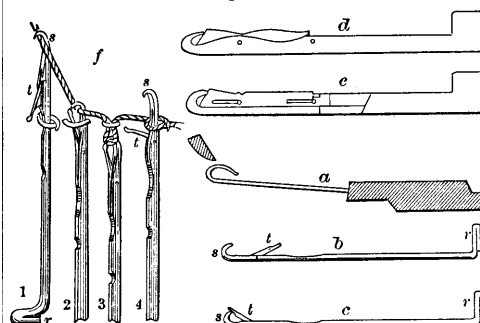


Knitting-machine' Needle. The hooked member of the machine which passes through a previously made loop catches the yarn, and retreats through the loop, bringing the bight of the yarn with it, forming another loop. The essential feature of a knitting-machine needle is that it shall catch and draw the yarn to form the loop, and shall cast it off by allowing it to slip over, at another period of the action. The devices for this purpose are flexible beards and latches.

a (Fig. 2773) shows the English knitting-machine needle, which has a hook at one end with a pliable barb, which bends down into a groove in the shank when depressed by a presser-bar. The barbed hook

Fig. 2773.



Knitting-Machine Needles.

then becomes a closed eye; and if a thread looped over the stem of the needle be drawn forward while the barb is thus closed, it will pass over the barb of the needle and come off at the end. If the thread be drawn forward while the barb is open, it will be caught under the hook. The principal action of the machine depends upon this feature.

b c show two positions of the *latch*-needle: one with the latch lying back, the hook being in condition to catch the thread; the other showing the hook closed by the latch, which acts as a mousing.

d e are two views of a needle which has a closing slide. The lower view of the two is a section showing the slots which traverse on the pins.

f shows a group of needles with the yarn looped thereon, as when the machine is at work. The needle employed is shown complete at 1. In the other numbers a portion of the lower part is broken away. The needle consists of a body, an angular bent portion or foot *r*, a hook *s*, and a latch *t*. The latter is pivoted to the body of the needle, and works partly in a slot formed in the body. The latch has, moreover, a spoon-shaped end, which, when the latch is closed, as shown in needle 2, meets and partly shuts over the point of the hook *s*, so that the loop formed on the needle easily slips off when the latter makes its downward movement. The needle 1 has passed up through a loop of the previous row, and the hook *s* has caught the yarn; the mousing-latch is thrown back, as shown also at *b*, same figure. The needle 1 descends, drawing with it the yarn, as shown at 2, the position of the previous needle; the loop on the

shank has come against the latch *t*, and closed it against the point of the hook, so that the hook and its yarn slip through the loop, which is cast off, as shown at needle 3. Presently the needle commences to rise again, as its turn of work recurs, and, as it does so, as shown at needle 4, the loop lying in the hook slips down the shank, capsizes the latch *t*, and falls over it into the depression in the shank, as shown at needle 1. This is one round of work for a needle. Knitting by machinery is a rapid repetition of these motions.

Knitting-machine needles are made in machines by which the wire is reduced. In Aiken's machine the blanks are clamped in the arbors and brought singly between the grooved rest and rotating cutter, and are reduced by the cutter, which turns in a longitudinal plane, the arbors rotating meanwhile. After the blank has been reduced, it is drawn back from between the rest and cutter, the arbor-wheel is unlocked from the spring detent-pin, and another blank brought into position.

In another machine, for making the tongues of knitting-needles, the machine first forms the bowl and nick of the tongue, and simultaneously forces back the feeder upon the wire. The wire is then moved between the flattening dies; it is then moved to the punching dies, then to the dies rounding the end next the hole. The tongue with the sharp piece projecting from it is then cut off.