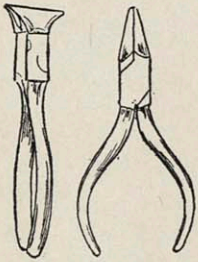
LESSON II

MAKING WIRE FRAMES

WIRE frames are made entirely by measurements, and, the method and use of tools once mastered, are really easier to make than buckram frames. If, however, the milliner designs a new shape, it is best to do so in paper, or buckram; then from this make the wire frame. If the frame is made experimentally, the edge wire should be lightly tied, the cross wires not clipped permanently tight, nor the other rings tied on finished with the tie wire, so that all may be adjusted, then when lines and form are right all fastenings are secured immovably.



A B

FIG. I
CUTTERS "A"
PLIERS "B"

The Tools

The tools necessary for making wire frames are a pair of small wire cutters, and a small pair of pliers, costing respectively 40 cents and 15 cents. There is a tool that combines the two, but it is not practical for millinery, as the points are necessarily wider and thicker, and do not lay hold of the fine wires, nor

bend intricate angles as neatly as the finer points of the true pliers. (Fig. 1, Cutters, A; Pliers, B.)

A narrow tape-measure, having inches and ⅛ths on one side and 1/16 of the inch on the other; avoid those that unroll from a case, the simple tailors' tape is best. Of wire, one needs for a nice frame four different kinds. A ring of thickly covered edge wire; this is a strong wire covered first with layers of cotton thread, running along the wire, over which is spun a covering of silk floss. (The same kind of wire, but softer, is used to edge hats, and run into "cordings.") The round rings of the frame should be of a heavier number of wire than the brace wires, the eight wires that form the spokes of the wheel, all crossing in the center of top of crown, as these have to be several times bent. Then there is the "tie" wire, which comes like coarse thread on a spool; all these are silk covered. But there are cotton and even paper covered wires, and uncovered tie wire, which is used for the cheapest frames, and is good enough for practice.

It is well for the beginner to use the tools on bits of wire, cutting, turning over, and clipping the turns tight, also tying crossed wires with the tie wire cut in 1-inch lengths; the tie must *cross* the wires twice; then the two little ends are twisted together and turned under.

Construction of Frames

The number of round wires in a frame varies according to the size and shape; there is always the edge and head wire; then if crown and brim are in one, there is the crown wire; if the crown is deep, there is a second wire between head and crown; if the brim is wide there may be two more round wires between edge and head; in a medium size, one is enough, and in a narrow brim none extra is needed. Often one side of a frame is much deeper than the rest of the brim; in that case one or even two part wires are put in. (Fig. 2.) This is also often necessary in toque and bonnet

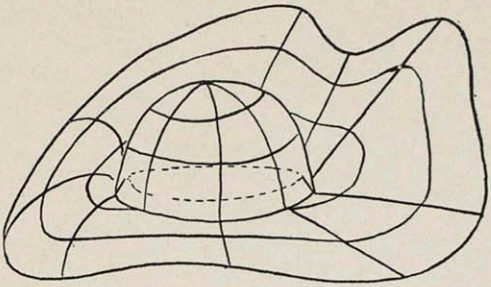


FIG. 2—FRAME SHOWING SEPARATE BRIM AND CROWN. EXTRA BRACE IN FLUTE AND EXTRA PART RING WIRE

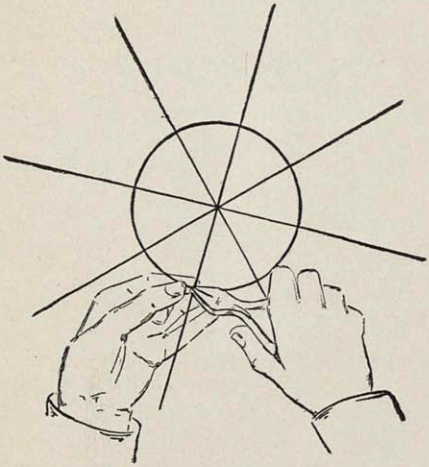


FIG. 3. CROSS WIRES TIED IN POSITION. TOP OF CROWN RING "TIED" ON, SHOWING ACTION OF TURNING WIRE WITH PLIERS FOR SIDE OF CROWN

frames, where one part projects considerably more than the rest of the structure; the part wires being secured either to the head wire or two of the brace wires. These wires are called "fillers."

There are always eight cross wires, and frequently one or two extra are put in if there are wide flares, as in Fig. 2; these, however, run only from edge to head wire. The first two cross wires are laid across each other in a perfect cross thus: +; the others are laid across these diagonally, and should be so tied in the middle that they form the spokes of a wheel, with (usually) even sections between. The lengths of the spokes, however, on each side of the center, depend on the measurements of brim, back, front, right side, left side, depth of crown, width of top of crown, all of which must be calculated and measured out. (Fig. 3.)

Measuring and Cutting Wires

Let the novice begin by copying a frame, or making a wire frame over a buckram model. Take the following measures:

Around edge.

Around head size. (The two key measures.)

Around top edge of crown.

Around other circular wires.

Cross wires. Front to back, entire measure including crown, if this is in one with brim.

Cross wires. Side to side, same.

Cross wires. Diagonal wires, same.

Width of brim. Front, edge to head wire.

Width of brim. Back, edge to head wire.

Width of brim. Sides, edge to head wire.

Width of brim. Diagonals, edge to head wire.

Each wire separately, set down on paper for reference. Add measures of:

Depth of crown; if this is deeper at any one place carefully note it down, together with the cross wire *where the extra height* is required.

Measure across top of crown. If this is a perfect

round the diameter will be the same back to front, and side to side, but if it is an oval, or other form, each measure must be taken the same as for the brim.

One and one-half inches extra is allowed in cutting the cross wires, this is a ½-inch for turn over at each end, and ½-inch for "take up" in the turns or bends.

Now cut your edge wire, allowing two inches for lapping in a satin wire, and three in a hard wire. In cutting, take care to *cut clean*, as bending hooks in the end of the wires and ravelling the covering makes untidy frames. The satin wire may be lapped and sewn, but hard wire must have the *ends* of the lap neatly twisted over with a bit of tie wire; it is unnecessary to twist the lap all along. Thus make all the rings you need for your frame, lay them down inside each other, so you can see at a glance which to take up. In the crown rings a lap of 1½ inches is sufficient, and all laps should come at the back of the frame.

Now cut the cross wires, allowing 1½ inches extra on each, lay them down in the position on each other as you cut them, so that no mistake is possible.

To Make the Frame

It is best to tie the front to back and side wires first, then secure the diagonals in place separately, being careful to allow on each one the necessary measure

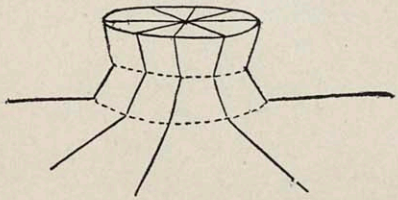


FIG. 4. CROSS WIRES BENT OUT FOR BRIM. DOUBLE BELL CROWN

from the center out. (Fig. 3.) Now measure from center out the *half* diameter of top of crown, if a

round all will be the same, but if an oval (Fig. 6) or boat-shape crown, the measures will be longer from back to front than from side to side. Bend each wire downward at the indicated measure, with the *pliers,* holding as shown in Fig. 3.

The next step is to bend the wires out at the head-line; for this measure downward on each wire from the first bend the depth of crown required. If this is a simple crown like Fig. 5, all the measures will be the same, but if the crown is higher at any place, this measure must be carefully given at the proper brace, and each wire bent out in the opposite direction to the first bend. (See Fig. 4.) We are now ready to lay in our round wires.

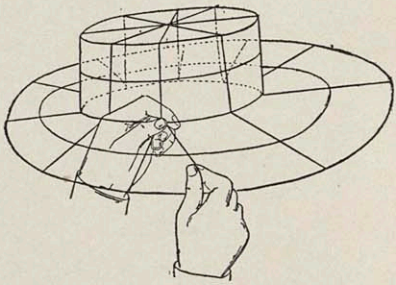


FIG. 5. ALL WIRES IN POSITION, SHOWING METHOD OF HOLDING FRAME WHILE TYING BIT OF TIE WIRE ACROSS WIRES

Begin with the head wire; slip it down *outside* onto the cross wires, and tie each cross wire to the ring with a bit of tie wire, as shown in Fig. 5, having a care that the spaces between are equal. If the top of crown —as in a bell shape—is larger than the head line, the ring can be left open and joined after being laid in position on the skeleton. In Fig. 4 a bell shape is

shown, which has *two* bends in side of crown; when this is used a ring must be placed at each bend.

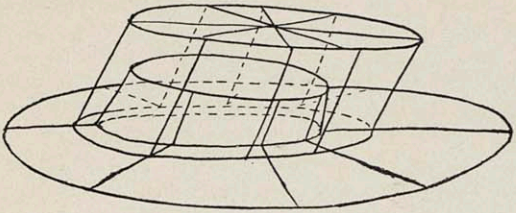


FIG. 6. SHOWING (SEPARATE) OVAL CROWN

When the crown is oval, however, the spaces from front and back to side wires will be a little wider than the two side spaces, the same proportions being retained in the brim. (See Fig. 6.) If this is much flared the extra brace mentioned before will be needed.

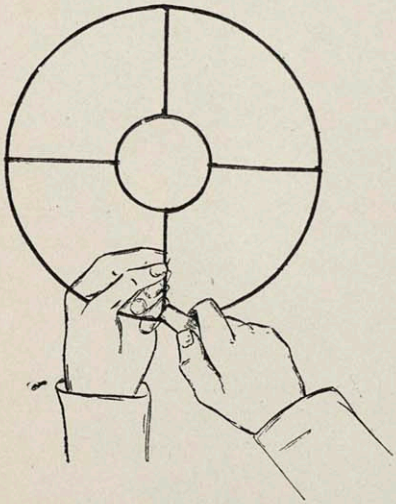


FIG. 7. METHOD OF HOLDING PLIERS FOR CLIPPING BRACE OVER EDGE WIRES

Now we put in our edge wire, and this is the test, if the cross wires have been correctly measured. The 1½ inches allowed on the length of each cross wire, have, of course, been equally divided, leaving ¾ of an inch to each side; of this ¼ inch will have been taken up in forming the bends; the other ½ inch at each end is now *turned up* over the edge wire, and with the pliers turned flat on *itself*, enclosing the edge wire firmly with a close clip of the pliers. Nothing is gained by having a double twist here; it only makes a clumsy bunch, that no amount of covering will effectually conceal; the wire must be neatly and evenly turned, and firmly pinched down; if the end turns down below the wire, cut it off quite close. (See Fig. 7.) Secure all eight wires in place, then add extra brace wires, or part circular wires if needed; and the middle wire around crown. (Figs. 2 and 5.)

Dome Crowns

Dome, or bowl-shaped, crowns may be shallow, medium, or deep; they may be separate from brim, or made in one with it; in either case they are *curved* evenly from center to headline; if separate from brim, the head wire is attached; then the ring near center, and if medium or deep, one or two extra rings mid-

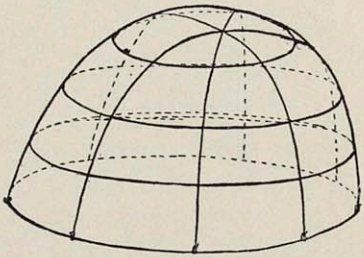


FIG. 8. DOME CROWN

way between these two, are put on, as in Fig. 8. These must be measured so that they hold the bowl in the required form, which may be wide, or more conical in shape.

If the crown and brim are in one the measures must be taken in the same way from center to headline, the wires *curved* and then bent out for brim.

Separate Brims

These are usually made when the crown is to be larger at the base than the head size of brim, or when the brim is of such eccentric form that it would be difficult to cover it with the crown on; in this case a one-inch band is turned up at the head size (see Figs. 2 and 9), which, when covered with crinoline, forms a foundation to which is attached the rest of covering, head lining and bandeau.

The same band, but deeper, is shown in Fig. 6, where the base of the crown forms one supporting

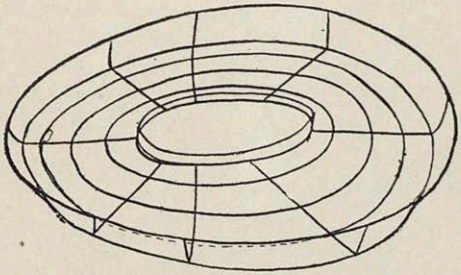


FIG. 9. TURBAN BRIM FOR LARGE SEPARATE CROWN

ring of the brim; net shirred on wire cords formed the hat, therefore the simplest skeleton was enough as frame, but a wider inner band, covered with cape net, was necessary.

In Fig. 9 we show a wide turban brim with head

band; the suitable crown would be wide and a little higher than the "gallery," i. e., that part of a turban brim that turns up around the edge. This shape, with headband reversed, forms also a mushroom shape.

Bonnet Frames

The small bonnet frame is but little used now, except for widows' mourning, and far less than formerly even here, but the method of making is useful to know. The edge wire is the first; this is bent into the desired shape (see Fig. 10); the back may be deep or shallow; if shallow, the cross wire that runs from the middle front to middle back must be cut longer, and curved down. The length of edge wire from middle front to "ears," i. e., the corner where the wire turns upward,

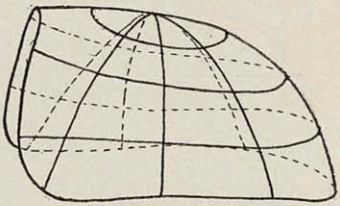


FIG. 10. BONNET FRAME

must be decided by the general effect desired, but a neatly rounded shell, neither too long around the face nor too deep at the back, gives the prettiest shape.

After front to back cross wire has been attached to the edge wire, and curved to shape, the side to side brace is put in, then the diagonal wires, which run from the ears over to the opposite side, half way between front and side wires, all, of course, crossing and being tied at top of crown. A ring is then set on top of crown; the diameter of this depends on the size of the shape, but about three inches is the usual measure. One other round wire is always needed;

sometimes, as in Fig. 10, two are used, because of the *depth* of the frame; these are as shown, attached to the edge wire at back; if only one is needed, and the *back is shallower,* this may be a ring coming half way all round between the crown wire and edge, except, of course, at the ears which are not taken into consideration here.

If a coronet is desired on such a bonnet, extra must be allowed for this on the *cross wires,* and these bent up at the desired angle from the edge, an extra edge wire giving the outline of coronet edge; this is clipped tightly over the bonnet edge at the ears.

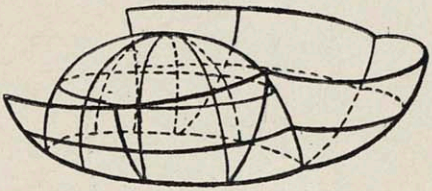


FIG. 10A

Child's Bonnet

For a child's close bonnet the edge wire is bent as shown in Fig. 11. To get the measurements, take these as directed in the lesson on children's millinery, i. e., around the face, over the head from front to back, around the head from side to side, and around the base of head from in front of and below each ear. The edge wire is in one (1), joined at back of neck. Put in first the wire from front to back, (2) next the one from side to side, (3) tie at back where they cross; these will be your keys, for the other wires, which may be cut approximately, tied on at the top, then curved to the right form, and tied at side and neck. In the model there are three each way; they are numbered in the order in which it is best to place them,

These forms for children's bonnets are also made of tape wire, called also ribbon and "taste" wire; this is used flat, and *sewed* at the intersections. In either case, all wire ends must be left *outside* of frame, or they are apt to work through and scratch the child. Made only to the size of the second wire around face (4), the corners *rounded,* as in the lady's bonnet, also the back shortened, it gives us the crown of a granny bonnet, to which can be added a flaring brim, either made in one with the crown; or a *corded* brim is set on by the milliner. (The writer has found flat featherbone an excellent substitute for wire for children's bonnets

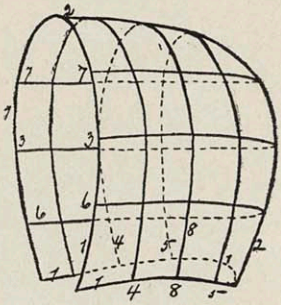


FIG. 11
CHILD'S CLOSE BONNET

and hats, as it rebounds into shape when crushed, which wire will not do. For small fur hats and the little fashionable evening toques it is equally practical.)

Let the learner look at a number of well-made frames, and notice how the lines are formed by edge wires and braces, and how the supporting rings or part rings are put in.

Methods of Holding and Handling

The easiest way is always the best way, and the *right* way is always the *quickest* way. If a thing feels awkward in the doing, be sure you are not doing it

right. It takes a little practice to use the tools so that they will do their work neatly and swiftly; the cutters must be opened just enough to pass the wire between, which must be severed with one firm clip, pressing the two handles together in the bowl of the right hand. (See Figs. 3 and 7.) The pliers must be used in the same way, but their points are used in place of finger and thumb, and with the firm pressure of the whole hand, hold more strength, and a firmer, as well as neater, grip than the fingers.

Keep all wires even, allow no "kinks." A firm, even pressure with the thumb will straighten the ring out, when it can easily be bent quite straight. Unless first bent straight, wires will twist, and if made up thus, the frame will have a squirm that nothing but remaking will remove.

Practice the tying; one twist each way across the wires is sufficient, if the ends are firmly twisted and turned under, and 1 inch is enough.

Frames of Twisted Wire

Many frames are made without tie wire; for these the cross wires are of much softer wire, as these are *twisted once* around the ring wire, where in the other method the tie is used. In this method a half an inch must be allowed extra for every turn, and the wire must be held *very* firmly, at the right length required, together with the ring, and the twist made with the other hand. It is one turn only, and this must be so close that it holds the ring firmly. It requires much practice to do this and not let either wire slip, which would spoil the lines and proportions of the shape.

Proportions

To get the right proportions relatively of round and cross wires, remember the rules given in the making of buckram frames, i. e., that the circumference of any given part is three times—and a seventh—that of the diameter. Thus, if your crown is 7 inches across,

the ring wire that encircles it must be 22 inches plus two added for lapping. If your brim is 14 inches across from front to back, *and side to side,* the edge wire will be three and a seventh times this, which is 44 inches; to this is added the two or more inches for lapping. If, however, the crown is oval, allowance must be made for this, and if the brim is flared, several inches should be allowed and the frame shaped in the making.

Machine-Made Frames

In imitation of the above methods a clever machine has been invented, adjustable to any required form, and, when once mastered, proving swifter, and more accurate than the fingers; it is used in many factories, and by manufacturing milliners, and is therefore well worth while learning.

Parisian Frames

Parisian wire shapes often have a covering of tulle shirred over the wires, it is folded lengthwise along the middle over the edge wire, the two layers shirred together below the wire, and fulled a little as the work proceeds; the material is then drawn smoothly down and shirred below the second wire, then the next and cut neatly beyond the head wire, which is covered with the piece shirred over the crown.

In England and America we cover wire frames according to what is going on them, but one of the nicest materials is horsehair (crinoline) gauze, especially under tulle.