

MODEL RESIDENCES.

Messrs. Isaac H. Hobbs and Son, of Philadelphia, Pa., have recently designed a villa residence for Mr. William M. Weigley, of Shaffertown, Pa. The architects describe their work as follows: The design is an evolution of the oval laws of proportion, with a mansard roof. It is built of a very fine stone, of a peculiar rich, reddish brown color. The work will be rock-faced range work with draft base course, and other dressings of picked centers. All the stone work will be very fine; the building is to be finely finished in the interior, with hard, natural wood. The situation of the house rendered it of advantage to have a broad front and not to be deep. The building will cost \$22,000. The interior arrangements, as shown in Fig. 2, are as follows:

First story: V is the vestibule, 6 by 12 feet; H the stairway, 10 feet wide, connecting main hall 10 feet, separated by an ornamental arch connection; P the parlor, 15 feet wide, 30 feet long; L is the library and sitting room, 15 feet long by 15 feet wide; an octagonal corner room, 10 feet in diameter, forming an alcove of beautiful proportions; A is a conservatory, connecting the library and side porch by windows running down to the floor; D R is the dining room, 15 feet wide by 26 feet long; K is the kitchen, 13 feet by 17 feet; S is the scullery, 15 by 16 feet. This story is supplied with ample store room, butlery, pantry, and a lavatory under the main stair, also a lift from the cellar to this story.

The second story contains four fine chambers, C, Fig. 2, all of which are 15 feet wide and of the following length; one with octagonal projecting tower alcove, 15 by 15 feet, alcove 10 feet; second, 15 by 25 feet; third, 15 by 17 feet 4 inches. This story also contains a dressing room or boudoir, 11 by 13 feet; a bath room, 11 by 10 feet, with ample linen and other closets. There is a verandah in front and a covered verandah upon its side.

The third story will contain the same number of rooms and accommodations as the second story.

Weighted Silks.

M. J. Pierson states that an increase of weight is produced in silks by treatment with salts of iron and astringents, and with salts of tin and cyanides; this factitious increase of weight may be carried to the extent of from 100 to 300 per cent. It cannot be too widely known that, by this adulteration, silk is rendered very inflammable, and under certain circumstances, spontaneously so.

The Cost of Modern Guns and Armor.

The Engineer places the cost of a vessel, protected by the latest modern armor and armed with an eighty-one ton gun, at \$1,500,000. Ships carrying this tremendous weapon have yet to come in conflict; but when such combat does occur, it will probably be the question of but one well aimed shot to send either antagonist to the bottom. The same end may be more easily and certainly accomplished by a properly managed torpedo. The war of the future, on the water at least, bids fair to prove expensive to the losing side.

Celluloid—What is it?

In reply to various correspondents asking for a description of this substance, which is now coming into extensive use, we would state that celluloid is the name given to a kind of solidified collodion. The latter is composed of some fibrous material, such as cotton, which is dipped in sulphuric and nitric acid. The cotton then possesses the quality of solubility and sudden explosion, and is termed "gun cotton," or pyroxylin. This pyroxylin can be dissolved in ether and alcohol, and when so treated is called collodion, and is used in photography for covering the glass plates on which the negatives are made. The dissolved pyroxylin is poured on the glass plate. The alcohol and ether rapidly evaporate, leaving on the glass a fine transparent membrane or skin, of considerable toughness, something like fine horn.

Celluloid is made by using camphor in place of alcohol and ether, in connection with the pyroxylin. The following is the description given by the inventors of celluloid, Messrs. John W. Hyatt, Jr., and Isaiah Smith Hyatt, of Newark, N. J.

"In the practice of our invention, we prepare pyroxylin by

grinding it in water to a fine pulp in a machine such as is used in grinding paper pulp. We strain off the water as far as practicable, and then subject this pulp to powerful pressure—for example, in a perforated vessel—to further expel the aqueous moisture, and to bring it to a comparatively solid and dry state, yet still retaining sufficient moisture to prevent it from burning in the further stages of the process.

We comminute gum camphor by grinding it in water, or, preferably, by pounding or rolling it, and thoroughly incorporate, with the pyroxylin pulp in the condition last above described, this finely comminuted camphor, in about the proportion of one part, by weight, of camphor to two parts,

ence resembling that of sole leather, but upon exposure to the atmosphere it hardens, by reason of a slight evaporation of the camphor. The ultimate product includes, however, a large proportion of the camphor as a permanent accretion to the mass, which accretion is not only a great gain over the use of ether, alcohol, or other solutions or volatile solvents, which would be entirely expelled or lost, but by its presence gives the solidified collodion or compound the new capability of being again rendered plastic by heat, and remolded into any desired form or shape, without requiring the use of solutions or volatile solvents, or the addition of fusible gums, as heretofore.

A recent improvement on the foregoing consists in transforming pyroxylin into solidified collodion or celluloid, by using a liquid instead of a solid solvent, which liquid solvent, like the solid, is latent at ordinary temperatures, but becomes active and dissolves the pyroxylin upon the application of heat.

The following is the process: We make a weak solution of camphor in alcohol, the proportions being, by weight, one part of camphor to eight parts of alcohol. This solution of camphor is not a solvent of pyroxylin at ordinary temperatures, and we therefore term it a latent liquid solvent, but it becomes an active solvent at an elevated temperature.

In using this latent liquid solvent we first reduce the pyroxylin to a pulp, and mix therewith such coloring or other matters, if any, as are suitable to the required character of the product. The aqueous moisture is then expelled from the pulp. We then add to the dried pyroxylin or pyroxylin compound the above described latent liquid solvent in about the proportions, by weight, of fifty parts of the solvent to

one hundred parts of the pyroxylin. The solvent is stirred into the pulp, and the whole kept in a closed vessel until the solvent becomes evenly diffused throughout the mass, no solvent action taking place to retard or prevent this even diffusion, as would be the case in the use of solvents that are active at ordinary temperatures. The compound is then subjected to heat and pressure in a similar manner to that employed when using the solid solvents."

Among the various uses for which celluloid is now employed is the production of dental plates for artificial teeth. It is regarded as superior to rubber in many respects. A beautiful species of artificial ivory is also produced from celluloid as follows:

"We take, say, one hundred parts by weight of ivory dust, one hundred parts of pyroxylin, and fifty parts of powdered gum camphor. The pyroxylin is ground into a pulp while moist, and it is afterward deprived of nearly all of its moisture, leaving it slightly damp, as a protection against its taking fire from any cause. It is thoroughly mixed with the ivory dust and gum camphor, in the proportions just named. After being mixed, the mass is deprived of all remaining aqueous moisture, preferably by pressure between absorbing pads. To this compound, deprived of moisture, we then add fifty parts of nitric ether, and keep the whole within a closed vessel for several hours, or until the nitric ether has become evenly and thoroughly diffused throughout the mass.

The nitric ether permeates and semi-dissolves the ivory dust, the camphor, and the pyroxylin, and thus properly disposes them for final treatment, which consists in bringing the whole compound together into a solid within a heated cylinder or molds under heavy pressure, or by passing it through heated rollers. From 150° to 250°, Fah., of heat is required. The result is a compound which, after being dried or seasoned, resembles natural ivory in compactness and homogeneity. It is free from grain, is not affected by moisture, and is with great facility remolded into any desired form by heat and pressure in suitable molds.

The proportions of ingredients above set forth may be considerably varied to suit the consistence required and the use to which the new compound is to be adapted.

To the mixture may be added such pigments as are appropriate to the production of various colors."

IRON may be cemented in wood by dropping in the recess prepared in the latter a small quantity of strong solution of sal ammoniac. This causes the iron to rust, rendering it very difficult to extract

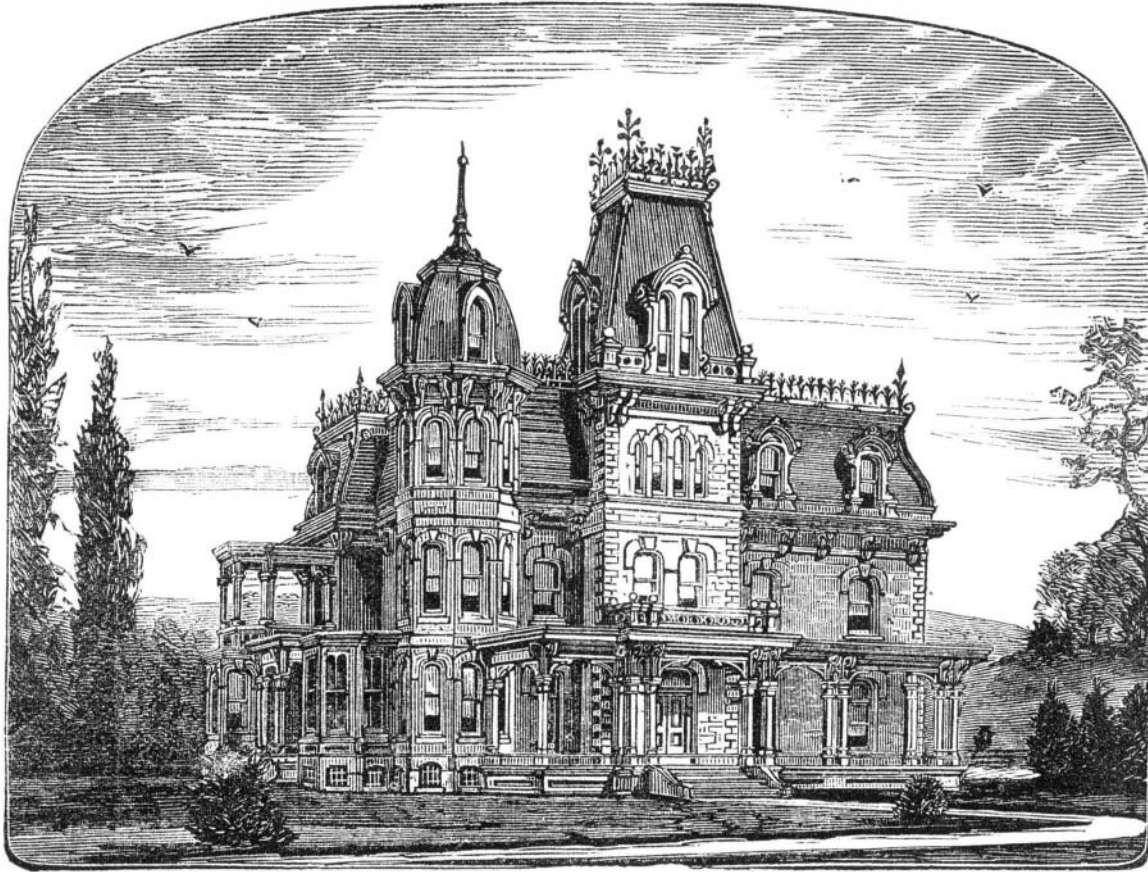
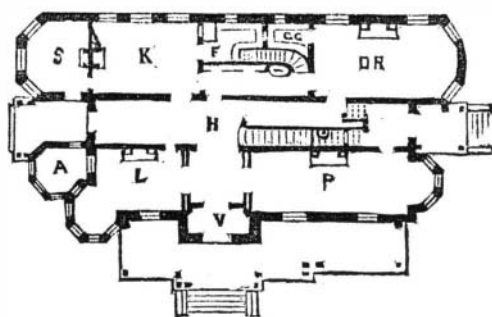
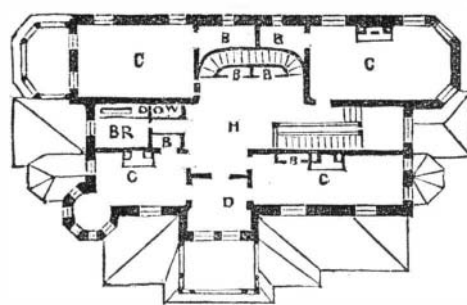


Fig. 1.—DESIGN FOR A MODEL VILLA.



SECOND STORY.



FIRST STORY.

Fig. 2.—PLANS OF A MODEL VILLA.

shall be in condition and place to exert its utmost converting power as developed.

The dried and compressed mass is next placed in a suitable mold or vessel open at the top, and into this open top is fitted a platen or plunger. The vessel is then placed in a hydraulic or other powerful press, and a heavy pressure, applied to the platen or plunger, is brought to bear upon the mixture, which, while thus under pressure, is heated up, by steam or other convenient means, to a temperature of from 150° to 300° Fah., varying according to the quantity of the mixture; and the mixture is kept at this temperature and under this pressure until the converting power of the camphor shall have been exerted upon the pyroxylin throughout the mass, the heat developing the latent converting power of the camphor, and the camphor exerting this converting power actively upon every atom of the pyroxylin, with which the pressure maintains it in close contact. The process of transformation is rapidly effected, and is completed almost as soon as the mass attains its maximum temperature, the resulting product being a homogeneous product, solidified collodion, or collodion compound having the qualities or properties hereinbefore specified.

This product, as it comes from the press, is of a consist-