How Rubber Tubes are Made.

The "good old times" when 3-16 inch tubing brought sixteen cents per foot have passed into history. The present sharp competitions make the manufacturers look closely into small leakages as well as large ones. Work must be rapidly done with little waste of material and no porous or blistered results.

Different manufactories have different methods of making tubing, as regards the minutiæ of the work, but on the whole they are practically the same in them all.

A common and easy way is to have the mixed sheet spread quite thin on cotton sheeting in rolls of some fifty yards in length. This is wound as fast as spread upon a wooden core. The table upon which the tubing is to be made is zinc covered and should be very smooth. If the tubes are to be twelve feet long three operatives are needed; if fifteen feet, four.

The roll of sheet rubber is hung in a "rack" consisting of two simple uprights with bearings for a horizontal bar which runs through the core. The "cutter," or boss of the gang, takes a clean squared stick, a trifle longer than the sheet is wide, and, slipping it under the edge, acquires a firm hold. One of his assistants winds the cotton sheeting off upon a second core, while the boss, still holding the rubber, backs slowly the length of the table, careful not to stretch the long sheet which follows him. Letting it drop upon the zinc, after wetting his knife in a convenient water cup (sometimes in his mouth), he cuts the sheet away from the roll, leaving it a little more than fifteen feet in length.

The tube makers now gather in their places, all on the same side of the table, the "cutter" standing farthest from the roll. The further edge of the rubber sheet is secured to prevent slipping. This may be done by running a small brush wet with naphtha under the edge of the sheet, or by striking with the palm of the hand the whole length of the edge, or better still, by having a long strip of board hinged to the table, on the under side of which is a corrugated strip of vulcanized rubber and on the upper side a few short weights of lead.

The mandrels, or wires, which are to form the core of the tubes, are laid upon a table at the back of the workers. The wires have previously been treated to either a thorough coating of grease or of soft soap, and thoroughly dried, after which a light coating of cement made of mixed sheet and some convenient solvent—naphtha is the most common—is brushed over the length of the wire. (Some use no cement at all, folding the rubber over upon itself.) In a few moments this is dry. A wire is then taken and laid upon the edge of the sheet, which has previously been "trimmed" by the cutter. The four tube makers strike it gently to "set" the cement, and then turning up the wire slightly, the edge is struck wherever not previously caught by the "setting." The wire is then raised free from the table, the sheet straightened out, and the core rolled over upon itself three or four times, gauges in the hands of the workers determining its size. The cutter, then wetting his blade anew, goes to the further end of the table, and walking backwards, by a single long skillful stroke, cuts the tube free from the sheet. After being rolled forward and back several times, and possible blisters being pricked, the tube is taken by the "end men," swung over the heads of the "middle men," and deposited upon the rear table, which is upholstered with a mattress of cotton cloth to prevent the waxy vulcanized tube from "breaking down" or becoming jammed. The same process is repeated until the entire sheet has been used.

This kind of tubing has an advantage over that made of one thickness of stock, inasmuch as it is very strong, and having no seam is not liable to break open longitudinally.

When a "heat" of tubes has been made and laid upon the mattress, then comes the process of wrapping them in cloth moulds. These moulds, or "formers," are simply long strips of cambric muslin or other fine cloth, which are thoroughly wet and laid upon the rear table. The end men, taking the top one, lift it over and stretch it upon the zinc table, and the tube is then lifted over, and having been laid upon the cloth, the edge is lapped over it, brushed down with the fingers, drawn tight, and with a quick roll wrapped as securely as a mummy in its shroud. In this, care should be taken that the cloth is not too wet, as they are apt to slip and cause damaged places.

It is further tightened, however, by a process of rolling either with four short boards or with one long fifteen foot board. The latter is preferable. Boards are sometimes covered with heavy frictioned canvas, which increases their rolling power and prevents warping. An iron pan, upon which is laid a thin mattress of coarse cloth, receives the tubes for the vulcanizer. They may be packed in layers, three, sometimes four deep, depending upon the size of the tube and the weight of the mandrel. Some of the heavier ones will need supports at both ends and a deeper bedding in the middle.

Sometimes the tube after being wrapped in cloth is heated until the rubber is thoroughly softened and has taken the necessary form, when it is plunged into water, the cloth stripped off, and the tube then buried in French chalk and vulcanized. This manner saves the cloth, which otherwise would soon be burned so as to be useless, but it is not profitable on account of the time it consumes.

After the tubes are "cured" the cloths should be stripped at once, or if they grow dry and cold should be wet before stripping. This simple precaution alone will save twenty per cent of the cloth, while the skill of a careful yet rapid "old hand," as compared with the clumsiness of a "green hand," will surprise one unaccustomed to such comparisons.

In removing the tubes from the wires it is necessary to heat them slightly, after which with the end of the wire gripped by a vise, they can invariably be slipped off without trouble.

Another way of making tubing is by having the mixed sheet spread as thick as the tube is to be, which after being folded over upon itself is cut off obliquely; the two edges, of course, fit together and form a tube. Into this a wire is thrust, and it is either wrapped in cloth and cured as previously described, or is packed in chalk without any cloth wrapping.

Tubing made by hand is all lengths, from one foot to fifteen feet. That of which we have been speaking is essentially rubber tubing, that is, it has no canvas or wire gauze in its composition. Of the different styles of tubes that are made by hand there is almost no end.

Tube machines are in use in many manufactories, and in some cases do very fine work. One of the most simple of these consists of a cylinder which is fitted with strainers and a tight piston. In the lower end are a number of holes through which run ingeniously constructed mandrels. The cylinder is filled with rubber softened by a solvent, the piston is pressed down, and the tubes are slowly forced out around the mandrel. A short exposure to the air evaporates the solvent, and the tube acquires the hardness of unvulcanized caoutchouc and is ready for the "chalk pan."

In tube making half of the time will be saved by having the cutter, one who is especially quick, and who can keep a knife in good trim. A thin "Tuck" blade is the best. The clothes in which the tubes are wrapped, after being stripped, should be sprinkled, laid together, and folded smoothly, ready for the next heat. If the sheet rubber sticks to the zinc after a heat has been rolled on the table, a little oil rubbed into the zinc and then carefully wiped off, or a slight dusting with French chalk will prevent it.

It is a good plan to put the talkative man of the party in the place of "middle man," as there he is liable to receive "accidental" blows from the swinging tubes and wet cloths which the end men manipulate, and then he will be under control, and may, if desired, be kept in a chronic state of misery.

An everlasting mattress for the tube pan may be made from asbestos covered with a thin sheet of coarse cloth, the latter to be renewed from time to time as it is burned up.

An ingenious "blister pin" is frequently made by cutters of a sharp piece of wire which is driven into the handle of the knife a little above the blade and bent away from it. In this shape it is always at hand and cannot be lost in the scrap.

Pure "gum tubes" should be dusted with chalk before being wrapped in cloth, as otherwise it will be impossible to remove the cloths whole.—*Rubber Era.*

Correspondence.

To the Editor of the Scientific American:

I have succeeded in showing by actual demonstration that a ventilating flue or duct, running up through a building either as a chimney or ventilating flue built in the wall, will not in extreme cold weather convey the heated or foul air out of a room. The chimney or the flue must be warmed by artificial means or current produced by fan blower to produce the desired result. It not only does not carry off the heated or foul air, but cold air will come in through registers in such flue, whether they are near the ceiling or at the floor line, until the air in the room gets to be overheated. And also if indirect radiation is used in heating by passing air over steam coils in air boxes there must be flues for conducting the cold or the foul air out of the room, if you would warm a room with rapidity and success.

As an illustration, the plan now adopted in the Microscopical Room in the University Hall building. This building is four stories high and basement; the room on first story in southeast corner, with three large windows on east side and two windows on south side of room.

The heating of this room was from register in floor in southwest corner, hot air coming in over steam coil; in northeast corner a large radiator, which had become necessary to keep the room warm. With this arrangement the room had been so cold as to be a source of continual complaint.

About the first of February I placed two registers in the floor in the central part of the room, about twelve feet apart, connecting these registers by galvanized iron tubes, eight inches in diameter, twelve feet long, and thence by tubes twelve inches in diameter to chimney or flue running out of roof of building. In the bottom of this chimney a small steam coil is placed, which gives the flue and the connecting tubes to register a good draught, making a complete revolution in the heating and ventilation of this room.

So great is the change that doors and windows may be opened and thermometer run down to thirty, and in an hour, by closing doors and windows, go back to sixty, and yet have the air pure. ANDREW CLIMIE.

University of Michigan, Ann Arbor,
March 16, 1881.

Serpents' Eggs a Cure for Hay Fever and Catarrh.

To the Editor of the Scientific American:

There is one feature connected with sulphocyanide of mercury (Pharaoh's serpents' egg material), as produced from the pernitrate) which deserves attention at the hands of medical gentlemen. It is its power to arrest coryza, hay fever, cold in the head, and all similar affections. The slightest "whiff" of the *thoroughly dried* precipitate (mercuric sulpho-cyanide) will, in from seven to ten minutes, or less, produce *a first-class specimen* of coryza (when *thoroughly* dried it is an impalpable powder); and, acting on the homeopathic principle of *similia similibus curantur*, I have, in myself and others, arrested violent attacks of like nature—through taking cold—by *slightly* snuffing it in the nostrils. I have it in a small pasteboard box, wrapped in paper, *i. e.*, the box (it is difficult to confine the dry powder), with a rubber band around it. I simply "snap" this band, without opening box or removing paper, and inhale the dust. It is *infallible.* J. DE W. CHURCHILL.

Richmond, Va., March 16, 1881.

An Honest Letter of Thanks.

The following is from a prominent and successful clergyman in Ohio, but who requests that his name may be omitted.

To the Editor of the Scientific American:

I am a Presbyterian clergyman, thirty-four years of age, and have been a subscriber to your two weekly publications for several years. This letter is to tell you in some degree how your papers are of use to a clergyman.

You noticed recently "A Rich Man's Workroom," that of Mr. Robert Coleman, of the great Cornwall estate; it was an item of decided interest, but your paper comes into many more humble workrooms. My own adjoins my study; in it are a lathe and five-inch aperture telescope, all of my own construction, save the grinding of the telescope lenses. Also a battery, tools for wood and iron, various bundles of wire, and bottles of chemicals. The room is fitted for work and for experiment; and during these seven years of my work as a minister, not a week has passed without my presence in the workroom, at something there. You may remember receiving from me two years ago a sample of my work. Now, then, into this workroom your two papers come regularly, and I assure you they are very welcome. When I have read my two papers I carry them to a mechanic, he reads them; I carry them to our physician, and he reads them. A good paper is worth carrying to others.

My parish is very large; my work in it considerable and burdensome, but the workroom affords my best recreation; for it I have chosen the best room in the house. While other clegymen find delight, and very properly, with their gun, oar, or fishing tackle, give me a tool, a crucible to watch, or an idea to work out in material form. I want no better delight, and with the delight comes successful endeavor, something to use. The correspondence of my workroom—for it stationery is provided and a desk—is considerable and increases.

But further. You may think my sermons not orthodox, and my habits of study quite unusual. I tell you that I have often quoted from your publications facts pertaining to scientific research, and used them for illustration and information in my sermons before an audience of three hundred. I read no other paper as thoroughly as yours, though I have many. I believe it is rare that a new advertisement appears in the SCIENTIFIC AMERICAN that I do not discover. So I thank you from my study for your papers. They afford a profitable relief for a tired brain; and then at the second reading, real material for the study of any mind. A young man has just called to invite me to scientific experiment at his house when I have time. I shall be glad to go. The next man will want some laboratory work done, and I am always ready for that. If I could do more of this investigating it would be most welcome work. Mr. G. M. Hopkins, Mr. Robt. Coleman, and Mr. T. A. Edison enjoy their investigating labor, I very well know, and I do not wonder at all that any such man forgets to eat and to sleep in the prosecution of work. Questions to ask you occur constantly. Once a year I venture to send you such as are not answered by that time, so what you receive from me are sifted questions. Go on Messrs. Editors, you are giving us a good thing in your papers.

AGRICULTURAL INVENTIONS.

Mr. Jonathan C. Deuel, of Reynale's Basin, N. Y., has patented an improved apparatus for bleaching fruit. The object of this invention is to set the original color of the fruit and vegetables, such as apples, pears, peaches, potatoes, etc., or bleach them immediately after they are sliced, so that they will not afterwards, in the drying process or manipulation, become discolored by exposure to the air and light. The invention consists of an improved fumigator designed especially for the convenient reception, exposure to the sulphur fumes, and removal of the fruit or vegetables, and for a continuous automatic supply of sulphur, and to prevent the escape of the fumes to annoy the operators.

An improved seed sower has been patented by Mr. Mason Gibbs, of Homer, Mich. The object of this invention is to furnish seed sowers for sowing clover seed, timothy seed, and other fine seeds. It is so constructed as to sow the seed uniformly, and it can be readily adjusted to sow any desired quantity of seed to the acre.

Martha J. Dorsett, of Prince George's County, Md., has patented a fruit drier, so constructed that it can be readily moved from place to place, will protect the fruit from insects, and may be compactly folded for storage and transportation.