

BRAIDING AND COVERING MACHINES. Braiding machinery is employed for making plaited fabrics, either flat or round, such as are used for braids and other trimmings, wicks, fish-lines, shoe and corset laces, curtain-cords, etc. It has also of late years found a very important employment in the manufacture of the covering for electrical wire. The general principle of braiding-machines follows closely the idea of the old May-pole dance, in which each of the dancers, holding a ribbon attached to the top of the pole, moved around one another, in and out, until the ribbons were braided or plaited up and down the length of the pole. The various strands of the braid or covering are applied to a wire as a central core by mechanism, which imitates substantially the movement of the dancers. Covering or armoring machines are used on applying the non-braided insulating envelope of electric conductors.

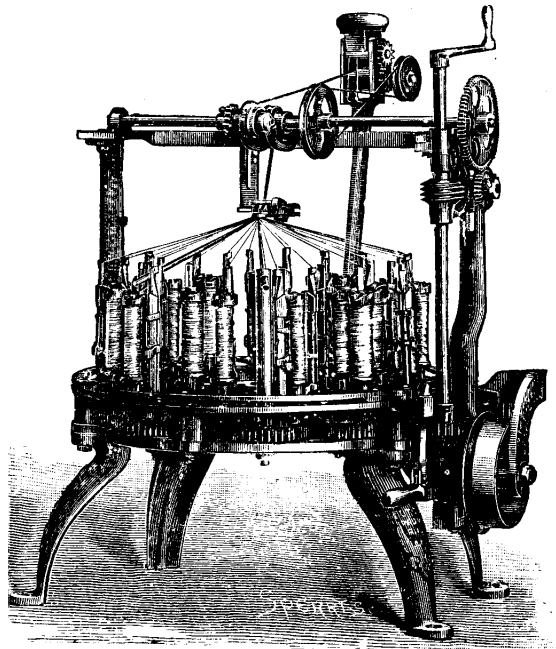


FIG. 1.—Braiding-machine.

Braiding-Machine.—We illustrate in Fig. 1 a machine intended for the manufacture of flat braids, and in Fig. 2 the carrier of that machine, manufactured by the New England Butt Co., of Providence, R. I. The mechanism of Fig. 1 consists of a series of gears meshing into one another, and provided with horns or lugs on their upper surfaces. These gears are mounted on a circular bottom plate. Above the bottom plate is a top plate, having openings or recesses in form corresponding with the periphery of the gears, and through this plate extend the carriers. Lugs on the bottom of the carriers extend down through the plate, and between the lugs on the gears, which in their rotary motion propel the carrier along the groove of the top plate which directs its course from the outer to the inner curve, a corresponding carrier on the other side of the curve going in the opposite direction, and at the intersection of each run crossing each other, thus forming the stitch. The carrier or bobbin-holder (Fig. 2) is provided with a spindle, *A*, for holding the bobbin, and a stem, *B*, for the weight and latch. The thread from the bobbin passes through a hole in the stem, and under a weight, *C*, which slides on the stem, then through a hole in the top of stem, and thence to the braiding-point. The weight acts in a fourfold capacity. It takes up the slack thread produced by the carrier, passing from the outer to the inner run. It makes a tension on the thread to braid tightly or loosely as may be required. It automatically stops the machine. The thread passing under the weight holds it suspended on the stem, and the breaking of the thread, or the running out of a bobbin, allows it to drop to the bottom of the stem, where it comes in contact with a point of the stop-rim, the contact operating a lever, which throws out the clutch and stops the machine. It regulates the supply of thread from the bobbins. As the thread is taken up in the process of braiding, it raises the weight until it comes in contact with the latch on the top of carrier; the latch being provided with a nose-piece engaging with a ratchet on the top of the bobbin, the weight raises the latch, disengaging the nose-piece and allowing the bobbin to let off thread; this act releases the weight, which falls to its natural position, the nose of the latch again engaging with ratchet in the bobbin, and holding it until the motion is repeated.

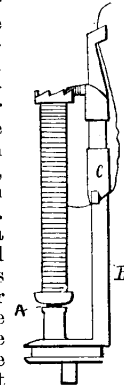


FIG. 2.
Carrier.

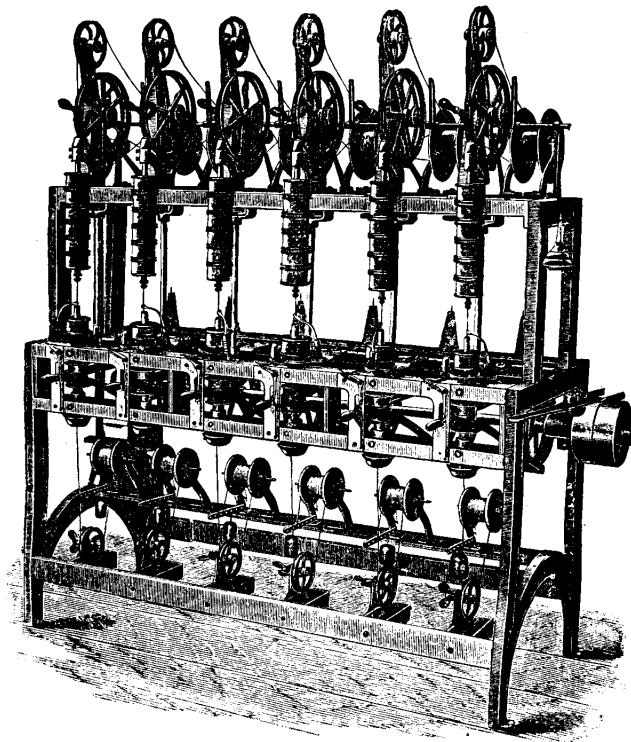


FIG. 3.—Six-spindle winding-machine.

These carriers, provided with bobbins of thread as described, two to each gear, in their continuous movement in and out and past each other at the intersecting points, form at the center of the machine, and at a proper angle above it, the plaiting or braid. A pair of rolls, driven by gears and shaft connection with the main driving device, forms the feed or take-up of the braid, from which it is led into a receptacle, or wound on to a reel. When made for tubular braids, or for round fabrics, it will be seen that any article inserted into the center of the machine and into the tubular fabric thus formed will be covered with it. The size of the braid depends upon the size and number of threads, and can be carried out indefinitely, a machine of 300 carriers having been built and operated successfully.

Six-spindle Covering-Machine.—Fig. 3 represents a six-spindle winder, designed more particularly for covering electrical wires. The bare wire on the commercial spool or on a reel is placed on the stand-

ards under the machine (a tension regulated by the adjustment of the weight being applied); it then passes around a small sheave-wheel, which is so arranged that it can be lowered down into the pan for holding a solution of white lead or other insulating compound, if used, and to raise it out of the solution when the machine is not in operation. It then passes up through the spindle, which is driven by a quarter-turn belt on to a tight and loose pulley, the

loose pulley being chambered and filled with wool to retain the oil for lubricating. The wire then passes up through the disk on which the flier is fastened, with a counterbalance opposite. The spool is placed on the spindle, and the thread carried from it to the flier and under the drop-wire of the stop-motion, then up through the eye of flier to the winding-point, where it is fastened to the wire coming up through the spindle, in the top of which is the grooved guide and support for the wire when being wound. The guide can be finely adjusted for more or less tension and for the *lay* of the thread. The revolutions of the spindle which carries the spool and the flier around the wire at a high speed cover it uniformly and with the smallest fraction of insulation. Hanging over the thread and in the bottom of the flier is the drop-wire, which, when the thread breaks, or a spool runs out, drops, and extending through the disk, in its revolutions comes in contact with a latch holding up the starting lever, releasing it, when it falls, changing the belt to the loose pulley and stopping the spindle, each spindle being independent. The spool is slotted, and when it runs out of thread is raised just above the spindle and taken off sidewise; the wire passing through the slot, a full spool is taken down from the spool-holder above and placed on the spindle and threaded up, when the spindle is ready to go on again. The wire passing up through the tube or spool-holder passes around the feed-wheel and over the sheave down on to the reel. The feed-wheel is driven by connections of shaft and gearing with the spindle, making it positive; a variety of changes of speed being obtained by change-gears, which is made by a simple and quick arrangement. The hand-nut at the left of the feed-wheel is loosened, the wheel is raised up, throwing the gears out of mesh, and, after the change is made, the wheel is dropped back to engage with the gears. The hand-nut on the right of feed-wheel, when loosened, releases the wheel from the gear, and allows it to turn back to repair the wire or to mend a break.