Chapter 5

Split soles, "chariot" planes, a "box mitre" plane, and more on skewed blades

If you reduce the bed angle of a "bevel-down" (BD) plane to 35^0, a blade sharpened with a typical bevel angle of between 25 & 30^0 will have barely enough clearance to cut properly. Drop the bed angle any further and the back of the sharpening bevel contacts the wood, preventing edge penetration. So blades mounted at lower angles (20^0 or less) always have their blade bevels facing "up" (BU). With this orientation, the bed angle can be reduced to the minimum practical clearance angle of ~10^0 which is also approaching the structural limitations of the steel. The extremely thin end of the bed is liable to distort under the pressure of the lever-cap and in fact, cracked corners in the beds of some factory-made low-angle planes is all too common.

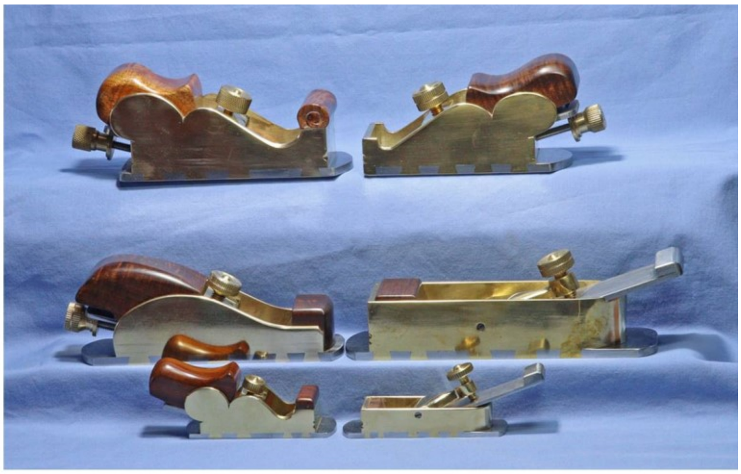
If you have a bed angle of 12^0 (a typical "ultra-low" angle), plus a sharpening bevel of 20^0 (a somewhat fragile angle for most blade materials), the lowest useful attack angle you can achieve is ~32^0. This means you are presenting the leading edge to the work at almost the same angle as a 35^0 bevel-down (BD) configuration, so given that making a bevel-up plane involves a bit more work, what's the point? I don't wish to get into a detailed technical explanation (which would exceed my competence), so let's just say there are tasks for which a BU plane is a better choice than a BD plane (and vice versa). If you have & use both types of plane you will already know this, so the following concentrates on the 'how' rather than the 'why'.

The extra work in a BU plane comes in forming the mouth. A very fine mouth is a desirable refinement on these planes but forming it the way shown in chapter 3 for a BU plane is impractical with hand tools. The mouth is a very narrow slot that admits only the tip of the blade and is far too narrow for any regular file to fit through. You *can* cut a mouth wide enough to get a file through and close it afterwards, either by fitting a sliding toe piece (as on many factory-made low-angle planes), or by permanently fixing a new piece in the gap after the mouth is formed, but both of these approaches make construction more complex.

An alternative approach, devised a couple of centuries ago, is to make the sole in two pieces. The blade bed is formed on one piece, then mated to the front (toe) piece with either a tongue & groove joint (traditional & most common), a Vee joint (less common), or (a more modern method), by silver-soldering them together in a butt or scarf joint. The joint does not have to be particularly strong, it is simply to keep the two parts of the sole registered accurately while you scribe & fit the side dovetails. Once sides & sole are locked together by the dovetails the T&G is essentially redundant. In fact, for a mini-plane I made, I wasn't confident I could make an accurate T&G joint in the thin sole pieces so I used 'superglue' to hold them together for scribing. This worked satisfactorily and the sole ended up rock-solid after peening.

On any dovetailed plane, a "pin" usually spans the mouth area to minimise the chance of bending or buckling during peening. On 'split' soles the joint and long blade bed make this section weaker & more susceptible to collapse during peening so this 'pin' should be long enough to fully span the bed area. The lower the blade angle, the longer the bevel & therefore the longer the pin needs to be.

Note wide 'pin' which extends from in front of the mouth to near the end of the long, shallow blade-bevel. This keeps the peening away from the thin sides of the mouth & bevel



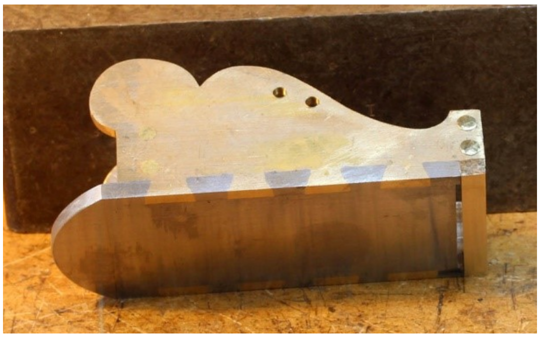
A selection of bevel-up planes.
Top: bull-nosed & extended-toe chariot planes. Centre: English thumb plane & box mitre. Bottom: miniature chariot & mitre planes

There were several different styles of BU planes with two-part soles made in the late 1800s to early 1900s. These included "box mitres", said to be the first fabricated metal planes made commercially (centre row, left), which have a box-like shape. "Chariot" planes were also named for their shape (top row, left), but how "thumb" planes (centre row, left) got their name I don't know, they are much larger than any thumb! Thumb planes were made with minor style variations in different parts of Britain, so "English", "Irish", & "Scottish" versions are recognised. They are similar to modern "block" planes in size & function & were presumably used for the same purposes. The "thumb plane" illustrated is inspired by a Norris 32 but has separate sides & a straight back rather than the single curved-back sides of the Norris. After around 1850 cast bodies (bronze or iron) became common, but fabricated bodies were still made into the early 1900s.

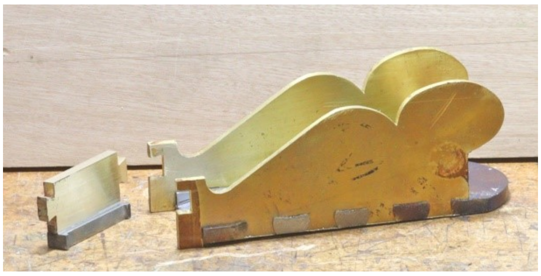
Constructing a chariot plane

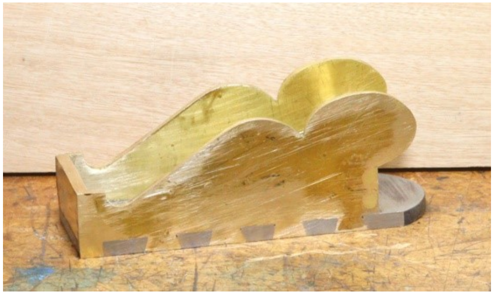
Most "chariot" planes were bull-nosed, i.e., they have a very short toe (~ 6mm) and were constructed a little differently from "full" toe versions. In the latter years of their era, most chariot plane bodies were cast, and a large gap was left at the front of the casting to get files through to smooth the bed. The gap was then filled with a piece of steel sweated, screwed, or pinned to the front of the plane & levelled to the rest of the sole. I have never been able to examine a fabricated version to determine how the nose of these was fixed. One description I saw of a dovetailed, bull-nosed version described the front-piece as being "L-shaped". There were no further details as to how it was fixed to the body, but dovetailing it to the sides is a likely method.

In the absence of specific information, I have tried a couple of ways to fit the toe. For my first attempt, I soldered & pinned a T-shaped piece of 6mm brass across the front to close it & form the toe (right). A sound solder joint would probably suffice but the nose is likely to be bumped when working up to edges, so I added pins as extra insurance. With a little light peening to tighten the joins, the front piece blends seamlessly with the sides & sole after filing & sanding it flush. The result is neat and functional and the plane works as intended.

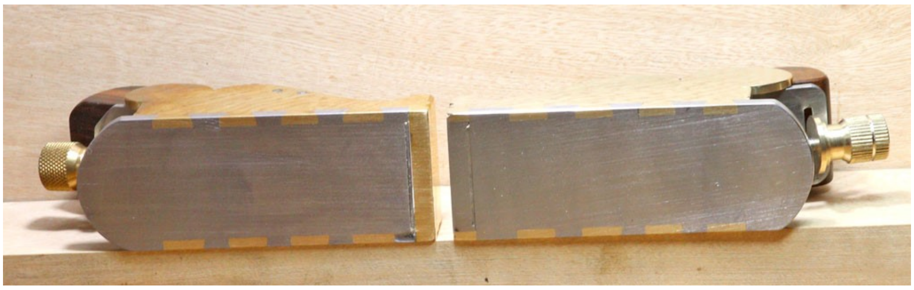


On a subsequent version I used a different approach, I soldered a 6mm wide strip of steel to a 4mm thick brass cross-piece (see below). The brass cross-piece was dovetailed instead of pinned to the sides & I added a rivet in the steel piece for extra strength, though again a sound solder joint would probably be sufficient.



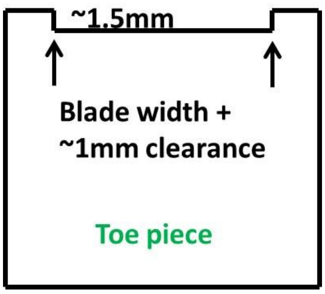


Fitting the toe by the first method is a little simpler; the second method gives the sole a continuous appearance. I don't think there is any significant functional difference, so choose whichever appeals to you.



Split-soles with a "full" toe

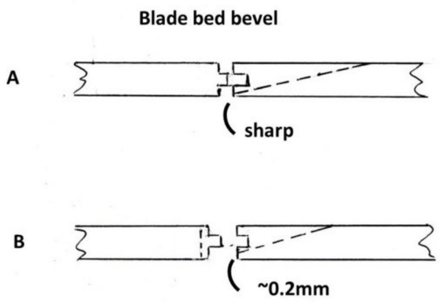
Mitre & thumb planes have a "full" toe (up to a third of the sole length on mitre planes) and the easiest way to form a blade bed & mouth is to split the sole. The following method is what I've evolved though some trial & error:



First, the sole pieces are cut to the required width, then cut across where the mouth will be. It's a good idea to make these a little longer than yje final length so you can have a second attempt at the joint if thigs go astray. Make sure the edges to be joined are straight & square & mate accurately. On the <u>toe</u> piece, mark out & remove a shallow notch to form two stubs each side on which the tongues are to be formed (as shown in the diagram). The suggested 1.5mm depth is quite adequate; you will not gain anything by making them deeper other than extra work.

Mark out the tongue on the toe piece 1/3rd of the thickness of the sole as for a wooden joint. I use a small marking gauge with a high-speed steel pin (an old drill bit) for this. The same setting marks the groove, you just cut on opposite sides of the layout lines. To form the shoulder of the tongue, align a straight scrap of steel to the scribe mark & clamp it firmly to the sole. Grip it in a vise and butt a hacksaw to the guide, then carefully saw the shoulders. Repeat for the other side. With a typical hacksaw blade and a 1.5mm tongue, this leaves just a small sliver of metal which can be broken off & filed flat to form the tongue. Note that you cannot file a perfectly square corner with the edge of a regular flat file because the edges are always slightly rounded. To get right into the corners I grind a square "safe" edge on a small file so it can cut into a right-angled corner.

Before making the matching grooves on the heel part of the sole, form the blade bevel to remove the metal in between so you will only need to cut a short groove on each side.



You can set out the bed bevel so that it comes to a sharp edge as shown in diagram A, or have it end with an edge about 0.2mm thick.

Making a full bevel that ends in a sharp edge means you will only need to remove a tiny amount from the toe piece to form a useable mouth. However, a knife edge on the bevel is fragile & contributes little or nothing to blade support so it should be filed back to something of the order of 0.2mm thick.

Option B, bringing the bevel to a blunt edge, will save quite a bit of filing, but you will need to take out more metal from the toe-piece in order to form the mouth. The overall amount of filing involved is less, but the catch is that it is more difficult to estimate how much to remove from the toe piece to form the mouth. The tolerances are tight & there will be adjustments to make either way, but after about a dozen split soles I've decided forming the full bevel makes it easier for me to achieve a really good mouth.

Making bed bevel: bulk waste removed with hacksaw cuts, & knocking out residual fillets

The waste from the bed bevel can be removed entirely by filing but there is a lot of metal to remove and it will be a very tedious job. So I use the "filleting" technique (described previously), to remove the bulk of the waste. (When sawing the 'fillets' be very careful, it is very easy to over-shoot when sawing at such a low angle to the work). You can twist the fillets off with a screwdriver if you cut them finely enough or saw them off by leaning the hacksaw over. The first few require great care to avoid over-cutting, but once you get a few off & can lay the blade flatter, it becomes easier & you are less likely to over-cut.

Using a guide block to complete filing blade bed

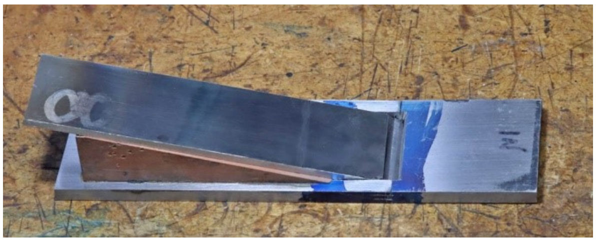
As for the BU soles, I use a guide block to file the bevel square & flat. With such a low ramp -angle, it is difficult to attach the block to the sole with clamps without having them in the way. My solution is to glue the block in place with PVA glue. Carefully position the wedge on the sole & allow it to cure overnight. When you have finished, an old chisel driven between wood & metal will usually pop it off cleanly. The water in the glue will cause some rusting of mild steel but that is easily removed.

Strive to get the bed both flat & square to the sole; if the bed is skewed even slightly on very low-angle beds, you may not have enough room in the body for adequate lateral adjustment of the blade. You can compensate by sharpening the blade with a slight matching skew but that can be inconvenient, so do your best to get the bed as square as possible.

Good-quality flat needle file & home-made scraper/burin for refining T&G joint.

With the bevel completed, you now have clear access to cut the matching grooves for the tongues on the rear part of the sole. I generally make a single hacksaw cut between the lines, then clean out the groove with the edge of a flat needle file, testing the fit of the front piece constantly as I approach the lines. I use a scraper made from an old file ground to a thin tip to clean out the rounded corners left by the file. The ideal is a firm fit that goes together with a few light taps. If the groove ends up a bit loose, you can gently tap it closed a fraction, but do this very sparingly, & on the top only, or you may cause a depression that won't lap out without removing an excessive amount of metal.

When the T&G joint is completed to your satisfaction, tap the sole together & using a wedge of wood cut to the bed angle (the one used to file the bed if it came off intact), check if the blade will come through, & if not, file the toe side a little to open it. I prefer to have it so the blade *almost* comes through & make final adjustment after assembly & lapping. Split soles can end up slightly misaligned after assembly and usually need a bit more lapping than solid soles, which may increase the mouth opening more than desired. Adjusting after assembly requires an extremely thin file &

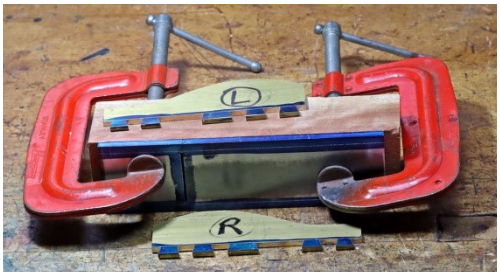


can be a very tedious process, so I try to get it very close to minimise the task. This one is what I aim for – the blade is right on the point of coming through. It did require a tiny amount more to be filed after the sole was lapped to perfect the gap, but the result was a very good mouth.

Make sure there is a bevel of ~10^0 sloping forward of the mouth for good shaving clearance.

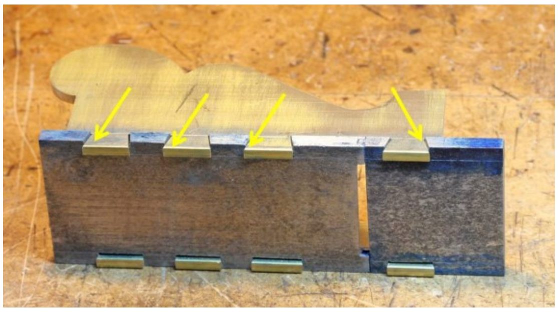
[*A "super-fine" mouth on these sorts of planes means a mere slit, of the order of 0.1mm (~0.005") between the edge of the blade & the front of the mouth – it looks ridiculously small! The narrower* *the mouth, the better it controls tear-out, but the greater the chance of clogging with some woods which may limit the plane's versatility. In reality, such super-fine mouths aren't necessary for planing end-grain, which is the task at which BU planes excel, so don't despair if your mouth ends up a bit wider than this, you can still have a very good plane.*

Note also that the width of the slot in the sole as seen from the sole side is ***not*** *the actual* *mouth.* *The total width of the slot in the sole depends on how much you reduce the sharp edge of the bed bevel. Filing this back increases the width of the slot, but does not affect the actual mouth opening which can only be increased by filing the* *front* *of the mouth, or lifting the blade to a higher angle.*]



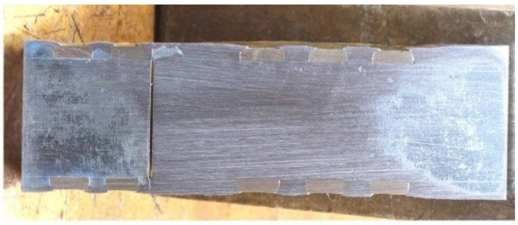
The next step is to mark out the pins on the sides of the sole, which is no different from other planes except you do need to ensure the sole pieces are clamped tightly together whilst scribing the pins.

Fitting the parts



When cutting & fitting the sockets on split soles I try to file the edges of the sockets so the fit is minutely loose on the sides closest to the join in the sole and tight on the opposite side ('tight' side arrowed in illustration at right), so that the two parts of the sole are pushed firmly together.

Peening a split sole plane is much the same as for a solid sole except I am careful which side of the pins I peen first. If you begin by working on the pin sides indicated by the yellow arrows it will tend to push the two parts of the sole together harder. Once these edges are closed reasonably solidly, the opposite side can be peened. If the T&G joint was a reasonably close fit, light peening over its edges will render it almost invisible after clean-up, but go easy, this area is not well-supported internally & you may collapse it if you are too enthusiastic. Bill Carter chamfers the inner sides of the tongue & groove so that if they are pushed inwards a little by the peening, they won't impinge on the blade. Wedging a bit of scrap steel across the bevel also prevents collapse but you need to do this before setting up on the peening block.



Initial lapping of sole: Toe section lower than heel section

If the sockets in the sides were perfectly in line and the sole pieces fitted accurately, the two parts of the sole should end up nicely co-planar after peening. In practice, I've found there is often a slight dip or bulge at the join, but if you've worked carefully, this should be minimal & not cause too much extra lapping.

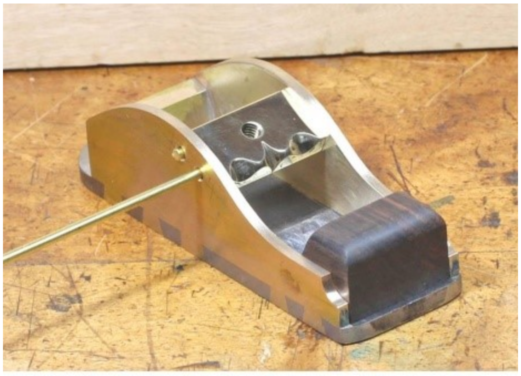
With the sides attached, you can now prepare & fit either the bridge for the wedge, or a lever cap, whichever is your choice. A fixed bridge can be installed by making tenons on each side of the bridge piece that extend through the sides of the plane, then peened & filed flush as for rivets. However, you must decide on that approach before assembling the body because you won't be able to get it in after peening the dovetails. Fitting a fixed bridge in this manner also requires a deep cut-out in the peening block to accommodate it & can make fitting the bed infill awkward.

An easier method, which I think is equally sound structurally, is to install the bridge after the sides are attached, using screws or pins though the sides (right). If using a wooden wedge to secure the blade, a single pin through the bridge will allow it to swivel & adopt the wedge angle, which both holds the wedge more firmly & is less apt to damage it.

Bridge attached with screws

Instead of a simple wedge, I prefer a fixed bridge & a thumbscrew bearing on a brass insert in the wedge to apply pressure (left). This method was used on similar Norris planes fitted with screw adjusters (e.g. the A32). It requires very little extra time & effort to make the thumbscrew & wedge insert, but adds convenience for the life of the plane, particularly if you intend fitting a screw adjuster.

If using a thumbscrew to secure the wedge, use two screws or pins per side so it remains fixed. My preferred method now is to use 3mm brass rod which is threaded and screw into the bridge for 6-8mm. Peened into small countersinks then filed & sanded flush, the pins become all but invisible.



Pinning bridge in with threaded rod, cut off & peened into countersinks in sides

Bridge pinned in place

A split-sole plane with a difference – the box mitre

The so-called "box mitre" plane is thought to have been made as early as the late 1600s though no datable examples survive from any earlier than the early 1800s. These are "boxy" low-angle planes, made in sizes ranging from roughly the size of a small modern block plane to quite large and hefty planes over 250mm long ,with blades ~50mm wide or wider & thick sides. Exactly what they were used for has been forgotten but the fact they are low-angle, bevel-up planes in an era of mainly wooden bodies which aren't suited to low-angle blades must have some significance. They had *extremely* fine mouths and one suggestion I've read is that they were used for levelling inlay & marquetry. Bill Carter has done more than any other person to revive interest in these curious relicts and has made an extraordinary number of them, from tiny miniatures to full-sized examples, many decorated with his signature "cupid's bows". He has an entertaining & informative set of videos on u-tube on making one: https://www.youtube.com/watch?v=KEL3ztrzBug&list=PLtrJ_TcbkJKK_qNTTpeF5DKmDuik6hSEf&index=4

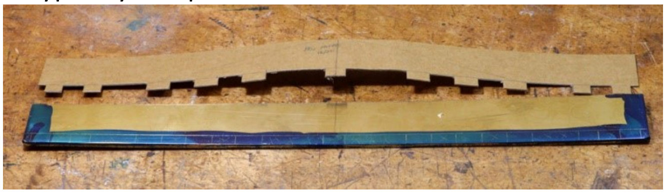
A Bill Carter bronze mitre plane with his signature Cupid's bow decorations

The main difference between these planes and the other split-sole examples above is that they have continuous sides, bent in a curve at the back, & closed at the front by a cross-piece. During the relatively long period during which these planes were made, only a few (mostly minor) variations evolved. Bodies were initially fabricated from wrought iron, but later, bronze and brass were also used for sides, or the body was cast in iron or bronze. On the latter, either a filler piece was added to close the mouth after the bed was formed or an iron sole sweated to it. Early examples had a wedge retained by a bridge or pin (or on cast bodies, by two lugs cast in the sides). Later, they were fitted with lever-caps. English versions on the whole retained the "boxy" shape but some regional variations developed. There are examples with square instead of rounded backs and late variants had separate instead of one-piece sides. The bridge on wedged versions is typically tenoned through the sides (see the Carter example above). While most of the later planes were fitted with lever-caps, even in the early 20th C you could still order one with a wedge if you preferred (traditions die slowly!). The vast majority of mitre planes had no depth-adjusters, Stanley's #9 and a late Norris version, the A11, being exceptions. (Incidentally, the A11's adjuster is almost identical to the adjuster used by Veritas for their low-angle planes).

What makes construction of this plane different is the single-piece sides. Once bent & closed, the sides must be fitted onto the sole from above which means you can't cut close-fitting dovetails as you can with separate sides. The "dovetails" are formed by a bit of artful peening. You *could* make full tails and get them fitted, but it would be very awkward, so the tradition developed to build them as described.

Constructing a Box Mitre plane

The plan & elevation given in chapter 6 should be enough to enable you to make a side template, but if you plan to make a larger or smaller plane, drawing a full-size plan and elevation of your proposed plane is almost mandatory. The blade bed angle was typically around 18^0, but a couple of degrees either way will make little difference so if you are making your own design, the blade angle can be juggled a little to get the best fit. On some planes, the blade exits at the back just ahead of the curve, while on others, the top of the curve was cut down slightly to allow the blade through (the drawing in chapter 6 is for the latter arrangement). There is no preferred way, choose whichever looks better to you. I was limited by the length of material I had for sides, had it been longer, I could have made the body long enough for the blade to clear the curve, but I am quite happy with the way it looks. Mitre planes also typically had pronounced extensions of the sole at the toe & heel, adding considerably to the total length of the sole.



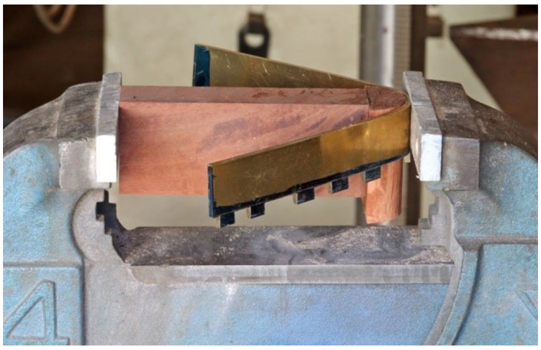
Construction begins by making a side template based on your drawing, with the tails for attaching to the sole set out accurately. I opted for a tail or pin on the centre of the back curve. Some makers did this whilst others relied on the side tails alone to pull the sides tightly against the sole. Note the pins are 'straight', not cut as "tails" like on separate sides.

I advise using a "soft" brass like H62 for sides because of the extra peening required to fill the sockets on the sole side. Hard brass like C385 is liable to crack if peened more than a little. Bill Carter tends to use heavy gauge material for the sides of his planes (as much as 6mm), which takes a lot of effort to bend and would add considerably to weight. The 3mm plate I chose for this medium-sized example (the 'box' is 138 x 46mm) took more effort to bend than I expected, so I would not like to be bending much thicker than about 4mm, myself. The chosen thickness imparts plenty of stiffness & at a bit over 900g, this is a moderately heavy plane for its size.

After sawing out the waste I used the same method as previously described to file the bottoms of the sockets to a straight, even line. It is important these all align precisely for a close fit on the sole.

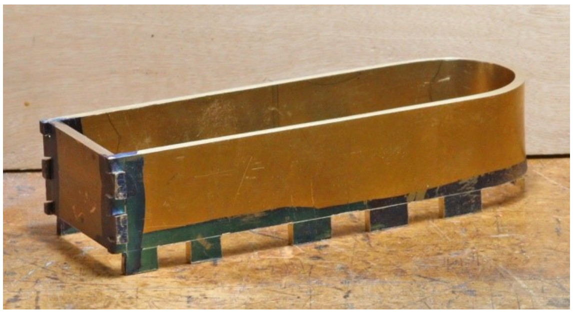
If you intend fitting a traditional through-tenoned bridge, you need to cut the slots in the sides now. This requires some very precise setting-out and also means you will have to get the bend perfectly symmetrical so they end up exactly opposite. You could fit a bridge after assembly in the manner described for the chariot planes, but I'm intending to fit a lever-cap, and that is easily done after assembly.

I made a bending form by turning a short cylinder of hard wood to a diameter matching the inside width of the plane (40mm in this case), cutting it in half, & gluing one half to a block a little narrower than the inside width. The form needs to be long enough to allow the sides to be brought fully around to parallel (as illustrated at right).



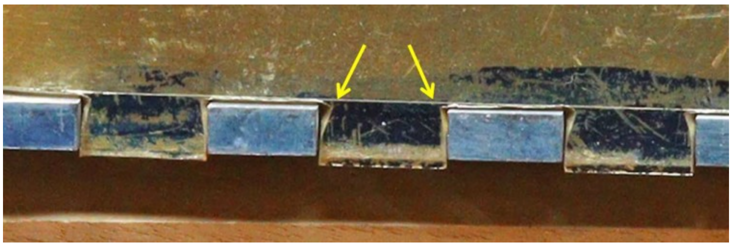
The top of the sides was aligned with the top of the vise & the form set against it so that the centre lines on it & the side piece matched exactly. The form also needs to be set at right-angles to the side piece, of course. I took a piece of hardwood & sawed off one end at a sharp angle so that I could push it between the brass & the vise jaw & lever the side away to start the bend. Once I had the bend started, I turned the block around & forced the bend further, keeping the wood against the curve to make it follow the form.

Even with the “soft” brass there was considerable spring-back, so to eliminate as much as possible I clamped the back of the sides between some steel scraps (hard wood would do) clamped hard against the form (above). This neatened the curve and reduced the spring-back to the point that when the sides were pulled together at the front, they were both straight & parallel (right).

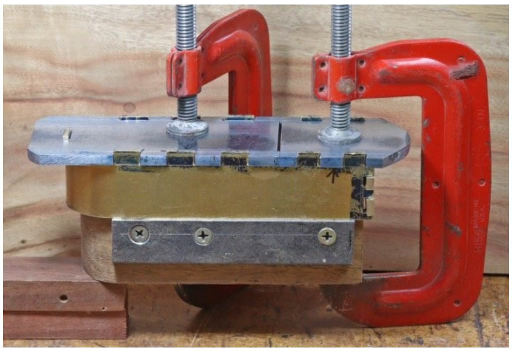


The front piece can be peened in now, or simultaneously with the sides. Peening with the sole in place is a bit awkward but you can pull the cross-piece tightly against the sole to get a tighter join, so there are pros & cons either way.

Preparation of a split sole has already been covered, the only difference is I suggest making the ‘pins’ on the sole protrude by an extra 0.5mm over what you’d allow for close-fitting dovetails so you have plenty of ‘spare’ metal for peening. To scribe the tails to the sole pieces, clamp the sides in place over the inside lines on the sole and make a mark against the edge of each tail with a sharp scriber. These marks are then extended to the edge & side of the sole using a trysquare, after which the sockets may be cut in the normal way.   You could cut the sole pins at a slight angle to help form the sides of the dovetails, but it isn’t really necessary & would probably make it harder to fit the sides.



To create the 'dovetails', a little sleight of hand is required. This involves filing a tapered chamfer on each pin as shown at right. These allow you to peen more sole material over the tops creating an angled side when filed flush. If masking an all-steel body, there is no point in trying to simulate dovetails since they won't be visible, but a similar chamfer or notch will still help secure them. It doesn't need a huge chamfer or notch to form a strong joint, peening the joints firmly & filling the gaps on the sole side will form a bond that should survive for centuries.



I screwed a couple of pieces of scrap steel on the peening block to fully support the sides – the extra support was helpful given the extra peening required to fill the gaps on the sole side, which are larger than with the more closely-fitted dovetails on separate sides.

Fitting the stuffing is also straightforward, requiring only a wedge infill and a front bun. Some makers left the rear unfilled, with the blade resting on the back & sole bevel only, which is fine with thick blades that won't flex under lever-cap pressure. The buns were traditionally very simple and either made flush with the tops of the sides, or very slightly raised above them with a small round-over of the edges, as I've done here. Occasionally, they were raised significantly above the sides, but "low" buns seem to have been most common.

In a nod to tradition, I added a nib to the top of the blade by riveting on a piece of steel and filing it to a cushion shape. If the surfaces are clean & the rivets clenched tightly, there should be no visible seam after the edges are smoothed. As well as being handy for tapping the blade back to reduce set it makes the blade more comfortable to hold (I found it natural to use the blade as a 'handle' with this plane).

The last part of construction is to install the lever-cap, which is covered in detail elsewhere, & the straight regular shape of the body makes this task quite easy. Then the blade can be inserted, the LC tensioned and the sole lapped.

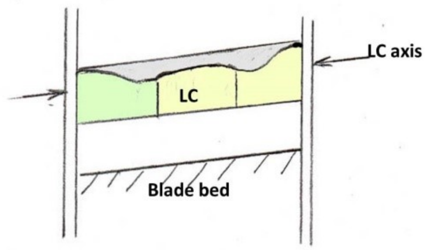
After lapping, the mouth may need some final adjustment, then your new plane should be ready to make shavings. I was pleasantly surprised by how well this plane performed. The low centre of gravity makes it easy to keep engaged on the work and for a bevel-up plane, it took very clean shavings from several ‘difficult’ woods, including ringed gidgee, which I didn’t expect with a blade sharpened at the low bevel angle I used. I assume that’s due to the very fine mouth.

Skewed blades and the badger plane

For a discussion on setting out skewed beds see the end of chapter 2. Skewing the blade of a bench plane has debatable merit because you can easily simulate the effect by simply pushing the plane askew, something we all do often. However, there are situations where having the blade skewed to the plane's axis is advantageous and some infill planes were made with skewed blades, in particular, so-called "badger" planes. These were generally large (300-350mm long) planes with blades that were both skewed, and canted, with one corner of the blade extended through a small gap in the side to enable it to cut into a corner.

The skewed plane below is not "badgered" , it is better described as a "half rebate" because the blade is not canted, the whole shoulder of the blade is let through the side similar to the "bench rebate" planes like Stanley's #10 and 10 ½, and the blade is not canted. It is roughly the same body size as the #3-sized plans in chapter 6, with the width adjusted to match the size of the blade (in this case a 45mm Luban rebate block plane blade with one shoulder cut off). What sets the construction of this plane apart from a regular 'square' plane is the skewed bed and the lever-cap.

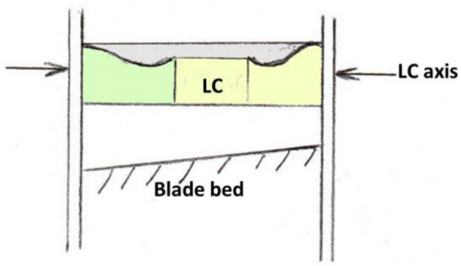
The conventional method on skewed infills was to fit the LC parallel to the blade bed as shown in diagram A at right. This means the pivot axis is also at an angle to the sides rather than square. To allow some rotation of the lever cap (necessary to get the blade assembly in & out) a corner usually needs to be cut away from the left side of the lever-cap toe, & even then it may only rotate over a very small arc. Planes with LCs mounted in this fashion also typically have "staggered" sides so that the LC axle is placed at the centre of the raised section on each side.



A. Plan view of typical lever-cap installation for a skewed blade

An alternative is to set the lever cap square to the sides as shown in diagram B.

This allows the LC to rotate freely, but creates an uneven gap between LC and the skewed blade. To remedy this, the toe of the LC needs to be "twisted" so it is parallel with the blade bed.



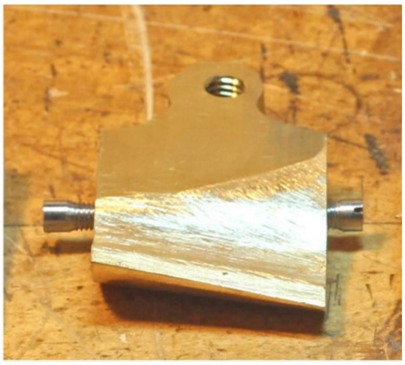
B. Plan view of LC mounted square to plane sides

Mockups for setting the LC parallel to blade bed (L) and sides (R).

The two wooden mock-ups at left demonstrate the alternative styles. The LC on the left is for mounting "parallel to bed". It has the sides angled so it can sit flat on the bed, and the toe is cut at an angle to match the mouth skew, but remains co-planar with the bottom surface of the LC. The LC on the right has square sides and instead, the toe section is twisted to the skew angle of the bed. (The thumbscrew should also be set at an angle in the LC as shown at right so that it is perpendicular to the blade bed otherwise it will tend to slew the blade when tightened).

Thumbscrew angled to make it perpendicular to the blade bed

There are pros & cons with either LC mounting method, & both involve getting your head around some mildly complex geometry. In general, I would only use the 'twisted', square-mounted LC for a small plane because it requires a considerably thicker piece of brass in order to be able to form the twist of the toe. Large chunks of brass are not cheap so it is prudent to use as little as necessary to form the LC.



Underside of LC roughed out. Note skew & twist at the toe end

Besides twisting the nose, I also had to make a large, asymmetrical cove underneath the LC to allow the blade assembly to slide into place.

After some careful cutting, filing and testing to ensure the toe edge made contact evenly across the cap-iron, the "twisted" LC was ready for installation. Building the plane itself is fairly straightforward; setting out canted beds and skewed mouths has been covered elsewhere.

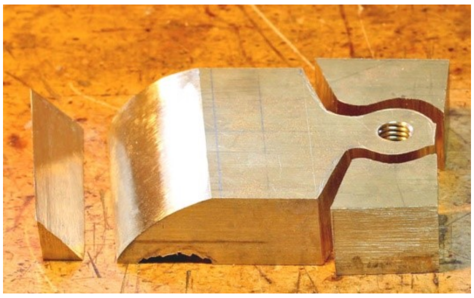
LC ready for installation in plane

The finished plane works quite nicely, much better than the Stanley 10 ½ I had for many years. On the Stanley the frog does not support the outer edges of the blade, making it prone to chatter whereas the blade of my "half rebate" is supported across its full width; it feels solid making partial or full cuts and works well as a regular smoothing plane. It takes clean shavings both with & across the grain, making it ideal for trimming the cross-grain edges of raised panels. Its only fault was that the modified block plane blade I used

was too short to stand above handle which was inconvenient when setting. I solved that by making a longer blade. I could have cut down a Stanley 10 ½ blade, but making a blade was almost as easy, and cost much less.

Alternative: Fitting the LC parallel to a skewed bed

This is my preferred method for a large skewed blade plane because it does not need such a thick block of brass. The first task is to bevel the sides of the block so that it fits snugly between the sides and flat on the canted bed. Shaping a LC has been described previously, & this one was not radically different, just more work.



Establishing the pivot points in the sides involves some very careful setting out because of the skewed axle which restricts the LC to a very small arc,

so you do need to take care in positioning it. In fact to get any rotation the left toe had to be filed off a little to let it lift up far enough for the blade assembly to slide in. I used cheese-head screws rather than the conventional through-rivet because it allows the LC to be easily removed should further work be required, particularly on the mouth (as happened with this plane because I ended up fitting a thicker, longer blade).

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