used is, I believe, erroneous, and this practice should be avoided. As all will readily see, the Southern manufacturer, who experiences warmer and more humid temperatures, will require less heat in his glue solution than will a manufacturer located in a northerly climate, in whose plant the temperature is naturally cooler and less humid; and where, as a consequence, the heat emanating from the glue is much more quickly absorbed, due to the greater difference in temperature between the glue and the atmosphere surrounding it.

My observation leads me to say that if I were personally interested in the use of glue in the manufacture of any one article I would make my standard of temperature 130 degrees Fahr. This degree of temperature, however, approaches the danger point in using glue, and I would not advocate using it at this temperature without some personal study and observation. However, if time and study are devoted to the subject it will be found that less glue is required and less glue shows through than where same reaches the veneers at a higher temperature.

Of course, the temperature of cauls must also be taken into account. As a matter of fact, I believe they are often the cause of glue showing through where the thinness of glue solution is given as the fault. While dwelling on the subject of temperature, let us note that the matter of draft in the glue room is often responsible for glue troubles, for once a skin has formed on glue all the hot cauls you apply will not give you what you have lost in allowing the glue to set.

Getting back to the mechanical conditions of flake vs. ground glue, much can be said on this point, and the few remarks given to the latter would illustrate what seems to me affords considerable advantage in the use of same in this the ground form.

Inasmuch as uniformity of mechanical condition plays so important a part in the successful use of this substance, the best possible reason would perhaps be the one that glue-makers, without exception, can maintain uniformity in ground glues to a greater degree than otherwise, for it permits of their overcoming mechanical defects which really do not affect any of the essential working properties of the glue. Of course, you are too practical and considerate to allow the thought to suggest itself that in ground glue you are more liable to be taken advantage of. For no doubt you appreciate that even though possessed of no higher motive, with the great number of competitors we glue-makers encounter, there are not any of us who could successfully and profitably manipulate ground glues, for it is the manner in which the article does your work and continues to do it that interests you; our every aim, then, is to maintain a uniform working quality throughout. Unfortunately there are some who know not how, but these same unfortunates are as disadvantageously situated on the flake or the broken glues.

A further advantage in the use of ground glue is the time required to soak it, which many of you appreciate is not 10 per cent. of that required for flake glue, and to such of you who have not been soaking flake glue, ground glue offers even added advantage. In other words, the advantage of ground glue is brought about by the fact that a given quantity of any ground glue will absorb water more readily than the same quantity of the same quality of flake glue, due to the fact that a much greater area of surface of ground glue is exposed to the action of the water than is possible in flake glue, no matter how much longer flake glue is allowed to soak.

MAKING OF MATCHES.

Of the manufacture of matches, whether of those which are traditionally said to be made in heaven or those which by their sulphurous odor seem as if originating in the other place, there is apparently no end. It seems in this modern day and generation a far cry from the time when there were no such means for ready production of fire as now exist and when coals were carefully covered with ashes at night to preserve them alive or fire was carried from one house to another, or, in lieu of these methods, resort was had to flint and steel. Yet it is less than the span of two lifetimes, for persons not yet old have heard their parents and grandparents talk of the days antecedent to the general use of matches.

That such a necessary article to modern civilization should have been lacking to the world for more than eighteen hundred years after the Christian era began appears almost incredible, and yet it was not until 1827 that the lucifer match, the pioneer of friction matches, was produced by human ingenuity. Fire was first made known to man by its direct descent from heaven, doubtless, in the form of lightning, which caused dry leaves or timber to burn. How to produce it artificially was a problem in savage days, and this was solved by the laborious method of friction, by rubbing two sticks together until they burst into flame, and later by the bow-drill, by which the process was shortened. With the advance of civilization began the use of flint and steel to strike sparks, which were caught in tinder and ignited it. From this grew up the first form of a match. This was a thin strip of wood, one end of which was dipped in melted sulphur. When this was presented to the spark caused by striking flint and steel together it burst into flame. But this process was cumbrous and costly.

The first improvement, about a century ago, was the construction of what was called an instantaneous light box. The device consisted of a bottle with sulphuric acid, into which were dipped splinters of wood, one end of which had been covered with sulphur and over this a paste spread made of chlorate of potash, loaf sugar powdered, gum arabic and a little coloring matter, so that the end to dip could be extinguished. While they ignited instantly there was danger in the use of so powerful a poison as sulphuric acid, and it absorbed moisture so as soon to lose its usefulness unless carefully corked. Out of this grew the lucifers, made with an inflammable mixture of chlorate of potash and sulphuret of antimony placed over the sulphur, and which would ignite on sandpaper. They were first made by John Walker in England.

The fact that sulphur and phosphorus would ignite by friction was dicovered in 1680 by a German chemist, but no practical use of the fact was made until a century and a half later, when phosphorus friction matches were made in Vienna. About the same time Walker began to use phosphorus in his matches. The first improved friction matches were made in this country, at Springfield, Mass., by Alonzo Phillips in 1836. A score of years later the so-called safety matches were devised to obviate the difficulty caused by the use of the ordinary lucifer match, part of the compound, the phosphorus, being left off the match head and put with the sand on the outside of the box, on which the match must be rubbed for ignition. The detestable odor of the ordinary sulphur match was obviated by the discovery of the so-called parlor match, in which no sulphur is used. But the danger in its use, from the readiness of ignition by stepping on or friction in one's pocket, has led in a large degree to the substitution of the safety match, also free from the odor of sulphur, but which cannot be ignited on any ordinary surface. Besides the prepared surface of the box on which safety matches may be struck it is also possible to strike them on a pane of glass or other smooth, highly-polished surface.