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The Clemson Agricultural College Extension Work Bulletins

RURAL SCHOOL IMPROVEMENT

BY

R. E. LEE.

Prepared for the State Department of Education.

Published quarterly by the Clemson Agricultural College, Clemson College, S. C.

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RURAL SCHOOL IMPROVEMENT

BY

R. E. LEE

INTRODUCTION.

Houses may be classed among the great conservative forces of civilization. The beginnings of organized society may be traced back to the time when men first constructed for themselves permanent places of abode. The early Christian church insured the perpetuity of its creeds and its forms of worship by embodying these in cathedrals which have endured the ravages of time, and have come down to us as monuments to the wisdom and zeal of their builders.

The building of a school house is a serious business. It is a work which cannot be done today and undone tomorrow. It lasts for years and throughout the period of its existence may largely determine the educational activities of the district, and will either help or hinder the whole development of the community.

It therefore behooves the school board about to erect a home for the children of the district to consider carefully and to build wisely. They should remember that for at least six hours of the day the school house is to be the home of the rising generation. About it will cluster the associations which will brighten or cloud the memories of coming years. The experiences connected with the school building will largely influence the attitude of the child toward education for his entire life.

The school should be the most attractive spot in the community, and the building should set a standard for the coming citizen in sanitation and comfort. They say that in Switzerland the school house is always the most imposing edifice in the village. A suggestive story is told of a Swiss boy, who was traveling with his father in France. On the outskirts of Paris they passed the palace of the emperor. It was the most beautiful building the boy had ever seen. In wonder he turned to his father and exclaimed, "See the school house!" Such an ideal of the school house should become more prevalent in South Carolina. To an increasing extent, as time goes by, the school house is destined to become the center of community life. Properly located and constructed it may be made the general meeting place for the adults as well as the children, and the center from which will radiate the uplifting social forces of the district.

All over South Carolina we are engaged in building school houses. This little bulletin is issued for the State Department of Education by Clemson College as a suggestive guide to those charged with the responsibilities of construction.

Plans of one- two- three and four-room school buildings are shown, and Clemson College will furnish free working plans of any of these buildings to any Board of Trustees which intends to erect a building.

This bulletin is intended to help the rural community in every legitimate way without entering into competition with architects. Trustees are urgently advised, whenever funds will permit, to secure the services of a competent architect, and in no case should a large building be erected without complete plans and specifications; and the architect should be employed to supervise the construction. The plans shown in the back of this bulletin were kindly furnished by the architects named and show some of the modern schools erected in the State. Thanks are extended to these gentlemen, and to Messrs. Birch & Harris, of the drawing division, for their efficient services in preparing the drawings shown. Grateful acknowledgements are made to Prof. W. K. Tate, State

Supervisor of Rural Schools, for copies of the school laws, notes on school grounds and architecture, and other valuable suggestions; also to Prof. J. E. Swearingen, State Superintendent of Education, for many helpful suggestions and words of encouragement; and to any other parties who by their assistance made this bulletin possible. All of the plans shown in this bulletin have been approved by the State Superintendent of Education.

If the contents of this book aid in any way towards the erection of better school buildings, and the beautifying of school grounds, not only in the rural districts but in the towns, it will fulfill its mission.

R. E. LEE,
Associate Prof. of Drawing and Designing.

SCHOOL LAWS.

Acts to encourage The Erection of School Buildings in South Carolina.

In order to encourage and assist the people of South Carolina in the erection of adequate public school buildings, the General Assembly of the State of South Carolina, at the session of 1910, passed the following Acts:

An Act To Encourage and Aid in the Construction of Adequate Public School Buildings in the Respective Counties of This State, and to Make an Appropriation for Same.

Section 1. Be it enacted by the General Assembly of the State of South Carolina, That for the purpose of encouraging and aiding in the construction of adequate public school buildings in the different counties of this State, the sum of twenty thousand dollars is hereby appropriated out of the Dispensary funds recently paid into the State Treasury by the Winding-Up Commission of the State Dispensary, and the said sum shall be used by the State Board of Education for such purpose.

Section 2. That when the friends, patrons or trustees of any school district of any county of this State shall raise by private subscription, special tax, regular tax, sale of old

building, issuing bonds, or otherwise, funds for building a school house in such district, the State Board of Education shall, upon application duly endorsed by the County Board of Education in which the public school desires aid, turn over to the trustees of such school from the funds set aside for such purpose under this Act, fifty dollars for each one hundred dollars so raised by such friends, patrons, or trustees for constructing such school building: Provided, That no one school shall receive more than three hundred dollars under the provisions of this Act: Provided, further, That no more than one school in any district, in any one year, shall receive such aid: Provided, further, That in the case of the consolidation of two or more schools, an additional bonus of fifty dollars may be granted: And Provided further, That the State Board of Education shall give the preference to school districts which have combined and consolidated two or more school buildings: Provided, further, That any school district availing itself of the provisions of this Act shall comply with plans and specifications approved by the State Board of Education.

Section 3. That no school shall receive aid under the provisions of this Act without the approval of the County Board of Education of the county in which said school shall be situated.

Section 4 That the funds provided for in this Act shall be paid out by the State Treasurer only upon the warrant of the State Board of Education, signed by the State Superintendent of Education.

Section 5. All Acts and parts of Acts inconsistent with this Act be, and the same are hereby, repealed.

Approved the 23rd day of February, A. D. 1910.

An Act To Amend Sections 1 and 2 of an Act Entitled "An Act to Encourage the Erection of Adequate Public School Buildings. "Approved 22nd of February A. D. 1905."

Section 1. Be it enacted by the General Assembly of

the State of South Carolina, That the County Boards of Education of the various counties of this State be, and the same are hereby, authorized to annually set aside an amount equal to five per cent. of the entire public school funds of their respective counties, which said amounts shall be used by the said County Boards of Education for the purpose of encouraging by aiding in the construction of adequate public school buildings in their respective counties.

Section 2. That when the friends, patrons or trustees of any public school in any school district in any county in this State shall raise by private subscription, special tax, regular tax, sale of old buildings, issuing bonds, or otherwise, funds for building a school house in such district, the County Board of Education of such county shall turn over to the trustees of such school, from funds set aside for such purpose under this Act, fifty dollars ($50) for each one hundred dollars ($100) so raised by such friends, patrons or trustees for constructing such school building: Provided, No one school shall receive more than three hundred dollars ($300) under the provisions of this Act: Provided, That in case of the consolidation of two or more schools an additional bonus of fifty dollars ($50) may be granted: Provided, further, That no more than one school in any one district, in any one year, shall receive such aid.

Approved the 24th day of February, A. D. 1910.

Extract from the Minutes of the State Board of Education.
March 21, 1908.

The following resolution, offered by Mr. Rice, was unanimously adopted:

"WHEREAS the danger of loss of life by fire is ever present in all our public schools, now, therefore, be it resolved:

Section 1. That it is the sense of this Board that in any and all public school buildings in this State, it is the imperative duty of trustees, or others charged with the construction of such buildings, to make such adequate provisions

for the escape of the pupils and teachers therefrom in case of fire, as will cover any and all contingencies that may arise, and this board recommends that all doors of entrance and exit to such buildings as well as doors to hallways and class rooms be made to open outwards, and that ample fire escapes from any upper story of any such school building be permanently attached thereto and made part thereof.

Section 2. That in all public buildings now in use in this State, not equipped with the safeguards against loss of life by fire, as set out in Section 1 hereof, that it is the imperative duty of the trustees of such schools to provide such safeguards without delay.

Section 3. That this Board further recommends that fire drills be practiced at least one a month in all our schools, and that the teachers and superintendents of said schools be requested to carry out this recommendation.

Section 4. That copies of this resolution be sent to the various city and county superintendents of education of this State for distribution among the trustees of the various schools of the State."

Steps in Securing County and State Aid in the Erection of School Buildings.

First—The district trustees should secure a clear title to the school lot and have this recorded.

Second—The plan of the building should be approved by the county board of education. When this approval has been granted, the county superintendent will forward this plan to the State Department for similar examination and approval. Adoption of any plan suggested in the school building bulletin, issued by Clemson College, can be indicated by the number printed in the bulletin, and will insure approval by the school authorities.

Third—A formal application blank furnished by the State Department should be filled out by the county superintendent and the chairman of the district board for filing in the office of the State Superintendent of Education.

Fourth—Any money raised by private subscription and

to be used as a basis for State and County aid, should be deposited with the county treasurer to the credit of the school trustees.

NEW "STATE FLAG" ACT.

An Act to Provide for the Display of the State Flag Over Public Buildings:

Be it enacted by the General Assembly of the State of South Carolina:

Section 1. That the State flag shall be displayed daily, except in rainy weather, from a staff upon the State House and every Court House, one building of the State University and of each State college, and upon every public school building, except when the school is closed during vacation.

Section 2. That it shall be the duty of the officer or officers in charge of said buildings to purchase suitable flags and cause them to be displayed, the expense to be borne out of the funds provided for maintenance.

Section 3. That it shall be the duty of Clemson College to manufacture in its textile department and sell at approximate cost flags of suitable sizes and correct design, which shall consist of blue, with white increscent in the upper flagstaff corner, and white palmetto tree in the centre, as prescribed in the resolution adopted by the General Assembly, January 28, 1861, to be approved by the secretary of the historical commission.

Section 4. That any person who mutilates, injures or

desecrates the flag of the State wherever displayed, as above provided, shall be guilty of a misdemeanor, and upon conviction shall be punished by a fine of not more than one hundred dollars, or imprisonment for not more than thirty days.

Approved the 26th day of February, A. D. 1910.

THE SCHOOL GROUNDS AND SCHOOL ARCHITECTURE.

The School Site.

The school should be located as near as possible to the center of the district. It should be accessible to the principal public highway, but far enough removed from it to be free from dust and distractions. Where a consolidated district provides transportation for its more distant pupils, it is sometimes best to place the building nearer to one end of the district, so that the pupils from that section may walk to school, leaving only the distant pupils from the other section to be transported.

A school lot should never be less than one acre, and the wise school board will secure school grounds containing three or four acres. With a four-acre tract it is possible to have an athletic field and space for a school garden.

The best shape for a one-acre lot is 10 rods front by 16 rods deep; for a two-acre tract 16 rods front by 20 rods deep; and for a four acre tract 20 rods front by 32 deep.

The lot selected for a school house should be well drained, but not so rolling as to cause troublesome washing. Parts of it should be level enough to furnish satisfactory play grounds and athletic field.

In some sections it has been the custom to place the school house on the least fertile spot in the district. With the advent of the school garden it is desirable that a more fertile soil should be selected.

Under the laws of South Carolina the ground on which the school house is built must be the property of the trustees.

Location of Buildings on the Lot.

If the lot selected has the shape above indicated, it is best to place the building so that the school yard left back of it is a square. This gives a large back yard for play grounds, and front and side yards large enough for flowers, shrubbery, and a school garden. The school garden should never be allowed to trespass upon the play ground space.

If the school yard is small, the privies for boys and girls should be placed in the extreme back corners, and should be screened by high board screens which should be covered with vines. If the yard is large the privies should be placed on the sides of the lot at a convenient distance from the school house, and the rear may then be reserved for a ball ground or athletic field.

It is frequently desirable to provide stalls for horses at the school building. These, too, should be placed on the rear of the lot, and a screen of vines should cover the walls.

Trees should be planted around the entire school lot, and it should also be enclosed by a good fence.

The School Building.

The adaption of the school room to its purposes, and not the external appearance, should determine the architecture. The school room is the unit in all school house construction. This room should embody certain essential principles, and should not vary widely from the standard described below.

The number of these standard school rooms in a building will be determined by the size of the school to be accommodated, and the finish and architectural adornment will depend on the taste of the community and the money at the disposal of the trustees. It is possible to embody the essential principles of good school construction in a very inexpensive building, or in a very elaborate one.

The Standard Class Room.

The class room for the average class should be 24 by 32 feet, and 13 feet high.

Whenever possible, the building should be placed so

that the principal light will come from the East or North. This avoids the direct glare from the sun.

The windows should be placed on the long side of the room, and on the left side of the pupils. They should be close together, so as to avoid cross lights and shadows. The front window on the side should not be placed beyond the front row of desks, and the rear window should be near the rear wall. No class room should have windows on opposite sides. It is better to have the light come from the left side of the pupils only. There should be no windows to the front or on the right of the pupils. Windows placed in the rear should either be transom windows above the blackboard, or should be provided with shades to protect the eyesight of the teacher. Since the best light comes from above the heads of the pupils, the tops of the windows should be within six inches of the ceiling. The area of the glass in the class room should be one-fifth to one-fourth the floor space. The room 24 by 32 feet should have at least 150 square feet of window space. This would mean five windows eight feet high and three feet wide banked on the left side, and two such windows in the rear. All window sash should be hung on pulleys.

The class room which has just been described differs widely from the one usually seen in South Carolina. We are all familiar with the ordinary type. The designer of this typical school building seems to have had just one object in view, and that was to get the same number of windows on each side of the house. The best school architects of the United States now have courage to leave blank walls in handsome city school buildings.

In the construction of the school house, we must consider the use of the room inside, and not our conceptions of exterior symmetry. The plans which follow in this pamphlet will show how this standard school room can be worked into a building which is also presentable on the outside.

Window Shades.

The best shade for a school room is one which rolls from the bottom on a spring roller with handle attached

and which is hung on a cord running through a stop pulley at the top of the window. Such a shade may be placed in any position on the window.

Blackboards.

Blackboards 48 inches wide should be placed on all walls where there are no windows. They should be placed 28 inches from the floor in ungraded rural schools. All boards should be provided with ample chalk rails for holding crayon and erasers.

The most economical material for blackboards in the ordinary school is the woodpulp composition board, now manufactured under various names. This may be had in convenient lengths, and is durable and easy to put in place. The dark green board is very agreeable to the eyes. The writing surface of this board may be renwed by an application of liquid slating. A fairly good cheap substitute for this board may be made by gluing two or three thicknesses of strong manilla paper upon a smooth plastered wall and giving it two or three coats of liquid slating.

In the front of each class room should be a movable platform five by six feet and six inches high for the teacher's desk and chair. This platform gives the teacher a better command of the class during general exercises and study periods.

Library Cases.

Near the teacher's platform, or in some other convenient place in the class room, a book case with glass doors and with locker underneath should be built in the wall. This should be provided with lock and key.

The Floor.

The floor of the school room should be double and air-tight, the lower floor being laid diagonally, and the top floor tongued and grooved, with building paper between, and should be stained with a dark oil stain. Much sickness, discomfort, and poor work in school are caused by defective floors. The entire exterior of the building should be covered with storm sheathing, nailed diagonally; on top of which is nailed the weather boarding, with building paper be-

tween. The double floor and sheathing will make the building much more comfortable and will make quite a reduction in the fuel bill.

Heat and Ventilation.

This subject has never received sufficient attention in the rural school. The ordinary heating apparatus of these schools consists of a square box stove, placed in the center of the room, from which heat is received by the pupils through direct radiation. This usually means that pupils seated near the stove are too hot, and that those distant from it are too cold. Its position in the center of the room interferes seriously with the heating arrangement.

A slightly greater investment will secure for the school a jacketed stove which heats the room by producing a circulation of warmed air through all parts of it. The principle of this stove is very simple. The cold air is taken through a pipe from outside of the building, and is carried through or under the sheet iron into contact with the hot stove on the inside. It is there heated, rises to the ceiling, and settles down over the entire room, producing a uniform temperature. As the impure air in the room settles to the floor, it is forced up through a pipe or wall register into a section of the flue, and carried from the building. This stove may be placed in the corner of the room, and does not necessarily break up the seating arrangement. The jacket prevents undue heat for the pupils seated near the stove.

There are a number of patented stoves of this type which are said to be very satisfactory, two of which are shown. A tinner or blacksmith, however, can very easily make a tin, zinc, or sheet iron jacket for the ordinary stove, which will be very satisfactory. The jacket should extend at least eight inches above the stove, and should, of course, be provided with a door, which may be opened for putting fuel in the stove. The cold air may be brought to the stove through a grated opening in the floor within the jacket, to which a duct two feet square, or equivalent, leads from under the floor outside of the building. The exit of the impure air should always be placed near the floor, and the smoke flue and the ventilating flue should be placed side by

side, so that the heat from the first may assist in causing the draft essential to satisfactory ventilation through the second. If this opening is placed near the ceiling, the air warmed in the jacket will pass out of the room immediately without settling. An old fashioned open fire place makes a good ventilating shaft and may also be used to supplement the store in extremely cold weather. The temperature of the school room should be kept between 68 and 70 degress. The windows should be opened and the room thoroughly aired at recess and at the close of the school session. 30 cubic feet of air per minute per pupil, or 1800 per hour is the accepted standard for school room ventilation. The Clemson authorities will be glad to furnish information on other systems of heating and ventilation to any parties requesting it.

Seating.

A room 24 by 32 will easily seat 48 pupils in single desks. The initial cost of single desk seating is greater than that of double desks, but this is more than balanced by the better order and discipline made possible by the single desks. The desks in such a school room will be arranged in six rows, each containing one "front", one "rear", and seven "completes". School desks are made in standard sizes, and are numbered from No. 6, the very smallest desk, adapted to kindergarten and primary pupils, to No. 1, made for college students.

For a one-room country school with 48 pupils there would be needed two rows of No. 5, two rows of No. 4, and one row each of No. 3 and No. 2. In an ungraded school two No. 4. recitation benches six feet long should be provided. For a larger school, desks should be ordered in about this same proportion of sizes.

The desks of the numbers given above vary in height and size of top, and the size should determine the distance between backs as they are placed upon the floor. The spacing distance from back to back for a No. 5 is 22 inches for No. 4 is 24 inches, for No. 3 26 inches, and for a No. 2 28 inches. Any attempt to place desks of varying sizes in line across the room will necessitate improper posture by

the occupants of some of them. Especial care should be taken to see that desks are properly put together. This will double the life of the desk.

Many school authorities prefer to screw the desks to one and one half by three inch strips, instead of fastening them to the floor. The rows are then easily moved for cleaning the floor or for convenient seating when two or more rooms are thrown into an auditorium. The aisles should be about two feet wide, and a broad aisle should be left all around the school room.

The cost of seating a room with the best desks, according to the above specifications, should be about $115.00 at the factory. A price list of school seatings and equipment furnished by reliable companies is on file in the office of the State Superintendent of Education, with the State Supervisor of Elementary Rural Schools, and with the Drawing and Designing Division of Clemson College; and from these sources, or from reliable dealers, boards of trustees may secure all neccessary information. There are great differences in the quality of school desks. It is always poor economy to purchase a poor desk at any price. The cheap all wood desk, sometimes sold in South Carolina, should especially be avoided.

The Tinting of the Walls.

The beauty and attractiveness of the school room will depend largely on the painting and the tinting of the walls. This subject is usually very much neglected in South Carolina. The glaring white walls, and deep blues, yellows and reds should be avoided. For rooms where the lighting is not the best, a cream is desirable. In general the best color for the school room is green. The wainscoting and woodwork should be a deep olive, the walls up to the picture moulding a sage green, and the ceiling a lighter stone green. All inside coloring should be "dull finish". For the woodwork the green stain and a "wax finish" is the cheapest as well as the best. An inferior grade of lumber can be used on the interior if well painted. All interior woodwork should be flat and plain, and all deep cut moulding avoided as

far as practicable. These mouldings catch dust and are difficult to keep clean. A picture moulding should be put on the walls of the room about 18 inches below the ceiling. A good finish can be gotten by wainscoting the space around the room below the blackboard level, although this is not as sanitary or desirable as the plaster and baseboard. A sanitary finish can be obtained by omitting all wood casing around the windows, and plastering the corner round against the window frame, and using a very narrow baseboard and few mouldings. The plastering should have a very fine sand finish.

Cloak Rooms.

It is very unsanitary to pile hats and wraps promiscously in the corner of the class room, or to allow wet coats and umbrellas to dry out in the room occupied by the pupils. Every classroom in a school building should be provided with a cloak room adjacent to it sufficiently large to accommodate the hats and cloaks of the occupants. It should be provided with shelves and two rows of hooks for hats and coats. It should in all cases have outside ventilation by windows.

Fuel and Work Room.

Every school building should have a room convenient in which fuel can be stored. A pile of wood in the room itself does not contribute to an orderly class room.

The best schools everywhere are recognizing the fact that there are many exercises other than study and recitation from the text books of the course which can be profitably conducted in connection with the rural school.

In the city schools manual training is now recognized as a subject worthy of a place in the curriculum. For the country boy the varied exercises of the home and farm may take the place to some extent of the formal manual training course. Nevertheless, we believe that in every country school there should be the ordinary tools of the country home, such as the hammer and nails, brace and bit, paint and brushes, saw, axe, and plane; and the boy should be encouraged to use them in making the school house and

grounds more comfortable and attractive. An admirable beginning for a school improvement league among the children of a district would be the acquisition of a few school tools and a little lumber, coupled with a few suggestions from the teacher as to desirable repairs and improvements in the building and surroundings.

Auditorium.

As the school becomes more and more the center of community life, the school auditorium will become more important and necessary as a part of the school building. When the finances of a district will not allow the construction of a separate auditorium, it is possible to arrange the building so that two rooms may be thrown into one when the occasion demands. If the desks are not screwed to the floor, but are attached to strips, as indicated above, they may be easily shifted so as to face in one direction when desired. If the teacher's platforms are movable, they, too may be shifted to form a temporary stage. In the plans are presented drawings of a two-room school house so arranged that the rooms may easily be thrown together in this way.

The Equipment of the School Room.

The school room should contain the accessories named below as a minimum equipment for good work:

1. A commodious teacher's desk with drawer and locker.
2. A comfortable teacher's chair and two extra chairs for visitors.
3. A call bell.
4. A box of good crayon, and a dozen wool-felt erasers.
5. Two or three blackboard pointers.
6. A good set of maps, including political maps of the World, the United States, North America, Europe, Asia, and Africa, and a physical map of North America. It is most economical in the end to buy these maps in the steel case mounting.
7. A good medium priced 12-inch globe.
8. A good dictionary.
9. A clock.
10. A thermometer.

In addition to these the school should gradually acquire sets of weights and measures, charts to assist in the teaching of the school subjects, and other auxiliaries suggested by the teacher. The skillful teacher and responsive pupils will gradually develop a school museum which will greatly enrich the work.

The School Library.

The days have passed when it is necessary to make any argument for a school library in South Carolina. Every school will make provision for its library, and will take advantage of the generous offer of assistance in securing books made by the law of the the State. A copy of this law and the list of books adopted by the State Board of Education may be had by addressing the State Superintendent of Education.

School Room Decoration.

A school room arranged and equipped as described above, kept clean, and occupied by an enthusiastic teacher and busy interested children, will require very little decoration to complete it. Avoid especially burdening the walls with cheap pictures. The penny pictures have their uses, but they are not intended to be pasted in "bunches" on the school walls. A few good pictures, which appeal to the understanding of the children, framed in good taste and hung artistically, will do more to cultivate the aesthetic sense of the pupils than a mass of cheap reproductions of the "masters", or even good pictures above the comprehension of children.

Doors.

All exterior doors should open outward, and the janitor should be required to keep the doors unbarred and unlocked while school is in session. It is best for the class room doors to open inwards so the teacher can have control over her pupils in case of panic. All entrances should be wide and be provided with a porch or vestibule so children can find shelter if they come before school is opened.

Corridors and Stairways.

In schools of more than two rooms the corridors should be at least ten feet wide. The stairways should be at least

five feet wide, and the flights should be broken by landings whenever this is possible. Winding stairways, sharp turns, irregular treads, and steep ascents should of course be avoided.

Exterior Painting.

No school house should be considered as complete until the whole exterior has been given three good coats of good lead and oil paint. This not only adds to the beauty of the building but prolongs its life as well. In selecting the paint, glaring colors should be avoided and neutral tints selected. Good taste in the selection of colors and harmonious trimmings will make the school building contribute to the elevation of the aesthetic taste of the whole community. Good results can be gotten by the use of stained shingles on the sides of the building.

The roof shingles should be given a coat of creosote stain.

Remodeling Old Buildings.

It is frequently possible to remodel an unsatisfactory building at a comparatively small cost. Among the plans which follow in this bulletin is one suggesting a way in which the rural school of the box type may be greatly improved.

Suggestions for remodeling old buildings will be given by the Division of Drawing and Designing of Clemson College to any trustees who will send sketches of the old building.

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THE SCHOOL WATER SUPPLY.

(By C. F. Williams, M. D., Secretary State Board of Health.)

In the equipment of a school building no single factor is of more vital importance than the quality of water to be supplied. Good water is absolutely essential to the maintenance of life and health, and in locating a school building, this fact should always be borne in mind.

Inasmuch as the quality of water is affected by various circumstances in different localities, it is impossible, in the absence of an examination, to determine beforehand the quality of water, and as the only means of safety, we urge that all supplies be examined both chemically and bacteriologically before their use is permitted. If the water is found potable on examination, then it is within the province and the duty of the school authorities to see that it is kept pure.

The purity of well water depends largely upon the manner in which the well is constructed and the precautions exercised to prevent its pollution. The accompanying cuts illustrate to some extent how water may be polluted, and how, in the construction of a well , pollution may be avoided. Driven wells when of sufficient depth, fitted with thread and screw joints are safe, but open wells near the surface should not be permitted, as they afford a means of entrance for surface water.

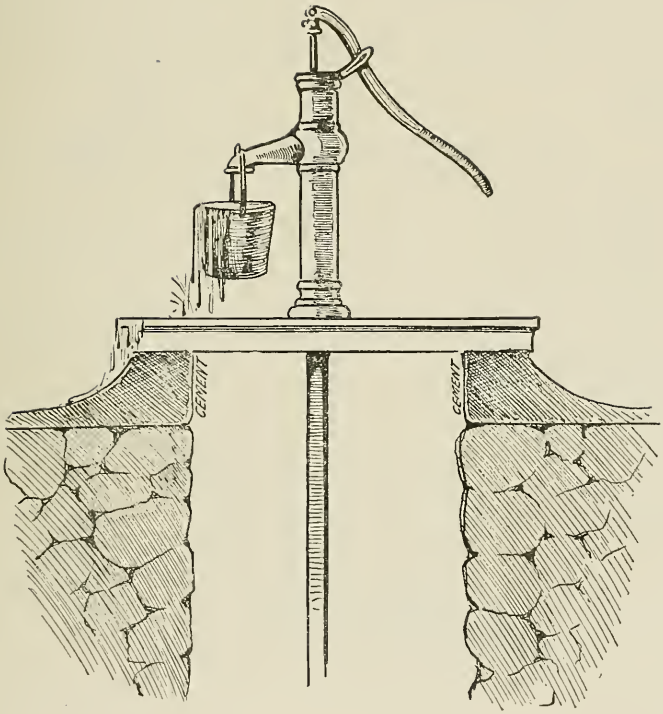
In certain localities in the State, Artesian wells are preferable to shallow surface wells, as the latter are always in danger of pollution through seepage.

When springs are used they should be boxed in with cement walls and covered so as to prevent surface pollution. A pipe or through spill way should be set in the wall, so that the spring will not be polluted by children dipping their hands into it when getting water.

A pure water supply is one of nature's greatest blessings. To pollute it with disease germs means sickness, suffering and oftentimes death. Well water in the country and small villages is, as a rule, pure when the well is of sufficient depth and properly constructed and its pollution is usually due to our ignorance or carelessness.

How often have you seen the picture? The woman here represented is washing bed linen and clothing of a typhoid fever patient. She handles the clothes, gets her hands covered with the germs, then practically washes them in the well in the act of drawing water, innocent, of course, of the danger.

Such a well can also become contaminated from surface washings.



A well properly located, of sufficient depth, and constructed like this one will hardly become polluted except through the underground current.

THE SCHOOL PRIVY.

Of equally as great importance in the sanitary appointments of a school is the toilet and its location, for the purity of our water supply depends almost wholly on whether or not privy deposits have access to it. The toilets should, therefore, be located at such a point that drainage is away from the water supply, so that, should there be any pollution of the soil, the well or spring will not be in danger of surface washings.

The privy should be properly constructed and cared for. This feature of sanitation in our homes, much less our schools, has been too long neglected. No single factor exists in our State that constitutes the menace to the health of our people that is found in the privy now in use.

Many diseases, as typhoid fever, hookworm, Asiatic cholera, dysentery and diarrhoea diseases are directly and indirectly products of the unsanitary toilet.

To illustrate the need of replacing the unsanitary toilet with one that is sanitary, we are here contrasting the two. We are also showing the plan for constructing a sanitary privy, and giving bill of lumber for same.

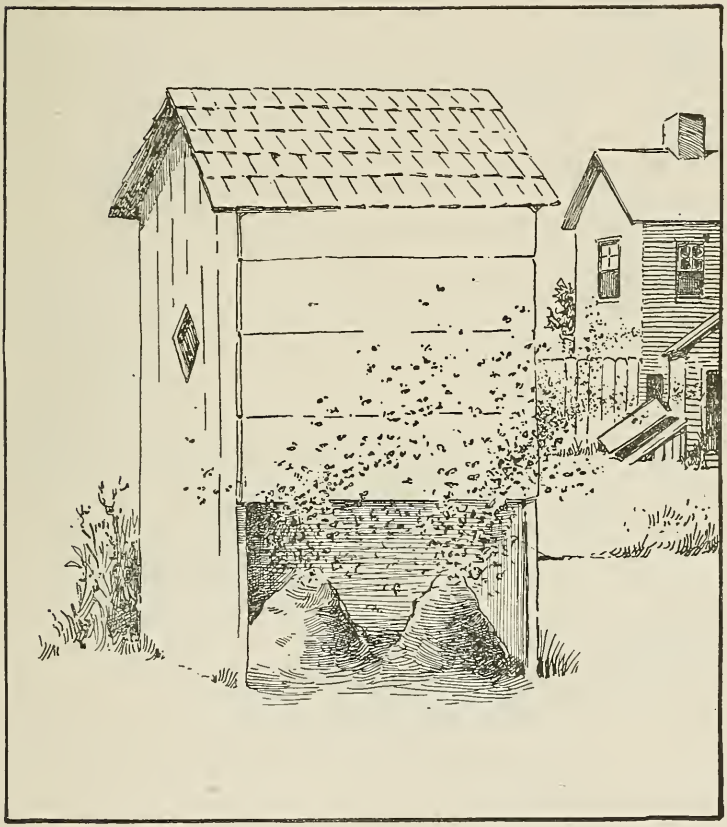
As the cost of the material varies in different localities, we cannot give accurately the cost of such a building, but it is safe to say that it can be constructed for $15.00.

In estimating the number of seats for toilets for school buildings, one seat should be provided for the first fifteen pupils, and one additional for each additional fifteen pupils, or any fraction thereof.

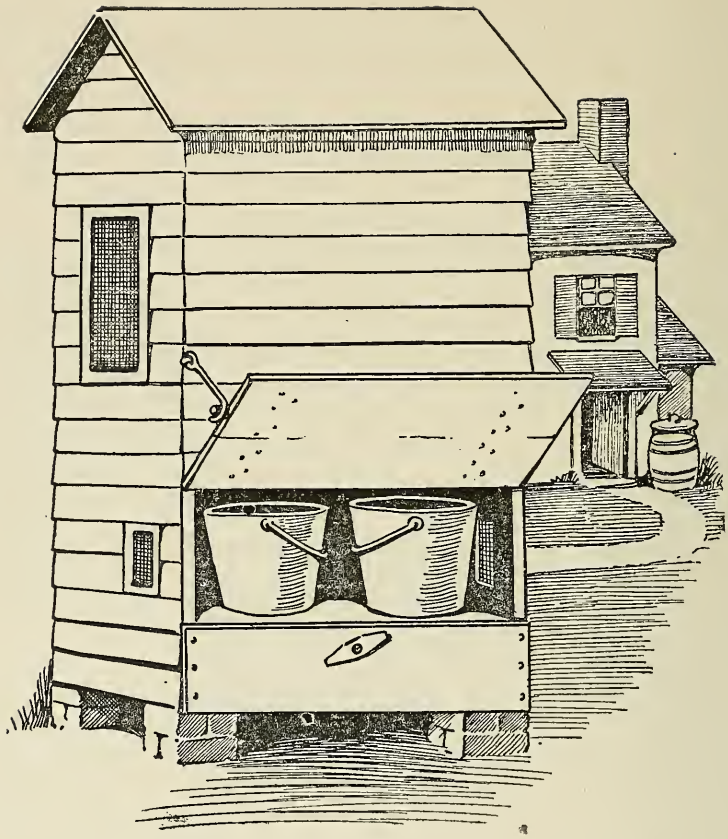
Separate buildings and widely separated, if possible, should, of course, be provided for boys and girls. Each seat should be partitioned off, as shown in the drawing.

When a sanitary privy is constructed, it should then receive such care as will keep it sanitary. The buckets should be filled one-third full of a 10 per cent. solution of crude carbolic acid, and when about two-thirds full, should be emptied —the contents being buried at least two hundred yards from a well, spring or stream of water. Privy deposit should not

be used as a fertilizer, unless disinfected beforehand, and under no circumstances should it be used as a fertilizer for vegetables.



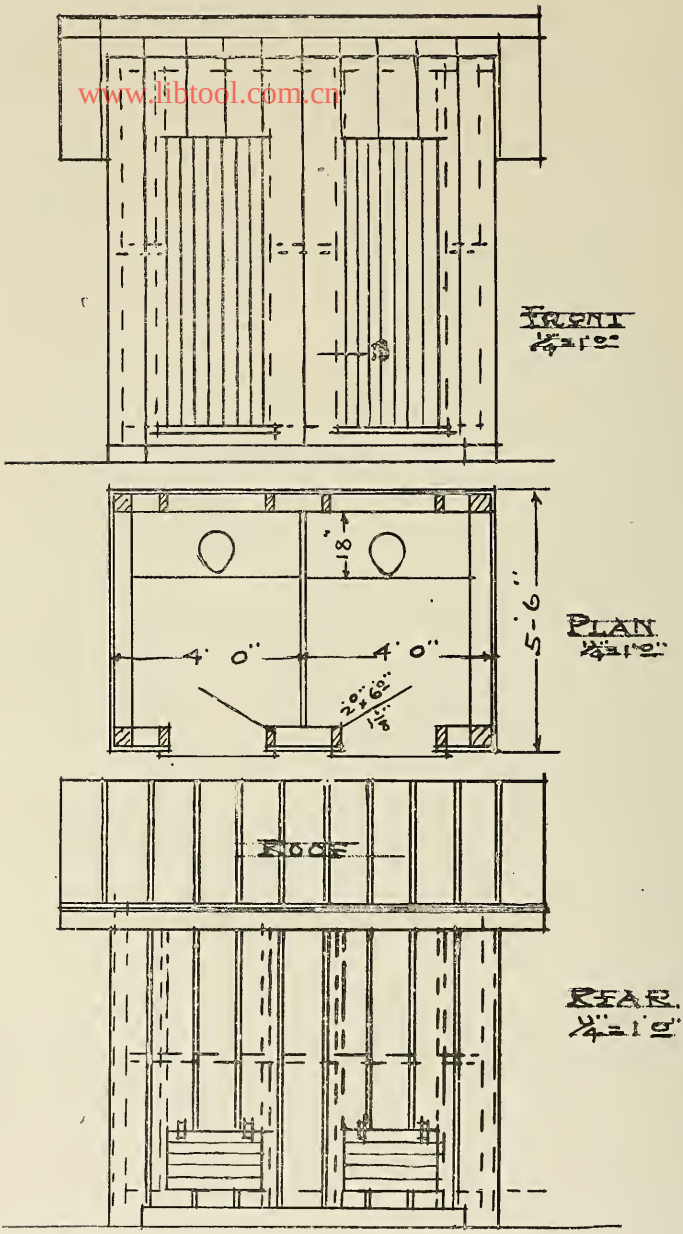
A privy of this kind not only serves as a breeding place for flies, but is a source from which typhoid fever, hookworm disease and other diseases frequently spread. We have learned that no greater danger threatens the health, happiness and prosperity of our homes than the unsanitary privy, for which there is no excuse.



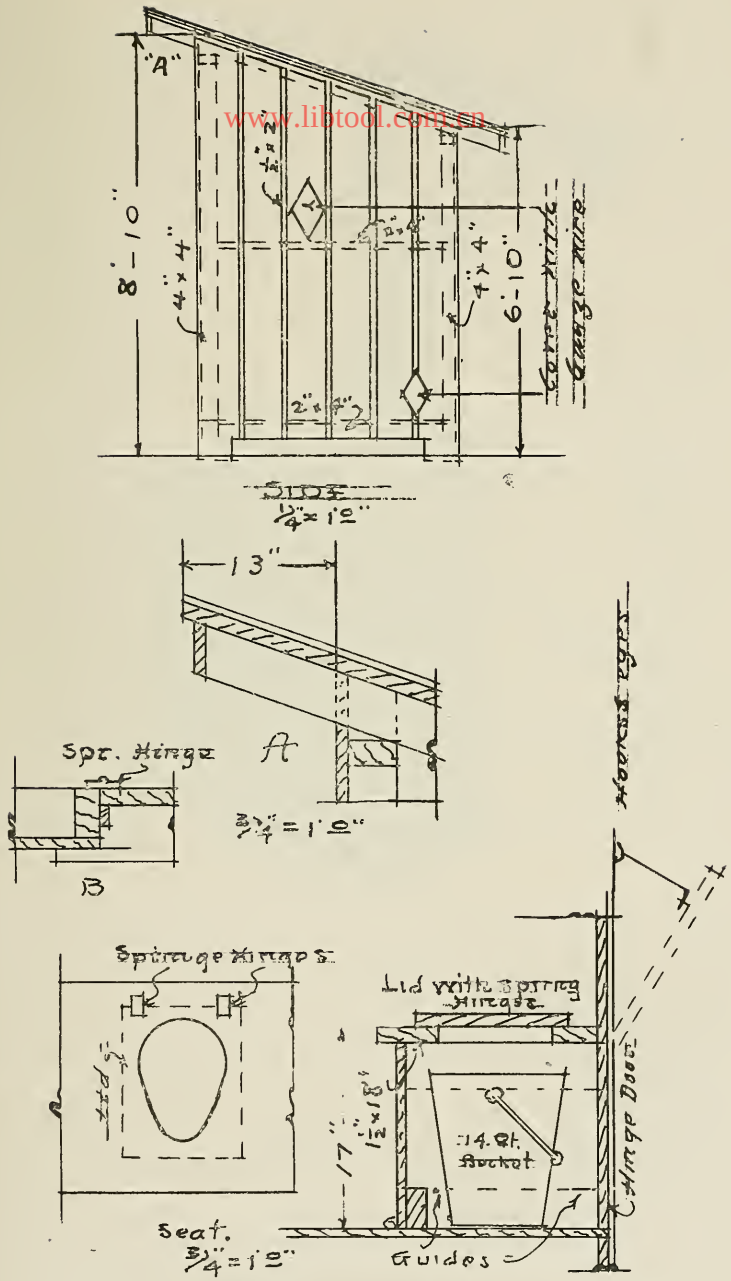
This kind of privy, while not as sanitary as sewerage, will, if properly constructed and kept, minimize the danger of spreading disease to such an extent that it may be called a sanitary privy. In its construction it should be made fly proof, ventilated as shown in the cut, and elevated off the ground, so as to keep the earth dry and prevent the breeding of rats.

BILL OF LUMBER FOR PRIVY.

2 Pcs. 4x4x7 corner posts
2 " 4x4x6 " "
4 " 2x4x8 rafters
4 " 2x4x7 sills
4 " 2x4x5 "
4 " 2x4x5 joists
2 " 2x4x8 plates
2 " 2x4x5 1-2 plates
2 " 2x4x5 1-2 nailing strips
2 " 2x4x8 " "
2 " 2x4x14 guides and supports for seat
4 " 1 1-2x2x3x10 sheathing
60 Ft. B. M. flooring T. and G.
22 Pcs. 1x10x16 siding and top
24 " 1-2x2x16 siding, and top strips
1 Pc. 1 1-8x18x8 for seat—dressed
2 Pcs. 7-8x12x12 for seat flaps
30 Ft. B. M. flooring for doors—12 f. length
20 " " " " " front of seat
2 hooks and eyes for flap door
2 Pr. hinges for doors on rear
2 Pr. spring hinges for front doors
2 Pr. hinges for flaps on seat
5 Lbs. 20 penny nails
5 " 8 " "
1 Yard gauze wire
2 14-quart galv. iron buckets 12 in. high.



Working Drawings of Privy.



Working Drawings of Privy.

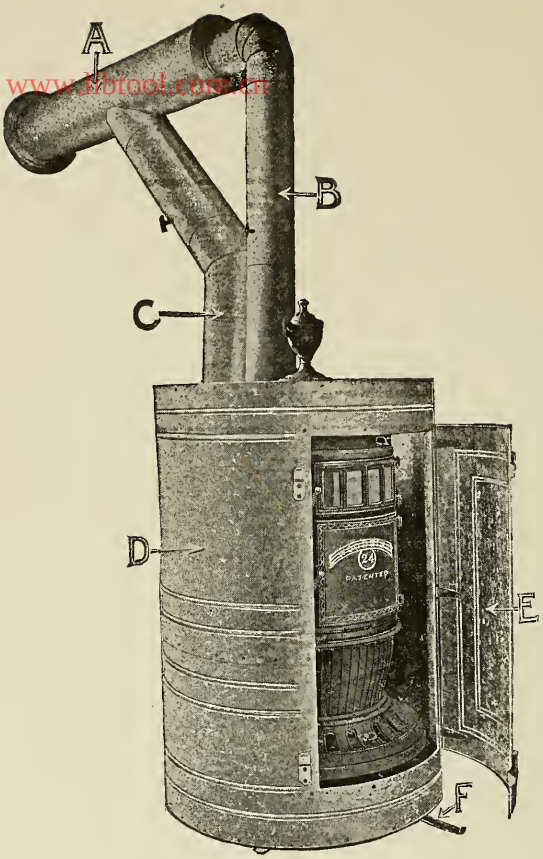


FIG. A.

Fig. A shows front of Old Dominion system, with door E open, showing heater inside.

D Galvanized reinforced iron drum.

F Register handle regulating the supply of fresh air under the heater.

B Stove pipe.

C Foul duct or pipe, running at an angle of 45 degress connecting with

A Combined smoke and foul air air pipe, having the same capacity of pipes B & C combined.

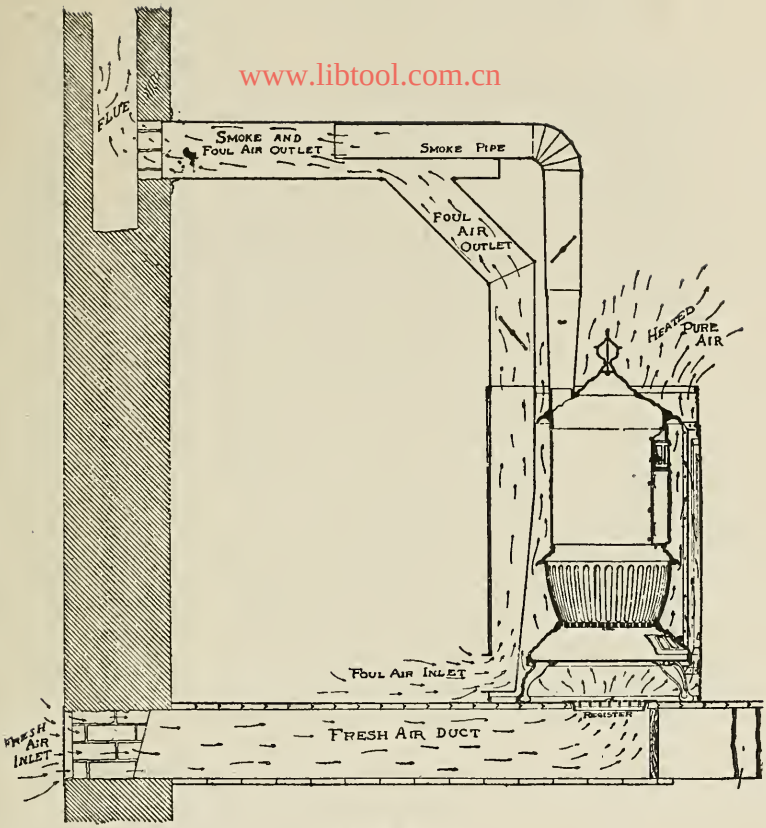


FIG. B.

Showing operation of Old Dominion System.—The manufacturers claim the Old Dominion System, shown in Figs. A and B, is best because,

It warms the room with pure fresh air, and combines a duct or pipe to exhaust the vitiated or foul air; no other system does this

It does not require a separate independent foul air flue of brick or metal; all other systems do.

It is simple, easy to set up, and easy to regulate, all other systems are complicated.

It does not clog with soot and rot out, requiring expensive experts to repair; other systems do.

It draws the foul or vitiated air from floor of room by Synhon Suction combined with the heater; no other system can or does do this.

It is the cheapest of all heating and ventilating systems, because it combines heater, ventilating drum, ventilating mat, stove pipe and foul air pipe or duct. Pipe furnished free, 6 ft. 4 ins. from center of heater, additional lengths 50 cents per foot. All other systems require expensive independent foul air flues or ducts, either metal, brick or stone.

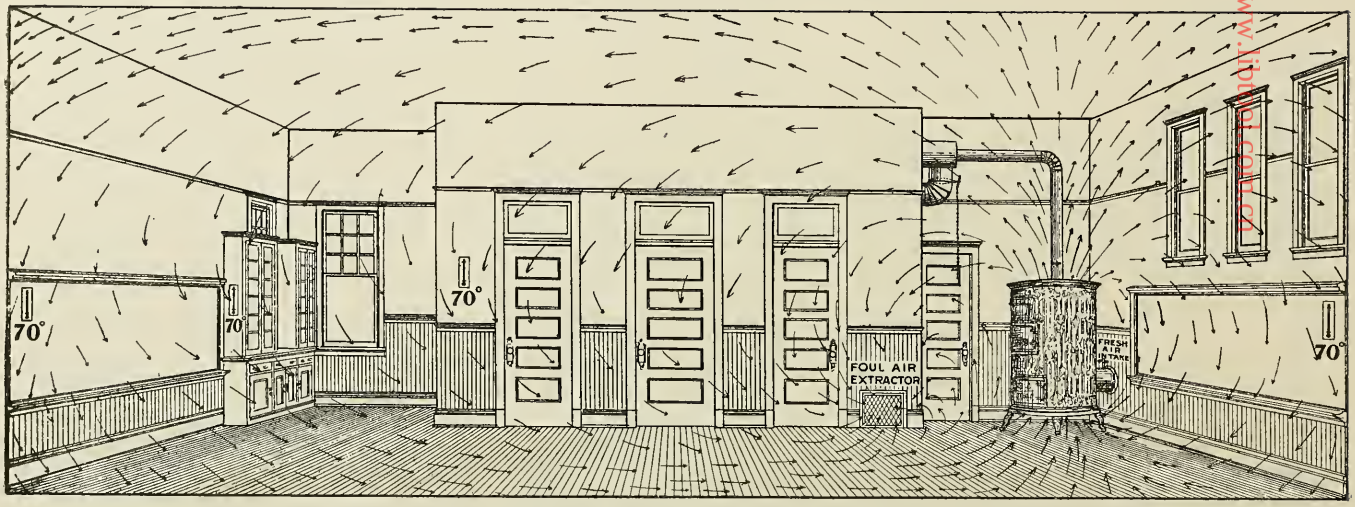
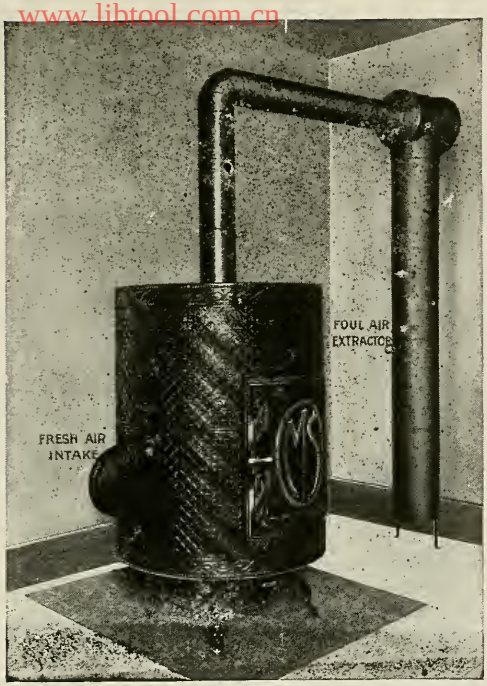


Fig. C.—Showing the circulation of air when the Smith System is used.



THE SMITH SYSTEM CONVECTION HEATER

The manufacturers claim the Smith System as shown in Figs. C, and D, is better than a stove.

Because it
1. Heats the whole room quickly.
2. Supplies plenty of warm fresh air.
3. Removes the cold foul air.
4. Warms the floors.
5. Does not "roast" persons near it.
6. Warms the persons farthest away.
7. Is economical in fuel.
8. Is much more pleasing in appearance.
9. Prevents headaches, colds and the spread of contagious diseases.
10. Furnishes a healthful, delightful atmosphere in which to work.

Is better than a basement furnace.
Because it
1. Gives quicker results.
2. Gives better ventilation.
3. Gives more even distribution of heat.
4. Will last longer.
5. Does not require a basement.
6. Heats only the room intended.
7. Is under better control by the teacher.
8. Does not require a janitor.
9. Uses 50% less fuel.
10. Costs only a fourth or half as much.

PLANS

FOR

RURAL SCHOOL BUILDINGS

BY

The Division of Drawing and Designing,

Engineering Department,

Clemson College.

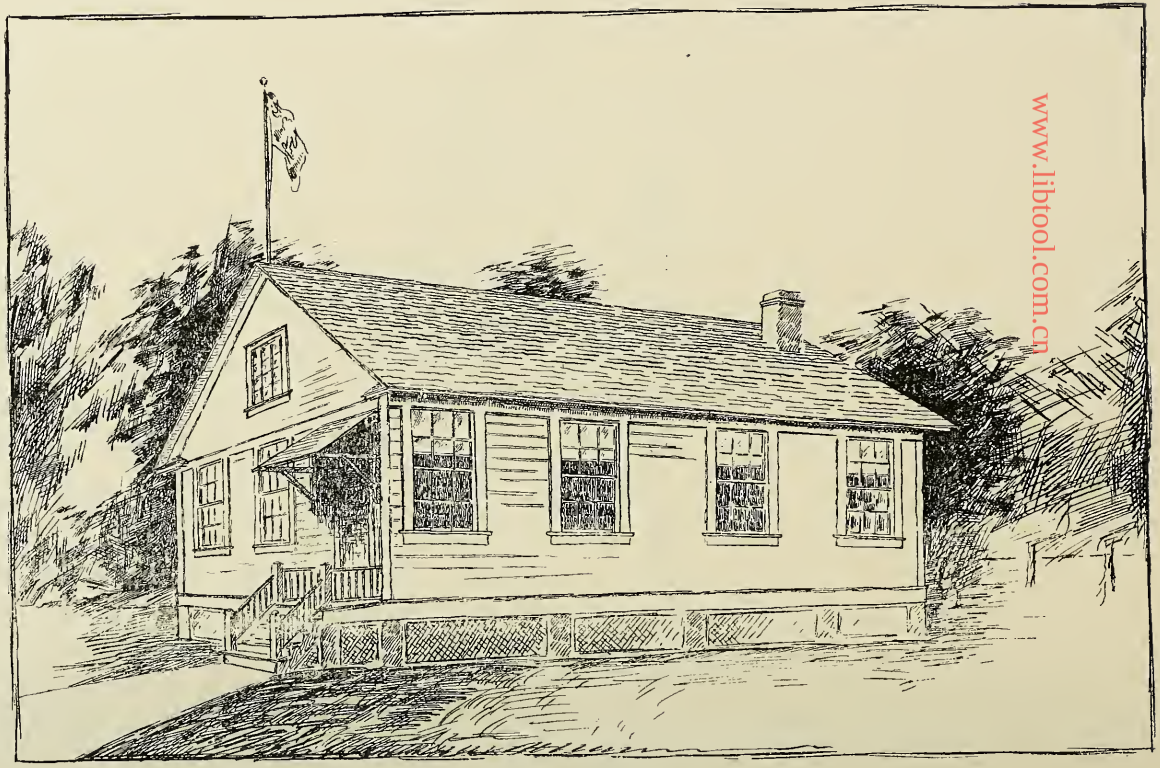


Fig. 1. Design 1.

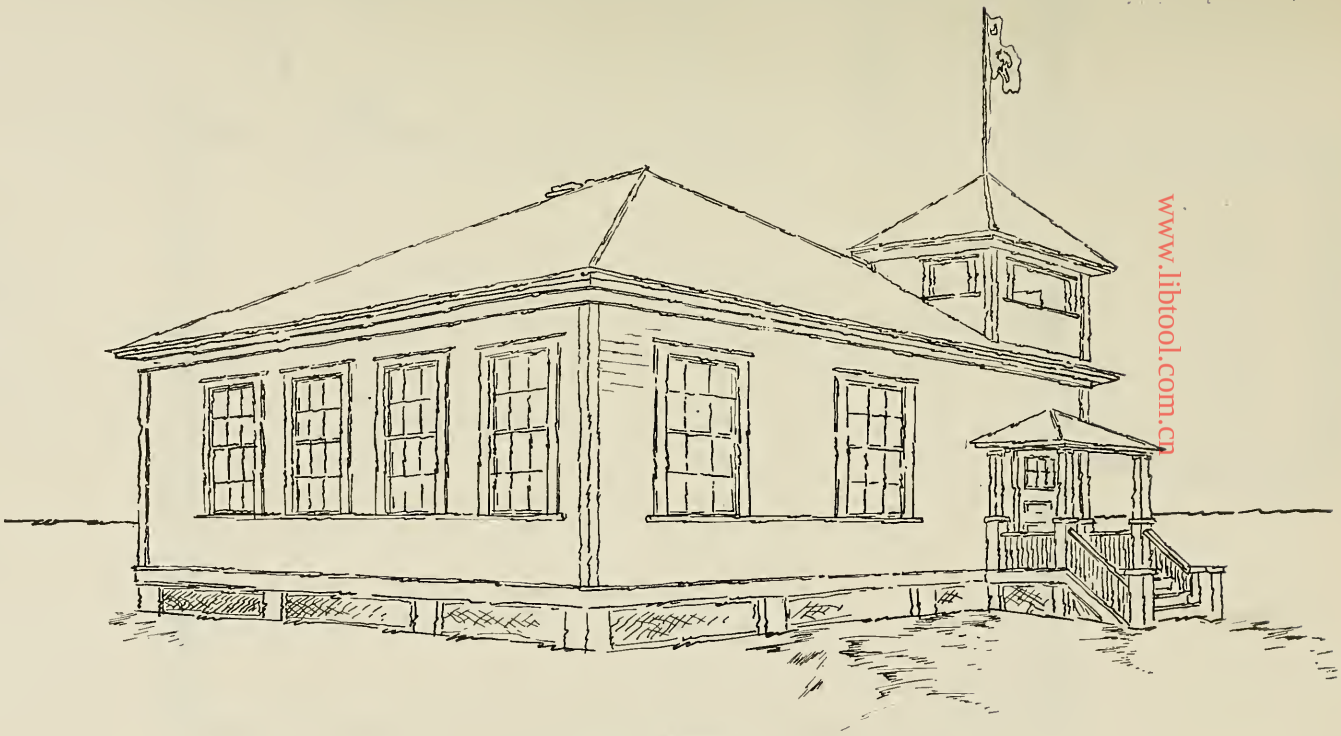


Fig. 2. Design 1.

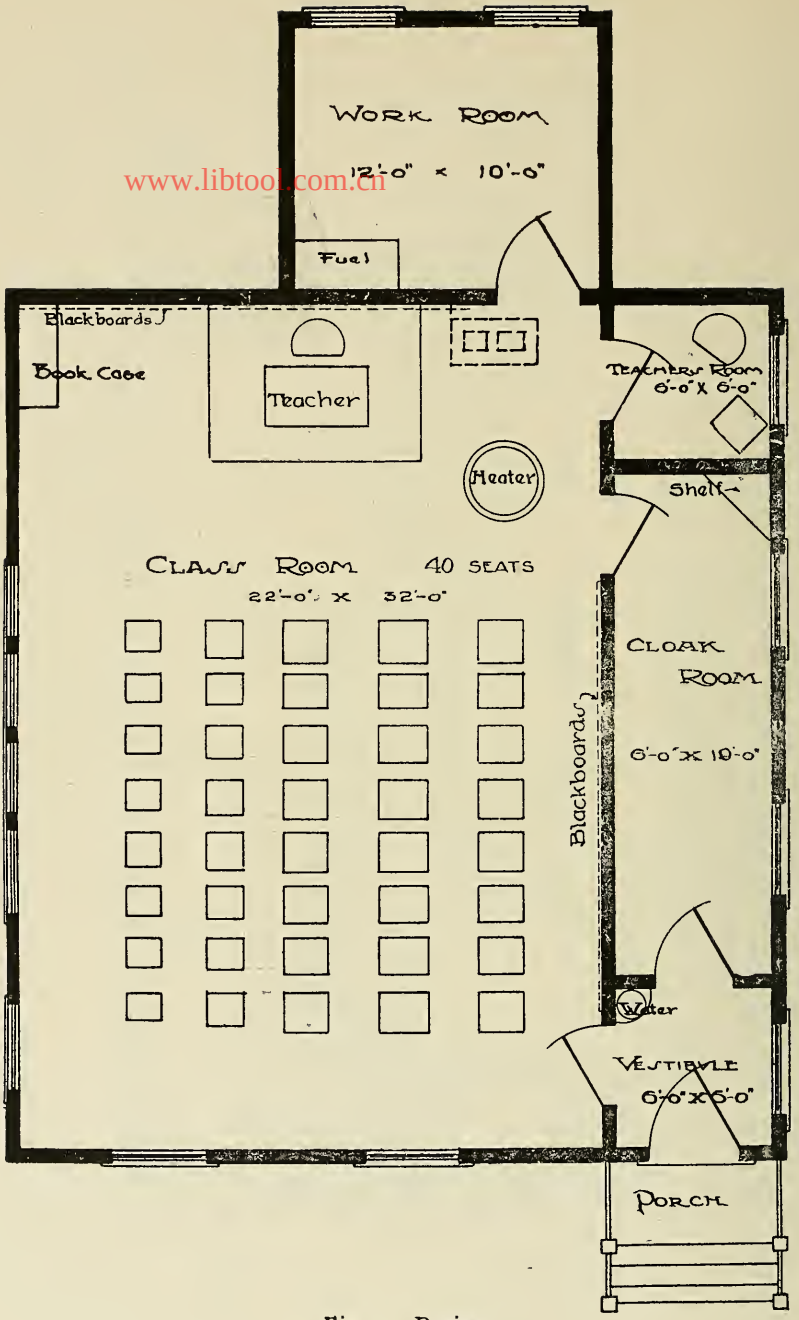


Fig. 3. Design 1.

DESIGN NO. 1.

A Model One-Room School Building.

This is a good plan for a one-room school building which can be erected at small cost. It has ample vestibule and cloak room is well lighted and can be heated by jacket stove or furnace. The windows are grouped on the pupils' left and are placed high in the walls, their tops being almost 6 inches below the ceiling. This arrangement is used in all of the designs shown. Fgs. 1 and 2 show alternate designs for the exterior of the building.

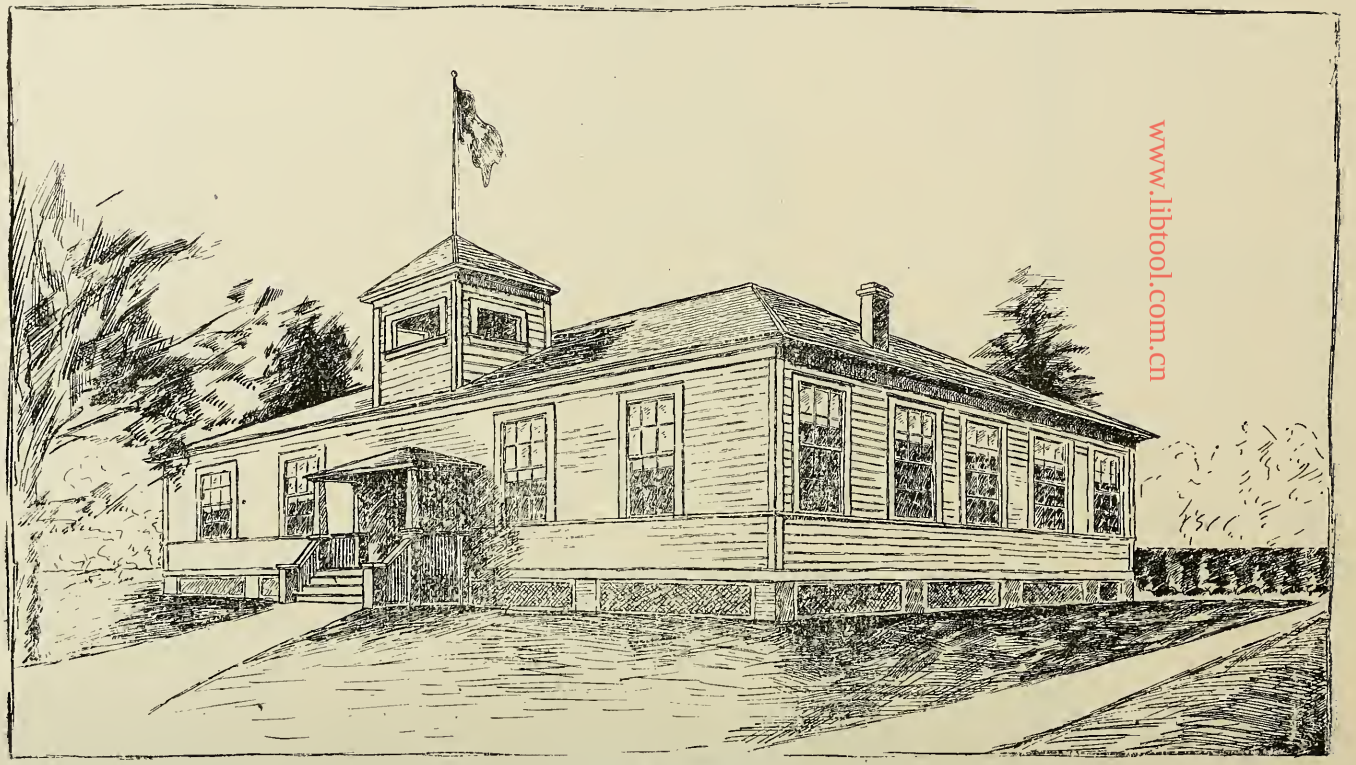


Fig. 4. Design 2.

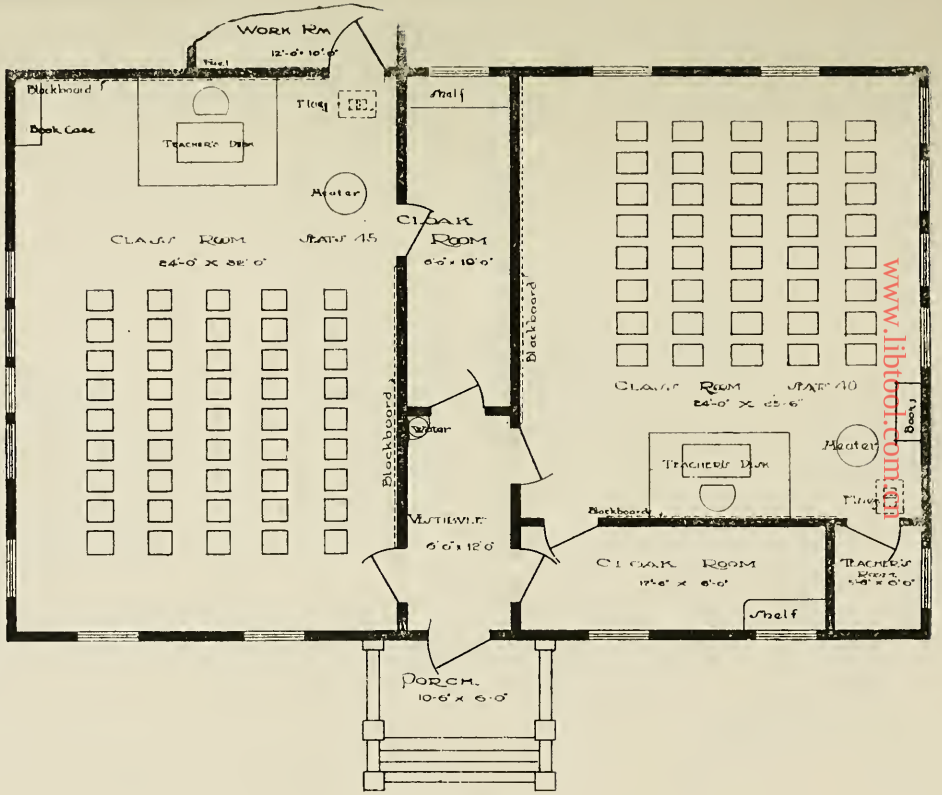


Fig. 5. Design 2.

DESIGN NO. 2.

A Model Two-Room School Building.

This building is well arranged in every way for the accommodation of the teachers with their classes . It will be noticed with what few changes this plan can be gotten from Design No. 1. This will allow a community to erect a one-room building and as the community grows the building can be enlarged by the addition of a second room as shown in this design, and of a third room as shown in Design 3.

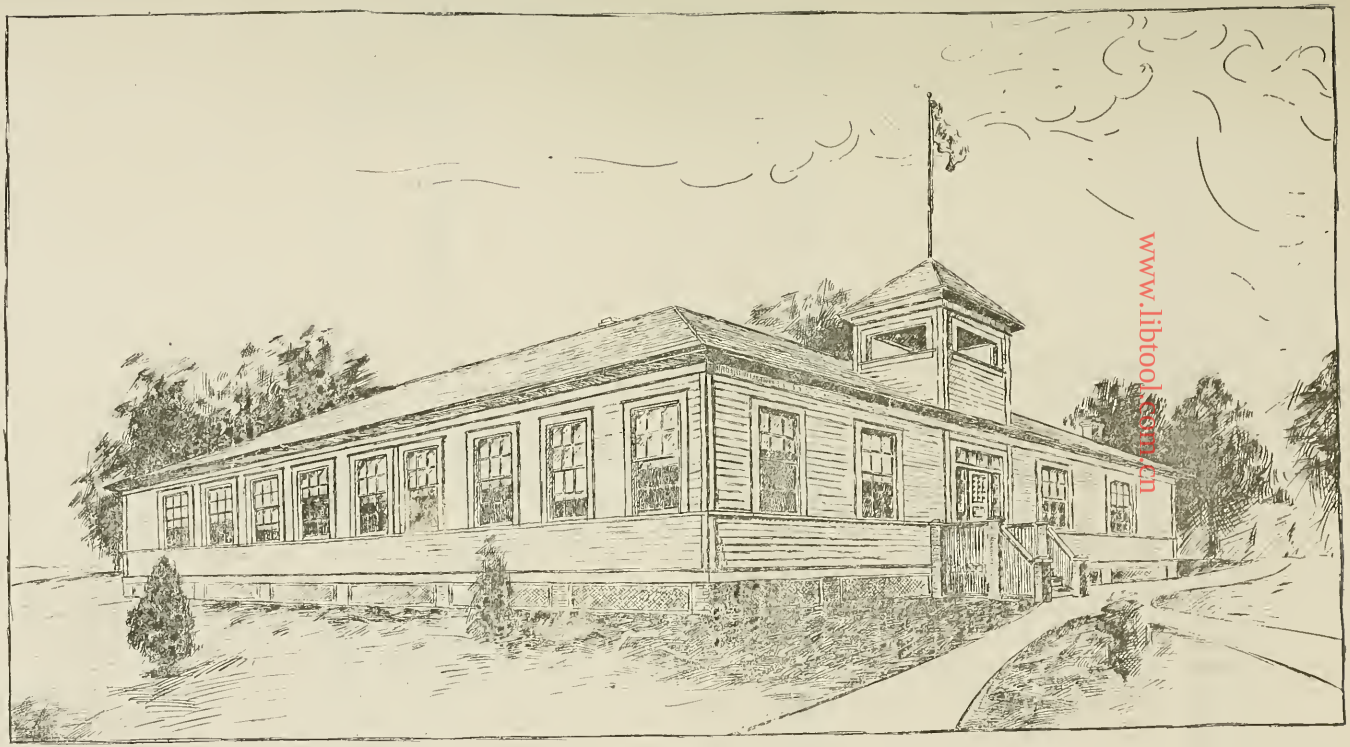


Fig. 6. Design 3.

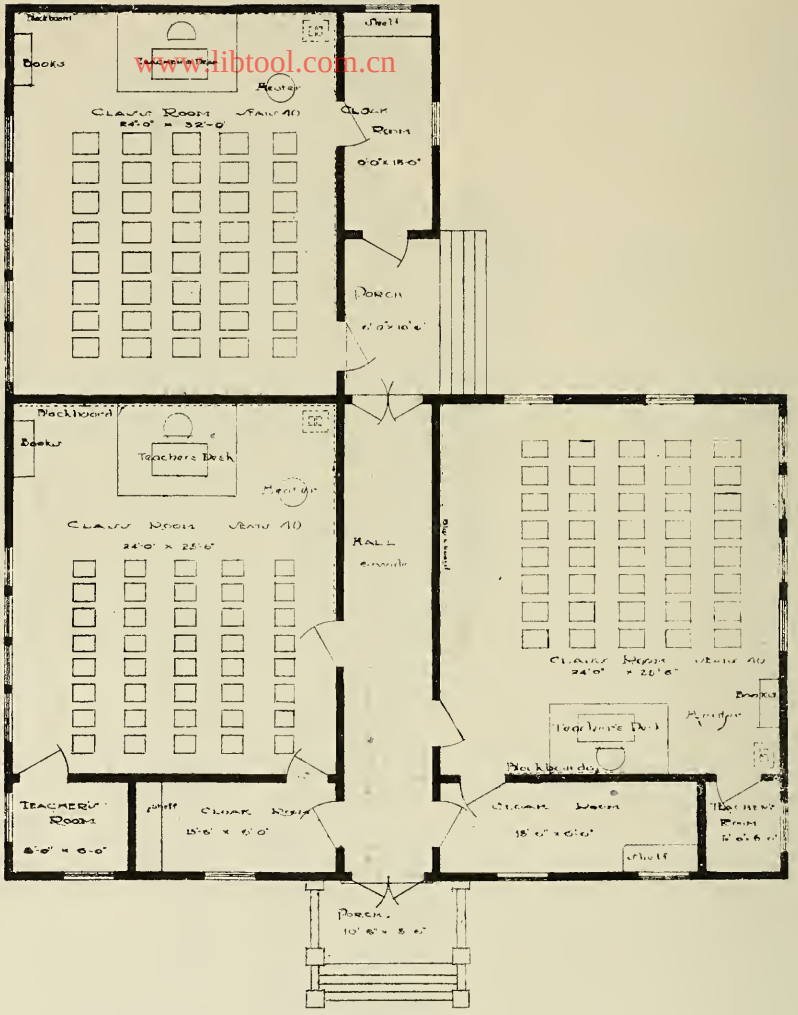


Fig. 7. Design 3.

DESIGN NO. 3.

A Model Three-Room School Building.

This design shows the completion of this series of one, two and three room buildings. The arrangement is good, the class and cloak rooms are large and well lighted. The exterior is simple, of good plain lines and inexpensive construction.

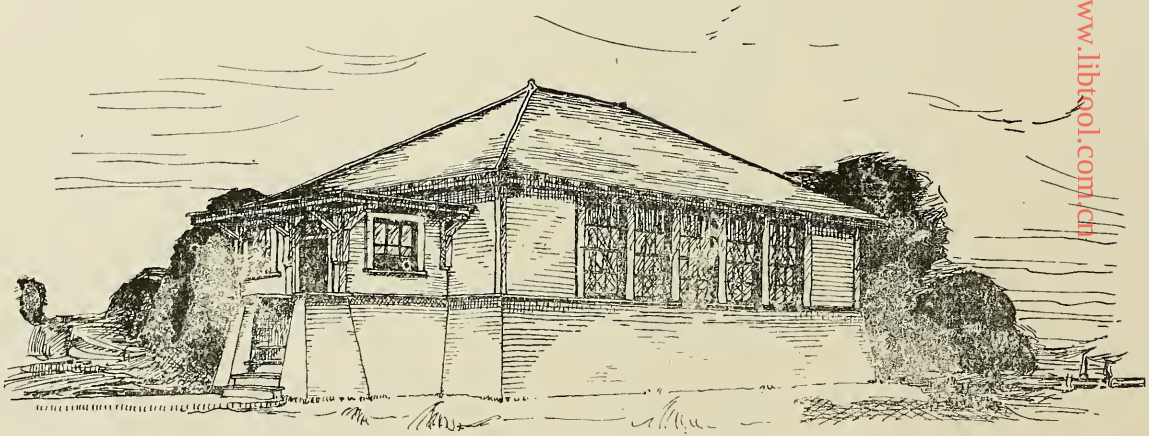


Fig. 8. Design 4.

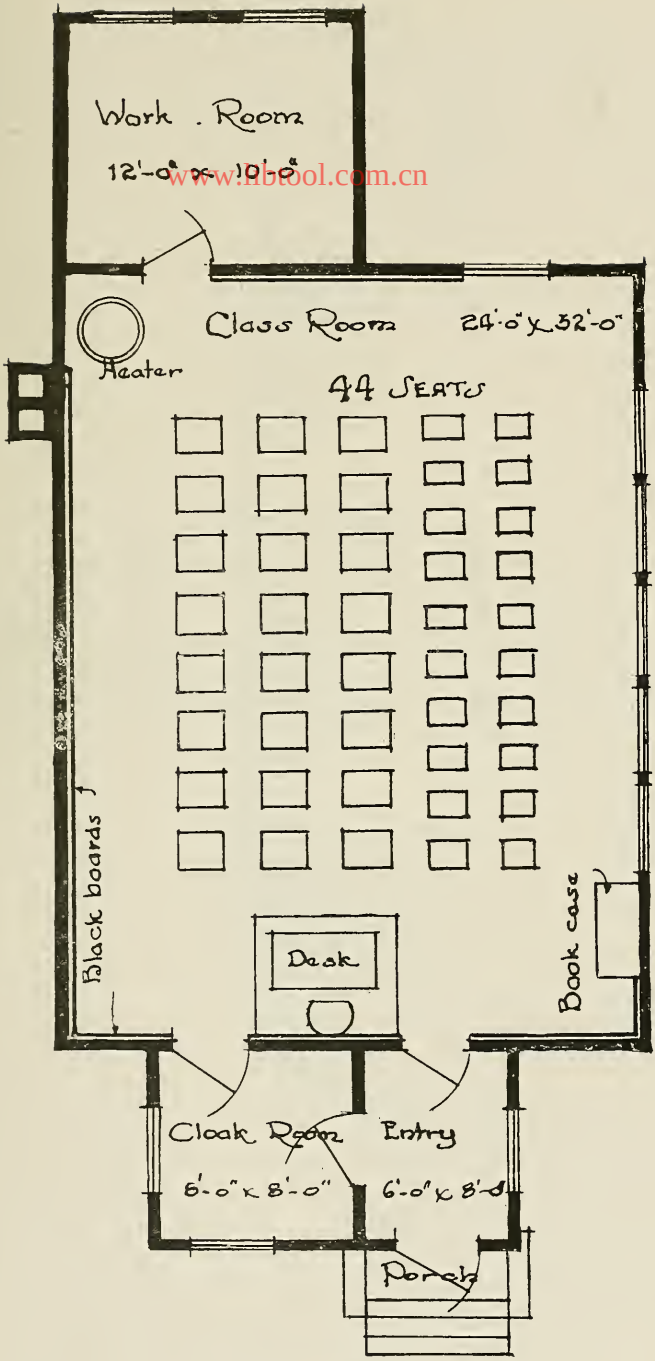


Fig. 9. Design 4.

DESIGN NO. 4.

A Model One-Room School Building.

This design is the beginning of another series of one, two and three-room school buildings. The arrangement of rooms is good and the exterior is externally attractive. It would look par icularly well in the country, especially if constructed of rough stone, which can be obtained at small cost in so many parts of our State.

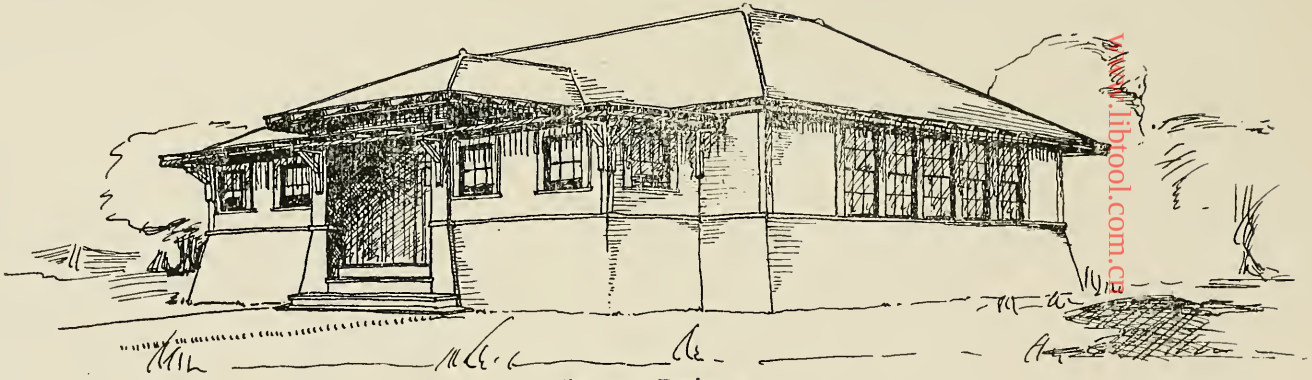


Fig. 10. Design 5.

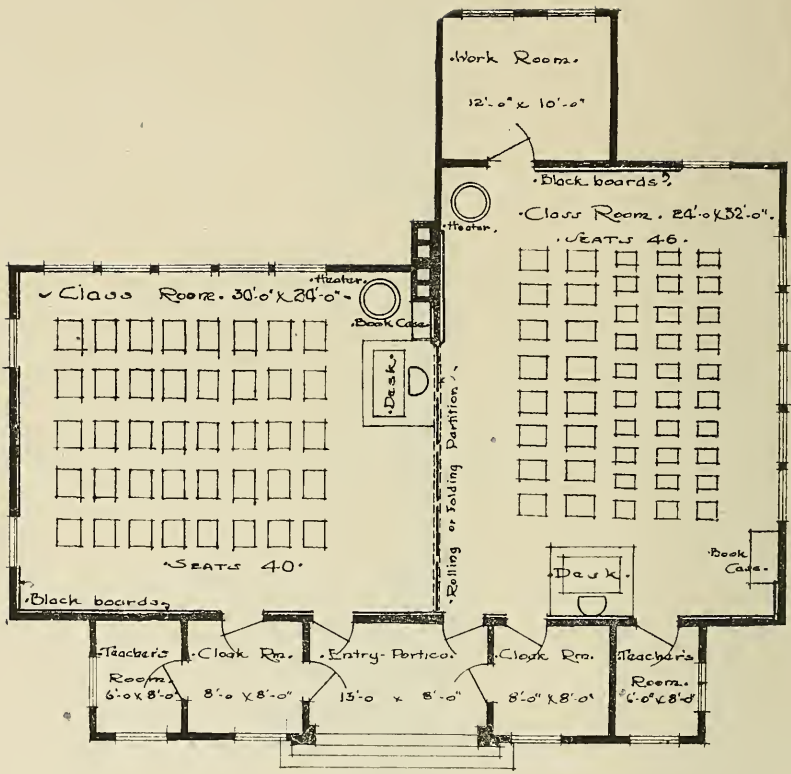


Fig. 11. Design 5.

DESIGN NO. 5.

A Model Two-Room School Building.

By the addition of a class room, with its teacher's and cloak room, on the left of the room shown in Design 4, we obtain a well arranged and in every way desirable two-room building. By means of the rolling partition the two rooms can be thrown into one, and if the seats are put on strips they can be quickly shifted to face the speaker.

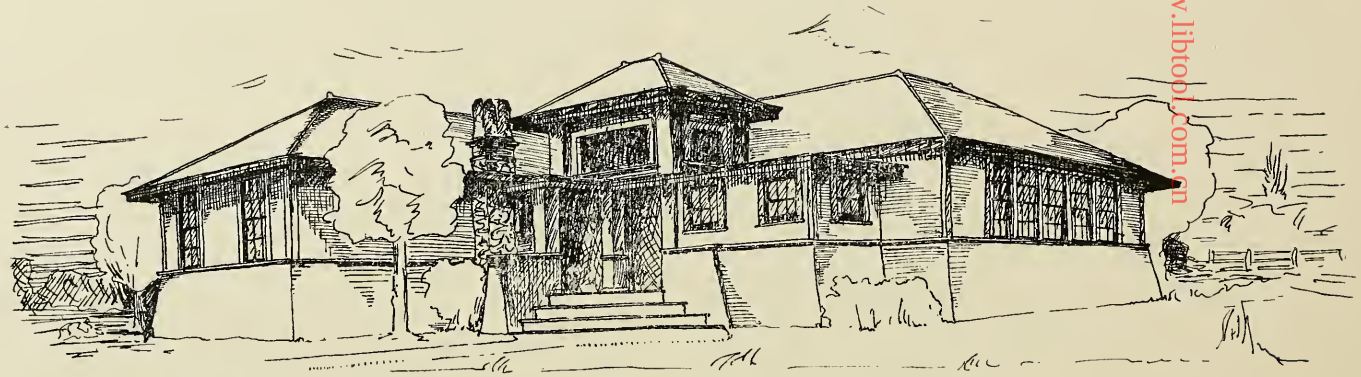


Fig. 12. Design 6.

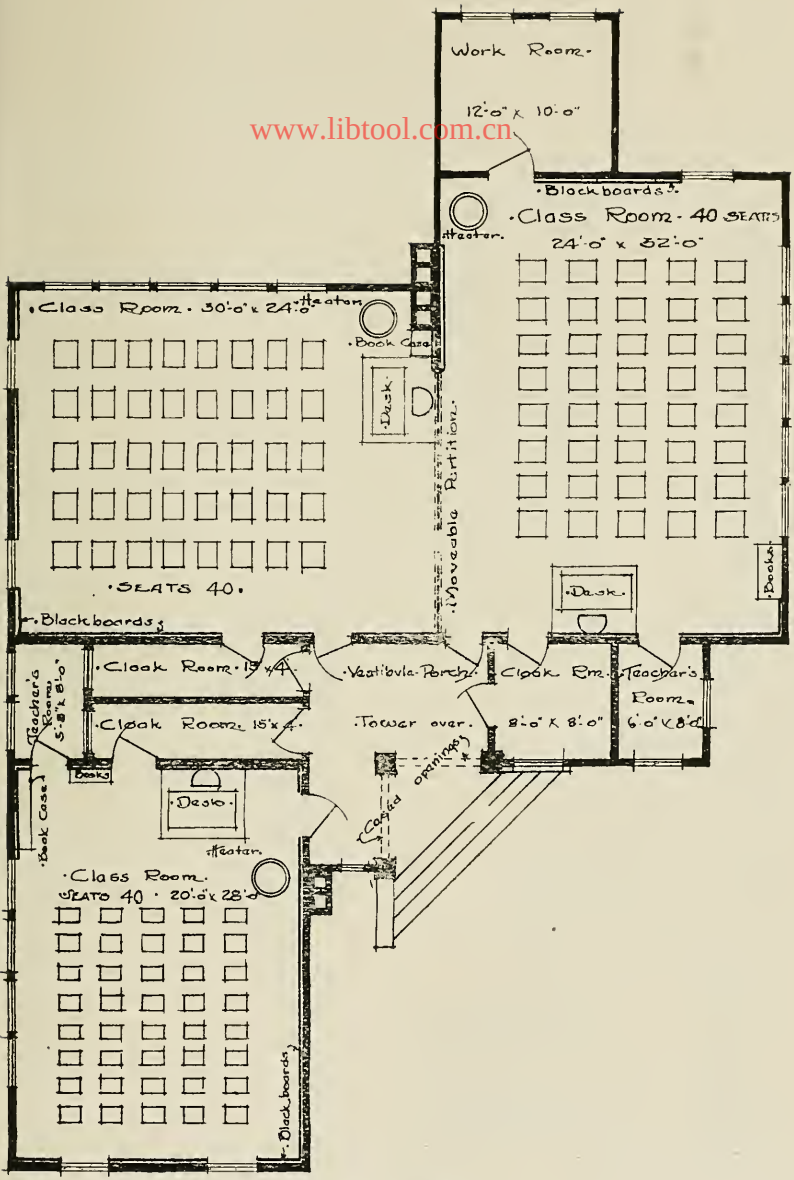


Fig. 13. Design 6.

DESIGN NO. 6.

A Model Three-Room School Building.

Extremely neat and artistic, all well arranged and well lighted, this desgn is one of the most desirable shown. Notice the addition of the third room, making a complete three-room building.

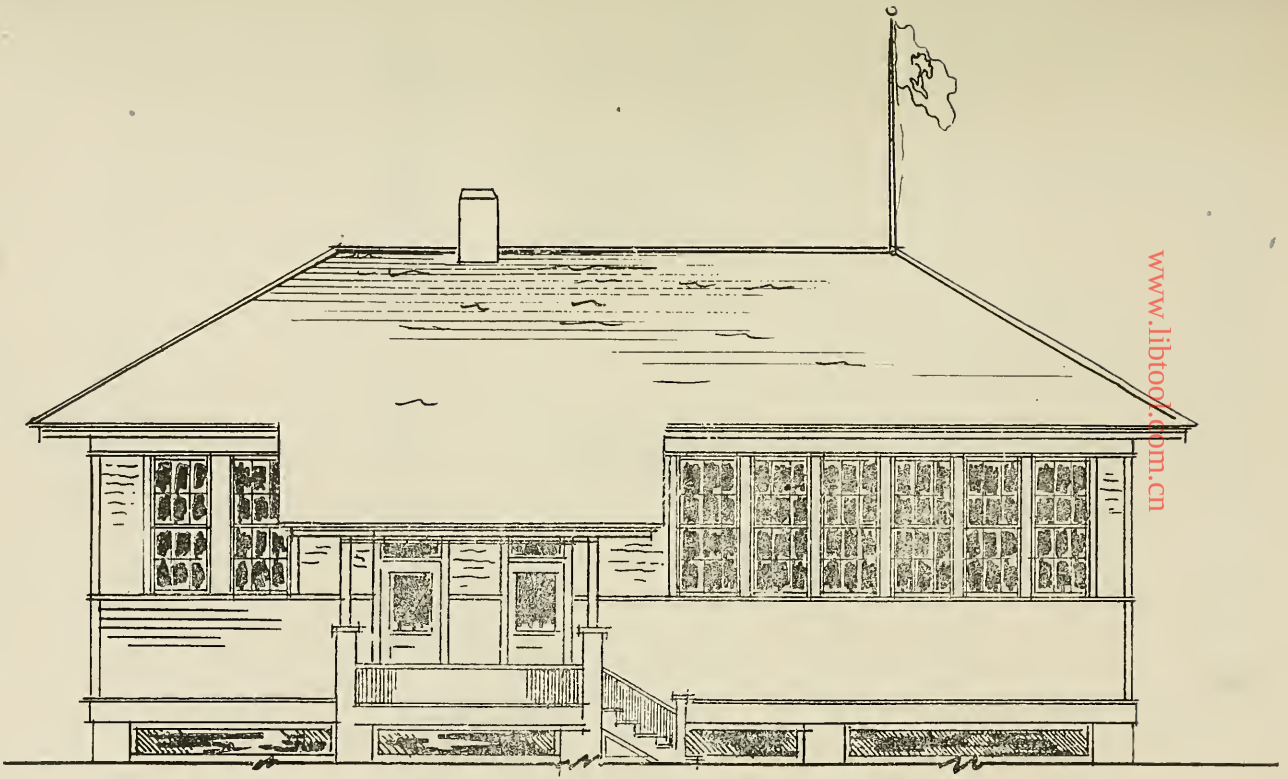


Fig. 14. Design 7.

Fig. 15. Design 7.

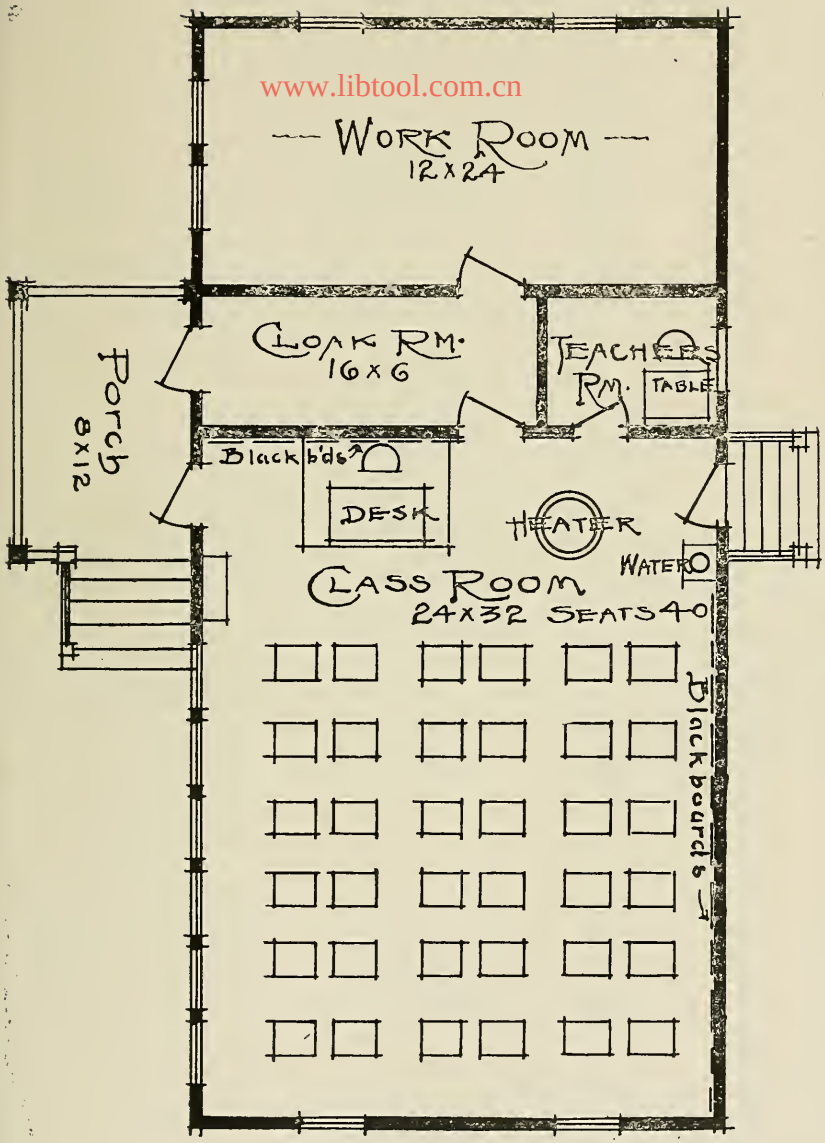


Fig. 16. Design 7.

DESIGN NO. 7.

A Model One-Room School Building.

This neat one-room building has many desirable features. The class room is conveniently arranged and well lighted. The cloak room is large and adjoins the class room permitting of entrance to the class room through the cloak room. The teacher's room is for the personal use of the teacher or for storage of supplies. The partition between the cloak room and teachers' room is only six feet high. The work room is a very desirable feature in all of these designs, but it can be omitted if desired.

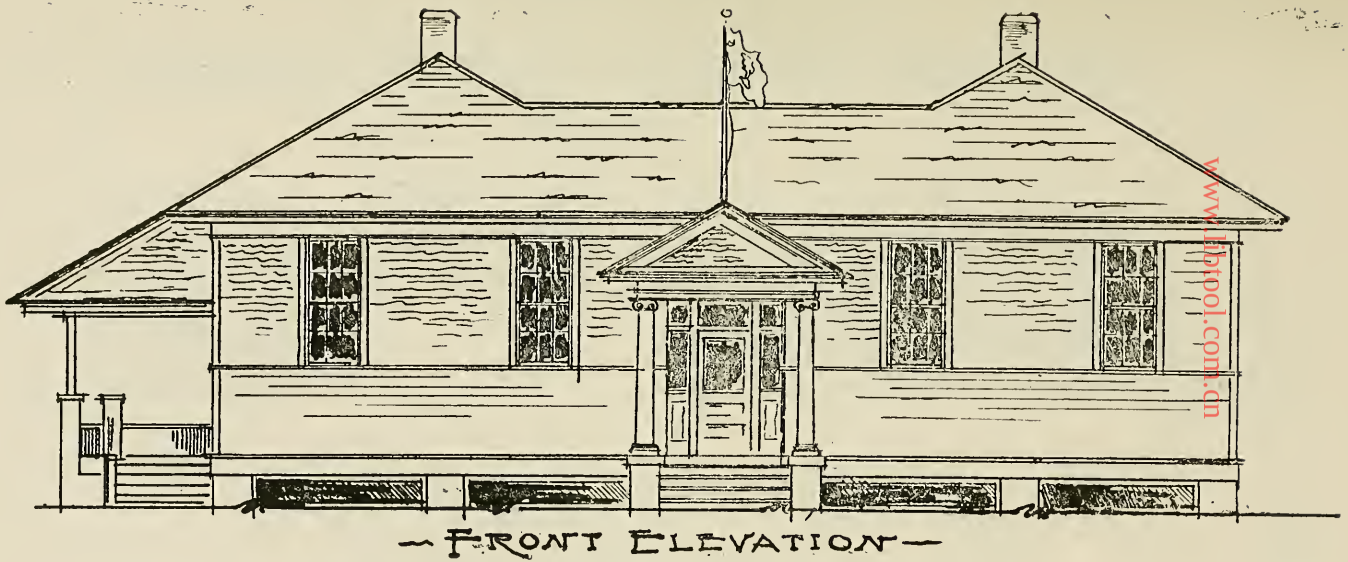


Fig 18. Design 8.

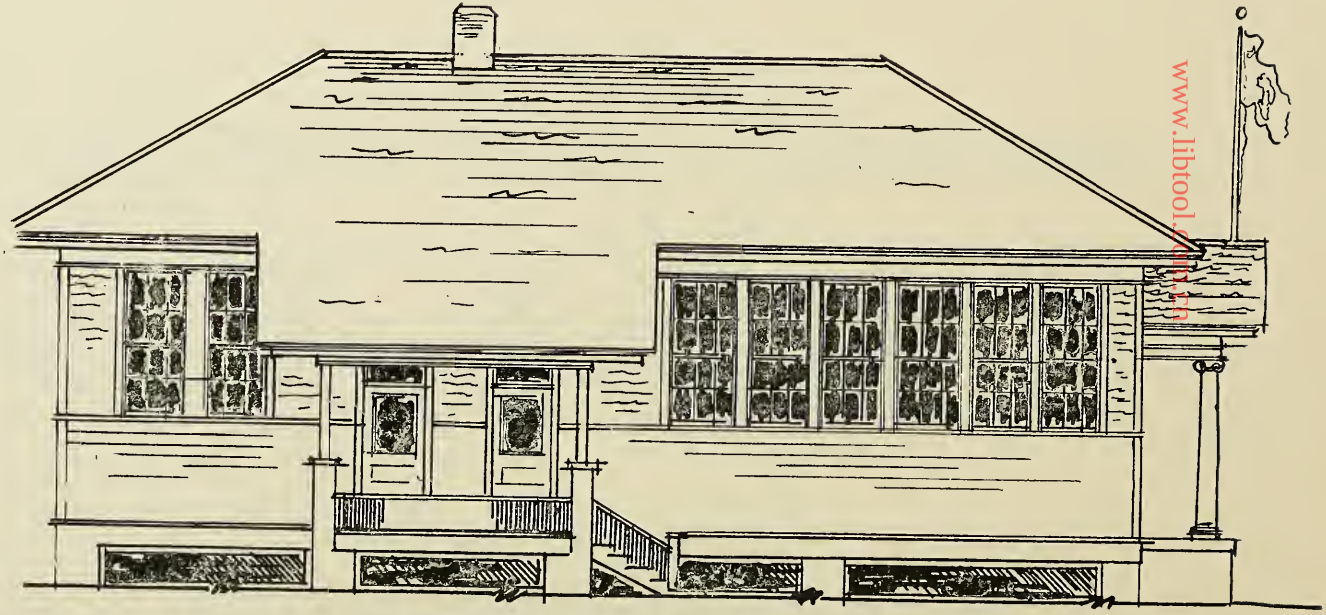


Fig. 19. Design 8.

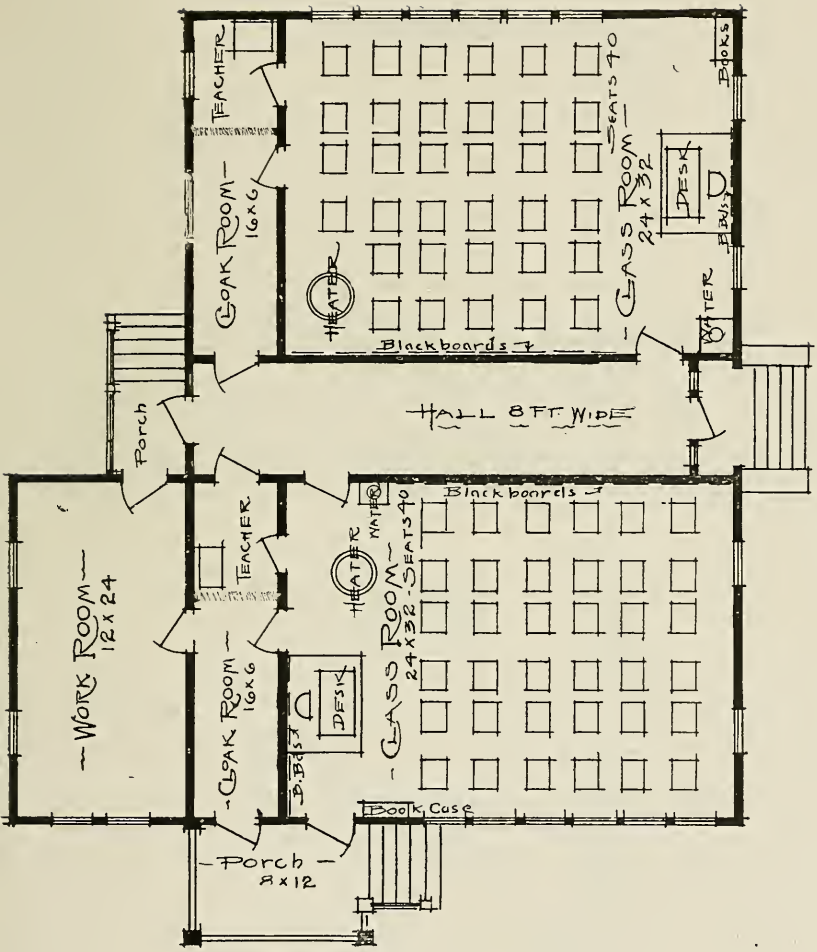


Fig. 20. Design 8.

DESIGN NO. 8.

A Model Two-Room School Building.

This design shows two class rooms with many desirable features. It has ample hallway, cloak rooms and teachers' rooms. The windows in the front of the right hand class room should be covered with shades, so as to keep their light from injuring the eyes of the pupils. This design is an enlargement of number 7 obtained by adding the right hand room.

Fig. 21. Design 9.

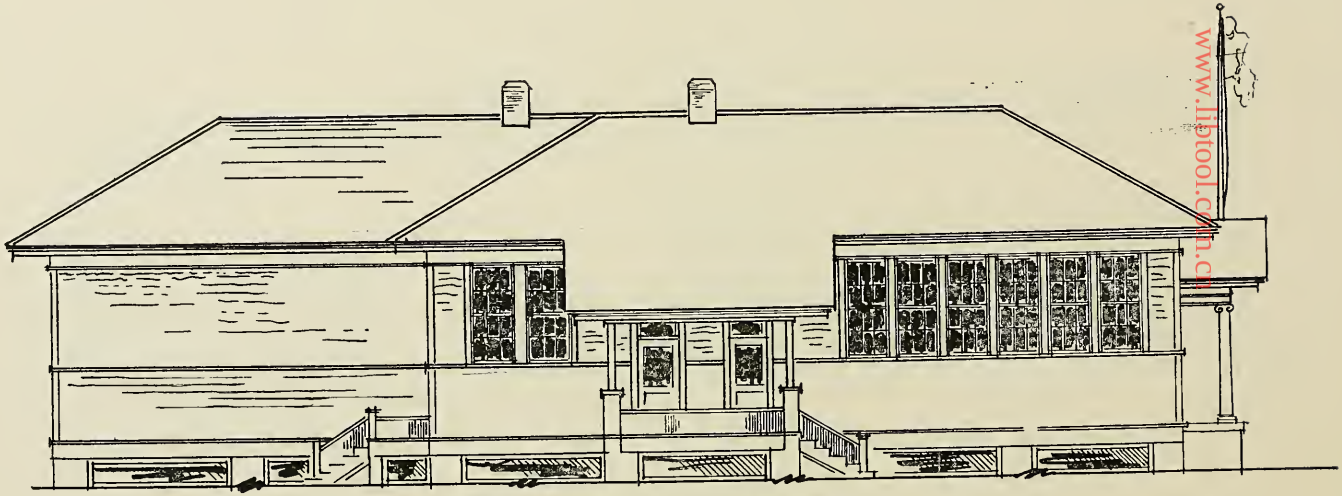


Fig. 22. Design 9.

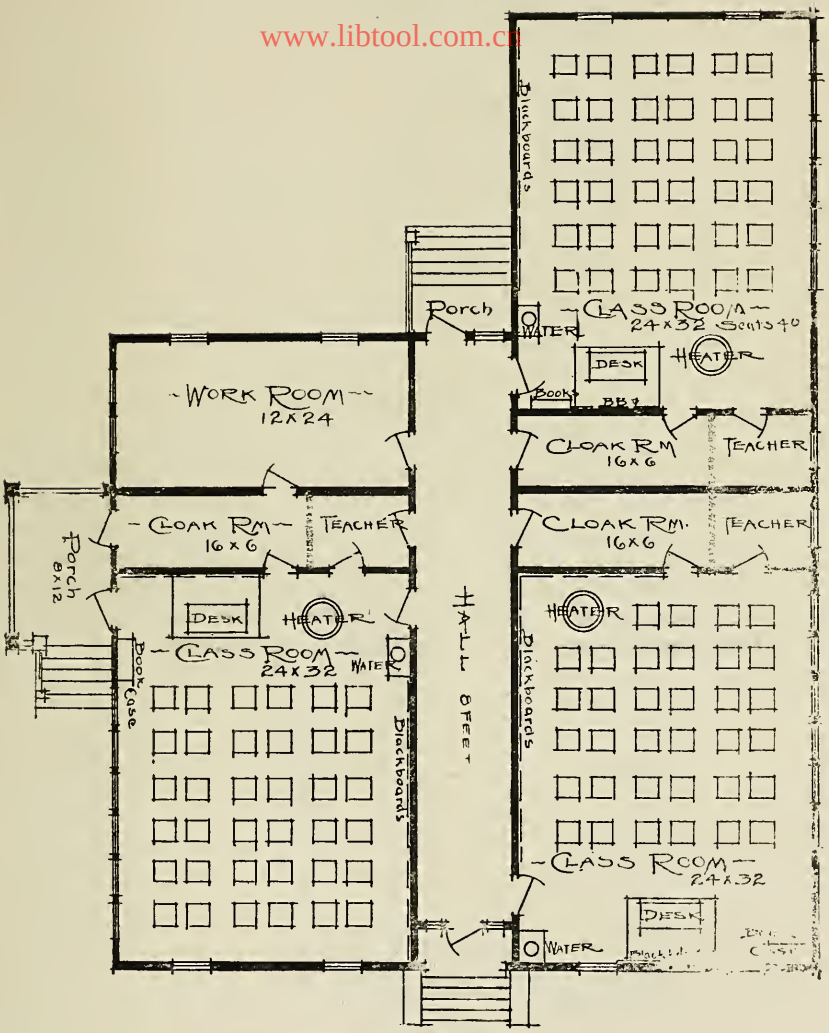


Fig. 23. Design 9.

DESIGN NO. 9.

A Model Three-Room School Building.

A third room is added in the rear of those shown in Design 8, making this excellent three-room building. The class rooms are all well lighted and ventilated. By means of the low partitions between the cloak rooms and teachers' rooms the cloak rooms have ample light. The exterior is plain and of good proportion. It would look well with the sides of the building between windows shingled and stained.

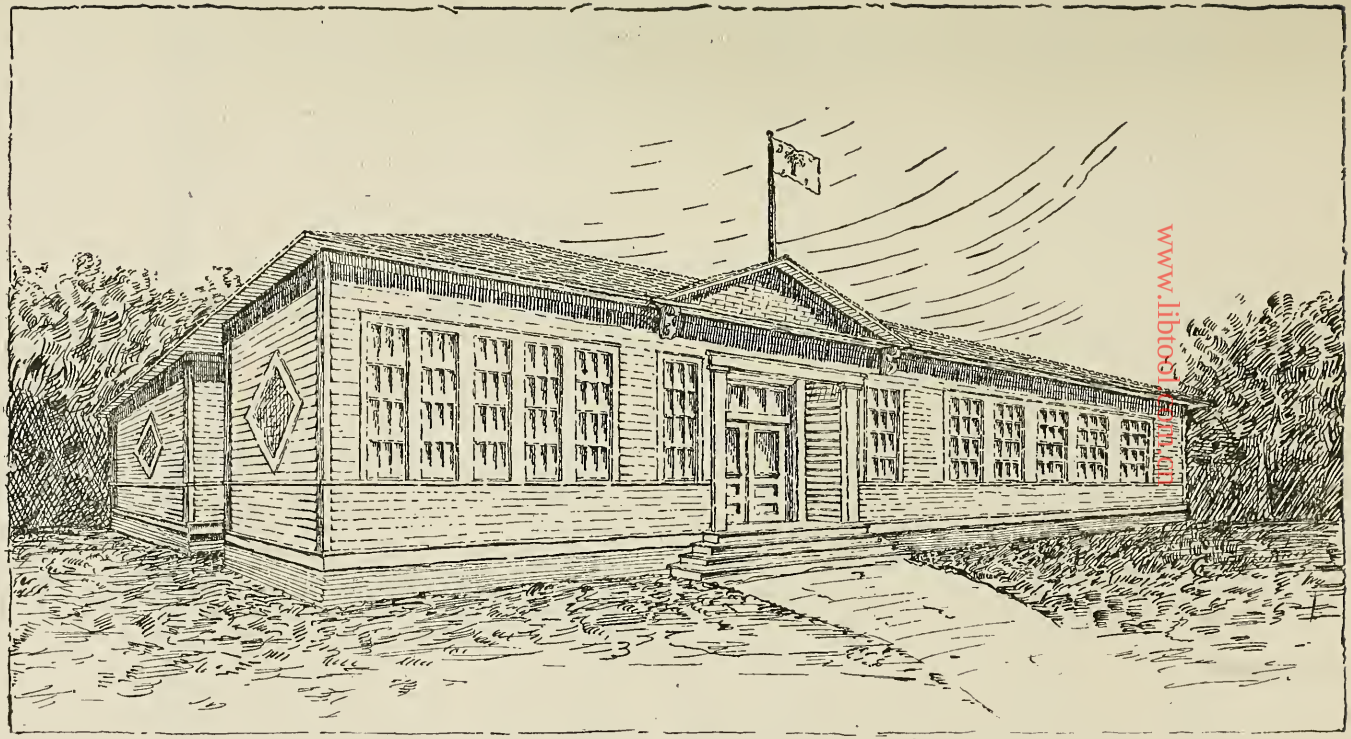


Fig. 24. Design 10.

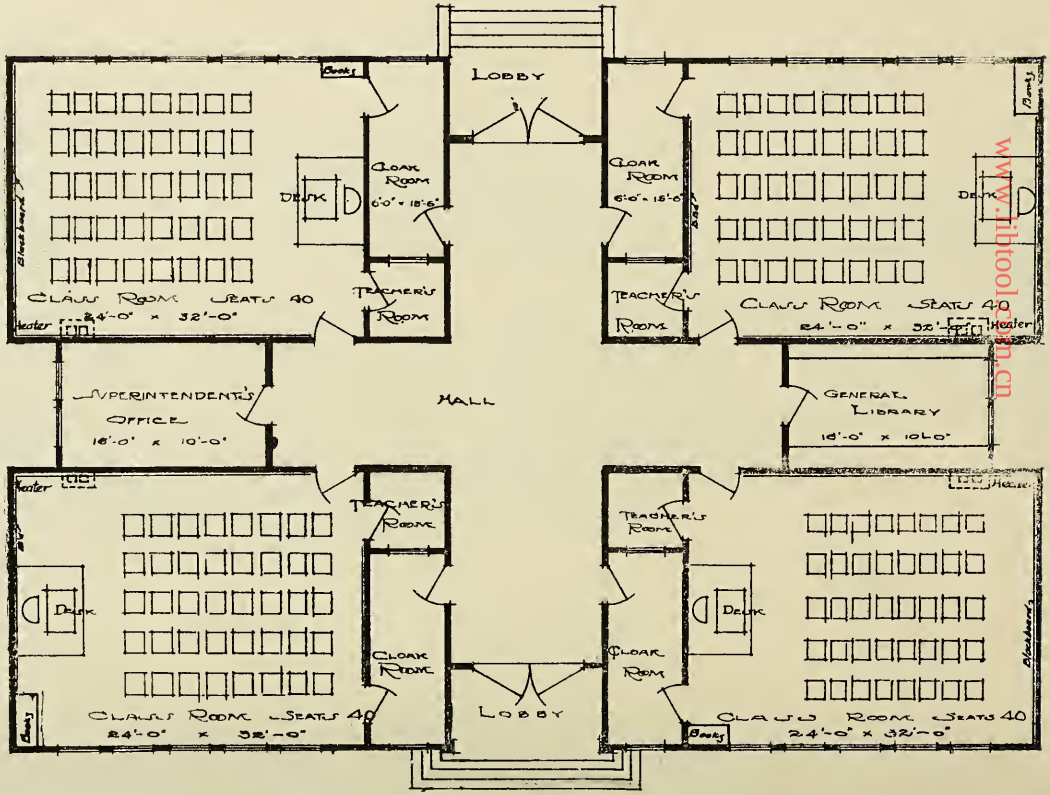


Fig. 25. Design 10.

DESIGN NO. 10.

A Model Four-Room School Building.

This is a most excellent design for a four room school building. It is a perfect example of bilateral lighting, a model seating space, and a model arrangement of cloak rooms and teachers' rooms. The hall is large and by means of the large glass doors and high transoms, it receives ample light. The superintendent's office and library are well situated and of good size. These rooms could be used for other purposes. The building can be heated by jacket stoves in each room as shown, or by furnace placed in the basement.

The building is of frame construction and has a pleasing appearance. A second story containing an auditorium, or additional class rooms, could be added.

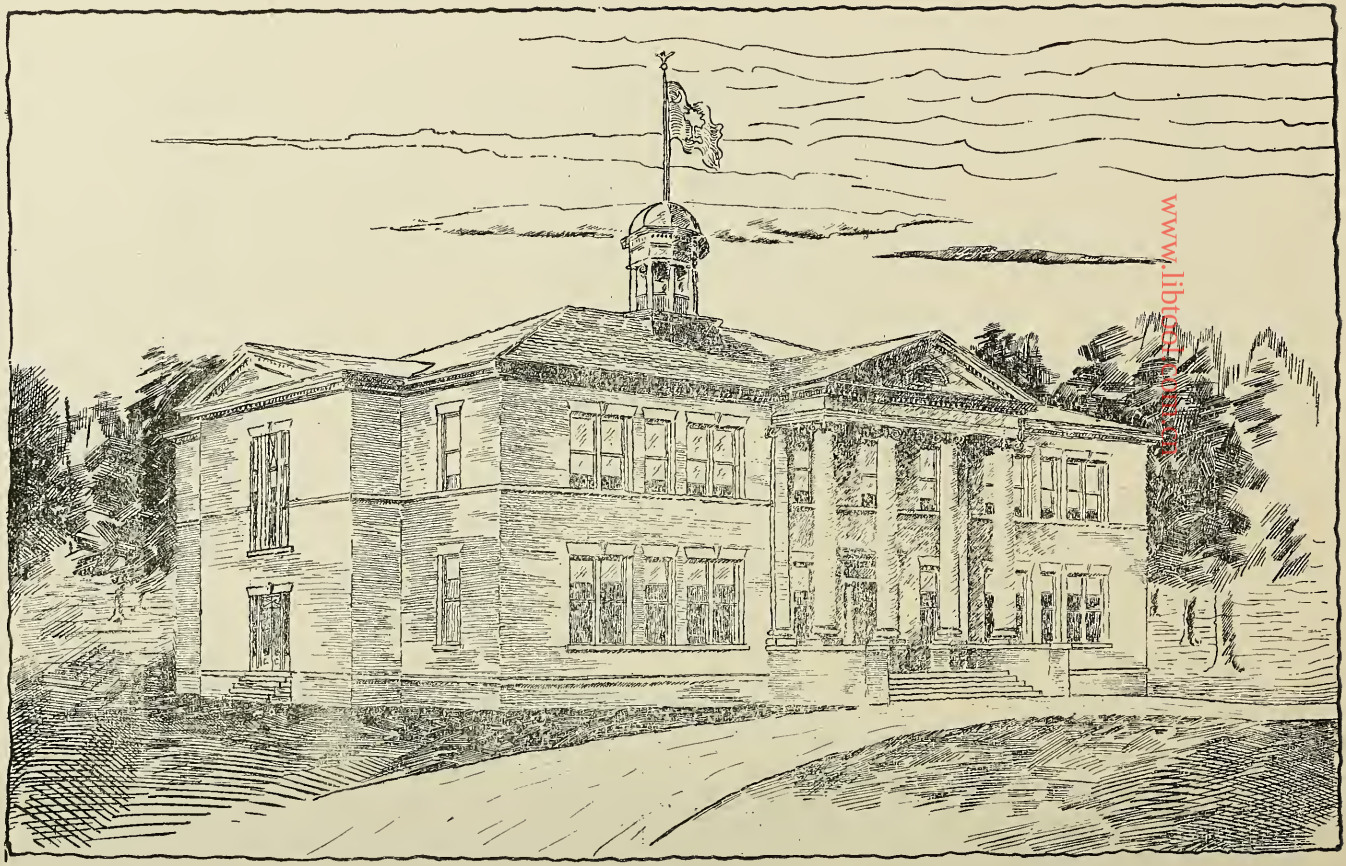


Fig. 26. Design 11.

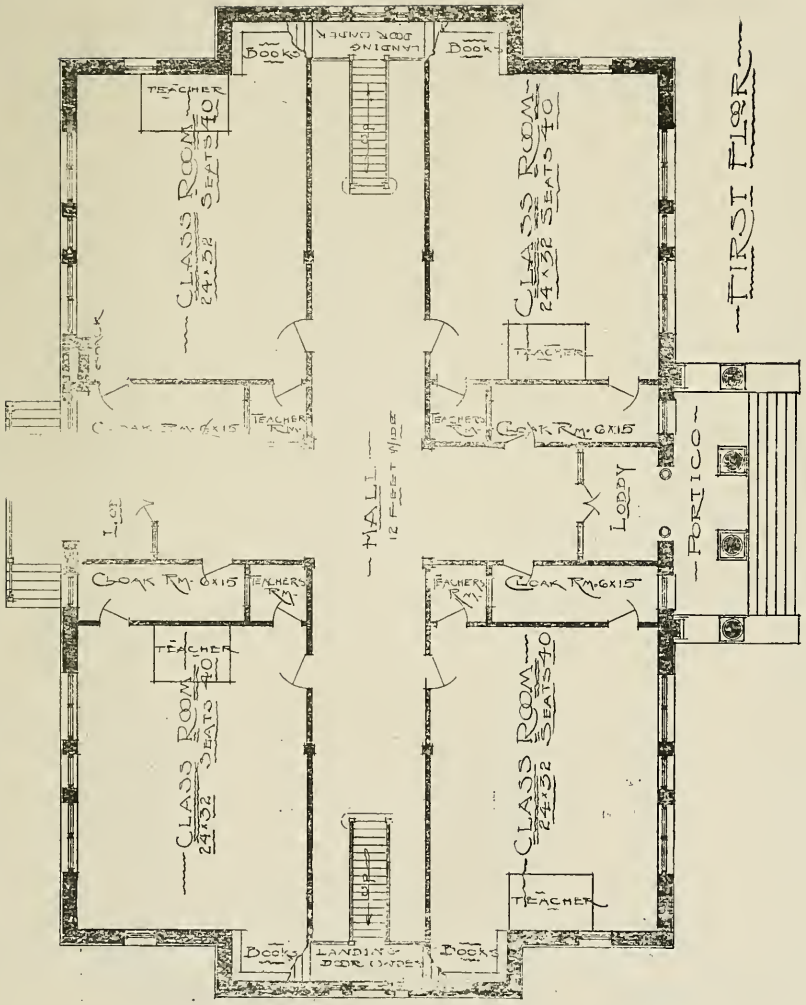


Fig. 27. Design 11.

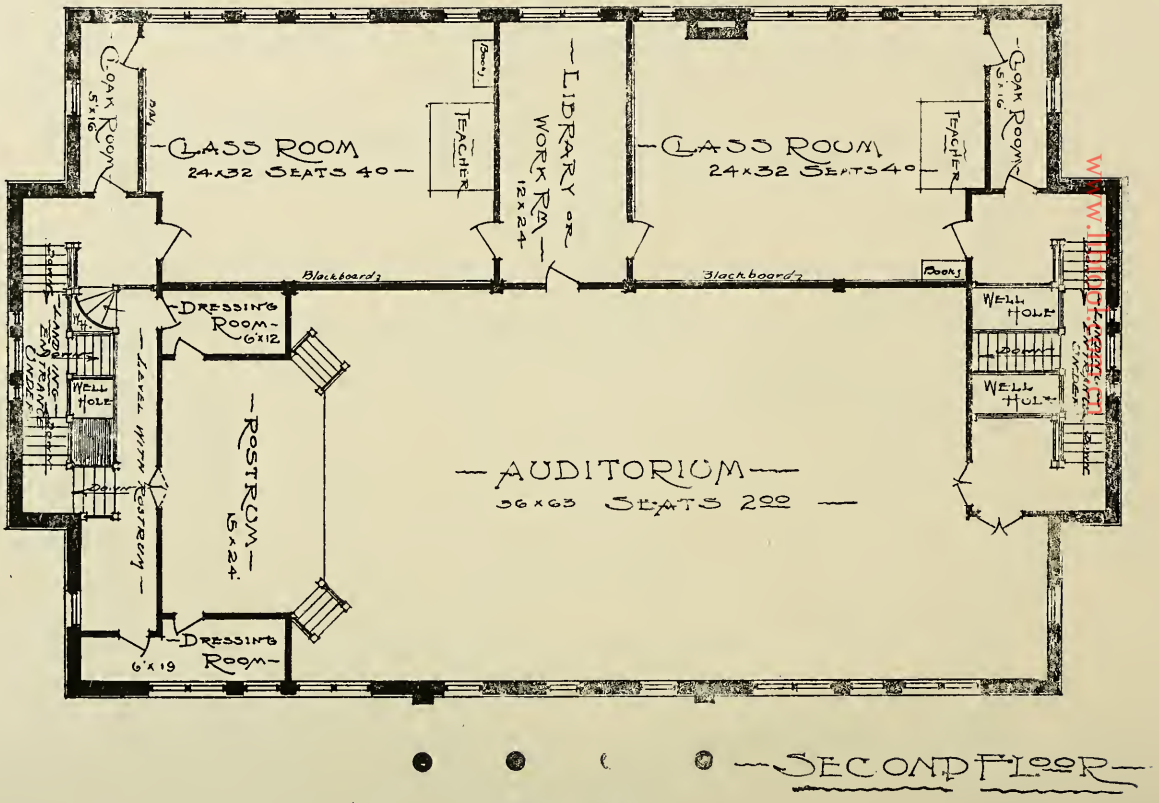


Fig. 28. Design 11.

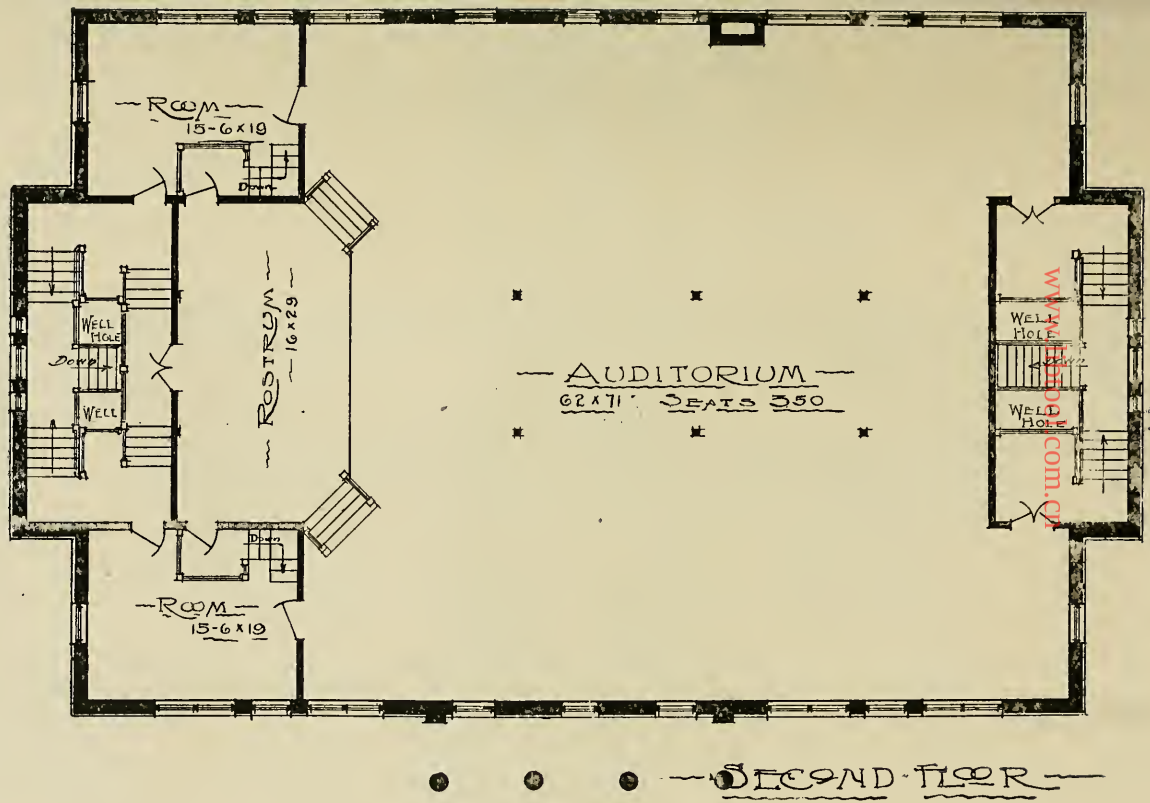


Fig. 29. Design 11.

DESIGN NO. 11.

A Model Six-Room School Building.

Quite a handsome building of classic design is shown. The building is of brick construction, two stories in height, and contains four class rooms with teacher's rooms and cloak rooms on the first floor, and an auditorium, library and two class rooms on the second floor. An alternate design of the second floor showing a large auditorium is given. Dressing rooms are conveniently arranged adjoining the rostum. The building is well lighted, heated and ventilated and has ample exits.

It is not the intention of the Clemson authorities to furnish working drawings for a building of this size. They will, however, be glad to advise in any way they can. Parties desiring to erect such a building should consult a competent architect.

Fig. 30. Design 12.

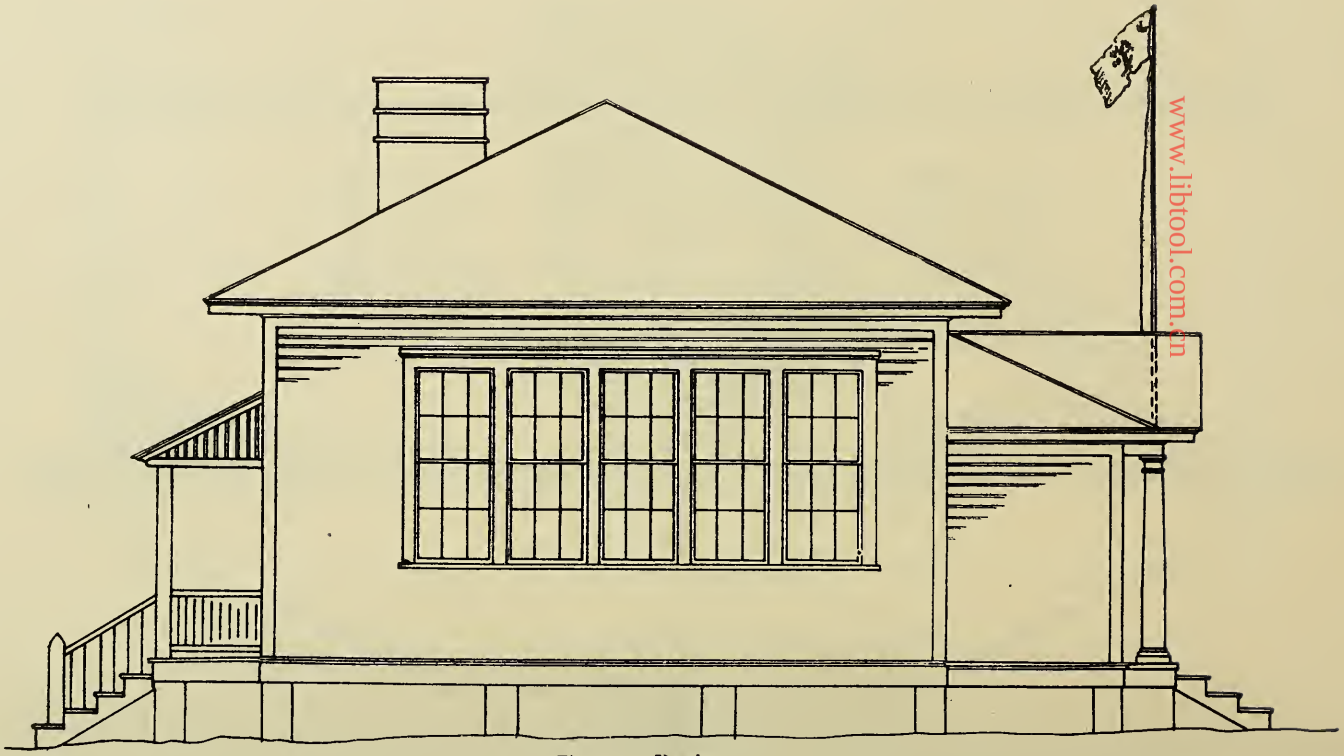


Fig. 31. Design 12.

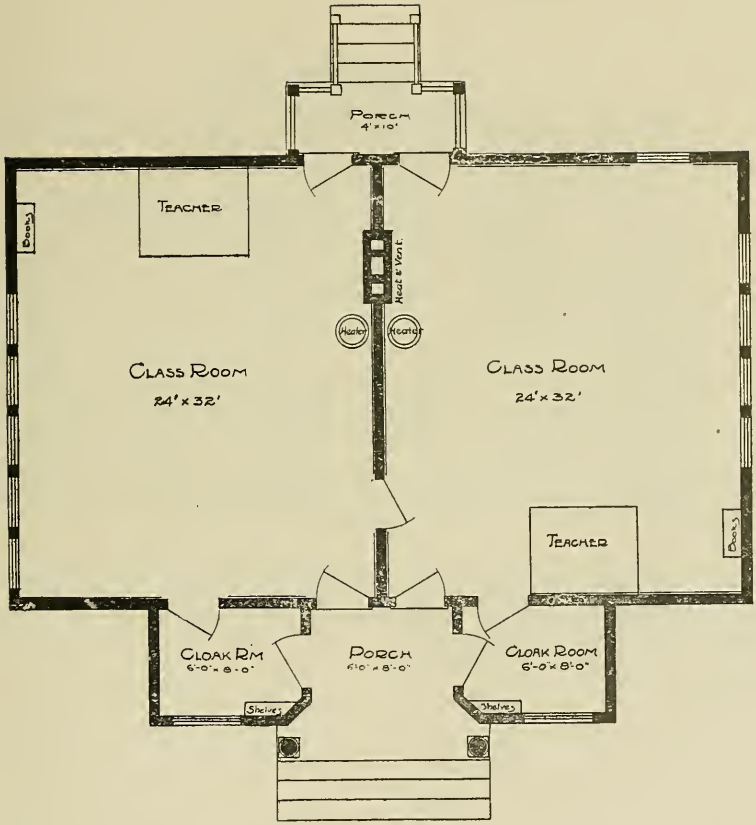


Fig. 32. Design 12.

DESIGN NO. 12.

Clemson College has recently made an appropriation to aid the trustees of this school district in the erection of a school building. Design No. 12 shows this building.

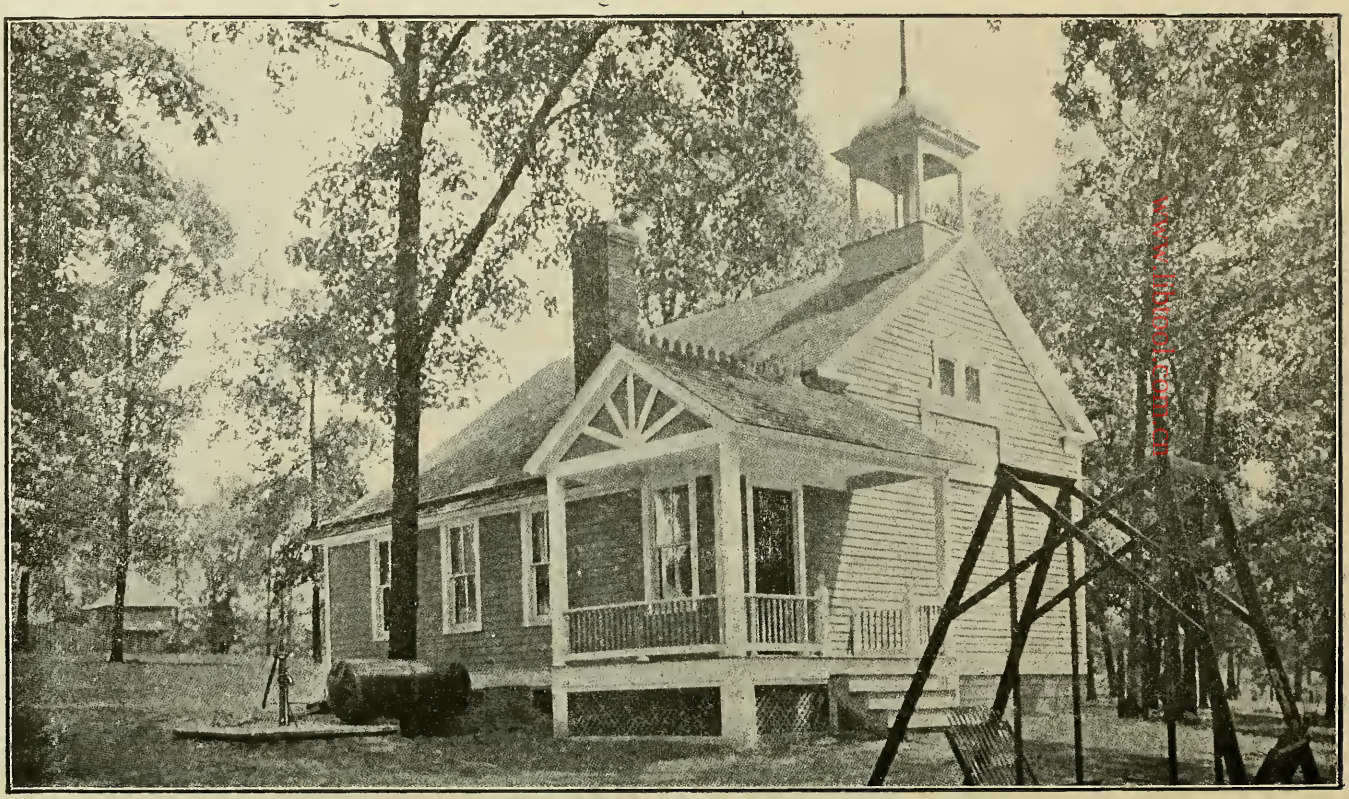
It contains two class rooms with a cloak room adjoining each. The class rooms are smaller than those shown in the drawing. The rooms are lighted from the left, in one room one window is placed in the rear, and are heated by a furnace installed in the basement. Hyloplate blackboards are on all walls not occupied by windows. The interior has plastered side walls, with wainscoting below the window level, which is almost 3½ feet above the floor, and the overhead ceiling is of wood. The rooms are finished in three shades of green. Stain is used on interior woodwork, and paint on the exterior. The windows in this design, as in all other designs shown, are grouped, and are placed high in the walls, their tops being near the ceiling.

On account of the varying prices of labor and material in different parts of the State, we will not attempt to estimate the cost of any of the designs shown.

TYPICAL SCHOOL BUILDINGS

IN

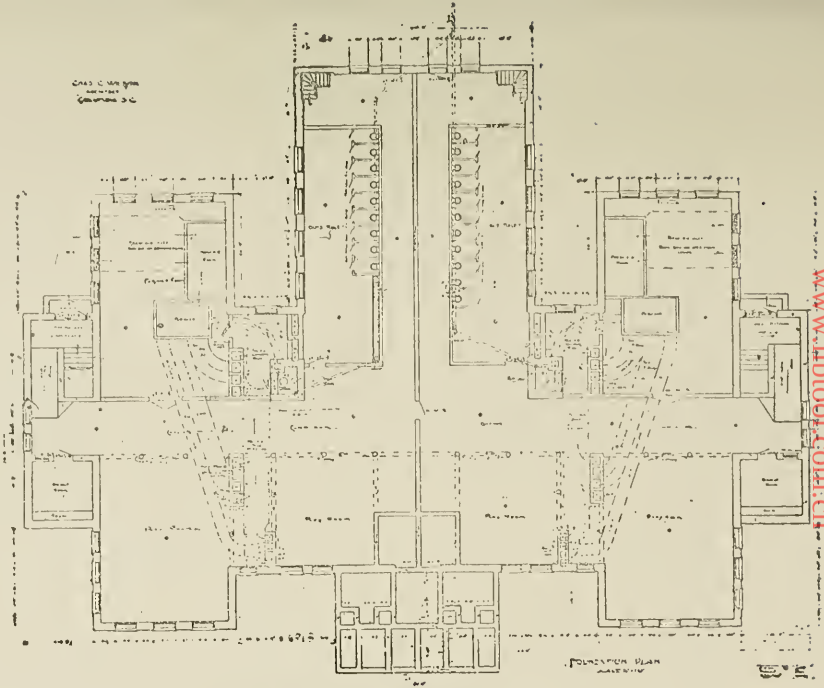
SOUTH CAROLINA



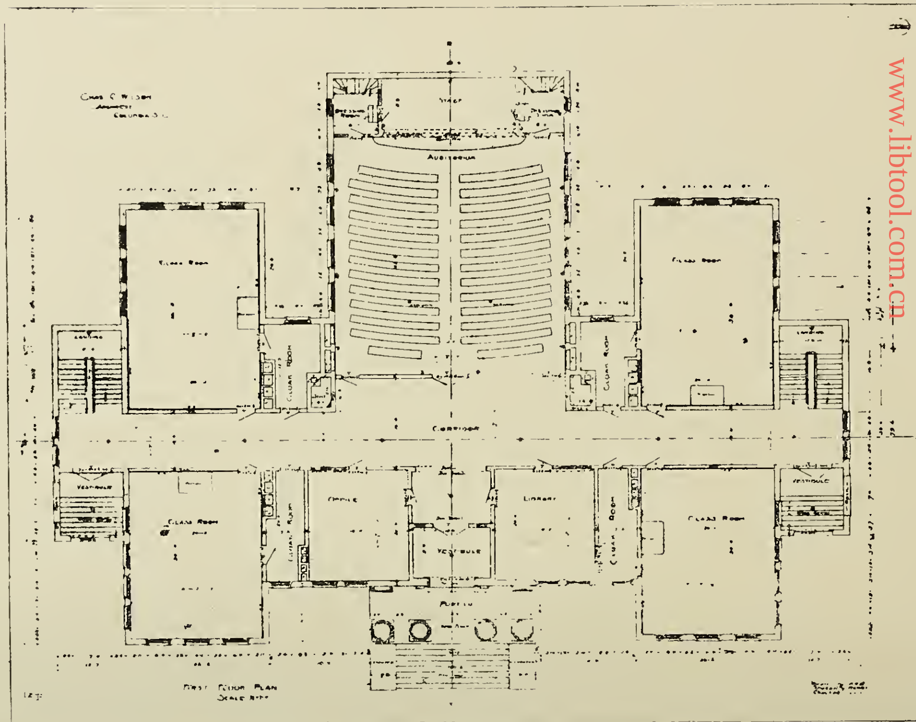
Model School, St. Louis Exposition.

MODEL RURAL SCHOOL HOUSE.

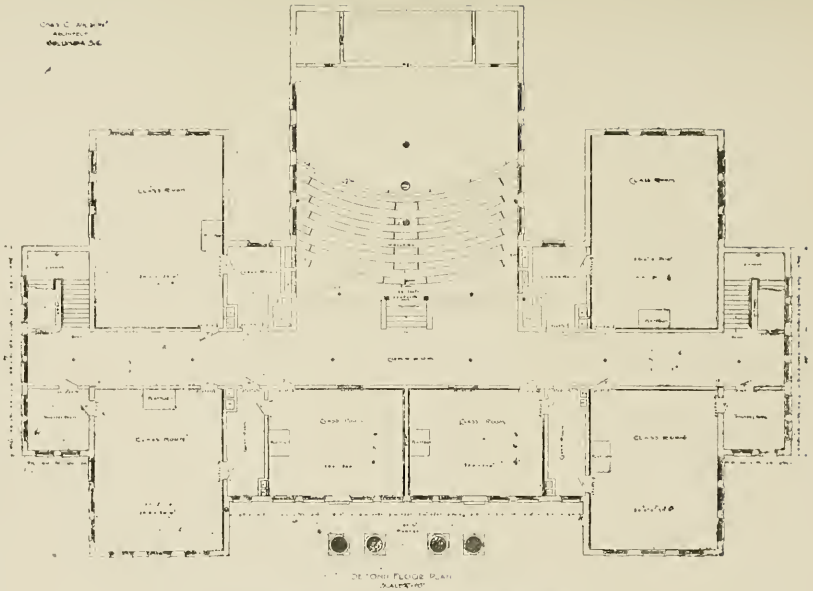
This model school house, of which a cut is shown, was erected on the grounds of the St. Louis Exposition. This cut was kindly loaned us by Prof. Howard A. Gass, State Supt. of Public Schools of Missouri.



Basement Plan, Darlington School.



First Floor Plan, Darlington School.



Second Floor Plan, Darlington School.

DARLINGTON GRADED SCHOOL.

A modest and inexpensive building erected at Anderson, S. C. in 1895 was perhaps the first attempt in South Carolina at distinctive school architecture. The principles governing the design of this building were followed by the same architect seven years later in the graded school at Darlington, S. C., which forms the subject of this sketch. Profiting by a broader experience and observation and maturer study, he was able to produce here, even with very limited means, a building, which meets every practical requirement of the modern school, without sacrificing the architectural character.

This building, fronting a broad, smooth plaza and surrounded by magnificent Darlington oaks, presents an aspect of dignity, repose and refinement, which impresses everyone coming within its influence, qualities which play no small small part in education. It is in a simple, classic style, which seems particularly suited to our land-scape and climate, and to the temperament and traditions of our people. It is in marked contrast to the gloomy Tudor and the factory type, which have been introduced recently.

The building immediately attracted attention throughout the State, and really marked the beginning of the present era of school architecture in South Carolina. It has served as a model for many of the more pretentious buildings in this and neighboring states, and its influence is more or less noticeable in many buildings which follow other general lines.

There is a well lighted and dry basement under the entire building, mostly devoted to play-rooms and toilets; one end for girls and the other for boys. These are approached by outside entrances with ramps for bicycles and by inside stairs at each end.

The heating and ventilating plant occupies the central portion of the basement, and delivers, through ten vertical

brick stacks, a supply of tempered air to each room and exhausts vitiated air, through independent stacks, above the roof, changing the entire volume of air in the building every fifteen minutes. This is accomplished by gravity alone, without the use of fans or other mechanical devices. The quantity of air flowing to and from the rooms remains always constant, but the temperature is controlled by hand from each room, by mixing dampers, by which cold and tempered air are mixed in any desired proportion.

The first floor contains a double office for the superintendent, a library, four class rooms, and an auditorium. The second floor contains six class rooms and a gallery to the auditorium. All the class rooms are of standard size for fifty pupils and have slate black-boards on two sides. Each class room has its independent cloak room with outside light and ventilation.

The class rooms are lighted from the left of the pupils, and the corner rooms also from the back, with a glass area in no case, less than one-fifth of the floor area. The windows finish six inches below the ceiling, so as to insure a sufficient light on the remotest desk, which is distant not more than one and a half times the height of the window.

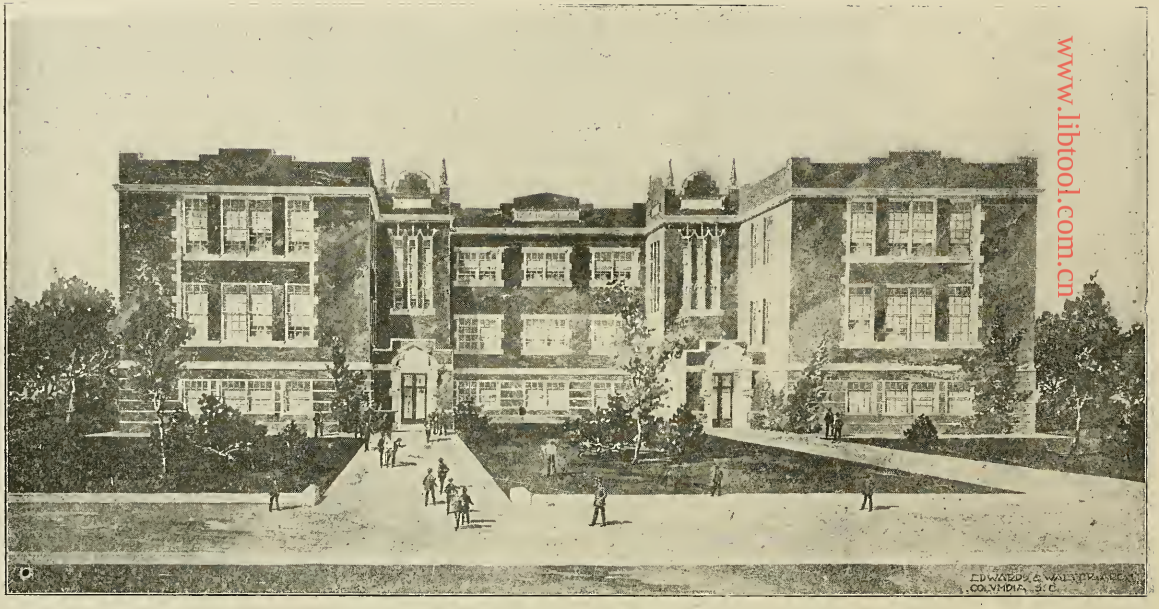
The auditorium is of sufficient size to assemble the entire school on the first floor, and there is a seating capacity in the gallery for visitors.

There is a broad corridor from one end of the building to the other, with a cross corridor from front entrance to auditorium.

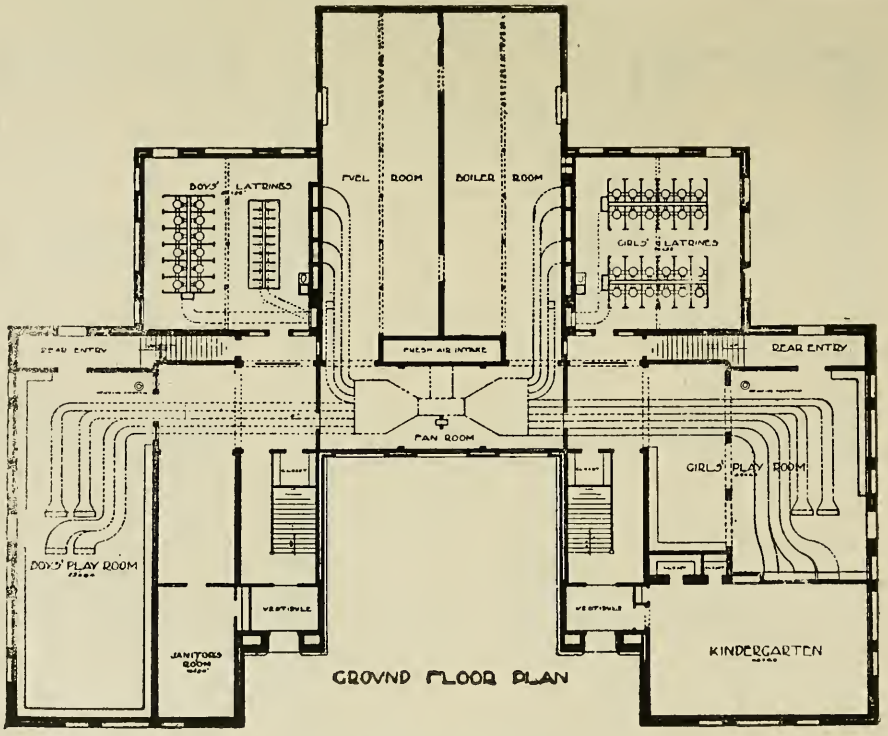
The stairs are placed entirely outside the body of the building, and are cut off from it by brick walls, thus reducing the noise as well as the fire hazard: They are of slow burning construction.

The building was designed by Mr. Charles C. Wilson, now of the firm of Wilson & Sompayrac, Columbia S. C.

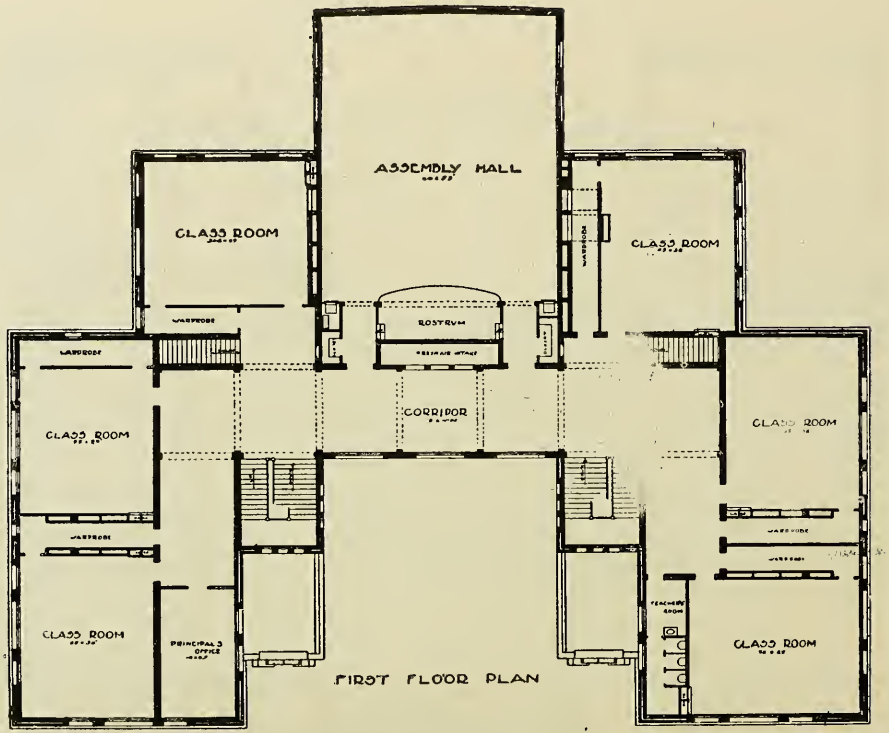
The cost was $22,000.00, but could probably not be duplicated now for much less than $40,000.00.



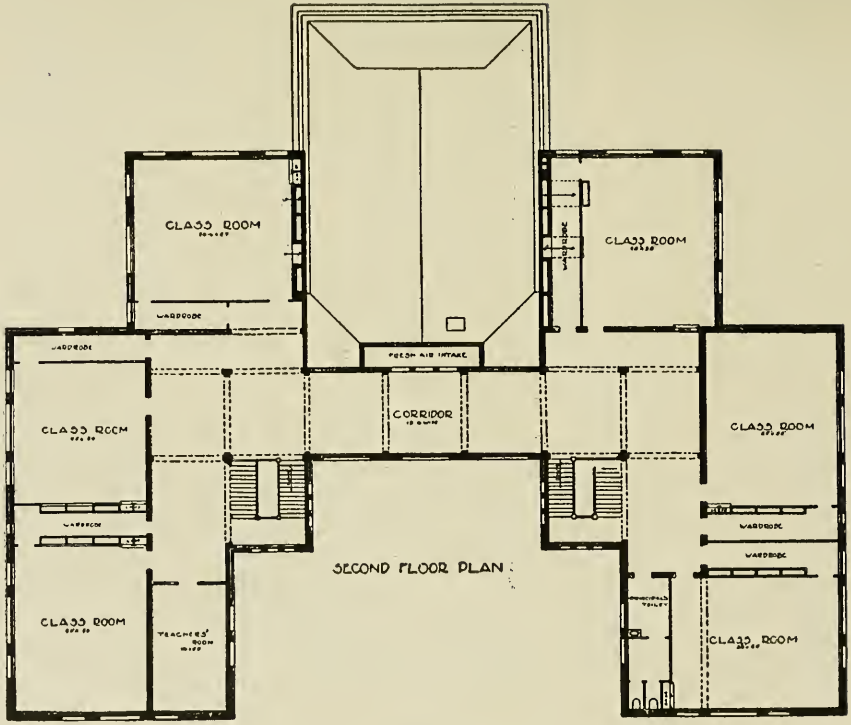
Taylor School.



Taylor School.



Taylor School



Taylor School.

TAYLOR SCHOOL, COLUMBIA, S. C.

Taylor school, of which a cut is published herein, is the first of the modern school buildings to be erected for the graded school system of buildings in the City of Columbia. It is also the pioneer of better school buildings throughout the State of South Carolina.

This building consists of twelve rooms and an auditorium on the first and second floors and in addition to this it has play rooms for the two sexes, a kindergarten room, and a most highly modern and improved system of sanitary arrangements for schools, all of which are placed in the basement of the building. The building is heated by a warm air mechanical system, with automatic heat regulation in each room, thus giving the highest form of efficiency for heat and ventilation in the building.

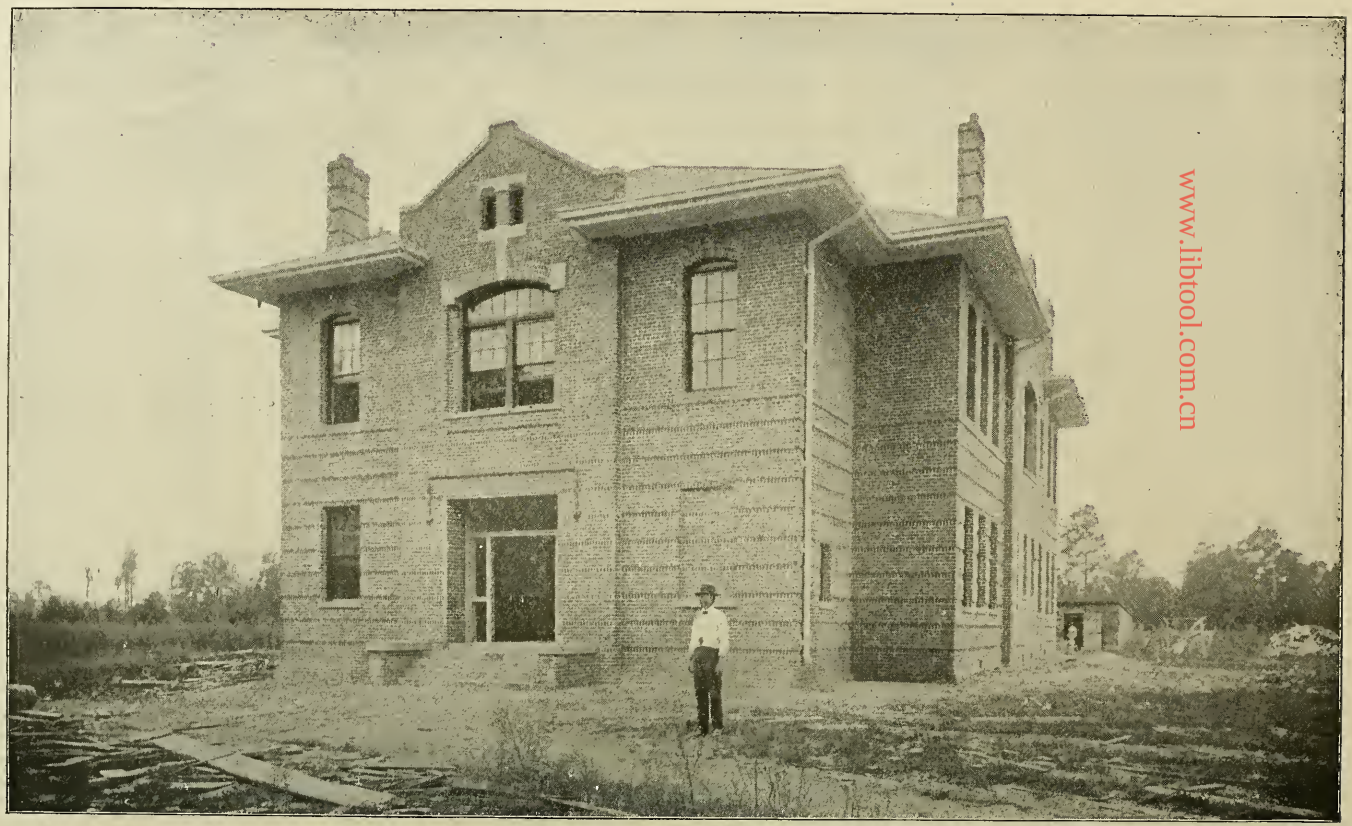
The building is constructed of brick and trimmed with stone. It has a flat roof consisting of asphalt and gravel. The class rooms are arranged along the most modern lines—giving the maximum amount of light to each pupil, and the rooms are designed to accommodate from 40 to 50 pupils.Each class room has its individual cloak room which is well ventilated, is lighted from the outside, and these cloak rooms are provided wih all modern utilities such as cloak and hat racks and umbrella stands.

Each class room has an individual book case for the teacher; thus none of the rooms are encumbered with books, chalk and erasers, but all are required to be put away in the teacher's case in the evening. All doors entering class rooms and cloak rooms are hung with double swing hinges, which will swing either way, thus making it impossible to shut a pupil in or out of the room in case of a panic. There are no locks allowed on the doors of any of the rooms of the building, except the outside door. The outside doors are all hung so as to swing outward.

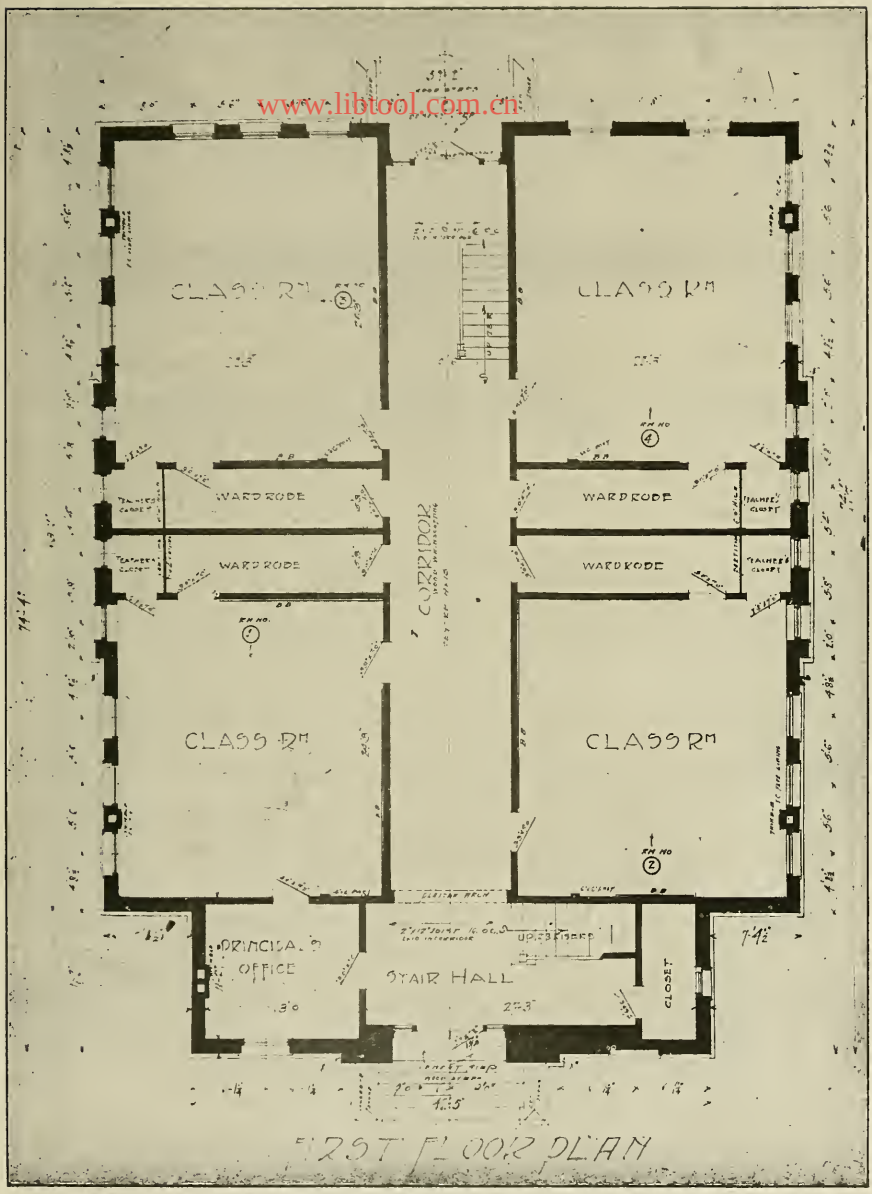
The building is equipped with bells from the Superin-

tendent's room to each of the teacher's rooms, and with a fire alarm system. There is every convenience in this building for the handling of a school in a perfect way. The building is so arranged that the sunlight at some portion of the day penetrates each class room and the main corridor of the building, thus insuring the greatest sanitary conditions.

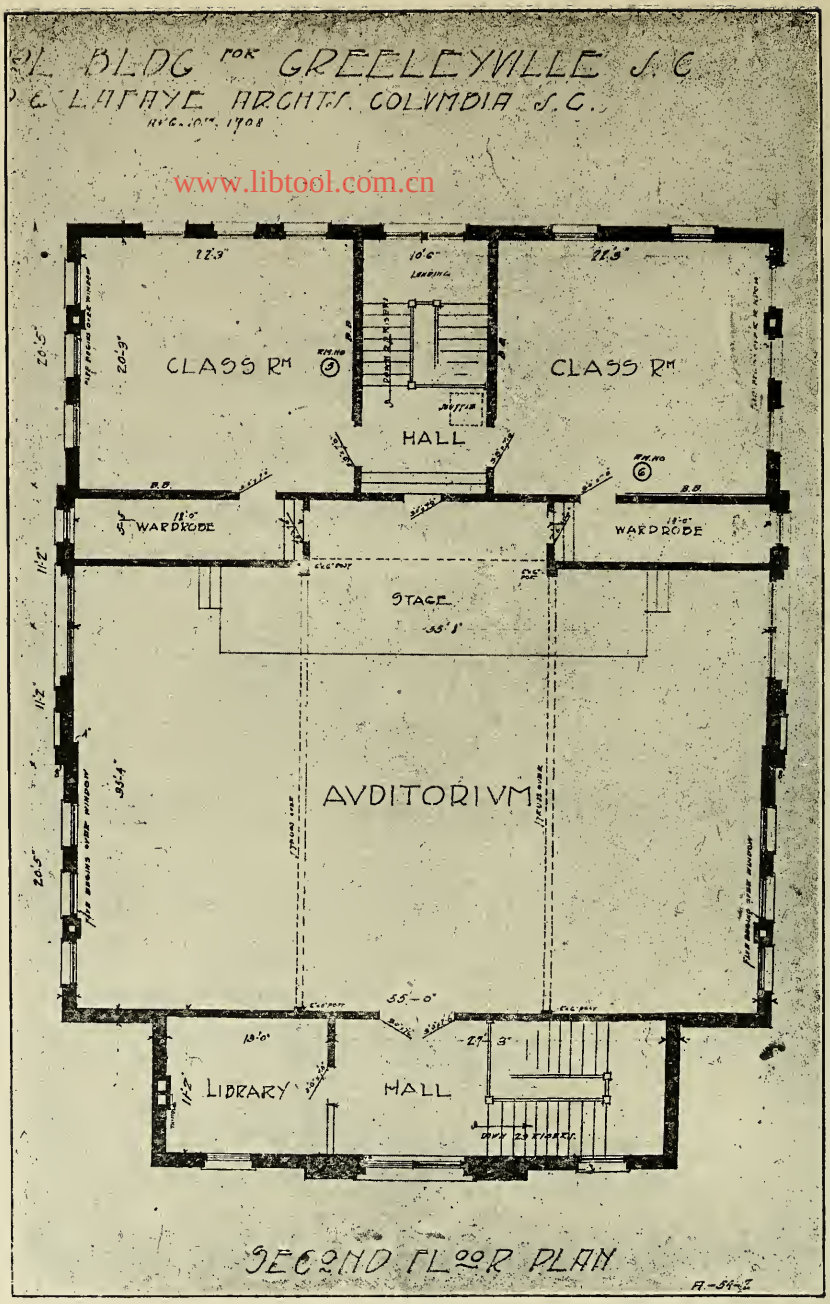
This building was designed and its construction supervised by Edwards & Walter, Architects, then of Columbia, S. C., of which firm Mr Wm. A. Edwards, 631 Candler Building, Atlanta, Ga., is now the successor.



Greeleyville School.



Greeleyville School.

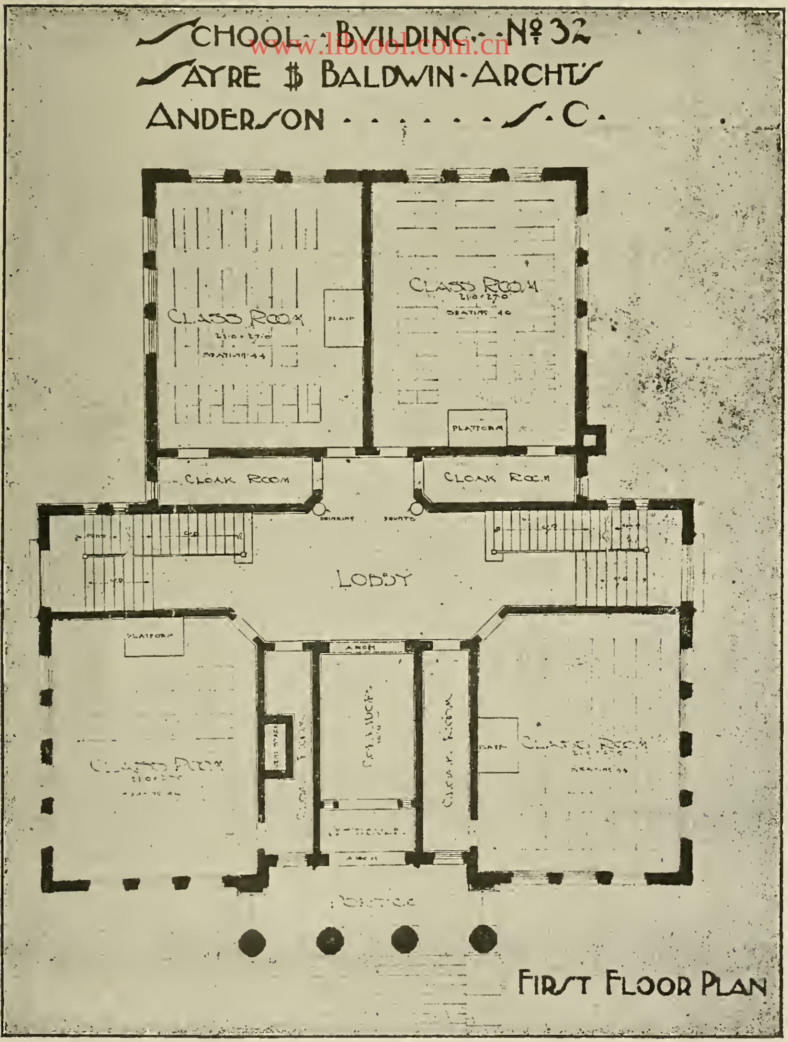


Greeleyville School.

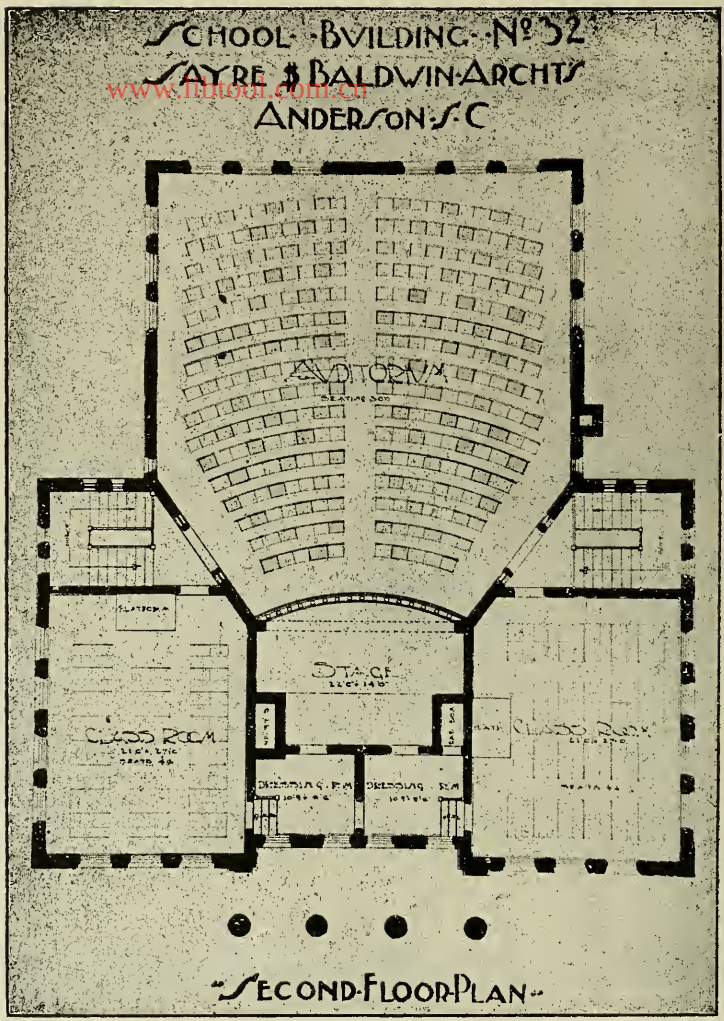
Greeleyville School, Greeleyville, S. C.

The plans for this modern school building were furnished by Messrs. Shaw & Lafaye, Engineers and Architects, Columbia, S. C.

Shandon . . ol.



Shandon School.



Shandon School.

SHANDON GRADED SCHOOL, COLUMBIA, S. C.

This cut shows an ornate, yet inexpensive building. The floor plans show a typical arrangement of a model six class room school building, a number of which type have been erected by the architects, Messrs. Sayre & Baldwin, of Anderson, S. C.

There are three entrances to the first story of the building. The main front entrance is through a large portico into a wide corridor which intersects with a cross corridor leading to the side entrances. The wide double doors to all the entrances are made to open outward to allow free exit in case of panic; but the class room doors, which are of sufficient width to allow pupils to march out two abreast, open inward, so that the teachers may control the egress of classes, and thereby prevent congestion in the corridors. The landing of the side entrances, being below the first floor, enables the pupils, during recess, to reach the toilet rooms in the basement by going down only a few steps. All of the six class rooms are corner rooms, allowing the seats to be so arranged that light comes only from the left and the rear of the pupils. Natural ventilation is secured where mechanical ventilation is not used,

It is to be noted that for each class room there is provided a seperate cloak room so arranged that the pupils may go through the cloak room into the class room, or directly into the class room. The cloak rooms are provided with ample clothes hooks and lunch shelf.

In the cross corridors, two wide, commodious flights of stairs lead from the center of the first floor, through side entrances, into the auditorium—a unique feature of the building. This auditorium, occupying all of the second floor except the space taken by two class rooms, is of such shape as to secure the best acoustic properties, and is so arranged as to give an unobstructed view of the stage from every seat. The private passage in the rear of

the stage, through two dressing rooms, which are also used for cloak rooms, makes a very convenient arrangement for the entertainments which are frequently held at these schools.

In the basement, which is not shown, the toilet rooms are placed at each end with the furnace or boiler room in the center. It is to be noted that the stair arrangement gives an easy exit from the auditorium, and also privacy to the sexes in going to or from the toilet rooms.

The first story height is twelve feet, and the second story height, on account of the auditorium, is made fifteen feet.

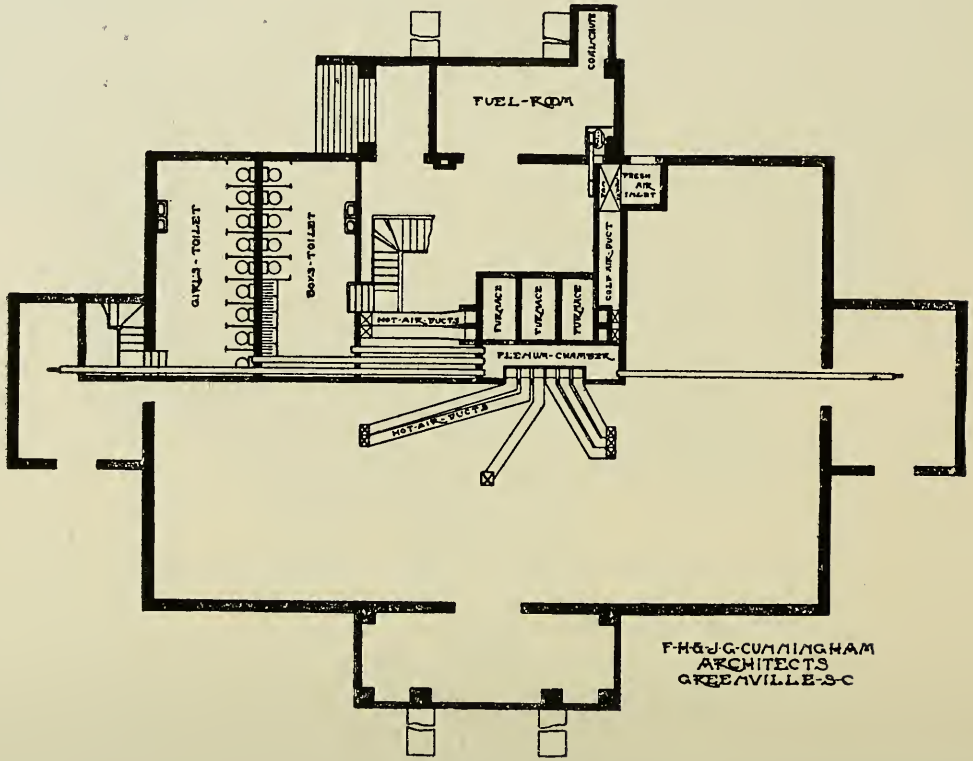
The light area of each class room is one-fifth of the floor area.

The air in the class rooms, where mechanical ventilation is used, is changed from three to four times per hour.

The building is of brick exterior with plastered frame walls and ceilings on interior.

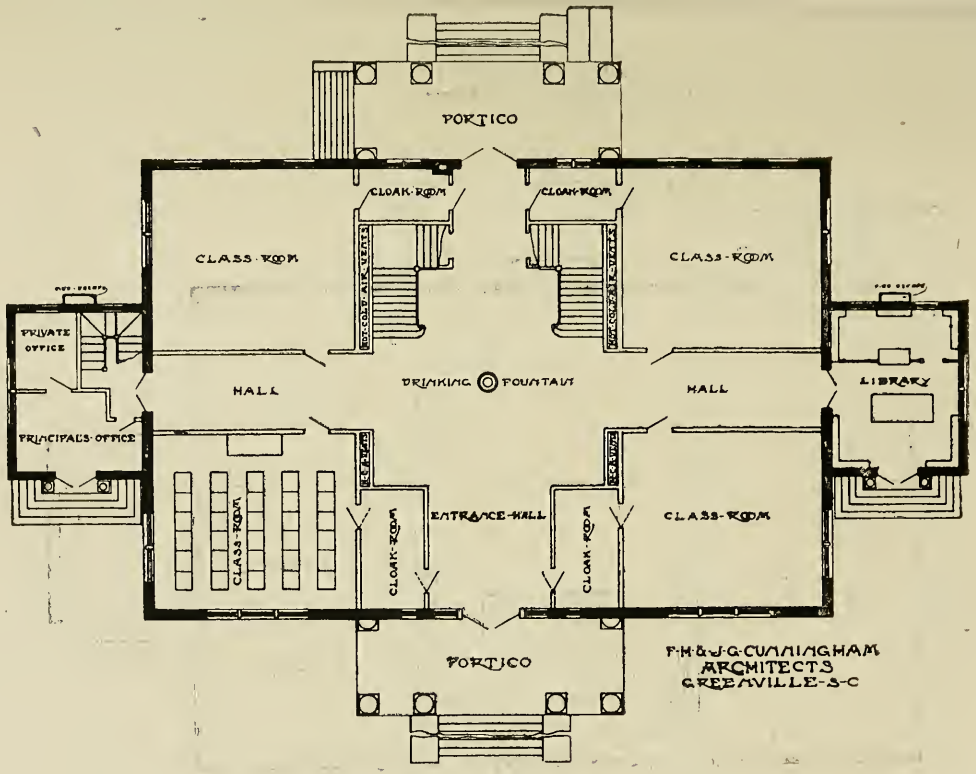
Deadening or sound-proof paper is used between the floors to prevent sound from passing from one room to another.

Abbeville School.

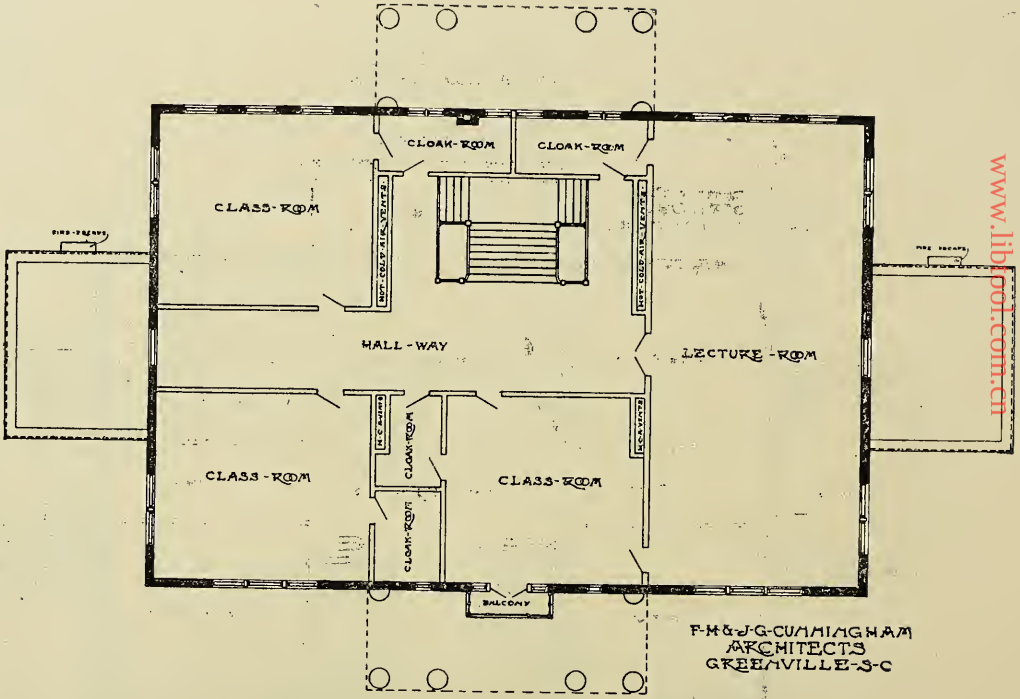


BASEMENT-PLAN

Abbeville School.



FIRST-FLOOR-PLAN
Abbeville School.



SECOND-FLOOR-PLAN
Abbeville School.

HIGH SCHOOL AT ABBEVILLE, S. C.

This building is of red brick of rather a rough texture, laid in red mortar, the joints are wide, being 5-8", and the mortar is a shade darker than the brick; window sills and belt course, key stones, and all trimmings are of cast concrete.

All wood work is painted white and all metal is painted with black metallic paint.

The building contains seven class rooms and a lecture room, six of the rooms are capable of seating 30 pupils, allowing for aisles around all sides of the room and between desks, using single desks; one of these rooms has a seating capacity of only 20 pupils under the same conditions. The lecture room will seat 200 pupils.

All blackboards are slate and there are 160 square feet of blackboard to each room; in the lecture room this amount is doubled.

The toilets which are situated in the basement, are well ventilated and lighted. In the girls' toilet the closets are of the low-down-type, with enameled steel flush tanks, and enameled iron bowls. The boys closets are "Standard" automatic enameled iron, low-down combinations, with "Osborn" improved automatic valves. The urinal is of slate and has five stalls. These closets are reached from separate portions of the building, lending privacy.

Heating is by mechanical draft heated air, the air being heated by means of three Peck-Hammond horizontal furnaces. The fresh air is supplied through a motor driven fan, at the rate of four complete changes of fresh air per hour, the foul air being discharged through ducts running to the attic and thence through the dome to the outer air.

Plans and specifications were prepared and the building erected under supervision of F. H. & J. G. Cunningham, Architects and Engineers, Greenville, S. C.

The cost of the building was $17,784.38.

BILL OF MATERIAL—DESIGN NO. 1.
Elevation, Fig. 2.

8 Pieces 4 by 10—17—Sills.
4 " 4 by 10—12— "
48 " 2 by 6—14—Ceiling joists.
48 " 2 by 10—12—Floor joists.
40 " 2 by 4—16—Rafters.
140 " 2 by 4—13—Studding.
4 " 4 by 6—13—Corner studding.
800 " 1" Boards for sub-floor.
600 " 1 by 3 Sheathing for roof and bridging.
7000 Shingles No. 1.
240 Yards plastering.
1800 Ft. Ceiling for overhead and wainscot.
1000 " Flooring.
11 Window frames 12 by 20—12 lights.
11 Pair sash, 12 by 20—12 lights, weights and cords.
1 Outside door frame 2-10 by 6-10.
1 Inside door frame 2'—8" by 6'—8" for closet.
3 Inside door frames 2-10 by 6-10.
4 Doors 2-10 by 6-10—1 3-8".
1 Door 2'—8" by 6-8'—1 3-8".
200 Lin. ft. wainscot—cap and base.
110 Square ft. Blackboard. 4 feet wide.
130 Lin. ft. mould for boards.
225 Lin. ft. 2½" Bed moulding for angles.
1700 Ft. Siding.
8 Pieces 5-4 by 5"—13' corner stiles.
140 Lin. ft. Boxing, 3 members.
4000 Brick.
7 Barrels of lime for brick work.
2 Columns 8"—9'.
2 Half Columns, 8"—9,.
20 Lin. ft. Balusters and rails, stick balusters.
4 Pieces 5-4 by 12"—5' for steps, D. 4 S.
4 " 7-8 by 7"—5' for steps, D. 4 S.
4 Gallons oil.
10 Gallons paint.
5 Pair 4 by 4 Butts for doors.
5 Locks.
8 Kegs nails.

BILL OF MATERIAL—DESIGN NO. 4.

7 pieces 8 by 8—17—Sills.
7 " 6 by 8—17—Sills.
7 " 6 by 8—13—Sills.
3 " 6 by 8—10—Sills.
48 " 2 by 10—13—Floor joists.
10 " 2 by 10—9—Floor joists.
10 " 2 by 10—9 Floor joists, Porch.
21 " 2 by 10—26—Ceiling joists.
7 " 2 by 6—14—Floor joists, Room.
10 " 2 by 6—10—Ceiling joists, Porch.
32 " 2 by 6—19'—Rafters.
18 " 2 by 6—14—Ceiling over room and porch.
18000 Shingles.
900 ft. B. M. 1 by 3 Sheathing.
1100 ft. Siding.
14 pcs. 1 1-4 by 5—7' Corner stile
1250 ft. 7-8 by 3 1-4 flooring "B."
1250 ft. 5-8 by 3 1-4 ceiling "B."
195 lin. ft. Inside Base (3 members).
160 lin. ft. O. S. Water Table.
160 lin. ft. 4" Shingle Mould for Rafter ends.
160 lin. ft. 7-8 by 5 facia boards.
8 prs. sash 12 by 20—12 lights, weight and cord.
8 Window frames 12 by 20—12 lights with inside trim.
3 pr. sash 12 by 20—6 lights, weights and cord.
3 Window frames 12 by 20—6 lights with inside trim.
4 doors 3 by 7—O. G. 5 pan. 1 3-8.
3 Inside door frames 3 by 7 with trim.
1 Outside door frame 3 by 7 with trim.
4 prs. 1 1-4 by 12 D. S. 6 ft. for steps.
4 prs. 7-8 by 8 D. S. 6 ft. for steps.
7 Brackets for front porch.
4000 plastering laths.
14 bbls. lime.
350 Brick.
3500 kegs nails.
7 door locks.
7 pr. door hinges.
250 sq. ft. Hyloplate boards (48" high.)
9 gallons paint.
3 gallons oil.
15 gallons Shingle stain for base.

BILL OF MATERIAL—DESIGN NO. 5.

6 Pcs. 6 by 8—17—Sills.
9 " 6 by 8—13— "
6 " 6 by 8—16— "
2 " 6 by 8—10— " Porch.
3 " 6 by 8—15— " "
90 " 2 by 10—13—Floor joist.
90 " 2 by 8—28—Ceiling joist.
60 " 2 by 6—18—Rafters.
280 " 2 by 4—12—Studding.
6 " 4 by 6—12—Corner post.
30 " 2 by 4—16—Plates.
1500 ft. B. M. 1 by 3 Sheathing.
24000 Shingles.
1200 ft. Siding.
16 Pcs 5-4 by 5 1-2—7 Corner stile.
8 Brackets on porch.
1 Piece 5-4 by 12—17' for steps.
2 Pieces 5-4 by 12—12' for steps.
1 Piece 7-8 by 8—17 for steps.
2 Pieces 7-8 by 8—12 for steps.
15 Pr. 12 by 20—12 lt. Sash.
15 Window frames, 12 by 20—12 lt., with inside trim.
6 Pr. Sash 12 by 20—6 lights.
6 Window frames 12 by 20—6 lights with inside trim.
6 Doors, 2-10 by 6-10 O. G. 5 pan.
6 Inside door frames 2-10 by 6-10 with trim.
2 Doors 3 by 7—O. G. 5 Par.
2 O S. Door frames 3 by 7, with inside trim.
2400 ft. 7-8 by 3 1-4 flooring, "B".
2400 ft. 5-8 by 3 1-4 Ceiling "B".
19 Lin. ft. Rolling partition 9' high.
7500 Plastering laths.
24 Barrels lime.
5500 Brick.
12 Gals. paint.
25 Gals. shingle stain for base.
3 Gals. oil.
9 Kegs nails.
8 Door locks.
8 Pr. door hinges.
285 Sq. ft. Hyloplate board (48" high.)
360 Lin. ft. inside base, 3 members.
170 Lin. ft. 4" Shingle mould.
170 Lin. ft. 7-8 by 6 facia board for rafter ends.
180 Lin. ft. 3" O. S. water table.

BILL OF MATERIAL, DESIGN NO. 6.

19 Pieces 6 by 8—13—Sill.
8 " 6 by 8—16— "
4 " 6 by 8—17— "
1 " 6 by 8—10— "
2 " 6 by 8—15— "
138 " 2 by 10—13—Floor Joists.
120 " 2 by 10—25—Ceiling Joists.
10 " 4 by 6—12 Corner Posts.
325 " 2 by 4—12—Studding.
45 " 2 by 4—16—Plates.
55 " 2 by 6—20—Rafters.
25 " 2 by 6—15—Rafters.
3000' 1 by 3 B. M. Sheathing.
42000 Shingles.
2100' Siding.
300 Lin. ft, 3", Water Table.
300 Lin. ft 4" Shingle Mould.
300 Lin. ft. 3-4" by 5" facia board for Rafter ends.
2 prs. 1 1-4" by 12"—18' steps.
2 prs. 1 1-4" by 12"—16' steps.
2 prs. 3-4" by 8"—18 steps.
2 prs. 3-4" by 8"—16' steps.
3500' 7-8" by 3 1-4"—"B" Flooring.
3500' 5-8" by 1-4"—"B" Ceiling.
390 Lin. ft. Inside Base (3 members.)
6 Outside door frames, 3 by 7 with inside trim.
7 Inside door frames, 3 by 7 with inside trim.
13 doors, 3 by 7—1 3-8 O. G. 5 panel.
23 prs. sash, 12 by 20—12 lights with weights and cord.
4 prs. sash, 12 by 20—6 lights with weights and cord.
1 Rolling Partition, 18' long and 9' high.
9000 Plastering laths.
50 bbls. of Lime.
8000 Brick.
720 sq. ft. Hyloplate Blackboards (48" high.)
18 gallons of paint.
5 gallons of oil.
30 gallons of shingle stain for base.
12 Kegs Nails.
13 Locks for doors.
13 prs. 4 by 4 ninges.
16 prs. 1 1-4" by 5 1-2—8' Corner stile.
300 Lin. ft. 3-4" quarter round.

BILL OF MATERIAL—DESIGN NO. 8.

12 Pcs. 6 by 8—17—Sills.
12 " 6 by 8—13— "
2 " 6 by 8— 9— "
75 " 2 by 10—13—Floor joist.
24 " 2 by 10— 9— " " hall.
75 " 2 by 8—27—Ceiling joist.
24 " 2 by 6—9— " " Hall.
40 " 2 by 6—25—Rafters.
1600 Ft. B. M. 1 by 3—Sheathing.
11800 Shingles.
10 Pcs. 4 by 6—12—Cor. post.
300 " 2 by4—12—Studding.
42 " 2 by 4—16—Plates.
275 Lin. ft. Cornice.
250 " " 1 by 10 D. S. Outside base.
250 " " 3" Water table.
2800 ft. Siding.
12 Pcs. 5-4 by 5 1-2' D. S. Corner stiles.
3150 ft. B. M. 7-8 Flooring.
3150 " " " 5-8 Ceiling.
14 Pcs. 5-4 by 12—D. S—8' for steps.
14 " 7-8 by 7 1-2 D. S.—8"— for steps.
2 Columns 8" by 8' with cap and base.
2 Columns 6" by 5'-6" with cap and base.
25 Lin. ft. Baluster and rail, square pickets—1 1-8 by 1 1-8.
21 Pr. 12 by 20—12 lights, Sash.
21 Window frames, 12 by 20—12 lights with inside trim.
2 Side lights for front doors.
5 Door frames, 3 by 7, with 24" transom.
5 Door frames, with 24" transom.
8 Doors, 3 by 7—O. G. 5 panel.
8 Inside door frames 3 by 7 with trim.
180 Square feet Hyloplate black boards. (48" high.)
8500 Plastering laths.
40 Barrels lime.
4500 Brick.
400 Lin. ft. inside base, 3 members.
300 Lin. ft. 3-4 quarter round.
15 Gals. Paint.
4 Gals. Oil.
10 Kegs nails.
13 Pr. hinges.
13 Door locks.

BILL OF MATERIAL—DESIGN NO. 9.

18 pieces 6 by 8—14 Sills.
13 " 6 by 8—13 Sills.
104 " 2 by 10—13 Floor Joists.
30 " 2 by 10 Floor Joists, Hall.
82 " 2 by 10—27 Ceiling Joists.
130 " 2 by 6—10 Ceiling Joists, Hall.
16 " 2 by 6—14 Ceiling Joists, Work Room.
130 " 2 by 6—19 Rafters.
20 " 2 by 6—16 Rafters.
380 " 2 by 4—12 Studding.
12 " 2 by 6—12 Corner Studding.
40 " 2 by 4—16 Plates.
4000' Siding "B".
4800' 7-8 by 3 1-4 Flooring "B".
8800' 5-8 by 3 1-4 Ceiling "B".
450 Lin. ft. Inside Base (3 members).
320 Lin. ft. Cornice.
320 Lin ft. O. S. Base 1 by 10 D. S.
320 Lin. ft. 3" Water Table.
12 pcs. 1 1-4 by 5 1-2 Corner stile.
2 8" Cols. 8' Cap and Base.
2 6" Cols. 6' Cap and Base.
15 pcs. 1 1-4 by 12—8' Steps.
15 pcs. 7-8 by 8—8' Steps.
28 lin. ft. Porch Balusters sq. pickets.
3000 Plastering laths.
4000 Brick.
16 bbls. lime.
404 sq. ft. Hyloplate Board (48" high.)
2 Doors 3 by 7—1 3-4 Glazed.
3 sets side lights.
1 Transom 36 by 24".
1 Front door frame—3 by 7—with 24" transom and side lights.
2 Doors 3 by 7—Glazed, 1 3-4, with 24" transom.
2 door frames 3 by 7 with 24" transom.
3 Inside door frames 3 by 7 with inside trim.
3 Doors 3 by 7—O. G. 5 panels.
11 Doors 2' 10" by 6'10"—O. G. 5 pan.
11 Inside door frames 2-10" by 6-10" with trim.
30 prs. sash 12 by 20—12 lights 1 3-8 with weights and cord.
30 Window frames 12 by 20—12 lights with inside trim.
11 Kegs nails.
3 Front door locks.
13 Inside door locks.
16 pr. 4 by 4 hinges.
30 Gallons paint.
8 gallons oil.

BILL OF MATERIAL—DESIGN NO. 10.

24 pieces 6 by 8—17 Sills.
16 " 6 by 8—13 "
3 " 6 by 8—12 " Hall
120 " 2 by 10—13 Floor Joists.
55 " 2 by 10—12 " " Hall.
120 " 2 by 10—28 Ceiling Joists.
55 " 2 by 6—12 " "
90 " 2 by 10—32 Rafters.
20 " 2 by 8—22 Rafters.
16 " 4 by 6—12 Corner Posts.
500 " 2x4—12 Studding.
60 " 2 by 4—16 Plates.
36000 Shingles.
2200' B. M. 1 by 3 Sheathing.
4800' Siding.
32 prs. 1 1-4 by 5 1-2—13 Corner stile.
330 Lin. ft. 4" Water table.
330 Lin. ft Cornice.
5000' 7-8 by 3 1-4 Flooring "B".
5000' 5-8 by 3 1-4 Ceiling "B".
8000 Lin. ft. Inside base (3 members).
14000 Plastering Laths.
70 bbls. Lime.
15000 Brick.
1 pc. 1 1-4 by 12—18 steps.
1 pc. 1 1-4 by 12—17 steps.
1 pc. 1 1-4 by 12—16 steps.
1 pc. 1 1-4 by 12—15 steps.
6 pc. 1 1-4 by 12—12 steps.
1 pc. 7-8 by 8—18 steps.
1 pc 7-8 by 8—17 steps.
1 pc. 7-8 by 8—16 steps.
1 pc. 7-8 by 8—15 steps.
6 pc 7-8 by 8—12 steps.
2 pr. Doors—Glazed 7-8.
2 Transoms 7 by 2.
2 O. S. door frames 7 by 8—with 24" Transom.
2 Doors 2-8 by 6-8 O. G. 5 panel.
5 Inside door frames 2-8 by 6-8 with inside trim.
10 Doors 3 by 7—O. G. 5 panel.
10 Inside door frames with trim. 3 by 7.
24 pr. sash 12 by 20—12 lights, weights and cords.
24 Window frames 12 by 20—12 lights, with inside trim.
300 Lin. ft. 3-4 qr. Round.
1040 sq. ft. Hyloplate blackboard (48" high.)
15 Kegs nails.

2 front door locks, double doors.
18 Inside door locks.
24 pr. hinges 4 by 4.
38 gallons paint.
10 gallons oil.

BILL OF MATERIAL—DESIGN NO. 12.

8 Pieces 4 by 10—11—Sills.
6 " 4 by 10—17— "
38 " 2 by 10—20—Floor joists.
19 " 2 by 10— 8—Floor joists, hall.
38 " 2 by 8—20—Ceiling joists.
19 " 2 by 6— 8—Ceiling joists, hall.
50 " 2 by 4—16—Rafters.
170 " 2 by 4—13—Studs.
8 " 4 by 6—13—Corner post.
900 Feet 1 by 3 Sheathing and bridging.
1100 " 1" Boards for sub-floor.
1300 " Flooring.
2300 " Ceiling for overhead and wainscot.
280 Lin. Feet wainscot, cap and base.
280 Lin. ft. Bed mould for angles. (2 1-2")
8 Pieces 5-4 by 5"—13, corner boards.
160 Lin. ft. boxing, 3 members.
160 " " 1 by 10—D 4. S. for outside base.
160 " " Base cap for outside base.
350 Yds. Plastering.
2000 Ft. siding.
1 Outside door frame 2—10 by 6—10.
1 " " 2—10 by 6—10 by 1 3-4".
5 Inside door frames 2—10 by 6—10.
5 Inside doors, 2-10 by 6-10 by 1 3-8.
16 Window frames, 12 by 20—12 lights.
16 Pair sash, 12 by 20—12 lights, weights and cords.
200 Square feet Blackboard 4 feet wide.
120 Lin. ft. mould for boards.
5500 Brick.
11 Barrels lime for brick work.
2 Columns 8"—9'.
2 1-2" Columns, 8"—9'.
20 Lin. ft. Balusters and rails.
4 Pieces 5-4 by 12" by 5' for steps.
4 Pieces 7-8 by 8" by 5' for steps.
6 Pieces 4 by 4 Butts for doors.
11 Kegs of nails.
16 Gallons of paint.
6 " " oil.
13000 Shingles.

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