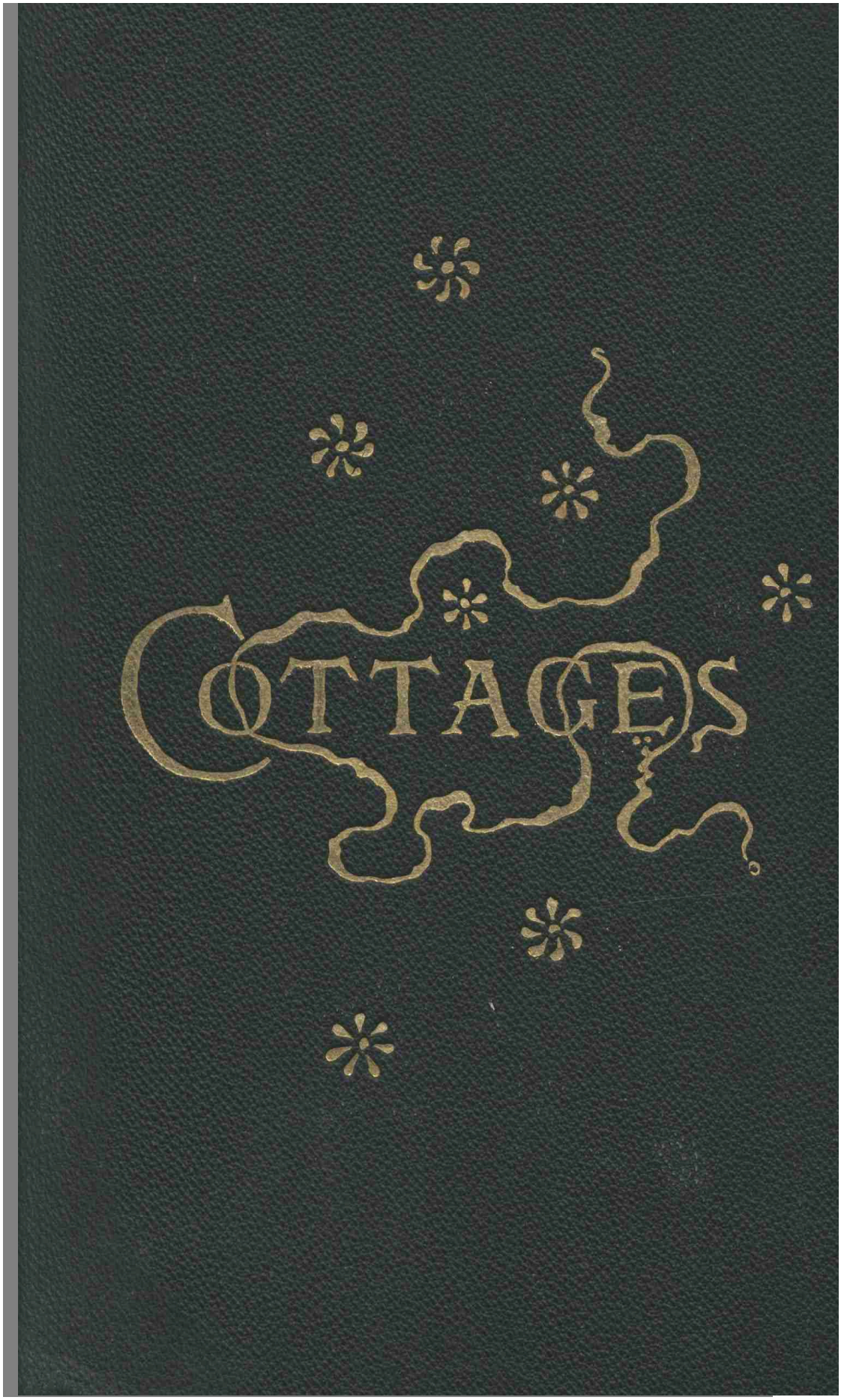
COTTAGES


COTTAGES

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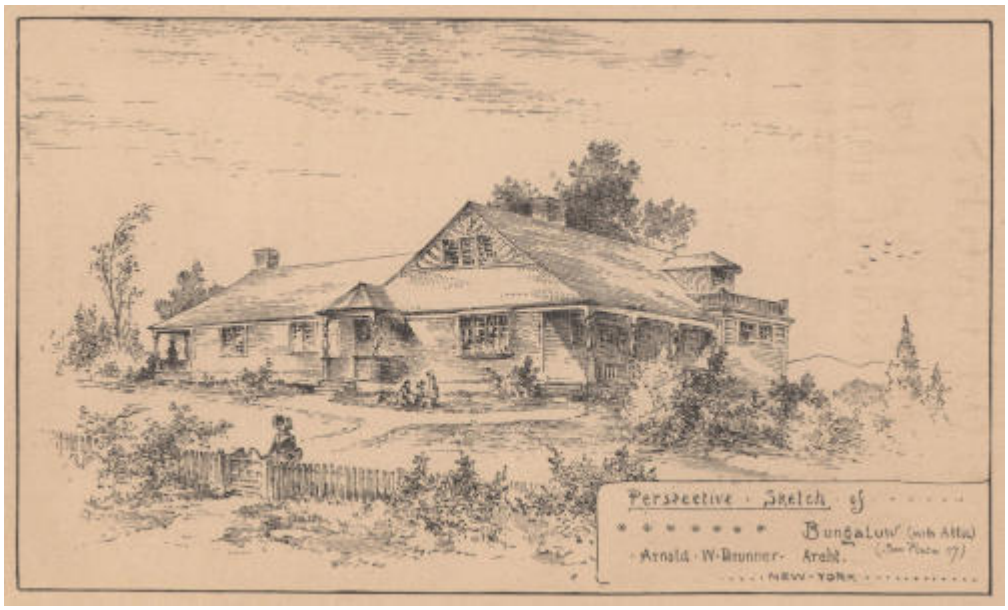

Perspective Sketch of Bungalow (with Attic)

(See Plate 17)

Arnold W. Brunner. Architect. New York.

COTTAGES

OR

HINTS ON ECONOMICAL BUILDING

CONTAINING

TWENTY-FOUR PLATES OF MEDIUM AND LOW COST HOUSES,

CONTRIBUTED BY DIFFERENT NEW YORK ARCHITECTS.

TOGETHER WITH

DESCRIPTIVE LETTERPRESS,

GIVING

PRACTICAL SUGGESTIONS FOR COTTAGE BUILDING.

COMPILED AND EDITED BY

A. W. BRUNNER, Arch't.

TO WHICH IS ADDED

A CHAPTER ON

The Water Supply, Drainage, Sewerage, Heating and Ventilation, and other Sanitary Questions relating to Country Houses.

BY

WM. PAUL GERHARD, C. E.

1884.
New York:
WILLIAM T. COMSTOCK,
6 ASTOR PLACE.

Preface

THE aim of this little book is simply to offer a few hints and suggestions to those about to build, or those interested in building, and to present a series of designs of low-cost cottages.

These designs were made, by request, by different New York architects who have turned their attention to the subject. In view of the rapid growth of "Art Ideas," and the great improvement in taste that has taken place during the last few years, it is believed that there is a demand for dwellings reasonable in cost yet artistic and home-like.

ARCHITECTS

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Cottages

Hints on Economical Building

I.

DURING the past few years our conception of what a country house should be, has entirely changed. Simplicity, elegance and refinement of design are demanded, and outward display, overloading with cheap ornamentation, is no longer in favor.

Naturally the more expensive houses were the first to get the benefit of the architectural inspiration drawn largely from England. But now that English gables and dormers have spread so widely, now that we realize the beauty of our own colonial architecture, and that the Queen Anne craze is subsiding, so that only its best features remain, the less ambitious dwellings must not be left to the mercy of those builders whose ideas of beauty are limited to scroll-saw brackets and French roofs. It is our intention, in presenting a number of designs for country houses, to show what can be done with simple means, and to give sketches of cottages that may meet the wants of many who desire inexpensive homes which shall be at the same time cosy and picturesque.

It must be stated, however, that all we can hope to do in the compass of this little volume is to give some hints on building and offer a few suggestions and ideas which may be of value to those about to build. It is by no means claimed that the drawings here given are sufficient for constructing the houses. Proper working drawings are a much more serious affair, and should in all cases be prepared by an architect. This is as important for a cottage as for a mansion.

It seems hardly necessary to enlarge upon the importance of an architect's services, since that is now generally recognized. Sensible people, when they are ill, consult a physician and not an apothecary; and when they wish to plan a house, they take the advice of an architect and not a builder. Both apothecary and builder are of course necessary, but they must be wisely directed or they may be dangerous indeed.

In this "intensely new world," as Matthew Arnold calls it, we have not yet had time to pay much attention to our simpler kind of dwellings. One can say but little for the majority of our cottages beyond that they give us shelter from the sun, rain and wind. The quaint interest, the great beauty of old European towns, are so marked, that we would do well to remember that each of the houses

in their picturesque old streets was evidently built to suit the special tastes and requirements of its owner. At present, the fashion is set; and, while it lasts, all cottages are built to suit. The fashion changes and the next batch of cottages must come up to the new standard. Now, ready-made houses, like ready-made clothes, *may* fit, but the conditions of house-planning are complex and the requirements are many and varied. The house in which we live should have some individuality, and not be a mere duplicate of our neighbor's dwelling. We do not care to confess that we are exactly like other people. Of course we are not. We may not wish to be considered eccentric or "funny," but we do flatter ourselves that we have some ideas of our own; so our home, if it is to be a home, must be planned just to suit our habits. Regarding the exterior appearance, that, to a certain extent at least, will proclaim both the disposition of the interior and its inmates.

Now the intelligent client will of course consult a competent architect, but being intelligent, he and Mrs. Client will first talk it all over very carefully, and after discussing the matter thoroughly will decide upon just what they need. When a decision has been arrived at, they will go to Mr. Architect and tell him their wants, and he will proceed, to the best of his ability, to solve the problem. This solution he presents in the form of plans, elevations and sections, which is his way of showing how he intends to fulfill the conditions imposed. But Mr. and Mrs. Client may not find it such an easy matter to decide upon what they ought to have. Building a house is generally a new experience, and many and vexed are the questions that arise. Being a bright, well-informed couple, with ideas of their own, they wisely decide to think it out for themselves and not to tell the disciple of Sir Christopher Wren to make them "something real pretty—you know what we want—and we'll call to-morrow to see the drawings."

No, they know better than that. It is for them to say *what* they want; and *how* it is to be done, is the architect's province. So, to help the worthy couple in their deliberations, we will mention some of the points to be considered in building a country home, only touching upon them, however; for volumes might be, and indeed have been, written on the numberless considerations that present themselves. A little thought and time spent before commencing to build may avoid a great deal of trouble and regret when it is too late to effect alterations. Even when the house is in the course of erection, changes are unduly expensive, as one deviation from the plans is likely to entail another. The superficial knowledge people

have of their own houses is often surprising, and it would be well for Mrs. Client to examine critically her present dwelling, while Mr. C. takes a few measurements of some of the rooms. This will bring their ideas of dimensions to a more definite shape and greatly aid them to fully understand a set of plans.

II.

THE first thing to be decided is where the cottage shall be placed. For a castle in Spain, any picturesque spot would do, nor need we choose it until our castle is quite complete. But for a real house, one that will keep out the cold and keep in the heat, one that will be comfortable to live in and presumably beautiful to look at, one that is subject to many practical as well as artistic conditions, we will proceed to select the prettiest piece of ground in the healthiest neighborhood we can find.

Healthy—of course. Better not build at all than make our house the abiding-place of malaria. So we will carefully avoid marshy or ill-drained ground. Sandy or gravelly soil is good. Clay is bad. A side-hill has many advantages and affords opportunity for something picturesque. We need not fear it, for a broad trench dug deep as our cellar, and running obliquely back of the house, will leave us high and dry. If we are sensible rather than ambitious, we will not choose the summit of a hill. Sooner be a little lower down on the slope, securing shelter from the wind and a readier water supply. The question of site is an important one, and much depends on a wise selection. Even a small lot offers some choice, and a few feet in either direction may avoid damp cellars and future fevers.

But if we have a wider choice, let us exercise it well, and secure a position where we can study nature in her varying moods and enjoy her beauty. Let us be surrounded by meadows and flowers and trees. Trees by all means. Not too near, or we may shut out sunlight and secure dampness instead; but trees are good neighbors, and we owe them grateful shade in summer and shelter from winter storms. A stately oak and a few graceful maples, or perhaps some faithful evergreens, will take away the barren and forlorn appearance a house often presents when standing quite alone. A little terracing and grading, besides helping to shed the surface water, often give the building the appearance of being well and firmly placed.

Care will of course be taken to see that an abundant supply of pure water is obtainable; to decide its quality a few preliminary borings should be made.

Having roughly chosen the position and driven a stake in the site, we must decide in which direction our house shall face. The living rooms should look to the south or south-east, as they will be cooler

in summer, receiving the southern breezes, and warmer in winter—and always cheerful. Next to a southern exposure an eastern one is best. We must consider how the grounds shall be laid out, the approaches to the house, position of the public road, and proximity of objectionable neighbors. Our friend Mr. Architect will want to know all this and more too. He will ask you from what directions come the prevailing winds, what is the character of the scenery, and whether there is any choice of prospect, or our pet view will stand in danger of being wasted on blank walls, or visible only from the kitchen. Then, after telling him how much we wish to spend, he will be in a condition intelligently to go to work and plan the house. A thorough understanding between architect and client is most desirable.

III.

"A HISTORY of house-planning is the history of civilization, one of the best means by which we can realize the social condition and family life of successive times," says Stephenson in his interesting book on House Architecture. The gradual change in the arrangement of dwellings indicates most clearly the development of what we call civilized ideas.

In all important houses in the Middle Ages, the Hall, which was frequently an immense apartment, was the chief feature. To quote Stephenson again, "It was in reality the house, and hence (in England) country houses are still called Halls." The ends were screened off by wooden partitions, the kitchen at one side, the private apartments at the other. The Hall was used as a dining-room and sitting-room, and the household would sleep there, both tables and beds being movable. Later, the tendency arose to have separate apartments for different purposes, and the number of rooms in a house multiplied. In modern planning strict privacy is essential, and each room must be accessible from the halls and stairways. As soon as a room becomes a mere passage to another, it loses its chief value. The arrangement of a house is, to a certain degree, influenced by considerations of exterior effect, but use and comfort are of prime importance. In the so-called "classic" houses, where symmetry was imperative, convenience of plan was often sacrificed.

A well-studied plan is characterized by compactness and the absence of any visible make-shifts or after-thoughts. Everything fits well and seems in its natural place.

A rectangular house is the cheapest and best, the octagonal and circular forms are better adapted for bays or projections only. Very irregular and straggling plans may produce picturesque results, but are sure to be comparatively expensive. A square house has always been a favorite with many practical-minded people. It is such a "sensible" shape and cuts up well into rooms. True, a given length of line, as a square, encloses a greater area than in any other rectangular form, so we get the most house for our materials and money. Still, we will probably find that, after arranging our plan, considering comfort and convenience alone, it will not result in a mathematical square; but, if it be compact and capable of being

simply roofed, we need not reproach ourselves with undue extravagance.

All space occupied in passages and corridors, increasing the size but not the capacity of the building, is wasted.

Light and air are, we know, essentials of life. Let us not forget it in planning our house. Dark passages and stairways should not be tolerated.

In our cities, where land is very expensive, and the houses which often cover nearly the entire building lot are crowded closely together, many expedients have to be adopted to render the inner rooms habitable. Light-shafts are used, and rooms often receive only borrowed light by means of glass doors or partitions. In country houses these methods are inexcusable. Fresh air and the light of day should have access to every nook and corner.

IV.

In our modern houses the hall is generally a mere narrow passage connecting the rooms, and only large enough to contain the staircase. Lately there has been a tendency to give the hall greater prominence; and, as many of the plans in this book show, it may be made a most desirable sitting-room, by adding a few feet to what before was almost waste space. It may have an open fire-place and some little nook arranged with a seat. The stairs may be partly or wholly screened, a treatment giving opportunities for a picturesque effect. Let us have plenty of light on our staircase, and plan it so that even at night one is not liable to stumble. "Winders," that is to say, steps which radiate at the corners, are to be avoided as much as possible, for it is easy to slip on the narrow end. Do not try to have your stairs in a single run. Platforms, which should be square, form a convenient rest. For ordinary stairs the risers may be 7½ inches, and treads 10 inches. If the risers are less, the treads must be proportionally greater. The old rule of a 6 inch riser and 12 inch tread is almost too luxurious, and when the risers are less than 6 inches they become actually uncomfortable and tiresome. If newels are used, as they are in the better class of work, have the tops rounded, and let there be no sharp angles that would be disagreeable to the touch.

The dining-room should have an eastern or north-eastern exposure, so that it may receive the cheerful rays of the morning sun. A western outlook is undesirable, for at sunset the "western waves of ebbing day" will flood the apartment, making it necessary to close the shutters, excluding the air and leaving the room in darkness. 11 feet in width is sufficient to admit of chairs on both sides of the table, with space for a servant to pass around, but a larger room is desirable.

The kitchen should be near the dining-room. It may be in the basement, and if the house is on a side hill this is a good arrangement, as the kitchen may then be entirely above ground. In some of the Southern States it is the custom to separate the kitchen entirely from the house, thereby avoiding all the smell and heat of cooking. It is a good plan for summer cottages to have the kitchen in a wing by itself, even if not disconnected with the rest of the house. In a small house, where the dining-room and kitchen must be placed

next to each other, a pantry with doors not opposite each other, between the rooms, will do much to intercept odors and noises.

A sitting-room or living-room should be bright and cheerful. Let it have the benefit of any good view that the situation of the house may command. Give it broad, generous windows, admitting plenty of light and sunshine. Sunshine may not be good for the carpets, but you are not building the house for them, and the health and cheerfulness of the inmates are the first consideration. If carpets will fade we may use matting, which is now obtainable in good designs and excellent colors. Or let us have good honest wood floors oiled or waxed, for they need not be very expensive. Then with a pretty rug, perhaps, in the middle of the room, we secure greater cleanliness than is possible with a carpet, and need not be afraid of the light of day, two points which should help to decrease our doctors' bills. In providing for light it is better to have one large window than two small ones. A broad casement with a window-seat, or a three-sided or semi-circular bay, with room for a few flowers, or perhaps a small work-table and chairs, will be a delightful feature.

In the pride of our heart we may want a parlor, or drawing-room, as our English cousins would call it.

Well, let us have it if we must, for hospitality is a virtue to be cherished. But true hospitality consists in giving our friends what we deem to be our best. Now a parlor that is kept for state occasions and is such a prim, formal room, that everything in it is too awfully nice to touch, is not a place where true friendship is likely to flourish. If we need another apartment for our guests, let it merely be an extension of our sitting-room. The room we occupy most will be the pleasantest in the house, as we will naturally surround ourselves with the objects we love best. But the spirit of cheerfulness and cosiness should pervade the entire house, and the selection we make of books, pictures and ornaments, will do much towards giving a room a friendly or unfriendly aspect.

In a large country-house a separate room for a library is convenient, also a breakfast or morning-room, and a billiard-room, is a luxury to be enjoyed, if possible. If we can manage it, a nursery, where the children can make a noise and have a real good time without shocking anybody's nerves, will be found a great comfort. Give the little ones space, where they can romp to their hearts' content, a large, sunny room, with broad windows and a big fire-place, a room with nothing in it that will spoil by contact with little hands, and you will contribute much to their happiness.

If we can contrive a little retreat or “den” in some out-of-the-way corner of the house, it may be well, for, although man is a social animal, “solitude sometimes is best society.”

Many of us will appreciate a little sanctum entered by one door only, where we can leave our books and papers, having the sweet satisfaction that they will remain undisturbed.

The bed-rooms should be specially light, airy and well ventilated. Space must be left for the bed, a consideration which, if overlooked in the plan, may make it necessary to put the bed in front of a window or against a closet door.

The arrangement of doors and windows requires particular attention, and a little care in regard to this will contribute much to comfort. A certain amount of wall-surface should always be left, or there will be no place to put the furniture—a fault often found in our houses, and productive of much discomfort. Every bed-room should have a closet, and, indeed, an abundance of closets is necessary, it being hardly possible to have too many of them. One for coats, in the front hall, one for linen, one for stores, and a good-sized pantry for the kitchen, are dear to the heart of a housekeeper.

No house should be without a bath-room, large and conveniently located. Care must be taken that the plumbing apparatus is not exposed to the cold, or the pipes will freeze in winter. The matter of ventilation and construction of the plumbing work, is ably discussed in a separate article devoted to that and other sanitary questions.

V.

Doors are generally hung according to the sweet will of the carpenter, but there are two ways to hang a door, one so as to expose the room, the other so as to screen it. The first may be good for the more public rooms, but, in regard to bed-rooms, the doors must swing so that, when partly open, they will shield the apartment from view. Closet doors should be hung so that the closet may receive light from the nearest window. Doors are sometimes made to swing out on stair landings or halls, and who has not seen two doors so placed that they strike each other when opened? It is hardly necessary to say that these methods should not be adopted.

The question of how to heat a house is discussed at length elsewhere, but from the point of beauty, cheerfulness and comfort, we must enter a plea for the open fire-place. It may be troublesome to keep clean, although this may be obviated by an ash-shoot to the cellar. We admit that the open fire-place is wasteful, as two-thirds of the heat goes up the chimney. And then most of the foul air in the room goes with it, and we have the best and surest ventilating flue yet devised. But the cheerful appearance, the crackling of the logs, the sparkling embers, the ruddy flames twisting themselves into fantastic shapes—are these worth nothing to us? Contrast a roaring fire of hickory logs, blazing on a broad brick hearth, with the dismal hole in the floor or wall covered with a cast-iron register. The cricket on the hearth is a little out of fashion now, and with it has gone the sense of comfort that the broad, picturesque chimney-piece always gave. Open fire-places alone are often insufficient in our climate, and furnaces are extremely useful for heating the halls and the house generally; but to rely on their heat entirely excludes one of the features which make home more home-like. The fire-place should be in a position so as to admit of a group sitting around it; it should not stand between two doors, for instance. A little nook or seat may be contrived next to it, making a cosy corner in the room. Chimney-stacks can be combined if the house be judiciously planned, and a saving of expense effected. The plans in Plates VI, X and XVII, show how one stack can serve three rooms on the same floor with fire-places, and in the case of the double houses all the designs show that this method of saving expense has been adopted. Chimneys must be carefully built of good, hard brick, laid in cement mortar, the flues straight and smooth and of uniform size. To allow of better

arrangement in the upper floors, the flues may be safely drawn on one side to at least 30° from the perpendicular. There must always be at least 8 inches of brick work when the chimney-stack comes in contact with any wood-work.

Every house should have a cellar with stone or brick walls and cement floors. And it is of the utmost importance that the cellar be dry. To insure this, the greatest care should be given to the *outside* finish of the walls—reversing the usual practice of carefully finishing the interior, and on the exterior allowing the rough edges of stone to project and form little courses and channels through which the moisture will pass. In case the cellar extends only under part of the house, the rest of the walls should be supported upon brick piers, only filled in between with wooden lattice, giving free access to the air, thus preventing dampness and rotting of timbers.

If the reader desires to study construction, or intends to superintend the building of his own house, he cannot do better than consult Mr. T. M. Clark's book on "Building Superintendence." The standard of workmanship that it gives may be a little too high for cheap work, otherwise it is an extremely useful volume.

VI.

PLANNING has been called a series of compromises, and in fact we will nearly always find it impossible to secure all we desire. Something must be sacrificed, and the best plan is the one that fulfills the most important requirements at the expense of the minor ones. After securing the proper relative arrangement of rooms, their exposure may be wrong, or the chimneys will not combine. We secure an economical combination of chimneys and find that the doors come "all wrong," and the staircase is crowded to one side. Then the shape of the rooms is ugly, the veranda seems only possible in front of the kitchen, the entrance porch faces the north, and there is no way of getting to the cellar.

These little difficulties overcome, we find that we cannot get upstairs, and even if we could, the rooms in the upper floors come just as we do not want them, and the hall will be dark. Then we will begin all over again. The amateur must not be disheartened if this is the result of his first attempt to plan a house. The best and seemingly most simple arrangement of rooms is generally the result of the most study.

In planning, as in many other things, the simplest is often the best, and what appears so satisfactory and looks as if it were quite the most obvious thing to do, was probably arrived at only after much consideration and thought.

Irregularities in our plan may be turned to account and picturesque and useful features result, but they must come naturally and not be forced, or they will give the appearance of striving to be eccentric.

It is a comparatively easy matter to plan a house which is intended exclusively for summer or for winter occupancy. But in those sections of the country where we have successively samples of every conceivable kind of weather, and we wish to build a permanent residence, the difficulties are numerous.

During part of the year we need broad verandas, large windows and doors so arranged that we can get a current of air through the rooms. The heat from the kitchen distresses us, and the refrigerator is regarded with more affection than the fireplace. In a few months the veranda only serves to shut out the precious sunlight, and double

sashes for the windows may be desirable to keep out the cold too easily admitted by the doors. We draw close to the hearth, piled high with blazing logs, and rejoice that the slight heat from the kitchen chimney is not wasted on the outer air.

Fortunately, what keeps out the heat keeps out the cold—or rather keeps in the heat—and walls constructed so as to keep the house warm in winter will keep it cool in summer.

The veranda is a particularly American feature, and should be encouraged, not only because it is American, but because it is a great comfort and a sensible contrivance. Let it be broad and low, to keep out the sun's rays; let it be large enough for plenty of chairs and a work table, and perhaps a rattan sofa or a hammock, and during the long summer months it will be a most delightful retreat.

Even in winter the veranda serves to keep the wind, sleet and snow from our windows, and so contributes a little warmth if it does rob us of some sunlight. It can be so constructed that it may be enclosed in winter, but it is difficult to heat, even if the cellar extended beneath it.

VII.

MATERIALS of all kinds have been used for building, but for our purpose only stone, brick and wood are suitable, and mud, papier-maché, glass, iron, and many others need not be considered. Stone is the favorite for all monumental buildings, but it may be occasionally used to advantage in low-cost country houses. If it must be brought from a distance, and is to be cut, tooled and dressed, it will be much beyond the average cottager's means. But when found in the immediate vicinity and laid in irregular courses "just as it comes," with the corners squared off only enough to make good joints, we shall get excellent effects without great expense. It is well to use it only for the first story of the house, as shown on Plate XII. If cut stone lintels and jambs are too costly, we may use brick, either red or buff, selecting the one which harmonizes best with the color of the stone. The doors and windows in this case will be arched and not square-headed. Stone walls need not be very thick—18 inches will be ample—and they need not be damp if properly furred, leaving an airspace.

Frequently use large stones, the entire thickness of the wall, as "binders," and leave the natural surface as much as possible. Then, if the stones are well selected, we shall have a beautiful surface, whose color, softened by that of mosses and lichens, and partly covered by the creeping ivy, will become more beautiful and mellow with age.

Brick is a most valuable building material, wonderfully durable, as the remains of the old Roman buildings testify, and fire-proof, as often demonstrated. To the minds of many, brick suggests all the ugliness of the immense crop of buildings that has sprung up in our American cities—buildings with wondrous painted and sanded cornices and window caps, with a front pierced with regularly spaced square-headed openings. But the builder and not the material is at fault, for as countless European examples show us, brick can be used with most excellent effect. Bricks are now made in many shapes, and good mouldings can be obtained for cornices, belt courses, etc.

Then terra-cotta, which is nothing more than its name implies, baked earth, or brick in other forms, comes to our aid, and we have ornamental panels, columns, pilasters, voussoirs and all sorts of architectural finery. For small cottages we may use brick laid in red

mortar, combining it with wood, and perhaps some of the simpler mouldings, with a terra-cotta panel or two, to give character to the design.

Wood is the material that will commend itself, as being the cheapest for building country houses, needing only a light foundation and being easily handled. The old “half timbered” houses give us suggestions for a most picturesque treatment. In these buildings the frame is exposed and filled in with brick or stucco, producing an excellent effect. In the north of France, where rain is abundant, the exposed wood is sometimes covered with slate. This method of construction is adapted to our climate, but brick is better for filling in than plaster or stucco, which is likely to be affected by our severe frosts. Clapboards and shingles are both excellent. The shingles may be cut in different shapes, or irregularly laid, giving a variety of surface. Tiles, which are more durable but more expensive, may be substituted. Battened houses, that is, houses faced with vertical boards, the joints of which are covered by narrow strips of wood or “battens,” are not recommended.

VIII.

THE FIRST four plates in this book show designs for the simplest kind of cottages. Strict economy has been observed, and the arrangement is as compact as possible, no space being wasted. The first has two rooms on a floor—the living-room containing the stairs. The roof is unbroken, overhanging enough to cover the bay, and merely extending to form the porch. Plates II, III and IV show a separate hall for the stairs, and closets and pantry are provided. In one case the upper floor contains two large rooms, in the others, four smaller chambers. Plate III shows the kitchen and living-room separated by a pantry with two doors, and in the next design, communication between these rooms is had through the hall, an arrangement quite suitable for such a small house. Nothing could be plainer, or more straight-forward, than the plans and exterior treatment of these four cottages, and the result is interesting in showing that even the simplest house may be planned with some reference to comfort, and a pleasing exterior expression attained without the least ornamentation.

Plates V, VI and VII, give designs for slightly larger cottages, with three rooms on the first floor. The roofs are boldly treated, and in Plate V we see the picturesque effect obtained by an exterior chimney. This design also shows an effective treatment of windows in the sitting-room, and a broad low veranda covered by a continuation of the main roof. Designs VI and VII are two six-room cottages very compactly planned; the exteriors show clapboards on the first-story, and shingles above.

Plate VIII gives a cottage without a kitchen (there is space for it if desired), which may be built in connection with a hotel. This is becoming a favorite way of living during the summer, the inmates of the cottage taking their meals at the hotel, and thus much of the trouble of housekeeping is avoided. Several of the plans in this book could be used in a similar way; the space for kitchen devoted to other uses or omitted entirely. In this plan the two rooms on the first floor open into each other, making practically one large airy apartment, which, with the shady veranda in front, is an arrangement well adapted for warm weather.

In Plate IX we have a small seven-room house. The sitting-room has a large fire-place with seats at the side, screened by an arch or

transom, and making a pleasant little nook.

Plate X is a design of a picturesque cottage which shows in plan a nearly square hall with a fire-place, opening into a broad piazza. At a little extra expense the small bed-room on the second floor could be made wider, or a bath-room added to advantage.

The plan of Plate XI provides an entrance hall or vestibule, which will be of special use if the house is occupied in winter. The side door opens into the end of the main hall, and the arrangement of rooms is well studied. The overhanging gables have a bold effect, and the materials used are the same as in nearly all the preceding designs.

Plate XII gives plans and elevations for a house, the first story of which is to be built of stone—the second of wood. The stone is irregularly laid, the rough surface contrasting well with the shingles above. The plan provides for six good-sized rooms with plenty of closets.

In Plate XIII we have a house planned so that the two main rooms on each floor are exposed on three sides, an arrangement which, if the size and shape of the lot permits, is good for a summer residence. The treatment of exterior also indicates this use.

Plate XIV gives a design for a seven-room cottage, with a wide hall and a bath-room. The kitchen is conveniently placed, both in regard to the dining-room and front door. The balcony in the second story adds to the exterior effect by giving more shadow to the front.

Plate XV is a design for a sea-side cottage. The hall is so arranged that the stairs are screened, thus making a little vestibule. The dining-room and parlor are only divided by an arch, and may be separated by a portière or thrown into one large room, while the veranda gives the shade so desirable at the sea-shore.

Plate XVI shows a picturesque house broadly treated. The second story overhangs the first, covering the piazza. The rooms are large and of good proportion, and each bed-room has its closet.

Bungalows, as the one-story houses used in India are called, seem adapted to some parts of America, particularly as summer cottages.

Plate XVII and the frontispiece show a house which will commend itself to those who dislike going up and down stairs. This plan provides a hall, dining-room and kitchen, each with its fire-place and closet, and three bed-rooms. The door of the bath-room and that of the bed-room opposite are misplaced, and should open

into the corridor. There is a small stairway to the attic, where there is space for dormitories, if desired. The construction of this sort of house is so simple, and the foundation may be so light, that it will cost but a trifle more than if the rooms were arranged in the ordinary way. The bungalow here given is very simply treated, the roof being only broken for the outlook from the attic, and extending to cover the veranda.

Plate XVIII shows a house suitable for an ordinary "fifty-foot suburban lot." The entrance hall is divided by an arch and book-cases, making an agreeable sitting-room or library. The second story contains three bed-rooms and a bath-room. There are accommodations in the attic for servants.

Plate XIX is a design for a cottage on a side hill, with the kitchen in the basement. The projection of the stairs in the main hall gives place for a seat opposite the fire-place, and may be made a cosy little corner. The dining-room, hall and sitting-room, open into each other.

The last four Plates are designs for double or "semi-detached" houses. If, instead of building single houses, two persons will combine, adopting some arrangement such as these designs show, they will effect a considerable saving of expense. The houses, although receiving light and air only on three sides, are bright and comfortable. Privacy is not destroyed, as the entrance porches are separated, and windows placed so as to avoid looking from one house to the other.

The exterior treatment in Designs XX and XXI seems to indicate more clearly than the others that they are double houses, while Nos. XXII and XXIII, though not concealing this fact, have more the air of large single houses. This is a nice question of "expression" which our readers may decide for themselves.

These drawings show different architects' conceptions of what small and medium-sized cottages should be. They differ greatly from each other, both in plan and exterior design, but the general expression seems to be much the same. They are not pretentious, and no ornament exists for its own sake. Chimneys and roofs are boldly and frankly treated, and a certain breadth and hospitality are expressed by nearly all. Only a few of their special features have been mentioned, a fuller description being deemed unnecessary.

IX.

It will be noticed in all these designs that whatever grace or charm they may have is the result of the simplest treatment. A building should be logically designed, and the exterior be the natural expression of the plan. This is what is meant by Truth in Architecture. But just how much need be expressed, is not always clear. A proper regard for our architectural morals does not require us to exhibit to the passer-by every detail of construction and arrangement. Only what *is* shown must be *true*. A building ought at least to declare its purpose, which should be recognizable at a glance. But a house may well express more than the fact that it is a house. It may have a pretentious and showy appearance, or be modest and unassuming. It may look cheerful and hospitable, or cold and forbidding.

Now, for a cottage to be pretentious is in bad taste. It need not be so humble as to nestle among the violets, but it can assert itself sufficiently without being decked with tawdry ornaments, or the vanity of cupola or towers.

On the other hand, it would be equally false for a large mansion which should have an air of dignity and magnificence to attempt to assume a simple, rustic appearance. Indeed, Southey informs us that the devil's "favorite sin is the pride that apes humility." Proportion —that is, the relation of parts to each other and to the whole, is the most important element of beauty in architecture. This has been the subject of much discussion and controversy. The parts of a building having a certain mathematical relation to each other, numerous attempts have been made to formulate this and establish reliable rules for the guidance of the designer. All the theories, however, are conflicting; notwithstanding that most of them are proved by their authors to apply directly to the Parthenon, which

> "Earth proudly wears...
> As the best gem in her zone."

It seems that the sense of proportion, like an eye for color or an ear for music, is an innate quality possessed by some and lacked by others; and that it is as impossible to design a building as to make a musical composition by mathematical rules.

Beauty alone is not sufficient to constitute architectural excellence. Architecture is the art of building, and utility is the first consideration. If the architect be an artist, endowed with an appreciation of form and color, he will so combine the materials at his command that he will produce a building at once useful and beautiful. Exterior ornament should be sparingly used on cottages, and, if at all, should be so employed as to emphasize the design. But it seems more sensible in an economical dwelling to keep the exterior quite simple. While we should not inflict our neighbors with an ugly house, we will not be open to the charge of selfishness if we choose the extravagance of a daintily carved oak mantel in our sitting-room to that of ornamented brackets and posts on the veranda.

X.

IN THESE designs for cottages it will be observed that there has been no attempt made to adhere to any historical style. And this, we believe, shows a greater appreciation of the beauties of architectural styles than if they had been misapplied and tortured into what once was known as “Rural Gothic” or “Italian.”

After defining architecture to be “the material expression of the wants, faculties, and the sentiments of the age in which it is created,” Owen Jones, in his “Grammar of Ornament,” said that “Style in architecture is the peculiar form that expression takes under the influence of climate and the material at hand.” Accepting this definition, we see the absurdity of copying buildings erected under totally different conditions from ours. Although an Italian villa is more adaptable to our wants than a Greek temple (and our country-houses have often copied both with lamentable results) it does not readily submit to be Americanized. Italy may give us suggestions, and France, England and Germany offer us many and valuable ones, but in adapting them to our country houses we must show discrimination. And our own wants and sentiments, if well and naturally expressed, take forms that are not displeasing, even if Corinthian columns and Gothic arches are absent.

The question of color is an important one, as an unfortunate selection may spoil the (otherwise) prettiest house. We have discovered that considerations of cleanliness do not require us to paint our houses white, which, even with the addition of green shutters, is hardly satisfactory. The staring, conspicuous effect of these white houses is what we should avoid, and the tints we choose must be those that will blend harmoniously with the surrounding landscape. The pearly gray that shingles become after exposure to the atmosphere has a very good effect if relieved by contrast with some other color. A good treatment is to give the house a coat of crude petroleum, and, if desired, a transparent stain may be mixed with it which will show the grain of the wood. A range of soft yellows, reds and browns, may be so obtained. Messrs. Rossiter and Wright have published a book entitled “Modern House Painting,” which gives excellent directions and examples.

XI.

If we strive to give to the exterior of our houses a pleasing appearance, how much more reason is there to beautify the interior.

It has been claimed that pretty and comfortable homes exert a decided moral influence. Be this as it may, we are all interested in making our homes attractive. And there is no reason why they should not be so. We are apt to think that costly things must be beautiful, but this is by no means true, nor is it true that inexpensive objects must be ugly. The same materials used in the construction and decoration of an ugly apartment might, with the exercise of a little taste, be so employed that a graceful combination result.

Low ceilings give an air of comfort, while very high ones have a cold and barren effect, and increase the cost of the house.

The ventilation of a room should be quite independent of the height of its ceiling, that is to say, a room with a low ceiling may be well ventilated, and one with a high ceiling may gain nothing by the extra height but greater facilities for retaining poisonous gases and foul air. Gwilt gives as a rule that the height of the ceiling of a rectangular room should be the same as the width of the room; but since the apartments on a floor are of unequal size and the ceiling commonly of the same height throughout, no such proportion can be kept. Nor is it necessary for a small cottage. From 9 to 10 feet is ample for the first story rooms.

The proportion of a room may be modified by the treatment of its walls. Vertical lines give an appearance of greater height, and horizontal lines make a room look lower. Accordingly, the division of a wall into horizontal bands by means of the dado and frieze, now in such favor, has a tendency to make a room look lower than it really is. This division, however, is a good one. The dado is simply a substitute of a cheaper material for a paneled wainscot of wood. The wooden base board and chair-rail should be retained, as they serve to protect the wall. A broad frieze is an excellent decorative feature. It should be separated from the wall surface by a picture-moulding from which the pictures will hang.

The excavations at Pompeii have shown many beautiful examples of harmonious wall decoration. The walls are divided by dado and

frieze, the dado being generally darker and the frieze lighter, than the intermediate surface. We will do well to follow this arrangement even if we do not adopt the Pompeian colors.

If the plaster is finished with a rough surface (sand finish) it takes color well, and makes a satisfactory wall. Within the last few years, wall-papers have been manufactured which are good in design and low in cost. Many of them, printed in two tones of the same color, are delicate, and make good backgrounds for pictures. Being delicate and quiet does not necessarily mean that the paper must be gray and colorless. It may have a decided color, and still harmonize well with the pictures and other objects in the room.

Dark red matting used for a dado gives a most satisfactory effect. It may be continuous or divided in panels by narrow strips of wood.

Cartridge or ingrain-paper is now made in excellent colors, and is a good substitute for printed wall-papers. To break the flat surface a stencil pattern may be traced on it, or this may be done directly on the plaster, which must first be colored.

A good ceiling is made of simple felting-paper in lieu of plaster; the paper divided into small panels by narrow beaded strips of wood.

Lincrusta-Walton is a valuable material for some choice bit of decoration.

For door and window trims and other interior woodwork, white pine is recommended, as it is the cheapest, and, if properly finished, looks very well.

It may be stained, if too light—the transparent stains merely darken the wood and do not conceal the natural grain. Under no circumstances try to imitate oak or walnut by graining. Such shams deceive no one and are in the worst taste. If we use paint for interior work let us use it frankly, carefully selecting the color, and avoiding a shiny surface, a flatted or dull finish being preferable.

We have a great variety of wood to choose from, if not limited in expense, but “hard woods,” such as cherry, oak, mahogany, etc., not only are expensive in themselves, but require more labor. Ash is the cheapest of them. If some of the patent “fillers” are used, an excellent surface may be given to the wood, but these require to be finished with shellac, and carefully rubbed down. For cheap work, two coats of boiled oil may be used; or, if a polished surface is desired, varnish may be substituted.

Our fire-places may be of brick laid in red mortar, with wooden shelves, and perhaps lightly framed with wood. Tiles are appropriate for facings and hearth, as they are not affected by the heat. Let our windows be large and extend well up to the ceiling. Have window-seats if we can, and dispense with interior doors as much as possible. A curtain of some soft material (it need not be expensive) will look better than a six-panel door, and it may be pushed to one side, while the door is irrepressible. Let us make our hall a bright, cheerful apartment, that may aid us to “welcome the coming, speed the parting, guest.”

XII.

THE cost of building depends so largely upon varying circumstances that it is impossible to give precise estimates without exact information upon such points as the amount of excavation needed, facilities for obtaining stone for foundation, etc. Then the prices of labor and materials vary greatly in different localities, so the figures here given can only be approximately correct. Cottage No. I could be built as shown on plan, for $500. A cellar under it would make it cost about $100 more. Cottages Nos. II, III and IV would cost from $600 to $1000. Those shown in plates VI, VII, IX, X, and others of similar character and size may be estimated to cost from $2.50 to $3.00 per square ft. That is to say, if, as in Fig. IX, the extreme exterior dimensions are 21 ft. by 29 ft., the house covers 609 square ft., and would cost from $1522 to $1827. Cottage No. XIV could be built for from $3000 to $3500.

These prices are given as guides, and may serve the reader as a standard to follow. If plain interior finish is adopted, these figures may be relied upon for ordinary cases. Some sites, however, present unexpected difficulties, and some localities are peculiarly favored. Then the style of interior finish adopted affects the cost greatly, and the expense may be easily doubled by the use of elaborate cabinet work.

A brick house of the same capacity as a wooden one, will cost nearly 20 per cent. more. Rubble stone, if easily obtained, costs about as much as brick.

In building double houses, we may save from 10 to 15 per cent. on the cost of the houses singly.

Good materials and workmanship are always the cheapest in the end, and it is by no means advisable to economize too closely on that score. There can be no comfort in a house that constantly needs repairs; and the money spent in building a home, carefully and substantially constructed, will never be regretted.

Sanitary Questions

By WM. PAUL GERHARD, C. E.

In selecting a site, a loose, porous **soil** is, for obvious reasons, preferable to ground liable to be damp or wet. Pure, dry sand, and gravel, make excellent sites for building purposes. Next to these, rocky soils may be chosen, and are usually quite healthy. Clay soils, which are more or less impervious to water, and therefore always damp and chilly, and alluvial lands, must not be chosen as a site for dwellings. But, above all, avoid *made* land. Although this refers more particularly to city lots, it is not uncommon, even in the suburbs of large cities, to find low ground filled with garbage, rubbish, and decaying vegetable and animal debris, which are prime causes of impure air in dwellings. Ground which has not before been built upon is, undoubtedly, preferable to sites of old, torn-down buildings. If the latter must be taken, a detailed and thorough examination should be made with respect to the purity of the soil. Some lots are literally honey-combed with cesspools, privy-holes, or have a net-work of broken drains full of accumulated filth, and the soil is at times found to be contaminated from liquid house refuse, or by soakage from barn-yards, stables, etc. A well should never be sunk through such formerly occupied ground. It is quite important to ascertain by preliminary borings, the level of the ground water, for a high water level means continuous dampness, and must be abated by thorough under-drainage.

By **underdrainage** of a site, we effect a permanent lowering of the ground water, and thus secure to the proposed dwelling, dry foundation walls, and absence of dampness from the house interior. To remove such subsoil water, small porous, round tile-drains, 1¼

inches in diameter, should be laid with open joints at least two feet below the level of the cellar floor. The general arrangement of the lines may vary somewhat in each case, but ordinarily the branch drains can be laid in parallel lines, their distance varying from ten to twenty-five feet, according to the amount of water to be removed. Wherever springs are found, special lines may be required. The trenches should be refilled with broken stones or coarse gravel. All branch pipes should be collected in one main pipe, for which a 2 inch tile pipe will answer in most cases. This main drain should be continued with proper fall to a ditch, ravine or water course. There must never be any connection between such subsoil drains and any foul-water drain, sewer, or with a cesspool or sewage tank.

If the dwelling stands on a hill-side, exposed to subsoil water flowing over an impervious stratum, the foundation walls of the house nearest to the hill are very apt to be wet, often even so much as to have the subsoil water percolate through the cellar walls. In this case, the subterranean water vein should be cut off by a blind drain, *i.e.* a trench dug above the house sufficiently deep and carried with proper fall diagonally across the lot. The trench to be filled with broken stones and to be carried down the hill to some outlet, either an open ditch or a brook.

Some attention should be paid to the proper *removal of surface water*. In the case of suburban cottages the rain falling upon the roof is almost always collected and stored for use in underground cisterns. Occasionally a public water supply is available, the cistern is omitted, and the roof water is allowed to run away on the surface, and partly soak into the ground, thereby tending to keep the foundation walls damp and unhealthy. To avoid this evil, the grounds surrounding the house must be properly graded, in order to shed the water off from the walls. At a good distance from the house the surface water may sometimes be permitted to soak away into the ground, the vegetation helping to absorb a part of it. In other cases, however, surface channels or gutters must be arranged, especially with clay soils.

Besides water, the upper layers of the soil always contain **ground air**, which has a tendency to rise into the dwelling, especially in winter when our heated dwellings act as huge chimneys, drawing up large quantities of air from the ground beneath them. Such exhalations, which consist in the case of a pure soil of carbonic acid and watery vapor, and which in the case of a contaminated soil are largely mixed with gases of decomposing organic matter, should be rigidly excluded from the interior of houses. For this reason,

dwellings without a cellar should never be placed immediately on the ground, but must be raised on piers, arches or posts sufficiently to allow of a large air space and perfect circulation between the surface and the floor beams. This will, at the same time, prevent the quick rotting of the joists and floor-boards. To prevent the rapid cooling of the basement floor this should be laid double with an intermediate space, filled with a non-conducting material, such as mineral wool.

It is more expensive, but always preferable, to excavate for a **cellar** and to build the house on strong, well made foundation walls. The floor of the cellar must be made perfectly tight against ground water and ground air. There are different ways of doing this. One of the best methods is the following: cover the surface of the cellar, which has previously been levelled, with a layer of concrete, at least four inches, better six inches deep. Next put on a thin layer (about ¼ inch) of hot, pure asphaltum, and on top of this a finish of Portland cement.

The cellar walls must always be made impervious to dampness. As usually built, they are extremely porous, and moisture rises in them by contact with the adjoining ground and by capillary attraction. The best plan to prevent **dampness of walls** is to have a complete cut-off between the foundation walls and the ground, by an open area, carried completely round the building, and well drained and ventilated. This, however, is expensive, and a similar isolation may be accomplished by building double or hollow walls, the space between inner and outer walls being well aired. The foundation walls should be placed upon a bed of concrete, and must be covered on their outside with a layer of asphaltum to a point somewhat above the level of the ground. It is very important to provide, at this height in the wall, a horizontal isolating or damp proof course, which may consist of a thick layer of asphaltum, or of slate, bedded in cement, or of layers of tarred roofing paper, or else of hollow tiles. The sill and the floor joists must, of course, be kept above the damp proof course. The surface water may be kept away from the outer walls by filling the space next to the wall, to a depth well below the foundation walls, with broken stones or gravel. Sometimes a tile drain is placed below the foot course to carry off any accumulation of percolating storm water. This trench may be covered at the top with a stone slab to shed off surface water.

Most so-called “practical” builders will probably sneer at these suggestions. I can assure those of my readers who care to build a *healthy* home, that the money paid for such preventive measures will

be spent for an excellent purpose. The proper construction of healthy foundation walls, and of a cellar, dry and cheerful at all times, is the basis of sanitation in cottage-building. This much accomplished, all remaining requirements are not so difficult to fulfill.

Next to dryness, the most desirable features of a good cellar are, that it is well lighted and perfectly ventilated. Good light in a cellar helps much toward its being kept in a proper condition. As regards the necessity of cellar ventilation, remember that your floors will necessarily have some crevices or shrinkage holes, and through these the cellar air will rise and mingle with the atmosphere of your living and sleeping rooms. Above all other things, do not allow your cellar to be made a sort of gigantic poke-hole for rags, cast-off clothing, old shoes, tin-cans, rotten vegetables, garbage, swill or other offensive matters. See that it is kept at all times free from rats and vermin. Do not tolerate any opening in the cellar floor for the removal of surplus water into foul water drains. Such opening, even if trapped, will be sure to act at times as an inlet for unwelcome sewer air.

THE **water supply** of cottages is derived either from wells, cisterns or springs. Rarely do we find in the case of scattered houses a public supply, delivering water under pressure.

A common sight in the country is a **well** located close to or adjoining a leaching cesspool or a privy. Such wells are usually sunk to but a limited depth, and the liquid sewage from cesspools soaks through the porous subsoil down to the subterranean water stratum. The danger to health from drinking impure water is now universally acknowledged. Polluted well water is rendered more dangerous by the fact that it often has a bright, sparkling and clear appearance and has, in summer time, a low temperature, making it particularly agreeable to drink. Nothing but a chemical analysis or the microscope reveals its unwholesome condition. It is extremely difficult to fix a limit of minimum distance between a well and a cesspool, or privy, as so many different factors have to be taken into consideration. In rocky ground, especially, there may exist hidden fissures carrying the contents of cesspools a much greater distance than is generally expected.

If there is no leaching cesspool, no privy, nor other cause of soil contamination, in the neighborhood, a well may safely be used. If

cesspools must be kept on or near your, or the neighbor's, lot, or if the ground has previously been saturated with filth, do not sink a well.

A properly built well should have walls made tight and impervious from the level of the ground-water up to the surface, in order to prevent any filtration from the soil surrounding the well. The surface of the ground should be raised somewhat at the well, and graded so as to pitch in all directions away from the well. This will prevent the entrance of surface-washings. The opening of the well must be *thoroughly well covered*, in order to prevent the falling into the well of vermin and smaller animals, or the washing in of decaying vegetable or organic matter. The following mode of building a well has many advantages over the ordinary way: Excavate down to the water-level, then arch the well over with stones, and place the suction-pipe into the well. Next refill with loose stones, on top of these place coarse gravel, sand, and finally clean earth. Carry the pipe above ground to the suction-pump. A thus built well is very safe against introduction of foreign matter.

The best wells are probably what are called "driven wells" or "Abyssinian" wells. They are constructed as follows: A wrought-iron tube, 1½ to 2 inches diameter, having at its end a steel point perforated with numerous holes, is driven into the ground, which must, of course, be free from stones or boulders, until the ground water is reached. If necessary, several lengths of tubing are screwed together by means of couplings. The upper end of the tube is attached to the pump, and continued suction will soon wash away the sand at the lower end of the pipe, and furnish a stream of clear water.

Wherever a well cannot be sunk, cottages should be supplied with rain water collected from the roof and stored either in tanks placed in the garret, or else in underground **cisterns**. The latter keep the temperature of the water moderately low throughout the year. Most people, unaccustomed to drink rain water, object to it on account of its flat taste, but if it is carefully collected, properly stored, boiled before use, filtered, cooled with ice and well aerated, it makes an exceedingly wholesome and agreeable drink.

To determine the amount of rain water available from a certain roof, ascertain the amount of surface of its horizontal projection, and multiply this by the annual rainfall in feet and decimals of a foot. The total amount in cubic feet must be divided by two, to allow for unavoidable loss through evaporation and for wasted, impure roof

washings. It is easy to arrive at a proper size for the cistern, if the available amount of water is known.

In collecting roof water, it is important to allow the first washings from the roof, which always contain more or less filth in the shape of dust, horse dung from the street, excrements of birds, leaves from trees, etc., to run off on the surface. This may readily be accomplished by cut-offs on the rain water pipes, to be worked by hand or arranged to act automatically. The best roofing surface for collecting rain water is slate, and next to this shingles. Underground cisterns are usually built circular in shape, of hard-burnt brick, laid in hydraulic cement. The walls of the cistern must be made perfectly watertight, not only to prevent leakage from it to the outside, but also to prevent the entrance into it of ground water. If an overflow pipe is provided, it should under no circumstances whatever communicate with any drain or sewer, or discharge into a cesspool. As soon as delivered into the cistern, the water must be kept scrupulously clean, and any possible source of pollution should be removed. It is a good plan to build into the cistern a filtering chamber to remove the coarser impurities in the water. Cisterns should be frequently inspected, emptied and cleaned; the opening at the top must be closed by a solid cover, to prevent the falling in of vermin, mice, rats, etc., and to guard against contamination by surface-washings.

Occasionally a dwelling-house is supplied from a distant **spring**, by a gravitation supply in case the spring is near a hill-top, or by means of a hydraulic ram if the spring is situated at a lower level than the house.

If the dwelling draws its supply from a well or a cistern, the water is usually lifted by means of suction-pumps, generally located, for convenience's sake, inside the house, at the kitchen sink. If the cottage has any plumbing fixtures on the upper floor, it becomes necessary to force water by a lift and force-pump to a small reservoir or tank under the roof, from which it is distributed to the fixtures under a constant head of pressure. Such **water tanks** should be made of cast iron well painted, or of wrought iron well protected against rust. Slate tanks are also very good. Cheaper than either of these are wooden tanks. Wooden tanks are often lined with tinned copper; lead, zinc or galvanized iron linings are undesirable. Care must be taken not to run the overflow of a tank into any soil or drain pipe. The simplest way of disposing of it is to run it into the gutter of the roof. If this is not feasible run it down to the kitchen sink, and

make it serve as a tell-tale for use with the force-pump at the kitchen sink.

Pipes for conveying water to the plumbing fixtures may be of drawn lead, or tin-lined lead, or of block tin. Wrought iron is used extensively, either plain or galvanized or enamelled; rubber-coated, glass-lined and tin-lined wrought-iron pipes are also made, but are too expensive for ordinary use.

Drawn lead pipe is a material possessing many merits, and hence it is used extensively. It should be remembered, however, that soft water attacks lead, and a sufficient amount of lead is occasionally dissolved to cause dangerous poisoning of persons drinking water from such pipes. It is a good precaution in the case of new pipes to allow the water to run for a while, especially if it has been standing in the pipes over night. Tin-lined pipes, although more expensive, are much safer for use, but great care must be taken in making joints in such pipe, lest the tin be removed at the joints. Tin-lined as well as block tin pipes should always be used as suction-pipes in wells and cisterns in preference to ordinary lead pipes.

Plain wrought-iron pipes rust quickly, especially if not constantly kept full of water; water conveyed through them is apt to make iron stains in the washing. A further disadvantage is the frequent choking up of the smaller sizes through rust. Pipes coated with some kind of enamel are better and safer, provided care is taken in making the joints properly. Plain wrought-iron pipes, made rustless by the Bower-Barff process, have lately been used and promise to show good results. Wrought-iron pipes are largely used, protected with a coating of zinc, and such “galvanized” pipes may be safely used, for, although water dissolves and is often found to contain salts of zinc, which are poisonous in large amounts, dilution makes them practically harmless. A more serious objection to galvanized pipes may be the fact that the zinc coating, unless applied with great care, soon wears off and ceases to protect the pipe against rust. Copper tubes, lined with tin, are occasionally used, but are expensive and troublesome to put up. In some of the Eastern States drawn seamless brass tubes are used for hot-water pipes. Their only advantage over lead would seem to be their neater appearance and less liability to sag, although changes of temperature affect brass pipes by expansion and contraction, causing leaky joints. Brass pipes, if used for drinking-water, should be tinned on the inside.

It is important to arrange all water-pipes so that they can be completely drained or emptied, when the supply is shut off. Pipes

running on outside walls should be suitably protected against frost. It is recommended, even in the case of the smallest buildings, to have a plan, showing the exact size, material and location of all water pipes, stop-cocks, faucets, cisterns, etc. All pipes should be kept accessible, and, wherever possible, in sight.

The supply for drinking purposes is often purified by means of **domestic filtration**. This is especially desirable with cistern water. Domestic filters should act not only as strainers by removing suspended impurities, but they ought also to act chemically by oxidizing a part or all of the dissolved organic matter. Various materials are used for domestic filters, amongst them being sand, sponge, flannel, cotton, animal charcoal and spongy iron. Nothing is more erroneous than the supposition that a filter, once started, will continue to act, without further attention, forever. Whatever the filtering material may be, it should be frequently cleaned and aerated, and renewed from time to time. It must, therefore, always be easily accessible. Most small filters, to be screwed to faucets on the supply pipe, are made reversible, and if this operation is regularly performed, they work quite well, although their action is of necessity largely mechanical. Larger filters are connected by means of a hose or a pipe with the pressure supply, and these, too, answer well, provided they have an arrangement for periodical reversing of the direction of the filtering current. Other filters are portable vessels to be filled by hand. Filters are also placed in cisterns, or at the end of the suction pipe in wells or cisterns. A good plan is to build into the cistern a partition wall, establishing a small chamber, in which the suction pipe is placed. The dividing wall is built with courses of brick, some of which, being laid dry, act as strainers. This arrangement, it need hardly be said, wants periodical cleaning as much as any of the household filters.

A SERIOUS and all-important matter is the question of **removal and disposal of the household wastes**. We will assume, as is the case in ninety-nine out of every hundred isolated country dwellings, that there are no sewers in the streets, and that a discharge into a large creek or stream, or into the sea, is not feasible.

The common practice is to build a *leaching* **cesspool**, if the soil is at all porous. All the liquid wastes from the household are carried by a drain to this cesspool, and allowed to soak away into the soil, while the cesspool, and the spaces between its wall-stones, are

gradually filling up with the more solid matter, the grease, etc., which undergo a slow process of decomposition, creating a noxious and disagreeable accumulation of gases. The cesspool is usually unventilated, and the only exit for gases is through the drain pipe, up the house pipes, and through defective joints and equally defective traps into the house.

Occasionally two cesspools are used, one for the kitchen sink waste, the other for soil and bath-room waste water. The conditions of these cesspools after some use will not differ materially from each other, and such an arrangement is, if anything, more of a nuisance than the one first-mentioned.

The smaller the house lot, the greater is the danger from a cesspool. No leaching cesspool should ever be placed nearer to a dwelling than one hundred feet. To locate such a cesspool close to the well, or even a cistern, is a practice which should be forbidden by law.

A cesspool or sewage tank, if required, should be built *thoroughly tight*, tighter even, if this were possible, than a cistern. It should be of moderate dimensions, preferably circular in shape, built with hard-burnt brick, laid in hydraulic cement, and the tank must be well rendered inside and outside with pure Portland cement. The tank should be arched over and covered with an iron cover. It must be emptied, cleaned and disinfected at frequent intervals, and it should be at all times well ventilated, by a pipe, carried up to a good height above ground. If possible, the cesspool should not be located in a direction from the house of the prevailing winds.

The liquid contents of a sewage-tank may with advantage be used to sprinkle and irrigate a lawn, or a kitchen garden, or shrubbery, or a vine trellis, while the solids, removed at *frequent* intervals, may be dug as fertilizers into the ground. If this arrangement is adopted I usually advise having two chambers in the cesspool; the smaller one for retaining the solids, the larger one to receive the liquid wastes. The overflow delivering the latter from the retaining or settling chamber for solids, into the liquid-tank, must dip well below the water-line, so as to avoid carrying scum with the water. The liquid manure may be pumped by a small pump, set over the top of the liquid cesspool chamber.

The question is to some extent simplified if the cottage contains no water-closets. The liquid manure will be easier removed and taken care of. The usual and much to be condemned substitute for a water-closet is a **privy**, located close to or at a distance from the

house. It rivals with the leaching cesspool in nastiness and danger to health. It pollutes the soil, taints the water in the well and contaminates the air of the neighborhood. A privy must always receive unqualified condemnation. There are cheap and cleanly substitutes for it, such as the various apparatus known as **earth or ash closets**. While I should hesitate to recommend placing an earth-closet inside a cottage, except for the use of invalids, it is very easy to arrange it so as to be quite near the rear part of the house, accessible from it by a not too conspicuous, well covered, shady, dry and sheltered walk.

The shed, in which the earth-closet is placed, should be well-built, strong and tight, and preferably plastered, so as not to be too cold in winter storms, but also sufficiently ventilated. A simple earth-closet is illustrated in the writer's book, "Hints on the Drainage and Sewerage of Dwellings." More expensive closets, with mechanical apparatus for throwing a fixed quantity of earth after use, are sold and generally give satisfaction if used intelligently, although plain earth-closets answer well in the case of inexpensive cottages.

With cottages, provided with earth-closets, the earth-manure can be advantageously used in the kitchen garden, or else it may be disposed of to neighboring farmers. The disposal of slop water (kitchen and chamber slops) may be effected where there are grounds about the house, sloping somewhat away from it, by **sub-surface irrigation**, consisting in placing a series of common 2-inch drain tiles in parallel lines, about 10 inches below the surface of the ground, and distributing the sewage water intermittently through such a network of pipes into the ground, where it is acted upon by the vegetation and purified by the earth, acting as a filter. The details of this system, which answers better than any other known method of disposal for isolated country dwellings, are given in the author's book, quoted before. This system is also practical when water-closets are used inside the house, but in this case, the solids should be intercepted in a small receiving reservoir, which must be frequently cleaned, otherwise the distributing tiles will speedily choke, and create a nuisance by ceasing to work.

Cottages or suburban dwellings of moderate cost should have as few **plumbing fixtures** as possible, especially if water is scarce, and must be pumped to a distributing tank by hand labor. Where there is a system of service pipes, tanks and fixtures, there will be more or less outlay for annual repairs, besides the frequent annoyance of apparatus getting out of order, or refusing to work, or freezing up and bursting. It is certainly much cheaper to have a properly

managed earth-closet and to confine the plumbing in the house to a kitchen sink, a force-pump, a tank and a kitchen boiler. Certain advantages, however, of an indoor water-closet, as regards comfort, convenience and health, must be conceded. A bath-room with a plain bath-tub is also a great convenience and an important aid to bodily cleanliness. It pays well to arrange for it, even where one must forego the luxury of a good water-closet. If means are not available for a system of hot and cold water pipes, the bath tub may be filled by pails. A small slop sink or slop hopper for removing chamber slops is also useful and facilitates the work of servants. Both sink and tub may be arranged in one room, which should have plenty of ventilation and direct light by large windows to the outer air. Even the smallest cottage must have a plain kitchen sink. Where the kitchen is large, a set of laundry tubs may be arranged close by the sink; in larger dwellings a special room is generally set aside for laundry purposes, next to the kitchen, or below the kitchen, in the basement, and hot water from the kitchen boiler is generally available. If a **bath-room** is wanted, with a water-closet and a bath-tub, and all necessary amount of hot and cold water pipes, waste and vent pipes, let the arrangement be as plain and as open—which does not necessarily mean unsightly—as possible. Keep all pipes outside of walls or partitions, have them where you can constantly see them and lay your hands on any stopcock or other plumbing detail, if necessary. Dispense with woodwork as much as possible. Arrange every fixture, especially the sink and the water-closet, open to inspection and accessible to the dust-brush and wiping cloth of the servants. It is important—for the sake of economy as well as on account of plain and straight arrangement of pipes—that the bath-room should be as nearly as possible directly over the kitchen, so that one waste pipe and one line of vent pipe may answer for both. A little skill and foresight in planning will usually accomplish this desirable feature.

Let the kitchen sink be of plain cast-iron, the laundry tubs of wood, or better, of slate; the bath-tub of wood, lined with 14 oz. copper, and select a good earthen-ware flushing rim hopper with supply-cistern. Of course, there is more expensive, more durable and handsomer plumbing apparatus sold, but the above fixtures, if well set, answer all practical requirements of a small home. The water-closet should be arranged with so little woodwork as only a seat resting on cleats; the closet itself standing on all sides free on the floor. This may be finished in hard wood or covered with oil-cloth, or with slate slabs. A closet thus arranged answers well for pouring

out chamber slops and for use as a urinal. For further details on plumbing fixtures see the author's books on the subject.

Here are a few approved rules on **house sewerage**, so far as they relate to plain cottages.

The main house sewer outside the building to be of strong well-burnt, and glazed vitrified pipe, circular in section, four inches in diameter, laid in straight lines, or with curves of large radius at changes of direction. Joints to be made with pure Portland cement. It is important that no cement remains on the inside of the joint. The bottom part of each pipe should be tightened with particular care. The drain to be firmly laid at the bottom of the trench, if necessary, on a bed of concrete. Grooves should be cut for the pipe-sockets. The depth of the drain should be about 3 feet. Junctions to be made with Y branches. Inclination to be, if possible, ½ inch to the foot. Wherever grades are very flat provide some simple and inexpensive flushing apparatus at the head of the house sewer.

All the pipes inside the house to be thoroughly gas and water-tight, and well flushed and ventilated. The house sewer inside the dwelling, to a point five feet outside of the house walls, to be of heavy iron pipe; of cast iron, if kept below the floor; of wrought iron or cast iron, if run along the cellar wall or ceiling. Provide a sufficient number of access-holes for inspection and for removing stoppages.

The soil pipe or waste pipe to be of heavy tarred cast iron with well caulked lead joints, or of asphalted wrought iron with steam-tight screw-joints. Pipes to run as straight as possible from the cellar to the roof, and to be continued full-size at least two feet above the roof. Mouth to be left wide open. Size of soil pipe 4 inches; of waste pipe 2 inches.

Provide a running trap on line of main house sewer, inside or outside of the house. Arrange a 4-inch fresh air pipe, at the house side of such trap, run preferably some distance away from the house and hidden from sight by shrubbery.

Branch waste pipes from fixtures to be of heavy lead pipe, 1½ inches diameter. Joints between lead and iron pipe to be made with brass ferrules or brass screw nipples.

Each fixture to be separately trapped near its outlet by a self-cleansing and secure trap. Overflow pipes to be dispensed with as much as possible; if used to join the waste pipe between the fixture and the trap. Traps to be either the siphon (S or running traps), in

which case siphonage should be prevented by an air pipe, or else to be anti-siphoning or mechanical or mercury-seal traps.

THE question of how to **warm** our cottage will depend, in the first place, upon the climate and locality of the proposed dwelling, and furthermore upon its exposure. Three methods of warming the air of halls and rooms must be considered, namely, warming by open fire-places, by stoves and by hot-air furnaces. Direct and indirect heating by steam and by hot-water apparatus are excluded on account of their cost for buildings, such as here shown.

Ordinary **fire-places** warm principally by radiation, the heat from the fire being imparted to surrounding objects or persons without much warming the surrounding air. The degree of heat varies with the square of the distance from the grate, and it thus happens that with a fire-place as the only means of heating a room of an exposed dwelling, a person near the fire may be nearly roasted, while at the opposite extreme end of the room the temperature may be almost down to the freezing point. A further disadvantage is the fact that it heats only the part of the body facing the fire. The greatest objection to the ordinary open grate fire lies in the fact that 85 per cent. and more of the fuel is wasted, the heat from it going straight up the chimney flue. A fire-place generally causes extremely cold drafts from window cracks, or from door spaces, especially in very cold weather. On the other hand, if such cracks are all carefully closed and stopped up, the chimney is apt to smoke. While, therefore, an open fire-place may be adequate in warm climates, it is entirely inadequate to warm, *per se*, cottages in our eastern, northern, and northwestern States.

To say that a very large waste of fuel is incident to warming by fire-places, is not strictly correct, for the heat is not actually *wasted*. It forms a good aid to the ventilation of rooms, and we will see later that, as an accessory of other heating methods, the fire-place is eminently serviceable, and much to be recommended. Better, however, than ordinary fire-places, are the improved, so-called **ventilating fire-places**, which are provided with a large air chamber, and a sufficient air supply from outdoors. There are several excellent devices of this kind in the market, and these are, of course, much more economical as far as burning fuel is concerned, about 35 per cent. of the heat being utilized. They make splendid ventilators, and are generally superior and free from defects.

In this country **stoves** of cast iron and of wrought iron are the usual and most economical means of heating small cottages and suburban dwellings. It is also, unfortunately, true that, as ordinarily arranged, they make the worst possible devices for warming the air of our rooms. Heating should always be combined with ventilation, that is, there should be a continuous removal of the fouled air and introduction of plenty of pure air instead, but arranged so as not to cause inconvenient or unhealthy drafts. A room warmed by an air-tight stove must soon contain air entirely unfit to breathe, for a close stove removes practically none of the vitiated air, and there is usually an entire absence of any provision for introducing fresh air. Less fuel is consumed, and stove-heating is consequently economical, at least apparently so, while in reality it causes loss of strength, vigor and appetite, and general debility and extreme sensitiveness.

If a dwelling is to be heated by stoves, the following precautions must be observed. Select a good-sized, well-built stove, with tight joints, and lined on the inside with fire-brick to prevent the iron from getting red hot and to retain, as much as possible, the heat. A supply of fresh pure air from the outside must be arranged, carried to a jacket surrounding the stove, where the air is warmed by contact with the stove, and circulated in the room. The smoke pipe of the stove should be large, and must never have a damper to shut off the draft. A valve may be placed on the fresh-air inlet pipe to regulate the amount of ventilation at will. For the removal of foul air outlets must be arranged, near the ceiling of the room, and into the chimney, care being taken to prevent down-drafts or entrance of smoke, by arranging a self-closing flap valve at the outlet. It is much preferable, however, to have an extracting or ventilating flue, arranged in the chimney adjoining the smoke flue and warmed by the latter, with outlets from the room into such flue. The stove should have ample capacity to heat the room even in very cold weather without driving the fire to a red heat. It is a good plan to supply a moderate amount of moisture to the air by placing a water kettle or evaporating pan on the stove.

Heating suburban dwellings by **hot-air furnaces** has many advantages over stove heating. Furnace heating is, strictly speaking, stove heating, but with this difference, that there is only one large stove, centrally located in the basement or cellar, from which air pipes of sufficient size carry the warmed air into the rooms as desired. There is, consequently, less labor in carrying coal and

making fires, less trouble in keeping up the fire, and less dirt and dust from removing ashes.

Furnace heating is disliked and has often been condemned by many as detrimental to health, and while such is true of improperly arranged furnace apparatus, it is, nevertheless, a mode of heating which can be made perfectly healthy and agreeable. It is impossible to heat a room well by furnace heat, unless arrangements are made, by an open fire-place or other outlet into a chimney flue, for withdrawal of the air once breathed and fouled by respiration. You cannot introduce pure, warmed air, unless you remove a like amount of fouled air. Another mistake, frequently made, is to take the air supply to the furnace air-chamber directly from the cellar. Thus, cellar air, ground air, or air from sewer pipes, is often sent up in a heated condition into the living and sleeping rooms.

If warming by a hot-air furnace is decided upon, care should be taken to select from the innumerable patterns in the market a good furnace. The furnace should be of the best quality of material of its kind—either cast iron, wrought iron or soap-stone,—and of a good size, for if the furnace is small, it will be overheated in extremely cold weather, which is very objectionable, as it renders the air less fit for breathing, and is liable to cause cracks in cast-iron, and loose joints in wrought-iron furnaces. The furnace must be well constructed, the pot must be lined with fire-brick to prevent the rapid burning out of the iron, the joints must be few in number and perfectly tight, and this must be made the subject of a special examination. The furnace should have one or two large cold air-ducts, leading to the outside of the house, located on opposite sides of the house if there are two. These air-ducts should take their supply preferably five or more feet above the surface of the ground. A slide-valve must be arranged in the cold-air box, to regulate the amount of incoming air, and where there is danger from impurities in the air, the air supply should be filtered through a loose cotton filter. At the mouth of the air box place a wire-netting to prevent rats or other animals from entering. The box should be constructed of well-dried, wooden plank, with closely fitted joints. Better, although more expensive, is a galvanized sheet iron air-duct. It is advisable to carry the cold-air box along the ceiling of the cellar, where it is in sight, and not below the ground, where it may and often is filled with ground water or pools of sewage from broken cellar drains. The size of the fresh-air inlet should be equal in area to the aggregate sum of all hot-air flues, leading from the air chamber into rooms. The fresh air should be kept tolerably moist by arranging an

evaporating pan kept constantly full of water in the air chamber of the furnace.

The furnace must be arranged as centrally as possible, so as to make the horizontal hot-air flues short, for in these the velocity of the air current is reduced by friction, especially if the flues are small. The hot-air flues should, preferably, be kept on inside walls, and must be as direct as possible, and of ample capacity. The inlets or registers, for admitting warm air into the room, should not be in the floor, for it is unhealthy to stand over them, moreover they form receptacles of dirt and dust, and are unsightly in the floor. The inlets should be placed in a side wall. To avoid danger from charring woodwork no hot-air flues should come in direct contact with floor-joists, boards or partitions; all woodwork should be securely protected by some non-conducting material. The smoke-pipe must be large and run to a good-sized smooth flue, so as to insure a good steady draft, which will remove all gases of combustion. There should be no damper on the smoke pipe, and the fire should be regulated only by more or less admission of air under the fire grate. Overheating of the furnace must be avoided, for it unduly dries the air, and scorches the organic matter in the air coming in contact with the fire, thus causing a peculiar, disagreeable smell.

An open fire-place in the hall and all principal rooms makes, in connection with hot-air heating, the most comfortable and pleasant arrangement for withdrawing fouled air from the room. With the air of the room introduced at a warm temperature, the radiant heat from the fire-place is particularly invigorating and comforting. We all love to gather around a cheerful, glowing fire on the hearth of a cosy home, and exchange pleasant thoughts or dream away twilight hours in looking at the flickering light.

If fire-places are not available for ventilation, outlets must be provided into warm, ventilating flues, arranged parallel to smoke-flues in chimneys. Chimney flues should preferably not be built against outside walls, for they are not apt to draw well in such position, unless a special air space is arranged in the rear of the flue to prevent its too rapid cooling. Ventilating flues must be without sharp angles, smooth on the inside and preferably round in section. If they remove the air from a number of rooms, their cross-section must be proportionately increased. Bedrooms should never be heated by base burner stoves, but should have a fire-place acting at all times as an efficient foul-air flue. Halls must be moderately heated to avoid cold drafts through door-cracks, and to insure a more

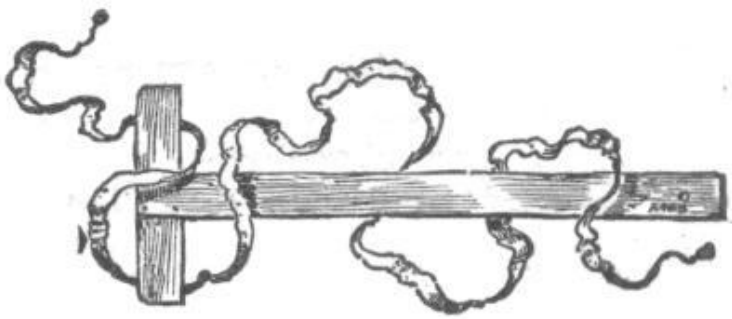
uniform heat throughout the dwelling. Bathrooms and kitchens must be ventilated with special care.

Ventilation or change of air in dwellings must go on at all seasons of the year. It aims at removing the vitiated air in a dwelling and introducing a sufficient amount of pure air, moderately heated in winter time, supplied with a proper amount of moisture, and thoroughly and uniformly diffusing it in the house interior in gentle currents, without causing undue drafts. Drafts are dangerous to health, because they rob the human body too suddenly of a part of its heat. In summer-time ventilation is happily and easily accomplished by opening doors or windows, and by occasional "air-flushing" by creating cross-currents through rooms. Fire-places should not be covered up in summer by fire-boards. In winter-time ventilation should always be combined with heating.

In the spring or fall of the year we often content ourselves with a small wood or coal fire on the hearth, and in such a case the easiest way to provide for incoming fresh air is by admitting air through the windows, directing the cold current to rise up to the ceiling. This may be done by lowering the upper sash and raising the lower one slightly, not enough to leave openings at top and bottom. A better way is, of course, to have a ventilating open fire-place, such as the "fire-on-the-hearth" stove, or other apparatus.

The so-called spontaneous or accidental ventilation by air penetrating walls cannot, practically, establish a sufficient change of air. Its effect is very much reduced by papering, painting, plastering on the inside, and by treating the outside walls by some water-proof process, as is frequently done, as a protection against driving rains.

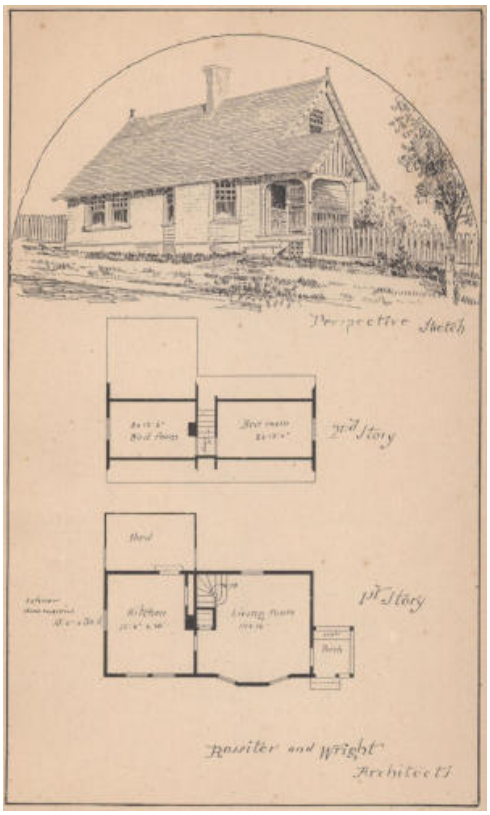
For details on ventilation, amount of cubic space in rooms, amount of air-supply required, proper position of inlets and outlets, and other questions, we refer to larger hand-books on ventilation.



PLATES.

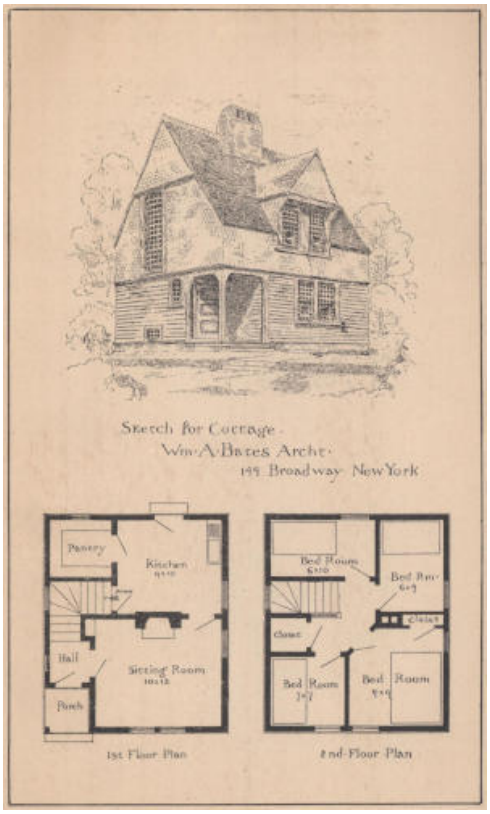
PLATES.

PLATE I



Perspective Sketch.
Rossiter and Wright Architects.

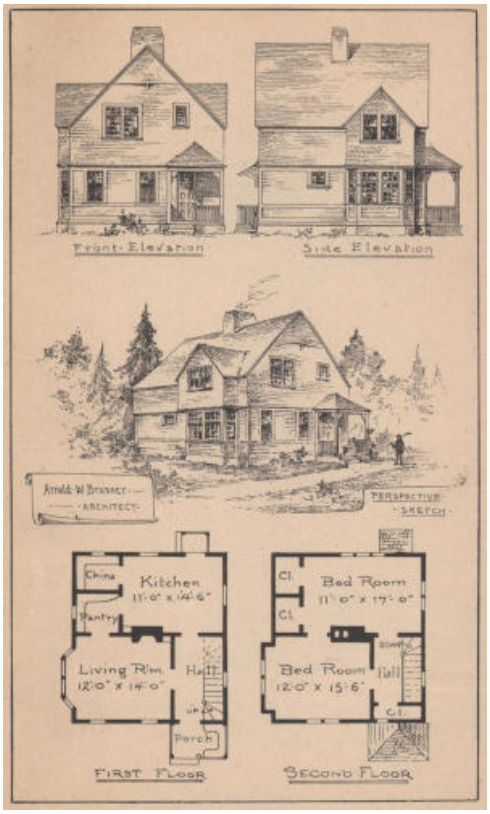
PLATE II



Sketch for Cottage.

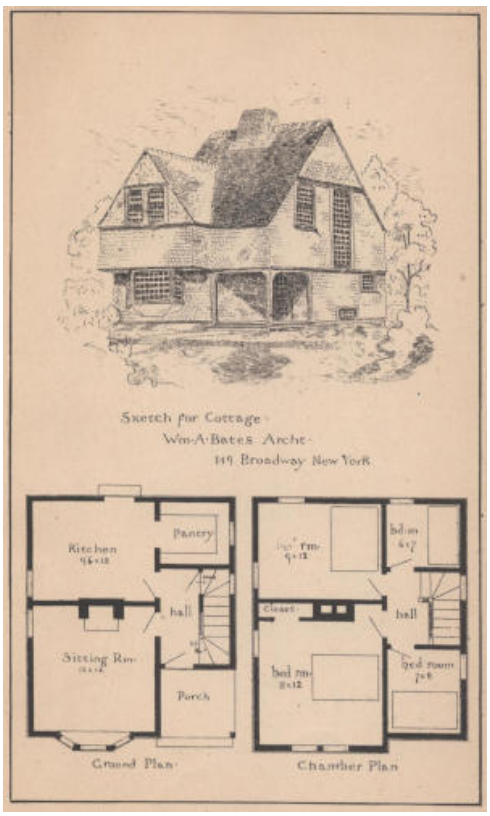
Wm. A. Bates. Architect. 149 Broadway, New York.

Plate III



Perspective Sketch.
Arnold W. Brunner. Architect. New York.

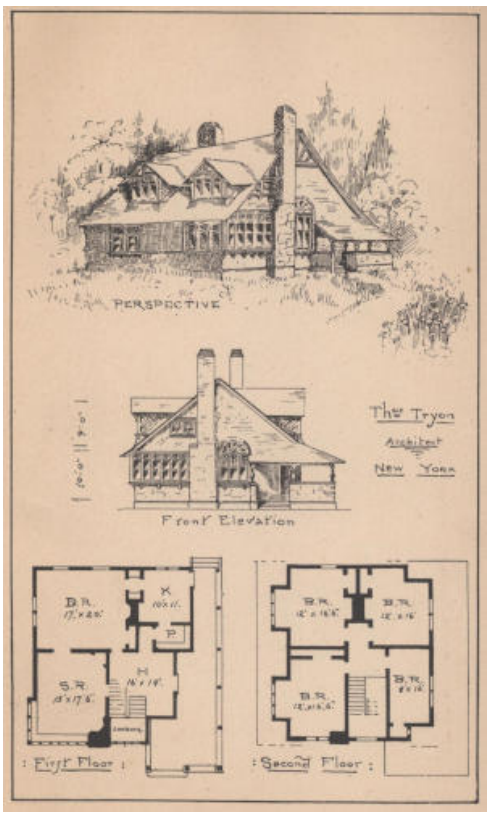
Plate IV



Sketch for Cottage.

Wm. A. Bates. Architect. 149 Broadway, New York.

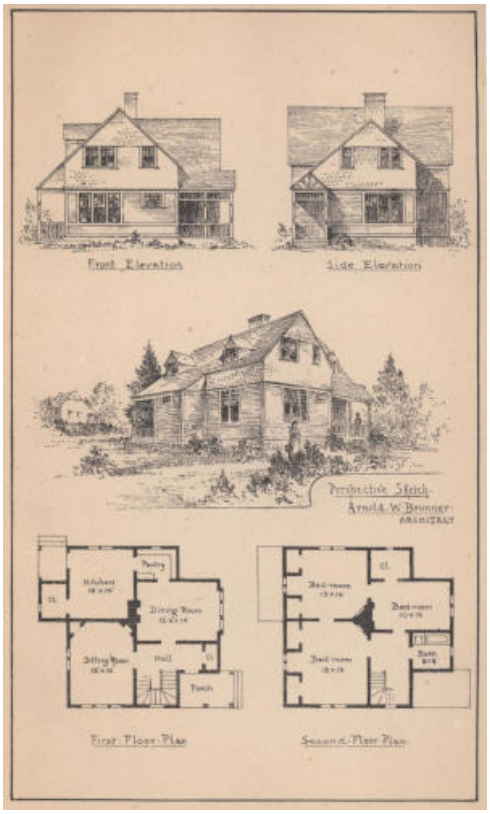
Plate V



Perspective.

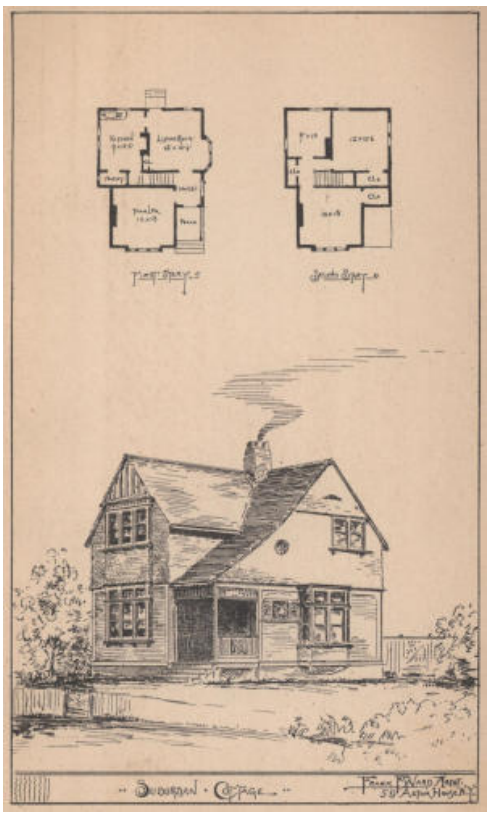
Thos. Tryon. Architect. New York.

Plate VI



Perspective Sketch.
Arnold W. Brunner. Architect. New York.

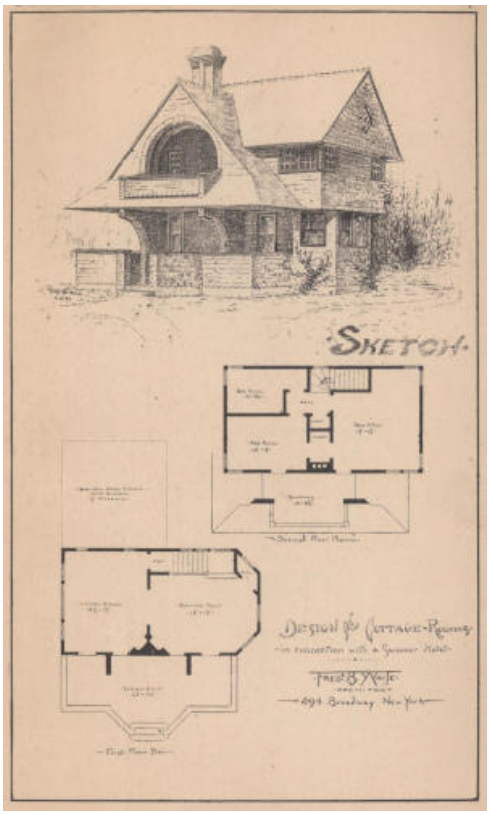
Plate VII



Suburban Cottage.

Frank F. Ward. Architect. 59 Astor House, N.Y.

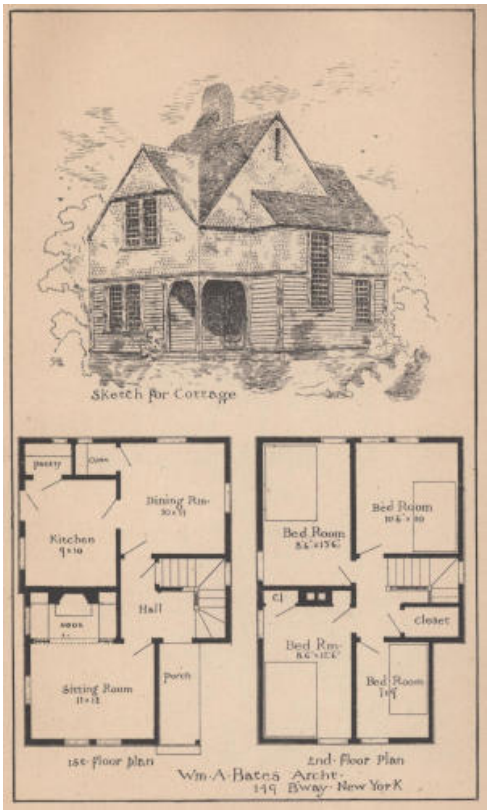
Plate VIII



Sketch. Design for Cottage-Rooms in connection with a Summer Hotel.

Fredk. B. White. Architect. 294 Broadway, New York.

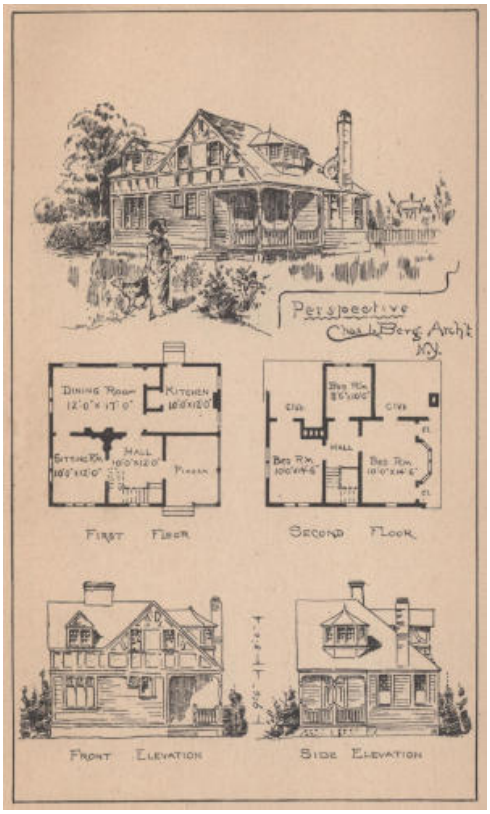
Plate IX



Sketch for Cottage.

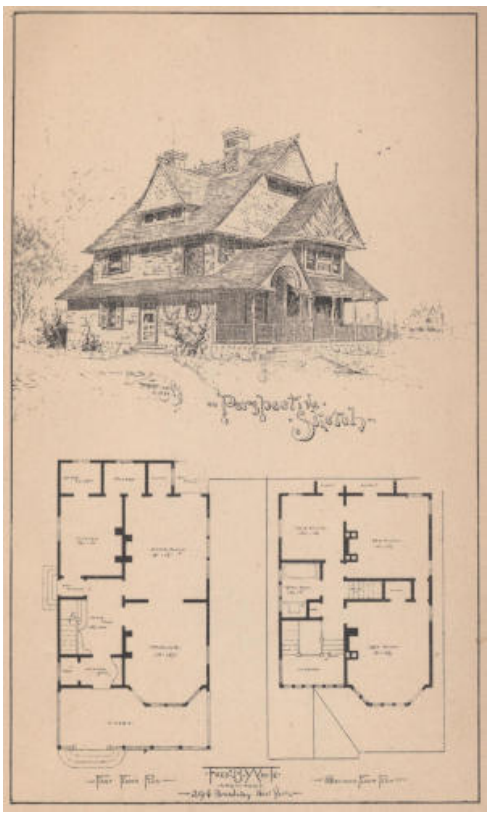
Wm. A. Bates. Architect. 149 Broadway, New York.

Plate X



Perspective.
Chas. I. Berg. Architect. N.Y.

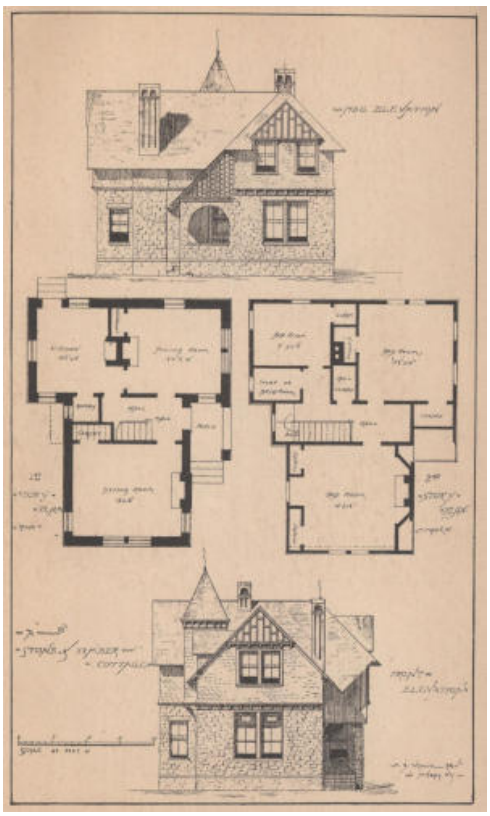
Plate XI



Perspective Sketch.

Fredk. B. White. Architect. 294 Broadway, New York.

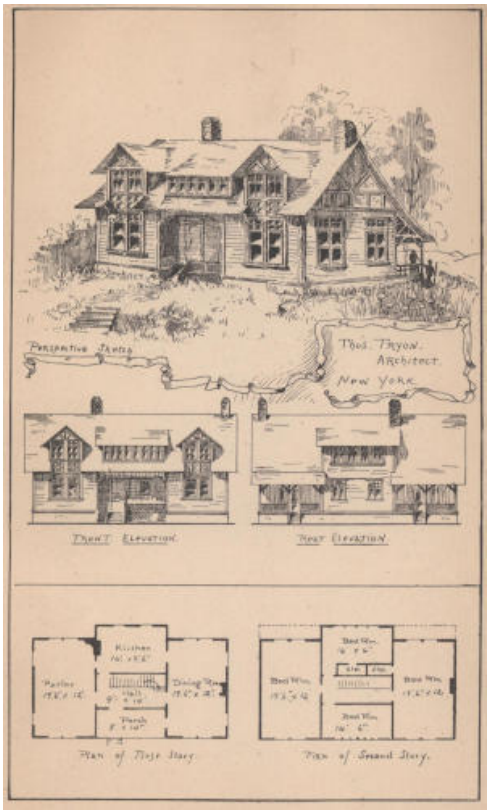
Plate XII



A Stone & Timber Cottage.

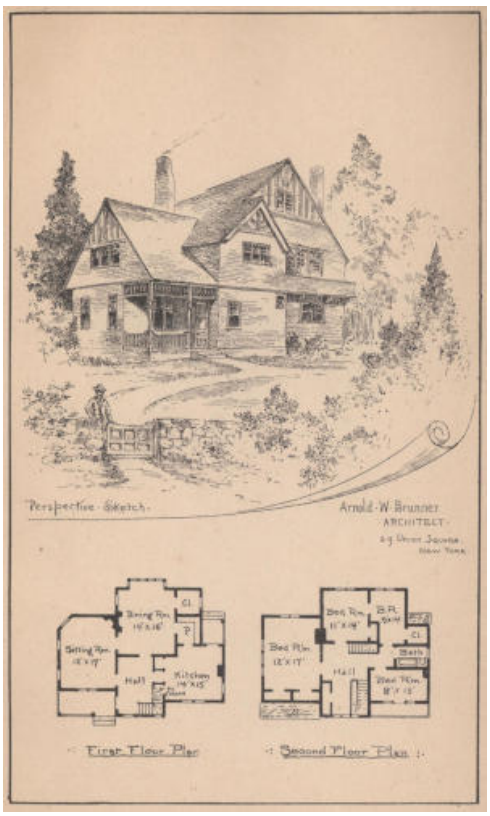
Wm. B. Tuthill. Architect. 52 Broadway, N.Y.

Plate XIII



Perspective Sketch.
Thos. Tryon. Architect. New York.

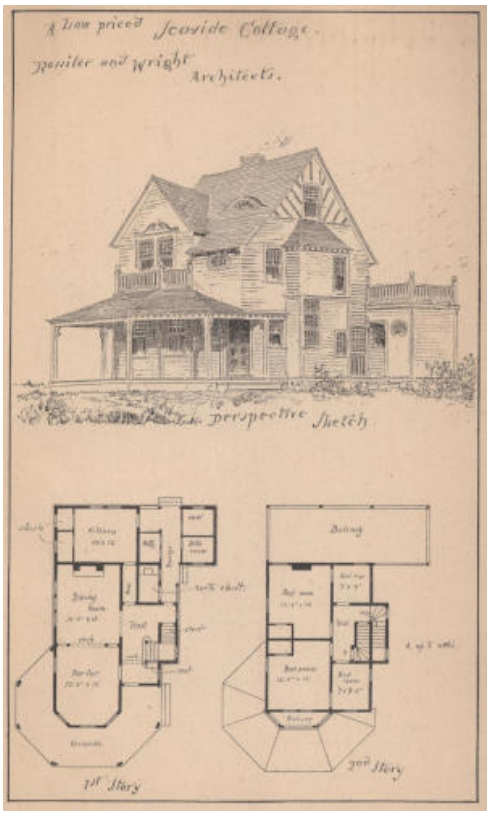
Plate XIV



Perspective Sketch.

Arnold W. Brunner. Architect. New York.

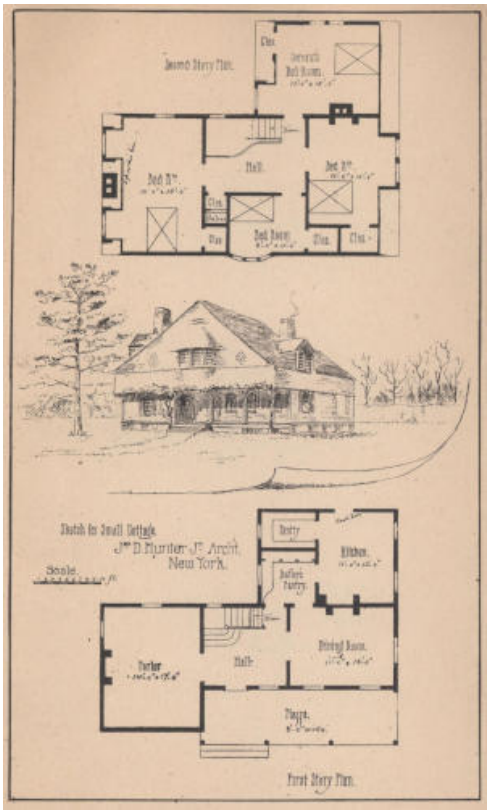
Plate XV



A Low priced Sea-side Cottage. Perspective Sketch.

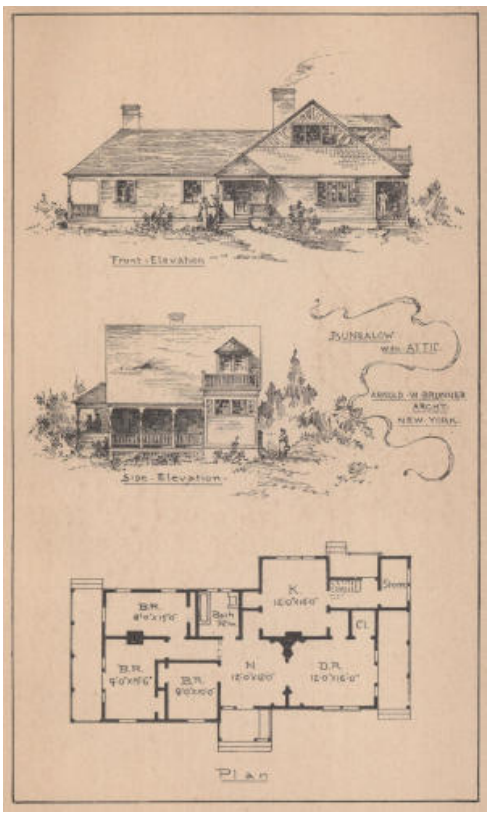
Rossiter and Wright Architects.

Plate XVI



Sketch for Small Cottage.
Jas. D. Hunter Jr. Architect. New York.

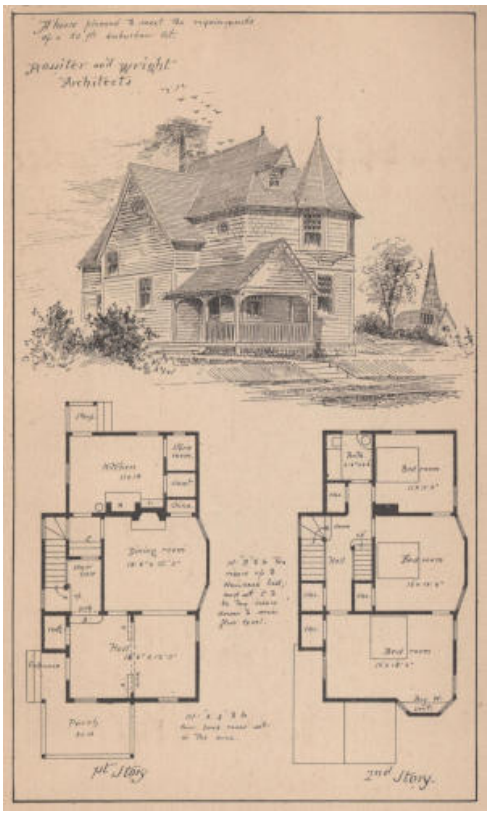
Plate XVII



Bungalow with Attic.

Arnold W. Brunner. Architect. New York.

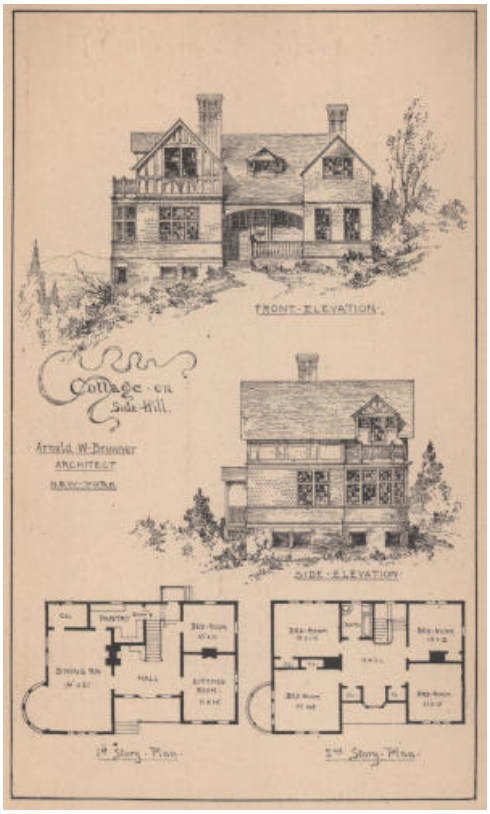
Plate XVIII



A house planned to meet the requirements of a 50 ft. suburban lot.

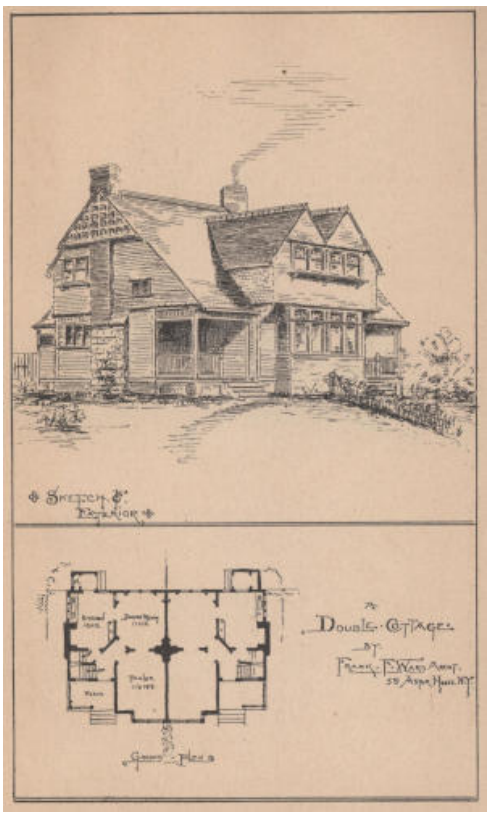
Rossiter and Wright Architects.

Plate XIX



Cottage on Side Hill.
Arnold W. Brunner. Architect. New York.

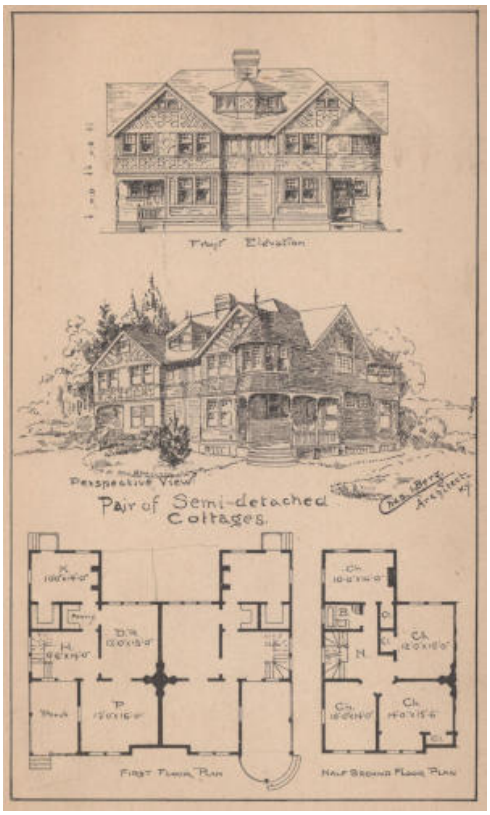
Plate XX



A Double Cottage.

Frank F. Ward. Architect. 59 Astor House, N.Y.

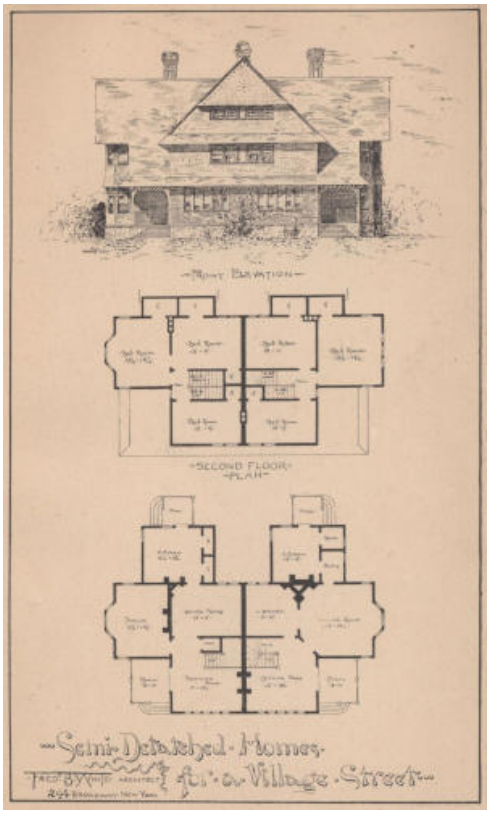
Plate XXI



Pair of Semi-detached Cottages.

Chas. I. Berg. Architect. N.Y.

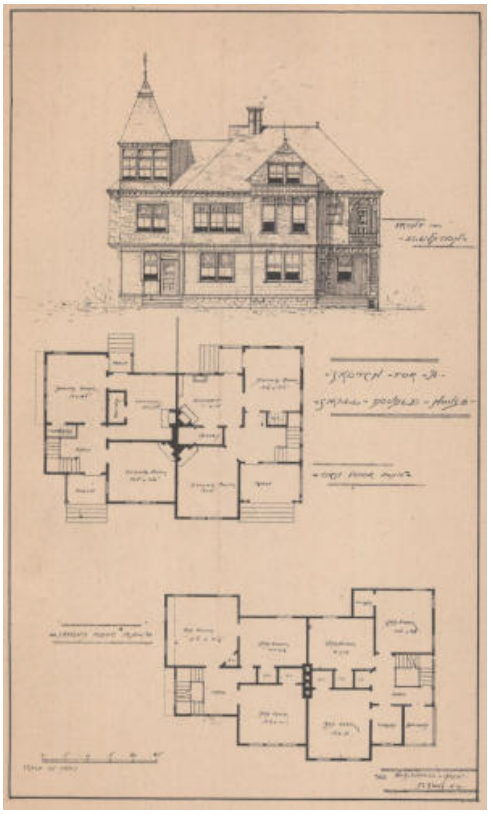
Plate XXII



Semi-Detached Homes for a Village Street.

Fredk. B. White. Architect. 294 Broadway, New York.

Plate XXIII



Sketch for a small double house.
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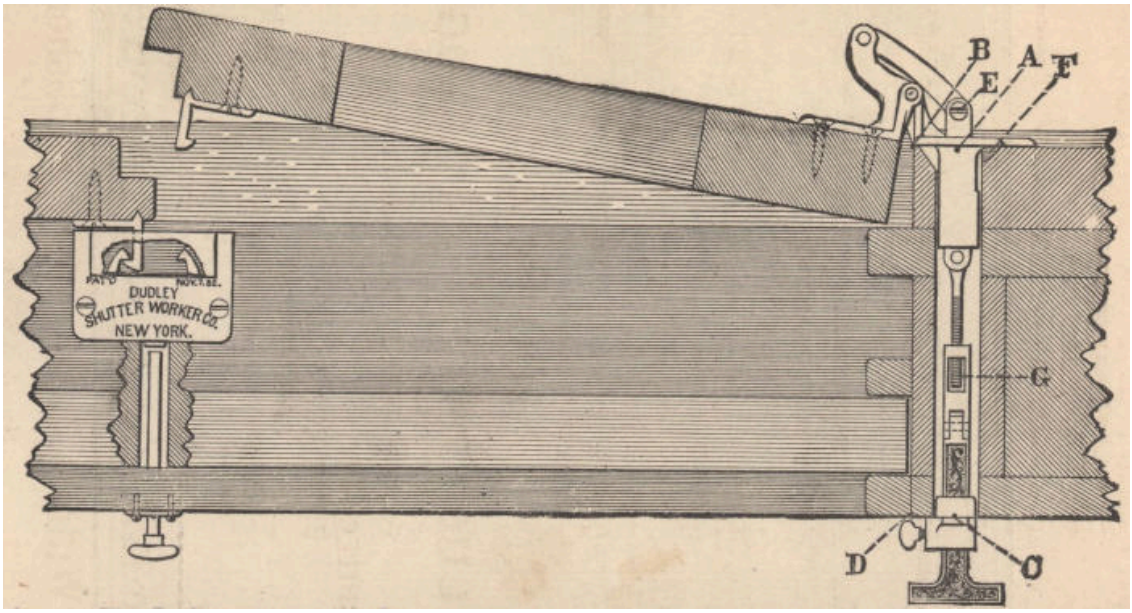

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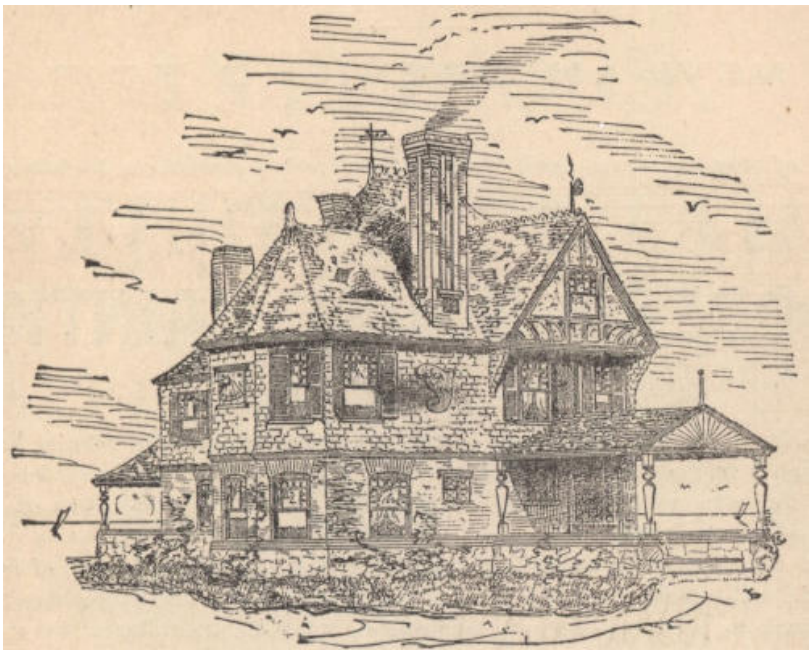

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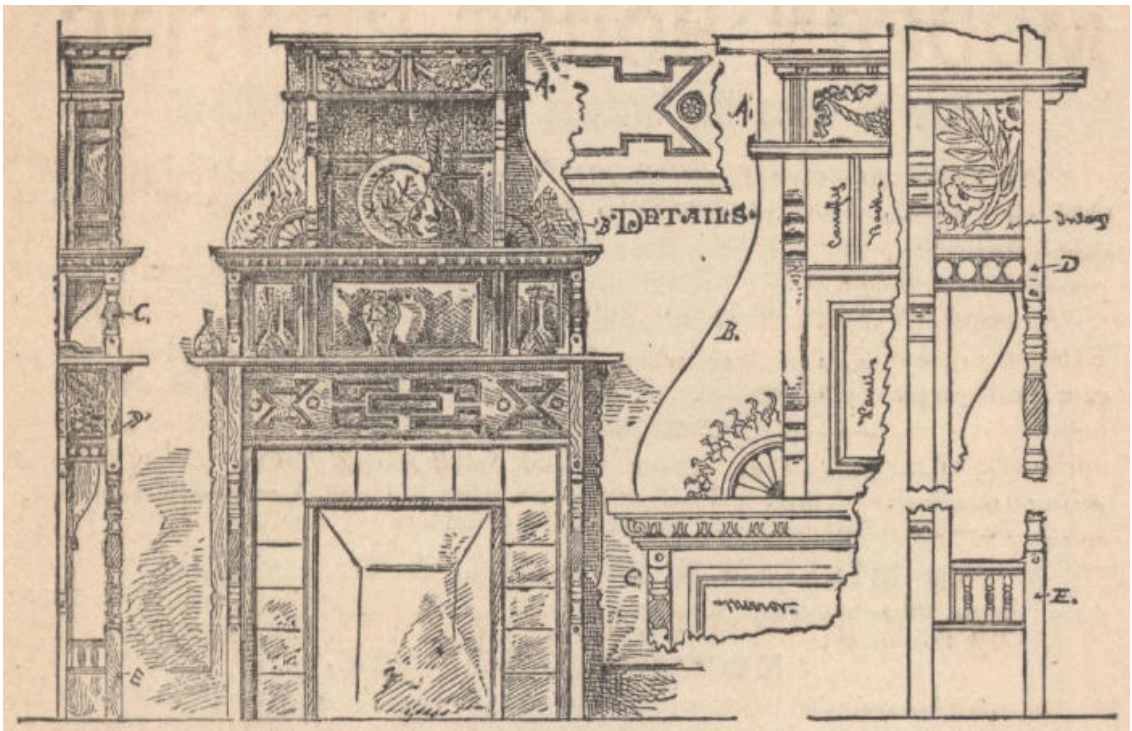

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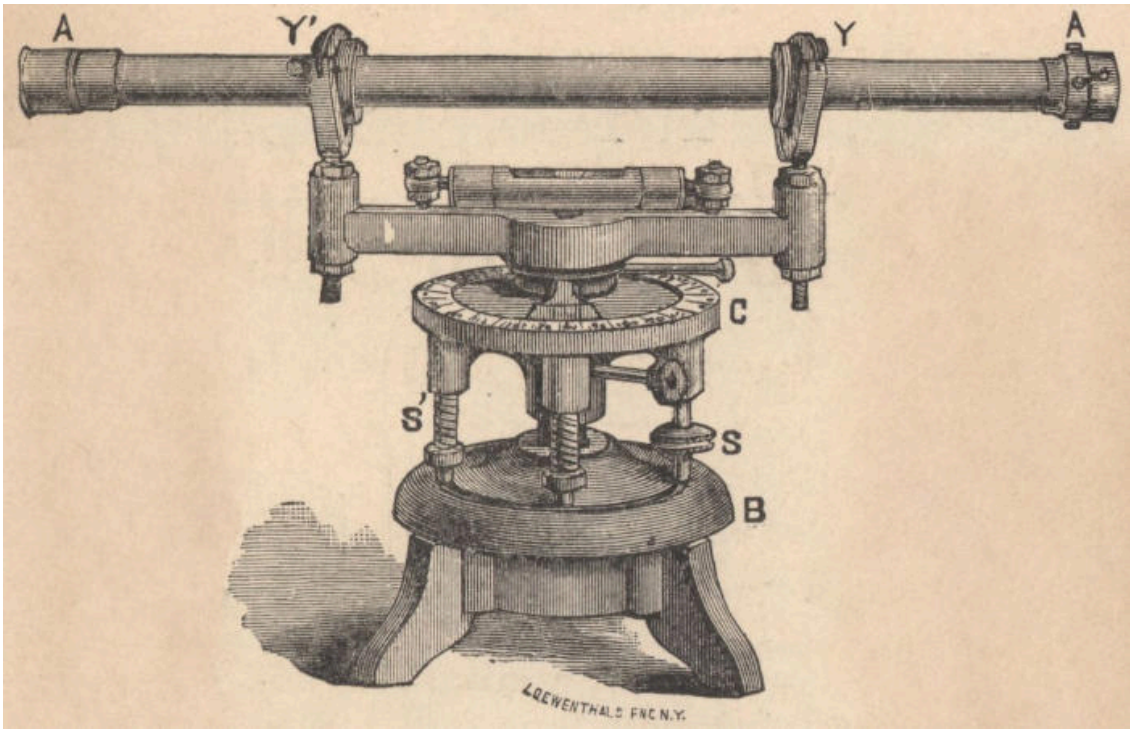

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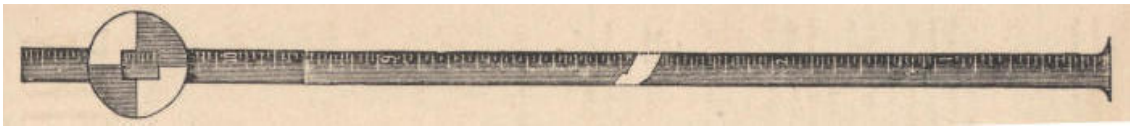

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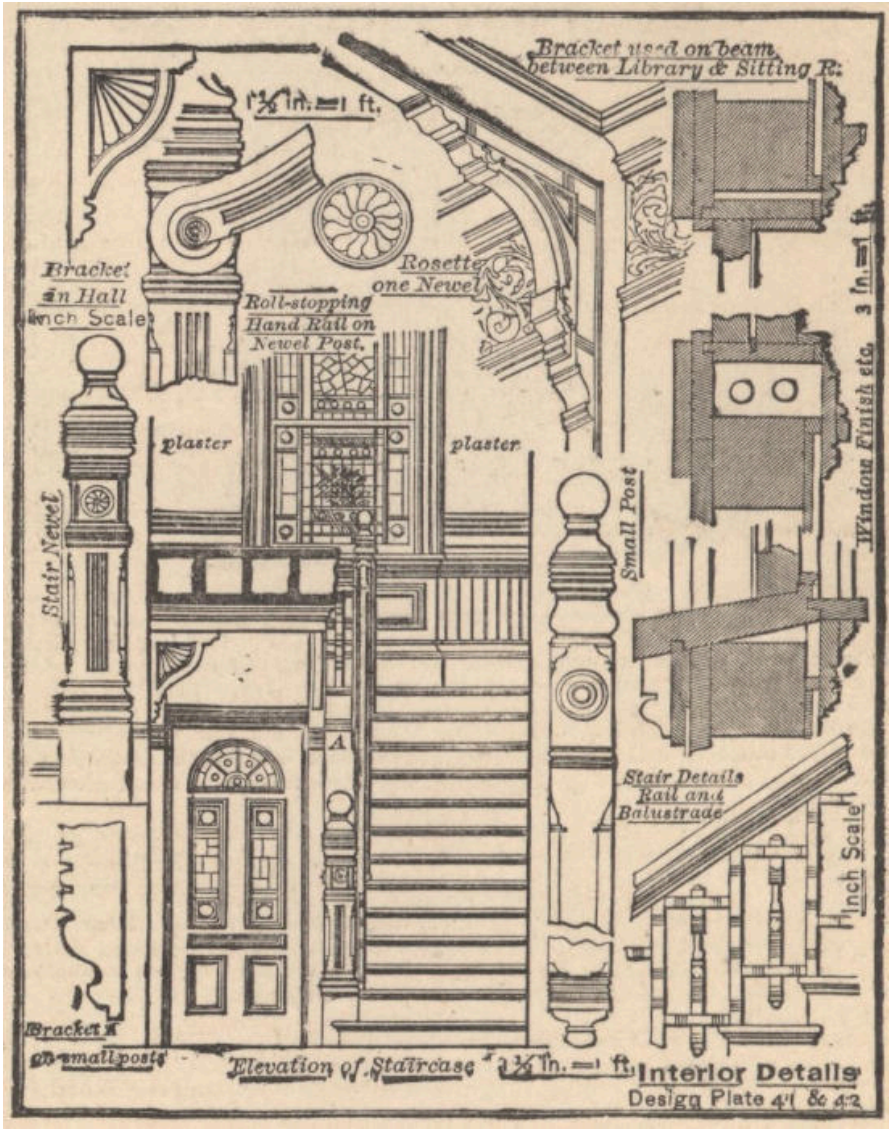

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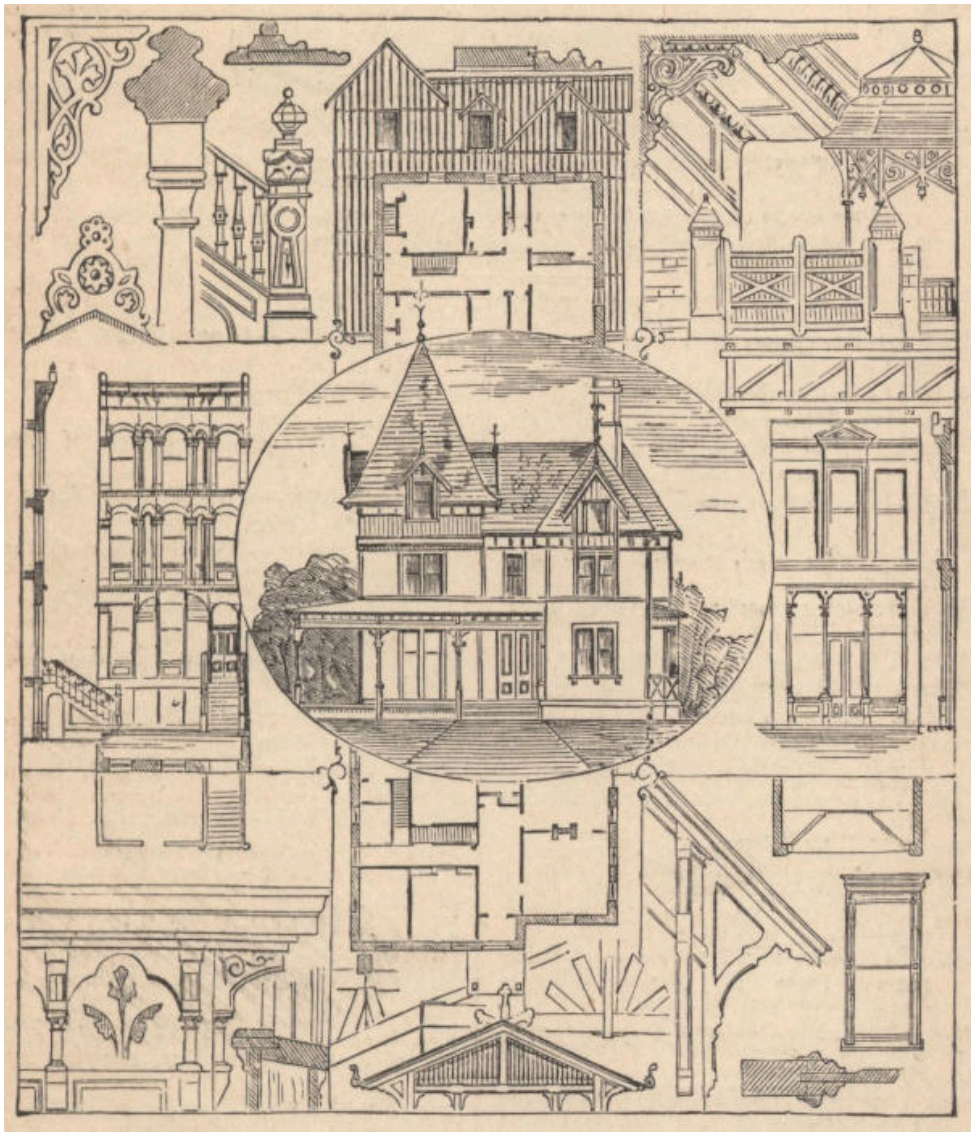

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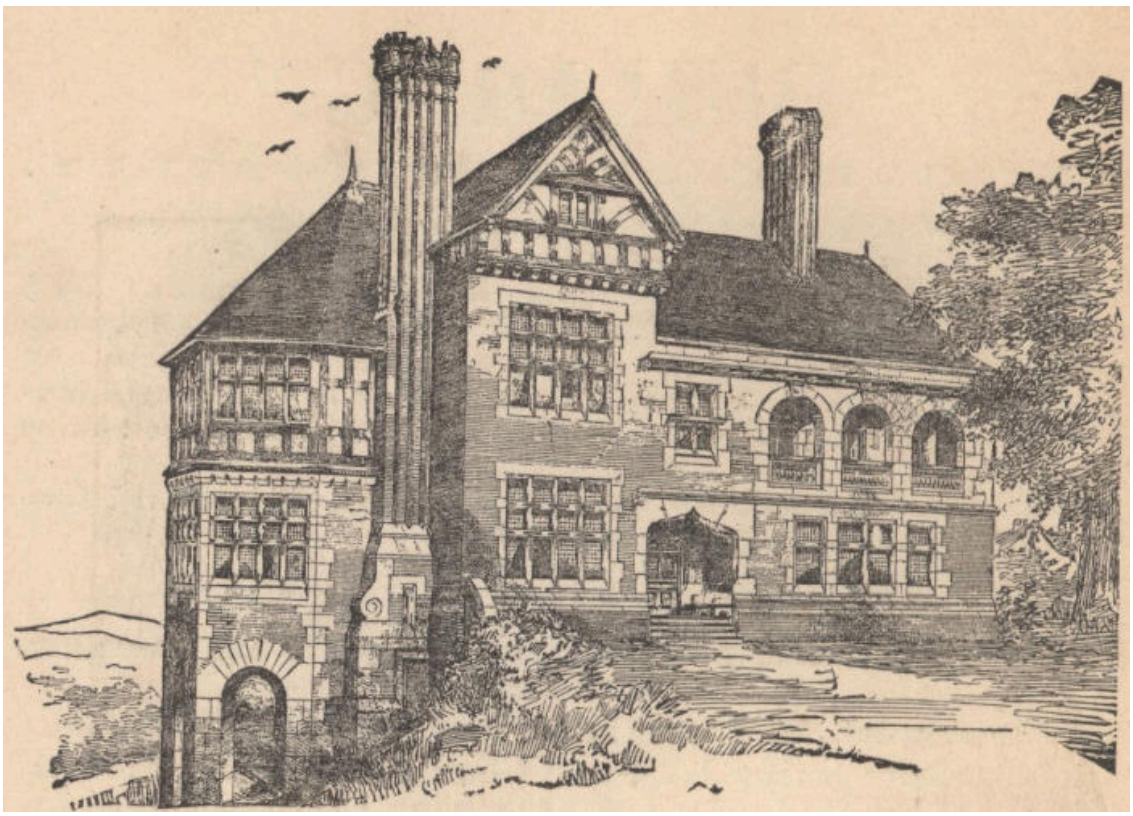

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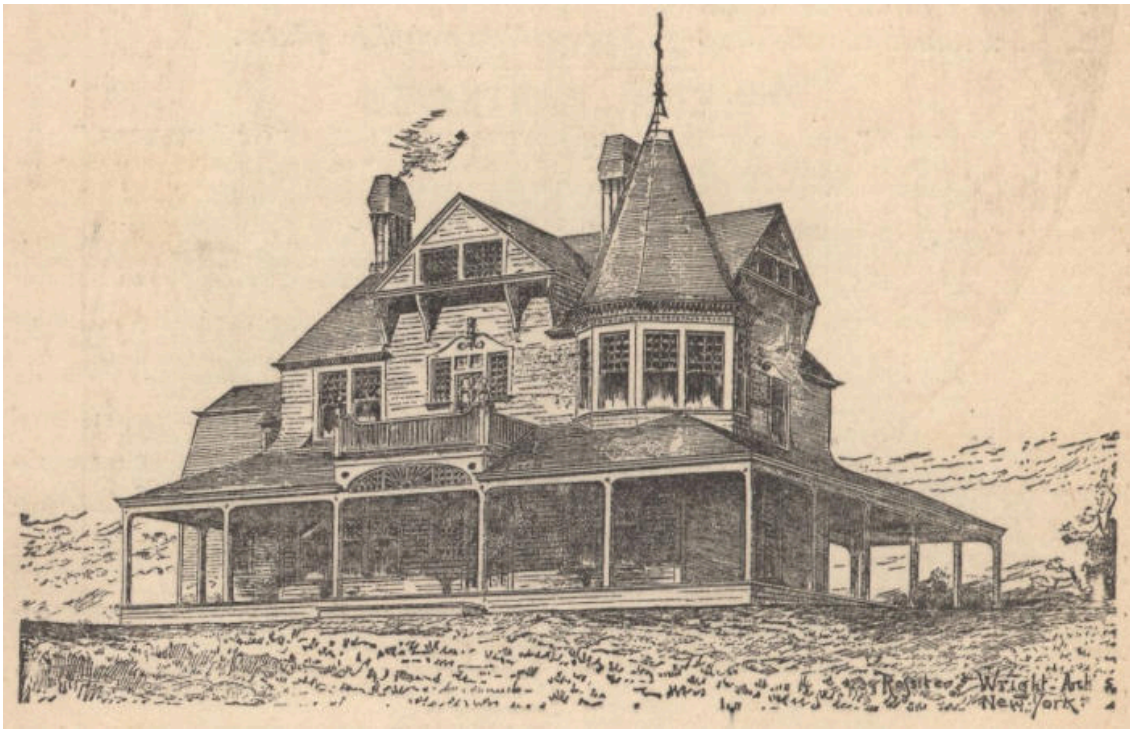

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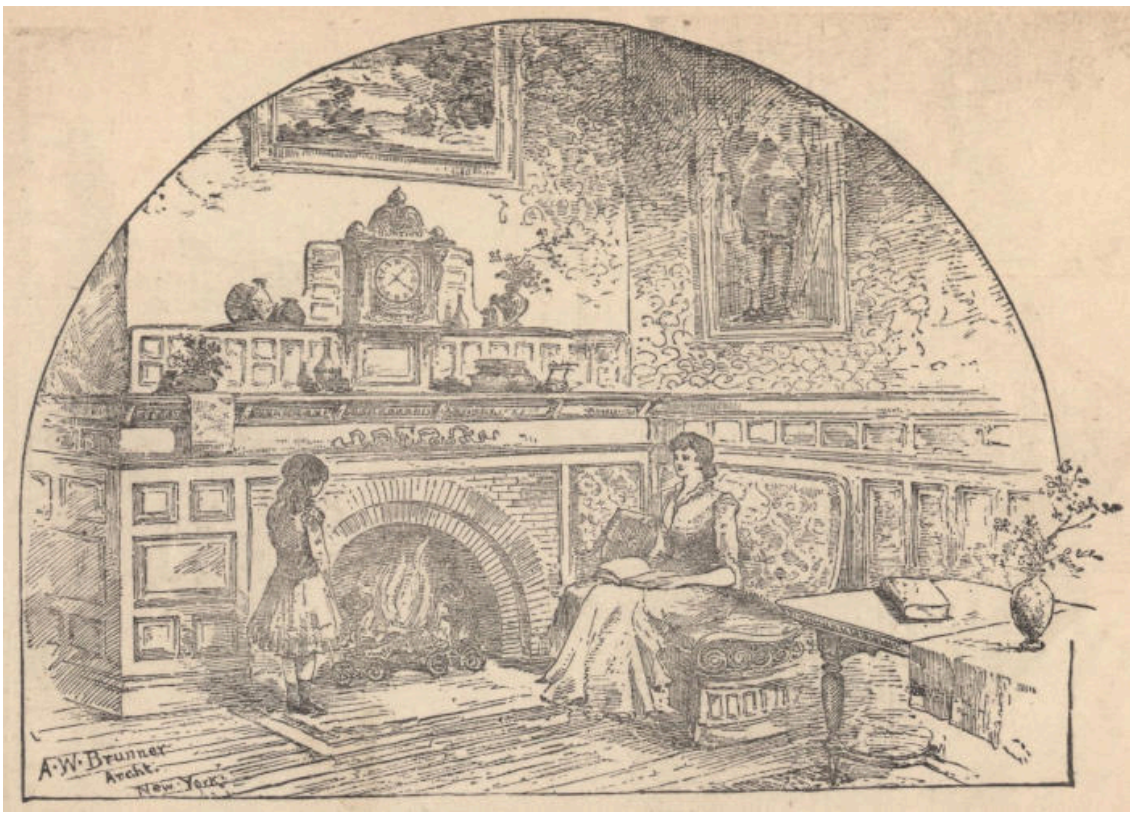

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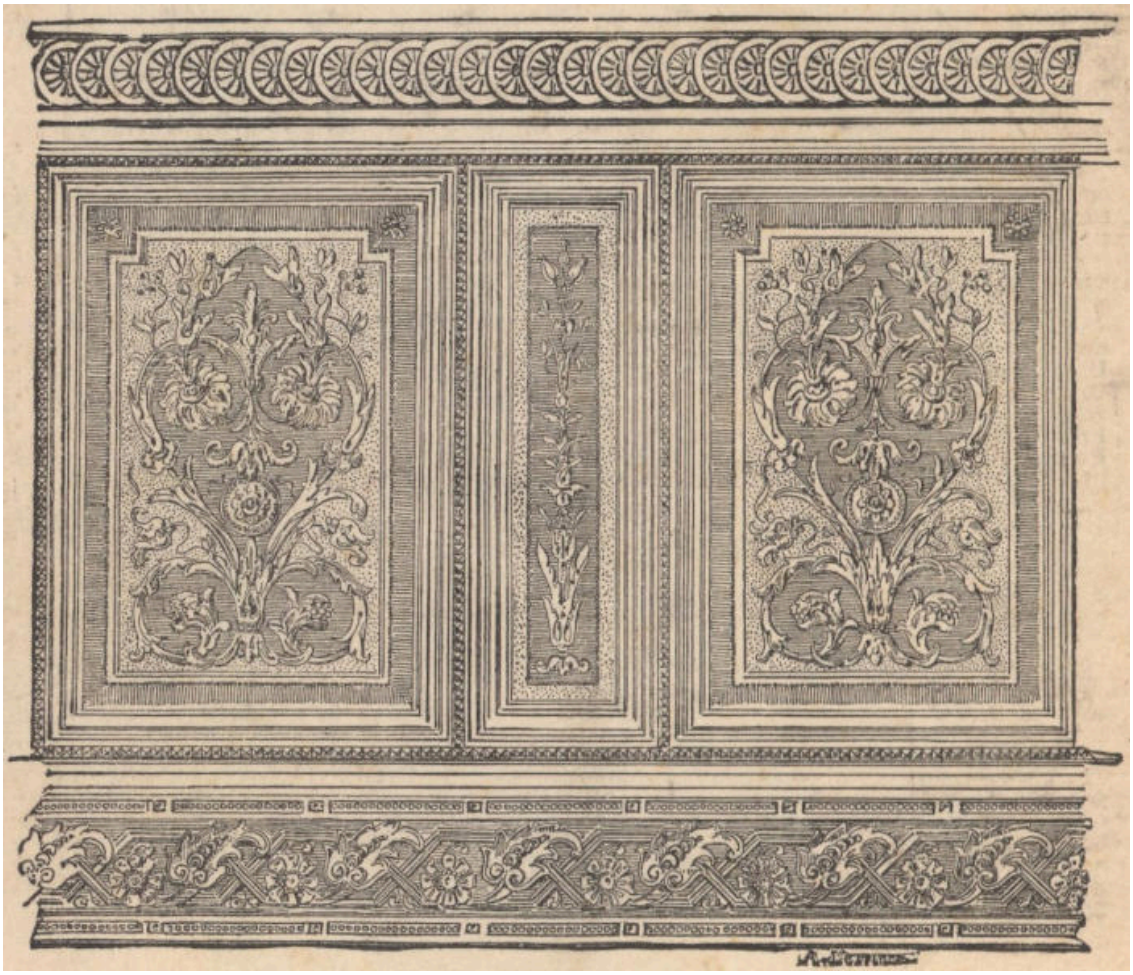

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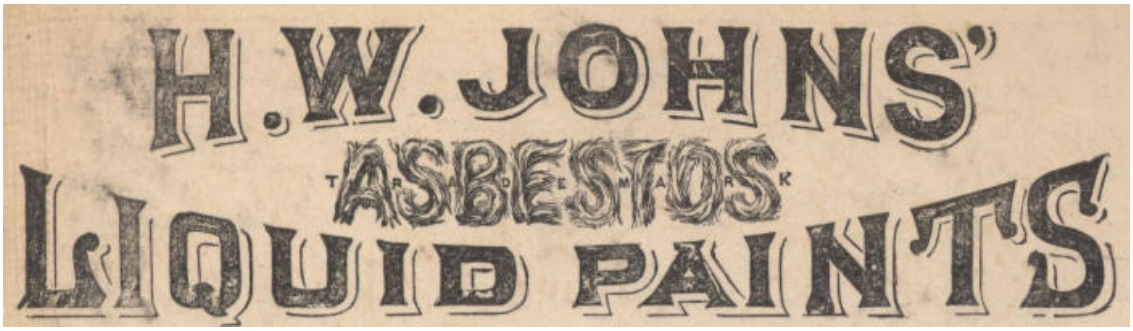

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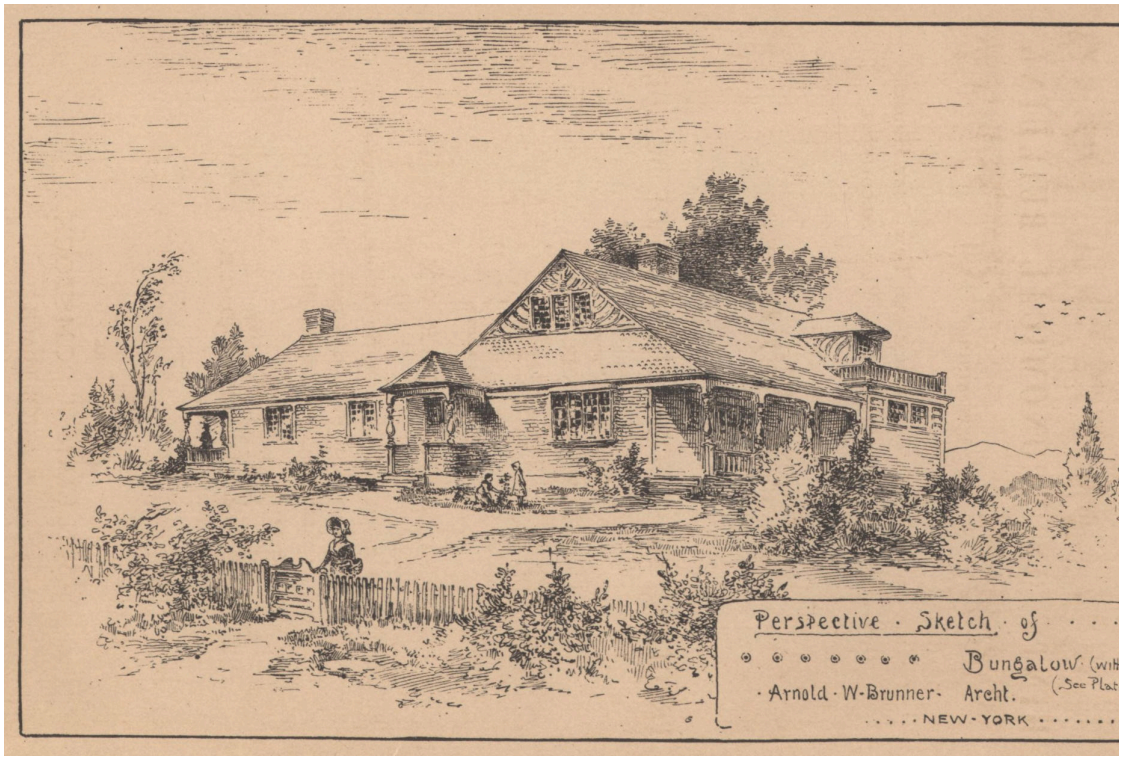
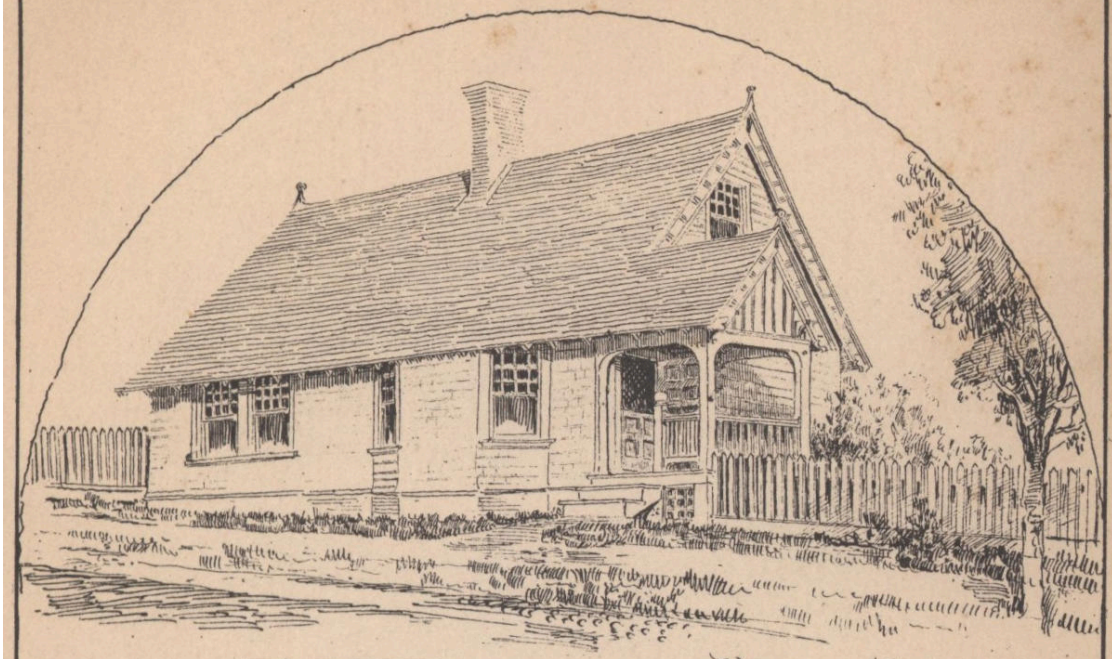
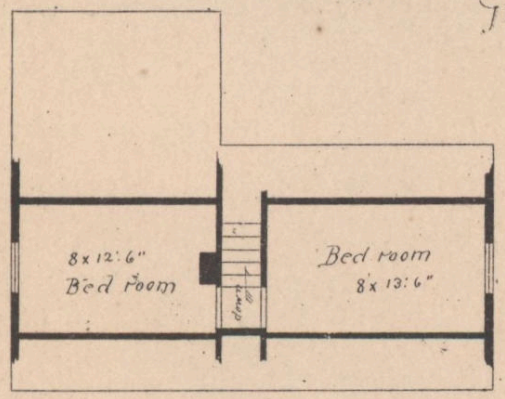

Perspective · Sketch · of
Bungalow
· Arnold · W · Brunner · Archt.
NEW · YORK

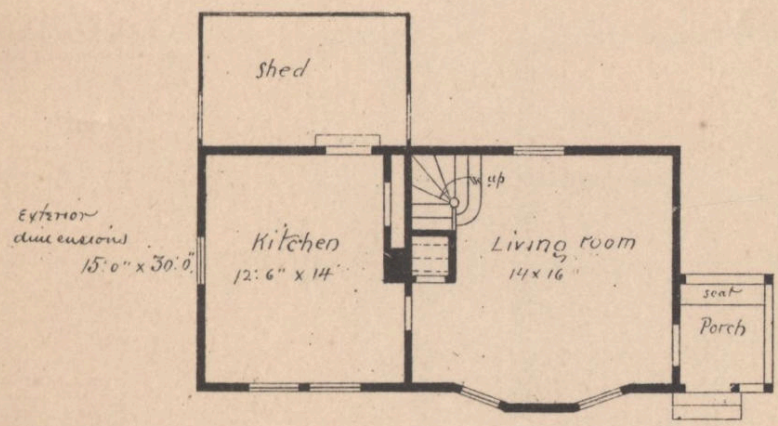
back



Perspective Sketch



2nd Story

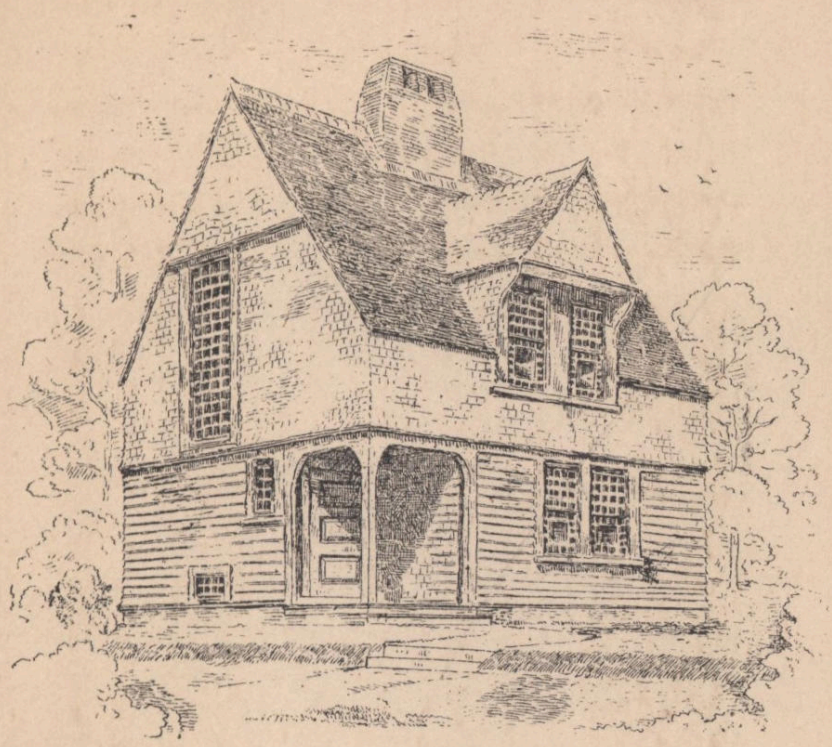


Exterior
dimensions
15:0" x 30:0"

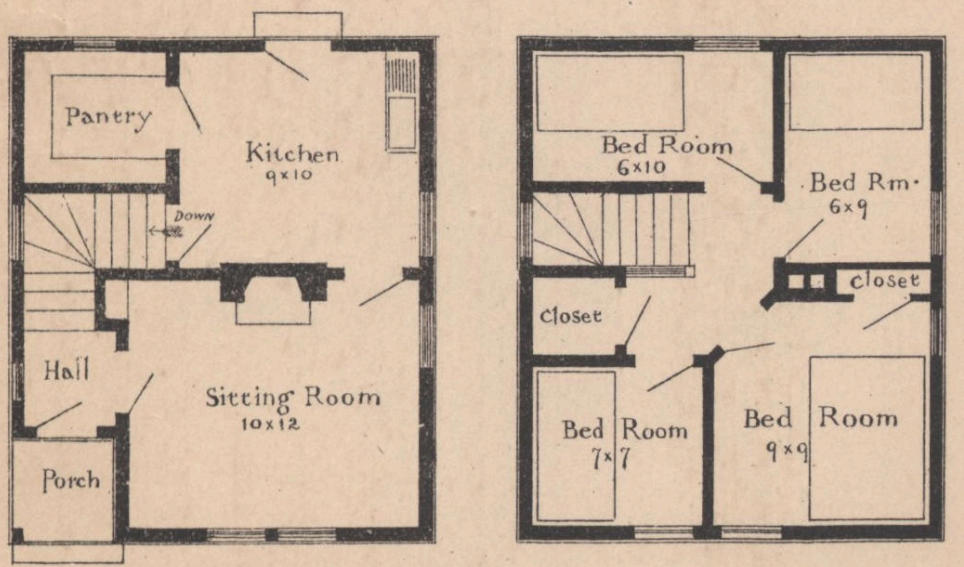
1st Story

Rossiter and Wright
Architects

back



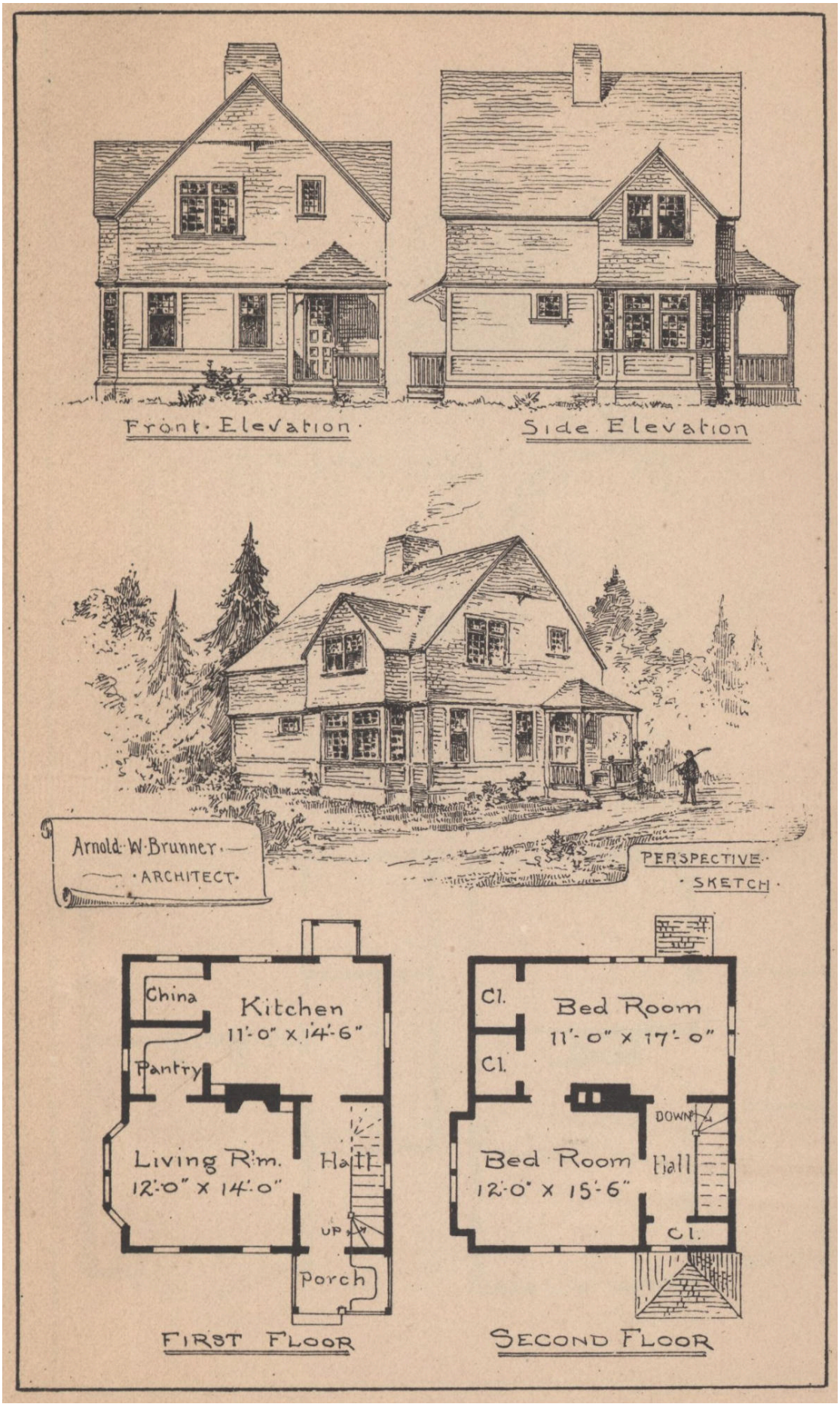
Sketch for Cottage.
Wm.A.Bates Archt.
149 Broadway New York



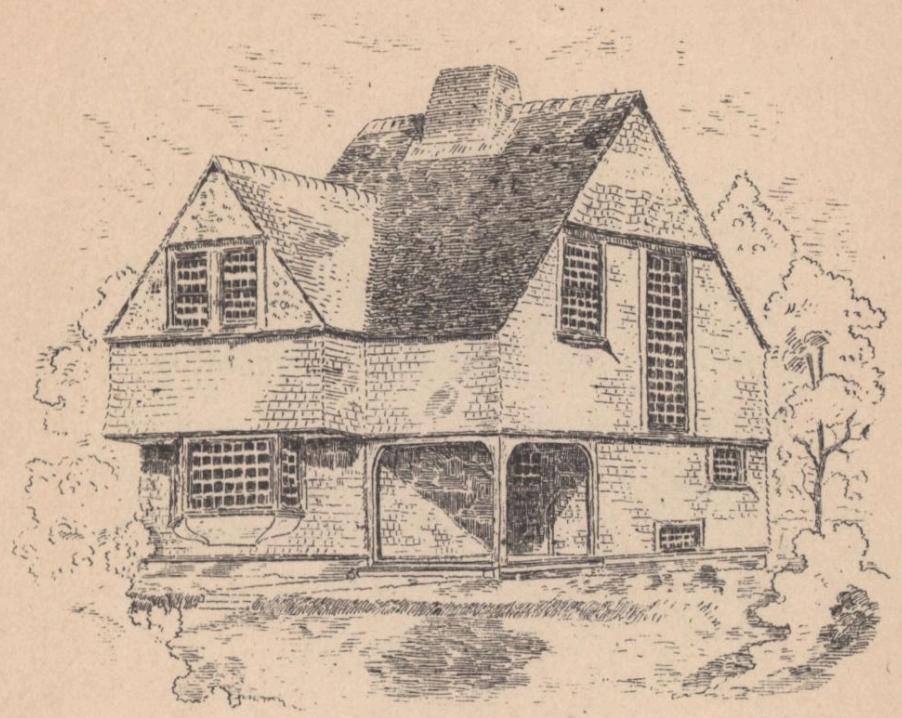
1st Floor Plan

2nd Floor Plan

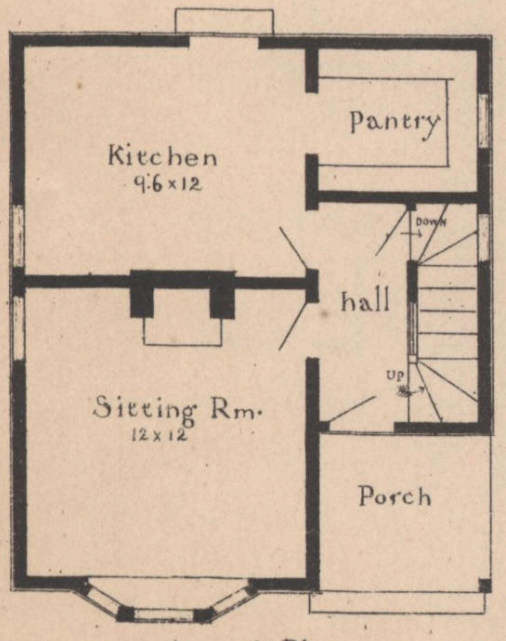
back


Front Elevation
Side Elevation
Arnold W. Brunner
ARCHITECT
PERSPECTIVE
SKETCH
China
Kitchen
11'-0" x 14'-6"
Pantry
Living R'm.
12'-0" x 14'-0"
Hall
UP
Porch
FIRST FLOOR
Cl.
Bed Room
11'-0" x 17'-0"
Cl.
DOWN
Bed Room
12'-0" x 15'-6"
Hall
Cl.
SECOND FLOOR

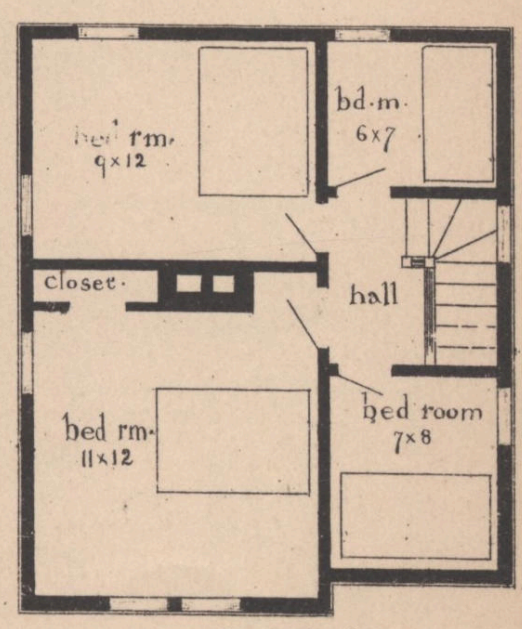
back



Sketch for Cottage
Wm·A·Bates Archt·
149 Broadway New York

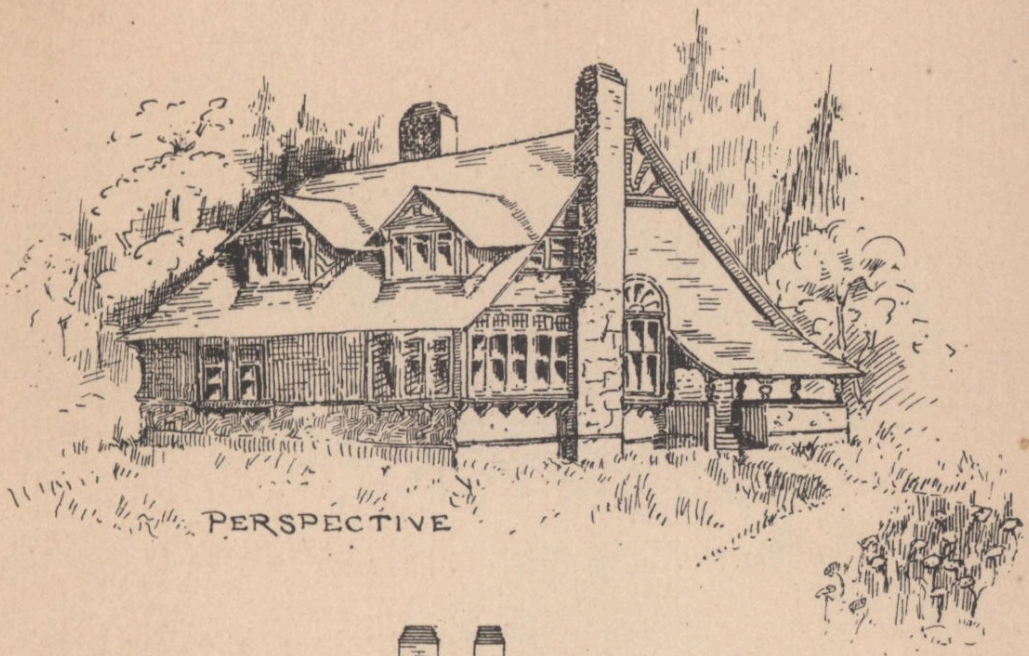


Ground Plan·

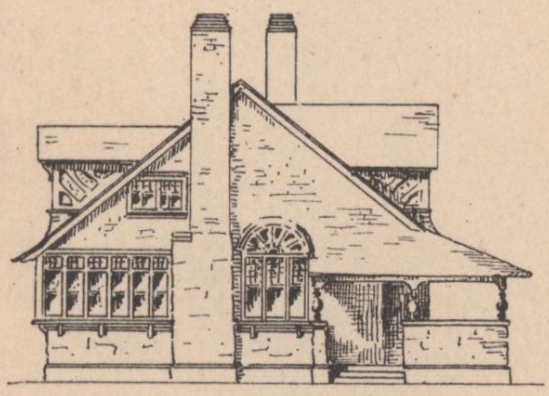


Chamber Plan

back



PERSPECTIVE

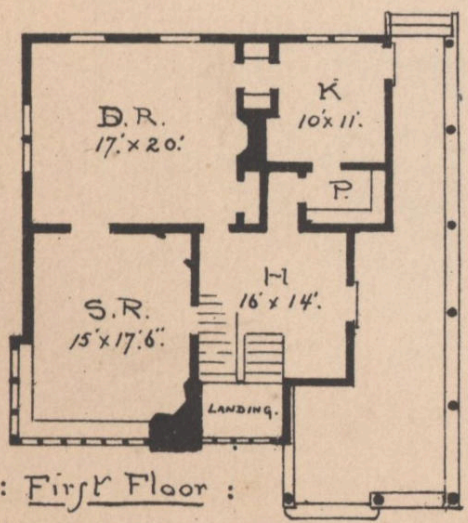


Front Elevation

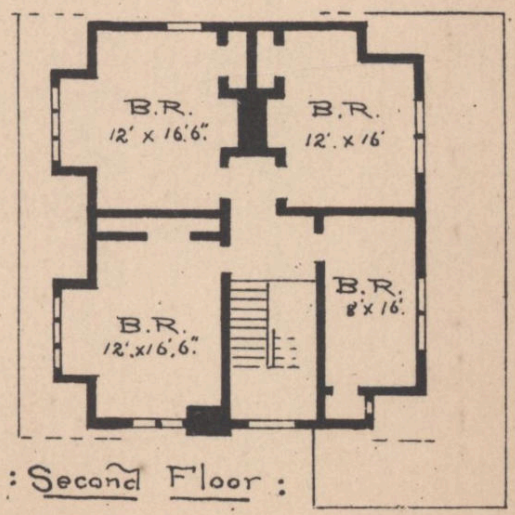
Thos Tryon

Architect

NEW YORK

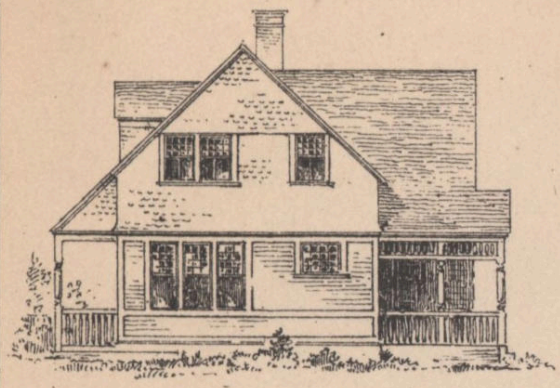


: First Floor :

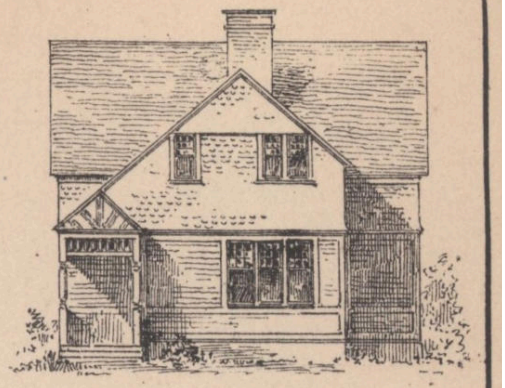


: Second Floor :

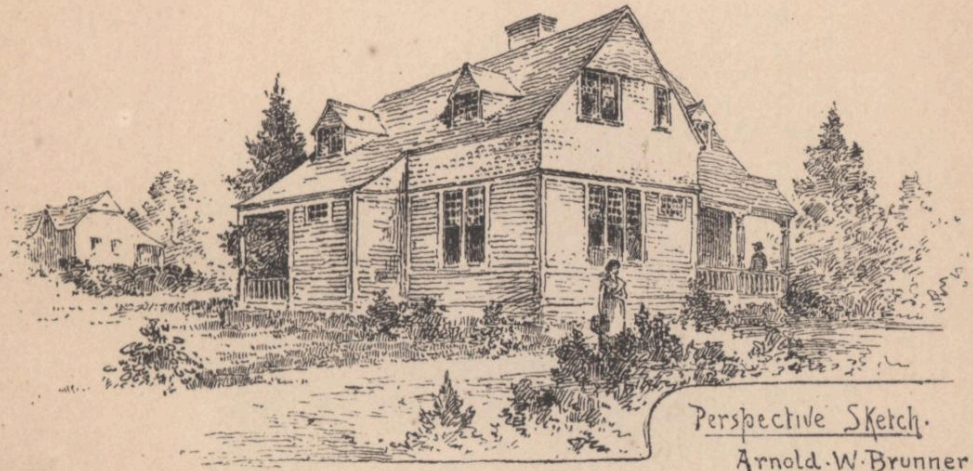
back



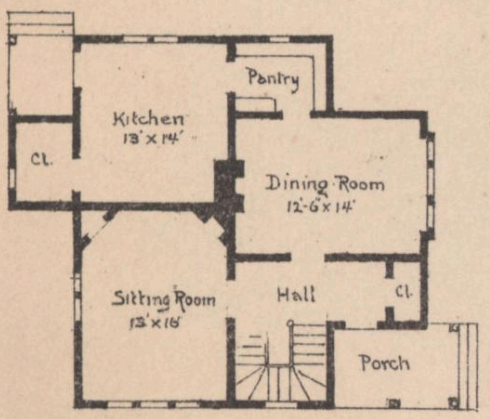
Front Elevation



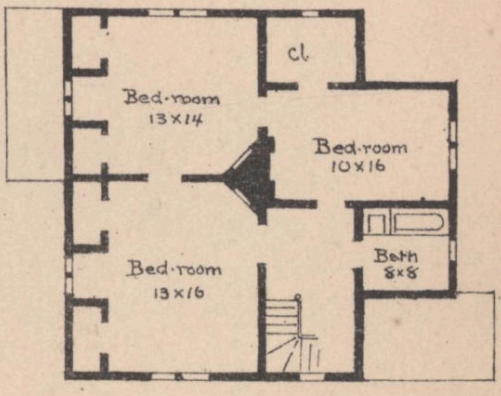
Side Elevation



Perspective Sketch.
Arnold. W. Brunner.
ARCHITECT

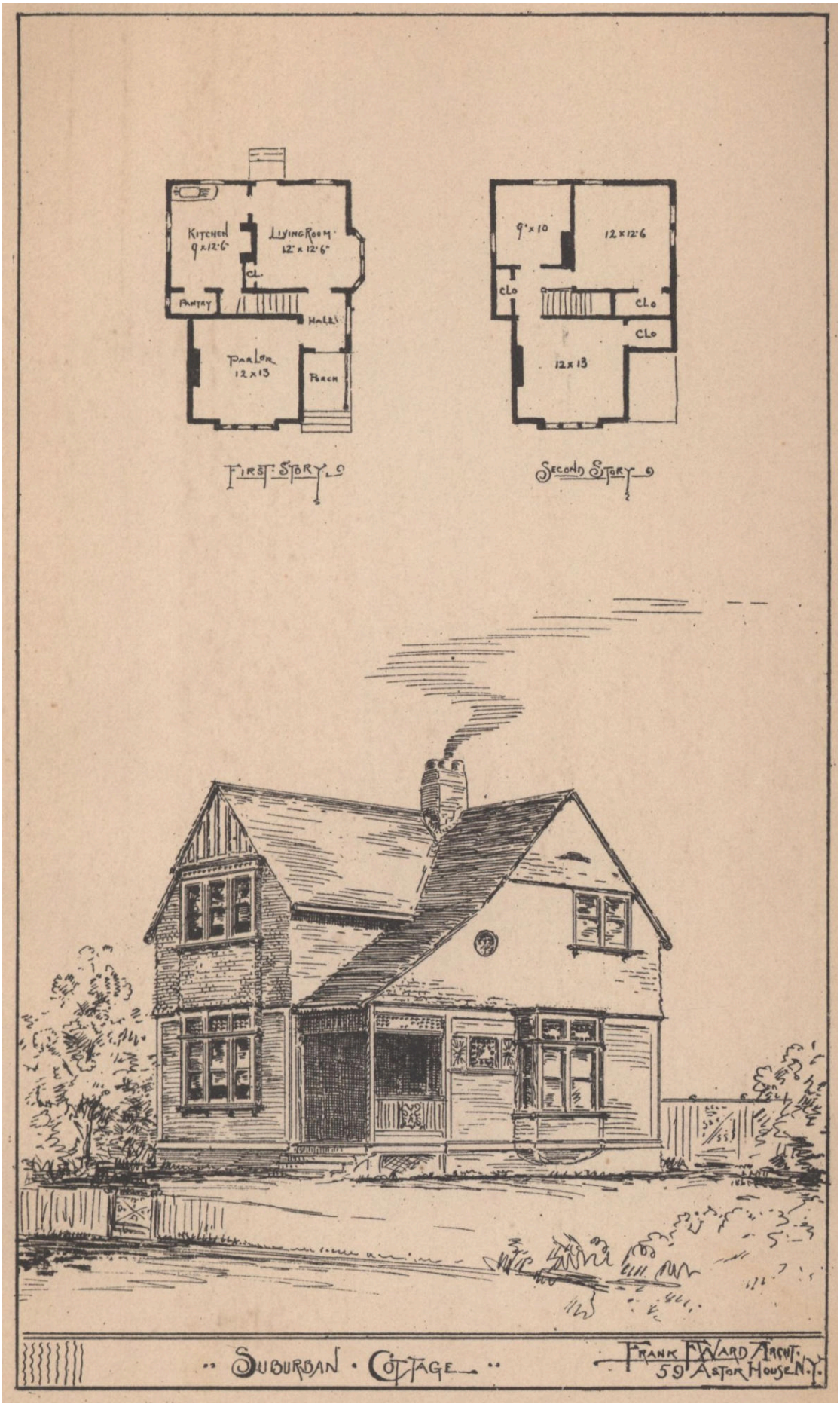


First Floor Plan

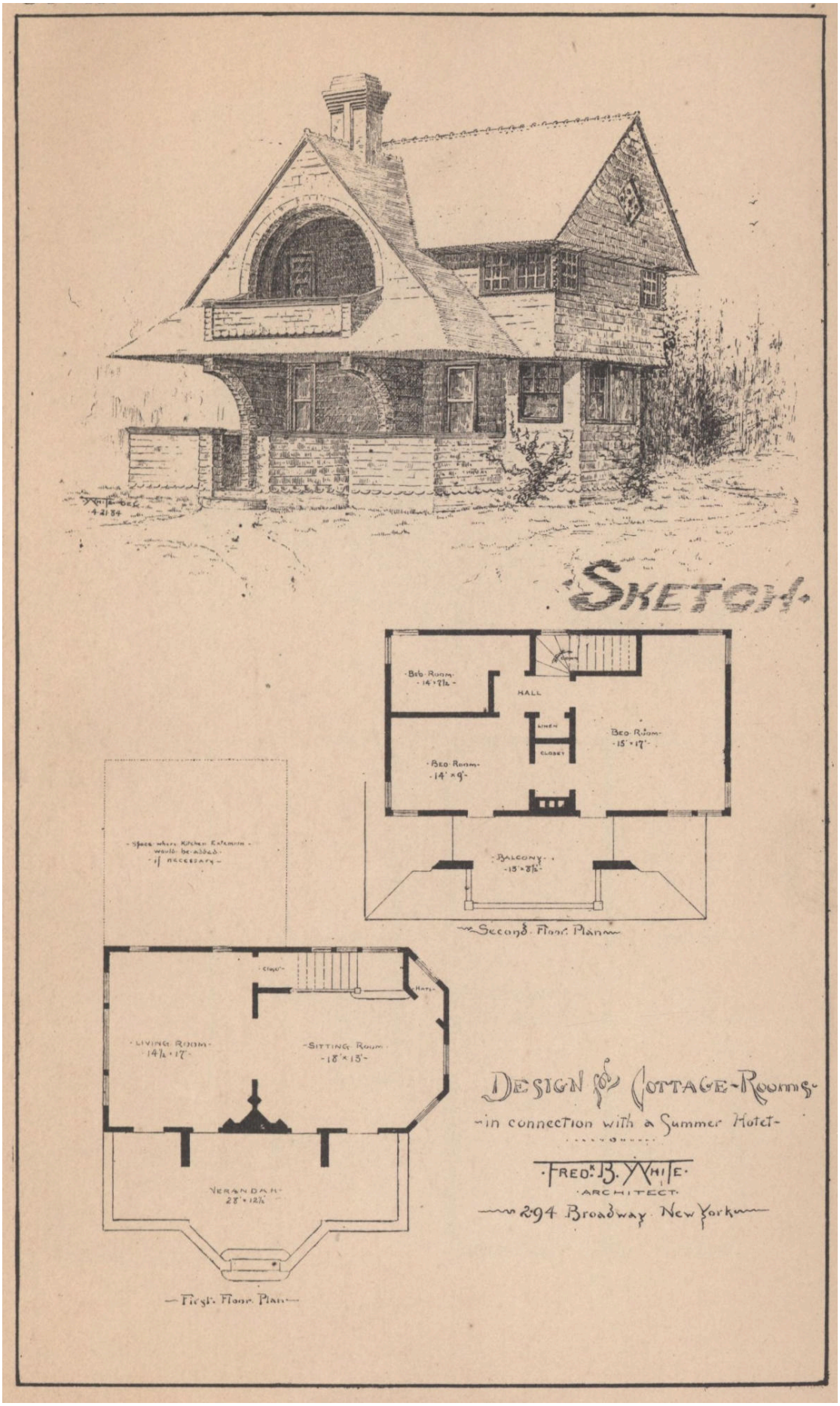


Second Floor Plan.

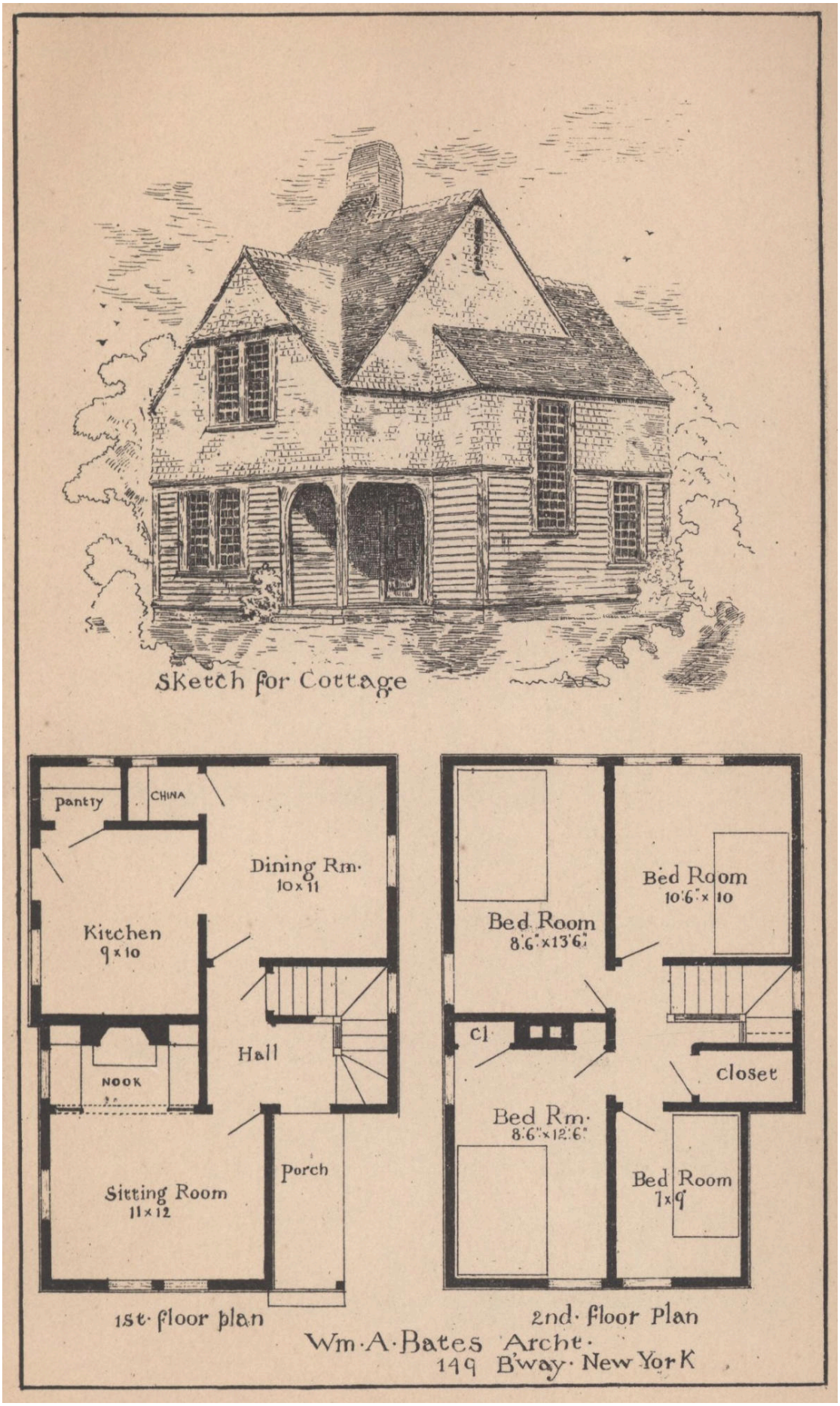
back


KITCHEN
9 x 12·6
LIVING ROOM
12· x 12·6
CL.
PANTRY
HALL
PARLOR
12 x 13
PORCH
FIRST STORY
9 x 10
12 x 12·6
CLO
CLO
CLO
12 x 13
SECOND STORY
SUBURBAN · COTTAGE
FRANK F. WARD ARCHT.
59 ASTOR HOUSE N.Y.

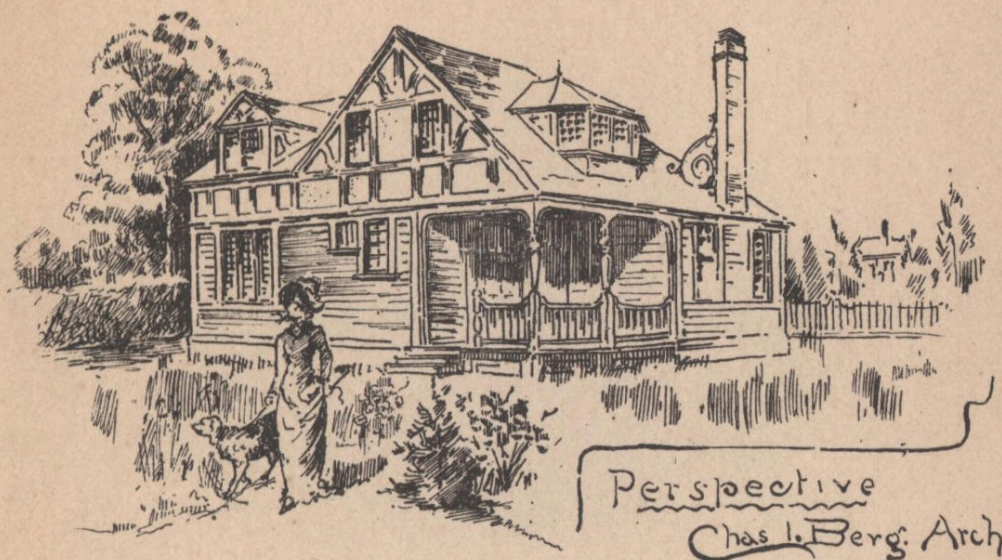
back


SKETCH
Bed Room
14' x 7½
HALL
LINEN
CLOSET
Bed Room
15' x 17'
Bed Room
14' x 9'
Space where Kitchen Extension would be added if necessary
BALCONY
13' x 8½
Second Floor Plan
CLOSET
HALL
LIVING ROOM
14½ x 17'
SITTING ROOM
18' x 13'
VERANDAH
28' x 12½
First Floor Plan
DESIGN for COTTAGE-Rooms
in connection with a Summer Hotel
FRED.K B. WHITE
ARCHITECT
294 Broadway New York

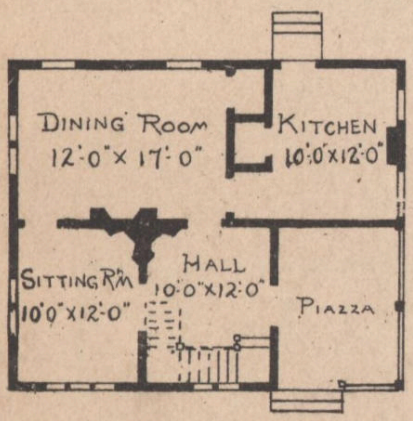
back


Sketch for Cottage
pantry
CHINA
Dining Rm.
10x11
Kitchen
9x10
NOOK
Hall
Sitting Room
11x12
Porch
1st. floor plan
Bed Room
8'6"x13'6"
Bed Room
10'6"x10
Cl
closet
Bed Rm.
8'6"x12'6"
Bed Room
7x9
2nd. floor Plan
Wm. A. Bates Archt.
149 B'way. New York

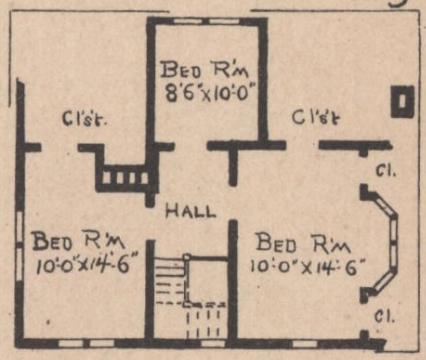
back



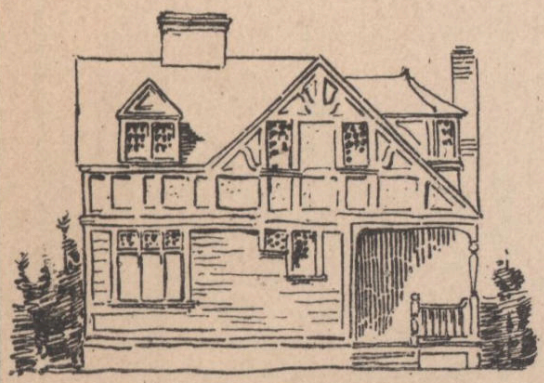
Perspective
Chas L. Berg. Arch't.
N.Y.



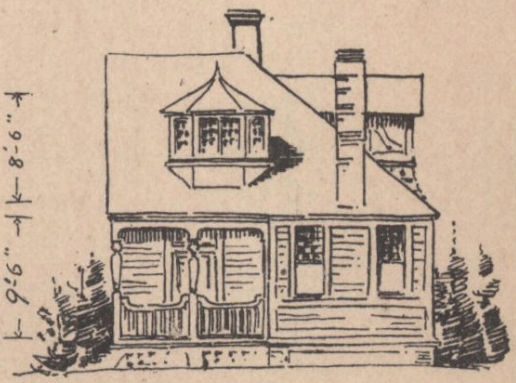
FIRST FLOOR



SECOND FLOOR

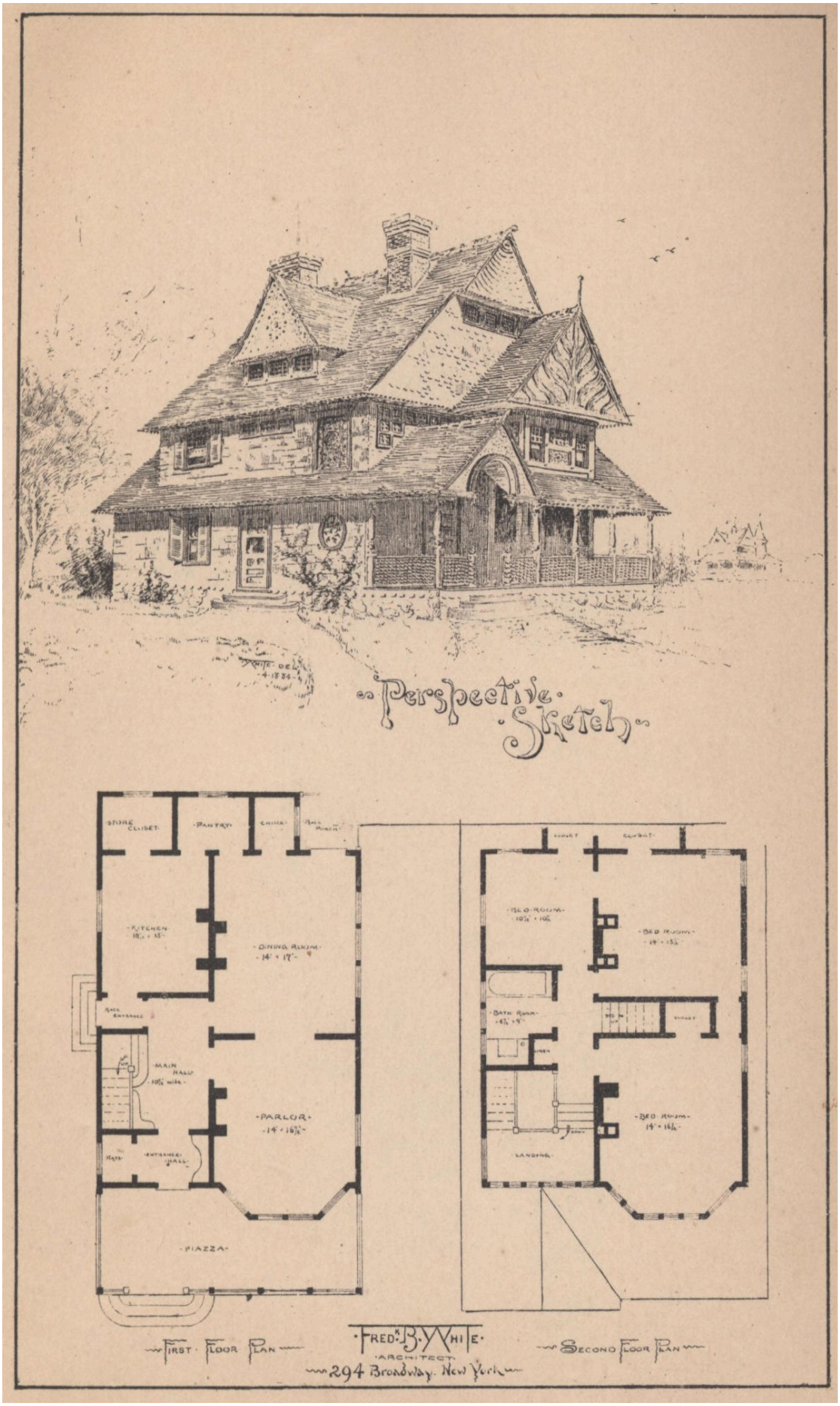


FRONT ELEVATION

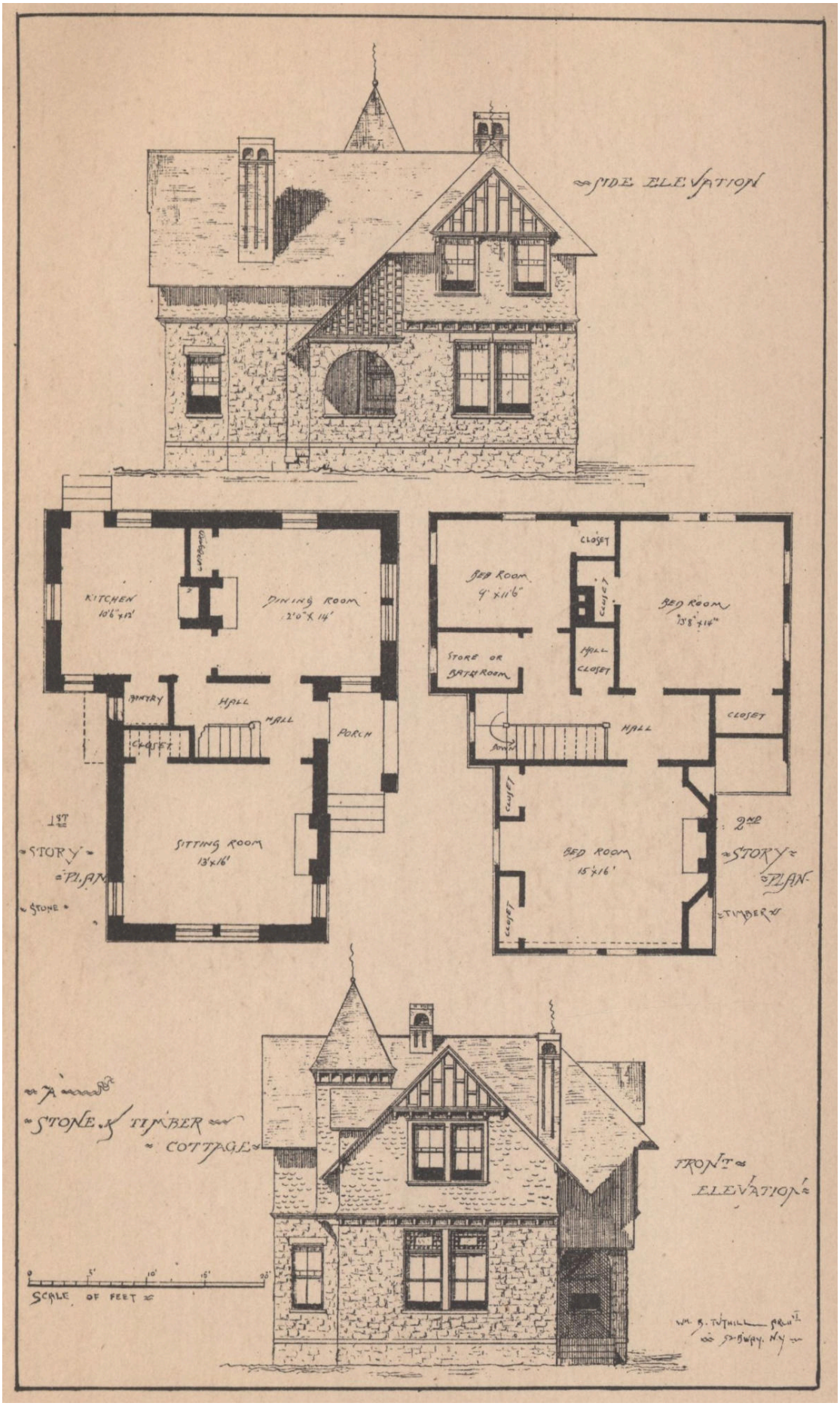


SIDE ELEVATION

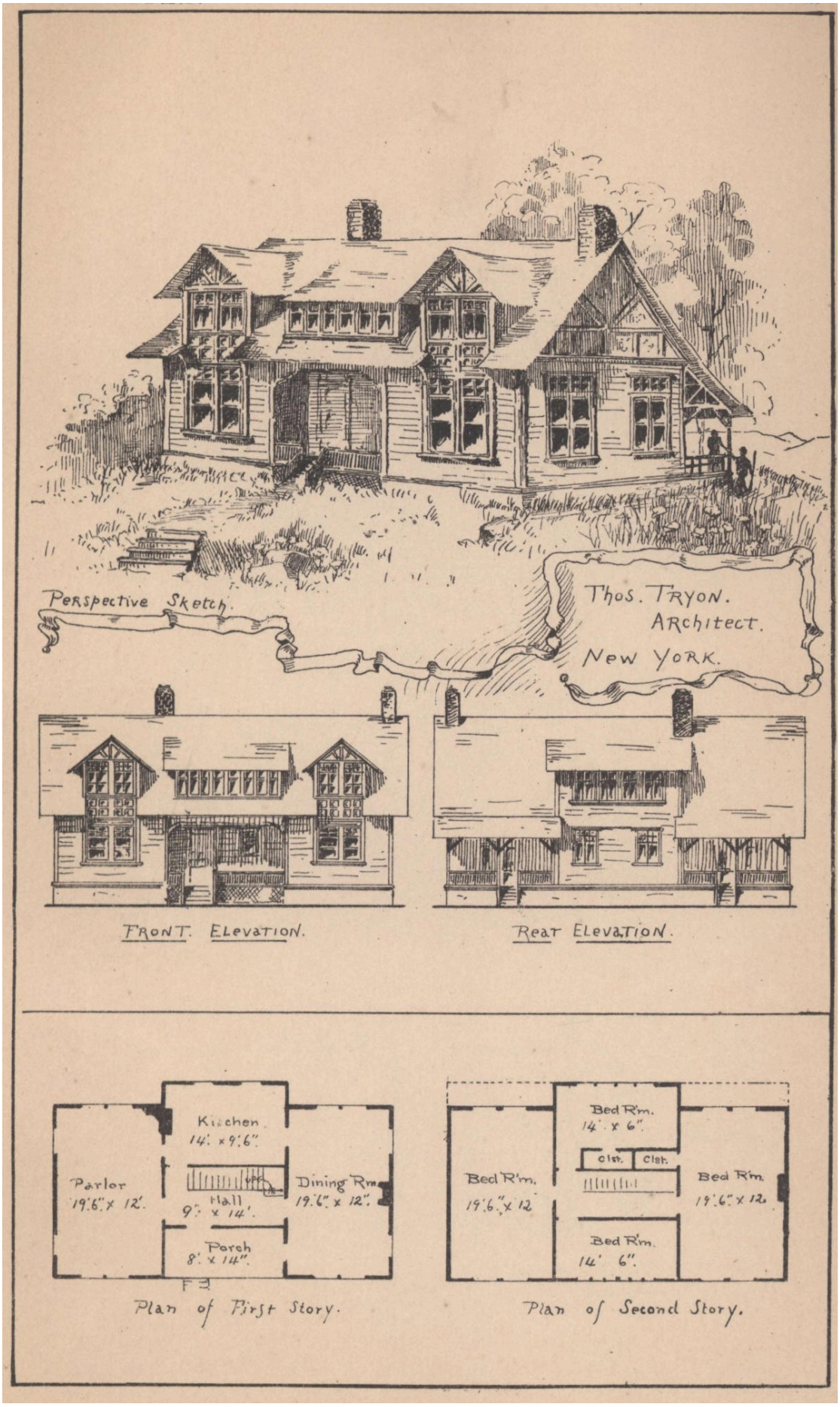
back


Perspective Sketch
STORE CLOSET
PANTRY
CHINA
KITCHEN
DINING ROOM
14' x 17'
MAIN HALL
PARLOR
14' x 16½'
HALL
PIAZZA
BED ROOM
BATH ROOM
LANDING
BED ROOM
14' x 16½'
First Floor Plan
Second Floor Plan
FRED'K B. WHITE
ARCHITECT
294 Broadway. New York

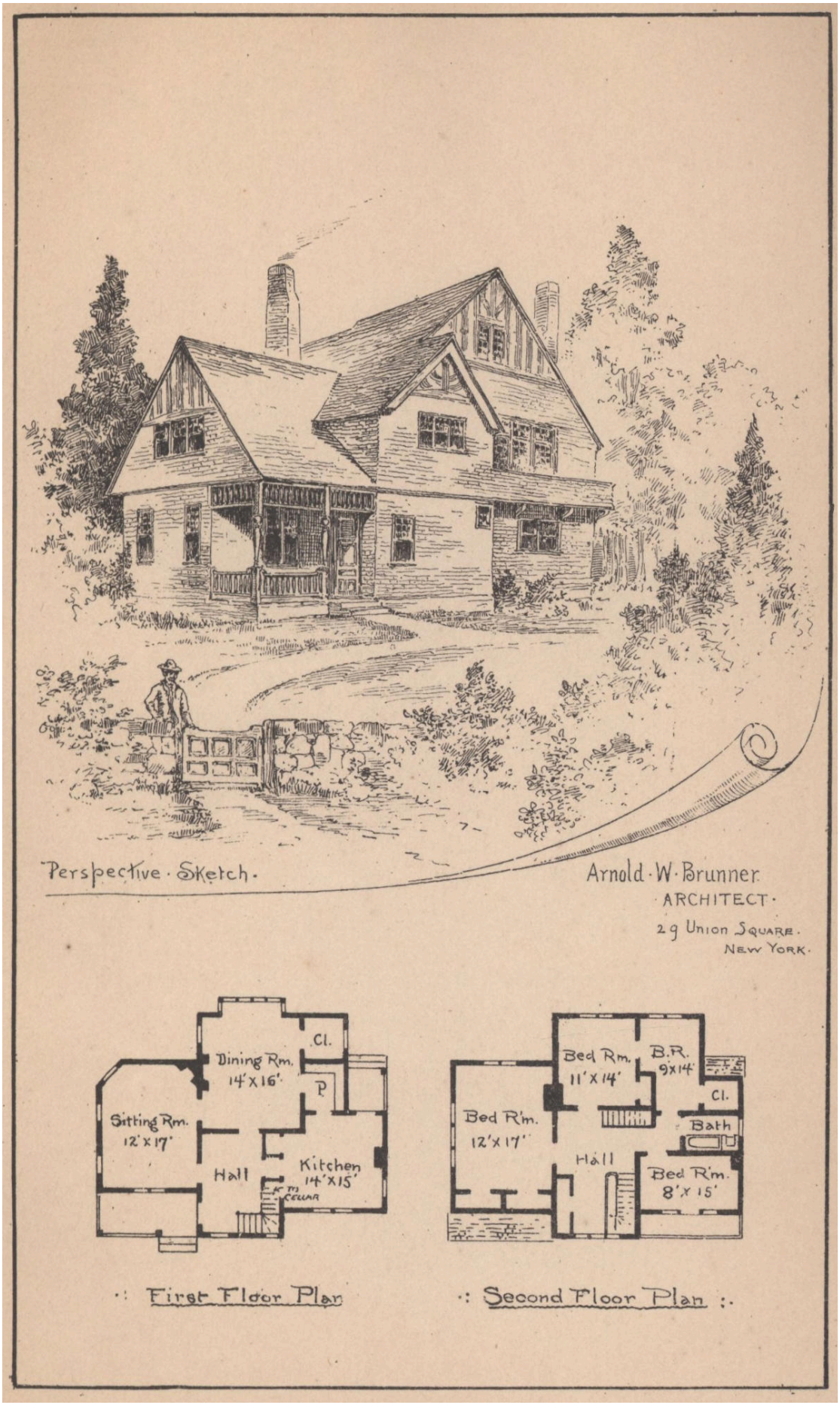
back


SIDE ELEVATION
KITCHEN 10'6"x12'
DINING ROOM 12'0"X 14'
SITTING ROOM 13'x16'
PORCH
HALL
CLOSET
PANTRY
1ST STORY PLAN
STONE
BED ROOM 9'x11'6"
BED ROOM 13'8"x14'
STORE OR BATH ROOM
HALL CLOSET
BED ROOM 15'x16'
2ND STORY PLAN
TIMBER
STONE & TIMBER COTTAGE
FRONT ELEVATION
SCALE OF FEET

back


Perspective Sketch.
Thos. Tryon.
Architect.
New York.
Front Elevation.
Rear Elevation.
Kitchen
14' x 9'6".
Parlor
19'6" x 12'.
Hall
9' x 14'.
Dining Rm.
19'6" x 12'.
Porch
8' x 14".
Plan of First Story.
Bed Rm.
14' x 6".
Clst.
Clst.
Bed Rm.
19'6" x 12
Bed Rm.
19'6" x 12
Bed Rm.
14' 6".
Plan of Second Story.

back

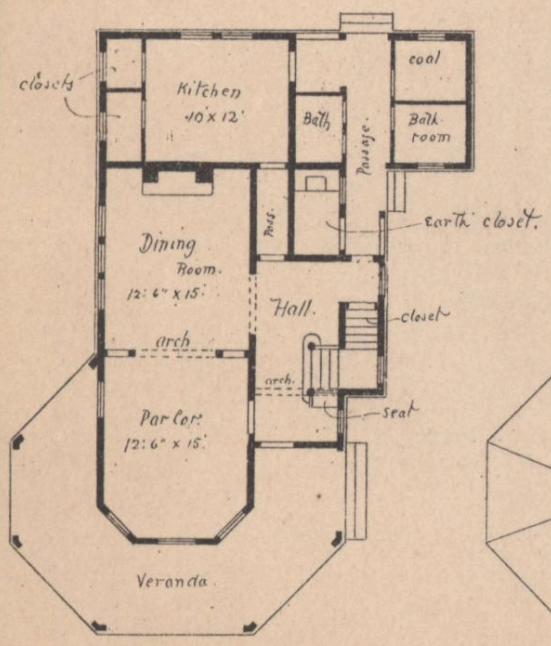

Perspective · Sketch.
Arnold · W · Brunner.
· ARCHITECT ·
29 Union Square.
New York.
Dining Rm.
14'X16'
Cl.
P
Sitting Rm.
12'X17'
Hall
Kitchen
14'X15'
To Cellar
Bed Rm.
11'X14'
B.R.
9X14
Cl.
Bed Rm.
12'X17'
Bath
Hall
Bed Rm.
8'X15'
·: First Floor Plan
·: Second Floor Plan :·

back

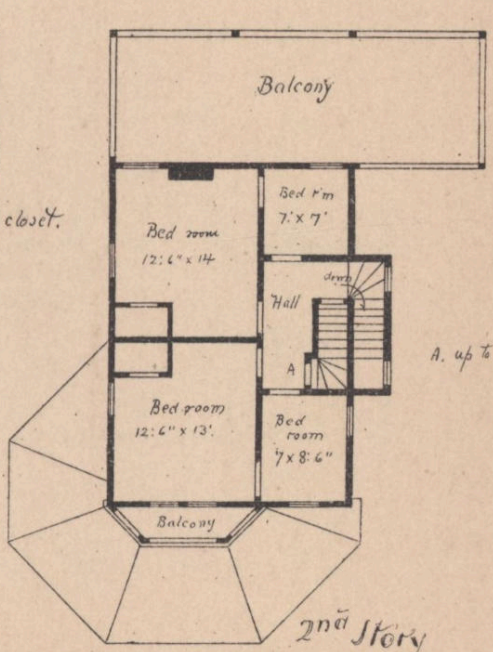
A Low priced Seaside Cottage.

Rossiter and Wright Architects.

Perspective Sketch.

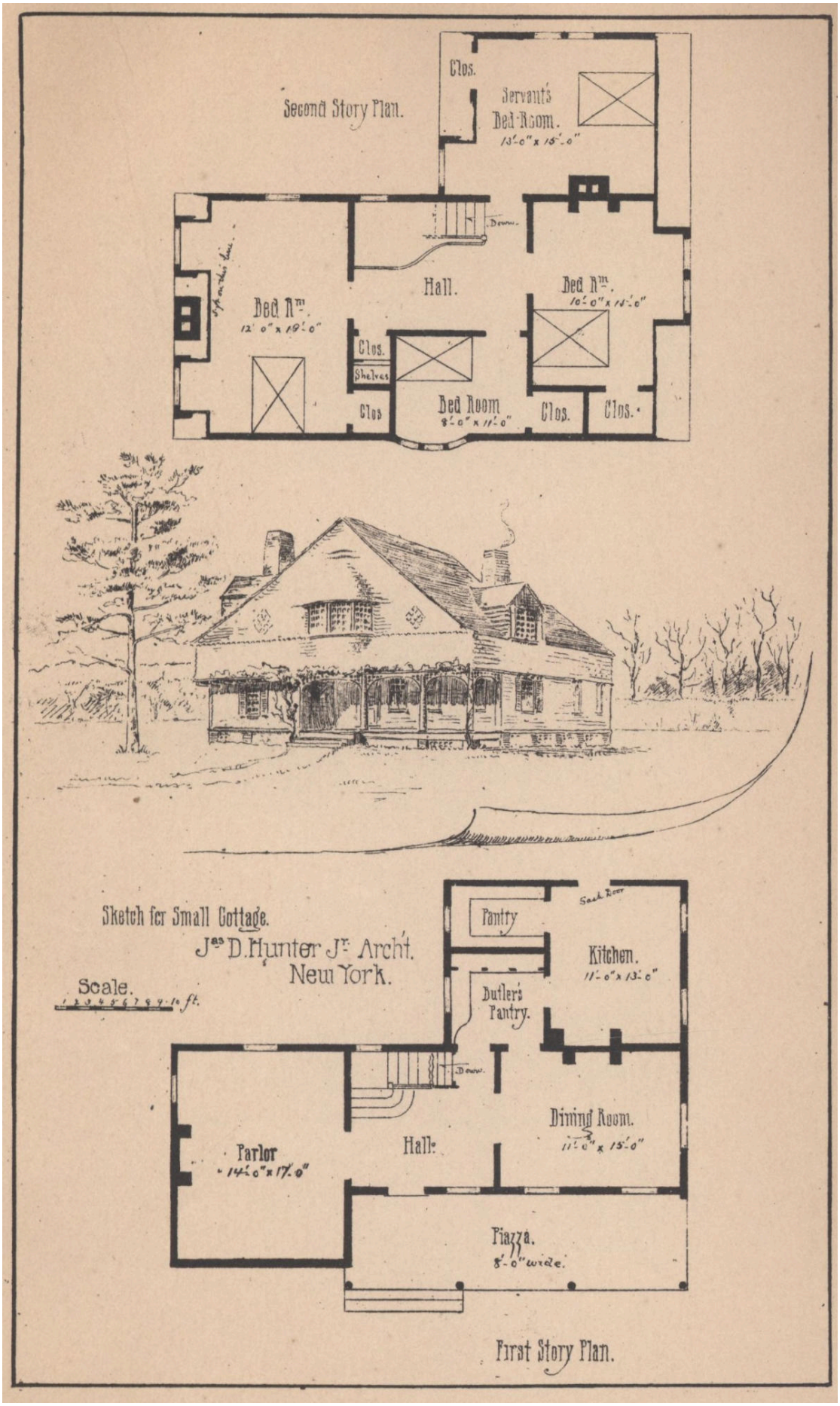


1st Story

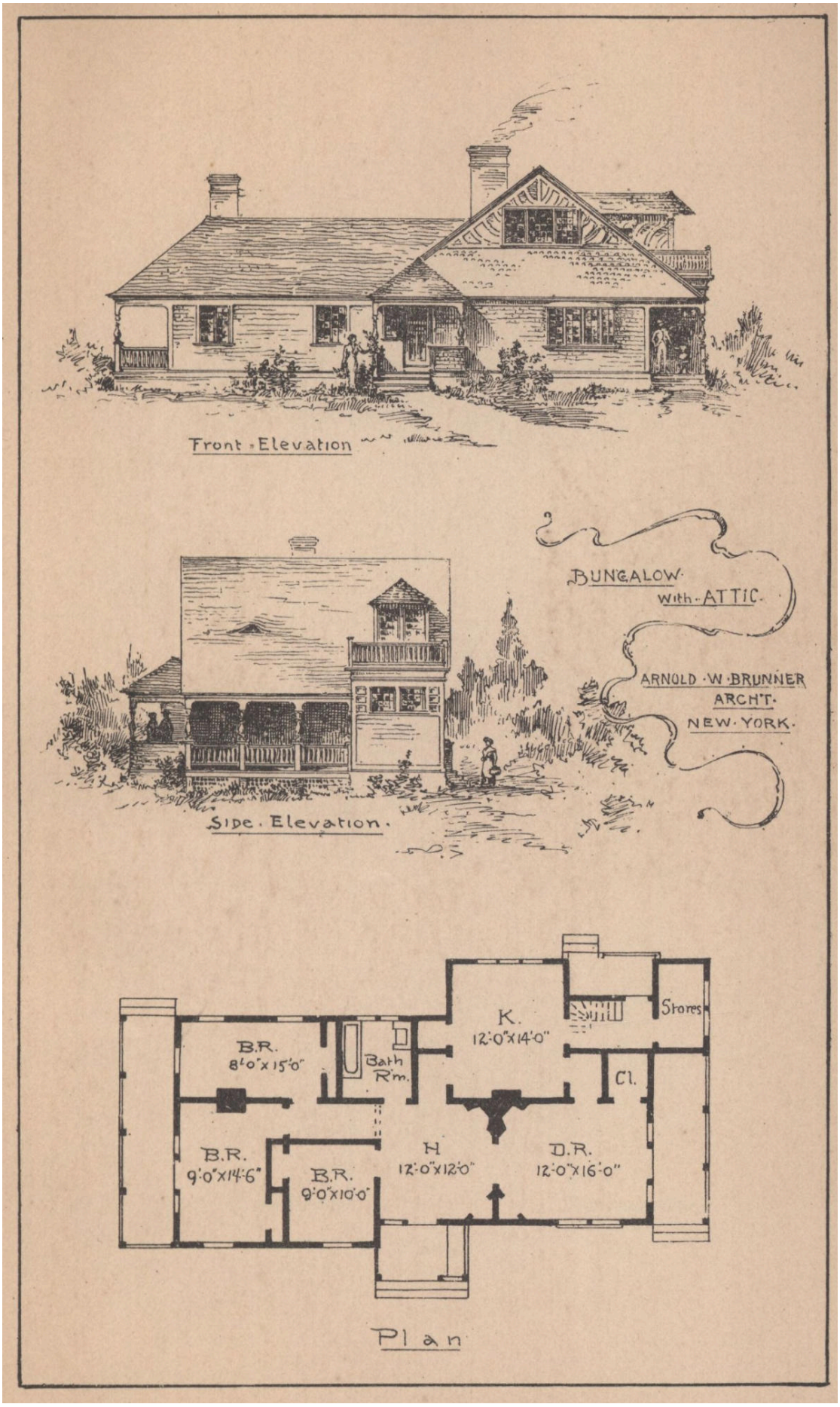


2nd Story

back


Second Story Plan.
Clos.
Servant's Bed Room.
13'-0" x 15'-0"
Down.
Hall.
Bed Rm.
12'-0" x 19'-0"
Bed Rm.
10'-0" x 15'-0"
Clos.
Shelves
Clos
Bed Room
8'-0" x 11'-0"
Clos.
Clos.
Sketch for Small Cottage.
Jas D. Hunter Jr. Archt.
New York.
Scale.
1 2 3 4 5 6 7 8 9 10 ft.
Pantry
Sash Door
Kitchen.
11'-0" x 13'-0"
Butler's Pantry.
Down.
Dining Room.
11'-0" x 15'-0"
Parlor
14'-0" x 17'-0"
Hall
Piazza.
8'-0" wide.
First Story Plan.

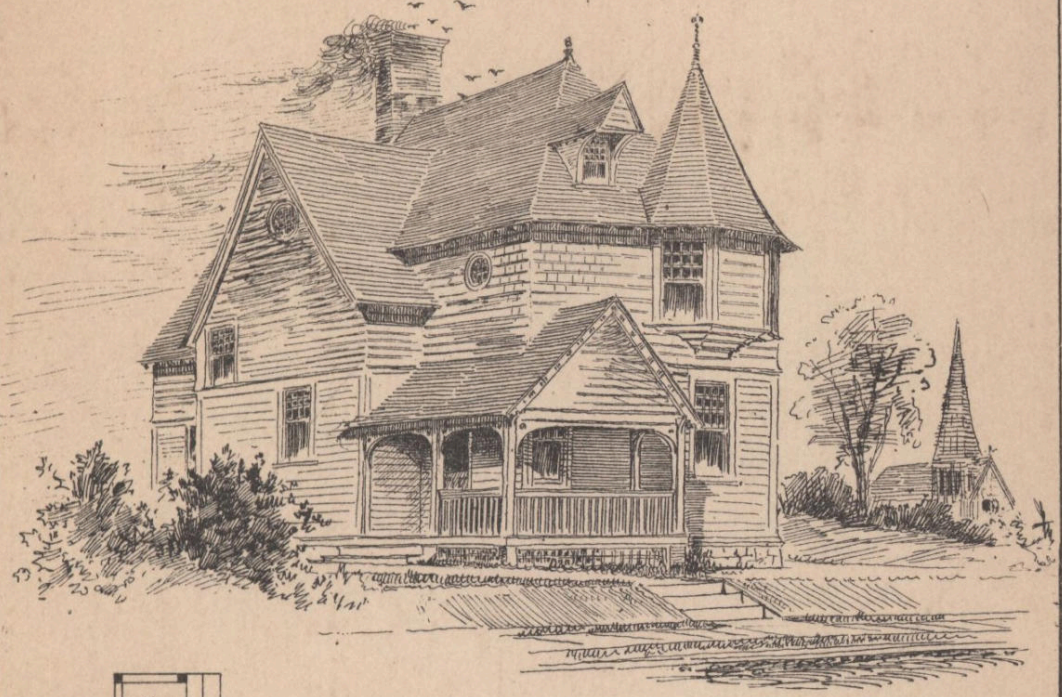
back

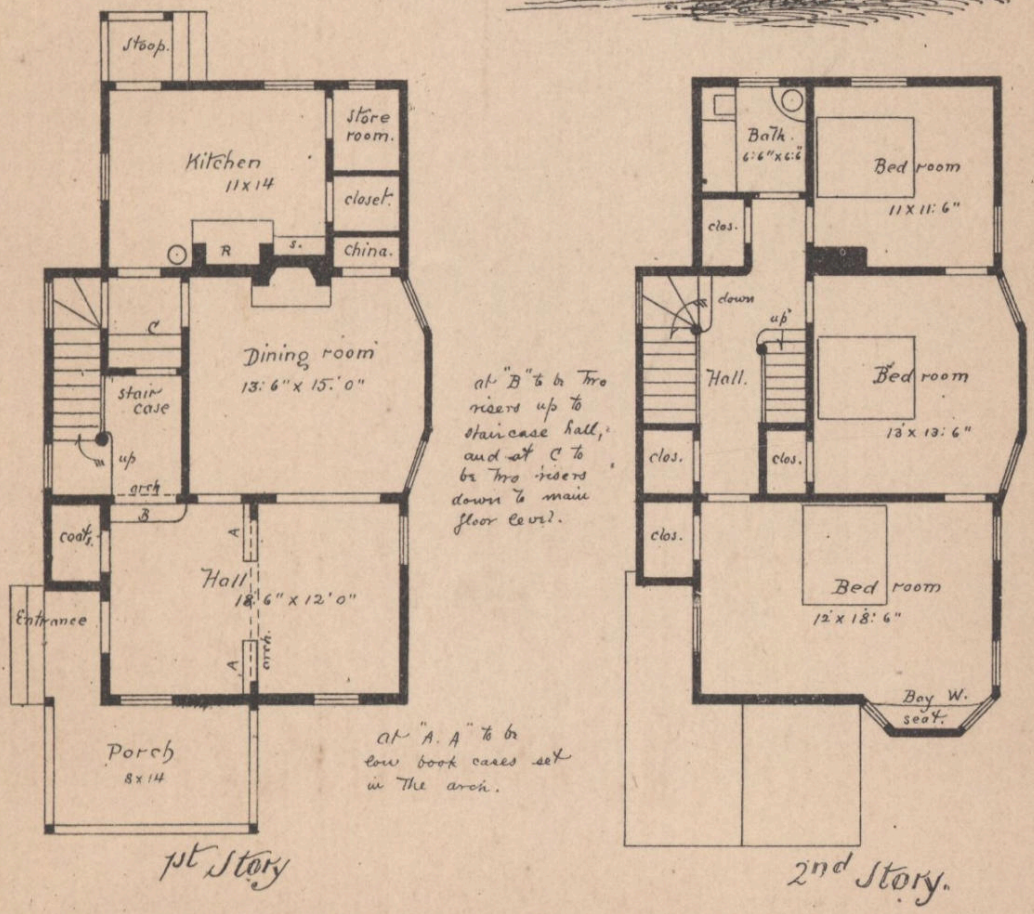

Front · Elevation
BUNGALOW
With · ATTIC
ARNOLD · W · BRUNNER
ARCH'T.
NEW · YORK
Side · Elevation
B.R.
8'0"x15'0"
Bath
R'm.
K.
12'0"x14'0"
Stores
Cl.
B.R.
9'0"x14'6"
B.R.
9'0"x10'0"
H
12'0"x12'0"
D.R.
12'0"x16'0"
Plan

back

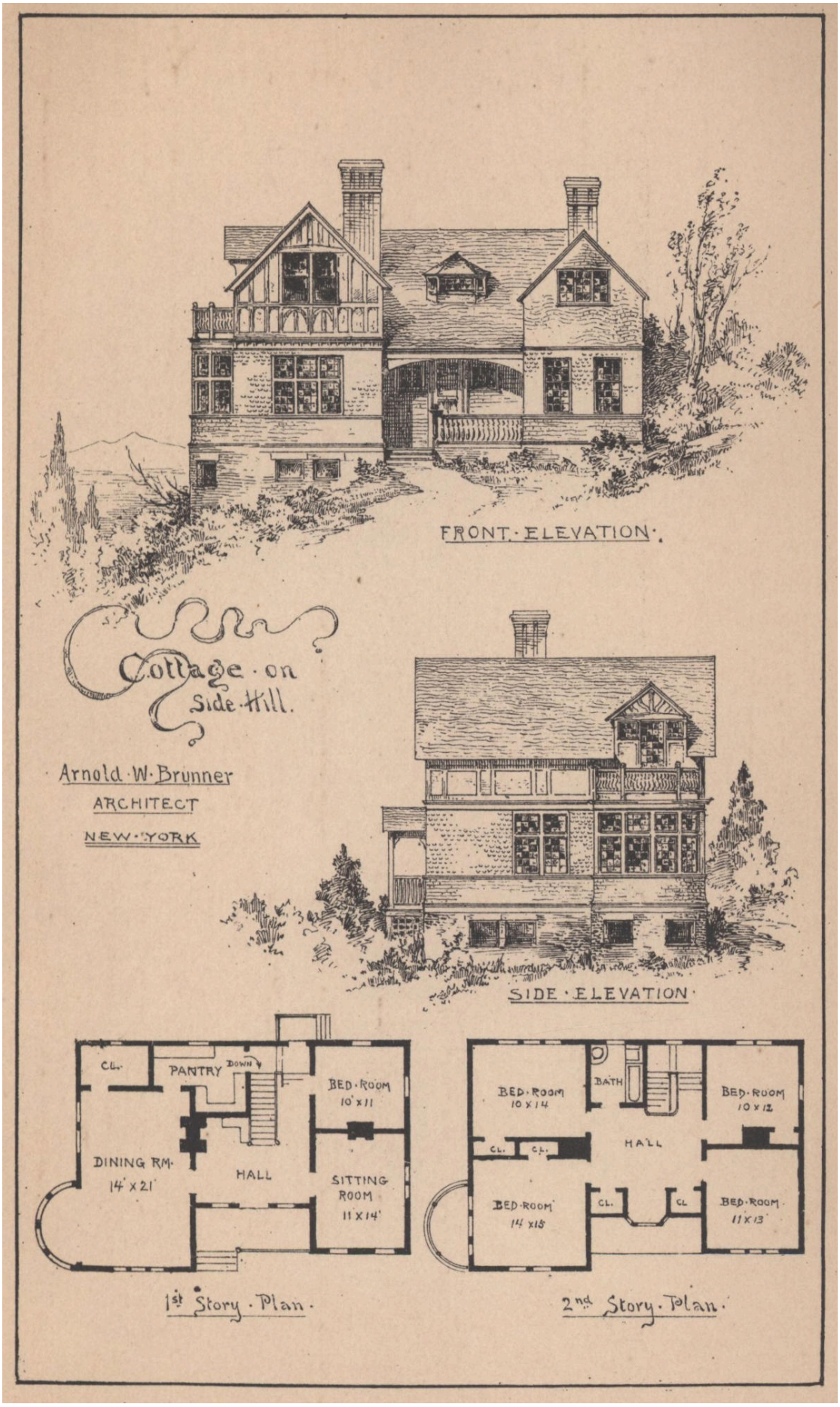
A house planned to meet the requirements of a 50 ft. suburban lot.

Rossiter and Wright
Architects

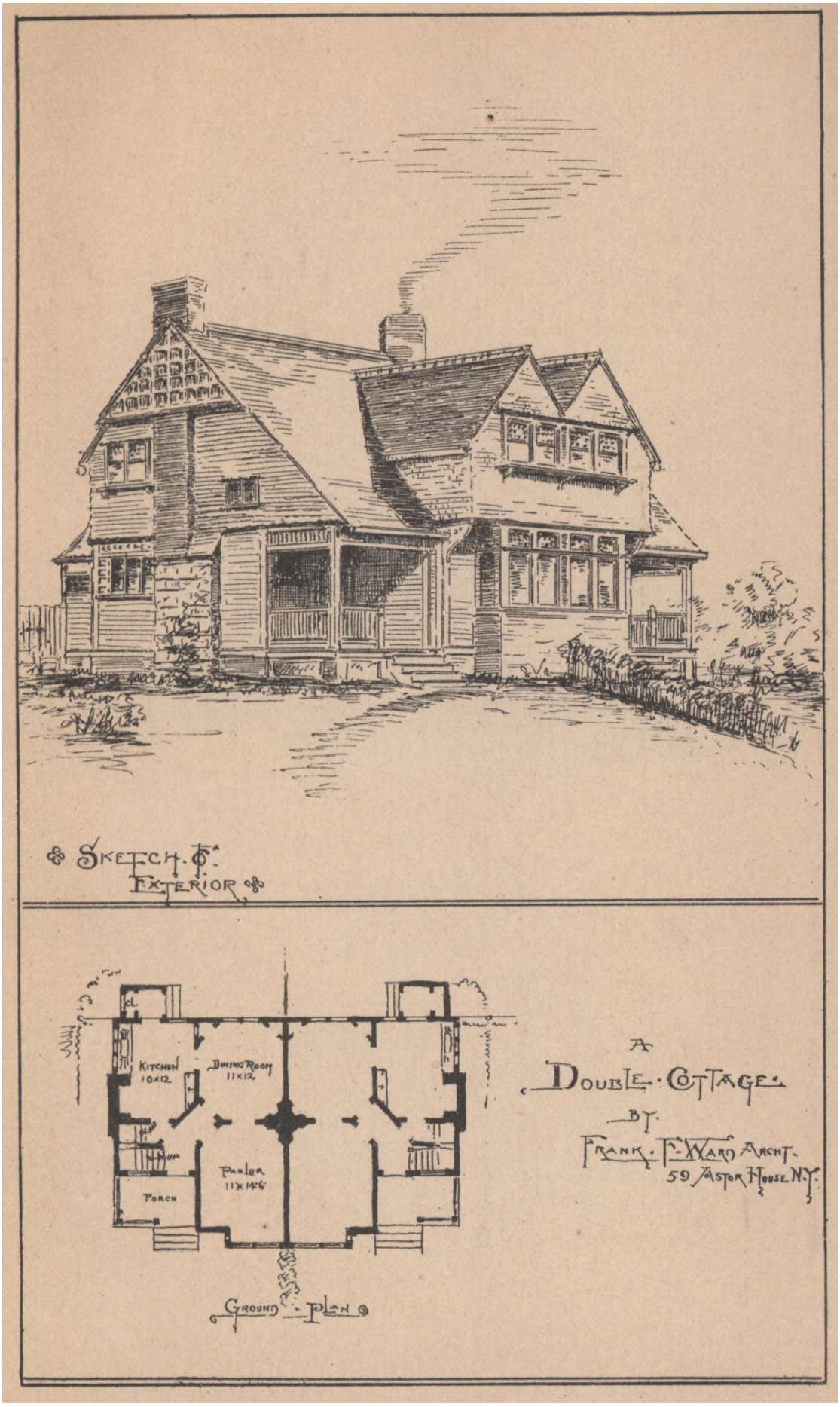




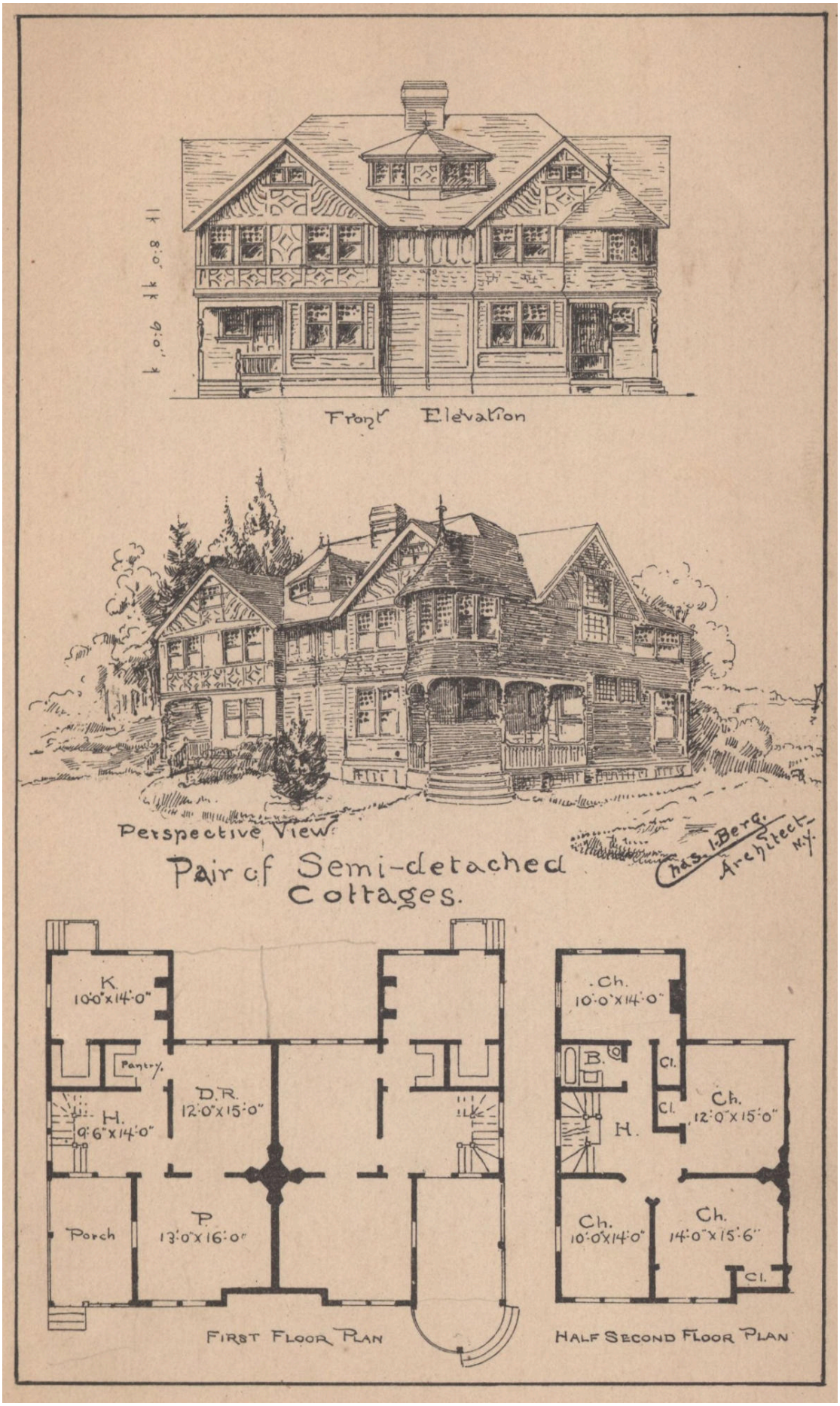
back


FRONT ELEVATION.
Cottage on Side Hill.
Arnold W. Brunner
ARCHITECT
NEW YORK
SIDE ELEVATION
CL.
PANTRY
DOWN
BED ROOM 10'x11'
DINING RM. 14'x21'
HALL
SITTING ROOM 11'x14'
1st Story Plan.
BED ROOM 10'x14'
BATH
BED ROOM 10'x12'
CL.
CL.
HALL
BED ROOM 14'x15'
CL.
CL.
BED ROOM 11'x13'
2nd Story Plan.

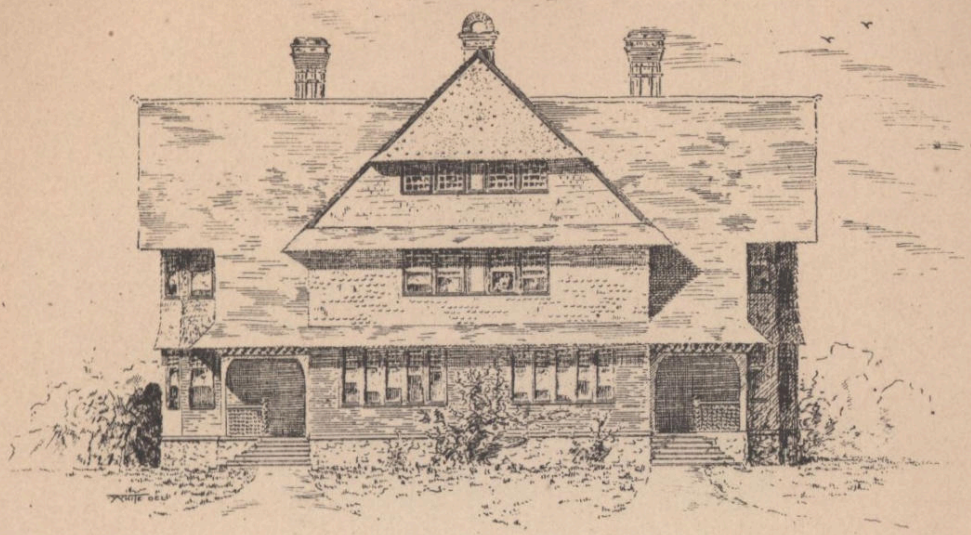
back


SKETCH OF EXTERIOR
KITCHEN 10X12
DINING ROOM 11X12
PARLOR 11X14'6
PORCH
GROUND PLAN
A DOUBLE COTTAGE
BY
FRANK F. WARD ARCHT.
59 ASTOR HOUSE N.Y.

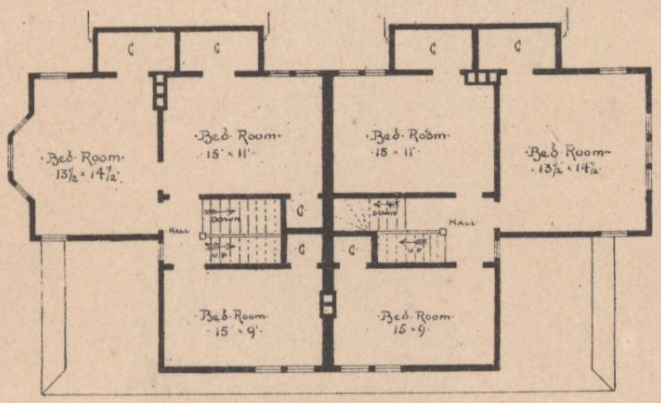
back


Front Elevation
Perspective View.
Pair of Semi-detached Cottages.
Chas. L. Berg. Architect N.Y.
K. 10'0"x14'0"
Pantry
D.R. 12'0"x15'0"
H. 9'6"x14'0"
Porch
P. 13'0"x16'0"
FIRST FLOOR PLAN
Ch. 10'0"x14'0"
B.
Cl.
Cl.
Ch. 12'0"x15'0"
H.
Ch. 10'0"x14'0"
Ch. 14'0"x15'6"
Cl.
HALF SECOND FLOOR PLAN

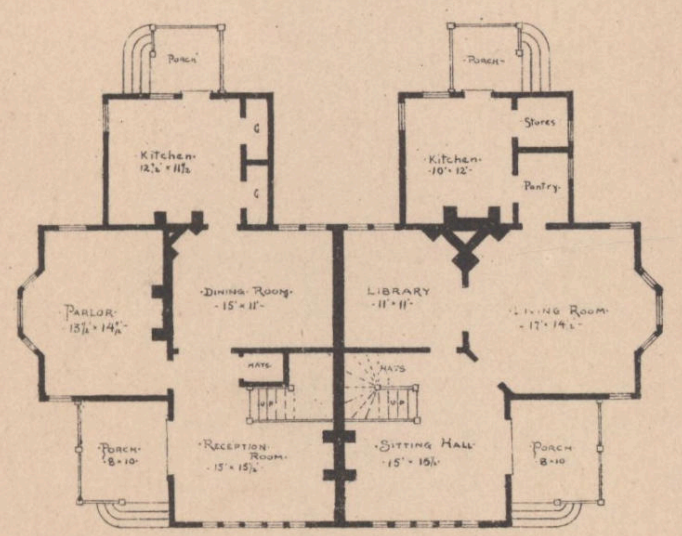
back



FRONT ELEVATION



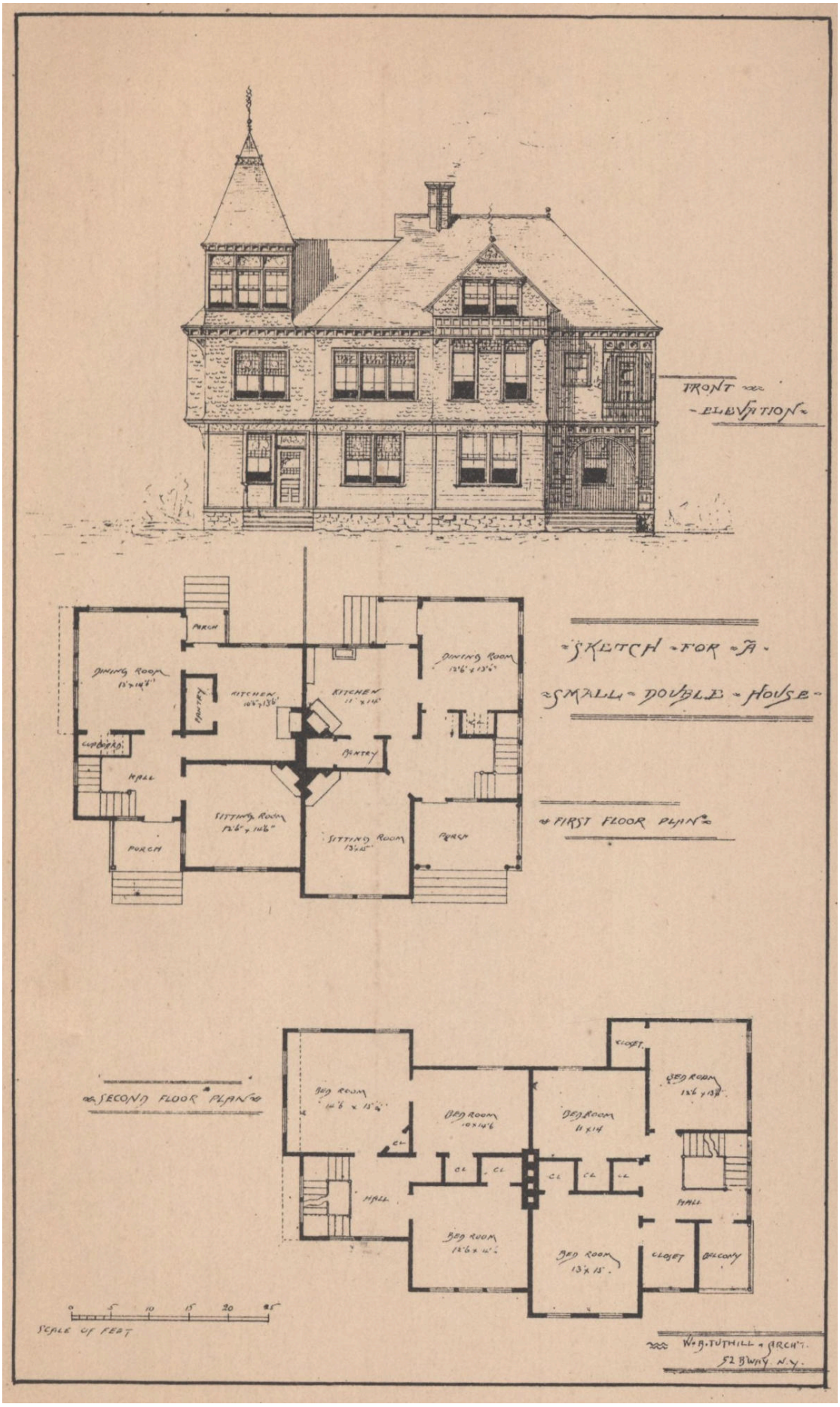
SECOND FLOOR PLAN



Semi-Detached Homes for a Village Street

FRED^K B. WHITE ARCHITECT
294 BROADWAY, NEW YORK

back


FRONT ELEVATION
SKETCH FOR A SMALL DOUBLE HOUSE
PORCH
DINING ROOM 13'6"x14'6"
KITCHEN 10'6"x13'6"
PANTRY
KITCHEN 11'x14'
DINING ROOM 12'6"x13'6"
CUPBOARD
HALL
PANTRY
SITTING ROOM 12'6"x14'6"
PORCH
SITTING ROOM 13'x15'
PORCH
FIRST FLOOR PLAN
SECOND FLOOR PLAN
BED ROOM 14'6"x15'6"
BED ROOM 10'x14'6"
CL
CL
CL
CL
CL
CL
CLOSET
BED ROOM 12'6"x13'
BED ROOM 11'x14'
HALL
HALL
BED ROOM 12'6"x14'
BED ROOM 13'x15'
CLOSET
BALCONY
0 5 10 15 20 25
SCALE OF FEET
W. B. TUTHILL ARCH'T.
52 B'WAY. N.Y.

back