

The greater part of the photographic action necessary to obtain an image is due to the successive transformation of the crystallographic system, the reaction of the iodide of silver being the most perceptible of all. The result is that an examination of the plate at different stages of the operation under a microscope of moderate power permits the operator to judge of the success or otherwise of the process he is employing.

PRACTICAL MECHANISM.

BY JOSHUA ROSE.

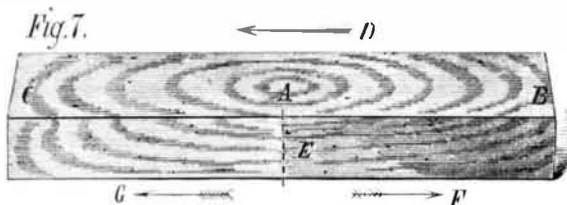
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PATTERN MAKING.

In using a jack plane, we commence each stroke by exerting a pressure mostly on the fore part of the plane, commencing at the end and towards the edge of the board, and taking off a shaving as long as the arms can conveniently reach. If the board is longer than can be reached without moving, we pass across the board, planing it all across at one standing; then we step sufficiently forward, and carry the planing forward, repeating this until the jack planing is completed. To try the level of the board, the edge or corner of the plane may be employed; and if the plane is moved back and forth on the corner or edge, it will indent and so point out the high places.

The fore plane (or truing plane, as it is sometimes called) is made large, so as to cover more surface, and therefore to cut more truly. It is ground and set in the same manner as the jack plane, with the exception that the corners of the iron or blade, for about one eighth inch only, should be ground to a very little below the level of the rest of the cutting edge, the latter being made perfectly straight (or as near so as practically attainable) and square with the edge of the iron. If the end edge of the cover is made square with the side edge, and the iron is ground with the cover on, the latter will form a guide whereby to grind the iron edge true and square; but in such case the cover should be set back so that there will be no danger of the grindstone touching it. The oilstoning should be performed in the manner described for the jack plane, bearing in mind that the object to be aimed at is to be able to take as broad and fine a shaving as possible without the corners of the plane iron digging into the work. The plane iron should be so set that its cutting edge can only just be seen projecting evenly through the stock. In using the fore or truing plane, it is usual, on the back stroke, to twist the body of the plane so that it will slide along the board on its edge, there being no contact between the cutting edge of the plane iron and the face of the board, which is done to preserve the cutting edge of the plane iron from abrasion by the wood; as it is obvious that such abrasion would be much more destructive to the edge than the cutting duty performed during the front stroke would be, because the strain during the latter tends mainly to compress the metal, but, during the former, the whole action tends to abrade the cutting edge. The face of the fore plane must be kept perfectly flat on the underside, which should be square with the sides of the plane. If the under side be hollow, the plane iron edge will have to protrude further through the plane face to compensate for the hollowness of the latter; and in that case it will be impossible to take fine shavings off thin stuff, because the blade or iron will protrude too much, and as a consequence there will be an unnecessary amount of labor incurred in setting and resetting the plane iron. The reason that the under surface should be square, that is to say, at a right angle to the sides of the body of the plane, is because the plane is sometimes used on its side on a shooting board.

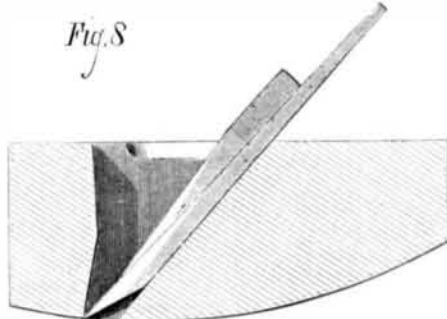
When the under surface of the plane is worn out of true, let the iron be wedged in the plane mouth, but let the cutting edge of the iron be well below the surface of the plane stock. Then, with another fore plane, freshly sharpened and set very fine, true up the surface, and be sure the surface does not wind, which may be ascertained by the application of a pair of winding strips, the manner of applying which will be explained hereafter. If the mouth of a fore plane wears too wide, as it is apt in time to do, short little shavings, tightly curled up, will fall half in and half out of the mouth, and prevent the iron from cutting, and will cause it to leave scores in the work, entailing a great loss of time, in removing them at every few strokes. The smoothing plane is used for smoothing rather than truing work, and is made shorter than the truing plane so as to be handier in using. It is sometimes impracticable to make a surface as smooth as desirable with a truing plane, because of the direction of the grain of the wood. Thus, in Fig. 7, let E represent a piece of stuff requiring to be planed on the upper sur-



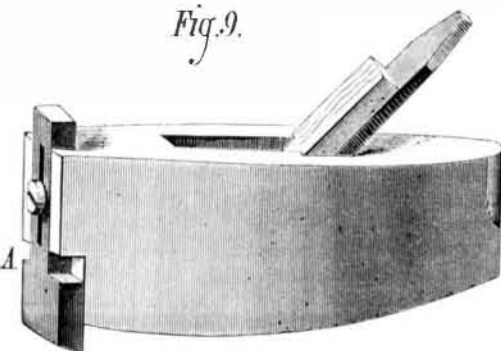
face, and let us plane it, cutting in the direction of the arrow, D; it is evident that the edge of the plane iron, when cutting the surface from B to A, will strike against the edge or end of the grain of the wood, tending to rough it up: whereas, while passing from A to C, the tendency of the pressure of the iron edge would be to smooth the grain of the wood downwards, the difference between the two tendencies being sufficient to make it necessary in many cases to use a smoothing plane cutting in both directions, as shown in Fig. 7, first from A to B, cutting in the direction of the arrow, F,

and then from A to C, cutting in the direction of the arrow, G. Thus the cutting will be at all times performed in the direction tending to smooth down and not rough up the grain of the wood. That this method of planing is necessary is demonstrated in planing across the end grain of wood, for which purpose the smoothing plane is almost indispensable, and in which operation it is necessary to use it, on small surfaces, with a side as well as with a forward sweep, thus producing a curved motion, the most desirable direction of which is determined by the direction of the grain of the wood.

Fig. 8 represents an ordinary compass plane, which is a necessary and very useful tool for planing the surfaces of

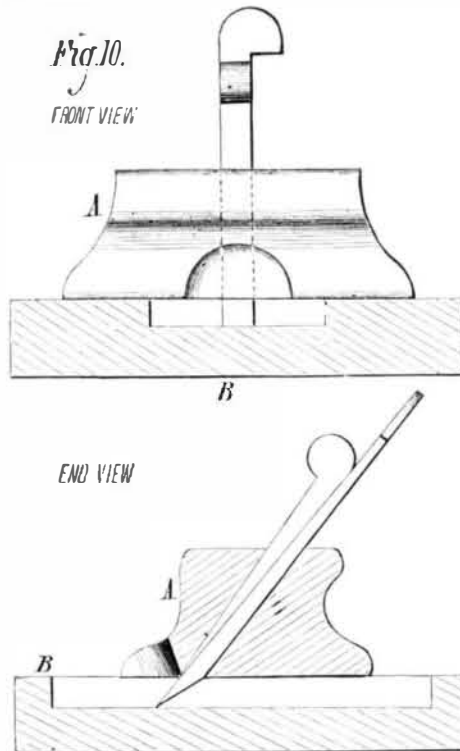


hollow sweeps. This tool is sometimes made adjustable by means of a piece dovetailed in the front end of the plane, as shown in Fig. 9, at A; which, by being lowered, alters the sweep and finally converts it from a convex to a concave. There is now, however, in the market a compass plane, the body of which is made of malleable iron with a sole made of

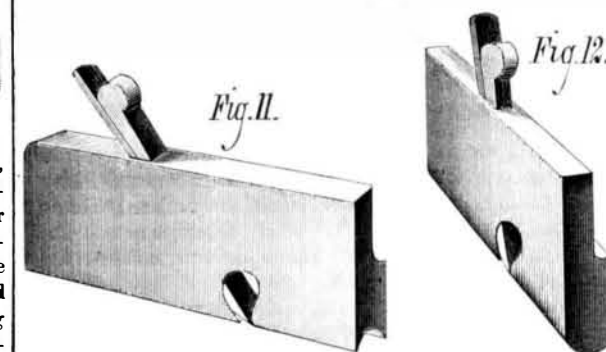


a blade of spring steel, which, by the operation of two screws, can be set to any curvature, either concave or convex, within the capacity of the instrument.

Another very useful species of plane is the router, shown in Fig. 10, which represents one of these planes in operation, A being the router, and B the work. The use of this tool is to plane out recesses (exactly to any given depth) such as are required to receive rapping plates. The wood in the plane stock is cut away just over the edge of the iron, to give clearance for the shavings, and so that the cutter may be seen at work.



Rabbit planes are narrow planes having the sole or side of a conformation to suit the work. Fig. 11 represents a rab-



bet plane to suit a round edge, Fig. 12 a similar plane for a groove, and Fig. 13 a side rabbit plane. The latter is, how-

ever, very seldom used, but is especially useful in planing hard wood cogs fitted to iron wheels, or the teeth of wheel patterns or other similar work. For ordinary use, it is sufficient to have two, a $\frac{3}{4}$ and a $1\frac{1}{4}$ inch, as represented in Figs. 11 and 12, and two or three having a flat sole for flat bottom grooves. Small thumb rabbit planes, having an iron stock, with the blade near the front end, are now supplied, and are very useful for cutting out half checks that are not cut right across the stuff.

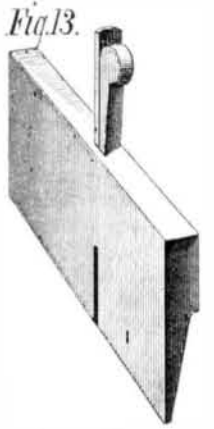
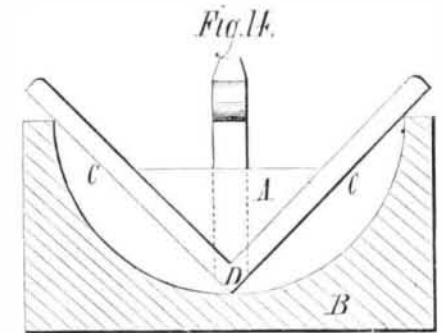
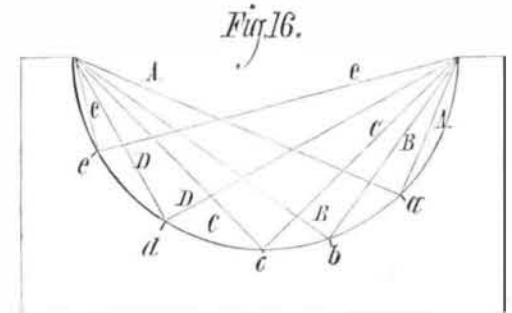


Fig. 14 is an end, and Fig. 15 a side, view of a core box plane, suitable for planing semicircular grooves out of the solid. The principle of its construction and use is that the angle in a semicircle is a right angle. Suppose, for example, that Fig. 16 represents a piece of wood having a semicircular groove in it, and we mark off on the groove the points, a, b, c, d, e, and strike from each of these a line direct to each corner



of the groove. We shall thus find that the two lines struck will be at a right angle to each other, the two lines, A A, meeting at the point, a, being at a right angle. The two side faces, C C, of the plane in Fig. 14 are made to stand at a right angle to each other; and while the plane is in position (as shown in Fig. 14) to bear against the corners of the core box, a semicircle (the apex of the plane, D, in Fig. 14)



must be in the semicircle, and will only cut away the wood in the form of the circle, no matter in what position the plane stands, so long as its sides touch the corners of the semicircle. This being the case, the first operation in using this plane is to cut out the required semicircle to the necessary width, which may be done with a rabbit plane. The core box plane may thus be employed to cut out the semicircle, commencing at each of the corners and planing on each side down to the center of the depth of the semicircle. As this plane is intended to finish the work, it is desirable to cut



away as much of the stuff as possible before employing it, the work appearing as shown in Fig. 17. These planes have one disadvantage. They are apt to abrade the corners of the work; hence great care should be exercised in their use, and care must also be taken that the extreme point of the plane iron stands just at the apex of the angle of the body of the plane; for if it be in advance or not up to it, the work will not be semicircular.

Trademark Decision.

In a recent application for trademark registration for the use of the words "Star Oil," the Commissioner of Patents refused registration, because a prior registration had been obtained, by other parties, for the use of the figure of a star in connection with the word oil, thus: "*Oil." The Commissioner held that, in cases where parties used a brand containing the figure of an object, the mere substitution, by a new applicant, of the name word of that figure, would no title such applicant to registration.