

frame must be twelve feet long, and at least two feet wide. The bottom is made of two sheets of iron, rivetted together at the ends, so as to be water tight. It must be turned up at the ends and sides, and the angles turned in just like a large baking dish; but the ends must turn up three inches longer than the sides. Holes must be punched or drilled all along the sides and ends of the turn up, for the purpose of putting in screws to hold the iron to the wood. The turn up should be two inches at the sides, and five inches at the ends. You then have a long, shallow, iron dish—the wooden frame is made to fit into this—and then the sides and ends of the iron pan are fastened strongly into the sides and ends of the frame.

The partitions are made of wood, eight inches broad, and slide easily into the grooves. On to the lower side of each partition a piece of two-inch strong iron hoop is fastened, by screws; but this iron, although it goes quite to the end on one end of the partition pieces, does not go to the other end by two inches. When the partitions are fitted into the grooves, this vacant space is put alternately at each side, and the iron pieces bear on the bottom of the pan, so that when liquor is poured into one end of the pan it must circulate backward and forward, from side to side, until it reaches the other end.

When the boiler is to be used for heating and defecating the juice, these partitions are taken out, and laid aside; they are only used during the process of evaporating the juice previous to crystallization.

This boiler is set on two walls of brick work, going its entire length. The fireplace is at one end, and the chimney at the other.

When you are evaporating or sugaring off, the partitions must be fitted into their places there must be two vessels or tubs used with the boiler, one placed near the chimney to hold the charge; the other, at the fire end of the boiler to receive the syrup. There is a tap hole or plug in the end of one of the sides of the boiler to draw off the charge, this must be capable of being partially or wholly closed as required. A sufficient stream is let into the boiler at the chimney end, so that it evaporates as it runs from side to side; and is finally discharged from the fire end in the shape of thick syrup. When all is done, this syrup is removed to the chimney end, and again made to flow through the boiler, when it comes out all the water evaporates and is fit to sugar off and go into the crystallizing pans. In this state it will keep any length of time without fermentation or change.

The fire must be used with care and judgment, and for sugaring off, a sheet iron plate ought to be used to slide in between the bottom of the pan, and the fire; and thus take off the rashest heat of the fire, and prevent burning.

Before however the syrup is boiled down,

to its thickest state, it must be strained through a filter of bone black, which we shall now proceed to describe, this is the most troublesome part of the process from the fact, that the bone black filter will only last a short time, without being reburned.

Bone black acts much more energetically on juice about one-quarter boiled down, than on *syrup*, therefore the filter should be used whenever the juice has been well boiled, and has been thus only in a measure evaporated, the bone black filter operates better on the hot juice than on cold, and where it can be done, the juice as well as the filter ought to be kept hot throughout the entire process of filtering.

The object of the bone black filter, is to take out the excess of lime, and the other alkaline salts in the juice, and also to purify the syrup from its bad taste; and to destroy its color. A certain portion of the sugar can be crystallized without the bone black, but the bone black should always be used where it is possible to use it.

THE BONE BLACK FILTERS.

Any one who has a potash kettle can make bone black, and can reburn the bone black when necessary, we shall describe the process with a potash kettle, leaving those who have not one to use some substitute which their own ingenuity must point out. Any thick cast iron vessel that will stand a red heat time after time, will answer, though of course not so well as a potash kettle. The regular sugar manufactories have proper machinery for this purpose, we only wish to point out the substitutes.

Collect all the bones together you can; break them up small, and fill them into the potash kettle, boil them well, steaming is better—and skim off the fat—when they are quite clean from fat, &c., and the water has been drained off, take some wet clay, cover over the bones with the clay, and apply the heat, this must of course be done out of doors, and away from the house, as the fumes will be very offensive; it should also be done out of a building; as the fat in the bones which cannot be got rid of by boiling will generate a great deal of gas as they are heated, this gas will catch fire, and burn with violence, all danger from this source must therefore be guarded against. The fire under the kettle must be urged until every thing is red hot, and until the bones are all burned, and no further smell comes from them. It would be all the better to have a fire over as well as under the kettle, but the ashes from the fire must not be allowed to get into the bone black, if any does, it must be carefully washed out, but no ashes must get in. When every thing is red hot, and the bones so well burned that no more smell or gas comes from them; cover up the whole with good clean clay earth, and let it cool, the wet clay first, and the clay earth afterwards, are to keep the external air from affecting the burning bones, if it was not for