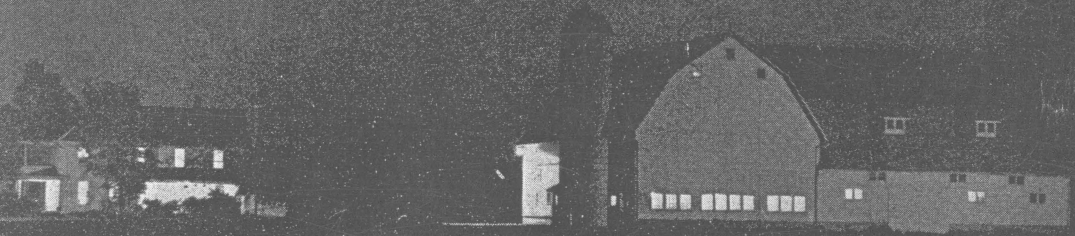


LIGHTING

the farmstead



Agricultural Extension Service
The Ohio State University

osu coll.
S544.3
03
328

12/51—10M

**The Ohio State University and the U. S. Department of Agriculture, Cooperating
Agricultural Extension Service, C. M. Ferguson, Columbus, Ohio
Printed and distributed in furtherance of the Acts of May 8 and June 30, 1914**

Lighting the Farmstead

Planning the Wiring

By I. P. Blauser, Extension Agricultural Engineer

ELECTRIC wiring about the farmstead, in the home, and in other farm buildings has but one purpose. That is to carry electricity where it is to be used.

Electricity is used for light, heat, and power. Some people have added a fourth use and call it electronics. Others consider electronics as a control of the flow of electricity rather than a separate use.

Almost every farm in Ohio now has electricity. Except for new homes, few are being wired for the first time. Wiring nowadays usually means additions or overhauls of old systems.

Electric wiring often gets no attention until trouble occurs—dim or flickering light, poor operation of equipment, or burned out motors. Installations of new equipment offers one a good opportunity to look critically at the entire wiring system. Then he can make needed changes so the system will be safe, adequate, convenient, and economical.

This section will give assistance in planning systems to users of electricity. It will not give instructions on installation. Trained wiremen usually install wiring. Anyone, however, who is willing to take time to learn rules and ways of electrical wiring can do a job which will pass inspection.

electric wiring system that will take care of all present and future needs for electricity, because new uses arise from time to time. It is not too difficult, however, to plan and install a wiring system that will need no additions for 10 to 15 years. The extent to which you accomplish this depends upon how carefully you plan and how well you can appraise future needs.

Plan for Life of Building

Wiring systems, if installed properly and kept in good repair, will be good for the life of the building. That calls for careful planning in locating lighting outlets, convenience outlets, and switches. Plan these so the electric service will offer *maximum convenience*. Poorly located outlets and switches may lose much of the convenience and safety of electric service. It is not always easy to correct those mistakes, for sometimes high expenses may arise.

Locate Switches Conveniently

Plan for control of all center lighting fixtures by wall switches, located at convenient places. Use three-way and four-way switches to control lights in halls, stairways, or in rooms to be used as passage ways. These switches make it possible for you to turn on and off the lights ahead and behind your path of travel. You will save many steps in the course of a year by not having to retrace to turn off lights.

You may avoid injury by not having to go through unlighted rooms or up and down unlighted stairs.

Consider Remote Control

You may want to consider, also, a newer method which replaces the three-way and four-way switch method. This method, remote control, uses a relay operated by low voltage. Push buttons which control the relay can be located anywhere since the control wire can be smaller. With such a plan you will not need to pay as much attention to insulation. If you want light control from two or three places, it is generally cheaper to use three- or four-way switches.

Provide enough convenience outlets to allow you to attach portable pieces of equipment easily and quickly to the electric circuit. Increased use of floor and table lights make it highly desirable to have an abundance of convenience outlets. This makes it unnecessary to attach them to center fixtures or have extension cords run under rugs or around the rooms.

Place Outlets Frequently

Install at least one double convenience outlet on each wall of every major room. In the living room, place outlets so it will not be more than six feet in any direction to a convenience outlet.

Nearly everyone is interested in getting an economical wiring system. An economical wiring system

is not necessarily one that costs the least money. The wiring system is a long-time investment for consideration as such. Weigh not only the cost of the system but also the safety, adequacy, and convenience of that system. If you attempt to save a few dollars on installation, you may have a system which is a fire or shock hazard.

Don't Be a Tightwad

If wires are not large enough to carry the current needed, lights and equipment will not operate efficiently. Money saved by doing without proper wires or enough circuits is soon used up by greater costs of operation. Increased costs continues, of course, as long as the system is used under these circumstances.

Transformer

The transformer (Fig. 3) is an important part of the electric service. It is the property of the power supplier and is the electrical device which reduces the high line voltage (2,300 to 12,000 volts) down to 115 and 230 volts for use for the farm and home. Since the transformer is the property of the power company, it is responsible to see that the transformer is the correct size to deliver the proper amount of power where the farm wiring begins.

There is a continuous loss of electricity in the transformer, and the larger the transformer, the greater the loss. Since this loss occurs before the electricity goes through the electric meter, it is at

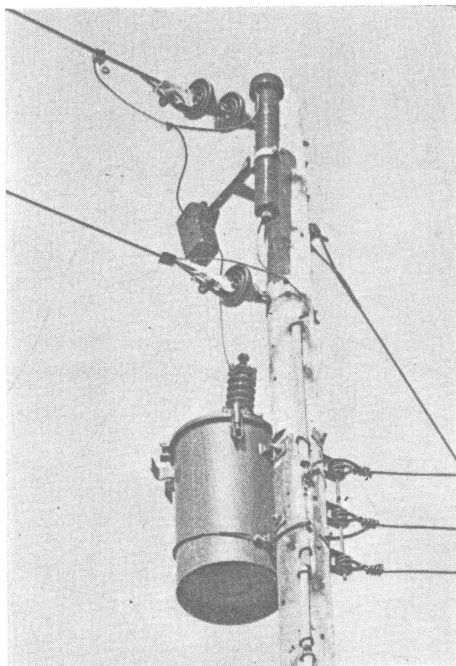


Fig. 3. Transformer, showing distribution line (6900 volts) at left, and service drop (115/230 volts) at right.

the expense of the power supplier. For that reason the power supplier is interested in installing the minimum size transformer which will do the job. The power supplier, however, is quite willing to see that the transformer is large enough when he knows that additional capacity is needed.

It is quite important therefore that power suppliers be notified when new equipment is placed on their lines so that good service may be given and also to prevent the transformers from being overloaded and possibly burned out.

Because of increases in farm loads, it has become general practice to place the transformer as close as possible to the load.

Types of Farm Wiring

Most common wiring in use on farms is non-metallic sheathed cable. It is cheap and easy to install but needs protection in exposed places. Regular non-metallic sheathed cable is not satisfactory for damp locations. A new type has a plastic or rubber covering and is satisfactory for damp locations.

Metallic sheathed cable wiring has an outer covering of flexible steel, interlocking ribbon. This gives good mechanical protection but allows rust and corrosion. If not carefully installed, it will "short" between wires and covering. Use a continuous and adequate ground for the outside metal covering.

Rigid conduit, metallic tubing, metal surface raceway, and knob-and-tube are less common. Rigid conduit costs the most and has some of the faults of metallic sheathed cable. Knob-and-tube once was most common. Installation and up-keep are all-important with any wire. Install only where the Code permits.

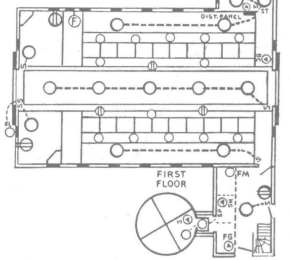
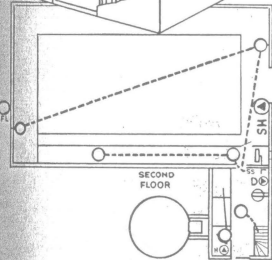
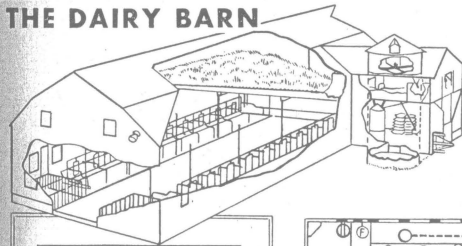
Wiring plans on following pages were prepared by the Farm Wiring Coordinating committee of NEMA Farm Electrification Bureau. The Ohio Agricultural Extension Service approves the plans.



Wiring Plans For Your Buildings

Dairy farming is one of agriculture's hardest as well as one of its most profitable operations. Also it is one of many jobs in which electricity has made outstanding progress. The building design, wiring, lighting, and equipment illustrated place top emphasis on efficiency, ease of operation, economy and cash returns.

THE DAIRY BARN



WHAT THE SYMBOLS MEAN

- CEILING OUTLET
- FL OUTLET FOR FLOODLIGHT
- WALL OUTLET
- FAN OUTLET
- ⊖ CONVENIENCE OUTLET
- ⊖BC OUTLET FOR BARN CLEANER
- ⊖C OUTLET FOR MILK COOLER
- ⊖D OUTLET FOR HAY DRYER
- ⊖M OUTLET FOR MILKING MACHINE
- ⊖FG OUTLET FOR FEED GRINDER
- ⊖FM OUTLET FOR FEED MIXER
- ⊖H OUTLET FOR HOIST
- ⊖HS OUTLET FOR HAY STORAGE EQUIPMENT
- ⊖S OUTLET FOR SILO UNLOADER
- ⊖SH OUTLET FOR SPACE HEATER
- ⊖ST OUTLET FOR STERILIZER
- ⊖WH OUTLET FOR WATER HEATER
- 5 SINGLE POLE WALL SWITCH
- 5P SWITCH WITH PILOT LIGHT

CIRCUITS

- 3 - 15 AMP. BRANCH CIRCUITS TO SERVE LIGHTS
 - 2 - 20 AMP. BRANCH CIRCUITS TO SERVE CONVENIENCE OUTLETS IN BARN AND MILK ROOMS, ALSO FAN OUTLET #12 WIRE MINIMUM
 - 1 - 20 AMP. BRANCH CIRCUIT TO CONVENIENCE OUTLETS IN FEED ROOMS, ALSO HEATER OUTLET AND FEED ROOM HOIST, #12 WIRE MINIMUM
 - 1 - 30 AMP., 230 VOLT BRANCH CIRCUIT TO STERILIZER, SPACE HEATER AND WATER HEATER OUTLETS IN MILK ROOMS
 - 8 - INDIVIDUAL 230 VOLT CIRCUITS AS FOLLOWS - -
- | | |
|-------------------------|----|
| MILK COOLER - | 12 |
| MILKING MACHINE - | 12 |
| SILO UNLOADER - | 12 |
| FEED MIXER - | 12 |
| HAY STORAGE EQUIPMENT - | 12 |
| BARN CLEANER - | 10 |
| FEED GRINDER - | 10 |
| HAY DRYER - | 8 |

Lighting outlets—Locate one every 12 feet on center of line of litter alley and one every 20 feet on center line of feed alley. If more light is desired, locate a second line of lights in the litter alley, placing outlets over the hind quarters of each row of cows.

Duplex convenience outlets—Should be located in the litter alley and in the two maternity pens, as shown. They are necessary for such plug-in equipment as clippers, immersion heaters, heat lamps.

Special purpose outlets—Are required for the milking machine, ventilating fan, barn cleaner, hay

curing fan, feed grinder and mixer, milk cooler, water heater and other equipment illustrated.

Service panel—Shown on an inside wall of the barn protects it from frost and moisture. The barn is served by 15 branch circuits.

Structural features—Includes a feed processing room, with connecting overhead bins, feed grinder and mixer for automatic handling of grain. The silo is attached to the barn so ensilage can be mechanically unloaded into carts in a section of the feed room. These features are in addition to those shown in the efficiently arranged and well-equipped milk house.

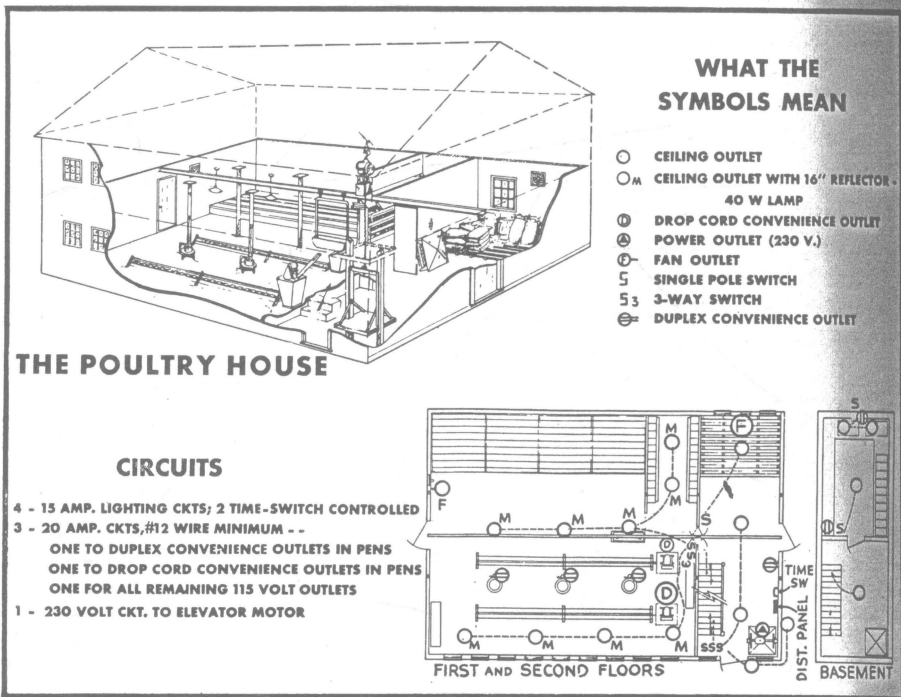
Electricity is an important factor in modern poultry farming, whether it be used in the larger than average poultry house shown, or in smaller installations. This is true in egg production, particularly.

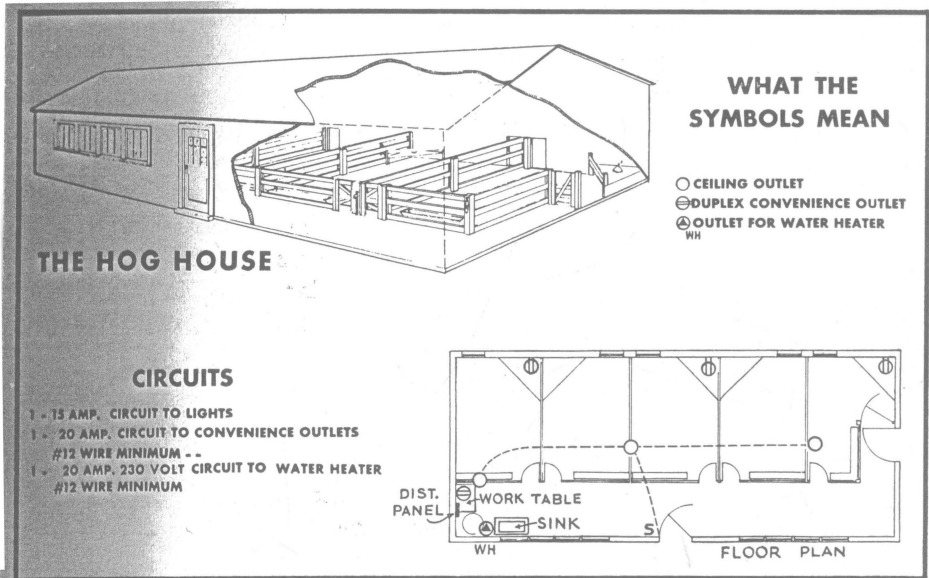
Lighting—Keeping a proper light-schedule—13 to 14 hours of light every 24-hour period — will help keep egg production high during cold or “off-peak” months. This means that natural light must be supplemented by artificial light in the fall, winter and early spring. To control the lighting schedule with the desired degree of regularity, automatically and without personal attention, is the job of the time switch, shown on the wall in the feed storage room. These de-

vices operate equally well for morning or evening light practices. Information on the correct type of light needed and their proper location in the poultry house can be obtained from Extension Services and power suppliers.

Switches have been provided so that all or a part of the lights can be worked by hand or time switch.

Feeding and watering—A motor-driven automatic feeder takes care of the feeding problem, while waterers, supplied from the pressure system, provide an adequate year-round supply of water for the flock. During cold weather, the use of immersion heaters and heating cable will keep water and pipe lines from freezing.





Brooding—The single electric hover-type brooder, shown in the illustration, is typical of those used in a poultry operation of this size. Electric brooding is safe, saves time and labor, enables chickens to feather faster and offers automatic operation.

Feed handling—The movement of feed from floor to floor is taken care of easily through the use of a stationary elevator, requiring an individual 230-volt circuit, as well as a 230- volt outlet.

There's money in hogs. But they must grow into marketable size to pay off. To help them get a "profitable" start in life is one of electricity's major jobs. Some of the uses

of electricity in the hog house are shown in the accompanying illustration.

Brooders—Electric brooders save many a little pig. For this reason, the illustration shows three duplex convenience outlets for connection of brooders in each of the five farrowing pens.

Lighting—Two overhead lights are located in the farrowing room and another in the cooker room for general illumination.

Cooker room—The wiring layout, as shown, makes provisions for the use of a water heater, hot plate, cooker and other equipment in the cooker room.

The farm shop, illustrated, contains all the elements of a complete work and hobby shop. Provisions have been made for both wood and metal working.

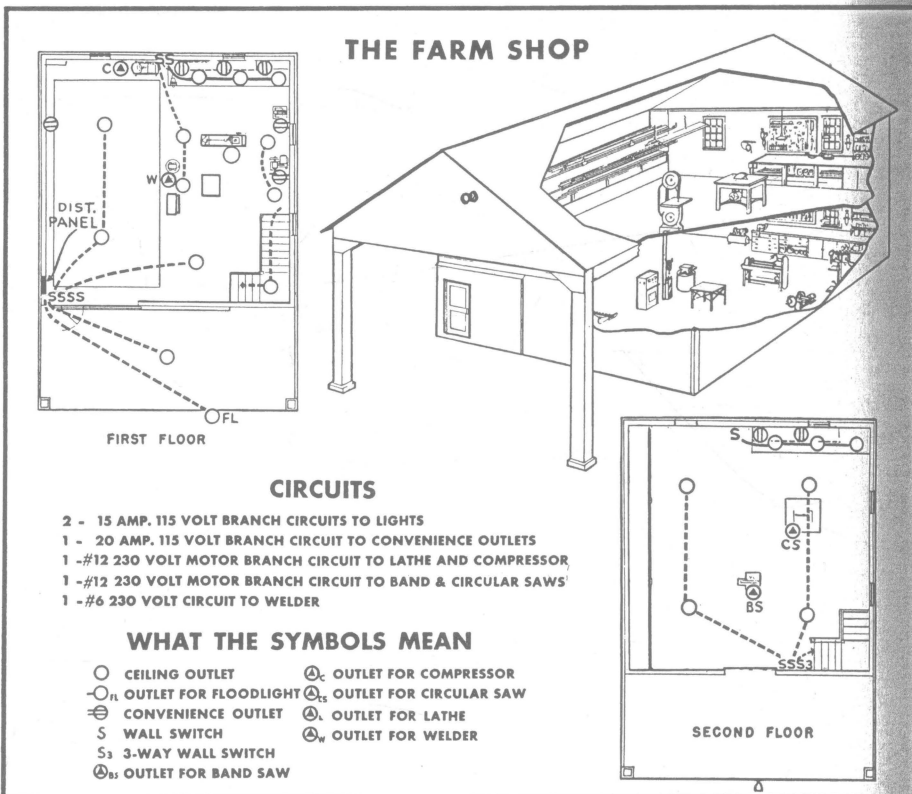
Lighting—Lights for general illumination are installed on the basis of one for every 200 square feet of floor area. "Work" lights include one for each permanently installed piece of equipment and one for every 10 feet of bench length. The stairway from the first to the second floor also is well lighted.

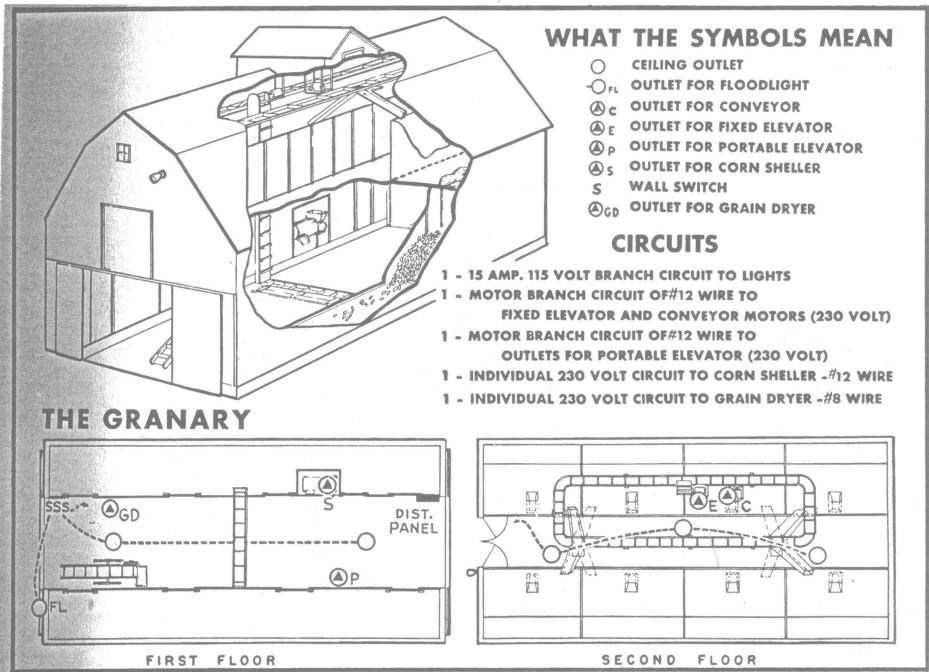
Motor branch circuits—Two 230-volt branch circuits are required

for the shop, to serve lathe, compressor, band and circular saw.

Welder—There also is a No. 6 wire, 230-volt branch circuit shown to serve the limited-input transformer-type arc welder. Duplex convenience outlets—eight duplex convenience outlets, which appear on the plans, are for the use of small electric tools, drill press and grinder.

Structural design—As illustrated, the building has a canopy over the front door so that machines may be repaired under cover. The door of the building slides





open and is large enough so that most equipment can be moved inside during cold or stormy weather.

The granary illustrated is equipped for quick, easy and automatic handling of ear corn and small grain.

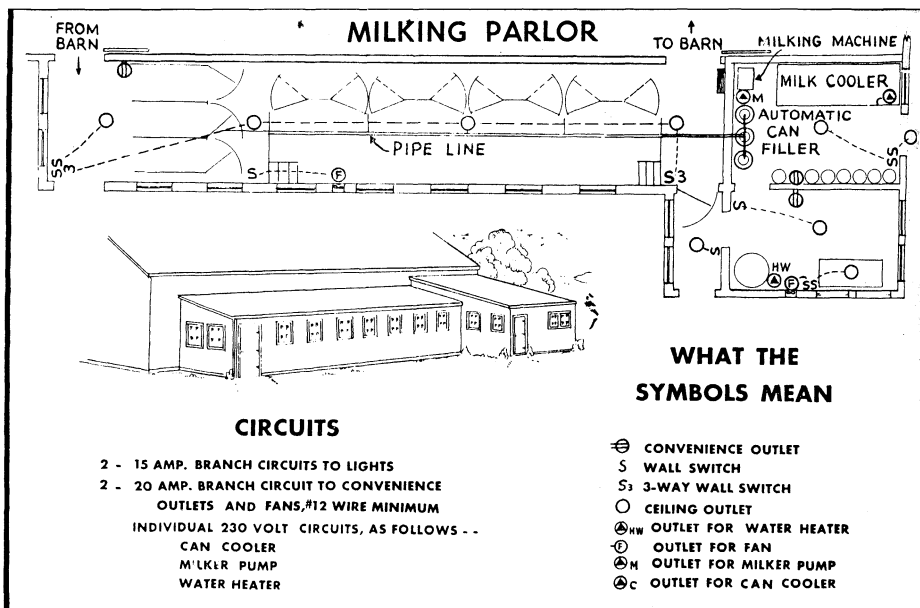
Lighting—Three lights are shown on each floor for general illumination.

Motor branch circuits—Two 230-volt motor branch circuits are required to operate the portable elevator, bucket type vertical elevator

and second floor conveyor. The portable elevator is used to crib corn in the side bins, to deliver it to the electrically operated sheller, shown, or to load cribbed corn into wagons. The vertical elevator delivers corn from the floor dump to the overhead conveyor, which carries it to the overhead bins.

Individual 230-volt branch circuits—Two such branch circuits are recommended—one for the corn sheller and the other for operation of either a wagon hoist or blower—the latter for drying grain.





Milking parlors, similar to the type shown, are growing in popularity in many sections of the country. Their growth has been noted in the south, particularly because of the mild winters, which make loafing barns or open sheds more feasible than in northern areas. In operation, cows walk from the barn, shown attached to the milking parlor, into the "parlor." They are washed in stalls at the entrance to the milking parlor and then walk into tandem stalls to be milked. Milk passes from the cow into a receiver, and then through a pipe directly into an automatic can filler in the milk house.

Lighting—Four ceiling lights are located in the washing and milking area. Also there are: One

ceiling light in the passageway leading to the milk house; three in the milk room to light work areas, and one light to illuminate the loading platform.

Duplex convenience outlets—Are located in the milking parlor and milking room for heat lamps, space heaters, etc.

Circuits—Five branch circuits are necessary to serve the milking parlor shown. These include two 15-ampere branch circuits for lights; two 20-ampere branch circuits to serve the ventilating fan and convenience outlets—the latter for clippers, heat lamps, etc.—and three individual 230-volt branch circuits to serve the milk cooler, milking machine, and water heater.



Lighting Your Home

By Ann Bierbricher, Extension Home Furnishings Specialist

GOOD lighting equipment located in the right places helps you to see easily and quickly. Not enough light, or a light that glares, tires your eyes. Let's think about the lighting in the different rooms in a house.

Many people find it difficult to see in their living room because light from unshaded ceiling fixtures glares; desk lamps don't spread enough light over papers. Women who sew cannot see their stitches because poor lighting causes shadows from their hands. Poor lighting shadows games as youngsters play, and good light is needed to see in the living room or any other room in the house. Often there is not enough soft light throughout a room to see clearly.

What Is Good Lighting?

Everyone needs more light to see small objects and dark objects. Good lighting gives enough light for you to see each job you do. Some jobs take more light than others, but always have plenty of light when you do close work.

Shaded or unshaded—light from lamps or fixtures often causes

strong contrasts and yet does not put out enough light so one can see the fine print in newspapers.

Prevent this by distributing enough light over your entire room so you do not look into a dark spot. This general light can come from ceiling and wall fixtures and also from lamps.

Spread or Diffuse Light ·

Light coming through a clear shade glistens like the sun. Shades need to spread or diffuse the light. When you buy shades examine the shape, too. Choose those which direct the light on what you want to see—not in your eyes.

If you want good light, have enough light over the entire room, avoid contrasts of strong bright and dark spots, and use proper shades on lamps and fixtures.

Watch Reflecting Colors

Although any room without several colors will be tiresome if you spend much time there, some colors reflect more light than others. For example, pale yellow reflects about 75 percent of the light that falls on it, but pale blue reflects only about 55 percent. White reflects the most light—about 85 percent. Black reflects the least. The darker a color the less light it reflects.

Dull finishes on walls and ceilings help to spread or diffuse light. Shiny finishes act like a mirror and reflect light into your eyes. Smooth walls reflect more light than rough ones.

Lamp shade color also will affect eye comfort. Light colored and translucent shades blend with light colored walls. Lamp shades are less spotty against dark walls if shades are somewhat dark on the outside.



Fig. 5. When there is light all around a person, reading is much easier.

Therefore, for good light, where walls and ceilings are dark, always provide more light.

Daylight Changes Colors

Colors in chairs or carpets often look different in the daytime when lights are turned off. Incandescent or filament lamps glow with rays of orange and yellow. This causes fabric yellows to look brighter and reds to look richer. Most other colors appear darker. Filament lamps are made in a tube as well as bulb shape.

Fluorescent lights are tube shaped, and are filled with vapor. Not all fluorescent lamps give the same colored light since they are made in different colors or types. Each lamp is marked with its type

or color. Here is a short description of some types of standard fluorescent lamps that you can choose from for the fixtures in your home.

- **Warm white** fluorescent lamps brighten red and yellow like filament lamps and can be used around the home.
- **The 3500° white** fluorescent lamp also can be used for general lighting in the home, but it emphasizes yellow, yellow-green, and orange colors.
- **Soft white** fluorescent lamps cast a soft pink light which emphasizes skin tones. Therefore, it is often used near mirrors.

- **Daylight** fluorescent lamps make blues and greens bright and clear as does sunlight but dulls red and orange. If you use this lamp in fixtures or built-in lighting, use some filament table or floor lamps, too, so complexions will have a more natural look.
- **Cool white** lamps give off a cold, white light which, if used in kitchens, sinks or stoves will look white and clean.

Deluxe warm and cool fluorescent lamps, also on the market, bring out natural colors.

Today you can emphasize some colors and dull others by the type of lamps you use in your fixtures. The right color of light will help to make it good light.

Lighting Your Living Room

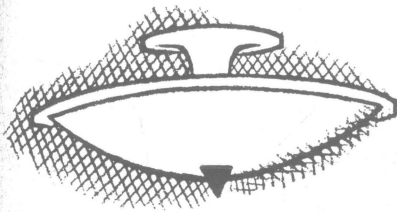


Fig. 6. Minimum diameter of shade is 15 inches. Use 150-watt filament bulbs or 50-watt fluorescent circular tube.

Good ceiling fixtures or wall valance lighting in your living room can give soft light over the entire room and enough light to prevent dark shadows. This blends into that from table or floor lamps which you need to read or sew. One central fixture is enough for an average sized room, but more may be needed in larger rooms.

Fixtures shown in the illustrations have shades that diffuse light

downward yet direct light toward the ceiling and walls. Wide shades on fixtures spread light. Shades which are too small make the light seem too bright. Highly diffusing materials—opal and enameled glass or plastic—are good for shades on the filament lamp fixtures. Less diffusing material as etched glass is satisfactory on fluorescent fixtures. Fluorescent lamps give more light for the current used but usually costs more than filament types. Size of lamps in the fixtures illustrated is suitable for the average sized room.

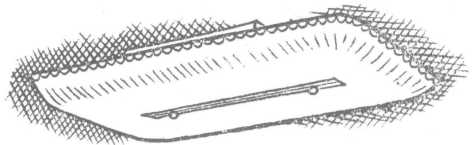


Fig. 7. Shape can be round or square to suit room. Use 80-watt fluorescent tubes.

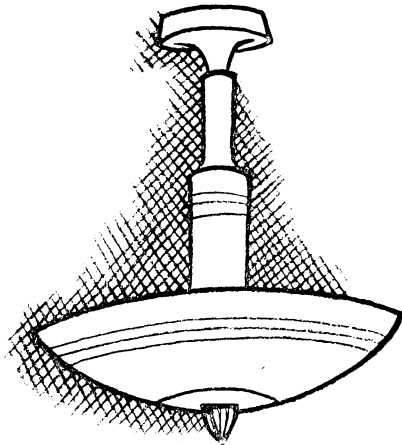
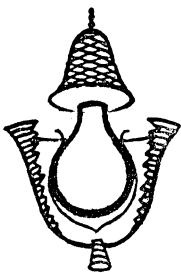


Fig. 8. Minimum diameter of shade is 15 inches. Use 150-watt filament bulbs or 50-watt fluorescent circular tube.

Hang large fixtures close to the ceiling in average-height rooms.

In high rooms, suspend the ceiling fixture farther from the ceiling. A rule of the thumb is to hang a ceiling fixture so it is at least 7½ feet above the floor.

If you have a ceiling fixture with bare bulbs you can improve the lighting. If bulbs fit base-up into the fixtures, use a mushroom shaped, semi-indirect 50-watt bulb



in each socket (shown below). Or, use a white plastic shade on each bare bulb. Fit a shade 7 inches in diameter on each 60-watt bare bulb (see drawing).

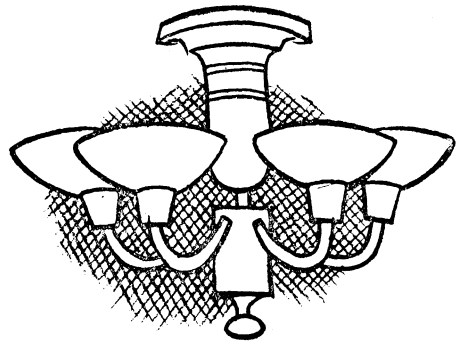
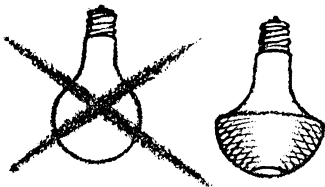


Fig. 9. Close to ceiling or suspended fixtures such as this need a minimum diameter of each shade of 5 inches. Use a 40-watt filament bulb in each shade.

Valance lighting will give general light over a room—conceal tubes behind the horizontal valance so light coming from behind the valance reflects into the room from the walls and ceiling. Extend the valance across one entire wall—even doors and windows. An average room needs at least 16 feet of lighted valance for good, general lighting. If you wish to use fluorescent lighting, place 20-, 25-, or 40-watt fluorescent tubes end-to-end behind the valance. And, if you want valance lighting on other walls of the room, build each section at least 4 feet long.

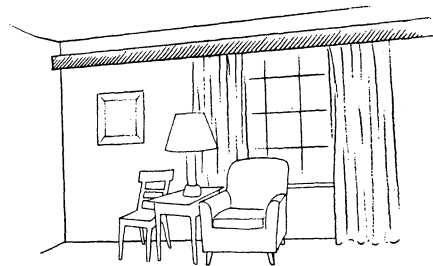


Fig. 10. A wall-to-wall valance can be as deep as 10 inches. Top of the valance should be no less than 10 inches below the ceiling.

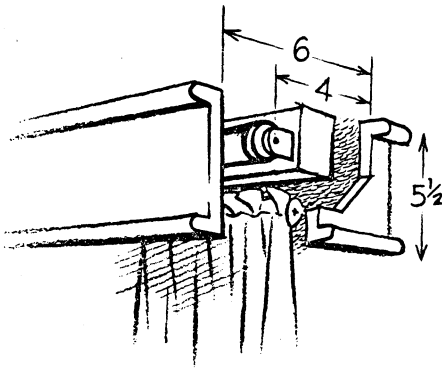


Fig. 11. Here are details of a wall valance. Install lighting tubes at least 4 inches out from wall. Place tubes near top of the valance so you cannot see them as you sit or stand in the room.

Table and Floor Lamps

Table, floor or pin-to-wall lamps will give extra light needed for reading or other close work. But,

choose a lamp with simple lines and a color that fits the room. Make sure it stands firmly, too.

White or cream colors inside a shade reflect whereas darker lining absorbs or wastes the light.

Choose a lamp tall enough to spread light over your work so you can see easily without having light in your eyes. A good reading lamp placed on a table or desk, 25 inches high, is 25 to 30 more inches to top of diffusing bowl which is 8 to 9 inches in diameter. Bottom of shade is at least 16 inches in diameter and from 15 to 17 inches above table top. Lamp is fitted with a 150-watt bulb in a diffusing bowl. Some lamps also have a circle fluorescent tube under the shade to give more light.

Lamp shade shape and width at

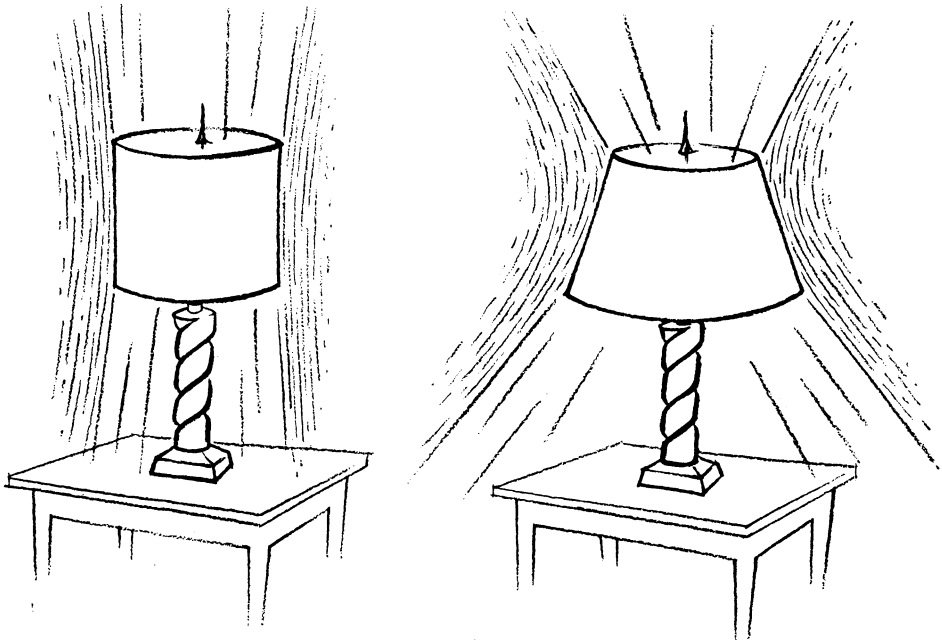


Fig. 12. Shape of shade affects spread of light.

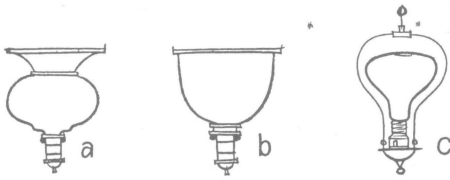


Fig. 13. Here are diagrams of different ways of obtaining diffused light.

the lower edge affect the spread of light. Slanted shades give a wide spread of light, and shades which are open at the top direct light upward.

Lamp parts under the shade also affect the spread of light. Some lamps have a reflector or diffusing bowl (Fig. 13-a or Fig. 13-b) under the shade to spread light. Other table and wall lamps can be fitted with a white, indirect bulb and need

no diffusing bowl. Such a bulb fits inside a wide harp which supports the shade (Fig. 13-c). The lamp must be tall and the shade shaped to direct the light on work.

Manufacturers make lamps, tagged as a "Certified Lamp," to meet lighting construction and safety standards set up by the Certified Lampmakers.

Many poor lamps can be changed into good lamps simply by adjusting the height if necessary. Fit the lamp with a diffusing bowl and proper size bulb, or with a harp and 150-watt white, indirect bulb. Use a shade of proper size and shape.

Place your lamp close to what you want to see. For example, place a good study lamp 15 inches from the center of your book on

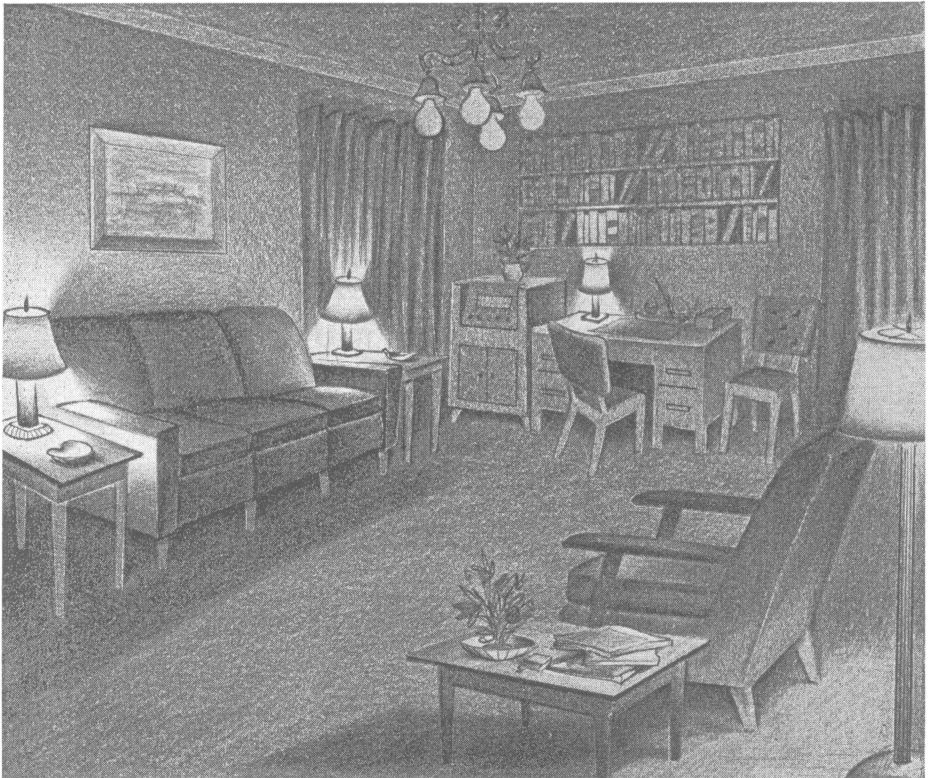


Fig. 14. Before arranging for good lighting.

your desk or table; place the center of the lamp base about 12 inches from the front edge of your desk. A lamp may seem too bright to you if it is too close or if it is directly in front of you. Your work will be in shadow if your lamp is directly behind you.

Place a table lamp at the side of your chair or place a floor lamp to the side and slightly toward the rear of your chair. Remember, the farther you work from the light source, the less you will be able to see what you are doing.

If you want to see your work easily, use the proper lamp.

Height, plus size, shape and color of the shade, affect the spread of light from the lamp. Size and type of bulb affect the amount of light

the lamp can give. Position of the lamp must be such that light falls on your work.

Brighten Dark Spots

When a room receives proper lighting changes (note Fig. 15), there is enough general light over the entire room so there are no contrasting bright or dark spots. All fixtures and lamps have shades to soften or diffuse the light. There is enough light directed on work surfaces to see close jobs. Color of the light is pleasing on the skin and also emphasizes the main color of the furnishings. Check the light in your living room. Which picture does it resemble—Fig. 14 or 15?

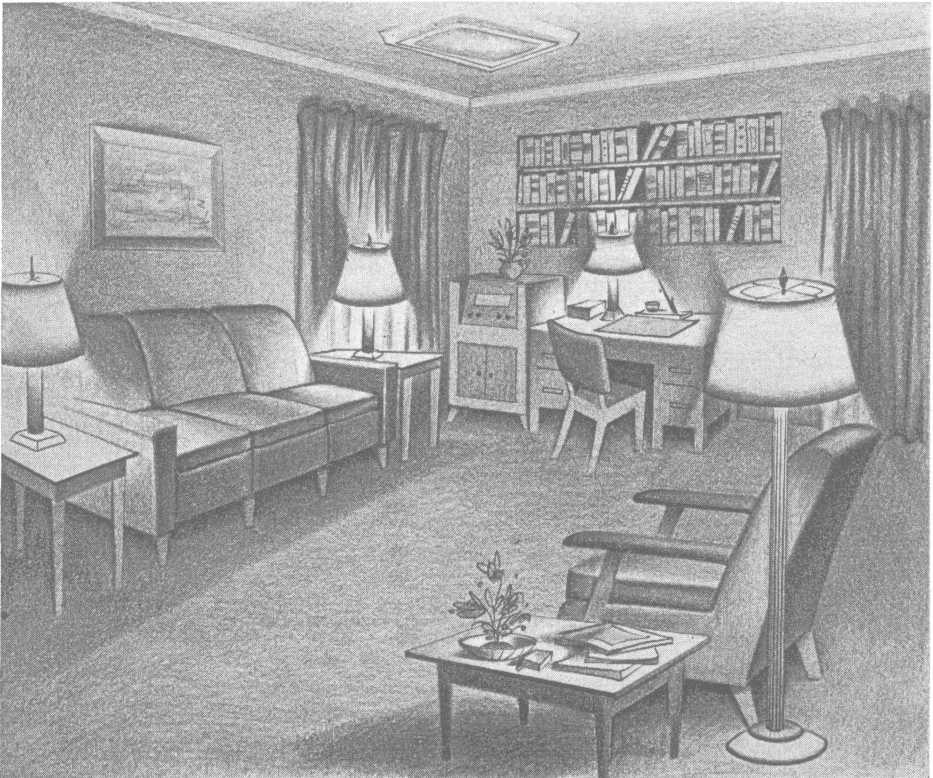


Fig. 15. After arranging for good lighting

Light for Viewing Television

Bright light from a television screen contrasts greatly with the dark in an unlighted room. Therefore, use your lamps to give a small amount of general light. Turn lamps with three-way bulbs to a low level but do not allow light to fall on the television screen or in

your eyes. You may want a small amount of light behind the set, but to avoid bright spots on walls or furnishings nearby, place all lamps some distance from the set.

When you look at a television program, sit back at least 10 times the width of the picture tube; for instance, sit no closer than 8 feet from a 10-inch tube set.

Lighting Your Dining Room

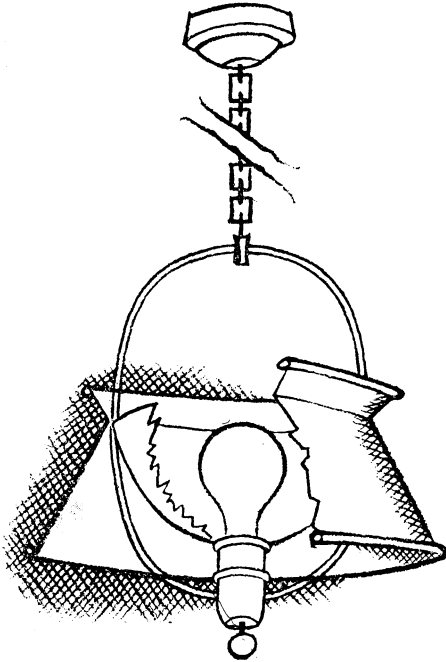


Fig. 16. With a fixture like this, use a shade with a diameter of 18 inches; 100-200-300-watt three-lite bulb.

Fixtures close to the ceiling spread general light over the dining room. They do not direct extra light on the table. Therefore, in order to study or do other close work at the table you will need a lamp on or near the table.

Lower edge of a fixture suspended from the ceiling must be 30 to 36 inches above the table top for

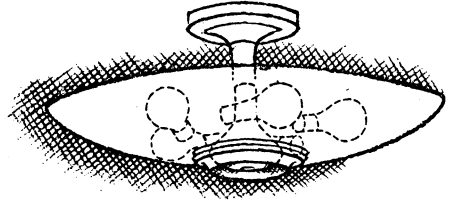


Fig. 17. Here, diameter of shade is 21 inches; four 60-watt or five 40-watt bulbs are in the upper part and one 75-watt lamp is in the center for direct down light.

the best lighting. Some suspended fixtures have a diffusing bowl under the shade. The bowl diffuses light downward and a switch controls a three-way bulb. A shade 18 inches in diameter with a 100-, 200-, 300-watt three-way bulb gives enough light for an average room.

Figure 17 may be a close-to-ceiling or suspended type. It directs light both up and down. The 75-watt lamp directs light down on the table and a switch controls the light to give general light or down light or both.

A wall valance—at least 35 inches long—can be used in the dining room with a central fixture to give general light or to direct light on furnishings. If there is a wide opening between living and dining rooms, place the valance on the wall opposite the wall used with a valance in the living room.

Lighting Your Kitchen

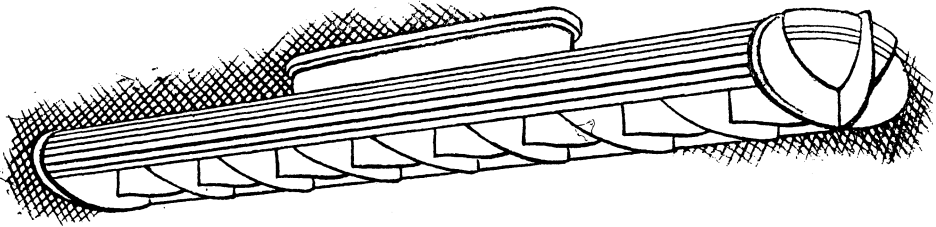


Fig. 18. At least three 20-watt or two 25-watt fluorescent tubes need to be in a ceiling fixture such as this.

Kitchens are work rooms and need enough general light so people can walk about safely and do simple jobs. However, more light is necessary over sinks, stoves, counters, and tables.

If you have only a central ceiling fixture, you probably work in your own shadow. Glossy surfaces of your sink and stove may reflect light making a glare. If you have this problem, shade your kitchen lamps and locate them so the light falls on your work. Ceiling fixtures shown in Fig. 18 or 19 give general light over the kitchen.



Fig. 19. Diameter of enclosing globe is 12 inches; 150-watt filament bulb.

A light fixture, Fig. 19, or a unit, Fig. 20, will direct light downward if you install them between the cabinets over your sink. Or, if you attach an unshielded fixture with two 25-watt fluorescent tubes to the ceiling over your sink you complete the same purpose. Then, fit a shielding board to the ceiling in front of the fixture to protect your eyes from glare.

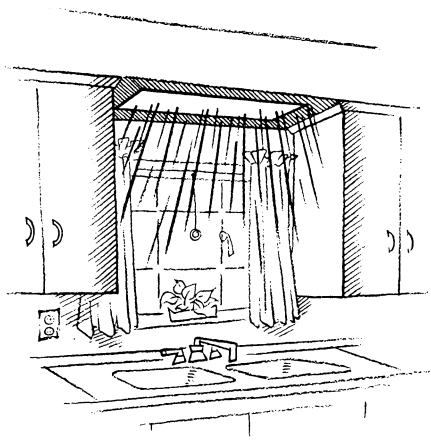


Fig. 20. Minimum size of recessed light is 8 x 25 inches; 200-watt filament lamps or 60-watt fluorescent,

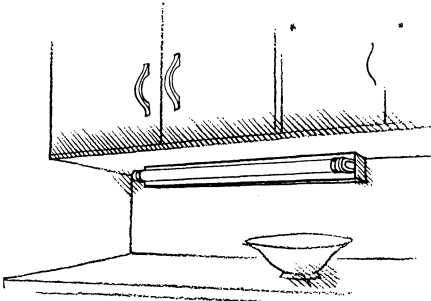


Fig. 21. For each 25 to 30 inches of work space, use a 20-watt fluorescent tube.

If you use wall fixtures over your work counter and stove, attach them to the wall, under a shelf, or under a cabinet. An unshaded fixture, Fig. 21, is suitable only when attached to the wall under a cabi-

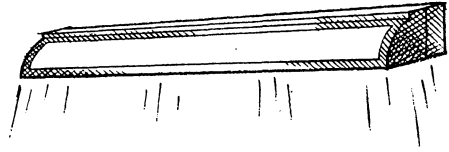


Fig. 22. This fixture uses a 25 or 40-watt fluorescent tube.

net that is low enough to shield the eyes from all direct lighting. Use a shaded fixture, Fig. 22, when no cabinet or other shielding surface is above it or if a cabinet is above eye level.

You could use portable pin-to-wall lamps over the stove, sink, or work counters to light work areas. Place them 48-56 inches above the floor or so their light does not shine in your eyes.

Lighting Your Laundry

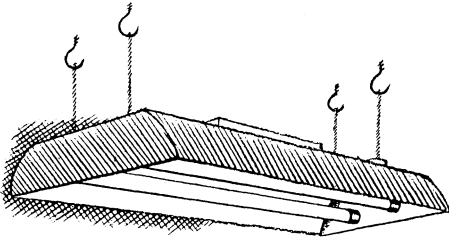


Fig. 23. Here, fixture uses two 25-watt fluorescent tubes.

To keep from missing spots and stains on soiled clothes, place fixtures to direct light down over washing equipment. Long fixtures, Fig. 23, will enable you to have better working light if they run in

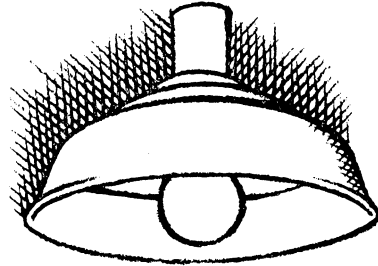


Fig. 24. A 150-watt silvered bowl filament bulb in metal reflector 12 to 14 inches in diameter.

the same direction as your ironing board. Place fixture, Fig. 23 or 24, over the center of ironing board or washing unit. These fixtures also are suitable over a work bench.



Lighting Your Bedroom

Many bedrooms need a wall switch near the door so no one will have to grope around to turn on a light. Shades on fixtures, Fig. 25 and 26, diffuse light both downward and upward. The fixture shown in Fig. 27 directs all light upward.

Some bedrooms can use a combined installation, which includes an outlet for a lamp or wall bracket, a convenience outlet, and a wall switch. These cost little to install. If you plan to have such a combination, place the wall bracket a little above the average height used for a wall switch.

Everyone needs more light in his bedroom than from ceiling fixtures. Occupants must see clearly at mirrors, as they read in bed, or as they sew or study.

If you read in bed, be sure to use good light. Portable lamps can give needed light and a good table lamp placed close to the side of the bed spreads light over the book. Place your lamp so the bottom edge of the shade is about 20 inches above the mattress top.

Wall fixtures and lamps that can be mounted over the bed are easy to reach, but always use at least a 25-watt fluorescent tube or two 40-watt lumiline lamps. A long shielded fixture or lamp, Fig. 22, mounted on the wall above the bed directs light both up and down. Or, hang

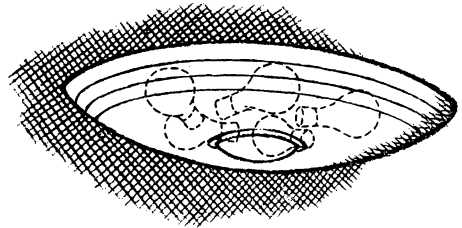


Fig. 25. Diameter of shade is 18 to 21 inches; five 40-watt filament bulbs.

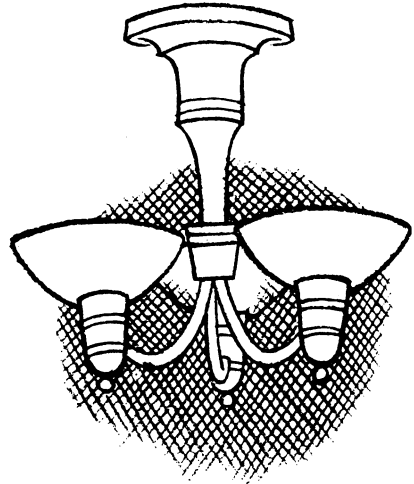


Fig. 26. Diameter of each shade is 5 inches; 40-watt filament bulb on each arm.

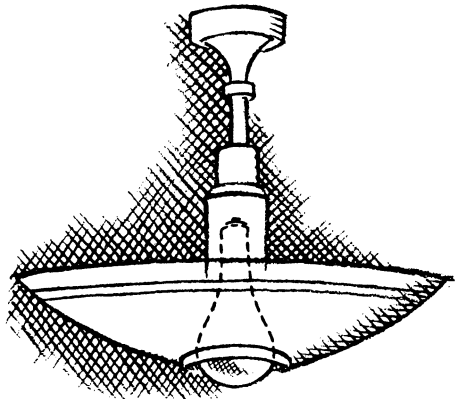


Fig. 27. Diameter of shade is 18 inches; 150-watt silvered bowl filament bulb.

a pin-to-wall lamp, Fig. 28, over the bed so the shade bottom is about 30 inches above the mattress top. Such wall lamps are useful also over desks or sewing tables.

The best dresser or dressing table lamps are those that are at face height. Use shades that let some light through them and are white or near white. Place a lamp on each side, about 18 inches from the center of the mirror, and about 6 inches out from wall. Make sure no bulbs shine in your eyes from any position you may take.

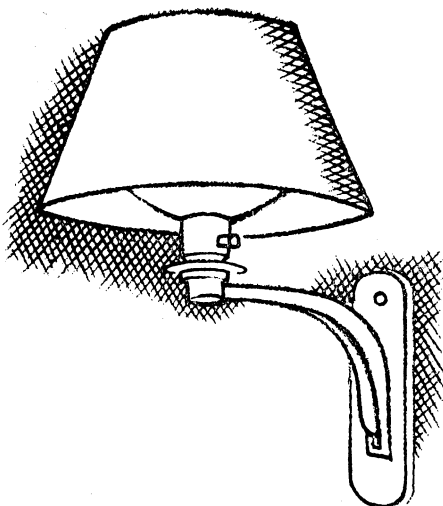


Fig. 28. This wall lamp has a diffusing bowl with a top diameter of 8 to 9 inches. Bottom diameter of shade about 13 inches. Use a 50-100-150-watt three-lite bulb or a 50-100-150-watt white indirect bulb without a diffusing bowl.



Lighting Your Bathroom and Other Small Rooms

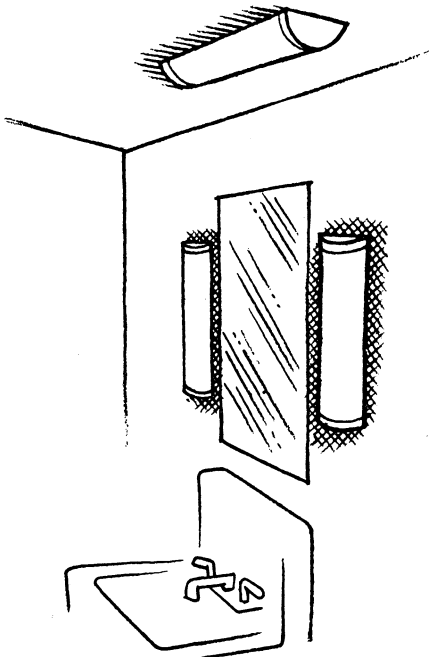


Fig. 29. Shaded fixtures like these use a 15-watt fluorescent tube.

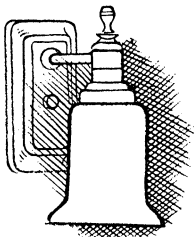


Fig. 30. Diameter of shade here is 4 inches; 60-watt filament bulb.

Use a wall fixture, Fig. 29 or 30, on each side of your mirror and 15 inches from its center to direct light on both sides of your face. Mount each fixture so its center is about 5 feet above the floor.

Be sure all wall fixtures are shaded as they are level with your eyes. You may want to mount a third fixture, Fig. 29, on the ceiling above the

mirror, 12-18 inches out from the wall—to direct light over your shoulders and over the entire room. Place a shaded bracket over the mirror if you can have only one lighting outlet in a small bathroom. Light passes down through the lens plate in the shade of bracket, Fig. 31.

Long fixtures, Fig. 29, cast light over your entire face and under your chin. Be

mirror, 12-18 inches out from the wall—to direct light over your shoulders and over the entire room. Place a shaded bracket over the mirror if you can have only one lighting outlet in a small bathroom. Light passes down through the lens plate in the shade of bracket, Fig. 31.

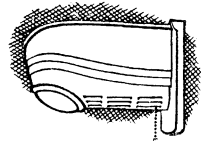


Fig. 31. This has a 100-watt filament bulb.

Ceiling fixtures, Fig. 29 or 32, also spread some light over the entire bathroom. Only in a very small room will mirror brackets light up the walls.

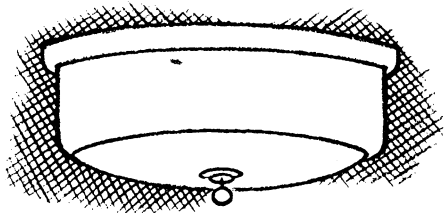


Fig. 32. Diameter of shade is 12 inches; 120-watt filament bulb.

Lighting Your Closets

It's a waste of time to search for clothing in a dark closet. In a shallow closet a simple porcelain pull chain socket is satisfactory. Mount the socket inside and over the door frame at the side where the door opens. Shaded ceiling fixtures will give a better spread of light in a big closet. Control the light by a switch just inside the door. Or, install an automatic switch in the door frame to operate the light as you open or close the door. Fixtures in halls often can be placed to light up nearby closets, too.

Lighting Halls and Stairways

Poor lighting in halls and stairways invites disaster. Both parts of a home need enough general light so one can always see to walk. Each stairstep needs to be well-lighted without glare.

A shaded close-to-ceiling fixture,

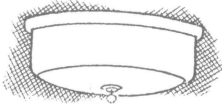


Fig. 33. Diameter of shade is 12 inches; 80-watt filament bulb.

Fig. 33, spreads light over a small hall and an open-top fixture, Fig. 34, also directs some light upward. Mount open-top fixture, close to

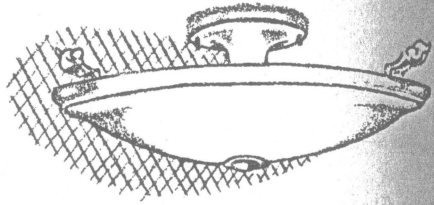


Fig. 34. Diameter of shade is 12 inches; 80-watt filament bulb.

ceiling so you cannot see bare bulbs as you walk down the stairs.

You can protect yourself by controlling the light in your halls and stairways with a wall switch. Have a switch at the head and foot of the stairs and at each end of the hall.

Lighting Your Entrance

Your family's safety is affected by the lighting at the entrances to your home, too. A bracket that directs light downward, Fig. 35, will make steps and doors easily seen. Use a bracket at each side of the door, but if you can have only one, place it at the opening side of the door.

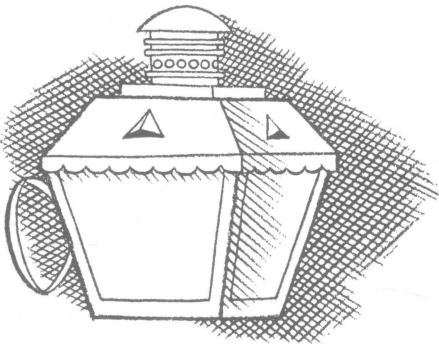


Fig. 35. Diameter of shade 6 inches; 40-watt filament bulb.

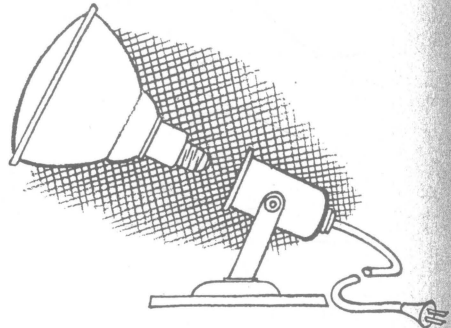


Fig. 36. A projector lamp fixture.

What Good Lighting Means

Good lighting in the home helps to make work easier, living more enjoyable, and adds to family safety. "Good light" means:

Enough light on each thing you try to see.

Enough general light over an entire room so that you do not look into dark spots or deep shadows.

Lamps and fixtures shaded so no light shines into your eyes from lamps or reflecting surfaces.

Lamps and fixtures placed so the light falls on your work surface.

Pleasing color of light in your room.

Switches to control the light, placed conveniently at entrances to rooms.

Good lighting requires satisfactory wiring throughout the home. Plan adequate and safe wiring necessary for your lighting improvements.