

There are upwards of eight hundred different articles made in this building by the company, and we have only touched upon a few of them. We witnessed the operation of making metallic cartridge cases, measuring tapes, dram flasks and a great many others not to be here enumerated. We were much interested in all the processes above-described, and regretted that our time precluded further research. We had, however, an opportunity, while in Waterbury, to witness the operation of making—

BRASS KETTLES.

The universal "blank" is in demand, here as elsewhere, and is an enormous brass disk proportioned to the size of the kettle it is desired to make. This blank is put into an ordinary engine-lathe running at a high speed. The face-plate of the lathe has a cast-iron cone or *fac-simile* of a kettle secured to it, and the blank having been previously partially formed up in a shape somewhat like the finished kettle is now rapidly rotated. There is a small steel roller placed in close contiguity, which runs along the surface of the blank and draws it up or spins it out to the shape of the cone; thus the kettle is formed, and it only remains to turn up the bottom and wire the top and bale it to complete the article. The process of making kettles is very rapid or they could not be sold at almost the price of the raw material.

We would call attention to the very handsome exterior, as also the thoroughness and fidelity of construction, which characterizes all the articles above-mentioned. At one time foreign workshops controlled the market in these wares; and we have reason to be proud that our manufacturers are taking the field successfully against competition abroad. That they may continue to improve and develop the interests of the country yet further is our most earnest desire. In our hasty walk through the factories noticed in this series of articles, we were much gratified to observe the almost universal substitution of machinery for manual labor; and, as we have previously remarked, such a course cannot fail to be of advantage to all concerned. Indeed it is imperative; and it is only through the instrumentality of instruments—to speak alliteratively—that the public are enabled to purchase the different articles so cheaply. What should we do for kerosene lamps or for thimbles, hinges and buttons, if we were dependent for them on tools only comparatively ingenious? The cost of those wares would be enhanced ten-fold. The progress of any manufacturing business that employs mechanical assistants, instead of depending on the various degrees of intellectual strength among workmen, is certain to be advantageous to all parties and cannot fail in its benefits to the world at large. The distinctive character of these articles on the manufacturing interests of the country will be retained in future numbers of the SCIENTIFIC AMERICAN, but our observations will be transferred to other localities.

DISCOVERIES AND INVENTIONS ABROAD.

Improved Drawing Rollers.—At a late meeting of the Institution of Mechanical Engineers, held in Birmingham, England, a paper was read by W. Weild, giving a description of an improvement in drawing rollers for spinning which he had lately invented and introduced. By the present method of spinning cotton the sliver is passed through a succession of fluted rolls, each pair of which runs at a higher speed than the preceding pair. The cotton fibers of the sliver are thus gradually drawn out and laid side by side in continuous juxtaposition ready for being spun into yarn or thread. The lower roller of a pair is the one that is driven, and it alone is grooved, the upper one being covered with leather and possessing a smooth surface. Being held upon the lower fluted metal the leather of the upper one gradually becomes indented by the flutes of the lower one, and when this takes place the fibers of the sliver are stretched irregularly and the thread becomes unequal in thickness. The success of making smooth even cotton yarn depends upon the uniform thickness of the drawn sliver. To obviate indentations being made in the leather rollers M. Weld forms his grooved rollers with spiral instead of straight parallel grooves, and by this arrangement the leather roller bears upon a number of flutes instead of only one. He also forms the flutes of the

rollers with milled edges, and the material which he uses for them is Bessemer steel. Such rollers are also made made of less diameter than those in common use, and by this construction of them he asserts that he can make superior yarn and thread with a much shorter staple of cotton.

New Cement.—A patent has been taken out by J. Duke and J. Clever, of Puriton, England, for manufacturing a hydraulic cement from very common materials. They take slaked lime and clay in equal parts, then combine them together by agitation with water in tanks and allow the mixture to settle, after which they run off the water, dry the precipitate and then burn it in a kiln. When ground it forms a good hydraulic cement.

Silk from the Mulberry Tree.—P. Potenza, of Naples, has patented a process whereby he obtains a silky fiber from the bark of the mulberry tree. The bark is first carefully separated from the wood, then dried in the open air. After this the bark is boiled in a solution of soap when its interior layers are easily separated into masses of fine fibers, and may be carded and spun into threads with common machinery used for manufacturing cotton.

Plate for Artificial Teeth.—M. Cartwright, of London, has patented plates for artificial teeth, composed of gold and dissolved india-rubber intimately mixed together. The india-rubber is first dissolved in benzine, then leaf gold is ground with it in this state until an intimate plastic mixture is formed. This compound is then heated to render it soft and capable of being worked into the model of the plate to be produced, after which it is vulcanized by heat in a suitable oven.

Mounting Artificial Teeth.—Another invention connected with dentistry has also been patented by J. Thom, of London, and is described in substance as follows:—A model of the mouth to which the teeth are to be fitted having been taken in wax (or other plastic material), and the artificial teeth placed in their proper positions, a cast is taken therefrom in plaster-of-paris in the usual manner. After the mold has been completed and become hard, the wax is removed, and its place supplied with the india-rubber and sulphur, which is heated to a temperature of about 330° Fah., when the india-rubber becomes semi-fluid and takes the form of the mold; at the same time it becomes vulcanized and hardened. In cooling, the vulcanized india-rubber is found to shrink or become distorted from the original pattern, and therefore does not accurately fit the mouth from which the model was taken. In order to remedy this defect, and give the required accuracy to the artificial gum, the patentee submits it to the following additional and corrective process, which he claims as constituting his invention:—Having trimmed the vulcanized india-rubber and made any necessary corrections thereto, he replaces it (the teeth being imbedded in their proper positions) in the plaster mold, within a metal collar of conical shape, which by means of a screw-press brings the parts of the plaster mold in close contact with each other and with the vulcanized india-rubber. While subjected to this pressure, he heats it to about 220° Fah., which so far softens the vulcanized india-rubber as to cause it to conform itself strictly to the mold. In this state it is left to cool and harden; and being taken out, it retains the form of the mold and accurately fits the mouth from which the original model was taken.

Strawberries.

The following very sensible remarks upon choosing strawberries are from the *American Agriculturist*:—

"This is the harvest month for strawberries, and the time when the fruit is in perfection is the proper time in which to plan for new beds. While to many one strawberry is as good as another, those of larger experience know that this fruit presents a great variety, not only in flavor and relative sweetness, but in the size and hardness of the fruit and the vigor and prolificness of the vines. The best berry for the table is not always the best one for the market firmness of flesh and abundant bearing are for this purpose the most important qualities. Though we may have many very fine varieties, perfection is not yet attained, and every year there are new claimants to superiority over old varieties. It is no doubt possible that the efforts of cultivators will yet produce

a fruit which will combine all the excellence of the best-known varieties. Now is the time for those who intend to plant in the coming autumn or spring to visit the grounds of cultivators or fruit exhibitions and make observations for themselves."

VALUABLE RECEIPTS.

CURING BUTTER.—Melt the fresh butter in a glazed stone-ware vessel, and heat it to 180° Fah. The stone-ware vessel should be placed in a metal vessel containing the warm water. The butter is maintained at this temperature as long as any froth comes to the surface, and it must be skimmed until it becomes quite clear. It is then strained through a coarse flannel cloth, which will separate any of the cheesy particles that may remain in it. It is then poured into a clean stone-ware vessel and cooled as quickly as possible, by surrounding it with cold water or ice. This is the method employed by the Tartars for preserving butter. They supply the market of Constantinople with it, and it is stated that it will remain perfectly fresh in a cool situation for six months. Butter so treated, and then salted will preserve its fine taste for two years when kept in a cool situation. The chief cause of butter becoming rancid is due to the cheesy particles left in it in curing. These may be all removed by melting the butter, but care must be exercised so as not to raise the temperature above 180° or the flavor of the butter will be injured.

RANCID BUTTER.—The rancid taste and odor may be removed from inferior butter by melting it in a water bath with some finely powdered fresh charcoal, then straining it through flannel. The curdy particles sink to the bottom of the vessel in which it is melted. This operation, however, will not restore the primitive flavor to butter. We have seen melted rancid butter treated with a small quantity of the carbonate of potash. The odor and rancid taste were thus removed.

PRESERVING CASKS.—There is much truth in the old saying, "Economy is wealth." It may be safely applied upon a very extensive scale in the care of casks, for assuredly it seems to be a general rule that they do not receive much care, as they are too much exposed, in almost all establishments where they are much used, to the weather. They should be kept in a dry situation, or in one that is uniformly moist, as the continual variation from the one to the other soon rots them. As soon as casks are emptied they should be bunged down air-tight with as much care as if they were full. When a hoop becomes loose, it should immediately be driven up tight; and if it is broken a new one should at once be put on. Iron hoops are made of very soft iron, which is very susceptible of rust. When the hoops of casks become slightly rusty, they should be coated with boiled linseed oil, and allowed to dry before they are used. The oil will prevent further oxidation, and the hoops will last five times longer.

CLEANING MUSTY CASKS.—Several methods are successfully employed to purify casks. The most effective is by desiccation with a current of hot air driven in by a blower, but there are few situations where this system can be applied. Another method consists in rinsing the cask with dilute sulphuric acid. About ten pounds of vitric oil mixed up with cold water, will serve to clean fifty hogsheads. They must be rinsed with water after being agitated with the dilute sulphuric acid. Musty casks are also purified by smoking them with a fire of wood shavings kindled inside. Fresh slaked lime, mixed with water is also used for rinsing casks, to remove the musty odor. In all cases they should afterwards be thoroughly rinsed with hot water. High pressure steam, where it can be conveniently applied, is perhaps superior to any other agent for purifying musty casks. A correspondent of the *California Farmer*, in alluding to the method of purifying wine casks, says (respecting steam):—"To steam a cask, I open the bung and faucet-holes, and conduct through an india-rubber hose the steam, from a boiler to the bung-hole of the cask. The steam escapes with violence through the open faucet-hole. Twenty minutes cleans the cask completely, after which I rinse it out with water twice, then use. This is the sovereign of all remedies, and ought always to be made use of whenever it is possible."