

ing machine. The length of straw depends upon the length of the root, and no crop is more injured by weeds. The crop is ready to pull when the bolls are filled and the lower half of the stalk turned yellow.

"It is very important to get off all the seed, else it stains the lint; and it is equally important, to make the business of flax-growing profitable, that the grower and manufacturer should be located near each other, so that the grower can sell the straw without attempting to clean it. If he rots it, he must take great care not to carry the process too far. It is now settled that mechanical and chemical operations must be combined to successfully prepare flax. A solvent is wanted, which has not yet been discovered, to dissolve the gum that holds the fibres together.

"At Lockport, N. Y., there is a chartered company in operation which pays \$10 per ton for flax-straw, and makes 300 pounds of flax-cotton at a cost of \$27. It goes through a great number of process, mechanical and chemical. It is first broken by fluted rollers, then hackled and worked again with rollers, then combed, steeped, boiled, washed, bleached, dried, picked, carded, roped and spun. For the coarse portions there is a great demand for upholstering purposes.

"There is also a large demand for paper stock. Indeed, there is no lack of demand, and no doubt of flax culture being profitable so long as the seed and straws can be sold near where produced at the present prices, and there will be a very large area in this State sown the coming spring."

Mr. Gould also described the Pen Yan flax machine, which puts the straw through a crushing process about fifteen minutes, and then it is beaten to shake out shives and then passed through fluted rollers, where it is combed by a toothed band. The product of a crop of nine acres of flax in Rensselaer county was given at 4,237 lbs of lint.—*Genesee Farmer*.

SOLDERING

Soldering is the art of uniting surfaces of metals together by partial fusion, and the insertion of an alloy between the edges, which is called solder, it being more fusible than the metal which it unites. Solders are distinguished as hard and soft, according to their difficulty of fusion. Hard solders usually melt only at a red heat, but soft solders fuse at lower temperature. In applying solder it is of the utmost importance that the edges to be united should be chemically clean—free from oxide—and they should be protected from the air by some flux. The common fluxes used in soldering are borax, sal ammoniac, and rosin. Hard silver solder is composed of four parts of fine silver and one of copper, made into an alloy and rolled into sheets. It is quite difficult of fusion. Soft silver solder is composed of two parts of silver, one part of brass, and a little arsenic, which is added at the last moment in melting them. It will be understood that these alloys are commonly run into convenient bars or strips for use. Silver solders are used for soldering silver work, gold, steel, and gun-metal. A neater seam is produced with it than with soft solder. It is commonly fused with the blow-pipe. A strip of thin silver solder is laid on the joint to be closed, the blow-pipe is brought to bear upon it, when it melts and runs into the joint, filling it

up completely. Button solder is employed to solder white metals, such as mixtures of copper and tin. It is composed of tin ten parts, copper six, brass four. The copper and brass are first melted, then the tin is added. When the whole is melted the mixture is stirred, then poured into cold water and granulated, then dried and pulverised in a mortar for use. This is called granulated solder. If two parts of zinc are added to this alloy it makes a more fusible solder. Fine gold cut into shreds is employed as a solder for joining the parts, of chemical apparatus made of platinum. Copper cut into shreds is used as a solder for iron. Hard silver solders are frequently reduced to powder, and used in that condition. Soft solder consists of two parts of tin and one of lead. An excellent solder is made of equal parts of Banca tin and pure lead; it is used for soldering tin plate, and, if well made, it never fails. The following is a useful table of solders with their fusing points:—

No.	Parts of Tin.	Lead.	Melting deg. F.
1	..... 1	..... 25	..... 558
2	..... 1	..... 10	..... 541
3	..... 1	..... 5	..... 511
4	..... 1	..... 3	..... 482
5	..... 1	..... 2	..... 441
6	..... 1	..... 1	..... 370
7	..... 1½	..... 1	..... 334
8	..... 2	..... 1	..... 340
9	..... 3	..... 1	..... 356
10	..... 4	..... 1	..... 365
11	..... 5	..... 1	..... 378
12	..... 6	..... 1	..... 381
13	..... 4	..... 4	... 1 Bismuth 320
14	..... 3	..... 3	... 1 " 310
15	..... 2	..... 2	... 1 " 292
16	..... 1	..... 1	... 1 " 254
17	..... 1	..... 2	... 2 " 236
18	..... 5	..... 3	... 3 " 202

The alloy No. 8 is used sometimes for soldering cast iron and steel; the flux used for this purpose is sal ammoniac, but common resin may be employed. Gold and silver are sometimes soldered with pure tin and a flux of resin. Copper, brass, and gun-metal are soldered with No. 8 and a flux of resin or sal ammoniac. The chloride of zinc is used for soldering sheet and plate iron as a flux with the same solder. Lead and tin pipes are soldered by plumbers with Nos. 6, 7, and 8, and a flux of resin and sweet oil. In soldering with soft brass, the ends of the article to be soldered are secured together by a wire, and granulated solder and powdered borax are mixed in a cup with a small quantity of water, and spread along the joint with a spoon. The article is then placed in a clear fire, and the solder melts at a bright red heat, when the article is then removed from the fire. In soldering small articles with the blow-pipe, they are supported on a piece of charcoal, or, better, pumice-stone, and the flame is ejected upon the solder. In soldering lead pipes, the parts to which the solder is not to be attached are usually covered with a mixture of lamp black and size. In soldering any articles care must be exercised to have the edges of the plates or articles perfectly clean, or the solder will not adhere. A flux is employed for the purpose of preventing oxidation. Resin and sal ammoniac, powdered and mixed together, make a good flux for copper and sheet iron soldering. In