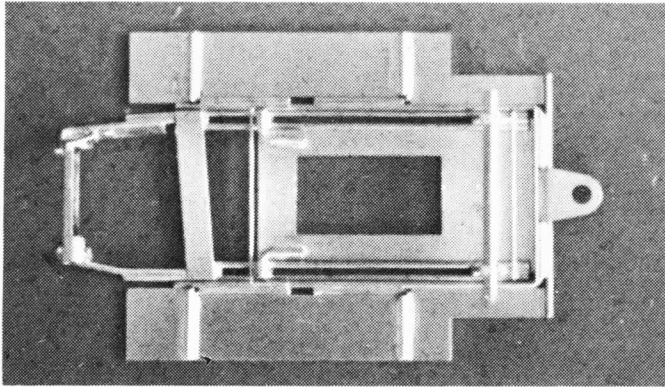
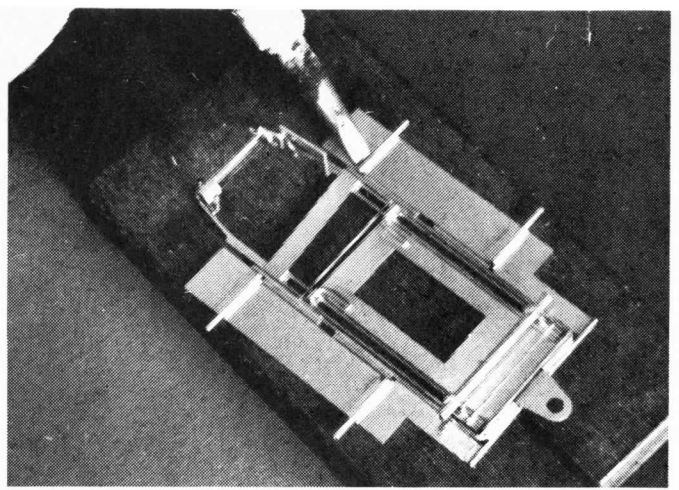


STEP 36 If you're in the mood, now is as good as time as any to trim all excess wires.

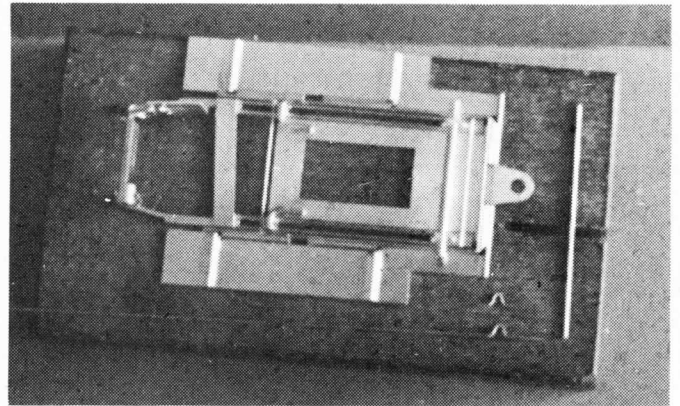


STEP 37 Now cut four pieces of 1/16" brass tubing for body mounts. Make each about 3/4" long and keep the ends smooth.

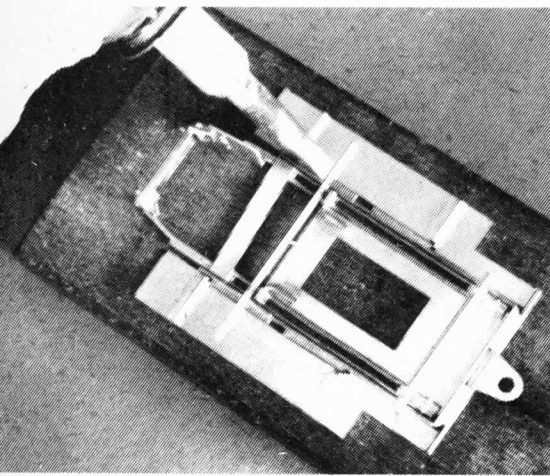
STEP 38 Lay the mounting tubes in as shown and solder up. You'll need lots of heat again.



STEP 39 Trim the mounting tubes and file smooth. A good trick, to make things easier later, is to countersink the ends of these tubes with your X-Acto knife.

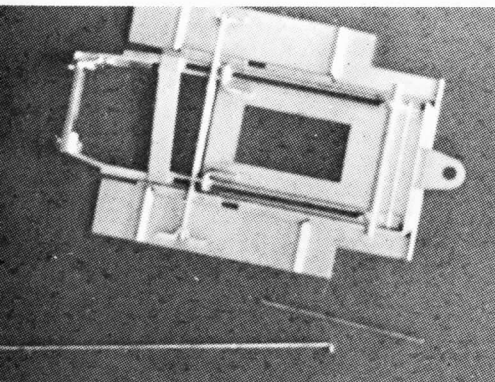
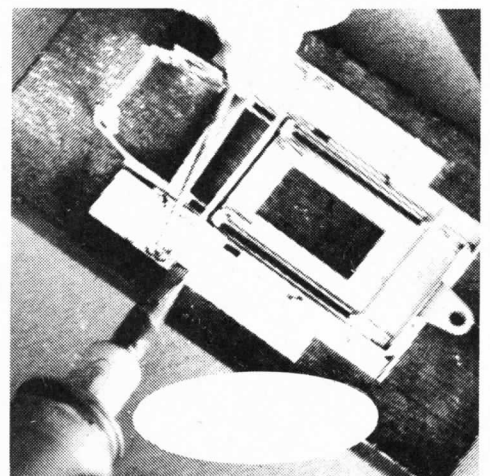


STEP 40 For the pan up-stops you'll have to cut a 2-3/4" long piece of 0.55" wire.



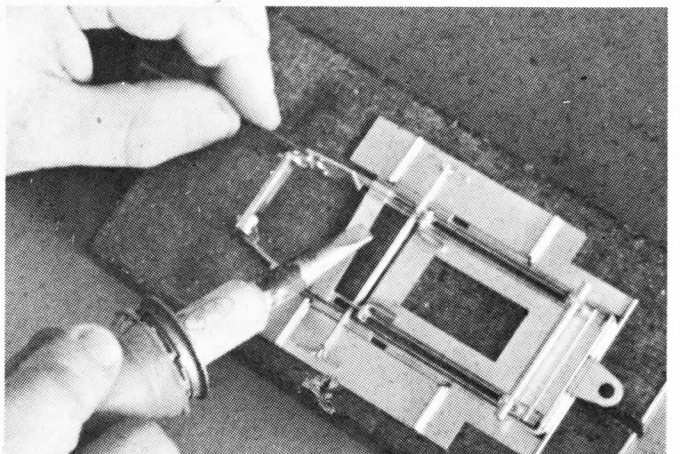
STEP 41 Drop the up-stop behind the rear plumber cross-piece and center it as shown. Solder the up-stop, being very careful not to make your chassis a solid unit like I do about half the time. Just be mellow and go easy on the solder.

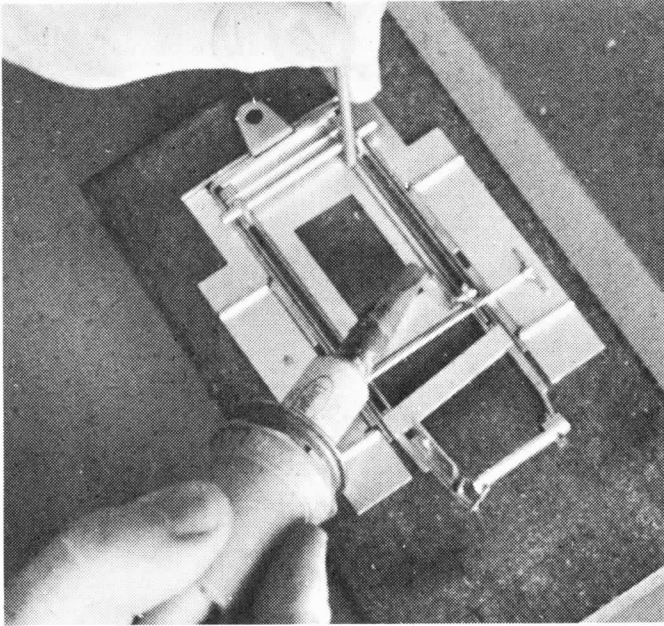
STEP 42 Bend two pan down-stops from 0.32 wire using the pattern provided. Solder the down-stops to the pans only, as shown.



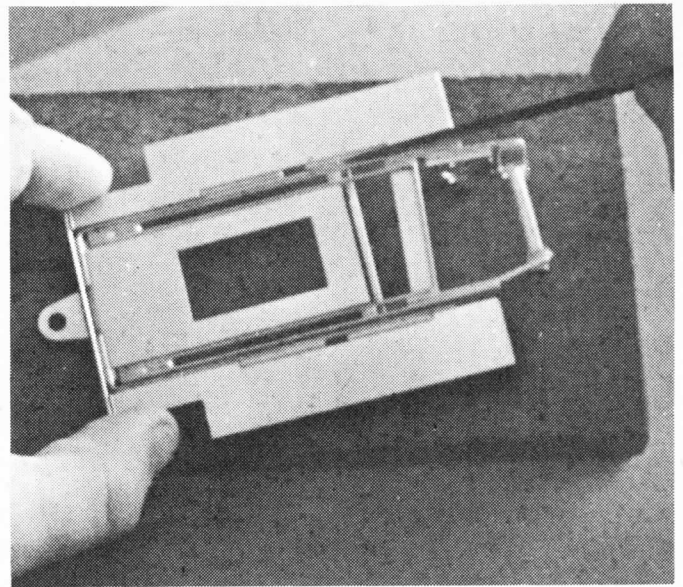
STEP 43 Bend two plumber up-stops from 0.32 wire as shown.

STEP 44 Now solder one plumber up-stop to the top of each drop arm hinge tube. Yes, this is another time to be mellow.



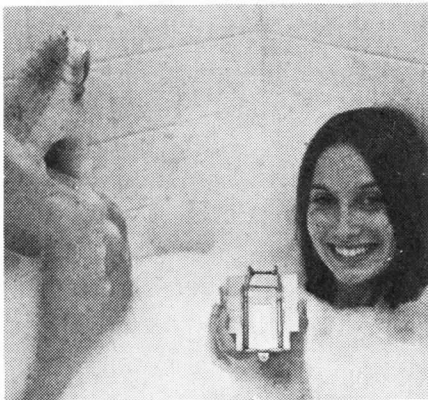


STEP 45 Make a drop arm spring from a 2" piece of 0.32 wire. Solder as shown and make as tight as possible without being ridiculous. After all, this is supposed to be a spring.

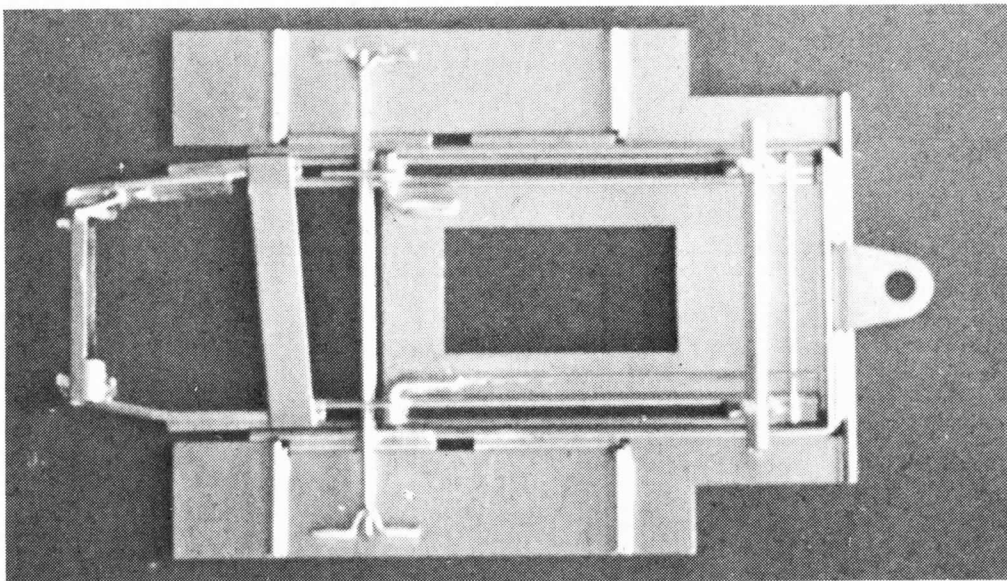
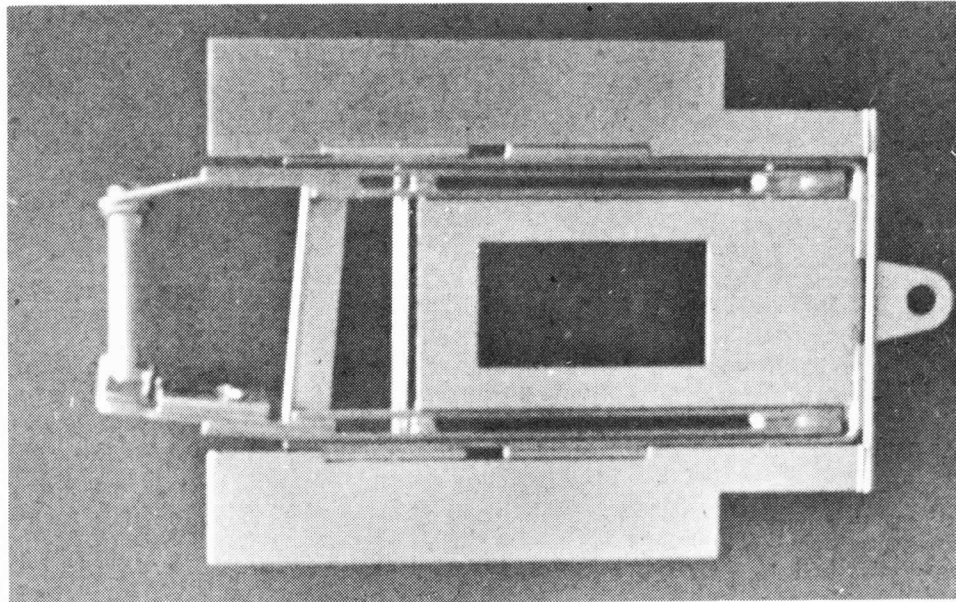


STEP 46 Clean up your soldering messes with a square file. Spend as much time as you need to make your chassis look real.

STEP 47 Grab the bathroom cleansers and your mom's favorite scrub brush and work out. Use plenty of elbow on this step.



"Keep it clean, Dona."



Well, here it is;
your very own
G i l b e r t
M a s t e r p i e c e. How
d i d y o u d o?