

## MANUFACTURE OF FELT HATS.

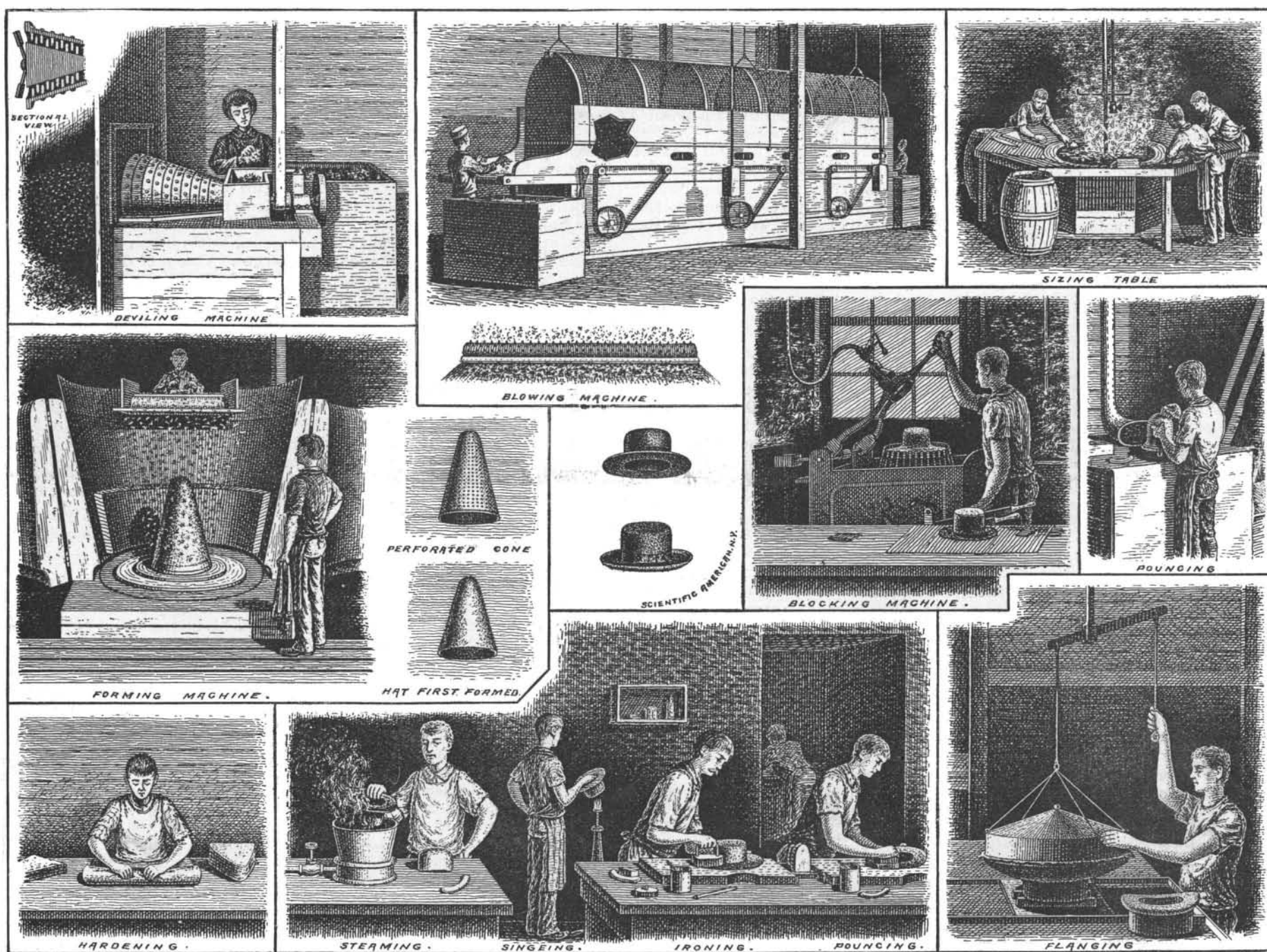
The present illustrations were taken from the No Name Hat Works, Orange Valley, N. J. The fur that is used in manufacture of felt hats is imported from Europe. They are made of a mixture of the fur taken from such animals as the coney, nutria, hare, musk, and short seal. Formerly, the fur first went through a process called bowing. This was an instrument resembling the bow of a bass violin, about 7 ft. long, with a string of catgut stretched from end to end. This string was drawn back and forth by hand, over a quantity of fur, the vibration of which caused the fur to separate from the mass and fly to the right into a receptacle ready for the next operation. The deviling machine now in use for separating and mixing the fur is a cone-shaped cylinder, about 3 ft. in length, 2 ft. in diameter at one end and 14 in. at the other. Projecting from the underside are rows of teeth set an inch or so apart. A shaft running through the center, about the same shape as the cylinder, is also set with teeth placed in such a position that, when the machinery is set in motion, they pass between each other. These teeth are about 3 in. in length and about  $\frac{1}{2}$  in. in diameter.

it to a brush roller, which whisks the fur over into the forming machine. The hat is formed over a perforated copper cone. These cones are of various sizes, running from 10 by 15 to 30 by 40 in., according to the size of the hat to be made. The cone is first wet and made to revolve over an orifice, under which is a powerful fan, which causes an inward draught through the perforated cone. The fur, as it is whisked over by the brush roller, is sucked down by the current of air passing through the cone, which, being wet, causes the fur to adhere to it. The cone revolves until the quantity required for the hat is run out. A wet cloth is then placed around it, to keep the stock together. A cap is placed over it, and it is taken up and placed in a tub of water. It is then taken out and off the cone and taken to be hardened. A dozen of hats is placed inside a cloth, and rolled about in the same manner a baker would form loaves of bread. This tends to shrink, and give the hat body. From here the hat goes through what is called sizing or shrinking. The sizing tables are octagonal in shape, and are made of wood. In the center of table is a copper kettle, about 3 ft. in diameter, filled with boiling water. The hats are first dipped

the hat then being rubbed off with fine emery paper, the particles flying from the hat passing up through the draught pipe. The hats are then taken to the finishing room. They are first steamed, so that they can be stretched over a hat block, then greased, ironed and singed. They are then taken to have the binding and sweat bands sewed on, and then to the flanging room. The hat is set into a frame of the same shape, the brim ironed, and then placed on the flanging table. This table is hollow, and is made of wrought iron. It is  $2\frac{1}{2}$  ft. in width and 2 in. in thickness. The table is filled with steam for heating the flanging pans. These pans are 30 in. in diameter, and 12 in. in height, with a heavy muslin bottom. This pan is lowered on to the hat; the weight and the giving way of the sand cause the brim to take the same shape as the frame. The pan is left on the hat from three to eight minutes. The hat is then ready for sale. This concern employs about 150 hands, and turns out about 200 dozen fine grade hats per week.

## Causes of Deterioration of Rubber.

In a recent paper on the vulcanization and decay of



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The fur is run through the small end of cylinder, the teeth of which separate it into fine particles, and also mix the different kinds of fur thoroughly together. The fur is drawn through the cylinder by the aid of fans at the end of the shaft, and gathered up for the next operation, which is the blowing process. This machine is about 20 ft. in length and about 4 ft. in width. It separates the good from the bad fur, and takes out all of the impurities. The fur is placed on an oilcloth belt, and run through a couple of iron rollers. It is then taken up by a 3 in. wooden roller, the surface of which is covered with sharp pins. The air caused by the revolving of the roller, with the aid of the pins, blows the good and bad parts from each other. This operation is performed six times, the fur passing out of the machine almost as fine as silk. It is then weighed out and pigeonholed for the different sized hats. From here it goes to the forming machine. This machine is pail-shaped, and made mostly of hard wood. It is about 4 ft. in diameter at the top and about 3 ft. at the bottom, and about 6 ft. in height. The weighed out fur, from which a certain sized hat is to be made, is first placed on an oilcloth belt, which carries

into the scalding water, and then gently rolled with a tapering rolling pin toward the ends, and worked in every direction to toughen and shrink them and at the same time prevent the sides from sticking. Wooden gloves are also used in rubbing. The process of sizing is gone over several times. The hats are then taken and stretched and dyed. After the dyeing process, the hats are placed in a tub of boiling water. A hat is taken while it is hot, and put into a blocking machine. This machine is made mostly of movable steel bars, circular in shape, and arranged so that they can be opened and drawn together by means of levers. A hat is first drawn over a set of inner bars, which form a solid block, the shape of a hat. The outer set of bars grasps the rim of the hat by means of the lower levers. The upper one, containing the ring with the hose attachment, is drawn down over the hat, which gives it its shape. Cold water from the hose is then applied. The hat is then taken out and sent to the drying room. The rough particles and hair that stick out of the hats are then shaved off with a sharp knife. The rims of the hats are shellacked. The pouncing process is done by stretching a hat over a revolving block,

rubber, by Mr. W. Thompson, are some statements which may throw new light on the deterioration of rubber hose used in railroad service. Copper salts have an injurious effect upon India rubber, and as such salts are sometimes used in dyeing rubber goods black, this may frequently account for their decomposition and hardening. Metallic copper in contact with rubber causes oxidation and hardening of the gum, although no appreciable amount of the metal enters into it. Zinc does not in any way affect the rubber. Oil containing even small amounts of copper coming in contact with rubber goods is highly injurious. There is also an acid in linseed oil which rots the cloth. All oils, except castor oil, exert a detrimental effect upon rubber. One of the evidences of decomposition is the evolution of a strong odor. When a piece of blotting paper is placed over decaying rubber it becomes discolored by some of the emanations, which does not occur when the rubber is in good condition.

From this it appears that volatile substances are emitted during the oxidation which produces the hardening of India rubber.