

ENGINEERING

Houses Without Steps

Common household accidents can be reduced and life made easier through the studied efficiency of the "stepless" house for the handicapped.

By EDWARD HOUSMAN

► "STEPLESS" HOUSES, one-story dwellings that hug the ground, are an architectural mode for the future. They mean independence for the handicapped. They can also mean a safer, easier life for the normal person.

Advocated by the National Society for Crippled Children and Adults as the "wheel chair house" in which the handicapped can live without outside assistance, the new kind of dwelling is arousing interest among architects, builders and prospective home owners.

There are more than 23,000,000 physically handicapped in the United States, by conservative estimate. These include those crippled by polio, accidents, arthritis and other ills that affect the use of limbs.

Also, there are the older people in our population who have trouble getting up and down stairs. All of them need the stepless house.

In such homes, all floors are flush with the ground outside. There are no doorsteps or door sills. Ground level terraces replace the raised porch.

Cabinets, electrical outlets and the major storage areas are built within easy reach, even from a wheel chair.

Doors Removed

Door knobs are lowered, with the lever type preferred. Swinging doors are even easier for the wheel chair housewife to manage, but wherever possible, doors are removed completely. Architectural experts point out that most houses have unnecessary doors. The historic need for inside doors—to keep in the heat—is obsolete today.

Doorways and hallways are widened in the stepless house, with protruding furniture removed for additional safety and ease of movement.

Arrangement of the rooms and furniture is designed deliberately with an eye toward the least possible motion in accomplishing the daily chores.

It surprises some to find that one of the most important places in a wheel chair house is the garage. In almost all cases the garage is attached to the house for easy access. The car is the handicapped person's major link with the outside world. He cannot get around very well in a wheel chair, but in a car his range is unlimited.

In advanced designs, the car stands in a pit so that the person can swing into the driver's seat more easily. Garage doors

open and close automatically, controlled by switches thrown from the car window.

Bathrooms and kitchens need special consideration to be functional for the handicapped. Leg room is provided under the kitchen sink and work table. Faucets are in easy reach from a wheel chair and cabinets are lowered. Protruding surfaces have convenient finger grips so the handicapped can hold themselves steady on their feet.

For persons who can walk with support, some object is always within grasp in the kitchen.

Most handicapped persons need large bathrooms. Among the common features are a lowered sink, with foot room underneath and a medicine cabinet at the side. A full-length mirror is often installed so not only the handicapped, but others can use it without discomfort. A retractable seat for the tub or shower, which may swing into the entrance for extra safety, can also be used.

Cheeriness and light is the theme for the living room, with as little obstructing

furniture as possible. Large windows that open by turning a crank are recommended. This room may face a sun porch or terrace. Furniture is kept near the wall or built into the wall. Scattered pieces get in the way and make cleaning more difficult.

Easy Access to Kitchen

A dining room is built for easy access from the kitchen. The two rooms could be unified, with perhaps an archway in between, for extra convenience in serving.

General rules for the design of stepless houses, as compiled by experts on the handicapped, include:

No steps, no ramps, ground level entrances, wide passages, sliding doors on closets, a color scheme for easy cleaning, plug-in telephones, no scatter rugs and high door stops to avoid tripping.

The modern labor-saving devices, such as garbage disposers, dishwashers, clothes washers and dryers, electric mixers are recommended.

The basic feature of the stepless house, the fact that it sits right on the ground, however, makes necessary radiant heating.

The ordinary house is raised a step or two above the ground to prevent damage



STEPLESS ENTRANCE—Doorways to house and garage are built flush with the ground in B. F. Good's stepless house in Falls Church, Va. A connecting path makes for easy access to both doorways, even from a wheel chair.

from moisture. A ground-level cement slab with radiant heat to keep out the dampness is a recommended foundation for the stepless house.

The slab may continue out to the attached garage, forming a cement apron around the slightly depressed car pit. It may spread under a screened porch or patio, Nena W. Badenoch of the National Society for Crippled Children and Adults, Inc., pointed out. With an overhanging roof, no raised sill is needed at the connecting door between the house and the patio.

Designed by Occupants

Each stepless house has its own refinements, since it is designed for, and partly by, the persons who are to make it their home.

Mrs. Foster Dudley of Burlington, Wis., her legs practically useless from a polio attack, has been running her stepless household for about nine years. In her back yard there is a revolving clothes line on which she can hang the family wash by leaning against a length of pipe. Electric outlets for the vacuum cleaner are on the light switch plates to avoid bending.

Mrs. Alice Miley, another polio victim, has her telephone in an opening between the kitchen and the living-dining room so that it can be answered from either side, eliminating the rush around corners when it rings. Her husband, a World War II veteran, is also confined to a wheel chair most of the time. The kitchen in their home in Carmel, N. Y., has an ironing board that folds into the wall, on which she can work from her wheel chair.

B. F. Good's stepless house in a suburb of Washington, D. C., was built with Veterans Administration aid. It features a cement connection between the front door and the attached garage.

Architects and designers are accepting the practical experience of such persons and others who have made their lives in these homes. A survey by the National Society for Crippled Children and Adults found agreement among such families that the outer door of the house be as light and easy to manage as possible.

Bigger Hallways

Doorways, halls, bathrooms and kitchens must have enough space for free passage of a wheel chair. For those unsteady on their feet, balance provisions such as handrails in long hallways are needed. Non-skid floors are essential.

For closets and cabinets, sliding doors with handles at the right level and interior rods, racks and shelves that pull forward make these areas functional for the handicapped. For others they add ease of operation, too.

"These features of construction in the stepless house are not only for the handicapped, but also for all persons who would change the trend of accidents in the home and make modern homes safe for living

and livable for the span of a man's life," the National Society for Crippled Children and Adults pointed out.

They recommend that public buildings be designed to be more readily available to the handicapped and aged who have trouble climbing stairs. Such buildings should have a major entrance on the ground level, the society said.

Easter Seal Funds

Part of the funds collected during the Easter Seal campaign goes to giving free advice to handicapped who want to build a stepless house.

The livable quality of the stepless house has different trends according to climate. In snowy regions, people like to draw their homes cozily around them. A small room such as the study then becomes the place the family and guests gather in the evening.

Another trend is a large expanse of glass separating the porch or patio from the living room, John Knox Shear, editor-in-chief of Architectural Records, said.

No matter the variations on the theme, the stepless house, a necessity for the handicapped, sets a trend for all modern living with its studied convenience.

Science News Letter, July 23, 1955

VETERINARY MEDICINE

Hog Virus Under Control

➤ A SERIOUS disease threatening the nation's swine industry has been brought under control through fast action by federal and state agencies and the livestock industry.

Less than three years ago, the virus disease, vesicular exanthema, or VE, had spread over 42 states and had hit swine herds in all major producing areas. Now the disease is chiefly limited to isolated parts of six states, the U. S. Department of Agriculture reported in *Agricultural Research* (July).

Key to the control of VE came when researchers discovered that it was spread mainly by feeding raw garbage to swine.

As a result, 45 state legislatures have passed laws prohibiting the feeding of uncooked garbage to swine, and the remaining states have introduced similar bills. Today, 74% of hogs fed on garbage in the United States get it cooked.

In July, 1953, the U.S.D.A. prohibited interstate movement of swine that had been fed uncooked garbage at any time in their lives. Six months later, this restriction was changed to allow movement of swine if they had not been fed raw garbage within 30 days.

This relief was necessary, the Agriculture Department said, because, at that time, on 42% of the garbage-feeding premises uncooked material was being used and satisfactory cooking equipment was difficult to obtain.

Now, however, only 17.4% do not cook

NUTRITION

Tomato Powder Made By Commercial Method

➤ YOU MAY be buying tomato juice by the bag soon.

High-quality tomato powder, which can be mixed with water to make tomato juice, can be produced by a continuous process in commercial vacuum-drying equipment, the U. S. Department of Agriculture, cooperating with the Chain Belt Company of Milwaukee, has found.

The Army Quartermaster Corps is testing the tomato powder made by the continuous process method for possible use by the military. It needs no refrigeration and is very light in weight, affording large savings in storage and transportation costs.

To make the powder, the juice is first concentrated by removing part of the water. The concentrate is dried in thin layers under special temperatures and pressures. The resulting powder is then ground up and packaged in a dry atmosphere, with a drying agent added to remove moisture after packaging.

From big juicy tomatoes, the final powder contains no more than two percent moisture.

Science News Letter, July 23, 1955

their garbage and suitable equipment is generally available. After Jan. 1, 1956, the old regulation goes back into effect, the Agriculture Department has announced.

VE, although well under control, cannot be completely wiped out until all garbage fed to swine is cooked. The U. S. cannot be satisfied with anything short of complete eradication of VE, the Department said.

Science News Letter, July 23, 1955

GEOLOGY

"Wonderland" Found In New Zealand

➤ PERFECT stalactites, as thin as straws and untouched by man, have been found in a cave on North Island, New Zealand.

The world-famous glow-worm caves at Waitomo have been surpassed by the new cave discovered only seven miles away.

Explorers describe the new find as "New Zealand's best underground wonderland." In contrast to the thin stalactites, there are massive stalagmites, in some instances rising 40 feet from the floor of the cave.

Science News Letter, July 23, 1955

Special ceramic-base *brake lining* designed to meet the searing heat of high-speed aircraft brakes is now being manufactured as lining for industrial and automotive clutches.