Selected Articles.

SEASONING AND DRYING LUMBER AND TIMBER.

A COMPARISON OF SUPERHEATED STEAM WITH OTHER MODES OF SEASONING, AS IT REGARDS SPEED, THOROUGH WORK AND CHEAPNESS.

It seems to be a great mystery to the uninitiated how lumber, and other substances, can be dried while in direct contact with steam.

All understand that steamed lumber will dry in the open air, more rapidly after, than before, it is steamed—though all do not understand why it does it. They notice that the lumber comes from the steam in a very wet and soaked state, and the general impression would be, that it would require a longer time to dry than before it was thus soaked.

The fact however that it does dry more rapidly, has induced many to adopt this mode, when they were in haste for some dry lumber, even though practical tests have shown that such steaming injuries its beauty of finish, as well as the strength and durability of the lumber and timber. The reason for this will be seen.

This steaming and soaking process extracts the albumen, which if properly coagulated and retained, is a preservative to the lumber, so that they never shrink again to their smallest size, and do not often return as tubes, but shrink into angles; thus injuring the strength as well as beauty of finish. If these improperly shrunk tubes were placed under a powerful microscope, they would look like hills and valleys and very high ones.

This albumen is somewhat difficult to dry in the pores of the lumber, by air drying, for it does not part with its moisture readily, and when dried in the outside pores of the lumber, it nearly hermetically seals the inside, as it becomes nearly impervious to moisture.

Many attempts have been made to get rid of this albuminous substance in the lumber, for even after it has been once dried, it will forment, if water be added, and this fermentation produces eramacausis or dry rot, which destroys millions of dollars' worth of railroad timbers, ties, and bridges, per year, as well as timber in buildings, ships, &c.

Kyanizing, paynizing, burnetizing, and other similar processes, are only modes used to congulate or chemically change this albumen, by using the various kinds of salts, such as corrosive sublimate, zinc, copperas, &c. Many of these modes have been found to be valuable for preserving the timber from the dry rot. But since these processes are usually performed by soaking or steeping the lumber in a solution of these salts, much of the albumen passes out, to the injury of the lumber; for when all of the strength and beauty of finish is desirable, the albumen should be coagulated and retained in the pores of the lumber. Of course the lumber comes from all these processes as well as in steaming, boiling, or soaking in water-in a wet and soaked state, and must therefore be used in the wet state, or afterwards dried by the air, either naturally or artificially. In either case, the • outside of the timber is dried first, and forms an

enamel, which will not further shrink, as the drying progresses, and therefore the timber cannot be brought to its smallest size, even though the drying process be continued forever.

Air drying we must remember always commences on the outside of the lumber, and its tendency is to close up its own way, and check materially its own progress, forming an enamel with dried albumen, and by closing the pores of the lumber on the outside first. The further therefore the drying extends into the lumber by this process the slower must be the future drying, for the passage of the moisture from the inside is the more strongly resisted, the thicker this enamel becomes. Is it any wonder, therefore, that the center of thick lumber is rarely ever dried. Comparatively small sticks of oak timber have been used for a fire piece for at least sixty years.

Many millions of dollars have been expended in experiments to season and dry lumber. The result has generally proved to be drying without seasoning, and seasoning without drying. But when both seasoning and drying have been attained by subjecting the lumber first to one process and then to the other, the result has usually been a sacrifice of the strength and durability of the lumber, as well as its beauty of finish, to say nothing of time and expense.

In contrast with the foregoing plans we will now examine the new mode, that seasons and dries at the same time, by what is called superheated steam without pressure, or with the simple pressure of the stmosphere. No other mode known to science has ever accomplished this, and yet the process is a very simple one, as I shall attempt to show, though I may fail to make it fully understood in an article that would not be too long for insertion here. If the principle, however, should still be obscure to any one they can inquire by mail.

Suppose a room 14 feet high be divided so that the lower room shall be 8 feet and the upper one 6 feet high. The lower we will call the fire steam room, and the upper the lumber or drying room. The division, however, between these rooms is only the joist on which the lumber is piled, or that sustains the cars on which the lumber is dried, and on which it is passed into and out of the dryer. The two rooms are, therefore, virtually one.

A stove or other heater, with long radiating or smoke pipe, to save all of the heat from escaping into the chimney, as well as to generate heat rapidly, is placed in the fire room, with the door of the stove opening out to supply fuel. This stove and the radiators are placed quite at the lower part of the fire room, which avoids the direct heat of the stove on the lumber, and also to cocupy the coldest part of the room, which is the most favorable for obtaining all the heat of the fuel.

A steam generator may be so arranged at a small expense, in connection with the heater, that steam will be generated just in proportion to the heat made.

This steam, whether generated in this or in some other convenient way, should be just sufficient in amount to fill both the fire and lumber room, with no steam to pass off to waste the heat. As soon as the rooms are filled with steam the air is excluded and the steam takes its place for con-