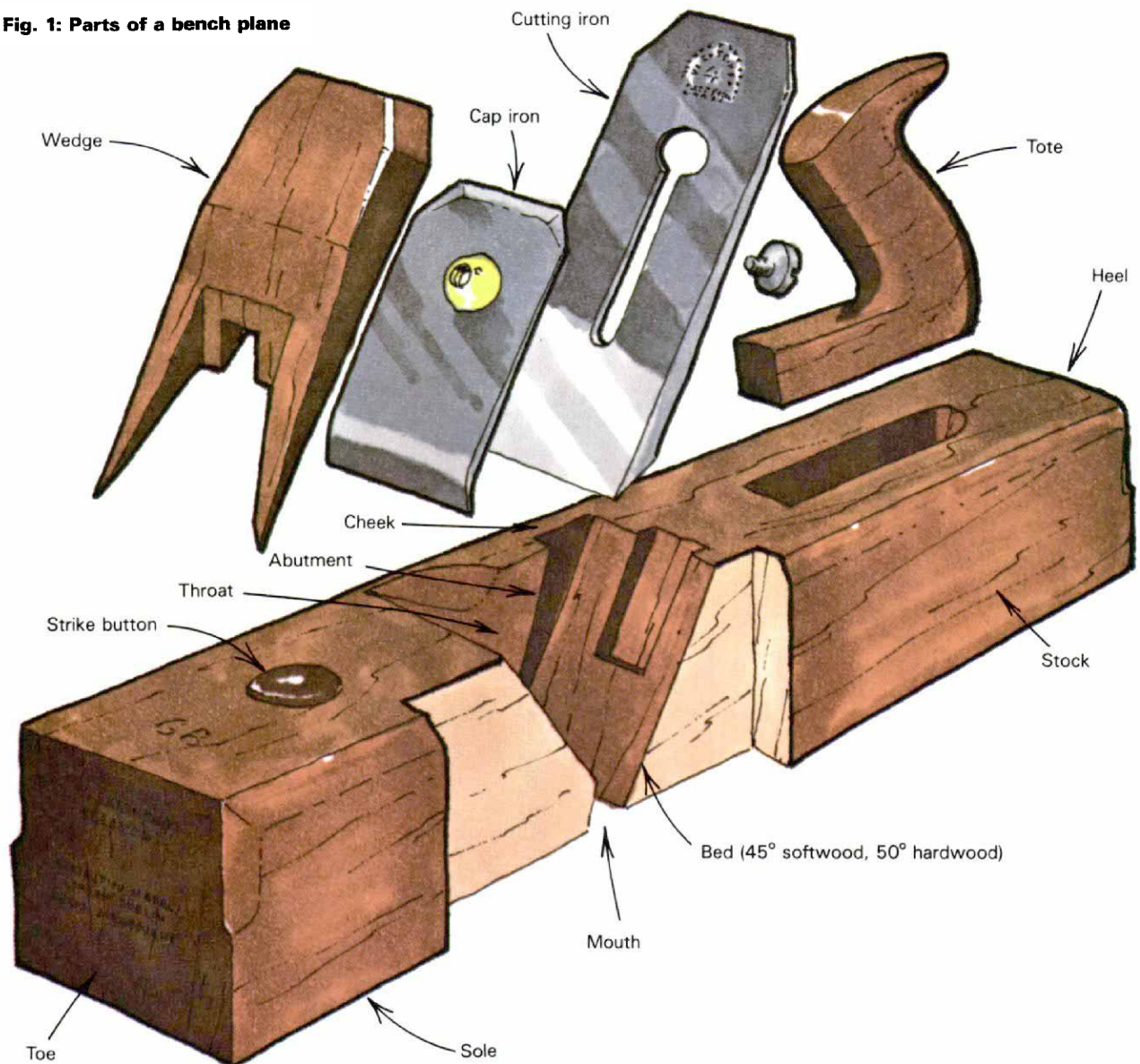


Old Wooden Planes

Reworking brings rewards

by Graham Blackburn

Fig. 1: Parts of a bench plane



When I was first taught woodworking as a boy in England, metal planes and power saws had long been the order of the day, but we still began with wooden bench planes and the whole array of hand saws. In the years since, the older tools have all but disappeared—not only from the more traditional classroom and tradesman's toolbox, but from circulation in general. Today, many woodworkers don't even know their names, far less their application and the techniques of using them.

Old wooden planes, meaning not only secondhand planes but also planes that may be obsolete and even genuine antiques, can constitute an invaluable workshop resource for today's woodworker. Moreover, these old tools are, in many cases, the last link with an age that saw some of the finest woodworking ever produced. Old wooden planes are usually much cheaper than their modern successors. But they have more to offer than economy, and that has to do with pride, personal satisfaction, and a love of the material. You benefit greatly if you can work with tools and materials that you respect, tools you appreciate for their beauty and their rich history.

Anyone seeking to incorporate a tool from the past into his or her work, for whatever reason, faces the problem of where to find and how to recognize a usable or refurbishable tool. Once you start looking, finding old tools is the easiest part. They crop up all over the place: in antique shops, junk shops, flea markets, yard sales, auctions, and even in modern tool supply houses. What is harder is being able to know if what you have found might be of any use. Buying an old tool isn't like buying your first router, complete in its box with attachments and instructions. Resist the temptation to buy the first old plane you come across until you have studied the matter a little.

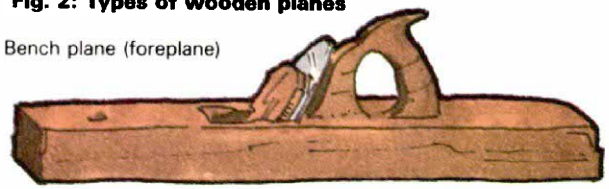
Hand in hand with potential utility goes the question of price. Collectors and antique hunters have helped preserve many tools that might otherwise have disappeared, but their interest has often raised the price capriciously, so that utility is no longer commensurate with cost. Collectors frequently look for qualities other than utility, which often means that an eminently worthwhile, but uncollectible tool may be offered for a song. For example, a plane with lots of shiny brass screws but a hopelessly checked wooden stock may be more expensive than a simpler, less-adorned plane in solid condition. The prices of the two are, therefore, in inverse relation to their use to the craftsman. Then again, collectors are often greatly concerned with makers. A perfectly usable plane produced by one manufacturer may cost significantly less than an inferior one made by a more sought-after firm.

In addition to gaining an understanding of how the tool works, you should also remember that its true cost must also include the time you may have to spend refurbishing it. Fixing a tool may seem inconvenient, an extra time-wasting obstacle, but it is, in fact, a very worthwhile process that will give you a more complete knowledge of the tool's functions and capabilities than had you bought the whole marvel complete and pristine in a box. You will make fewer mistakes in learning to use the tool, and be less likely to force it to do something it's not fit for.

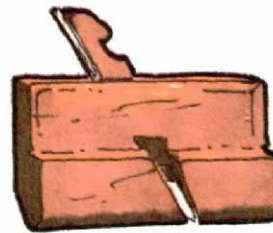
At first, the variety of wooden planes may seem endless, but many were made in sets, differing not in function but only in size. You could, in fact, divide all planes into just three basic groups: bench planes, molding planes, and special-purpose planes (figure 2). Bench planes are the long, squarish planes used for smoothing and straightening wood; molding planes are thin upright planes used for molding the edges or faces of boards; and special-purpose planes comprise everything else—

Fig. 2: Types of wooden planes

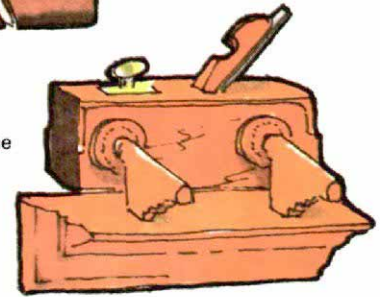
Bench plane (foreplane)



Molding plane (round)



Special-purpose plane (sash fillister)



they make grooves, rabbets, tongue-and-groove boards, window sash, raised panels, and a host of other things.

Planes that were needed by virtually every woodworker are far more abundant than seldom-used, specialized planes. This means that the planes easiest to find, namely the bench planes, are likely to be of greatest use to you, and, generally, the cheapest to buy. Wooden bench planes exist in a much greater variety of types, sizes, and qualities than modern metal planes and offer niceties not possible with machines or metal planes. For example, it is sometimes difficult to avoid tearout on rowed or curly wood on the jointer, whereas there are bench planes designed specifically for such awkward wood. Remember that much of the following discussion about old bench planes applies to all planes.

There was a time, before the advent of the power planer, when all wood arrived at the bench, or on the site, just as it was sawn from the tree—rough and not necessarily straight or flat, and in varying thicknesses. Before much else could be done to it, it had to be dressed, that is, tried, trued, and made smooth, and it was the bench planes that did this. Most of this work is now done by machine, but for small, individual jobs, as well as for the very best results, most wood must still come under the plane.

The smallest of the bench planes is the smoother, or smooth plane. Its job is to put the final finish on a piece of wood. Wooden smooth planes are 6 in. to 9 in. long, straight-sided or coffin-shaped, and the iron (blade) may be bedded at 45° or 50°—the steeper angle produces a better surface on hard wood.

The jack plane is 12 in. to 18 in. in length and is frequently the first to be used when dressing down the stock. British and American jacks are usually fitted with a handle (called a tote), which is most often of the open type. When the tote is set on a lowered portion of the stock, the plane is called a razee jack in America and a technical jack in Britain. The next size includes

planes from 16 in. to 22 in. long. These are variously referred to as panel planes, foreplanes, or trying planes. Their size overlaps not only with some jack planes but also with some jointer planes—the next larger type. In fact, over the last 300 years names have been far from standard; I'll call them foreplanes. Whatever they're called, these planes are used for finer work than the jack: removing the ridges left by the jack, truing the surfaces, and trying (making straight and square) the board's edges.

The fourth, and last, of the bench planes may be anything from 20 in. to 30 in. long, and is known in America as the jointer, in

Britain as a trying plane. It is differentiated from foreplanes only by size. Its job, however, is primarily to prepare the edges of boards to be joined to each other—the longer the plane, the easier it is to obtain a perfectly straight edge.

In real life, personal preferences, coupled with a large selection of patterns and sizes, make any absolute rules about the uses of planes ultimately impossible. The jobs to be done remain the same, however, and every woodworker is free to select his or her own slightly different combination of planes to do them.

At first glance, the typical wooden bench plane discovered on a blanket at a flea market might not appear to be capable of anything but the coarsest class of work. However, excepting truly hopeless and unrestorable ones, I think that when refurbished it will probably perform many times better than most contemporary store-bought iron planes.

Several things can render the tool fit for nothing more than decoration or exhibition, and of these the most immediately apparent is the lack of a cutting iron. You might find a replacement iron elsewhere, but it's usually not worth the effort, given the ease with which you could find a plane with its iron. The reverse is true of the iron—that is, the plane might be worth buying for the iron alone, even if the rest of the tool is useless!

Until the 18th century, all planes had only a cutting iron. Thereafter, a second iron, called variously the top iron, the break iron, the back iron, or most commonly the cap iron, was added to stiffen the cutting iron and break the shaving. For this reason, bench planes with double irons are preferable. (Single irons continue to be used for block planes and molding planes.) Cap irons are almost always screwed to the cutting iron, which will have a slot cut in it for this purpose. If your plane has a solid iron there never was a cap iron; if there is a slot but no cap iron, it is missing and you should look for another plane, just as you should if the cap iron isn't the same width as the cutting iron.

Next, examine the back of the cutting iron. It doesn't matter if the edge is in horrible shape, it usually is, but if the back of the iron is deeply pitted with rust, rather than merely rusted on the surface, you should pass it by. To obtain a truly sharp edge, the back of the cutting iron must be perfectly flat. Sooner or later every part of the back will be at the edge, and a pitted back will result in a pitted "saw" edge rather than a smooth "knife" edge.

The most common mystery associated with wooden planes is how to get the iron out of the stock. Jacks and bigger planes must be rapped on the top of the stock near the toe, as shown in figure 4. There is often a strike button inset here for the purpose. Short planes, like smoothers, must be knocked on the back end, and you will usually see the marks of previous hammer blows in this area. A mallet works just as well and damages the wood less.

Resist the temptation to wiggle the wedge as this risks damaging the plane's cheeks and the slot that contains the wedge. If the cheek should already be split or badly checked, there is little you can do to repair it, and the plane will never hold the wedge and iron securely in use. A damaged or missing wedge is another matter; replacement needs to be exact, but isn't difficult.

Look at the body of the plane next. Note the condition of the tote and the areas where the stock has been hit for iron removal. A few moons and dents are to be expected, but beware a plane that has had its toe or back pounded to splinters. A tote can be replaced easily, but, if the stock is too far gone, you must look else where. What constitutes too far gone? Well, it may look worse than it really is. Small checks in the ends are not serious; many can be closed up with liberal applications of linseed oil. Larger checks or

Fig. 3: Types of bench planes

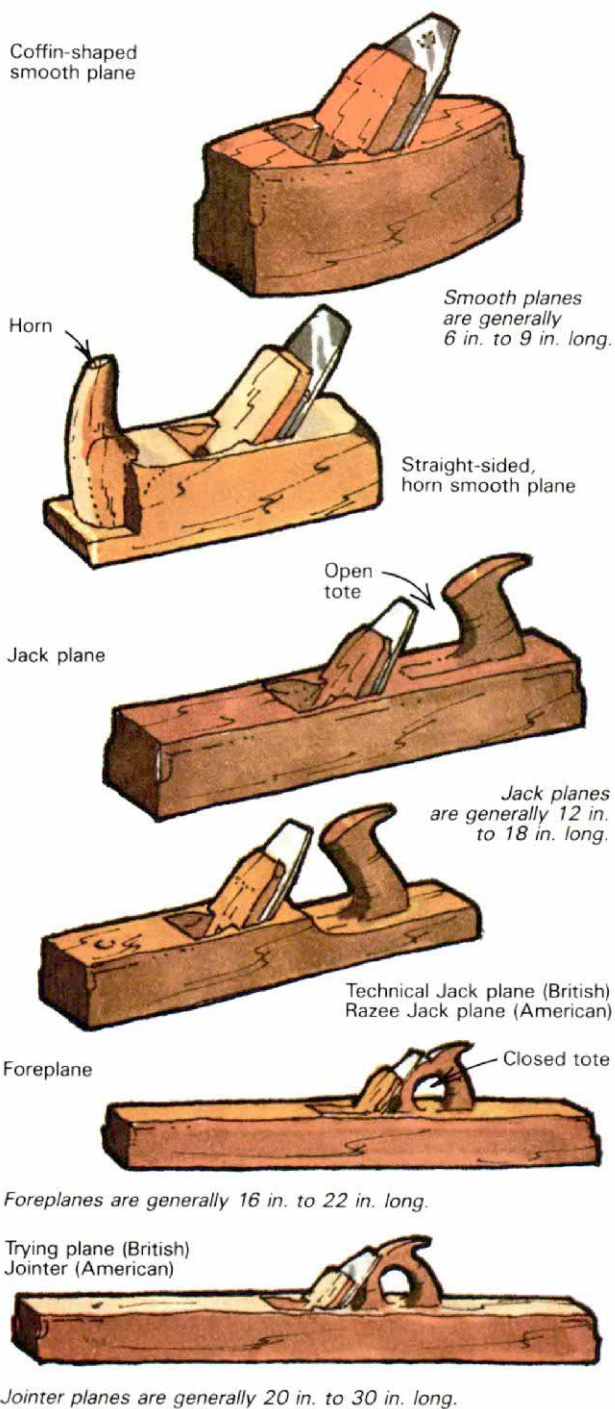
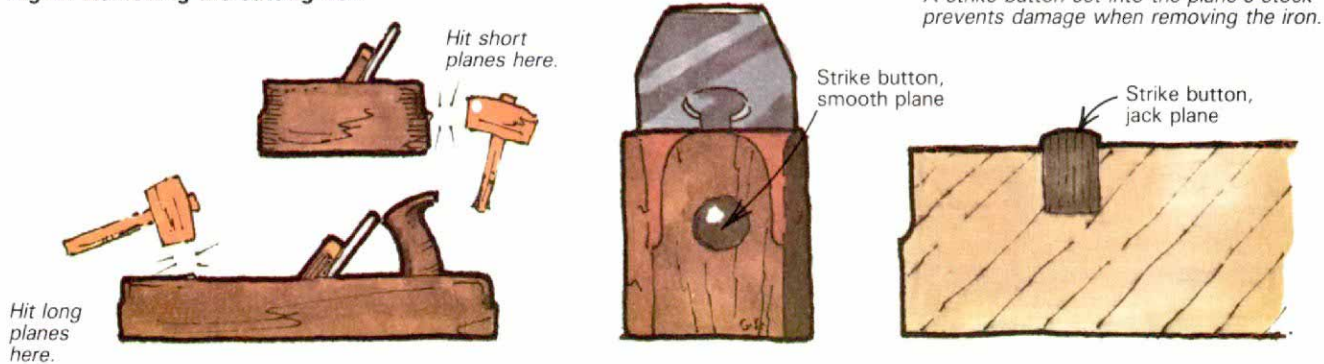


Fig. 4: Removing the cutting iron



cracks, especially any extending from the corners of the throat where the wedge and iron are seated, are cause for rejection. If the plane has been kept in a damp basement or allowed to dry out over the years, it may appear a deathly gray, but, if the wood isn't spongy, rotted, or riddled with worm holes, you'll be surprised how nice it will look after a sympathetic cleaning and reoiling.

It is unlikely that there will be any checks in the sides, unless these stem from a split throat, since the stock should have been cut so that the annual rings are perpendicular to the sole, thus providing maximum resistance to warping and wear. All other things being equal, ring orientation, as seen on the end of the plane, is a reason for choosing one plane over another.

The ideal sole is perfectly flat and smooth with a narrow mouth—the gap in front of the iron when it is set barely protruding. Here is where you must use some imagination. It has been a long time since most of these tools have been used, and it's extremely unlikely the sole will look anything like it should. First, try to imagine the iron properly sharpened, with the cap iron set right, and everything correctly positioned, and judge how wide the mouth is. If it is wider than the thickest shaving the plane will be expected to take, you must remouth the plane. This might sound like an unpleasant paramedic operation, but it's not too hard, providing the sole is not badly checked or too worn down. (I'll describe the process a little later.) The plane body was originally made square, but use and rejoining—the replanning of the sole to keep it perfectly flat—may have made it somewhat wedge-shaped. It is just possible that there may not be enough body left for more jointing or remouthing. In any event, it is almost certain that you will have to joint the sole, so check it carefully for excessive worm holes (one or two will do little harm) and the odd nail, to be sure you can do this.

If the plane you are considering passes all these tests, and if the asking price is no more than that of a comparably-sized new metal plane, then feel confident about buying it. It will usually cost much less unless the seller believes that he has something "extremely antique" and of interest to collectors.

When you get the plane home, the first thing to do is to disassemble it and clean it. Secondhand planes seem to have an amazing affinity to paint spatters, and these I scrape off with a pen-knife or razor blade, but if possible, I leave the rest of the patina alone and simply treat the wood with linseed oil. Frequently, however, more is needed. Many people regard removing the finish as a violation of the tool's "antiquity," but unless the tool is a rare or a special example of its class, it is first and foremost a tool, and should be maintained in as good condition as possible,

so that it may function as well as it did when new. Wooden planes were mostly made of beech, oiled or varnished. When the varnish wore off, periodic wipings with linseed oil combined with oil from the user's own hands kept the wood in good condition. If too much grime has accumulated on the plane for oil to penetrate, clean it with paint stripper, soak it in linseed oil, and wax it with a paste wax, such as Butcher's or Johnson's. (If you remouth the plane, oil it after making the new mouth.) Even the grayest plane will respond to this treatment, and with use you will soon rebuild the patina, this time on a healthy body.

For extremely dry planes, and planes with open checks in the ends, you can stand the plane on end in a container of linseed oil to allow more oil to be absorbed, and stuff an oil-soaked rag in the throat (seal the container to prevent spontaneous combustion of the rag), since these end-grain areas get thirsty faster.

The tote is glued into a shallow mortise in the stock; totes sometimes become loose and need to be reglued. The most common damage is to the tip, which gets broken off. It is astonishing how much more comfortable it is to use a plane with a fully-formed tote than one with a piece missing from the end. Depending on the extent of the damage, it will be very worthwhile either to graft on a new tip, or to make a whole new tote. The easiest way to make a new tote is to copy the profile from another one; experience will tell you whether a slightly different shape is more comfortable for you, but be sure to make the tote fit its mortise snugly or it will work loose again.

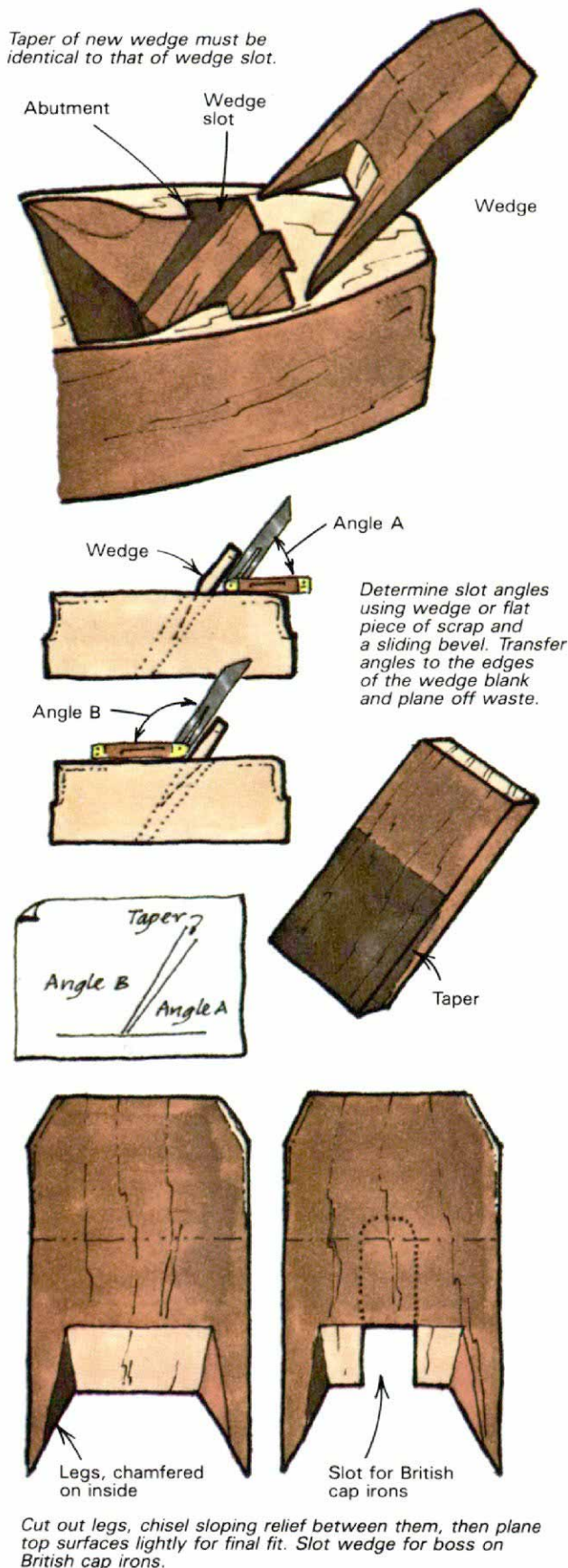
Damaged or missing wedges are also easy to replace. The new

Planes by post

Not everyone lives in an area well stocked with old tools. Fortunately, a number of old-tool dealers around the country sell through the mail. In addition to collector's items, the four listed here handle large numbers of tools for use. Vern Ward publishes the **Fine Tool Journal** (RD #2, Poultney, Vt. 05764), a combination magazine/catalog that carries ads for his own Iron Horse Antiques, as well as dealers and auctioneers nationwide; \$10 buys six issues a year. **The Mechanick's Workbench** (PO Box 544, Front St., Marion, Mass. 02738) publishes a handsome "magalog" several times a year, usually for \$10 each. **Bud Steere** (110 Glenwood Dr., North Kingstown, R.I. 02852) puts out six catalogs a year at \$5 each. In the midwest, **Tom Witte's Antiques** (PO Box 399, Mattawan, Mich. 49071) will send a catalog and several supplements for \$3.50 per year. □

Fig. 5: Replacing the wedge

Taper of new wedge must be identical to that of wedge slot.



wedge, however, must fit its slot exactly or it will not work: either the iron will chatter, you'll damage the abutments, or nothing will ever stay put. The secret is in precisely mating the taper of the wedge to the slot. Cut a wedge blank to width, then plane its back surface flat. Figure 5 shows how to establish the correct taper using a sliding bevel. Transfer the taper to both edges of the wedge blank using carbon paper, then plane away the waste. If you're not copying an existing wedge, you'll need to insert the new wedge and trace the line of the abutments on it to establish the position of the legs. Cut out the legs, and chisel the center slope, which eases the passage of the shavings. Trial-fit the wedge and irons; lightly plane the top surfaces of the legs, where necessary, to give a tight fit against the abutments. (On British planes slot the wedge for the brass boss that holds the cap-iron screw, as shown in figure 5.) Lastly, chamfer the inside edges and tips of the legs and the end of the slope.

Unless the cutting iron rests firmly without rocking on the bed, fine and secure adjustment will be impossible. Check the iron first, for accumulated rust or burrs on the metal. If the bed has warped or moved, careful filing with a flat file, and cautious paring with a chisel, should allow the iron to reseat properly.

Once the stock is clean, the tote and wedge in good shape, and the bed has been checked, all that remains to check is the mouth, but you can't do this until the iron is properly sharpened and the cap iron set. Sharpening is beyond the scope of this article, but make sure the iron is ground to the desired profile—I prefer a slight curve for jack planes and virtually flat for smoothers and foreplanes—and the bevel is ground to the right angle, usually between 25° and 30°, according to the quality of the steel and the hardness of the wood on which you will use this plane. In general, the harder the wood, the greater the angle.

The cap iron must fit perfectly against the back of the iron (figure 6), and, for fine work, exceedingly close to the cutting edge, since not only is it supposed to deflect and break the shaving, but also to put pressure near the cutting edge in order to reduce potential chatter. Furthermore, any gap between the two irons will trap shavings and "choke" the plane. A perfect fit requires that the back of the cutting iron be absolutely flat (if not, work it on a sharpening stone) and the leading edge of the cap iron be straight across its width, and as sharp as possible. You can straighten and square the cap iron with a flat file or diamond plate. A fine sharpening stone will remove file marks and sharpen the edge. It is most important to sharpen so that only the leading edge of the cap iron touches the cutting iron.

Now, slip the iron into the stock so that it barely protrudes from the mouth, to judge whether this gap is too large. It will almost inevitably be so, not only because the sole wears down, and has been possibly rejoined, but also because most irons were themselves wedge-shaped. Being thicker at the cutting end, they were worn to an ever thinner profile by frequent sharpening, thereby increasing the size of the mouth. A wide mouth makes tearout more likely; the remedy is remouthing, which involves inlaying a piece of hard wood into the sole just in front of the iron, as shown in figure 7.

The size of the mouth depends on the type of work expected of the plane—the shavings must be able to pass through. Coarse work producing thick shavings requires a larger mouth than fine work with its thin shavings. For fine work, I prefer a jack plane's mouth to be about $\frac{1}{8}$ in. wide, and smooth plane, foreplane or jointer mouths as small as possible. Make the new mouthpiece $\frac{1}{4}$ in. to $\frac{1}{2}$ in. thick, and wider than the existing mouth to avoid fussy fitting at the corners. Place it on the sole and carefully mark

Fig. 6: Touching-up the cap iron

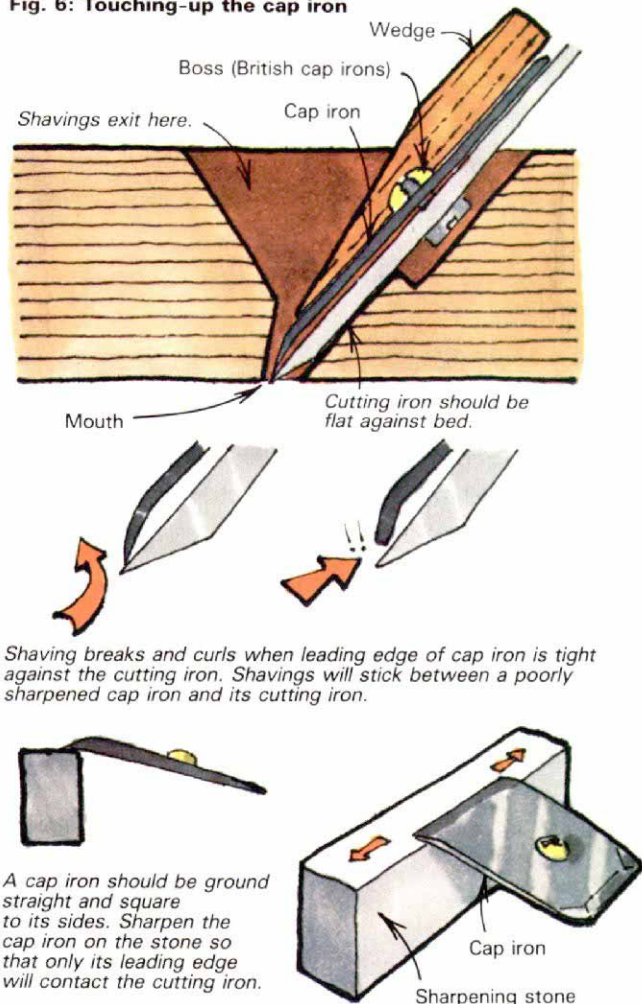
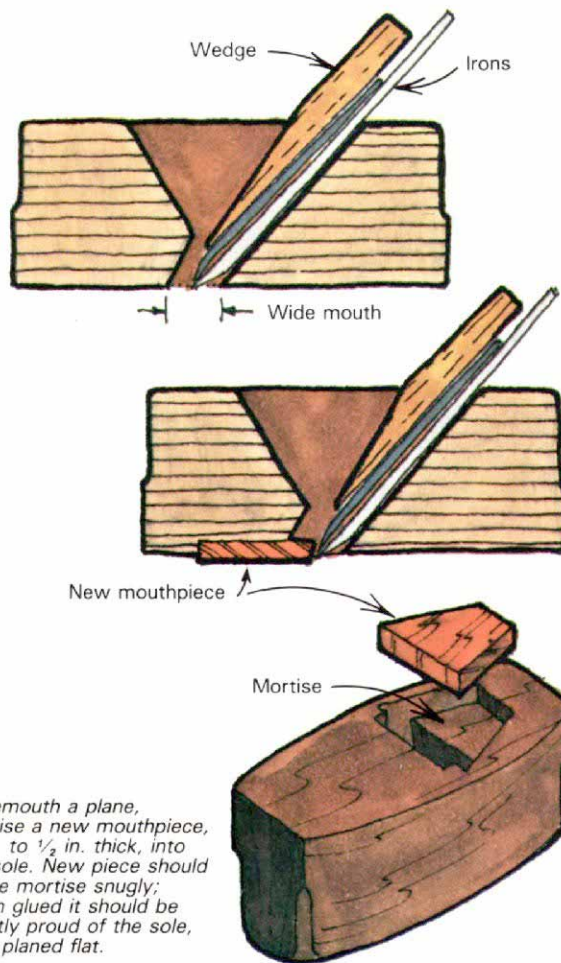


Fig. 7: Remouthing



around it with a sharp scratch awl. Mortise the sole carefully, making the sides square and the bottom level. This is easily done with a light-duty router or Dremel tool, or by hand with a Forstner bit and chisels. The mouthpiece should fit snugly and stand a little proud of the sole—this makes clamping easier. I bevel the edge of the mouth toward the iron, so that subsequent jointing won't widen the mouth unduly.

You can joint the sole of a long plane on a power jointer. But, if yours is a short plane or you don't have a jointer, then secure your longest bench plane upside down in a vise and push the sole over it, the way coopers planed their staves. Sight over the sole by eye and check with a straightedge and square to make sure that it is perfectly flat and square to the sides.

Oil the sole, wipe it dry, then polish it with wax or simply rub a candle over it. Setting the iron is the final step. The theory is simple, but only repeated, patient practice will make you quick and accurate at it. Insert the iron and the wedge so that the iron does not quite protrude, then gently tap the wedge to secure the iron, but only just. To lower the iron, simply tap its top end, then tap the wedge in a little more firmly. Sight along the sole and adjust the iron sideways by tapping its top end to the requisite side. If the iron is protruding too far, simply tap the back of the stock. That's all you need to know: tap the top of the iron to lower it; tap the back of the stock to raise it.

The wedge shape of the blade and the wedge itself are what make the process tricky. As you tap the blade deeper, it necessarily presents a thinner part to the wedge, thereby loosening the latter's grip, causing the iron to slip more deeply than you wanted. The secret is in securing the wedge firmly enough to hold the iron even after you have tapped the iron in some more, but not so firmly that a light tap won't move the iron. This is made a little easier by setting the iron as close to the desired protrusion as possible, before you first secure the wedge.

At this point you should now be in possession of a bench plane that will compare favorably with almost anything you can buy new, and for considerably less outlay. It may take a while before you feel perfectly comfortable with the adjustment process, and, of course, a lot depends on how well you sharpen the iron, which will most likely be of the superior, old-fashioned laminated type. Planing can be taught only partly by words and pictures; experience will teach much more, for the feel of a wooden plane is quite different from that of its metal counterpart. In the long run, I think the potential of wooden planes is far greater, given the wider range of tools making possible a size and shape for almost every job and every hand. □

Graham Blackburn, author of numerous books on woodworking, is a furniture designer and maker in Woodstock, N. Y.