SOME OLD WARWICK HOUSES.

The two sketches which we produce from the pencil of Mr. Prince, of Manchester, afford a good idea of the Midland timber framed house, though they have not the ornate character of those within the walls of the old borough. The tree depicted in front of the old inn in Coton is one of the many trees in the neighborhood which is reported to mark the "center of England." The house in Mill Street, just under the Castle Tower, is larger and more pretentious. In its rear is a court-

SUGGESTIONS IN ARCHITECTURE.—OLD WARWICK HOUSES.

yard of considerable dimensions, and was of some importance when the highway from Brantmery to Warwick passed by it, when the old bridge was in existence a century ago. In its selected position it is little known, save to architects and artists, with whom it is a favorite subject.—*Build. and Eng. Times.*

THE RELATION OF DOMESTIC CHIMNEYS TO THE CONSTRUCTION OF ROOFS.

There is no detail in house construction so perplexing as that of chimneys, especially with those addicted to so-called smoking, that is, to not passing the smoke in the way intended, but periodically admitting it into the apartments. By the same rule, there is no detail about which so little is known, or which is subject to so much neglect in house planning and building. There are few who will deny the assertion that faulty chimneys are the rule, and that perfect ones are the exception, or that their faults arise from a variety of causes.

In the present chapter we propose to deal with the relation of chimneys to the construction of roofs, and to leave the character of the grate, the construction of the chimneys, the temperature of the rooms, the supply of air, the situation of the flue in internal or external walls, and their size and form, for subsequent review. There is a common belief that in whatever position a chimney is situate, it is only necessary to carry it up to the height of the roof ridge; this is a popular error, and one that has intensified during the last century.

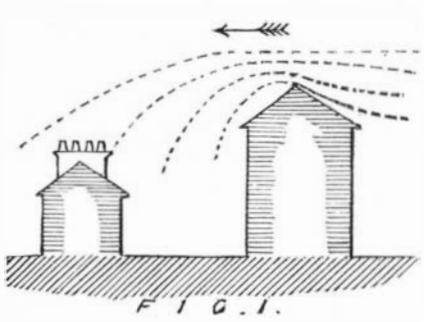


FIG. 1.

From the period of the old open fires of our ancestors, when the inmates breathed the wood or peat smoke, which mainly escaped from penthouses on the ridges of the roofs, there was a gradual advancement in the detail of chimney construction to the time of Queen Anne. The fire hearth had been moved from the center of the apartment to the wall, and the fire itself placed against a reredos, beneath a capacious chimney. These chimneys, in their infancy, were constructed of wood, lined or pargeted with clay, as may still be seen in our rural districts; or they were of brick, being independent constructions to the half timber buildings, as seen in Gainsborough Old Hall. At the Queen Anne period, when houses were built of brick, the chimneys, although amalgamated with the buildings, remained important features of construction, and as such were carried to a great height above the roofs.

In some cases these Queen Anne chimneys were carried up with the gables, in others they rose from the level of the eaves; but in every instance their height was far superior to that of the ridge of the roof. From this date there was a gradual reduction in the capacity of the flues, a movement warranted by the introduction of grates, one which reduced the height and strength of the chimneys, and made them secondary features in house building.

It is to this custom, the one followed, with few exceptions, by the builders of to-day, that we wish to confine our remarks.

Perhaps there has been no former period in the history of house building in which smoky chimneys have been so common as they are at the present day. Certainly there has been no period when chimney doctors, patent coals, etc., were so numerous. This, in large measure, is owing to the use of gables and steep-pitched roofs, details credited to the so-called revival of Gothic architecture, a style which introduced long and artificial lines of ridges, which act as screens for the wind, and disturbing details in the working of chimneys. The steep pitch of such roofs disturbs the passing wind, at one time raising it over the ridge, and at another depressing it, and causing down-draughts in the adjoining flues. If the chimneys of a house are to work, a flat roof is of all kinds the best. The second best is a roof with a low pitch hipped at all points. The third best is a high pitched hipped roof, and the worst of all is a high pitched roof freely gabled.

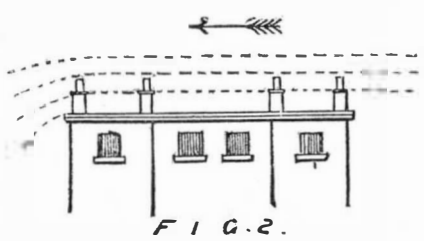


FIG. 2.

In the relation of domestic chimneys to the construction of roofs, it must be borne in mind that defects only present themselves in certain states or directions of the wind, and that, however a builder might try, he cannot succeed in constructing a chimney that will smoke under all circumstances. The wind in certain directions is favorable to the working of a defective chimney; in other cases it is opposed to it, and hence the construction of a chimney that will work under all states of the wind is a desideratum.

There are certain sites of houses in which it is impossible to construct chimneys which will satisfactorily work under all circumstances, such as that of a hillside. In certain states of the wind it will come over the top, and pass down the hill, falling to the gradient of the land; in such cases, down draughts are created in the chimneys. In proof of this we can point to a steep pitched gabled house on a hillside, on the skirt of an important town; it is the highest house of all, and its chimneys are black over with smoke, and a great number of them are surmounted with smoke preventing cowls. The best sites are those on the summit of hills or on open level land, those in valleys being superior to those on hillsides. All outward circumstances being in favor, we we will consider the various forms of chimneys in relation to the construction of roofs by the aid of diagrams. In doing so, we must assume there is no adjoining property overtopping the chimneys, as in Fig. 1, which shows a 40 foot street, with two story houses on one side and a tall mill upon the other. Here we see the wind passing over the tall building, damping down the chimneys of the houses, which, were it in an opposite direction, would create an up draught. Fig. 2 shows a flat roofed house, which has no influence upon the working of the chimneys.

Fig. 3 shows an ordinary row of houses, with an ordinary pitched roof. The flues at the ridge will work under all circumstances (so far as their outward construction is concerned), while those placed at a distance from that point will smoke, as they are within the influence of the falling air; and hence it is customary to see the outside flues (if regularly used) raised or surmounted with cowls. Fig. 4 shows a very bad style of chimney, viz., that placed upon the eaves of a roof. If the roof is of flat pitch, and not very long on the span, such chimney may be relied upon to work if carried up a good height; but if the pitch is high or steep, and the span large, the evil is intensified; and such chimneys may be seen raised stage after stage, and surmounted with patent cowls, the whole stayed with iron bars to the roof, presenting appearances truly dangerous. Fig. 5 shows a familiar form of placing chimneys on the eaves of steep roofed houses. Fig. 6 shows the roof plan of a house where a steep pitch is indulged in. The chimneys A and B will not work when the wind is traveling from left to right, because a vacuum is created at that end of the building, which causes a strong down draught in the air passing the line of the ridge. The other chimneys, so long as they are the height of the ridge, will work under any circumstances. We have this case actually before us: A and B are the only chimneys which have been raised on the building, and these flues are fitted with smoke-preventing pots and cowls of various patterns. The B flues are much the worse, owing to a fall in the ground, the house being much the highest at this point. The chimney stacks are a dangerous height above the eaves, and are supported by iron stays. There are ladders on the roof, and reared against the chimney at B, as if permanently in use. With all this paraphernalia, the passer-by may see at a glance that these chimneys are not satisfactory in their working.

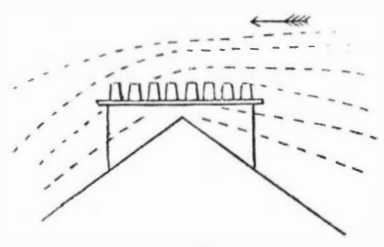


FIG. 3.

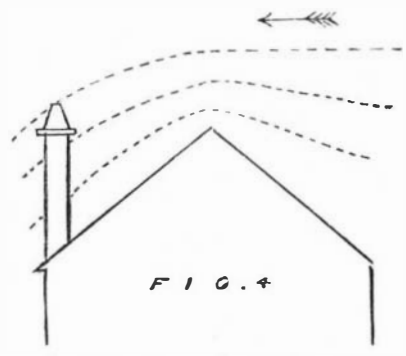


FIG. 4.

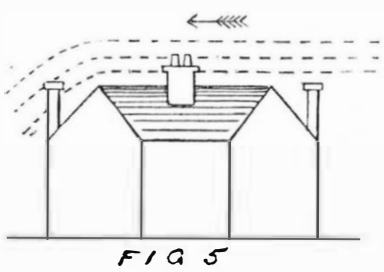


FIG. 5.

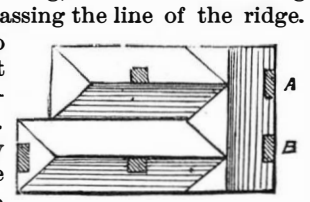


FIG. 6.

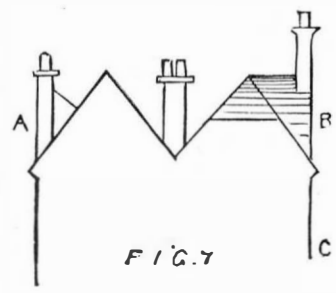


FIG. 7.

In house planning, the disposition of the chimneys is a matter of great importance. Steep pitch roofs may be indulged in if the flues are carried up in the ridges. Gable-creating cross ridges should be avoided; but where necessary, two gables are advised. The chimney, when not convenient to be at the ridge, may be placed between the two, as in Fig. 7. Where it is imperative to place the flues on the eaves, as in A, Fig. 7, the roof should be gabled at the back to support the chimney, as at B, Fig. 7, by which a greater height may be safely indulged in, a further improvement being wrought by hipping the front gables. When the wind is coursing left to right, it falls on passing the ridge to fill the vacuum at *c*, and in avoiding this down draught the chimney must be carried a great height. The force of hipping the main gables and shortening the ridge is thus seen, as it tends to give the chimney an increased

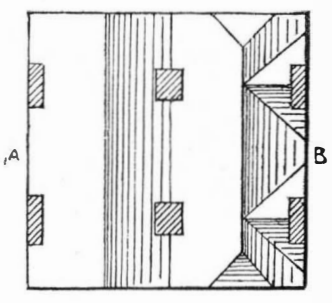


FIG. 8.

height in connection with the falling current of air. A very stupid arrangement is commonly carried out in middle class houses, of the kitchen being built out at the back, and the range being placed at right angles with the back wall, some two or three yards distant. The flues are here gathered over to the back wall, by which they are particularly horizontal at their junction with the main building, up which they are conveyed to a chimney at the eaves, as at Fig. 4. As is well known, such flues rarely work, and are most difficult to clean. A far better plan would be to place the range along the back wall of the main building, giving the full width to the narrow kitchen, and carrying the flue past the line of the eave to a height superior to the ridge, and protecting it with a gable, as at Fig. 7, B. Fig. 8 shows the roof plan of Fig. 7, where A is the ordinary faulty mode of construction, and B the improved mode of gables supporting the taller chimneys.

We have said sufficient to show that the subject of "The relation of domestic chimneys to the construction of roofs" is one worthy of great and careful consideration. That it has not had the attention it deserves is most true, proof of which is furnished every day. We can instance a large builder of fifty years' standing, who resided in a house in which the chimneys were constructed on the principle of Fig. 7, A. He dare not raise the brickwork of the chimney, and trust only to stays from the roof. The only course which appeared open to him was to fix pots and cowls designed for the prevention of smoky chimneys. This he did, indulging in about half a dozen varieties in three years; they all failed, and he had to leave, having built himself a house on adjoining land, on the same roof and chimney model.—*Building News.*

Tests of Stained Glass.

I have discovered a simple mode of testing whether, on the one hand, glass is sufficiently opaque so as not to appear flimsy or watery when put up in a window, unassisted by shading, according to the practice of the flat style of glass painting; on the other, whether it is sufficiently clear to produce as brilliant an effect as the old does. As follows: If the glass, when held at arm's length from the eye, and at the distance of more than a yard from an object, does not permit of that object being distinctly seen through it, the glass will be sufficiently opaque. And if when held at the same distance from the eye, and at the distance of not more than a yard from the object, permits of its being distinctly seen through the glass, it will be sufficiently clear and transparent.

I have found this to be the case with a great many pieces of glass of the twelfth, thirteenth, and fourteenth centuries, which had been rendered clear by polishing the surface, or which were already quite clear; for it is a great mistake to suppose that all old glass has been rendered dull on the surface by exposure to the atmosphere. I have seen a good deal of glass of the twelfth and thirteenth centuries that is as clear now as when it was first made, its surface not having been corroded in the least. But the glass of which these imitative works are made is either smooth on the surface and so pellucid or watery as, when held at arm's length, to permit of any object being perfectly seen through it which is at the distance of 100 or even 1,000 yards, or more; or else is artificially roughened on the surface, a practice which reduces the condition of the glass nearly to that of ground glass, for, when held at arm's length, it will not permit of any object being seen distinctly through it which is distant more than an inch from the glass.

The practice, not unfrequently resorted to by the imitators of old glass, of *antiquating* smooth surfaced glass—that is, dulling it with the enamel color used for painting the outlines—renders it, when held at arm's length, nearly if not quite as opaque as rough surfaced glass; indeed, almost the only perceptible difference in this respect between rough surfaced glass and smooth surfaced glass that has been antiquated is that the former is free from the tint necessarily imparted to the latter by the enamel color with which it is antiquated. Thus we find that imitations of glass of the twelfth, thirteenth, or fourteenth century, if executed in smooth surfaced glass that has not been antiquated, are very poor and watery in comparison with original work of the period; and that, if executed in glass that has been antiquated, or rough surfaced glass, they are much too opaque. In the one case, to speak popularly, the vision passes too uninterruptedly through the glass; in the other it is stopped at the surface of the glass, instead of passing about a yard through it, as in the case of ancient work.—*C. Winston, in The Architect.*

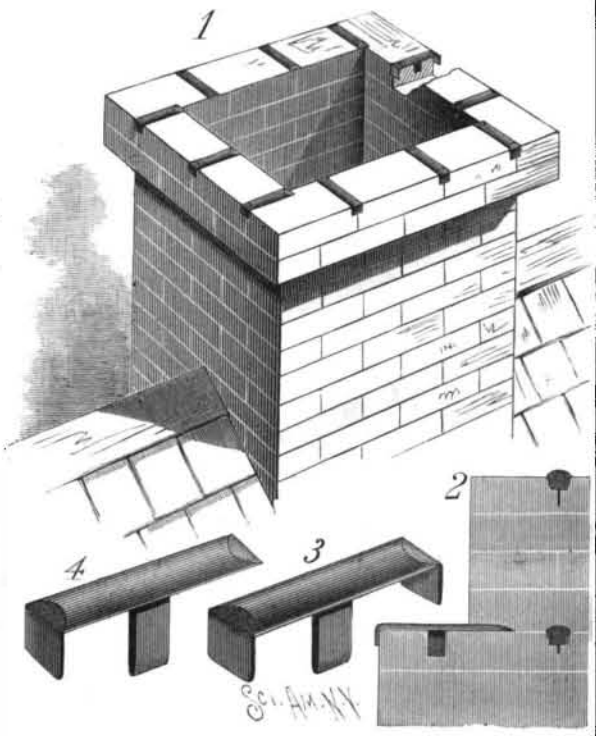
Westward the Squirrel.

Millions of squirrels are stated to be emigrating from Mississippi to the more elevated grounds in Arkansas. The plucky little animals swim the Mississippi River, beginning at a point about five miles below Memphis, and continuing from there twenty miles down stream. Thousands of them have been killed by the farmers, who use clubs in place of guns, on account of the immense numbers. A similar emigration occurred in 872.

IMPROVED CHIMNEY CAP.

For durability in exposure to the weather, nothing seems better than the glazed surface of good, well burned brick. But in the upper courses of chimneys the end joints of the brick lack this quality of endurance; the mortar in these joints gives way, the loosening extends, and the whole chimney top falls to pieces. To protect these weak points and still utilize the brick surface in the chimney capping, is the object of the device shown in the accompanying engraving, and for which letters patent have been granted to Mr. J. W. Wetmore, of Erie, Pa.

One of the caps is about 4 inches in length, and crosses a joint from the outside to the inside of the chimney; it is held in place by a thin shank projecting from the under side down into the mortar between the ends of the brick. A flange extends from the outer end, as shown in Fig. 4, and a flange may also be made from the inner end, as represented in Fig. 3, down a short distance along the joint. The cap is convex on the upper and concave on the under side; but Fig. 2 shows a flat cap designed for covering a joint in an offset. In manufacturing chimney caps from stone and cast iron, the sizes must vary in order to adapt them to different chimneys. The advantage of this device is that the cap fits all chimneys built of brick of ordinary size. A builder who



WETMORE'S IMPROVED CHIMNEY CAP.

has used these caps, which are manufactured by the Chimney Cap Company, of Erie, Pa., says: "I examined them in the spring, and found them in good condition. The caps were perfectly firm in their places, the rain and gases and the freezing and thawing not having affected them in the least. There is nothing more to be desired for a complete chimney cap."

The Rotary Iron Jail.

The new jail just completed cost $30,000. Its peculiar feature is that the cells are arranged in the form of a great iron cylinder, which revolves about, so that only one cell is at the opening at any one time. This cylinder is three stories high, there being ten cells on each floor. Its weight is forty-five tons, and this ponderous weight is hung from above instead of turning on a track below. The strangest part of the arrangement is that the great cylinder can be turned by a simple crank with very little force—a man with his left hand moving it readily. When all is complete, it is the intention to have a little water motor in the basement, and then by simply moving a lever the cylinder will be set to rotating.

It is suggested that when there are prisoners who it is feared may be trying to cut out, the cylinder can by a motor be easily kept moving slowly all night, so that the prisoners do not remain long enough in one place to do any mischief, or even to crawl out if they had made a partial break. It seems that prisoners have little chance for escape from this new jail. A cage of iron bars completely surrounds the cylinder in which the cells are. The entrance on each floor is guarded by two doors. The officer standing outside does not have to unlock even the first door, but can swing the cylinder around until the cell appears in which is the desired prisoner, and then by a simple movement the inner door is opened, and the prisoner can step out of his cell. Then the officer can open the other door and let the man out, but the other prisoners are way beyond any possible reach of the officer, and it is impossible for them to make any break on him while he is taking a man out or putting one in. He can handle any number of men in the same way, and they cannot get within reach of him until he chooses to let them.—*Omaha Bee.*

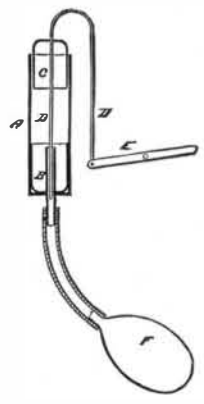
PHOTOGRAPHIC NOTES.

INTENSIFIER FOR NEGATIVES.

It is recommended that a plate whitened with a weak solution of bichloride of mercury be washed, and immersed in a weak solution of pyrogallic acid and water. The density is greatly increased, and from three to four plates may be successively immersed in the single solution, after which a fresh solution of pyro should be made.

Simple Pneumatic Release for Shutters.—At a recent meeting of the Society of Amateur Photographers in this city, Mr. Grisdale presented a simple form of pneumatic release, constructed from a common combined patented metal pen and pencil holder. The handle or cylinder of the pen had a punched up coarse thread at each end, into which the shorter tubes holding the pen and pencil screwed, their threads being half an inch from their extreme rear ends. The handle was shortened and the screw thread was cut off, both on it and the pen tube holder; the latter was then inverted and fitted like a cap piston loosely into the handle. The accompanying illustration explains the construction more fully.

A is the handle with both screw threads cut off. B is the lead pencil cap inverted and soldered to tube, A. Through its center is seen a small metal guide tube, over the end of which is a rubber tube leading to a rubber bulb, F. C represents the penholder cap inverted, soldered to the guide wire, D, which passes through its center and also outside downward to the release trigger, E. The wire, D, also fits loosely in the lower guide tube. When the bulb, F, is compressed, the air passes through the guide tube around wire, D, and raises the piston cap, C, thereby elevating the wire, operating the release lever, E, and letting off the shutter. When pressure on the bulb is released, the cap, C, drops back. The cylinder, A, and cap, C, are nickel plated, making scarcely any friction to the movement of the cap.



The object of the lower guide tube is to prevent the cap, C, from binding against the sides of the cylinder. The release worked as perfectly as if it had been expensively made.

Orthochromatic Photographs.—No better proof of the failure of ordinary gelatine dry plates to accurately register the varying intensity of different colors is found than when one attempts to copy a brilliant oil painting or a chromo. Improvements in this direction are always interesting, and to Mr. Fred'k E. Ives, of Philadelphia, inventor of the Ives phototype process, belongs the credit of the development of chlorophyl as a sensitizing medium.

We were recently shown a few comparative specimens made by this process, which were remarkable for their softness and the brilliancy with which ordinary non-actinic colors, such as red and yellow, were brought out. Under each orthochromatic photograph was mounted an ordinary one. One of the drawbacks of the process is that the solution has to be freshly prepared shortly before use, and the exposure necessary is unusually long.

In explanation of the specimens shown us, Mr. Ives states that a wide angle rectilinear lens with the largest stop was used. The exposure was *five* minutes in direct sunlight. When the picture is particularly bright colored, only one or two minutes are necessary; but if, instead of a wide angle lens, a rapid rectilinear lens is used, it is possible, with a brilliant light, to reduce the exposure to less than a minute.

A curious fact observed was that the plates were relatively much less sensitive in a weak light than with bright sunlight, so much so as to require at least *twenty* times more exposure, while the proportion in an ordinary rapid gelatine plate would not be more than four or five times.

Speaking of the emulsion, he says: "The most sensitive plates are prepared with a fresh chlorophyl solution, which has been made up with alcohol tinted with eosine. But no eosine should be used in making up chlorophyl solutions which are to be kept more than a week, because an *old* chlorophyl solution gives more accurate photographs when it contains no eosine."

Regarding some of his recent experiments, he continues: "Lately I have had some emulsion which would not work clear except when the tea organifier was used with it. I would therefore advise any who experiments with the process to use the tea organifier, not only because it increases the sensitiveness to light, but because it may insure better results."

It is probable the line of experiments commenced by Mr. Ives may be followed up by some other interested experimentalist, who may discover a way of making color sensitive plates which will retain their sensitiveness, similar to the ordinary gelatine plate, for any length of time.

There is an ample field for improvement in this direction, and the subject is worthy the attention of all photographers and amateurs.