Filling Mill. 1. The old filling mills were generally of wood, and the necessity for weight gave rise to their being of enormous size. The beating mill, which the nearest resembles the ancient trampling—practiced in Asia with camel's hair for thousands of years past,—is shown in Figs. 2125, 2126, p. 923, "Mech. Dict." The roller mill, which is more compact, is shown in Figs. 2127, 2128, Ibid.; but a still more improved form is the Rodney Hunt, shown in Fig. 1109.

In this mill, the shape of the box answers to the requirements of the work, to avoid useless quantity of ends. The rubber sending is of iron, and casing of hard pine. The main squeezer rolls have cast-iron shafts covered with wood, the fibers of the wood being presented endwise outward. The bottom rolls have brass flanges between which the top rolls run. The rolls are geared, and pressure is obtained by elliptic springs. All the inside working surfaces are of wood or brass, to avoid staining the goods. By certain attachments the fuller has control of the goods, feeling and stretching lengthwise, or feeling the width as he may desire. An automatic stop-motion stops the mill in case of the "knooting up" of the goods.


2. A machine in which wool hats are felted; an operation equivalent to the sizing formerly done at the battery.

The hat having been formed by a fleece of wool from the cutting machine wound upon the cone, and thence removed and given a certain amount of consistence known as hardening (see Hat-Hardening Machine), it then to be felted or failed to give it strength, an operation which compacts the fiber and makes the cone much smaller.

The principle of felting is probably sufficiently well understood, and need not be explained here. See pp. 833, 834, "Mech. Dict."

The precursor of the filling mill was a machine invented by James S. Taylor, of Danbury, Conn., and patented May 3, 1830, as a hat-shrinking machine.

It had four rolls set with their axes in relatively angular position, which caused a roll of hats placed between them to travel slowly along while turning around between the rollers. Two of the rollers had also a vibratory motion, and the effect was a rubbing pressure, and an advancing motion. An ingenious device, and useful in its day.

The first successful filling mill was used in the factory of the "Sennett Clothing Manufacturing Company," of Maltewan, N. Y., about 1850, at which time the company commenced the manufacture of wool hats: and it may be remarked that the use of the filling mill is yet principally confined to the wool hat factories, the sizing of fur hats being almost wholly done by hand on the battery.

Various styles of filling mills are now used.

Fig. 1100 shows a mill called a "winder," which is used to start the hats—to follow the language of the factory—when they leave the hardening machine. The beater is driven by a bell crank, which receives motion from a crank shaft by means of a connecting rod, which is adjustable in a curved slot in the bell crank to vary the stroke of the beater.

Sometimes one beater is used, but generally two beaters moving in opposite directions, and placed side by side in the same filling bed, and consequently acting upon two batches of hats in the respective ends of the bed.

To finish the hat body another kind of filling mill is used, having filling stocks.

Four cast-iron frames are bolted to a solid foundation; these form the bearings for the beater shafts, and contain the filling beds. A driving shaft operates two large gear-wheels, to which the lifting gears which actuate the beaters are attached. Two beaters operate in each bed; and the hat bodies placed in a body in each bed, slowly turning by the successive blows, are gradually filled to a suitable size.

In some cases agitated water is used to facilitate the filling of the hat bodies, but in most cases fuller's soap is employed.