

THE IMPROVEMENT OF THE FARM KITCHEN

by

EDITH ANTONETTE HOLMBERG

B. S., Kansas State Agricultural College, 1908

A THESIS

submitted in partial fulfillment of the requirements

for the degree of

MASTER OF SCIENCE

KANSAS STATE AGRICULTURAL COLLEGE

1928

Coll
LD
2668
T4
1428
H63

TABLE OF CONTENTS

Statement of Purpose.....	page 1
Acknowledgment.....	1
Introduction.....	1
Discussion.....	5
The Efficient Kitchen.....	5
Importance of Good Kitchen Arrangement.....	8
Location of the Kitchen.....	13
Relation of Kitchen to other Parts of House...	16
Size of the Kitchen.....	20
Making the Kitchen Smaller.....	21
Doors.....	24
Ventilation.....	25
Windows and Lighting.....	25
Artificial Lighting.....	28
Water Supply of the Farm Kitchen.....	29
Walls and Ceiling of the Kitchen.....	34
The Woodwork of the Kitchen.....	37
Floors.....	41
Finishes for Floors.....	44
Arrangement of Equipment.....	48
The Preparation Center.....	51
The Cooking Center.....	64

The Cool Storage Center.....	64
Improving the Kitchen by Rearranging or Remodeling.....	71
Electrical Appliances.....	123
Summary.....	128

Illustrations

The Dunn Farm Home.....	15
The Mayhall Home.....	22
Water Systems in Sedgwick County.....	31
The Sink.....	55
Model Kitchen.....	58
Too High a Work Table.....	62
Built in Refrigerator.....	73
Built in Cupboard.....	78
Built in Cupboard in the Cooke Kitchen.....	80
Built in Woodbox, McCormick Kitchen.....	87
Built in Cupboard, McCormick Kitchen.....	88
Built in Breakfast Table.....	91
The Pass Cupboard.....	97
Built in Cupboard, Huff Kitchen.....	98
Cupboards in the Eplee Kitchen.....	102,103
Grouping of Equipment.....	113
Electrically Equipped Farm Kitchen, L.P.Lupfer	124,126
Electric Range,Stitt Farm Kitchen.....	125

Drawings and Blue Prints

A Typical Farm Kitchen.....	9
A Simple Water System.....	33
Kitchen Wagon.....	55
The Dumb-waiter.....	70
The Ice Box.....	72
Plan of the Cooke Kitchen before Remodeling.....	74
Plan of the Cooke Kitchen after Remodeling.....	81
Plan of the McCormick Kitchen before and after Remodeling.....	85, 86
Plan of the Dunn Kitchen.....	90
Plan of the Huff Kitchen before and after Remodeling.....	95, 96
Plan of the Eplee Kitchen.....	101
Plan of the Stitt Kitchen.....	105
Plan of the Wood Kitchen.....	108
Plan of the O'Bryant Kitchen.....	109
Cupboard in the O'Bryant Kitchen.....	110
Plan of the Mayhall Kitchen.....	112
Plan of the Household Searchlight.....	113-a
Plan of the Demonstration Wheat Belt Kitchen.....	115
Plan of the Schlickau Kitchen before and after Remodeling.....	117, 118
Plan of the Cole Kitchen before & after Remod.	119, 119-a
Plan of R. H. Henson's Farm Kitchen.....	122
Plan of a Model Kitchen.....	127

STATEMENT OF PURPOSE

The purpose or aim of this study is to determine the essentials of an efficient farm kitchen and to show what is being done in Kansas to make the farm kitchen an attractive, convenient, and well equipped workshop.

ACKNOWLEDGMENTS

Grateful acknowledgments are due to Dr. Helen Ford, Walter G. Ward, Miss Myrtle Gunselman, Mrs. Laura I. Winter, Miss Lois Holderbaum, and others for help and valuable suggestions in working out this thesis.

INTRODUCTION

The Kansas farm home is fast coming to its own. There is no question but what it has suffered neglect in the past while the farmer and his family were busy getting a start but the need for this sacrifice no longer exists and farm people are beginning to realize better than ever before that home improvements are necessary in order to get out of life the things most worth while. More and more, farm people are realizing that the future holds greater opportunities for the farm home and so there are also greater in-

centives for improving it than have obtained in the past.

Social lines between the country and town are growing less distinct. Better transportation facilities have made it possible for farm people to associate with their neighbors and with town people more frequently. This has led to greater cooperation among them and a better understanding of each other's problems. City folks are building country homes; farm families are driving in their automobiles and riding on interurban cars to church, to school, and to market.

In the past we have thought of the farm home as being isolated but the obscure farmhouse of today may be on a paved highway tomorrow. With better roads and more automobiles, with telephones, radios, running water, electricity and other home conveniences there will be better farm houses. With improved conditions more people will want to live on the farm.

The Extension Service of the Kansas State Agricultural College has done much in the way of helping the farm people of Kansas to study the problems of the farm home and to make these homes more convenient and more attractive to live in.

In cooperation with home management specialists, home demonstration agents and county agents, the extension rural

engineering department of the college has carried out a project in home improvement which has resulted in the building of 123 new kitchens and the remodeling of 715 kitchens in Kansas during the past seven years. The remodeling work has consisted of improvements similar to those given in the plans shown in this study. It has also included installation of some type of water system. In addition much work has been done in making the kitchen attractive. Other rooms of the house have received attention also, so many of the farm homes present quite a different aspect from what they did 10 years ago.

In almost every community in Kansas today one may find earnest and trained farm women leaders teaching groups of other farm women the most efficient methods of homemaking, stressing the importance of good management through efficient kitchen arrangement and through the use of labor saving equipment in order to have more leisure time to give to the higher life of the home. Out of all this has come a finer appreciation of all that the word home stands for, as well as a realization of the need for conservation of the farm woman's time and energy that she may have better health and more leisure time to devote to the mental, moral, and apiritual life of the family.

More farm women of Kansas should be induced to interest

themselves in becoming efficient homemakers and with that end in view to study the problems of the home.

The average farm woman spends much of her time in a kitchen that is often not well ventilated and frequently so poorly arranged and equipped that she spends much more time and energy in preparing meals than is necessary. This waste of time and strength means that she is often over tired and that her family has been deprived of attention they might otherwise have had.

Nine years of Home Demonstration work in Kansas and practical experience in helping farm women to solve their problems in efficient kitchen arrangement has led the author to make such a study as this.

Problems of kitchen arrangement, household equipment in general, and the systematizing of housework are receiving an increasing amount of attention in many quarters. A number of state extension services are featuring demonstrations, campaigns or contests in kitchen improvement. Successful kitchen demonstrations have been completed in Virginia, Iowa, Montana, Wyoming, North and South Dakota, Ohio, Wisconsin, Michigan, Minnesota, and other states. *Nebraska has recently conducted an interesting study of 371 farm kitchens by use of score cards.

*Gray-The Nebraska Rural Kitchen-Jr.Home Ec.19:504.

*In North Dakota efficiency studies of farm kitchens have been made in one community where it was found that the average farm woman walked five miles a day and the highest walker traversed 12 miles. By applying efficiency principles to their kitchens these women saved themselves 150 to 300 miles of walking each year.

DISCUSSION

The Efficient Kitchen

Every homemaker should be able to plan a kitchen intelligently. This does not mean a kitchen that seems convenient merely because it expresses certain pet whims or ideas but one that measures up to some standard tests on general essential points. It is important to the work that there should be enough storage space and that the utensils used at the sink be placed near the sink, but all these details are of small importance when compared with such fundamentals as the size of the kitchen, the amount of light and air, and the general arrangement of the large equipment. Too much or too little floor space, too many doors, too few windows, and too little wall space are basic

*Willard-"That Kitchen"-Corc.63:2, N.D.Agric.Ext.Div.

matters that may break the entire convenience of the place.

It is too late to plan a kitchen after it is built for the structural conditions are fixed and the possibilities of arrangement are then limited. The importance of planning the kitchen rightly at the start cannot be over emphasized. This is not meant to discourage the remodeling of old kitchens, however.

What are the essentials of a convenient, well arranged kitchen and what are the points to consider in planning or replanning a kitchen? Properly speaking the kitchen is a room intended for operations connected with food materials and for this purpose only. It is not the province of the kitchen to provide space for eating, washing and ironing clothes, for lavatory purposes, and for removing boots, wraps and overalls. For sanitary reasons such activities should be provided for elsewhere. One objection to the old fashioned kitchen was its large area but this was necessary in an economic era when the kitchen was a workshop as well as a place in which to cook and to eat. The loom in addition to the spinning wheel, had to find floor space reasonably near the fireplace. Even after the stoves were substituted for the open fire much industry had to be carried on in the kitchen. Many of the farm kitchens of Kansas have carried over the idea of the big kitchen and are

much too large and the equipment has been placed to cover enormous wall space without regard to convenience or arrangement for efficiency. Washing and ironing as well as dairy work is still done in many farm kitchens and now and then on an occasional cold spring morning the peep of chickens may be heard from behind the stove. We cannot hope to eliminate all these things from the farm kitchen, but we can help the farm women to study and to analyze their kitchens and to determine what activities normally belong in the kitchen. We can teach them to see that it is poor economy to plan for such features as laundry tubs in the kitchen because they are unsanitary and too unrelated to food work to have a place there.

A kitchen plan suitable for all farm conditions cannot be found. The plan must be made to fit each case. Every housewife has some very definite notions about some items in her kitchen. If she has been accustomed to a large kitchen she will probably discard all plans for a small kitchen and if she has been accustomed to a small kitchen she will in all probability not be interested in plans for a large kitchen.

Conditions vary somewhat in different parts of the state. In the western part of the state where the acreage farmed is larger and more men must be fed, the kitchen may

need to be larger in many instances to accommodate more than one worker in the kitchen. While ready made plans cannot satisfy all conditions they can often be used for valuable suggestions in planning new kitchens and in remodeling old kitchens. The housewife herself must decide whether the laundry work is to be done in the kitchen or elsewhere; whether it is better to have an extra kerosene stove and establish a temporary kitchen and dining room on a porch, in a shed or in another room for seasonal work or whether to have a large kitchen and to travel over its great distances all the year around.

Importance of Good Kitchen Arrangement. The average American housewife spends very little time in the scientific arrangement of her kitchen equipment and for that reason she walks several hundred miles each year in her kitchen just in preparing the meals for her family. If the icebox fits the space and looks well in a certain corner it is generally kept there and little or no thought is given to its relation to the work table or to the range and yet the misplacing of any one piece of equipment may add many miles a year to the distance traveled by the worker in that kitchen.

In Figure 1, page 9 we have an inefficient arrangement of equipment such as may be found in many farm kitch-

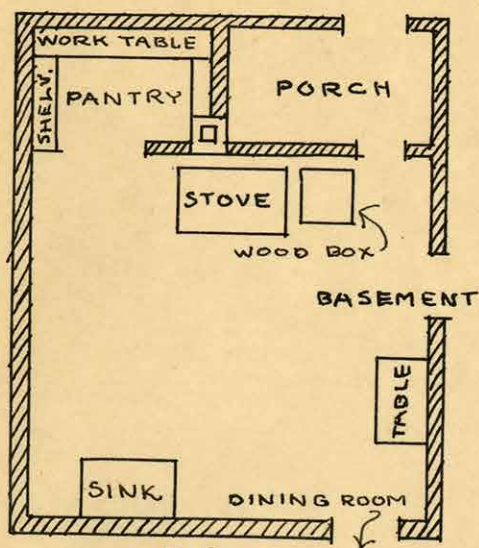


FIG. 1

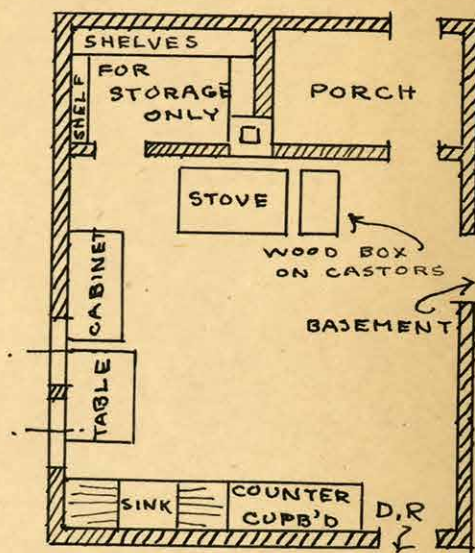


FIG. 2

ens. Many unnecessary steps must be taken in going to the basement for supplies, then to the pantry and sink for preparation of foods and to the range for cooking it. The sink is too far away from both the work table and stove. In such a kitchen, the lines of travel will cross and recross each other as the meal is prepared, cooked, served, and cleared away.

Figure 2 on the same page shows a grouping of the equipment which is more convenient and which will save steps. By adding a cabinet and placing this near the table and sink we can eliminate the use of the work table in the pantry. Utensils used at the stove may be stored in this cabinet as well as supplies. The cupboards above and below the work table near the sink provide storage space for dishes, utensils, tea towels and the like. The pantry may be used for the storage of large quantities of supplies and equipment seldom used or it may be used for other purposes. Many women feel that because plumbing or chimneys may not be changed that it is useless to try to "work over a kitchen" but it is often possible to group equipment in such a way that steps may be saved and the work in the kitchen made easier even though the arrangement is not everything that may be desired.

The plans that are presented here suggest what may be

done to insure efficiency of arrangement in any kitchen but in making the plans the author has kept in mind the problems which are peculiar to farm homes and has endeavored to relegate to the kitchen those processes which normally belong there and have suggested that the caring for the milk, the laundry work and the like be done in another room near the kitchen or if these processes must be carried on in the kitchen as they must be in many of our older kitchens, that a space be left for them so that they need not interfere with the cooking and food preparation processes which rightfully belong in the kitchen.

The remodeling of old kitchens is often a difficult problem but even minor improvements such as giving walls, woodwork, and floor an attractive, durable, easily cleaned finish and adjusting table and sink to a comfortable height for the worker, reduce drudgery and save energy. The plans of the remodeled homes given here illustrate what has been done in some of the farm kitchens of Kansas which presented in many cases an almost hopeless arrangement when compared with our ideals of what an efficient kitchen should be.

All the plans given here from Sedgwick County were furnished by the farm women of that county who are enrolled in the "Better Kitchens" contest sponsored by Mrs. Laura I. Winter, Home Demonstration Agent, who also assisted me in

personal visits to these homes and in securing pictures and information about them.

The plan of Mrs. Henry Eplee's kitchen was obtained through a personal visit in August of the year 1927. Miss Lois Holderbaum, Home Demonstration Agent of Labette County accompanied me at that time and assisted in getting additional information and in helping Mrs. Eplee make a time and efficiency study of her kitchen.

Reno and Pratt County kitchen plans were secured by the author while working directly with these kitchens in the capacity of Home Demonstration Agent.

The plan of Mrs. W. Cole's kitchen was secured November ninth, 1927 through a personal visit during a "Better Kitchens" tour in Clay County under the direction of Miss Nellie Bare, Home Demonstration Agent of that county.

The three plans of the Wood, Mayhall, and O'Bryant kitchens were furnished by Mr. Walter Ward, Extension Rural Architect, Kansas State Agricultural College, to whom much of the credit of better homes for farm people in Kansas is due.

The Household Searchlight plan was secured through a personal visit in November, 1927.

Location of the Kitchen

The most desirable location for the kitchen is at the corner or in a wing, so that light may be obtained from more than one direction and so that cross ventilation may be secured.

Whether the chief exposure shall be north, south, east or west depends upon local conditions and personal preference. In Kansas the north, the northeast or the northwest sides are cooler during the summer mornings and except on very large ranches one can usually be out of the kitchen during the late afternoon when it is hottest. South, southeast and southwest are less desirable exposures for the kitchen because they are likely to be hot and glaring.

The kitchen should also be so located that the prevailing winds need not bring dust from the road or unpleasant odors or flies from the barn and other out buildings.

Many women prefer a view of the barns and fields so that they can see the men as they come from work or where they may watch the children at play. A hedge or vine may be used to screen undesirable features and the outlook from the kitchen window should be made as pleasant as possible. Neat walks of gravel, concrete or wood and a seeded lawn about the kitchen door will do much to prevent the carrying

of dust and mud into the house.

In the "Better Kitchens" contests that have been carried on in Sedgwick, Pratt, Reno, Clay and other counties of the state which resulted in the improved kitchens shown here, improving the back window view has been stressed in order that the farm woman as she looks out from the added and often enlarged windows upon the backyard may find the view pleasing.

Mrs. W. Cole of Clay County in pointing out the improvements she herself had planned and made said, "I planted bulbs on each side of the walk so when I look out now I see flowers instead of weeds from my kitchen window. I also planted a vine around the clothesline posts which has been beautiful all summer with its heavy green foliage and red blossoms. Another vine was planted along the side of the wood shed which improves its appearance as I view it from my kitchen window. When we moved the refrigerator the water from the drain was piped into the flower garden thus saving carrying water for them." Plenty of light, air and sunshine and a good view from the kitchen window are important. The things that the homemaker looks upon daily while at her work in the kitchen may have an unconscious but definite bearing on her life, making her happy and contented if the view is pleasant and inspiring, or

discontented and unhappy if she has to look out upon a littered, untidy yard filled with tin cans, weeds, brush, tumbled down old sheds and other nuisances.

The Dunn Farm Home



Fig. 3- This farm home shows a favorable location of the kitchen which has been extended to make possible the window on the west which looks out upon the highway. The windows on the north command a view of the barns. Note the screened in porch on the northeast corner. (See plan Fig.25)

Relation of the Kitchen to Other Parts of the House

No one room in a house can be planned alone; all rooms must be planned in relation to each other. When one is building a new house one may build the kitchen around the necessary equipment and the floor space, doors, windows, cupboards, sink and other stationary features can be planned to the best advantage. Even in remodeling much can be done to group equipment in an efficient way and no farm woman need be discouraged if her kitchen falls short of the "efficiency standard".

1 - The Dining Room. The kitchen should be next to the dining room but a direct view from the dining room into the kitchen should be avoided whenever possible. A double swing door leading from one to the other is convenient. In many homes space is allotted to the kitchen which serves as a dining room. An alcove at the end or side of the kitchen with built in tables and benches is frequently used in city and country kitchens. For occasional use the living room serves also as a dining room and a glass enclosed porch provides for the serving of meals during the seasons when additional farm help is needed. This porch may be used also for a family dining room. The breakfast alcove is welcomed by many women who do all their

own work and it saves many trips in serving meals. It is highly desirable, however, that meals be served in restful and attractive surroundings at all times and the dining room meets this condition better than any other arrangement. See page 122 for plan of kitchen where breakfast nook and dining porch may be substituted for the dining room (Figure 52). For plans showing dining living room combination with breakfast room see page 113, Figure 45 (Household Searchlight). For plan where the kitchen is used as a dining room see page 109, Figure 41 (O'Bryant).

2 - Basement. The steps to the basement should lead directly from the kitchen or from an entry close to the kitchen door. Some of the food supplies will of necessity be stored in the basement and the housewife will need to make several trips there during the day and for that reason she should not have to walk a great distance to reach the basement stairs. A dumb waiter such as shown on page is now used in many Kansas farm kitchens. This saves many trips to the basement.

3 - Back Entrance. The back door of the house should open into a hall or upon an enclosed porch on account of the cold in winter and the flies in summer.

4 - Wash and Wrap Room. A small room where outdoor wraps may be hung and where the men and children may wash,

saves the farm women the annoyance of having the men wash at the sink while they are preparing and serving the meals. Much dust and dirt will be brought into the kitchen with the wraps and mud will often be tracked across the kitchen floor. From a sanitary point of view, the use of the kitchen as a lavatory and a place for shoes and wraps is highly objectionable. A door from the outside should lead directly into the wash room. Another door should open into a hall or the dining room or into another part of the house. If desired this room may be made large enough to take care of the separator. It may also be used for a laundry if there is no separate room provided.

5 - Laundry. If there is a good basement the laundry may be located there. However, if there are small children and no help on wash day a basement laundry is inconvenient. Compact, well protected plumbing pipes, heated rooms in winter, fuel near by and nearness to the kitchen are some of the advantages of a basement laundry. Clothes chutes from the floor above add to the convenience of laundries so placed.

Detached laundries can be made easy of access from the house and there is an obvious advantage in having the mechanical equipment for the house and out buildings concentrated and this can best be done in a building located

separately. Laundries thus removed can be used to better advantage if there are two or more members to do the housework.

6 - Bedroom or Bathroom. For sanitary reasons these rooms should not open directly into the kitchen or dining room.

7 - Front Door. The front door should be so located that it will not be necessary for the housewife to go through other rooms or walk far in answering a rap at the door or a ring of the bell. A hall makes a better arrangement possible. Some housewives prefer to have the kitchen in the front part of the house.

8 - Pantry. The pantry has largely been done away with in the farm home for the reason that it requires too many steps for the housewife. In its place have come built in cupboards and bins or storage cabinets with units which are fitted on the walls of the kitchen so that needed supplies may always be at hand.

Only when the pantry is used as a storage room has it any reason for being a part of the house. It may be used to store large quantities of supplies and large equipment and such equipment as is not used frequently.

Many old pantries in Kansas farm homes are being changed into store rooms, dairy rooms, dining alcoves or

bath rooms. If there must be a pantry, it should open directly into the kitchen and near the working center of the kitchen.

Size of the Kitchen

The size of the kitchen will vary with the purpose for which it will be used and the number of persons who expect to work in it. If the kitchen is to be used mainly for cooking, the small kitchen is best and will save many steps. A size of 9 x 12 ft. or 11 x 13 ft. will be large enough for the average family. A slightly oblong kitchen can be arranged to better advantage than a square one. A proportion of two to three is satisfactory. Other sizes are: 8 x 10 ft.; 8 x 12 ft.; 9 x 13 $\frac{1}{2}$ ft. or 10 x 14 ft.

Where coal and wood are used for fuel the kitchen must be somewhat larger, also where the kitchen is used for laundry room or wash room or where milk is cared for in the kitchen, and when it must be used for the storage of extra supplies and cleaning equipment; likewise where it is used part of the time as a dining room extra space will be needed. A small kitchen used primarily for cooking purposes is the most desirable.

Canning, cooking for extra farm help and other seasonal demands for extra kitchen space may be met by an oil

stove on a porch. This kind of expansion for seasonal work is much better than a large kitchen which permits the handling of heavy seasonal work but which is so large that it requires extra steps through the remainder of the year. A screened in porch makes a pleasant dining room in summer for the family and when not in use as a dining room makes a delightful summer living room. It is also a comfortable place in which to do many of the kitchen tasks.

Making the Kitchen Smaller. In many of our old farm houses in Kansas we find large kitchens which have poorly located doors and windows. The plan in Figure 16 shows such an arrangement. In cases where doors or windows are poorly located it might be well to close them if possible and to cut new doors or windows. A door which is unnecessary may be permanently closed and a large piece of equipment placed before it. Where it is necessary to close a window this may be made into a wall cupboard.

Kitchens that are too large may be made smaller in several different ways. The equipment may be grouped in one end of the kitchen and the working area reduced. This method is especially adaptable to kitchens in which meals are served, the other end being used as a dining room; or the kitchen may be made smaller by use of partitions. The part of the original room not used for the new kitchen can

be used for a wash room or a dairy room or for a breakfast room. Another suggestion is to utilize the old kitchen for a laundry, wash room; bedroom or dining room and to build a new compact and convenient kitchen. This latter arrangement was made in the plan of the Mayhall kitchen. In this case, however, the old kitchen was moved several feet from the house and made into a detached laundry room.



Fig. 4- The Mayhall home, Sedgwick Co. showing the old kitchen which was detached. For plan of the new kitchen see Figure

In another farm home in Sedgwick County a bedroom was exchanged for the kitchen to secure better light and to bring the kitchen nearer to the water supply. The new ar-

rangement also gave a desired view of the barns. A large porch was added to be used for a dining room in the summer. See picture Figure 5.



Fig. 5- Picture showing kitchen, which was originally the bedroom. The old kitchen was dark and gloomy. By exchanging the kitchen for the bedroom, more light and better ventilation was secured. Nearness to the water supply and a desired view of the barns and road was made possible. A large screened in porch was added. This is used for a summer dining room.

Doors

The number of doors should be reduced to two if possible. One door should lead into the dining room and one into the back hall from which the doors to the other rooms and basement may open. If there is no back hall care should be taken to have the outer door so placed that the kitchen will be protected from the cold winter winds. The north opening found in many homes makes the kitchen a bleak place in cold weather and likewise the hot summer winds blow dust and sand into a kitchen which is not protected by a porch or entry on the south.

If more doors are necessary they should be placed so that the lines of travel will not interfere with the working space.

The plan of the Cooke farm kitchen shows an inconvenient arrangement of doors (See Figure 16).not uncommon in many old houses. Figure 17 shows how the working space was changed to overcome the interference of lines of travel with the working space.

A swinging door that is equipped with door stops should be used between the kitchen and dining room. If the door leading to the dining room is placed near a corner and is hung so as to swing toward the center of the room and

not against the wall there will be no direct view from the dining table into the kitchen. Where space is limited the doors opening into the kitchen may be hung to open out thus giving more room in the kitchen.

Ventilation

*"The outdoor life of country folk may render less harmful the lack of good house ventilation but that it does not obviate the need of this essential to health is attested by thousands of cases of tuberculosis in farm homes."

It is generally understood that light, air and sunshine are excellent agencies for combating tuberculosis. Tuberculosis like dry rot in timber thrives in poorly ventilated places and will continue to thrive unless we change many of the prevailing conditions of housing. Architects are striving more than ever to provide light and air and sunshine in their plans for farm houses and the farm people also are realizing the need for improvement along this line.

Windows and Lighting

North light is desirable for kitchens because it is

*The Farm House Improved Bul. No. 7 - W. A. Etherton.

less intense and more uniform than any other light. However, ample sunshine especially in the morning should be provided for the kitchen if possible. Windows serve the twofold purpose of supplying light and ventilation and should be placed so that the worker gets good light at the work table, sink and stove and from the left if possible. In order to get light at the best angle, the windows should be placed in at least two sides of the room and this will also make cross ventilation possible.

The height of window sills from the floor should not be less than 34 inches and may be 50 to 52 inches but never so high that one cannot look out of them when sitting at work. One window should be low enough to permit the children to look out of doors if there are children in the home. Some of the windows should be built high enough to permit a sink or work table to be placed under them. Since more work is usually done at the table than at the sink, it is better to place the table before the most important window rather than the sink if the cupboard arrangement permits it. The kitchen plan in Figure 25 permits of good light on both work table and sink.

In general the window area in a well lighted kitchen will need to be not less than 20 per cent of the floor area. A glass panel in the upper part of an outside door

is one way of increasing the light in a dark kitchen . If both windows must be in the same wall as sometimes happens there should be a ventilating register in the opposite wall or a transom over the kitchen door leading to the porch or vestibule. Cross ventilation can be accomplished by extending the kitchen wall beyond the outline of the rest of the house as in the Dunn home in Figure 3.

In the Household Search Light the range in the kitchen has a hood over it. This is equipped with an electric fan which quickly drives odors from the room and draws fresh air in from the outside. Stirring the air also prevents the humidity or moisture from being felt.

Aside from the importance of an abundance of light and sun for sanitary reasons there is also the need for more cheerful work rooms. Many of the old kitchens are dark and gloomy and in remodeling these, additional windows have been cut, glass panels have been placed in outside doors and light colored shades of linen or unbleached muslin have taken the place of the usual dark green. Sheer curtains of voile, cheese cloth, scrim and swiss have replaced heavier hangings. Light colored walls and ceilings with touches of color on the tables, chairs and cupboards have been used to make many Kansas farm kitchens cheerful and homelike.

Artificial Lighting

During the late fall and winter season much work must be done in the kitchen by artificial light and for that reason the brackets or sockets should be placed in such a way that the stove, sink, and work table may have good light. In addition to a central light near the ceiling, side lights near the stove, the sink and work table should be provided. Note in Figure 23 the lamp fastened on brackets above the stove. A small shelf near the work table in this same kitchen has also a lamp on it. If possible the light should be placed to the left of the worker. At least two lamps are needed if kerosene lamps are used and more if the kitchen is large. These lamps should have good burners and large wicks, with reflectors behind them to focus the light where needed.

The care of these lamps is no small item. Daily cleaning and washing of chimneys is required with frequent renewing of wicks to get a good light and to prevent the lamps from giving off an unpleasant odor while burning.

As soon as finances permit, the majority of the Kansas farm homes will have lighting systems, many have them now, but for the majority, kerosene, mantle lamps and gasoline lamps which give light equal in intensity to a 40

candle power electric bulb will have to do for the present.

The Water Supply of the Farm Home

Most housewives agree that a supply of running water is one of the best investments one can make for it saves not only time and energy for more profitable things but it permits of more sanitary conditions in the home, adding to the comfort and contentment in it. One of the great drawbacks to country life has been this lack of water in the home, yet it is relatively easy to install simple water systems which will serve the purpose and yet cost very little.

In Figure 8 is shown a simple system which is being used in the T. W. Baker home near Pratt until the time comes when the house may be remodeled and a more complete system be installed. This system costs from \$1.75 to \$5.00, depending on the amount of material which is to be found about the farm home, such as a barrel or tank and some pipe. A houseside tank which catches rain water might be used instead of the barrel. This may be filled with a hose or pipe attached to a force pump operated by a windmill, engine or handpower. A pitcher pump if the well is not over 20 feet deep or a small force pump for deeper wells may be put in the kitchen. A new pitcher pump and a small sink

including 40 feet of pipe and fittings can be installed for approximately 25 dollars.

Running water may be supplied by a simple gravity system where the water is forced by power from a windmill into a tank located in the attic or in an outside building or tower. The attic is the best location for such a tank to protect from freezing but there is the disadvantage that the tank may leak, and ruin the ceiling of the room below.

If there is a spring near by the farm house a hydraulic ram may be used to force water into the home. This requires but little attention and very little upkeep. Cisterns may also be dug and put down with comparatively little expense.

For practical information in regard to the farm home water supply the reader will find the following especially helpful:

U. S. D. A. Bull. 1227, Sewage and Sewerage of Farm Homes.

Farmers' Bull. 1926, Farm Plumbing.

Farmers' Bull. 1448, Farmstead Water Supply.

Farmers' Bull. 941, Water Systems for Farm Homes.



Fig.6- The electrically equipped water system of a Sedgwick Co. farm home.

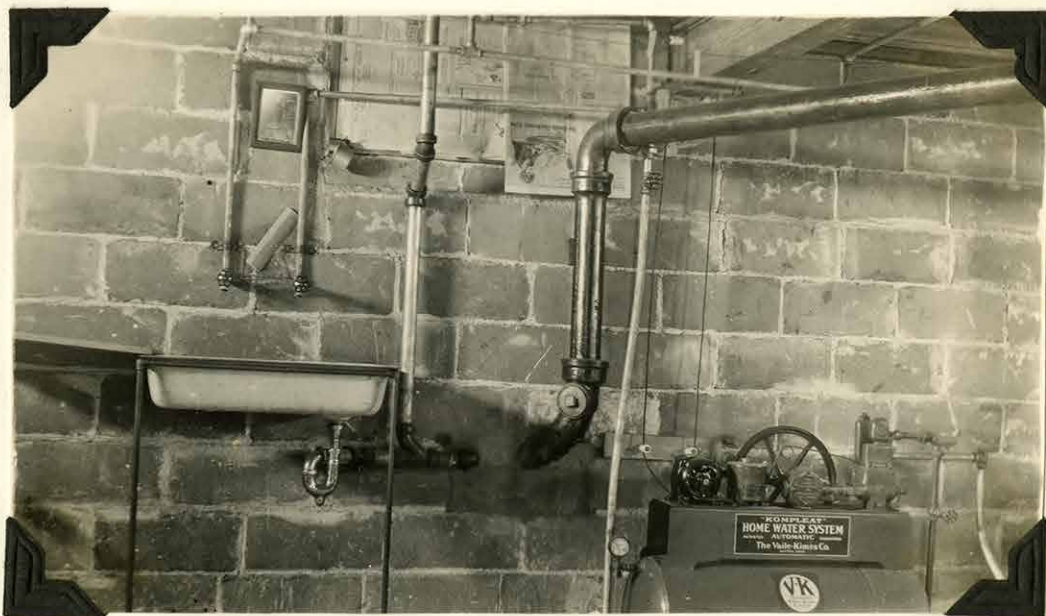


Fig. 7- Water system in Sedgwick Co. farm home.

Walls and Ceiling of the Kitchen

A kitchen that has rounded or curved corners saves much work in cleaning. The rounded corners are made by bending lattice metal lath to the desired curve and then tacking it on the same way as for square corners, plaster is then applied in the usual way.

A smooth, fine grain hard plaster with two or more coats of good glass paint or enamel flat paint makes a good finish for the walls and ceiling of the kitchen.

Because of its durability, color possibilities and ease with which it may be applied, paint has for centuries been a favorite wall finish and now modern chemistry has developed it to its highest form. There was a time when the same paint that was used for the outside of the house was also used for the walls and woodwork, but today we may choose a flat wall paint which dries with a dull finish quite unlike the glare and shine of the old time paint and a paint which offers a hard, durable surface which can be easily and frequently washed.

Painted walls may be cleaned by wiping with a cloth wrung out of warm water in which soda has been dissolved or a little kerosene may be used in place of the soda. Washing with a dilute solution of household ammonia and water

followed by rinsing with clear water to remove all traces of ammonia is also good.

According to Child (1925) in her book entitled "The Efficient Kitchen" kitchens may be "starched". After the paint has dried a thin solution of starch may be applied with a wide brush like a whitewash brush. When the dirt mixed with coal dust and grease makes the walls look dingy, the starch solution is washed off with warm water and a solvent, leaving the paint fresh and clean. A fresh solution of starch is applied to protect the paint for another six months or so. The dirt is said to come off easily this way and the paint remains unimpaired. Painted walls when given a coat of clear waterproof varnish are also easier to clean. However, this makes a shiny finish which is sometimes undesirable. A rough plaster wall is not so sanitary as a smooth plaster wall and is less easily cleaned.

Wallpaper and Calcimine. A kitchen wall should be washable, and for that reason we would not recommend using for it either wallpaper or calcimine. Neither is varnished wallpaper durable enough to be satisfactory for kitchens.

Oilcloth and Sanitas. Oilcloth or cloth back painted material such as sanitas, is sanitary, easily washed and attractive. It may be had in different colors. If hung well and occasionally varnished, it is durable. If figured

material is selected all over designs are best. The plain material is preferable for the design will wear off unless the walls are varnished. Walls that have been covered with sanitas may later be painted if a change is desired as it makes a permanent wall covering. Old sanitas covered walls that need freshening may be quite transformed by mottling or stippling. Flat wall paint may be used, the sanitas being considered the under coat and the fresh paint mottled or stippled over it as desired.

Tile. Tile is attractive and easy to care for but its expense makes its general use prohibitive. Tile back of the sink and the stove where there is more or less of a spattering of water and grease, is very desirable.

Brick or tile shaped markings on the enameled surfaces of the kitchen walls are not to be recommended for farm kitchens since the grooves collect dust and require much cleaning.

Wainscoting and Paneling. Although these are attractive, they require too much cleaning and care to be practical in the kitchen.

Composition Board. Composition board such as Upson plaster board and Sheet Rock are sometimes used for new walls or in remodeling. These give good service. They should be applied in strips that will correspond in width

and size on opposite walls. Wood strips should be used over the seams and these should be painted. All nail holes should be filled.

The Woodwork of the Kitchen

The walls and woodwork with the floor form the background for each room of the house and the importance of their proper finish cannot be over emphasized.

The usual finishes for woodwork may be divided into two main types: natural and painted; or enameled. By the first, the native beauty of the wood is strengthened and brought out by the use of transparent finishes. By the second the surface of the wood is entirely covered and the grain of the wood is concealed.

The materials used for finishing the woodwork should be of the best that can possibly be afforded. The extremely high cost of all building today makes close figuring necessary. Yet with labor as high as it is, it is poor economy to use cheap materials for it costs just as much to put on cheap paint as good paint. In the end it costs more because the work will have to be done over just that much sooner.

Natural Finish. Because all woods do not take the same finish equally well, in planning a house the choice of

wood finish desired should determine the choice of material for the wood trim. Soft woods like poplar and white-wood do not take the natural finish well. Cypress and birch cost very little more and take stain very well. Other good woods for natural finish are oak, gumwood, and spruce. Pine varies greatly but usually it is better to paint it.

A light stain enriches the quality of the wood. A primary coat of raw linseed oil and turpentine should be applied to the wood and when dry the wood should be sandpapered by No. 00 sandpaper and a coat of white shellac applied. Wax may then be rubbed in or after the stain has been applied two coats of interior varnish of a dull finish may be used. While this method may seem somewhat laborious, short cuts in refinishing natural woodwork are rarely successful.

Painted and Enameled Woodwork. By this method the grain of the wood is entirely concealed. Enamel is better than paint for this purpose as by its use a new surface is built up coat by coat and the success of the final work depends upon the carefulness with which the undercoats have been applied. For first class enameling not less than five coats should be given.

Light colored woodwork will brighten dark rooms and

in remodeling old kitchens miracles can be accomplished by giving the woodwork a "new dress". With soft wood, whether painted or in natural finish it is better to apply paint or enamel. Old painted woodwork in good condition is easily done over as it is not necessary to remove the original paint. If the old paint or varnish is in bad condition, it should be removed with a good paint and varnish remover and the wood made thoroughly smooth by sandpapering. If the old woodwork has not been stained, the procedure is the same as for new woodwork, but if it has been stained, the stain left in the wood may work through and discolor the enamel. In such a case a coat of white shellac should be applied first to seal or bind whatever stain may still be in the wood.

The woodwork in the kitchen should be plain with no grooves so that it may be cleaned easily. Enameled woodwork is probably the most satisfactory finish to use in the kitchen although the original cost is somewhat high. White pine or birch are best for this finish. If yellow pine is used, it should be shellacked first if white enamel is to be used, to prevent it turning the enamel yellow. Equipment and cupboards should be finished to match the woodwork.

Color of Walls, Ceiling and Woodwork. The ceiling should be lighter in value than the walls and woodwork

which should be next in value, the floor being the darkest.

For a kitchen on the shady side of the house ivory, buff, light tans and yellow offer a wide choice. If on the sunny side, cooler shades such as the many tones of a soft grey or light green are good. White surfaces are often a strain on both eyes and nerves and for that reason colors are recommended. Tan, sand and putty by their very neutrality are delightful colors and so far as cleaning is concerned, effect a compromise between light woodwork and dark.

Blue, green, yellow or blue green are sometimes permissible but one must use great care that the effect produced is not bizarre and ugly. These colors may often be used successfully for the breakfast room.

In general, a neutral and not a dominant tone should be selected for the large surfaces of the wood trim. Touches and accents of color may be used in stencil borders and on the tables, chairs and cupboards.

Ivory, tan and buff are said to reflect back into the room 67 per cent to 76 per cent of the light, while dark brown reflects only 22 per cent of the light and dark green 14 per cent.

Floors

The chief qualities required of flooring are hardness, even wearing and freedom from splinters. There are many types of finished wood flooring materials on the market. The choice of the wood to be used for the kitchen floor will depend upon three things: whether it is to be covered with linoleum; original cost of investment and probable cost of maintaining the floor in good condition; and the selection of a floor to harmonize with the interior decorative scheme.

Pine. The cheapest wood to use for floors is pine. This comes in two definite forms, the edge grained and the flat grained. The edge grained is quarter sawed and presents a reasonably attractive and fairly good wearing surface and is often used for the sake of economy. It may be stained and varnished or painted. The flat grained pine is not so desirable and is more apt to splinter. It is used primarily where the floor is to be covered with some such covering as linoleum. Pine flooring usually comes with very few short lengths and produces an ideal surface for a painted finish. For the four inch edge grain wood in the yellow pine the retail price in Manhattan is at the present time \$125 per M. The flat grain in the same size will cost \$90.

Oak. Oak is one of the most popular woods used for floors. It is hard and has a most characteristic and interesting grain and a lively luminous color. There are two types - the plain sawed and the quarter sawed. The quarter sawed oak is cut slantingly across the grain so that the resulting pattern is richer and more varied. It is more expensive than the plain sawed.

Oak flooring comes in two grades Clear select No. 1 Common and No. 2 Common. The cost of oak flooring at retail prices in Manhattan is as follows:

13/16 x 2 $\frac{1}{4}$ Standard Quarter Sawed \$160 per M and in the Clear \$225 per M.

Plain Red Oak in the same size will cost \$100 per M.

Maple. Maple is a strong, heavy wood of compact structure. It absorbs liquids slowly which together with its hardness makes it admirably suited for kitchen floors. It may be obtained in two colors - brown, the heartwood of the maple and light golden brown, the sapwood. Maple has a refined beauty of grain all its own. It is extremely light in color and will be the choice of those who want a light natural floor. Maple should be given a natural finish. It is too light grained to take heavy staining successfully. The grades for maple flooring are: Clear No. 1 and Factory.

Beech. Beech flooring looks much like the maple but it has more grain pattern and when varnished and waxed takes on deeper color tones. Beech is graded the same way as oak except that it has a Clear Red grade.

Birch. Birch because of its smooth surface and grain is one of the best woods to use when a dark stain finish is desired. It takes stain very nicely.

Any architect or decorator can show color plates of the approximate effects which different stains have on all these woods so that one may know what to look for in finishing them.

Hardwoods make better floors than the so called soft woods since they do not splinter readily and they take attractive finishes easily. Douglas fir although listed as a soft wood makes a durable, beautiful floor.

For the kitchen, hard wood floors are expensive, not resilient and absorb grease if not properly finished. Soft wood floors soon splinter, wear away, absorb grease and are hard to keep finished.

Birch is graded the same way as beech. Woods are also classified as open or close grain. The maple, beech, birch, cypress, pine, redwood, gumwood and cherry are close grained woods while the open grain woods are all kinds of oak, ash and chestnut.

Finishes for Floors

When using an open grain wood a good paste filler should be rubbed in before applying the finish to get a smoother more permanent finish. The filler comes in paste form to be reduced with benzine or turpentine. This is applied by brushing lengthwise of the grain and allowing to dry. The wood is then rubbed with a coarse cloth like bur-lap crosswise of the grain and allowed to dry for several days.

The next step is to sandpaper with No. 00 sandpaper. After dusting thoroughly, the wood is ready to be stained, varnished or waxed.

For close grained wood it is not actually necessary to use a filler but it is desirable since it gives an additional hard foundation. It also permits of a more even shade when finished.

It is better to use only oil stain under the varnish as other forms of stain will bleed through. If a penetrating or acid stain has been used to get the desired effect the stain should be sealed in with a coat of shellac. The use of both shellac and varnish is not a good practice as a rule, since shellac is much more brittle and less elastic than varnish. When the two are used together the

finish is more likely to crack or check than straight varnish or straight shellac coats.

For a Wax Finish. The surface is first built up with filler if necessary a stain and two coats of shellac or varnish. Shellac is generally regarded as the most satisfactory. Two coats of wax are then applied, each coat being polished with a weighted brush or polishing machine. Waxed and varnished floors are not satisfactory for the farm kitchen, since the sand and dust tend to break and mar the surface and they require much time and care in upkeep.

Painted Floors. No special preparation of the surface is necessary for the painted finish or new floors. High grade floor paint should be used. Three thin coats of paint need to be applied. It is important that the right shade or tone be obtained. If the desired color cannot be obtained ready mixed, the paint can be tinted with tube oil colors. Bright yellow and dingy drab colored paints should be avoided and clear, soft colors used instead.

Old Floors. An old floor should be made tight level, smooth and clean by planing and sandpapering. All dirt, wax and old stain should be removed. A good varnish remover may be used to soften old varnish which may then be scraped or brushed and the floor wiped with a cloth dipped

in gasoline or naphtha.

Home made varnish removers such as lye paste are effective, quick acting and cheap. The lye paste is made by mixing one cup of flour in two cups of water, then one half cup of lye is dissolved in one cup of water and added to the flour mixture. This makes a thick paste which must be applied with a swab or cloth tied around a stick. The paste is allowed to remain on the wood one minute and then the softened varnish quickly removed and the wood washed thoroughly with water and dried. Lye stains wood and must not be allowed to remain on it. If there are persistent stains to be removed, these may be bleached out by oxalic acid which may remain over night and thoroughly washed off. Water and soap may also be used in scrubbing the floor but water should always be used sparingly, since it raises the grain of the wood. All cracks should be filled with a crack filler. The floor is now ready to be finished.

Oiled Floors. Oiled floors have been found satisfactory in some farm kitchens. Where the floor is old, it should be scrubbed thoroughly before oiling. To one gallon boiled linseed oil boiling hot add one fourth pound of paraffin wax. This is applied to the floor with a woolen cloth or swab. As much of the boiling hot linseed oil as the wood will absorb should be used. All excess of

oil is wiped up and after a day or so the floor should be polished with a weighted brush. The oil finish should be renewed two or three times a year.

An oiled floor should be dusted with a dust mop or wiped with a cloth dipped in cold water.

Rubberoid Roofing. Rubberoid roofing, although not to be highly recommended, when painted makes a cheap floor covering which is better than a rough wood floor.

Tile, Concrete and Composition. A tile floor is often advocated for kitchens. When properly laid tile is durable, sanitary and easily cleaned but it is not resilient. It is also somewhat expensive.

Concrete also has the disadvantage of being so hard that one becomes fatigued when walking and standing on them for any length of time. The use of rugs or rubber and cork mats overcomes this disadvantage to some extent.

Mastic flooring can be mixed and laid by anyone who can lay cement. This flooring has resiliency not unlike linoleum and comes in black, brown, red and buff. It is somewhat higher priced than inlaid linoleum but may be used in an unbroken surface to form the baseboard as well as the floor covering.

Linoleum. Linoleum is perhaps the best all around kitchen floor covering. If carefully laid and cared for

it will last for many years, but if improperly laid dirt and grease accumulate in the seams and water getting under it, causes it to crack and wear out. Good inlaid linoleum over a soft wood is a good choice.

A plain pattern or small over designs are best. It is economy to have linoleum laid by the dealer. A charge of one dollar per square yard is usually made. This includes the felt, paste and cement. Proper laying of linoleum is important since it may add many years of length to its service.

After linoleum has been cemented down it should be scrubbed with hot water, wiped dry and while still warm paste wax should be thoroughly rubbed in to fill the pores and to repel dirt.

Printed linoleum is less durable than the inlaid and the patterns wear off. Printed linoleum should be varnished with a good spar varnish. Old worn off printed linoleum may be painted with a good floor paint.

Arrangement of Equipment

Unless the placing of the larger equipment in the kitchen is planned for at the time the kitchen is built the best step saving arrangement may be prevented by the improper placing of doors or windows or chimneys.

The importance of saving time and energy in the kitchen cannot be over-emphasized, for every minute that can be saved in the kitchen makes the other jobs of home-making easier because it means additional time to plan. Every step that can be eliminated by efficient work saves that much energy for the rest of the work that has to be done that day and for joyous living. There are over a thousand meals to be prepared each year and the lightening of even the smallest kitchen task may mean much to the homemaker.

A good way to test whether a kitchen is efficiently arranged or not, is to take a piece of paper and a pencil and draw the plan of the kitchen locating its equipment. Plan a meal, then trace the paths that must be traveled in preparing and clearing away this meal. If the lines or paths cross each other many times, then the kitchen equipment needs to be rearranged. An efficient kitchen means careful thought and study on the part of each homemaker, whether it be in planning a new kitchen or rearranging an old one.

Another plan is to make a drawing of the kitchen to scale locating the doors and windows. For instance if the size of the kitchen is 9 ft. x 12 ft. the plan may be drawn using one inch to the foot. Pieces of card board may be

cut representing the equipment to be placed in the kitchen. For instance if the stove measures $2\frac{1}{2}$ ft. x $4\frac{1}{2}$ ft. the size of this cardboard would be $2\frac{1}{2}$ inches x $4\frac{1}{2}$ inches. The pieces of cardboard representing the various equipment may then be arranged on the plan and the proper location of each equipment determined.

The kitchen jobs center around the following general operations: the preparation of meals; the serving of meals; and the clearing away and washing of dishes. There are two things to remember in the grouping of equipment in a kitchen plan. (1) All of the equipment related to the same kitchen process should be grouped together. (2) The equipment should be so arranged that each task can be carried out in as convenient a manner as possible. The more continuous the arrangement of equipment the more convenient will be the work.

Every kitchen has three main working centers: the worktable where food is prepared for cooking; the range or stove where the food is cooked and the sink where the dishes are washed and where fruits and vegetables are prepared for cooking or for serving uncooked. In addition, there are storage spaces for food and for utensils.

These centers or groups should be arranged so that in preparing a meal the housewife can start at the cool stor-

age center and work continuously to the preparation center and then to the dining table without retracing her steps or crossing from one center to the other. The refrigerator holds perishable supplies and since these are prepared either at the sink or at the worktable the refrigerator should be near both if possible.

The staple groceries are usually used at the worktable and these should be stored in a cupboard near it. The small utensils used most at the table may hang on hooks above the table.

Food prepared at the worktable is usually taken to the range to be cooked and for that reason the range is most conveniently located near the cabinet or worktable and also near the dining room door.

A serving table beside the range and near the dining room door is a great convenience. A kitchen wagon similar to the one shown in Figure 10 saves many steps. Setting the table and clearing away the dishes is usually accomplished by numerous trips from the kitchen to the dining room table and return. This may be done with one or two easier trips with a kitchen wagon which can be rolled close to the work carried on. Such a wagon will also be found useful for other purposes in the kitchen.

The Preparation Center. This includes the sink with

drain boards, cabinet or worktable with shelves above and shelves and bins below for staple groceries and for utensils.

In a great many farm homes the kitchen sink is used merely for a lavatory. The kitchen sink has great usefulness in the preparation of foods and in doing other kitchen tasks and should not be used for this purpose.

Before locating the sink a careful study should be made of what work will be done at the sink and how much light will be required. The sink and drainboards demand the greater part of one wall of a small kitchen and so are best placed opposite the range. If possible the food and water centers should be combined into one arrangement so that all the table space, such as the table top, the cabinet shelf and the drainboard forms a continuous workshelf on the same level. See Figure 10-b.

The sink should have at least one drainboard and preferably two that there may be ample stacking space on the right side of the sink. If only one drainboard is provided this should be on the left side. A small table at the right of the sink may take the place of one of the drainboards or the arrangement in Figure 37 is satisfactory.

The sink itself should be of one of the sanitary materials, porcelain enameled, iron or porcelain or vitreous china. Sinks of painted cast iron and also of sheet steel

can be obtained but these are not easily kept clean. Slate or soapstone sinks are often used in farm kitchens. They are inexpensive but absorb grease. The back wall may be cast in one piece with the sink or a separate back may be secured and attached later. The former is preferable.

The size of the sink will be determined by the size of the family and of the kitchen but a short sink with ample table and shelf room near it is often more convenient than a long sink. The sink should be large enough to receive a dishpan at least twenty inches wide. A 20" x 30" or 20" x 36" is a convenient size.

As a general rule, the sink should have open plumbing so that it will be possible to get at the pipes and so that the light and air may keep everything clean. It is possible to keep a sink closet clean but it means extra work and hooks or shelves near the sink will accommodate everything usually kept in this closet. It is better to keep things in sight and in order than to have the extra work of keeping the "sink closet" clean and tidy.

Sink water should never be allowed to run out on the surface of the ground. It causes foul odors, is unsightly and makes a breeding place for flies. Owing to the grease present in this waste water a trap should connect with the waste pipe to separate the grease so that the water can

A 3-1
Cabinet + Sink + Cutlery

My family.

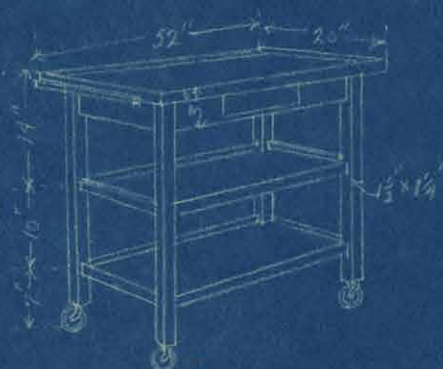
Sunshine
Keeps You
SMILING

pass out into a tile system without danger of clogging it. Figure 10a shows a good type of sink with two drainboards.

Perhaps 90 per cent of the kitchen sinks are too low for comfort. A sink should not be so low that it requires stooping. The proper height of the sink can only be determined by experiment. Most sinks are too low even for a woman of medium height to wash dishes in without stooping. The bottom of the sink should be not less than 30 inches from the floor and 31 inches is better for a woman of average height. If the sink is too low it may be raised by a piece of pipe threaded on both ends which can be added just below the trap under the sink. A concealed hanger attachment is more desirable than the legs or brackets.

Much of the work at the kitchen sink can be done sitting down. The stool should be low enough to allow the knees to go easily under the sink. To determine the height of the stool measure from the bottom of the sink or edge of the table to the floor and subtract the distance needed for the knees which is from five to nine inches.

A small cabinet for holding supplies used about the sink should be built above or to one side of it. An open shelf may be used if desired.



KITCHEN WAGON



GARBAGE PAIL UNDER SINK

FIG. 10

For storage of food materials like groceries a minimum of space is now required. Whether to install a kitchen cabinet or to have one built in is a matter of personal preference. In the majority of the farm kitchens which have been newly planned or which have been remodeled preference has been expressed by the housewife for the built in cupboards rather than the commercial cabinets although the latter have been carefully planned on the basis of long research and have been constantly improved until they provide convenient storage capacity for all staples in mouse proof containers.

If the cupboards are to be built in they should extend to the ceiling to do away with dust collecting on the top. The shelves near the top should be used for articles which are seldom used. Sliding doors are convenient.

The shelves of the cupboard should be placed just far enough apart to accommodate the articles to be kept on them. The space between the shelves may vary from 4 to 12 inches and the shelves should be narrow, just wide enough to hold one row of the articles to be stored on them. Shelves four inches wide will conveniently hold spices, flavoring, extracts, baking powder and the like. More than a 12 inch shelf is rarely needed. Much time and energy may be saved by not having to reach behind the first row

to get something at the back which perhaps we cannot see without standing on a chair. This involves considerable danger of knocking things off from the shelf and breaking them. Open shelves save time in that there are no doors to open and shut but because of the dust the closed cupboards are preferable.

The most important supply shelves in the kitchen are those directly above the worktable where the worker may have the supplies easily within reach as she sits or stands at the worktable.

If a cupboard has shelves that are wide and far apart and these cannot be adjusted, shallow boxes may be used to hold small articles. It is more convenient to take out one of these trays and select the article one wishes to use than to move a large number of things about on the shelf.

Narrow shelves with rims or racks may be attached to the cupboard doors or hooks may be placed on the inside of doors that open outward for small equipment such as egg beaters, spoons and the like.

The upper cupboards should be placed 14 to 16 inches above the work surface in order to reach the farther edge of the worktable easily, and prevent this space from being a catch all. The counter or table should not be too wide, 22 to 24 inches is wide enough.



102

fig 101

The lower part of the worktable may have a molding board and bins for flour, sugar and other staples. The bins should be made so that they may be easily cleaned and must be lined with tin or zinc to be vermin proof. The bins may be fastened to the doors as in the picture shown on page 79a. Drawers should operate on guides to prevent binding when pushed in or pulled out.

A "toe space" two inches wide and three inches high should be allowed for the toes that one may stand comfortably in front of the table while at work. Cupboard space should be provided for pots and pans near the stove. Racks for tins and lids may be made on the inside of the door narrowing the shelf accordingly so that these may not interfere.

Unfinished wooden tables require much scrubbing and become stained and hard to clean. Varnishing or painting and enameling the lower parts to match the woodwork or the other furniture and covering the top with a non-absorbent easily cleaned material saves much labor. Sheet zinc is often used for covering the worktable. It should be brought over the edges and carefully fitted and tacked in place so that water cannot get underneath and that the sharp edges may not be exposed. Zinc is affected by both acids and alkalies and is hard to keep in good condition.

Other working surfaces used on the commercial cabinets are porcelain enamel, nickel, aluminum, marble, zinc, wood, plate glass and composition.

A table covering which has been used in a great many farm kitchens in Kansas is the inlaid linoleum. Inlaid linoleum is a durable covering which hot dishes will not injure. It is easy to clean and is not a noisy surface to work on. The linoleum should be cut flush with the edges of the table and fastened to it with waterproof cement. Paraffin wax may be ironed into the porous surface of the linoleum with a warm iron. Two coats of varnish will add to its wearing qualities.

Porcelain and glass topped tables are attractive and easy to clean but they are expensive and must be used carefully to prevent being broken. Enamelware tops are not expensive and are convenient. Acids will stain if permitted to remain in contact with the glossy surface. This will not affect their usefulness, however. Tops of this material are not affected by heat but they will chip if carelessly used.

The main points to consider in planning the storage space in the kitchen are: (1) To keep each article near the place where it is to be used the most frequently. (2) To place the shelves and drawers where they are easily ac-

cessible and easily kept clean and still not in the way and where they will utilize space which otherwise might be wasted. (3) To make the cupboards, shelves and drawers of good smooth wood to insure ease of cleaning.

Working heights should be adjusted so that the housewife may stand erect, breathe with full lung capacity and with relaxed shoulders. It is a known fact that correct posture permits body balance, free use of the body, deep breathing and proper functioning of the digestive organs. *"Energy is saved, fatigue reduced and youth of body is retained by correct posture - 'she who bends will break' not only her back but her health." As a rule stoves and tables and bottoms of sinks are too low for the woman of average height and the result is often poor posture with tired backs and rounded shoulders.

To determine the proper height of the table, stand before it and without stooping place the hands so that the palms are parallel with the table top. The table is of the proper height when the palms of the hands can be laid flat on the table without stooping. If the hands are above the table it should be raised this distance.

The table may be raised (1) by means of a block of wood with metal strips and screws or nails for fastening;

*Clark, Ira - Columbia, Mo. Ext. Circ. 167.

(2) By a block of wood with wooden pin or bolt. This piece is set into a hole in the table leg. (3) By a block of wood sawed to fit in a corresponding notch in the table leg and fastened by means of long nails. (4) Castors may serve also to raise the height of tables and other equipment $1\frac{1}{2}$ to 2 inches. Oilstoves may be placed on brackets or fastened to the wall at the desired height. If the working heights are too low the castors and legs can be removed. A platform can also be made for the worker to stand on. The woodbox may be raised at least two feet from the floor by placing on legs to which castors have been attached. This will save needless stooping as well as making it easier to clean around and under the woodbox. High ovens, long handled dustpans and brushes also save stooping or bending. See Figure 11.

The Cooking Center. This includes the stove with cupboard for skillets, supplies and utensils and serving dishes needed at the stove, a small serving table, shelf or wheel tray.

Since the heat from the stove often proves uncomfortable in the summer the stove is generally placed somewhat apart from the other equipment. It must also be accessible to the worker at two or three sides.





Fig. 12- If a work table is too high, a high stool may be used. However, the posture of the worker as shown in the picture is awkward and means unnecessary strain.

The kind of stove chosen will depend largely upon what fuel is to be used and the size will depend upon the amount of cooking that needs to be done. If the stove is to be depended on for heat as well as for cooking the range is a good choice. However, many farm homes are now using a liquid fuel stove in the summer for cooking purposes and it may be wise to use a small heater for heating the kitchen thus saving fuel and avoiding over heating the house in summer. When the kitchen is too small for two cooking ranges and a coal range must be used in the winter season a combination type is a wise choice. Coal and gas, coal and electricity and coal and oil stoves may be obtained in good models.

The points to look for in choosing a stove are plain design for fancy trimmings require work to keep clean; a ground polished top which may be kept clean with soap and water; a warming oven, an oven thermometer or heat indicator, a water front attachment and a high oven which saves much stooping.

The coal and wood range should have a chute to carry ashes directly to the basement. A metal hood opening into a flue over the range will carry off steam and odors and unnecessary heat from cooking and will keep the smoke from settling on the ceiling and walls.



Modern electric ranges, gas ranges and electric fireless cookers have heat regulators, automatic clock devices and many other conveniences.

Both wick and wickless types of kerosene stoves are satisfactory if they are kept clean. The wickless type of stove must be set level as the oil is fed to the burners by gravity. Both types can be had with a giant burner in addition to the regular burners.

Gasoline and gas stoves also give good service. Some of these have closed in cupboard space for kettles below the burners. Where space is needed a kerosene or gasoline stove may be placed on a wall shelf or on brackets. A device of this sort makes cleaning easier.

All stoves should be placed far enough from the wall so that the floor behind it may be cleaned easily. For fire protection the stove should be placed several feet from any woodwork unless properly protected by metal shields.

Cool Storage Center. Today householders rarely make their own iceboxes. These are not difficult to make and will keep ice well. Full instructions for making an icebox is given in Figure 15.

Since so many of our refrigerators are purchased it is important that we know every essential of a good refriger-

erator. These essentials are: a storage chamber with an evenly maintained temperature in a range of five to ten degrees below 50° F (48° F should be the maximum); a low humidity; a good circulation of air throughout the interior of the chest.

The reason for the necessity of the first condition is that at a temperature of 45° F bacteria begin to have a languid life and growth. Above that they grow very rapidly. No refrigerator which cannot constantly maintain a temperature below 45° F is efficient. Low humidity is required because of rapid development of fungus growths in damp air. Mould is a symptom of poor refrigeration and indicates that the air is damp.

There is a difference of from 20 to 25 degrees between the inside of the refrigerator and the room in which it stands. The walls of the chest should be carefully insulated so that the refrigerator may not take up this extra heat in addition to its job of absorbing the warmth on the inside of the container.

Cork covered with asphaltum is about the most satisfactory insulator. Mineral wool has a tendency to settle and disintegrate and for that reason is not so satisfactory. Fibre board is also less satisfactory than cork.

There are many satisfactory moveable iceboxes but a

built in refrigerator arranged for when the kitchen is built is best. It should have an opening in the back or the end for outside icing. The refrigerator may be built in the wall making the outside doors come flush with the wall or it may be set in the kitchen and have a corresponding opening in the house wall. The refrigerator should fit tightly against the wall or cold air will come into the house in severe weather. The built in refrigerator may serve as a cold closet when the outside icing door is left ajar.

The efficiency of the refrigerator may be determined by placing a thermometer on the coldest part of the storage compartment which will be the middle floor of the chest and reading the temperature registered at this point. Readings should be taken at regular intervals, preferably in the morning and evening. The thermometer should register from 40° F to 45° F. Milk, raw meats and fish should be placed at the bottom of the refrigerator since this is the coldest part and vegetables and foods of bland flavor may be placed near the middle, with foods of decided flavor near the top.

The refrigerator should be placed near the door so that ice may be delivered into it without tracking across the kitchen floor. It should be placed not far from the

sink and should be protected from draughts and sudden changes of temperature.

A backporch, or entry and above all, a cellar are most undesirable locations if the life of the chest and its proper functioning is to be taken into consideration.

The size of the refrigerator will depend upon the size of the family and the amount of food to be stored. A 75 pound capacity is good for a family of two or three; 100 to 125 pound capacity will be needed for a family of four or five. If quantities of butter and cream are to be kept in it, the refrigerator should be larger.

The drain of the refrigerator should be connected with the main drain or should extend out of doors into a flower bed or to a lawn.

The iceless refrigerator works very well in western Kansas due to the dry atmosphere. Under favorable conditions a temperature of 50 degrees may be obtained. It should be kept in a shady place where there is a good breeze. It may be attached to the wall near a window where the food may be placed in it through the open window.

The iceless refrigerator is comprised of a wooden frame 42 x 16 x 14 inches. This is covered with a rustless type of wire. The door fits closely and is mounted on brass hinges. The bottom is solid but the top is covered

with screen wire. The shelves may be made of poultry netting, solid wood or strips of metal and may be adjustable. A large enameled pan 14 x 16 inches is placed on the top and the frame rests in a 17 x 18 inch pan. A cover of cotton flannel, duck or burlap is made to fit the frame. The bottom of the cover should extend down into the lower pan. Four double strips which taper to 8 or 10 inches in width, are sewed to the upper part of the cover. These strips form wicks that dip over into the upper pan.

The operation is very simple. The upper pan is kept filled with water which is drawn by capillary attraction through the wicks and saturates the cover. The evaporation of the water lowers the temperature of the refrigerator inside. In order that evaporation may take place continuously and rapidly, the air must be dry and there must be a strong breeze. When the air is full of moisture the evaporation will be slow and the refrigerator will not work as well.

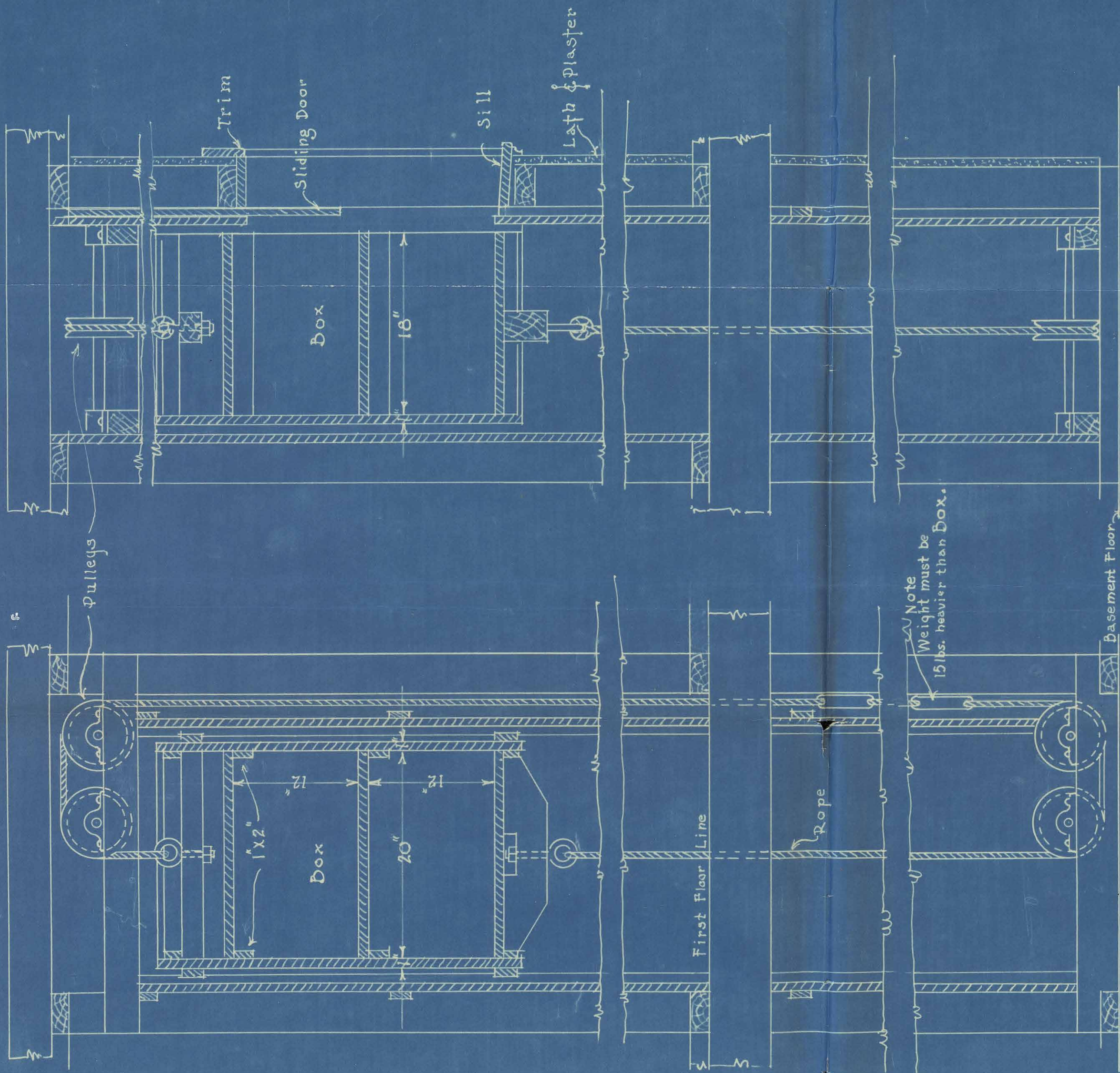
Many farm women in Pratt, Reno, Sedgwick and other counties in Kansas are using iceless refrigerators and find them satisfactory substitutes for ice.

During cool weather a window box is often used for keeping food. For this an ordinary light box may be fitted to the outside of the kitchen or pantry window. The

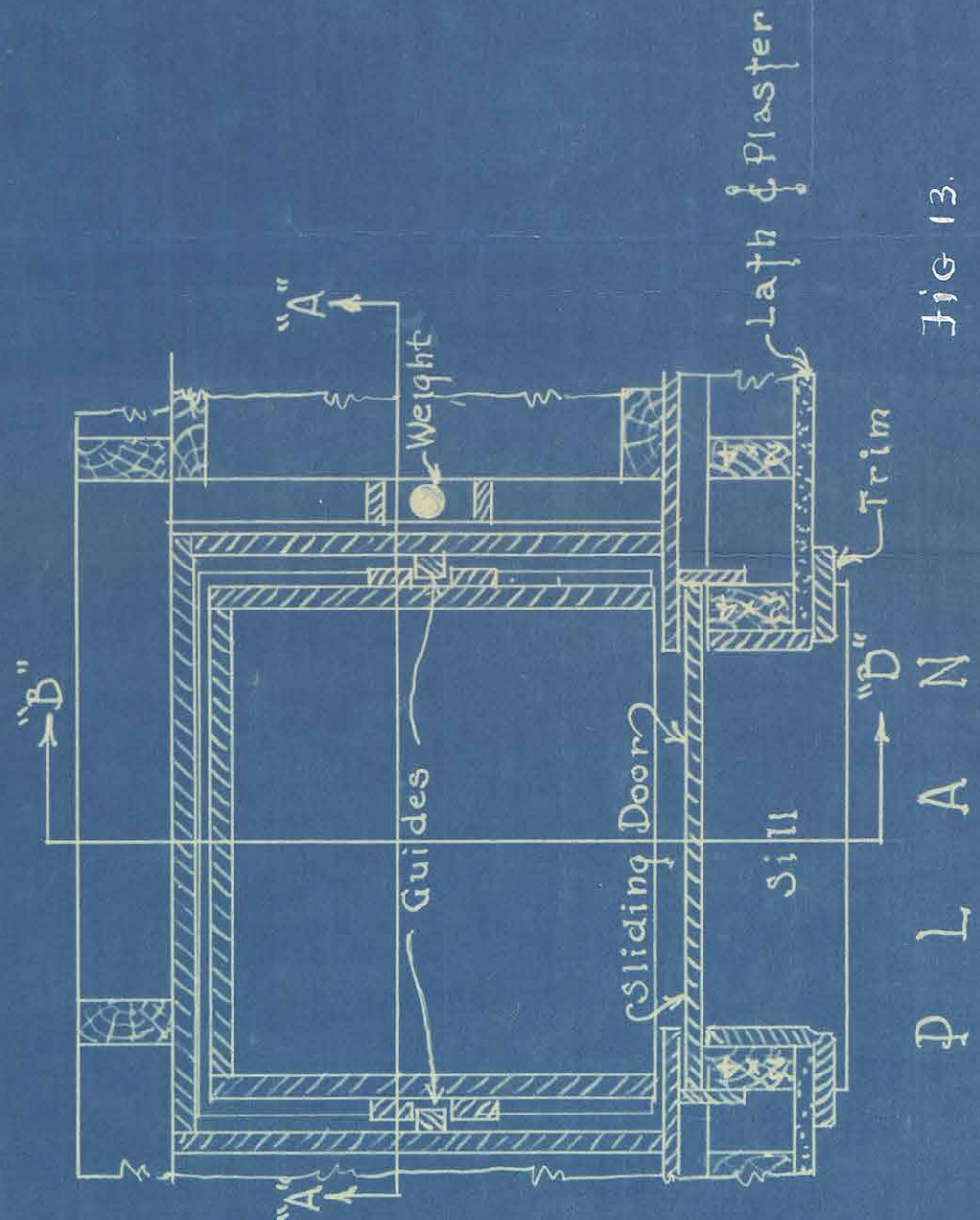
north exposure is the coolest location. Raising the window gives access to the box. The window sill is extended by a shelf supported by wooden braces. The cold box is fastened by screws to the window sill and the extended shelf. The box should have a slanting top to shed the rain. Holes for ventilation are made in the sides, these are screened. The shelves may be of wood or poultry netting resting on cleats fastened to the sides of the box. All food placed in the box must be covered to protect it from dust.

The dumb-waiter saves many steps between the kitchen and basement. Where there is no basement, it may run into a pit with cemented sides or into a cold well. Good circulation of air should be provided for. In the winter cold air can be admitted into the dumb-waiter compartment through the openings in the wall. In this way a good cold closet is provided. For construction of dumb-waiter see Figure 13.

Window boxes are dependent on the outside temperatures, hence foods often freeze when these go down and at other times the temperature of the box may go up to a point where food will not keep. If the box is not well made dirt will sift in on the food. However, they are temporary helps to the farm housewife who cannot always have



SECTION "A-A" SECTION "D-D"



KANSAS STATE AGRICULTURAL COLLEGE
ENGINEERING EXPERIMENT STATION
R.A. SEATON Director

DEPARTMENT OF
ARCHITECTURE
A. DUMB. WAITER

Scale 1/8" = 1'-0"
Designed By H.W.
Traced By C.A.B.
Approved By

Sheet 1 of 1 Sheets
Date Jan. 6, 1928
Drawing No.
File No.

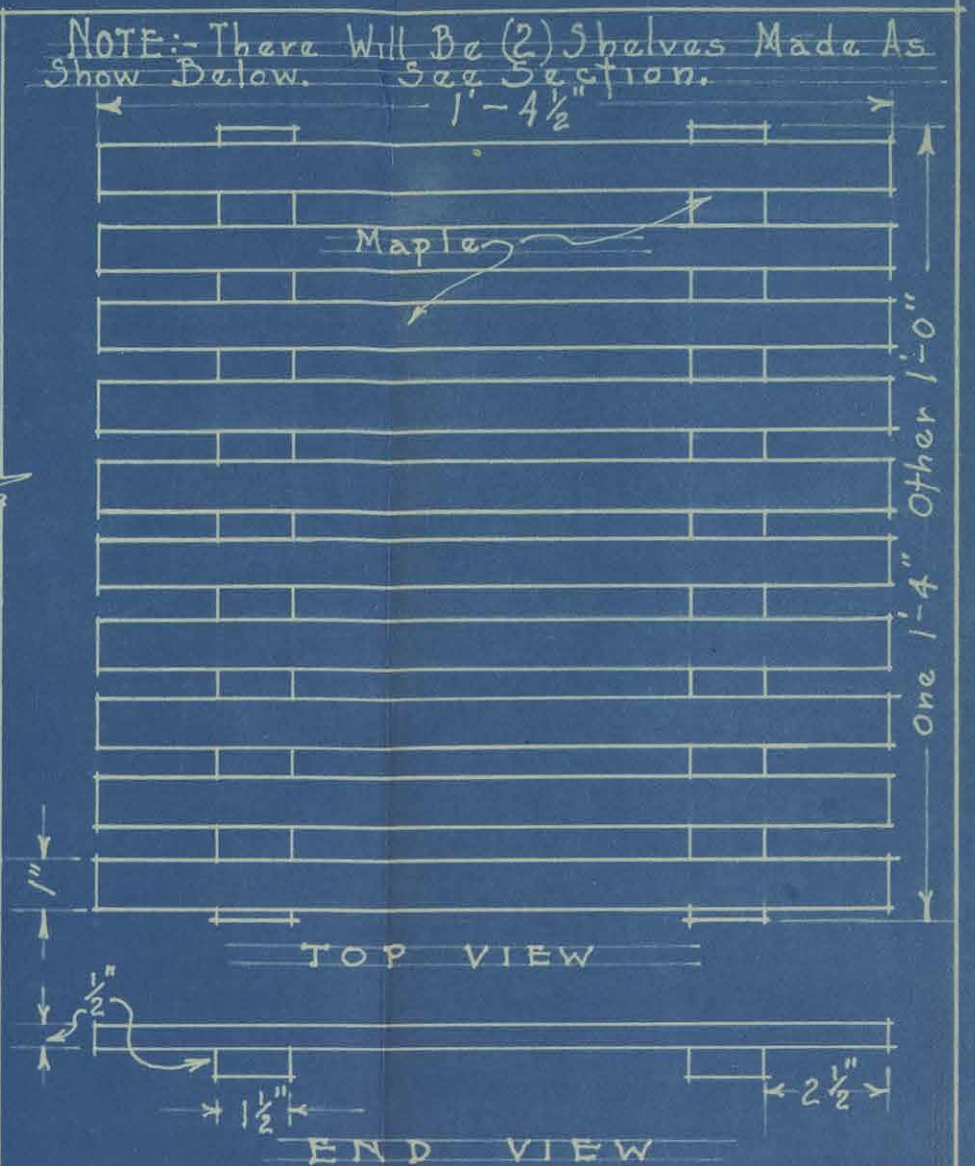
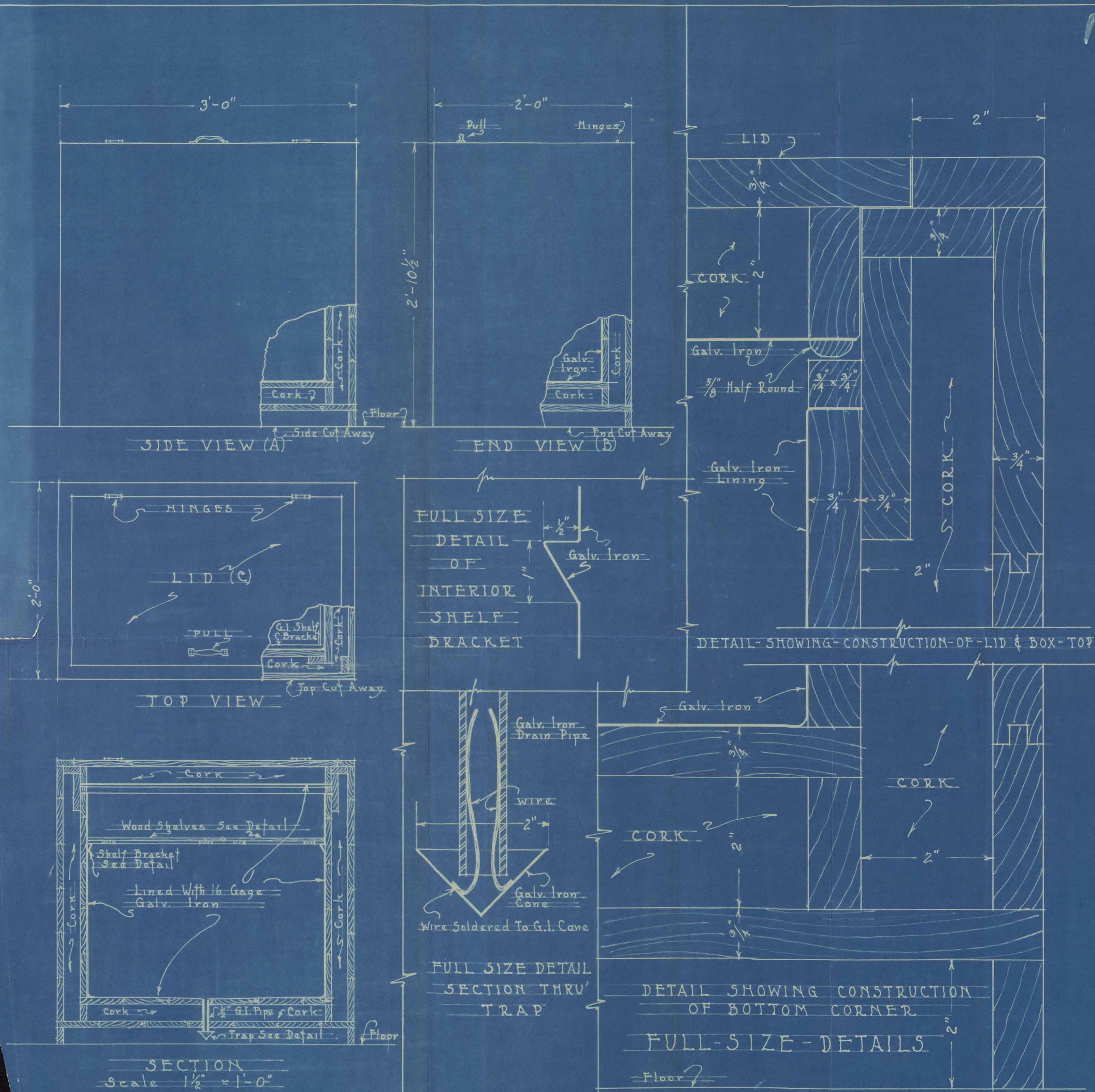
ice.

*According to estimates made by the Good Housekeeping Institute not more than 40 per cent of the homes in the United States are using refrigeration, and not more than 17 per cent of these homes use their refrigerators in the winter. The Good Housekeeping Institute does not recommend discontinuing the refrigerator during the winter months since it is difficult to keep foods in the most sanitary way and to keep them from spoiling without ice.

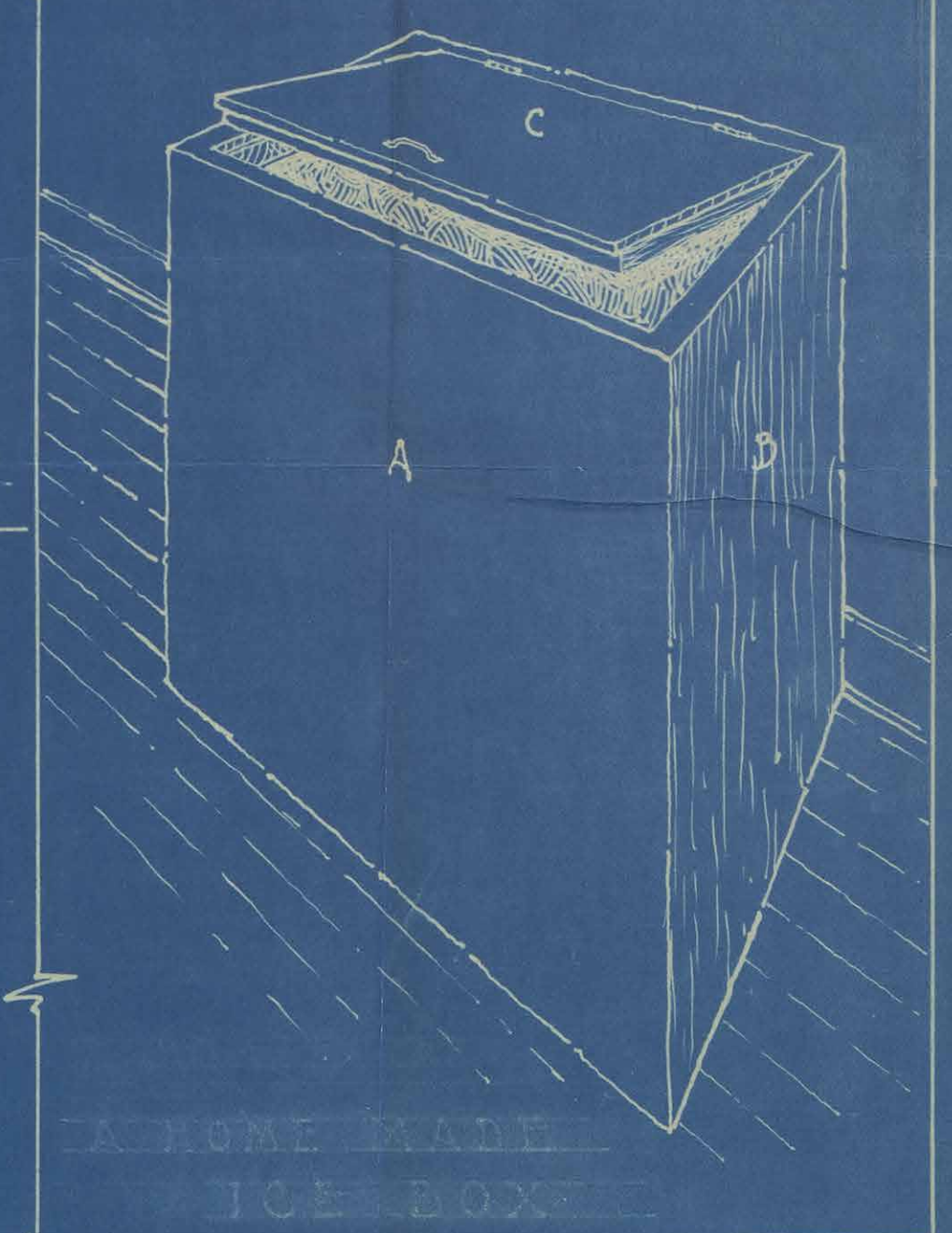
Improving the Kitchen by Rearranging or Remodeling

Figures 16 and 17 show the plans of Mrs. Ida Cooke's kitchen of Sedgwick County before and after remodeling. The arrangement at first was very inconvenient. Since there were only a living room and one bedroom without closets in addition to those shown in the plan on the first floor, the kitchen served also for a dining room. The three doors on the east wall broke up the space badly and left no room here for any equipment. The windows were long and narrow and a porch on the west shut off much of the light. Upon entering the room, the lines of travel crossed in all directions, from the outside to the wash room, to the living room and to the stairway leaving no area free for the preparation and clearing away of meals.

*Good Housekeeping, Oct. 1927. "For Refrigeration All the Year Around".



DETAIL OF WOOD SHELVES
Scale 3" = 1'-0"



KANSAS STATE AGRICULTURAL COLLEGE		
ENGINEERING EXPERIMENT STATION		
R.A. SEATON Director		
DEPARTMENT OF ARCHITECTURE		
AN ICE BOX		
Scale As Shown	Chk	Sheet 1 of 1 Sheets
Designed By		Date Dec 1 1927
Traced By		Drawing No. 84-72
Approved By		File No



Fig. 14- Picture of Mrs. Stitt's built in refrigerator. Note the drawers and cupboards above the refrigerator. These extend to the ceiling and give added storage place for staple groceries.

Storage space was confined to a small cabinet in the southwest corner and the pantry across the room. Sugar and flour were kept upstairs. Food, dishes and utensils were stored hit and miss in the pantry. Various containers were placed on the floor and had to be moved each time the floor was cleaned. The sink and pump were located in the bath room. In preparing a meal Mrs. Cooke would have to bring the water from this room and the supplies from the pantry and carry them to the cabinet for preparation and then back again to the range for cooking.

Through the efforts of Mrs. Laura I. Winter, Home Demonstration Agent of Sedgwick County, Mrs. Cooke became interested in a campaign for more convenient kitchens and the room was remodeled in accordance with the plan shown in Figure 17. Mr. Walter G. Ward, Extension Rural Architect, visited this home and suggested the changes that were finally made.

The partition between the pantry and bath room was removed first and all the shelves and equipment in these two small rooms were taken out. The room formerly used for coats and other storage was made into a bath room. The sink and pump were left as they were, but a built in cupboard and work table with bins and drawers were added on both the north and east sides. This makes a very con-

venient working area and takes care of the storage problem nicely. The old range which was inadequate for heating the large room was sold, and a heater was purchased to be used in cold weather. A Kitchen Kook range was added as new equipment and placed on the west wall of the working area. The two windows, one above the sink, the other above the work table between the cupboard and the wall give good light. Adequate ventilation is provided for by these windows, the windows in the dining room and by the door to the outside.

Pictures of the built in cupboards and work table may be found in Figures 18, 19, and 20. Note the zinc bins fastened to the doors of the lower cupboards for storage of flour and sugar. These are large enough for 100 pounds of these staples and there is no longer any need for storing these upstairs.

The built in cupboards above the work table on the north are used for storage of supplies and the lower cupboard between the two bins for utensils. This latter arrangement is not as convenient as one might desire as it necessitates stooping and reaching in for the utensils and unpling these when required for use. A shelf placed above and to the side of the range low enough to be within

easy reach and with hooks below for small equipment is to be added. Supplies like tea, coffee, salt, pepper and some utensils such as the teapot and coffeepot will be placed on this shelf.

Since Mrs. Cooke felt that she could not spend a great deal of money on the remodeling, the working surfaces were enameled. After a year's use these showed much wear and will be replaced by inlaid linoleum cemented to the wood, and waxed.

The woodwork of both rooms was painted an ivory color. The cupboards were painted in the same color and trimmed in robin egg blue. Cream and blue colored print linoleum is used for floor covering at the present time but Mrs. Cooke expects to replace this with inlaid linoleum as soon as she feels that she can afford it.

To make the kitchen more attractive white curtains with narrow yellow ruffles were hung at the windows.

At the time this remodeling was done Mrs. Cooke did not own a refrigerator but purchased one later. This is not used in the winter time and this accounts for its inconvenient location in the plan. In the summer this could be placed where the heater now stands. A better location would be on the east wall but the ironing board will interfere with its location there. The separator is not con-

veniently located and a separate room for it and for outside wraps, shoes and rubbers is needed.

This house is one of the very old houses found on many Kansas farms. There are eight members in the family. Five boys make hired help unnecessary. Under the new arrangement, the use of the dining room for such purposes as sewing and a place where the family may spend much of their leisure time has been made possible. Mrs. Cooke enjoys listening to the K. S. A. C. Housewife's Half Hour while doing the morning's work and at noon the men may listen to the market reports and to discussions by experts on farm problems.

The cost of remodeling this kitchen was as follows:

Carpentry-----	\$46.00
Lumber-----	50.00
Hardware-----	5.00
Paint-----	<u>5.00</u>

Total\$106.00

I visited this kitchen November 25th and to my query how she liked her "new" kitchen Mrs. Cooke said, "I can hardly tell you- now all my work is in a small space, only one step from the range to the pump and sink. Everything is right at my finger tips - only three steps across my working area. I never have to lift a heavy ironing board,



Fig. 19- The built in cabinet is the key to a step saving kitchen. It combines the sink, the cupboard, the bins and the work table into one, compact unit and saves the steps ordinarily wasted in walking back and forth between these pieces. It is best built along one wall of the kitchen with the sink below central windows.

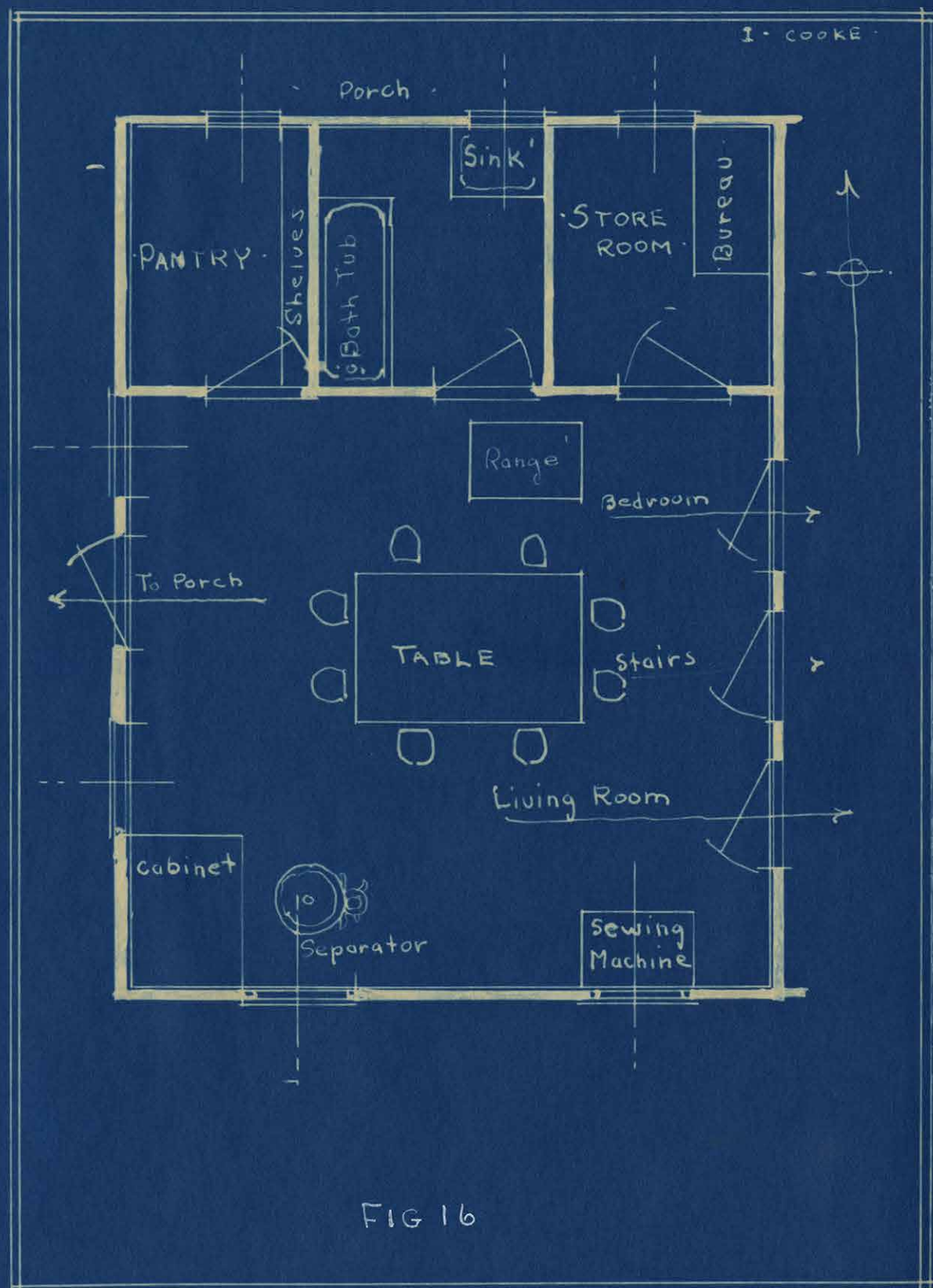


FIG 16



Fig. 18-Built in cupboard and work table on the west wall of the Cooke kitchen. Note part of zinc container for flour and the drawer space for other staples. The cupboard above is used for dishes.

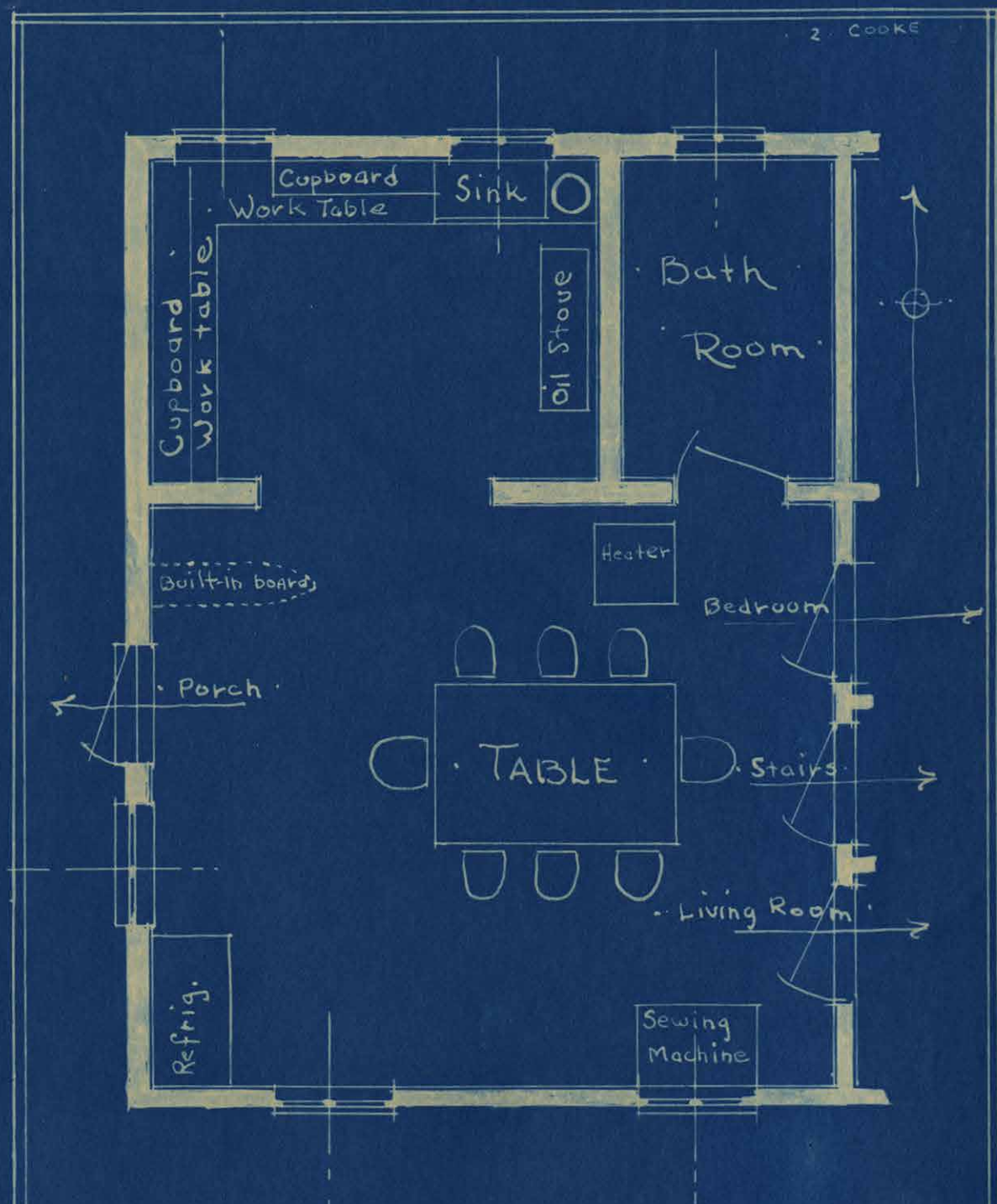


FIG. 17.

it drops down when I open this little door in the wall. My stove which I bought to fit in that space in the kitchen is just like having city gas."

Figure 21. The original kitchen shown in the plan was 8 ft. x 16 ft. with a 6 ft. x 16 ft. addition on the north side under a shed roof. The floor of this addition was one step lower than that of the kitchen floor. It was divided into two parts, a pantry and a screened porch. The only storage space available was in this pantry which had narrow shelves along the north and east walls. The floor was used for flour, sugar and lard containers. These had to be moved each time the floor was cleaned. The kitchen itself was inconvenient and the dining table was used also as a work table. The stove was placed in the southwest corner of the room against both walls. The pipe hole of the chimney was at the side and this made two turns by means of "crazy" elbows necessary. The stove did not draw well and the pipe, being unstable, often fell down scattering soot over everything. Mrs. McCormick had often spoken of remodeling but could not figure out a way to do it.

When the Farm Bureau Unit in her community became interested in a campaign for better kitchens Mrs. McCormick held back, thinking that the 65 dollars which she had

saved would be insufficient to do the work but Mrs. L. I. Winter, Home Demonstration Agent of Sedgwick County, urged her to go ahead with the remodeling and with suggestions from Mr. W. Ward, Extension Rural Architect, Kansas State Agricultural College, Mrs. McCormick accomplished the results shown in the plan, Figure 22.

The old pipe hole in the side of the chimney was closed and a new hole cut at the front. The stove was moved directly in front of the chimney. A wood shed was built on the northwest corner with a door cut from the kitchen leading into it. See picture of stove and door leading to wood shed, Figure 23. A closet for brooms with shelves for cleaning was added on the west side of this wood shed. A small window on the east gives light and permits of fuel being put through from the outside.

The partition between the pantry and kitchen was removed. A new floor was laid on the same level as that of the kitchen floor.

Cupboards for supplies and a work table with drawers, shelves and bins for flour and sugar were built along the north and east sides. Water was piped in from the well and a sink added. The walls were covered four feet up and above the baseboards with oilcloth and the remainder of the walls and ceiling was papered. Inlaid linoleum was

used for the floor. The woodwork was painted a light tan. The cupboards were also painted this same color with blue trimmings.

Mrs. McCormick's family consists of only three members and since the house is small, the kitchen serves also as a dining room. By the rearrangement and remodeling of this kitchen, a compact arrangement of the equipment in a small space was accomplished, ample storage provided and a more attractive, convenient kitchen was made for Mrs. McCormick to work in. The porch was closed in with glass sash windows and is used for many kitchen tasks.

In Mrs. McCormicks own words: "The cost had worried me some from the start but I knew I had 65 dollars that I could use. I stepped out on faith as my men (husband and father) were not backing me very strongly at first, although they came over all right later without my trying to talk them into it too. I knew I had earned that kitchen and deserved it. My health is not of the best. The great saving of steps in good arrangement of table, sink and stove and the home made service wagon which carries dishes from sink to cupboard and table and back again, and my high stool on which I sit and do so much work save me from much weariness that I used to feel. The time saved leaves me free for other things to which I can now go fresher in

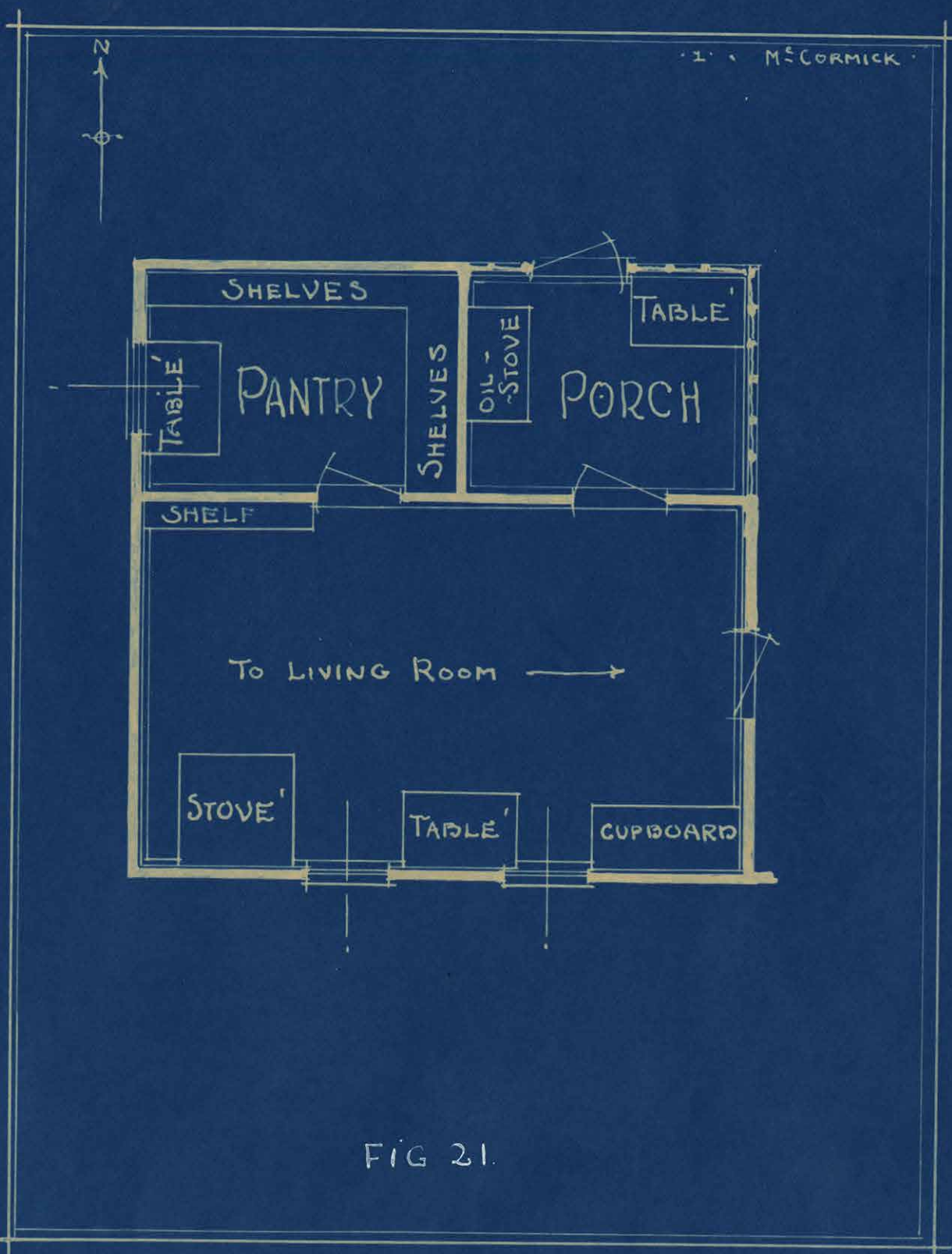


FIG 21.

-2- MCCORMICK

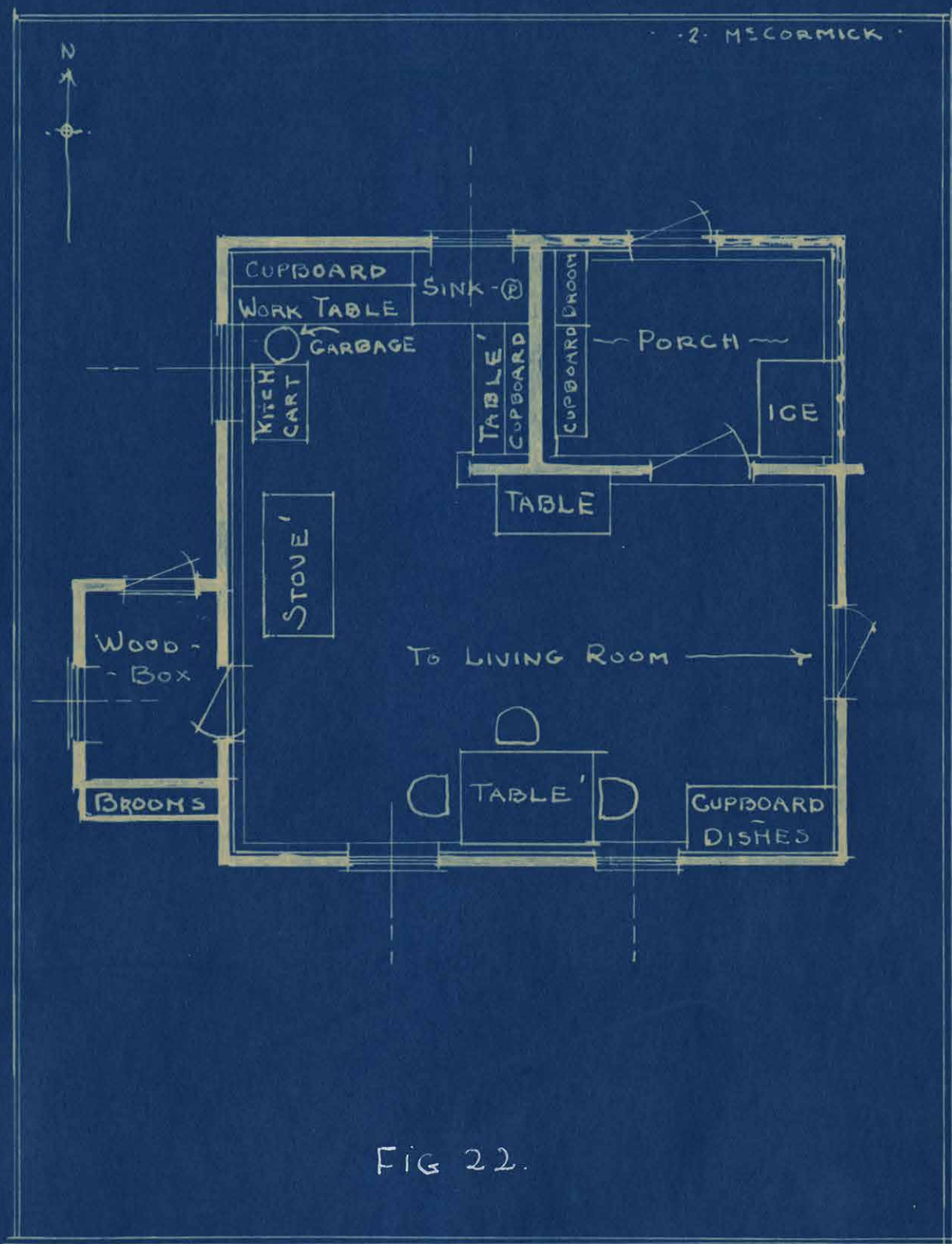


FIG 22.

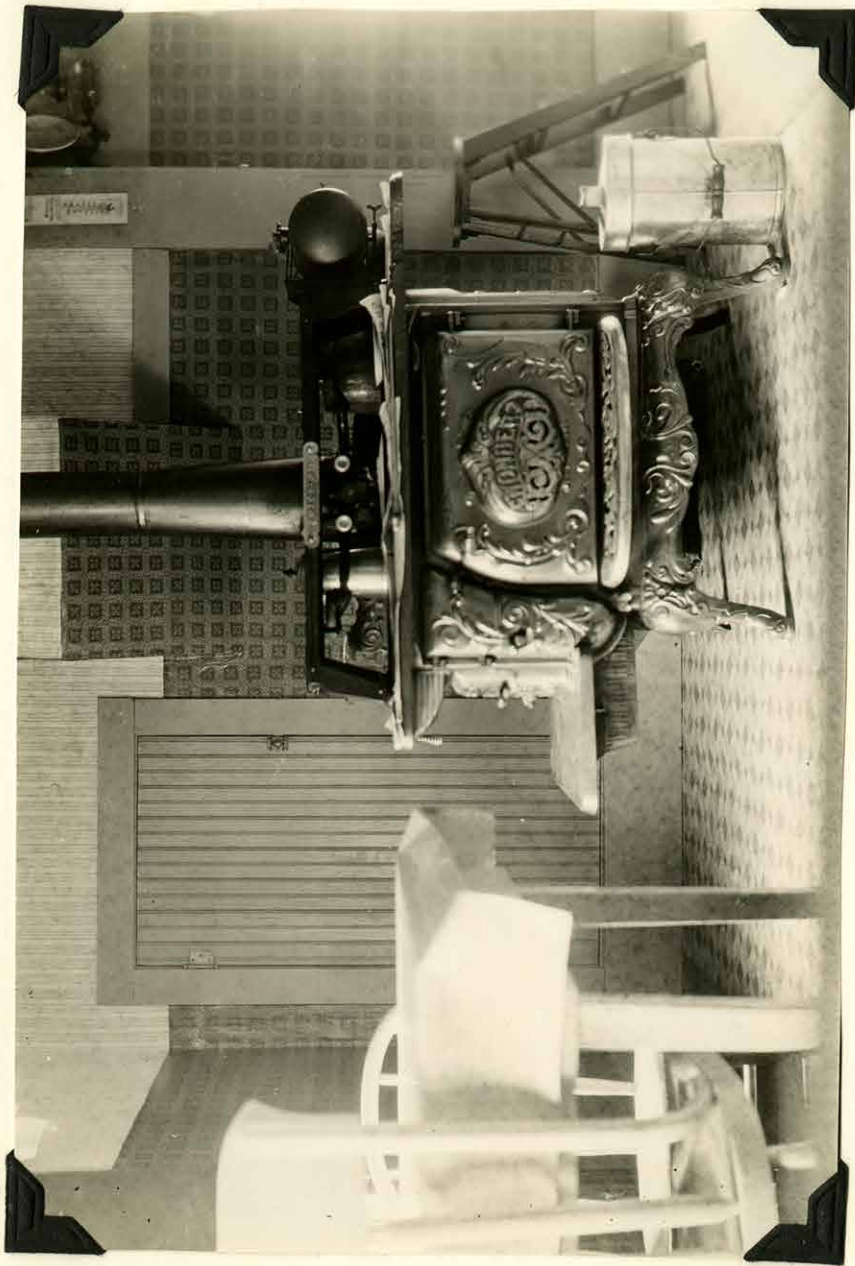


Fig. 23- Mrs. McCormick finds the built in wood box a great convenience. The gas stove placed on top of the coal range is used in summer. The lamp on brackets gives sufficient light on the stove. The ornateness of the stove has the objectionable feature of being difficult to clean.



Fig. 24- This work table with cupboard for supplies above and bins for flour and sugar as well as shelves for utensils made housekeeping less of a drudgery to Mrs. McCormick.

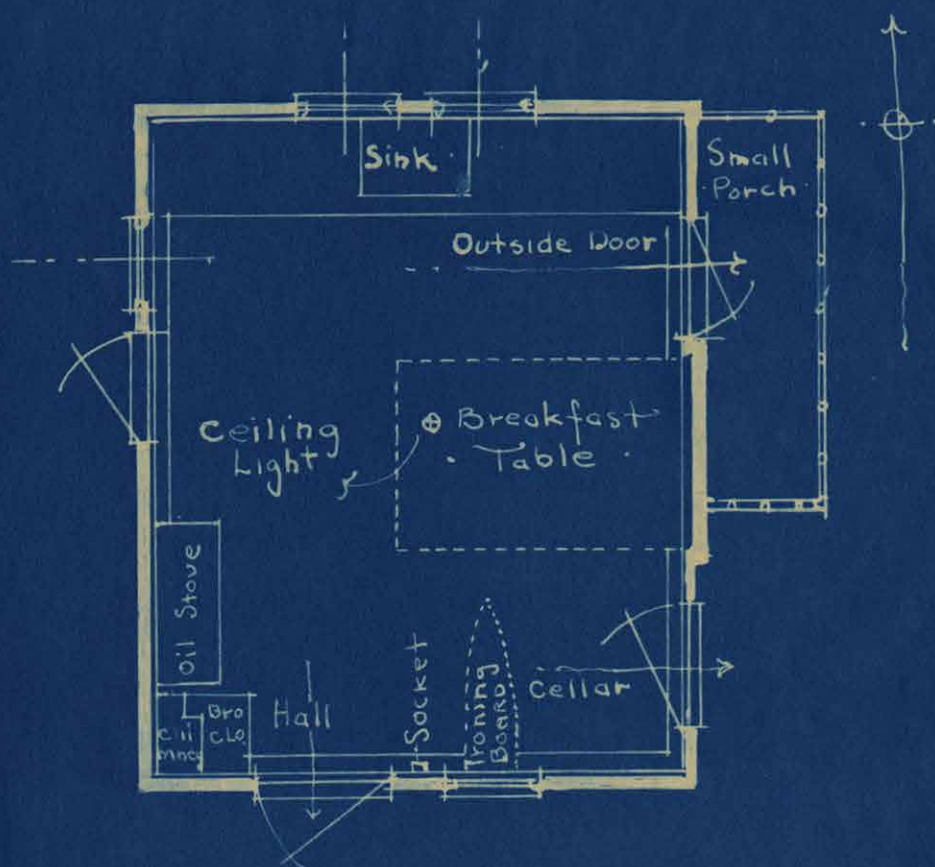
mind and body."

Total cost of remodeling was:

Doors for cupboards -----	\$12.00
Lumber, sash and hardware -----	16.00
Lacq-----	19.50
Carpentry-----	39.50
Sink-----	8.00
Linoleum-----	17.00
Wood shed-----	12.00
Wash stand-----	2.00
Pipe for drain-----	1.00
Service wagon-----	<u>2.00</u>
Total	\$129.00

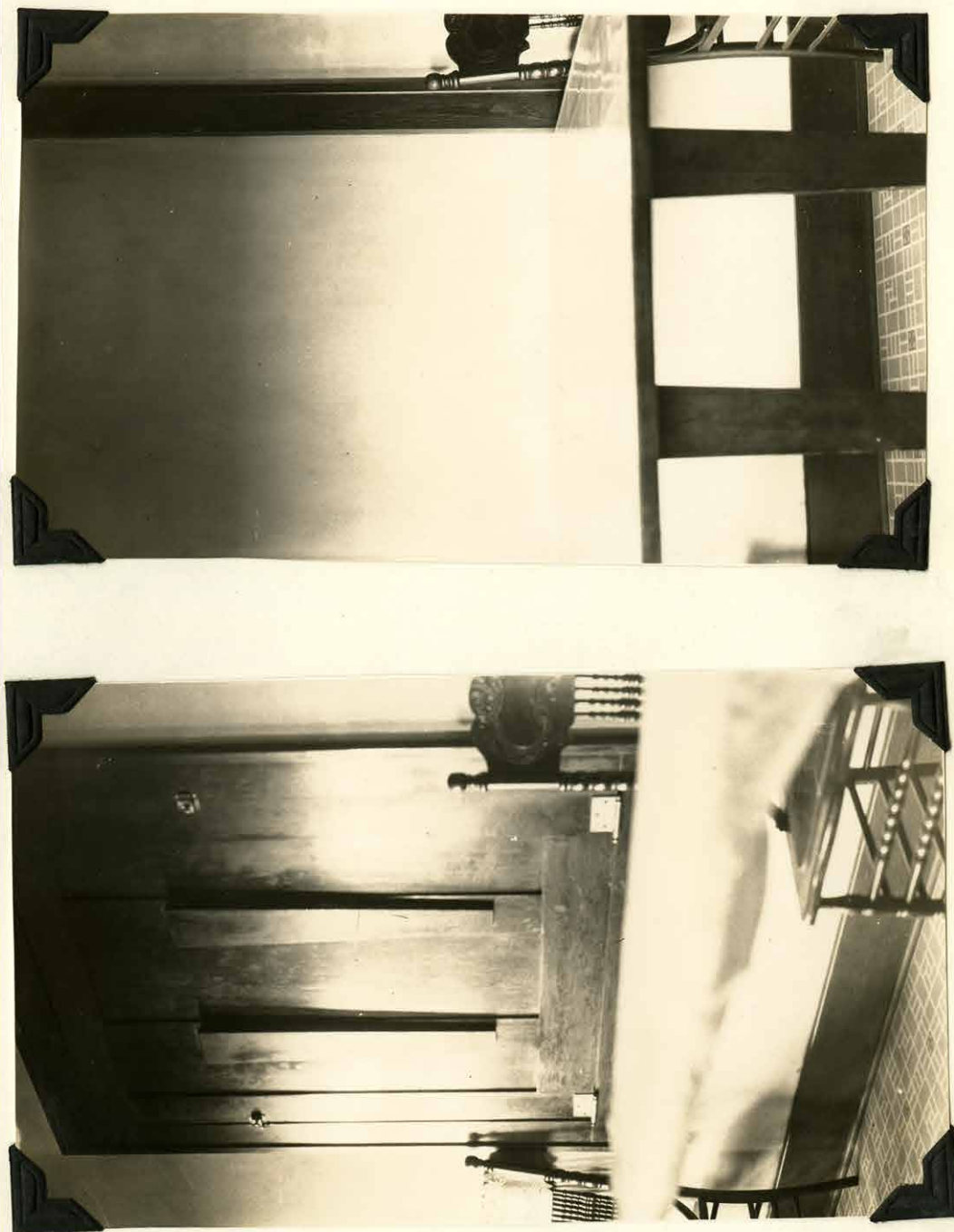
Figure 25. The kitchen of Mrs. J. H. Dunn of Valley Center has many desirable features. Note in Figure 3 how the kitchen has been extended to provide for good light and ventilation. The two windows on the north together with the window on the west give ample light on the work table and sink. A view of the barns and fields may be had from the north windows as well as a view of the road from the window on the west.

The breakfast table is built into a panel on the wall. See Figure 25. This is a convenient arrangement for the table is out of the way when not in use and there are no



Breakfast table built in panel can be let down or stowed away as needed ~

FIG. 25



Figs. 26 and 27-Built in table in Mrs. Dunn's kitchen.

heavy pieces of furniture to move in cleaning as is the case in many breakfast nooks. The table is large enough to seat six people and takes care of Mrs. Dunn's family nicely. When a larger number of persons are to be served the dining room is used. Note also the built in ironing board on the east wall.

The large work table with storage space above and below provides ample room for storage of supplies, utensils and dishes used in the kitchen. A small serving table on castors near the oil range would facilitate the serving of meals in the dining room. A central light fixture with brackets near the sink gives sufficient artificial light. The built in broom closet under the chimney is another convenience.

The woodwork, cupboards and table are of pine in natural finish. The top of the work table was planed smooth and sandpapered after which it was given an application of boiling hot linseed oil. When this had thoroughly soaked into the wood three coats of spar varnish was applied. After more than a year's use it shows but little wear.

A door leads into the basement from a small screened in porch. On the landing a coat closet has been built for outdoor wraps and over shoes.

Figure 28. This plan shows a very common arrangement in many farm homes built years ago. Much of the space in this large kitchen could not be utilized to good advantage because of the location of the wash room which made the kitchen very dark and gloomy. The only window which the kitchen possessed was too small and narrow and the kitchen was too dark to work in with any degree of satisfaction besides being poorly ventilated

Mr. and Mrs. I. Huff as well as Mrs. Huff's father were anxious to improve the conditions in the kitchen. The other rooms were large, well arranged and well furnished in every respect but the kitchen seemed quite hopeless.

This home was built more than 50 years ago and it is not strange that the kitchen presented a hopeless aspect to the Extension Rural Architect and the Home Demonstration Agent who had driven the 14 miles from Wichita to "diagnose and suggest the remedy" as their part in the campaign for more convenient kitchens in Sedgwick County

From the suggestions made at that time the kitchen was remodeled as shown in Figure 29. The two inside partitions of the wash room were removed. This made the kitchen light and gave wall space for the built in cupboards and for the oil stove on the west wall.

Mrs. Huff had always been very much annoyed at meal

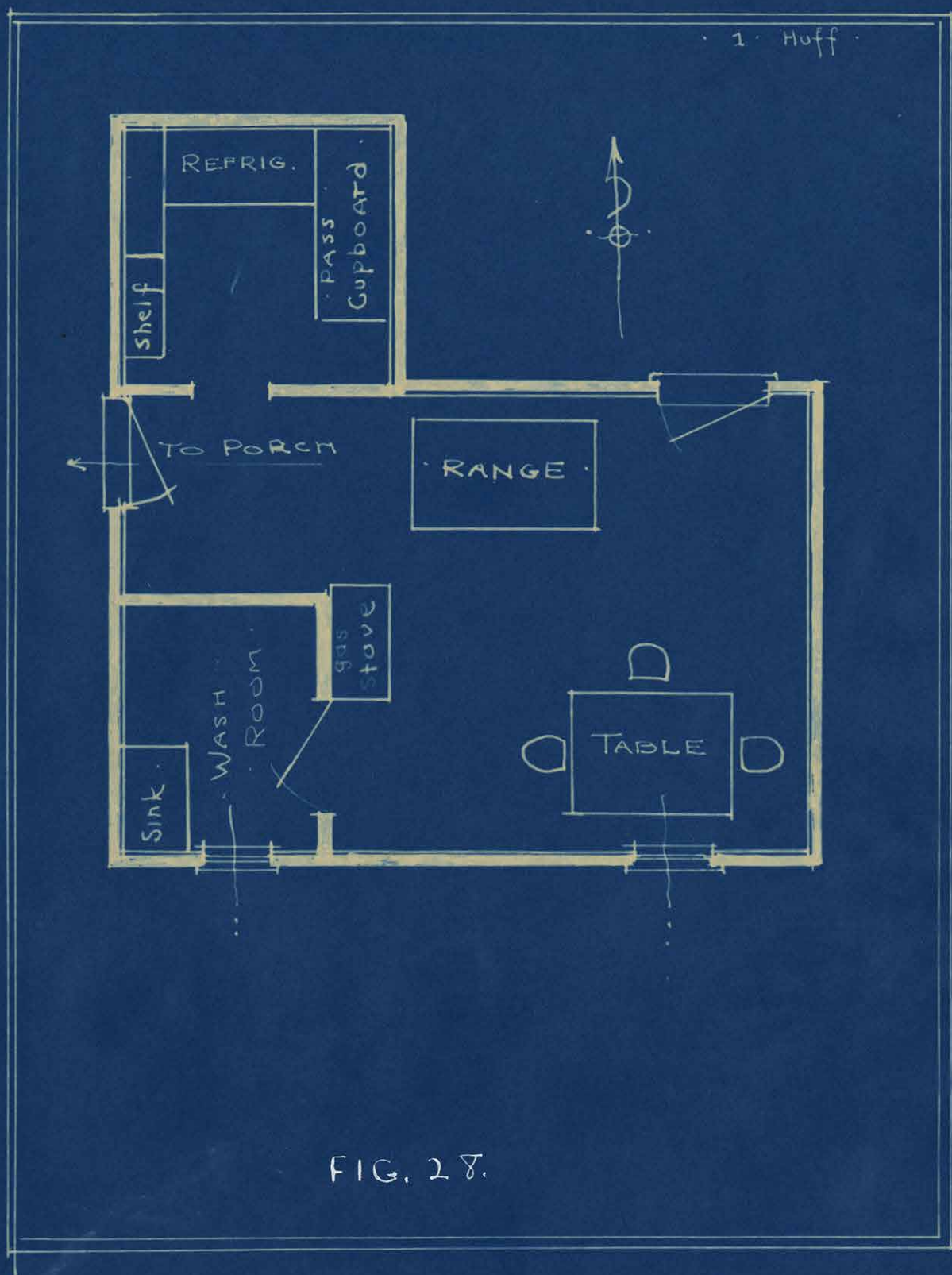
preparation time by having the men walk in front of the oil stove to the wash room to clean up and then brushing past the stove again on their way to the dining room, when preparations for serving a meal were under way.

A window was added to the south wall giving more light on the sink, and other working surfaces and a glass panel in the door on the west made an additional improvement. The sink was moved to the south wall and a work table made with drawers and shelves for storage of table linen, cutlery and large utensils. The cupboard on the west wall was used for storage of supplies, the lower part having bins for flour and sugar and also space for utensils used near the stove.

The pass cupboard from the dining room to the pantry cannot be used to good advantage. At the present time this cupboard is used for dishes, but since the family eat in the kitchen most of the time, this arrangement is inconvenient. Mrs. Huff expects to have a cupboard for dishes built above the work table in the southeast corner.

Since the sink has no drain board at the right, a kitchen wagon would be very desirable for carrying and stacking dishes when clearing the dining table.

The refrigerator is located too far from the work area. The oil stove might be moved to a place nearer the



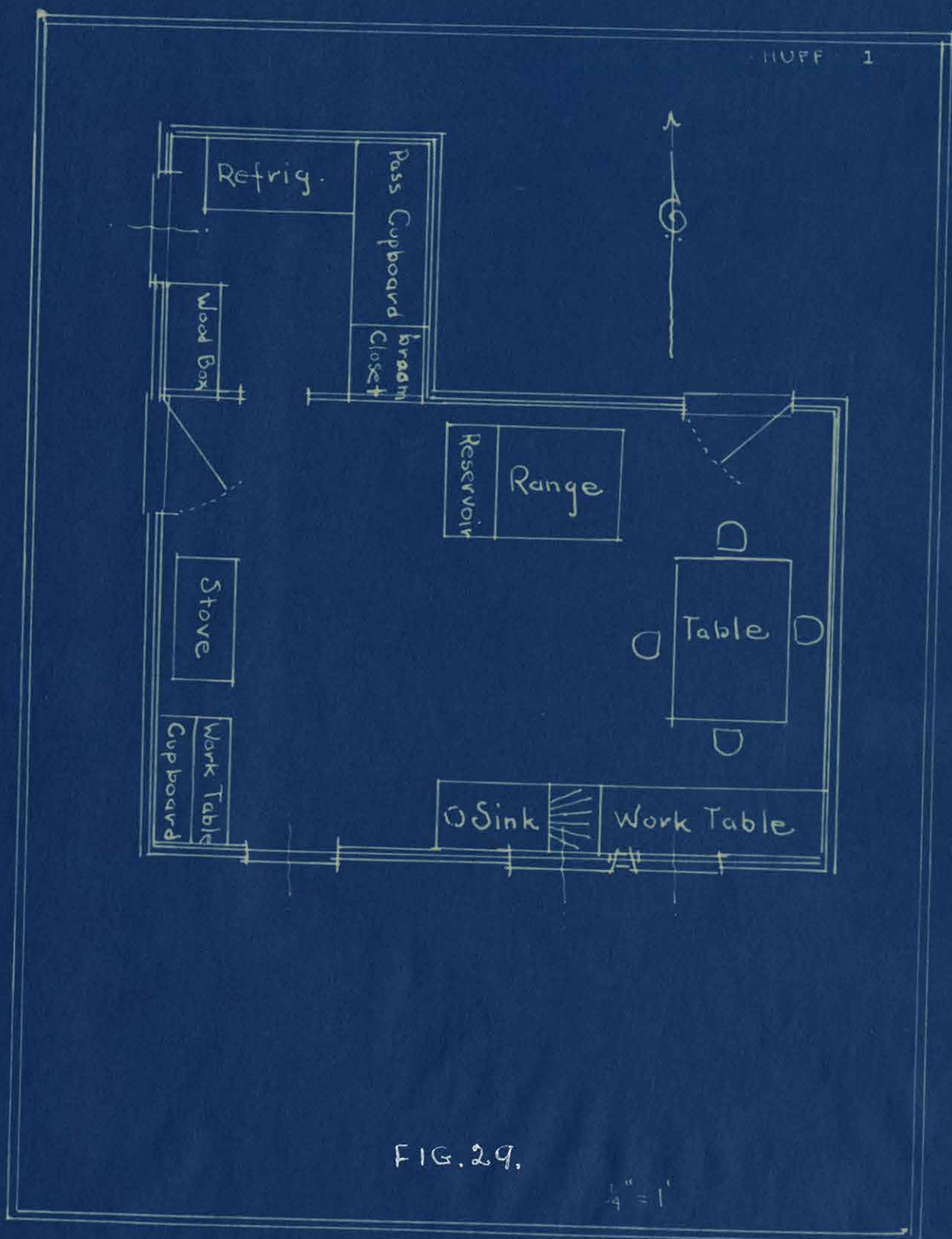




Fig. 30-Anpass cupboard from Mrs. Huff's dining room to the pantry. This cupboard illustrates a waste of space. The shelves could be made adjustable and the space between them reduced. Additional shelves could thus be added to make room for more storage.



Fig. 32- Cupboards and work table in Mrs. Huff's kitchen. The windows give good light on all work surfaces. The dish drainer is a time saver.

range which might be moved closer to the dining room door to make room for the oil stove. In that case the dining table would have to be turned with the greatest length east and west instead of north and south as it is now. Mrs. Huff prefers the present arrangement, however. Since there are only four in this family, the size of the dining table could be reduced.

Note the built in cupboards and good light and sunshine on the work table in the picture. The dish drainer saves time in drying dishes and the plants give cheerfulness to the room.

The walls and woodwork were painted a light tan and the built in cupboards and work table were varnished. The print linoleum for the floor was varnished, making it easier to clean and serving as a protection to the designs, keeping these from wearing off.

Figure 33. Last year Mrs. Henry Eplee of Labette County enrolled in the Better Kitchen contest held under the direction of the Farm Bureau of that county. When the Home Management Specialist and the Home Demonstration Agent visited the home to score the kitchen they found a small kitchen, 3 ft. x 8 ft. with a pantry 8 ft. x 3 ft. on the north. The pantry had dark red walls and only one very small window. The walls were lined with deep shelves

which held all sorts of utensils and equipment. Behind the door in a corner the men piled their shoes and coats. Mrs. Eplee always used a flash light in the pantry when she went to get something from the shelves.

The kitchen had one long, narrow window looking out upon the porch on the east, and a somewhat larger window near the stove on the south. The kerosene stove which had a high back on it was placed in front of the small window on the east shutting off the light from the cabinet which stood close by. The wood stove was placed on the west wall with a wood box in the corner. See Figure 33.

From the suggestions made at this time, the kitchen was remodeled as shown in the plan, Figure 34. Most of the partition was removed leaving an opening of $5\frac{1}{2}$ ft. between the pantry and kitchen. Built in cupboards as shown in Figure 35 were substituted for the shelves giving storage for supplies and utensils. In the northeast corner a unit for brooms and cleaning materials took the place of the shoes and coats.

A sink was purchased and placed on the east wall under the high wide window which was rebuilt from the long, narrow window of the original kitchen. Built in cupboards for storage of supplies and utensils above and below and a work table replaced the old out of date cabinet. The oil

H. EPLEE

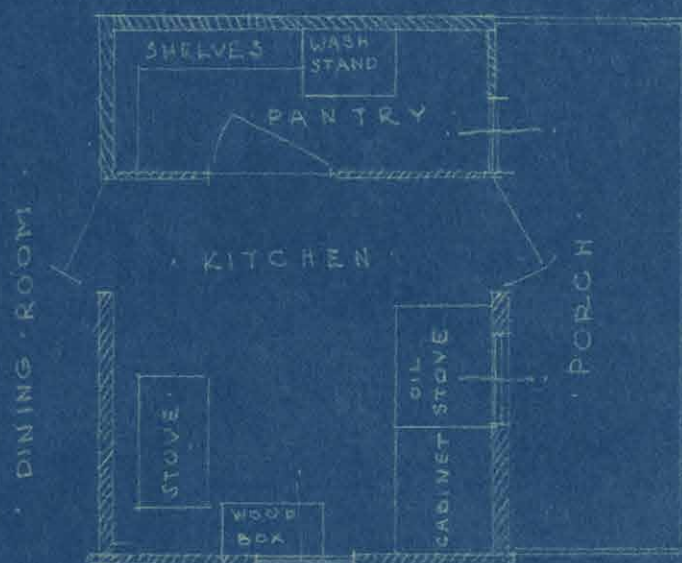


Fig. 33

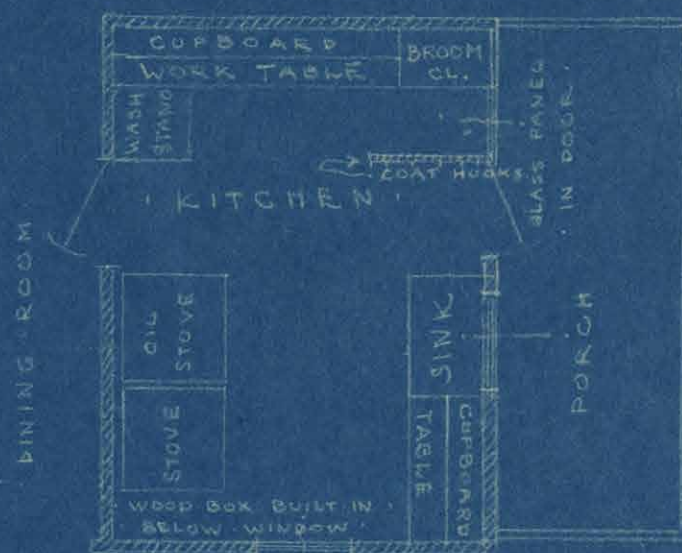


FIG. 34

Mrs. Eplee wore a pedometer and checked on the time spent in preparing the three meals of the day and the number of steps saved. She found that the new arrangement saved her two hours of time and 528 steps.



Fig. 35- The cupboard which replaced the pantry shelves provided for more storage place for supplies and is easier to keep clean. Space for the fireless cooker is provided beneath the table.



Fig. 36- A small shelf built below the cupboard provides an excellent storage place for cleaning materials and small utensils used at the sink. Hooks may also be placed on the side of the cupboard if desired. The picture following this page illustrates how a built in work table may be used in place of a drain board on the right for stacking dishes.

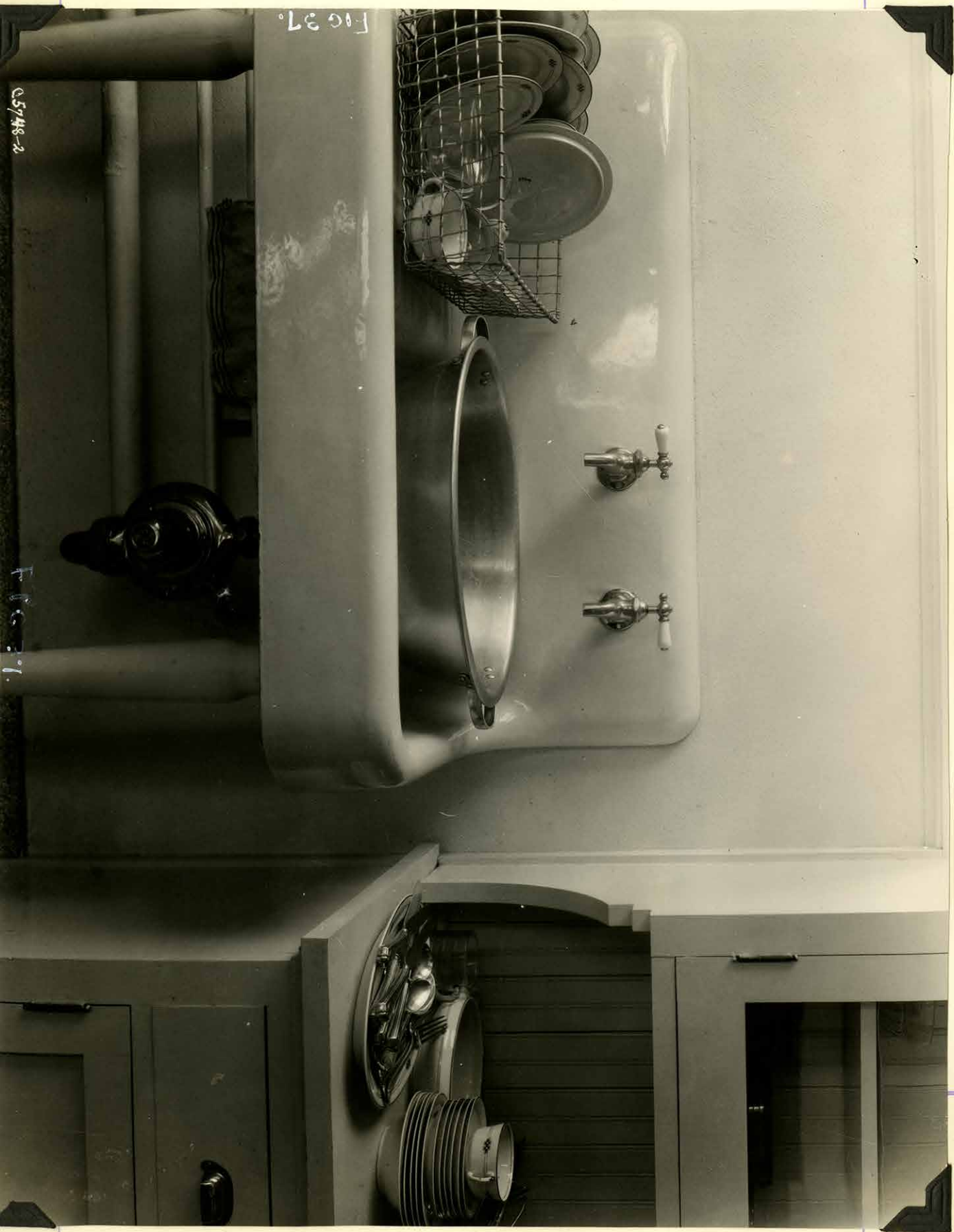


Fig 37.

C5748-2

Fig. 37.

stove was placed beside the wood stove and a wood box was built in below the window on the south. A glass panel in the door leading to the porch increased the light of the kitchen. A row of hooks on the wall near the door solved the problem of what to do with the outside coats and caps.

The inlaid linoleum of an unattractive brown was painted a tan and blue in stippled effect. The walls of the pantry and the woodwork of both the pantry and kitchen were painted a light tan. The kitchen walls were papered with sanitas paper of a small design in tan and blue. Oil-cloth shades were used for the kitchen windows. The cost of remodeling this kitchen was \$93.15.

Mrs. Eplee received a pressure cooker as first prize in the contest. She expressed herself as being "happy" saying that she had hated the "ugly" kitchen ever since she came to the home as a bride 18 years ago.

Figure 39. Mrs. Stitt had a large kitchen to start out with and in remodeling it was possible to add a cozy breakfast nook, built in cupboards and a small wash room.

The entrance to the basement was changed as shown in Figure 38 and a wash room or lavatory made from this space. The arrangement of the built in features is most convenient. The built in icebox has been extended by means of



Fig. 39-a. The sink has a hinged drainboard on the left. Note drawers and cupboard.

cupboards to the ceiling. See Figure 14 (note built in icebox),.

The windows on the north and west give ample light and ventilation is well taken care of. The sink has a drainboard on the right under which is a number of small drawers for storage of tea towels, paper napkins, string and the like. The drainboard on the left is hinged and may be put down when not in use. The walls are painted a french grey and the woodwork enameled in the same color. The table top is of maple which has been treated with a filler and varnished. The breakfast nook is attractively papered and the woodwork is enameled buff with narrow bands of red orange for trimming.

The cost of this remodeling was as follows:

2 drainboards	\$1.00
1 breakfast table	4.00
2 breakfast room benches	5.47
2 sink uprights	1.75
4 shelves	1.75
4 caster	.16
16 pine drawers	5.40
1 maple table top	2.52
3 small panel doors	1.20
1 long panel door	1.10
3 frames for glass	.75
2 drawer fronts	.42
1 lid 7" x 20"	.10
1 shelf with ledge	.15
3 window frames	.75
2 small window frames	.30
1 board 26" x 28"	.40
Total	<u>\$27.22</u>

The work of remodeling was done by Mr. Stitt and his son.

Figure 40. This plan shows the arrangement of a small kitchen in the farm home of C. J. Woods, Paola, Kansas. The large screened porch on the north is a good feature in this plan. It may be used for dining room during the summer and also for many kitchen tasks. The hinged table is used for a breakfast table. The arrangement is compact and simple. Convenient working space for preparing foods to be cooked is provided by the modern kitchen cabinet while the storage space including the cupboards and the dumb-waiter are well taken care of. A kitchen wagon would make serving in the dining room easier.

Figure 41. This plan shows the arrangement of the kitchen in the C. E. OBryant farm home in Pratt County. The large area and the poor light of this kitchen made it a very inconvenient place to work in before it was remodeled. There was only one window and a screened porch and many trees about the house shut off much of its light. The pantry was used for storage of supplies and utensils and here much of the baking and cooking was done.

In remodeling the kitchen, two windows were added. A full sized window was put in the west wall. The window on the east was changed to accommodate the sink under it and another window like it was added to the same wall.

The range and cabinet were left as in the original

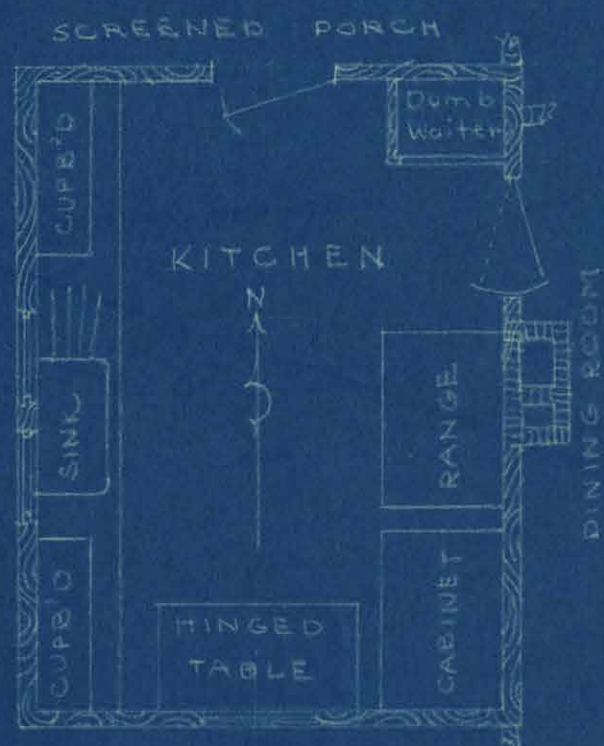
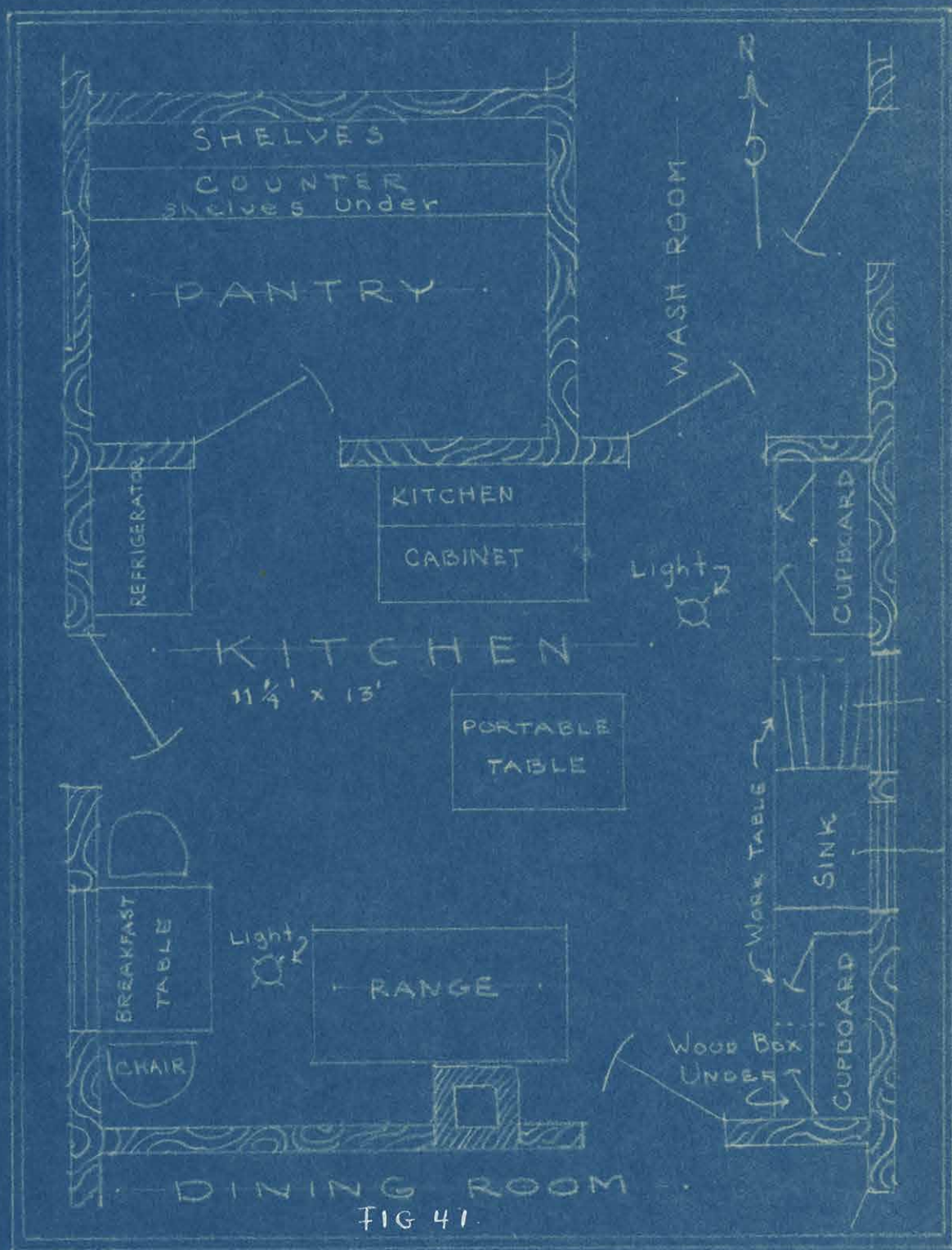


FIG. 40



plan but additional storage was provided for by means of built in cupboards on the east wall. The addition of a sink and a work table improved the routing of this kitchen and made the serving of meals in the dining room more convenient. A small portable table also facilitates serving and may be used to carry the supplies from the pantry to the work table. The small hinged table on the west is used for a breakfast table. The placing of the lights is indicated on the plan.

Figure 43. The old kitchen of the Mayhall farm home was removed from the main part of the house (see picture on page 22) and a new kitchen built on. The plan shown in Figure 43 is that of the new kitchen. The old kitchen was dark and poorly arranged in regard to doors and windows. It could be used for other purposes, however, so it was not torn down.

The new plan necessitated the remodeling of the dining room and some other parts of the house. The range is somewhat remote from the dining room, but the portable table used to facilitate serving, overcomes this disadvantage to some extent. The sink and work table on the west have abundant light and ventilation is well provided for in the windows and doors. The small porch on the southwest may be used for many kitchen tasks.

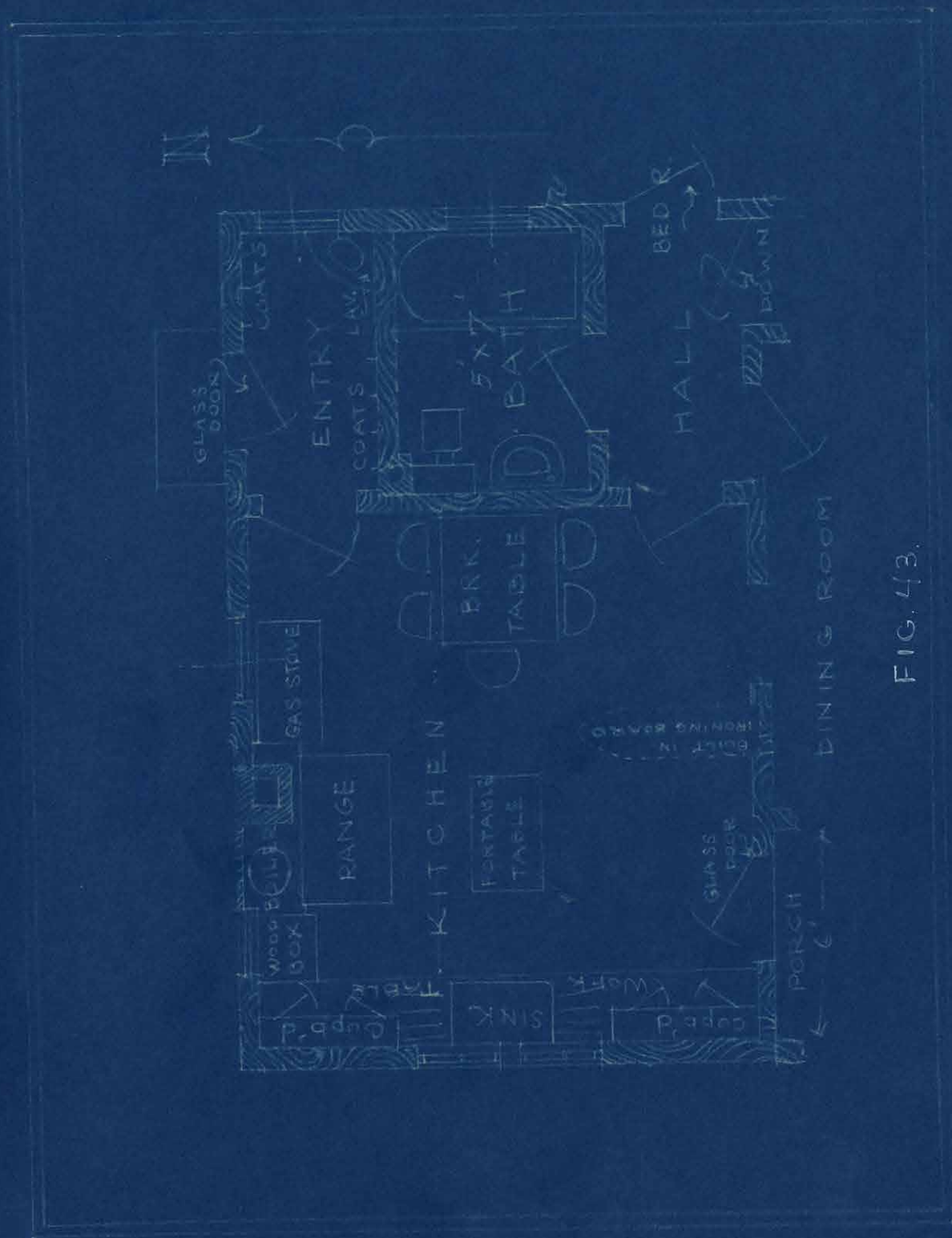


FIG. 43.



Fig. 44.5000 Grouting of Equilibrium

Steps may be saved by using the table in the kitchen for serving of breakfast. By the new arrangement it was also possible to have a lavatory and a place for wraps in the entry. There is also sufficient space for a refrigerator. This kitchen is well planned in relation to the hall, stairs and dining room.

Figure 45. The Household Searchlight of Topeka shows an interesting arrangement of the kitchen in relation to the other rooms. The living room and dining room have been combined into a single large room. This has the advantage of occasionally providing one large room for social purposes. It obviates the necessity of buying expensive dining room furnishings since the table and chairs that would normally belong only in the dining room may if properly selected be used also for the living room. At intervals when a dining room capable of seating a large number of people is needed the entire room is available.

The breakfast room is large enough to accommodate a family of five. A pass cupboard with drawers and shelves may be reached from either the kitchen or breakfast room. In this cupboard are stored all the dishes used in the breakfast room. The two upper drawers of the cupboard are plush lined and are used for the silver. The lower drawers are used for linens. The electric ventilating fan in the

hood over the range provides ventilation for the kitchen and other rooms.

Household refuse such as garbage, tin cans and bottles are consumed in the kernerator or incinerator. The incinerator is fed through a conveniently located door near the stove.

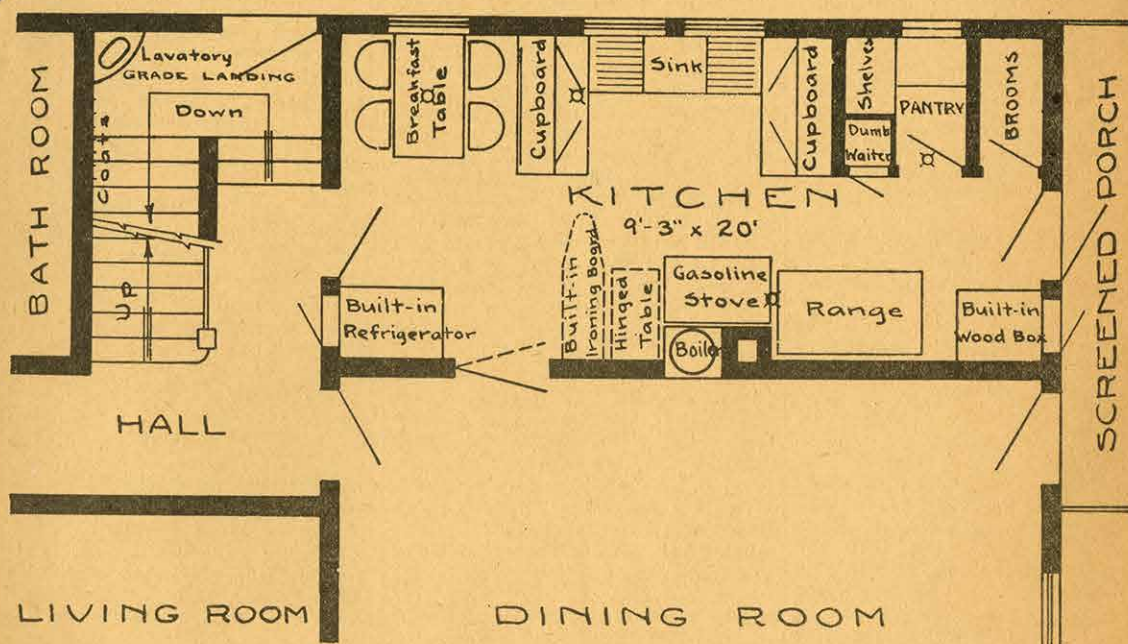
In the hall near the kitchen door is a built in desk for recipe files and cook books. The telephone is conveniently located on this desk. The small room on the northeast corner is used for the refrigerator. This room may be used for coats and wraps.

Figure 47. This plan shows the old kitchen in the Schlickau farm home in Reno County. The kitchen before remodeling was not too large for food routing but the equipment was not compactly arranged and storage space was confined largely to the pantry which made it necessary to walk great distances in preparing the meals.

Mr. Schlickau, the state wheat champion, was a member of the party on the Wheat Special . He became interested in the model kitchen which was a part of the exhibit shown. Upon returning home he planned the remodeling of his home as shown in Figure 47. The pantry was converted into a breakfast room and the small hall changed into a wash room. Cupboards and work tables were built in along the north wall

The plan shown on this page is a good illustration of efficient arrangement in a long narrow kitchen. The location of the kitchen in relation to the stairway, hall and dining room are especially good. Ample storage place is provided for in the pantry, dumb-waiter, cupboards and refrigerator. The hinged table near the stove is convenient for use in serving.

Plan of the Demonstration Wheat Belt Kitchen



A kitchen well planned and equipped saves time and labor for the housekeeper and adds to the health and comfort of the entire family.

A well planned kitchen should have:

1. A plentiful supply of running water and a good drainage system. These help more than any other one thing to lighten kitchen work.

2. Good light, both natural and artificial, on all working surfaces.

3. Equipment should be adequate, easy to keep in order, and so grouped as to save steps.

4. Working surfaces should be of such a height that the worker will not have to stoop unnecessarily.

5. Covering of working surfaces should be such that they are easily cleaned and easily kept clean.

6. Plenty of cupboard and storage space.

7. Floors, wall, and woodwork should be attractive, sanitary and durable.

8. Rollers on everything that is rollable so there will be no unnecessary

pulling and lifting by the housewife.

The kitchen should be so planned that:

1. It allows for efficient work. (a) Convenient and comfortable; arranged compactly for the routing of work. (b) Completely and economically equipped with labor and time saving tools.

2. It is easy to keep clean. (a) Sanitary; all surfaces smooth and washable.

3. There is no traffic way through working centers.

4. It is attractive. (a) An inviting restful place in which to work, through wise choice of color and orderliness.

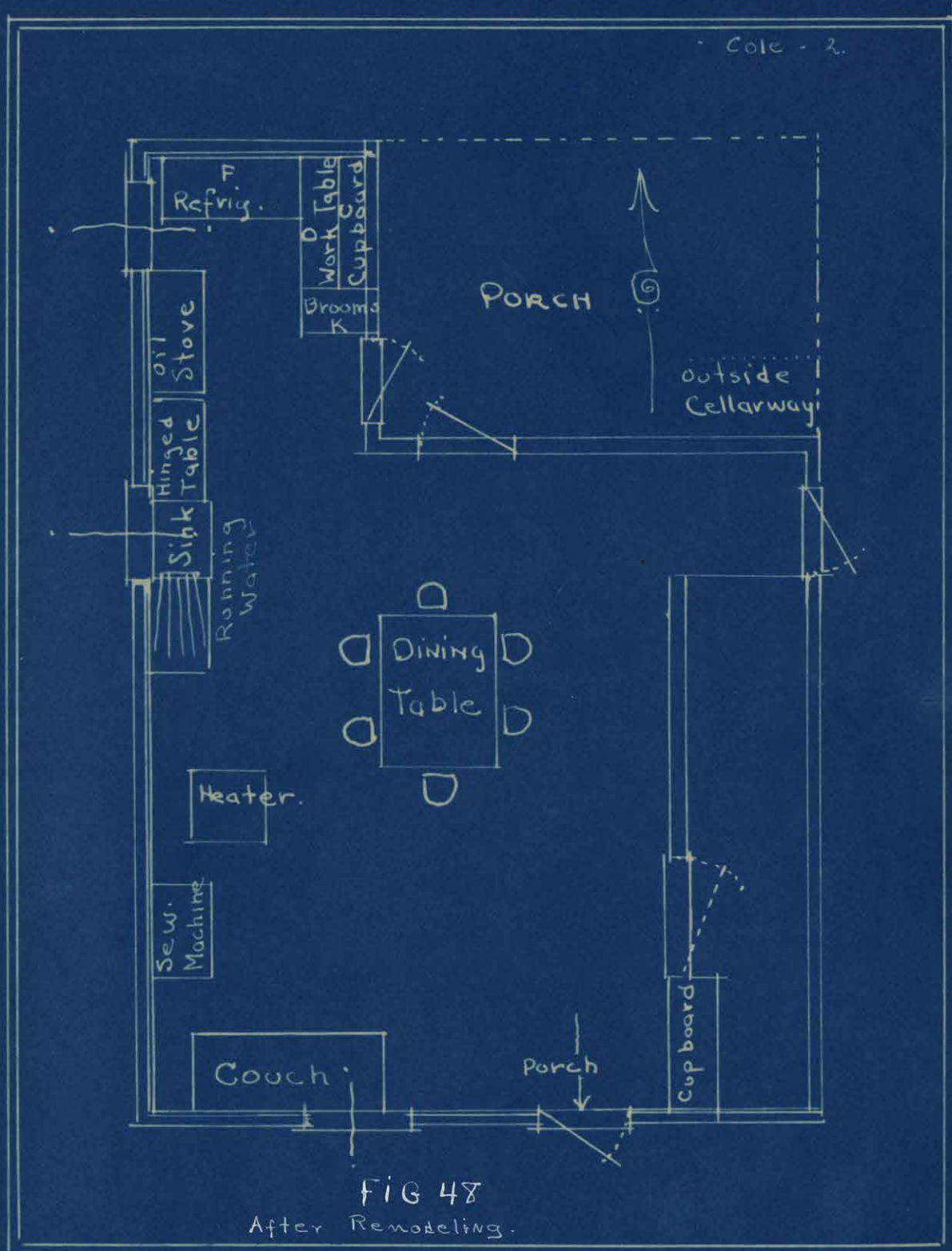
Fig. 46.

and a new sink was purchased. The location of the range remained unchanged. The routing could not be made as convenient as desired because of the doors and window on the south and the location of the chimney. The present arrangement makes long paths of travel necessary and leaves rather too generous a space for the worker. A kitchen wagon could be used to good advantage in serving and clearing meals.

There is ample space for a desk and for shelves for books and magazines in the southeast corner of the kitchen. Because of its excellent light it would make an ideal rest room.

Figure 48. On February 5, 1927 Mrs. Cecil Cole of Clay County scored her kitchen using the score card which the home management specialists made for Kansas kitchens. Her score was 53 points out of a possible 100 points. Nine months later this kitchen was rescored with a total score of 92 points. The plan of the remodeled kitchen which raised the score by 39 points is shown in Figure 48. Since Mrs. Cole had always wanted a dining room, the pantry was remodeled to provide a compact work area leaving the large room practically as it was.

The walls were covered with Sheet Rock which was painted a light gray. The ceiling was painted a very much



lighter and the woodwork a somewhat darker gray. A gray and blue inlaid linoleum was chosen for the floor.

Water was obtained from a well 25 feet from the house. Under the new arrangement water is piped from this well into the kitchen and a force pump used.

The partition between the pantry and kitchen was removed and built in cupboards on the east wall provided for storage. The old range was sold and a kerosene stove purchased.

The old kitchen which is now the dining room was papered and the woodwork painted the same color as the kitchen. Unbleached muslin shades with painted border and sheer white curtains were made for the windows. Many other minor improvements were made such as casters on the dining room table, wood box, and couch, shelves and brackets for clock and lamps. The cost of the improvements listed by Mrs. Cole are as follows:

percolator	\$1.15
table	5.50
kettle knobs	.05
lamp bracket	1.75
carpentry	5.80
paint and shellac	2.95
Total	\$17.20

The above does not include piping the water into the kitchen. Much of the remodeling was done by Mr. and Mrs. Cole and in many instances old material was used.

Figure 52. The location of this kitchen is especially good. The porch on the north is desirable since it prevents cold air from coming into the kitchen when the door is opened. The windows on the east provide good light and sunshine in the morning when most of the kitchen work must be done. The relation of the kitchen to the other rooms in the house has been well worked out.

The kitchen opens directly into the dining room and also into a hall. The front door may be reached by passing through the hall into the living room.

The area of the kitchen is just large enough to accommodate the necessary equipment and just enough space has been left so that the worker may move about easily. The arrangement of the equipment such as the sink with drainboards, the range and the work surface with provisions for usual storage of cooking equipment and supplies have been well planned. Ample working space has been provided and storage has been well taken care of. The sink with its drainboards is conveniently located between the two work surfaces and beneath the high windows. The range has been well placed near the dining room door. The refrigerator and dumb-waiter provide for necessary cool storage. The refrigerator may be iced from outside.

The breakfast nook is well planned. A kitchen wagon

would facilitate serving in the dining room.

Electrical Appliances in the Farm Home

A survey conducted by the Kansas Committee on the Relation of Electricity to Agriculture under the direction of Director of the Agricultural Experiments Station shows that Kansas has 900 farms receiving electrical service from central power stations. A more detailed study of 324 of these farms revealed the fact that practically all the homes where farmsteads had the electrical service from central power stations, lighting systems had been installed. This indicates that the farmers' greatest appreciation of electricity is for illumination.

The electric iron was found to be used more than any other heating unit and was found in 90 per cent of the homes. Next to farm lighting it is used more generally than any other service. Electric ranges were found in $5\frac{1}{2}$ per cent of the homes and mangles in only three homes. Nine electrical refrigeration plants were found on the 324 electrified farms. 60 per cent used artificial or natural ice and every user of ice according to the survey was interested in electric refrigeration.

It is not the purpose of this thesis to make a study of electrical equipment for the farm home, but the author



Fig. 53- One of the nine demonstration kitchens in Pawnee County before remodeling (L.P.Lupfer).

merely desires to point out that there is a growing tendency at the present time in Kansas towards an extension of electric power lines to take in rural homes. This had been done quite extensively in several counties already.

The Kansas Committee on the Relation of Electricity to Agriculture was formed in 1924 for the purpose of developing ways and means of extending electric service into the farming communities in Kansas. Detailed studies of the uses of electricity on the farm and in the home are being made on nine Pawnee County farms under the direct supervision of the Agricultural and Engineering Experiment Station of the Kansas Agricultural College. Figure 53 -b is one of these homes. Figure 53-a shows the kitchen before remodeling and Figure 53-b after the improvements had been made and the electrical equipment installed.





Fig. 54- The demonstration kitchen after remodeling.

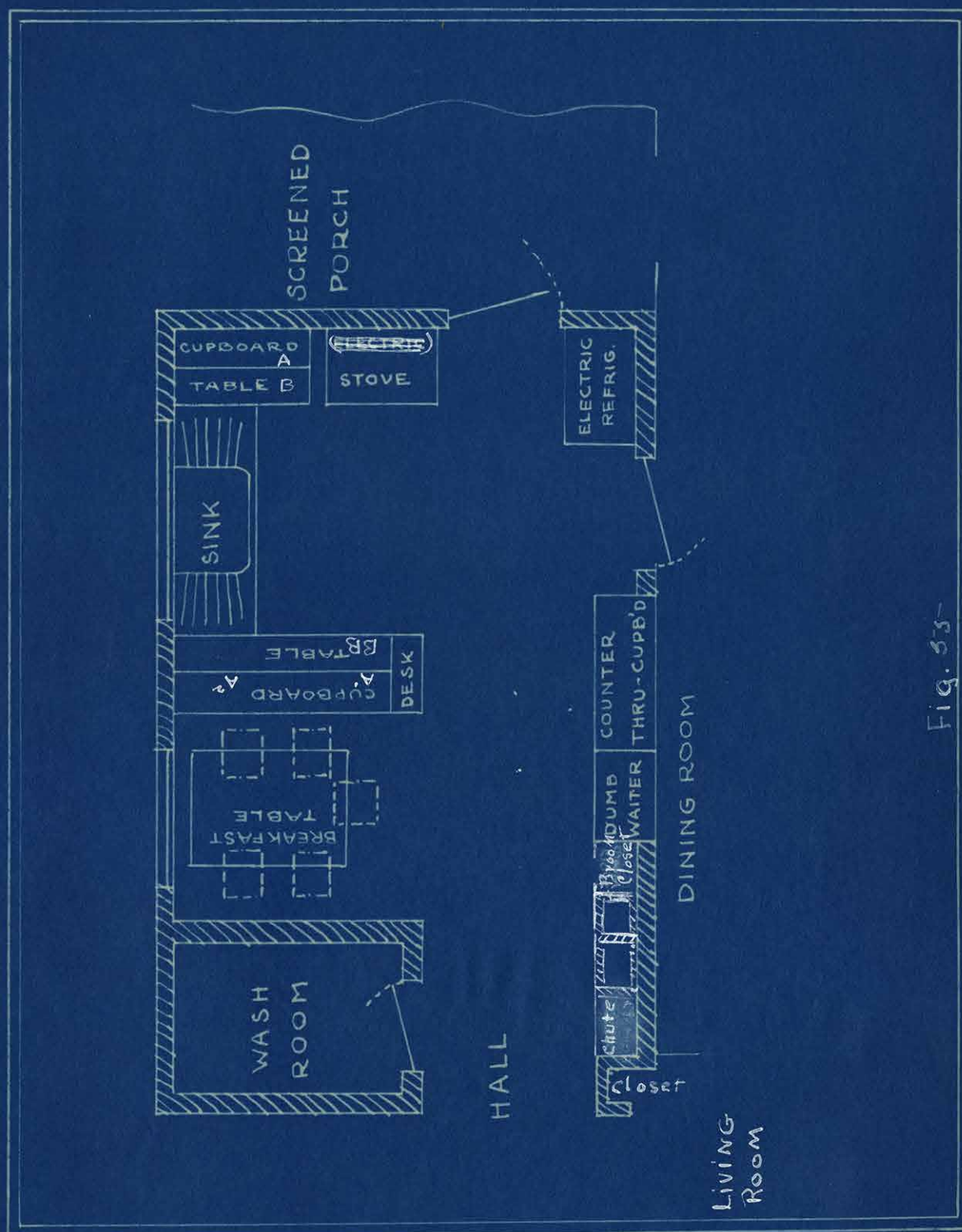


Fig. 53-

SUMMARY

After having made an extensive study of actual kitchens throughout the state and from the observation and study of the kitchens which have been remodeled in order to tie up what seem to be the most valuable points of these kitchens, the author has planned a kitchen for an imaginary family situated as a large number of Kansas farm families are today.

This imaginary family of five, two adults and three children live on a 320 acre farm, eight miles from the city of Wichita. Their income is approximately \$3,500 per year. The house was built at a cost of \$7,500 and comprises a living room, dining room, three bedrooms, kitchen, wash room, besides a bath room, breakfast alcove, sleeping porch, hall and screened in porch. The basement is equipped for laundry purposes. The house is heated by a hot air furnace. Mr. X practices diversified farming and uses up-to-date methods and equipment. A married man who with his family lives on the farm is hired for the year. Seasonal work requires additional help both out of doors and in the home.

Electricity from a Delco plant furnishes power for light, washing machine, iron and the refrigerator. When

the power lines are extended to take in the rural homes in Mr. X's community, the present system will be replaced and more electrical equipment such as a stove will be added.

The water is piped into the house from a spring a hydraulic ram being used for power.

The kitchen is located on the northeast with a screened porch on the east. The entry is on the south. The windows placed above the sink on the north permit an immediate view of a grape arbor where the children play, a well kept lawn and a more distant view of the barns and fields. The kitchen is well placed in relation to the dining room, opening into it by means of swinging doors. Through the hall one has easy access to the living room as well as the wash room. The screened in porch may be used for many kitchen tasks such as shelling peas, preparing fruit and vegetables for canning and the like.

The kitchen itself is a most attractive room. The walls, ceiling, woodwork and built in equipment are of an ivory color. The walls are of a hard plaster painted with three coats of paint, the last coat of a dull flat finish. A narrow stencil design in blue, yellow and green gives an accent of color near the ceiling. The woodwork is finished with five coats of enamel. It is smooth and easy to clean. A small design in the same colors as those used for

the border near the ceiling has been placed on the cupboards. All corners and baseboards are rounded to permit of easy cleaning. The walls back of the sink and stove as well as the space between the cupboard and work table and below the work table are of tile in ivory and green.

A fan in the wall above the window on the east wall keeps the air moving and draws out moisture and odors of cooking. A glass panel in the door leading to the porch, with the wide windows on the north and east give ample light. The floor is covered with a red brown inlaid linoleum in tile effect. This has been properly laid on a pine floor and the color harmonizes well with the color scheme of the kitchen and breakfast nook.

The cupboard A is built to the ceiling with shelves at the top which are used for equipment seldom used. The lower shelves are used for kitchen utensils and racks on the doors hold pie tins and pot lids. Tin lined drawers have been built in the space at the left above the table B to be used for bread and cake. The cupboard A² is also built to the ceiling and has adjustable shelves. Supplies are kept in this cupboard. The work tables are covered with inlaid linoleum cemented to the wood. These have been waxed and varnished. The cupboard A' is a through cupboard above the table. Dishes are kept in this cupboard. Below

the work table BB are two swinging, white enamel containers for sugar and flour. The space in the corner is reserved for the kitchen stool. Small drawers below the cupboard A' are used for cutlery, two drawers in the work table are used for tea towels, paper napkins and the like. All shelves and small containers for supplies are enameled in ivory color, decorated with narrow bands of green and blue and yellow.

The sink is of porcelain with two drainboards and back cast in one piece. The plumbing is simple and inconspicuous. A small opening in the wall beneath the sink allows for the removal of the garbage can which is of white enamel and placed in a brace similar to the one shown in Figure 10. The location of the sink between the two work tables with the cupboards above makes a continuous work surface which is very desirable. A small glass shelf above the sink is used for cleaning materials used at the sink.

The stove used at the present is a gas stove with a high well insulated oven on the right. The type of stove is one that can easily be cleaned. Below the burners is a small drawer for kitchen equipment. This stove will be replaced later for an electric range. Hooks and a shelf have been placed near the stove for utensils and supplies like salt and pepper used at the stove.

The through cupboard between the dining room and the kitchen is especially well designed. The upper part of the cupboard has adjustable shelves and the lower portion has a series of drawers graduated in size. Two of these are shallow, plush lined drawers used for silver; the lower drawers are deeper and extend the entire width of the cupboard. These are used for table linen used in the dining room. A desk for writing with shelves for cook books and magazines is conveniently placed in the kitchen.

The electrical refrigerator and the dumb-waiter provide for ample cool storage.

The walls, ceiling and furniture of the breakfast alcove are of the same finish as the kitchen. The decorations here consist of narrow bands of chinese red on the table edges and on the chairs. The inside of the built in cupboards on the east and west walls are enameled a chinese red and are used for the dishes which belong to the breakfast service. Built in drawers beneath the cupboard on the west wall are used for breakfast linen and tea towels. Drawers beneath the window are used for sewing materials since Mrs. X often times uses this alcove for hand sewing.

Shades of a light tan and narrow curtains of pongee trimmed with bands of green and chinese-red silk bias tape are used for the windows. These curtains are easily laun-

dered and being narrow, they do not shut off the lovely view of the flower gardens and the more distant orchards.

The area of this kitchen is well adapted to the proper placing of equipment and to good routing. Convenient working space for preparing foods to be cooked and storage space has been well taken care of. The kitchen wagon is especially handy when meals are served in the dining room for bringing food to the table in the dining room and soiled dishes to the kitchen.

It has been quite impossible in this sort of a summary to touch upon all the details of this kitchen, but the author has endeavored to point out that it is possible for farm women to have intelligently planned kitchens and that time and effort are necessary to make the kitchen scheme sound, not only in convenience of arrangement but in general appearance as well.

It is obviously impossible to ignore the needs of the body so we must learn how best to satisfy those needs in the most simple and intelligent way. The kitchen is the heart of the house, and the general tone of the home is dependent upon its healthy action. "If the physical business of living can be accomplished with fitness and despatch, the spirit will be free to grow and to express itself." In this lies the real significance of homemaking.

BIBLIOGRAPHY

- Abel, Mary Hinman
1926. Successful Family Life. J.B.Lippincott Co., Phila. Pa.
- Andrews, Benj.R.
1927. Economics of the Household. The Macmillan Co., N.Y.
- Balderston, S.R.
1919. Housewifery. J.B.Lippincott Co., Phila.
- Bane, Geneva M.
Just Kitchens. Ohio State Ext.Bull., 66:1-20.
- Barrows, Anna T.
1921. The Farm Kitchen as a Work Shop. Farmers' Bull., 607:3-22
- Byers, Charles A.
1927. Ideas From Other People's Homes. Better Homes and Gardens.
- Child, Georgie Boynton
1925. The Efficient Kitchen. R.M.McBride & Co., N.Y.
- Cowles, May L.
1923. Convenient Kitchens. Agri.Ext.Circ. 156:3-20, Madison, Wis.
- Dodd, Helen
1912. The Healthful Farm House.
- Donham, Agnes
1921. Spending the Family Income. Little, Brown & Co.
- Dorsey, Jean Muir
1928. Planning a Workable Kitchen. Better Homes and Gardens 6:21, 61-63.

- Douglas, Paul
1927. Wages and the Family. Univ. of Chi. Press, Chi. Ill.
- Dressler, Martha Estella
Exp. Data on Relative Cost of Gas and Electricity for Cooking. Eng.Exp.Sta. Bull. 21:3-14, Seattle, Wash.
- Elliot, Berton
1926. Floor Treatment. H.B., 59:388-390.
- Etherton, Wm. A.
1917. The Farmhouse Improved. K.S.A.C. Eng. Exp. Sta. Bull. 7:1-84
- Fraser, Chelsea
1925. The Practical Book of Home Repairs. Thos. Y. Cromwell Co., N.Y.
- Frederick, Christine
1925. Efficient Housekeeping. Amer. School of Home Economics, Chi. Ill.
- Floor and Floor Coverings. Farmers' Bull. 1219:3-36.
- Gillespie, Harriet S.
1927. Kitchen and Bathroom Equipment. H.B., 61:156.
- Gray, Greta
1926. Convenient Kitchens. Farmers' Bull., 1513:1-29.
- Gumaer, P. W.
1915. The Economics of Electric Cooking. Eng.Exp.Sta.Bull.27:3-62, Columbia, Mo.
- Harap, Henry
1924. The Education of the Consumer. The Macmillan Co., N.Y.
- Hienton, Truman E.
1926. Turn the Switch. Agri.Exp.Sta.Circ. 134:1-16, Lafayette, Ind.
- Hoffman, Gertrude
1925. The Kitchen. Mont.Ext.Bull.75:3-91, Bozeman, Mont.

- Jones, Gladys B.
1926. The Handy Woman About the House. H.B., 59:172,232.
- Jordan, Ruth
1926. Care and Use of the Home Refrigerator for Food Preservation. Purdue Ext. Bull.147:3-8, Lafayette, Ind.
- Kirkpatrick, E. L.
1925. Living Conditions and Family Living in Selected Farm Homes of Kansas. Bur. Agri.Ec. U.S.D.A.
- Kloeffler, R. G.
1917. Electric Cooking Appliances. Eng.Exp. Sta.Bull.20:5-70, K.S.A.C.
- Knipe, F. W.
1927. Water at the Kitchen Sink. Conn.Agric. Coll.Ext.Bull.115:1-8, Storrs, Conn.
- Koehler, Arthur
1926. The Identification of Furniture Woods. Misc.Circ.,66:1-76, U.S.D.A.
- Koues, Helen
1923. Decorative and Practical Treatments for Woodwork and Walls. G.H.Inst.,N.Y.
- Loew, Edgar Allan
1923. Electric Heating of Residences. Eng. Exp.Sta.Bull.20:5-48, Seattle,Wash.
- Loring, Chas. G.
1926. The Diminishing Dining Room. H.B.,49: 159,206.
1925. Building Annual. Atlantic Monthly Co., Boston.
- Lynn, Gertrude
1924. The Step Saving Kitchen. Ext.Bull. 47: 2-20, Ames, Ia.
- MacDonald, Elizabeth
1926. Traffic Regulations in the Kitchen. H.B.,59:322,356.

- 1926. Kitchen Equipment. H.B.,59:174,216,218
- 1926. The Professional Attitude. H.B.,59:72,74.
- 1927. How Small May a Kitchen Be. H.B.,61:816, 852.
- 1927. Fuels and Fires. H.B.,61:180.
- 1927. Electrical Equipment. H.B.,61:668,713.
- 1927. Ask Me Another About Refrigeration, H.B.,62:64,93.

McMahon, Kathryne

- 1926. The Farm Home Kitchen. Purdue Univ. Ext.Bull.141:1-12, Lafayette, Ind.

Ordway, Warren

- 1926. Finishing Furniture Is Fun. H.B.,59:550-560.

Overholt, Virgil

- 1923. Getting Water Into Farm Homes. Agri. Coll.Ext.Bull.14:3-16.

Piper, C. W.

- 1919. Electric Ranges. Eng.Exp.Sta.Bull.2:5-40, Purdue Univ.,Lafayette, Ind.

Rawson, Marion N.

- 1926. The Four Walls of a House. H.B.,60:436,438,466,468-472.

Reese, Madge, J.

- 1922. Farm Home Conveniences. Farmers' Bull. 927:3-32.

Smith, Delos

- 1926. Our National Building Standards. H.B., 60:275,321
- 1927. Experiments with Paints and Varnishes. H.B.,61:196,230,232,234.
- 1927. A Few Final Considerations. H.B.,61:346,394.

Smith, Marian Rogers

- 1925. Farm Kitchens. Ext.Bull.37:1-16,Mich. Agri. Coll.

- Steele, B. L.
1917. Fuel Economy in Domestic Heating and Cooking. Mech.Arts and Eng.Ext.Bull. 32:3-14, Pullman, Washington.
- Stratton S. W.
1918. Safety for the Household. Cir. Bur.of St., 75, Govt. Print. Office.
- Taber, C. W.
1926. The Business of the Household. The J. B.Lippincott Co., Chi. Ill.
- Talamon, Beatrice
1926. Rejuvenating the Middle Aged Kitchen. 60:210-214.
- Van Deman, Ruth
1923. The Well Planned Kitchen. U.S.D.A. 189:1-3.
- Walker, H. B.
1920. Present Status of Rural Electrification in Kansas. Eng.Exp.Sta. Bull.16: 7-47, K.S.A.C.
- Warner, Frances L.
1927. When Equipment Overflows. H.B., 61:164.
- Ward, Florence
The Farm Woman's Problems. U.S.D.A.
- Willard, Ruth
1924. That Kitchen. N.Dak.Agric.Coll.Ext. Circ. 63, Fargo, N.Dak.
- Wilder, Susan Z.
1925. New Wall Finishes. Agri.Ext.Circ.231: 1-8, Brookings, S. Dak.
- Winslow, Emma
1925. Purchasing Power of the Consumer. The A. W. Shaw Co., N.Y.
- Wichers, H. E.
1927. The Design of the Kansas Home. K.S.A.C
- Young, Helen
1916. Plan.Home Kitch. Circ.108, Cornell.