Park Automobile Barriers
Michigan State University Extension
Park Management Series Bulletin
Arthur T. Wilcox, Editor,
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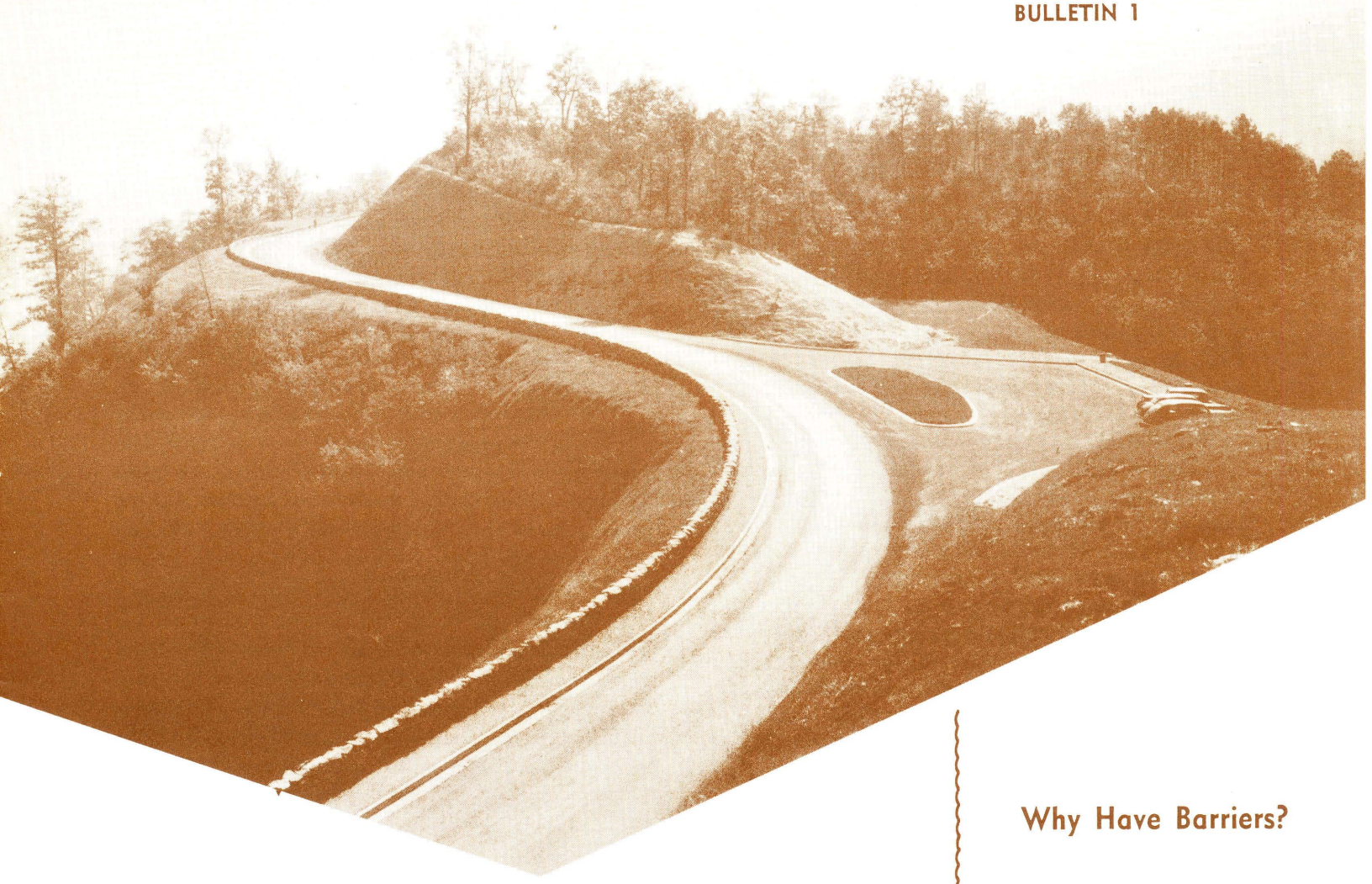
PARK MANAGEMENT SERIES
BULLETIN 1



Park Automobile Barriers

Why Have Barriers?

Design of Barriers

Barrier Types

Service Entrances

MICHIGAN STATE COLLEGE
AGRICULTURAL EXPERIMENT STATION
& COOPERATIVE EXTENSION SERVICE
EAST LANSING

ARTHUR T. WILCOX, Editor

AMERICAN INSTITUTE OF PARK EXECUTIVES
PARK EDUCATION PROGRAM
CHICAGO

Why Have Barriers?

Well designed, properly located automobile barriers mean more efficient use of parks.

Modern parks are used by large numbers of people who move about in automobiles. Proper accommodations for the movement and parking of those automobiles must be provided. However, unless precautions are taken, landscape values so important to park enjoyment will be damaged or destroyed. Good barriers, by keeping vehicles within the areas designed for their use, will minimize park operation and maintenance costs.

This bulletin shows some designs and uses of recommended types of automobile barriers for park roadsides and for parking control. The recommendations are the concensus of experienced park administrators, who have found the practices both sound in theory and practicable in use.

These recommendations can be considered only as general suggestions intended to guide the park administrator in the solution of the many problems in traffic control resulting from local conditions. The wise administrator will rely upon the advice of a skilled designer to insure the use of satisfactory barriers in the parks under his jurisdiction.

The principal function of barriers is to define clearly the roads and parking areas. However, it may be necessary to control *completely* all automotive traffic in a park. Good park design provides for 1) direct and continuous circulation of automobile traffic between points of interest and 2) carefully designed parking accommodations of proper size and location to serve each use area. *Parks thus properly designed for automobile traffic need a minimum of artificial barriers to insure proper use by park visitors.*

In some localities, good public relations, community spirit and public appreciation of well designed and properly maintained parks have reduced the need for artificial barriers. In such places barriers may be nothing more than painted lines or grass, marking the pavement's edge. In some parks widely spaced barrier units define the road and parking lot boundaries, and act as an effective psychological barrier. Unfortunately, these conditions are the exception, and more postive controls usually are necessary. The park administrator will probably never be able to dispense with barriers in heavily used areas, especially those areas subject to periodic over-crowding.

Design of Barriers

Well designed automobile barriers possess certain characteristics. They should be:

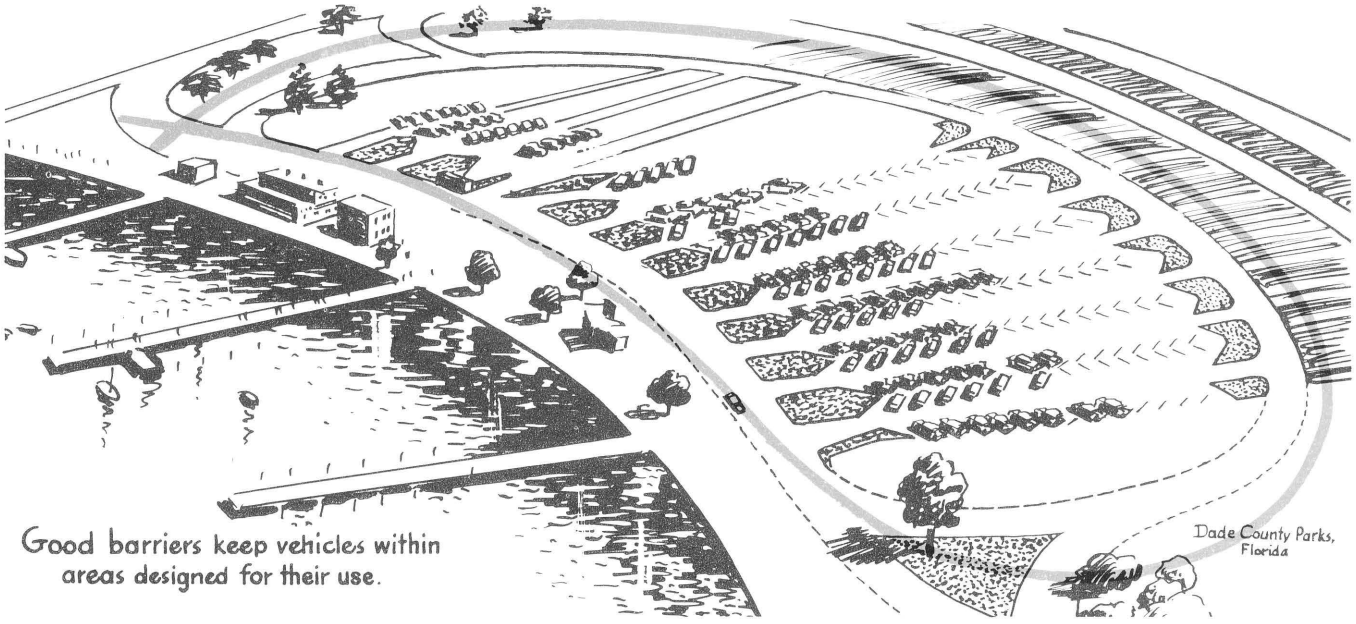
- Simple in design and relatively easy to construct.
- Strong and durable.
- Attractive in appearance and generally unobtrusive in the landscape.
- Reasonable in total cost, including initial investment and maintenance cost.

The use of materials which harmonize with the surroundings, including architectural features, is suggested. An urban park with its many and varied activities, surrounded by many types of neighborhood architectural styles, gives great latitude in design and choice of materials. A reservation type park, with its dominant theme of naturalness, suggests a barrier of simple design, with emphasis placed on the use of local materials. It is a fallacy to believe, however, that materials in their natural form—and especially massive stone or log barriers—*always* fit well into the landscape. Use of such materials requires skillful design and placement; else the result will be ugly and conspicuous.

To be effective, a barrier subject to bumping by automobile tires or bumpers, must be strong and stable to withstand the shock. The design of the barrier should permit easy replacement of damaged sections by use of standardized parts, cheaply made and easily secured.

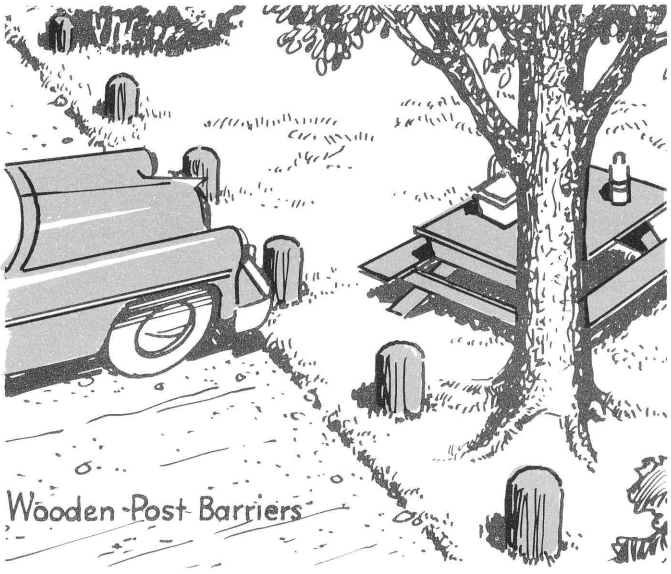
Original cost, annual maintenance and life expectancy are important considerations in selecting a suitable barrier. A barrier of white cedar posts, set in holes made with a mechanical post hole digger and cut to proper height with a power saw and simple jig, may be much cheaper to construct than a monolithic curb and gutter. In contrast to the low initial cost are the maintenance problems which result from tipping of posts when the ground is wet or from constant impact from automobiles, and subsequent destruction and breakage of posts. Mowing grass around posts may be a continuing maintenance cost not encountered when curb and gutter barriers are used.

Cover Photograph: Courtesy Tennessee Valley Authority.

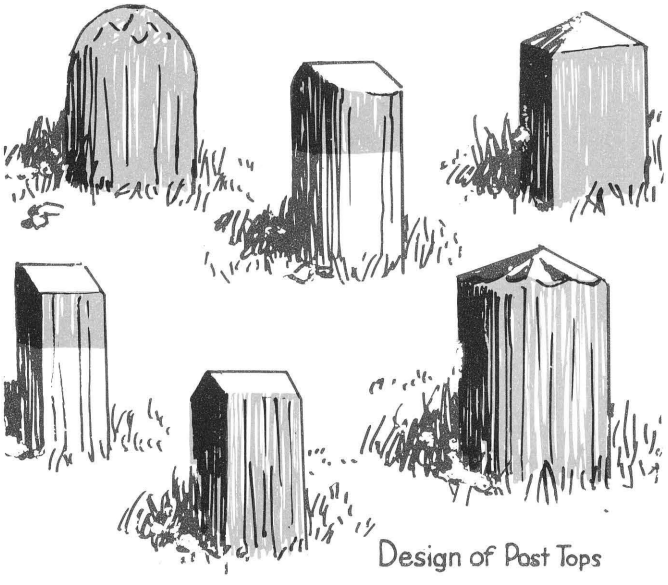


Good barriers keep vehicles within areas designed for their use.

Dade County Parks, Florida



Wooden Post Barriers



Design of Post Tops

Types of Barriers

Individual Unit Barriers

Vertical barriers are simple in design and construction but one of the most effective forms of vehicular control. They are used extensively, and correctly, to control vehicles along low-speed roads and in parking areas. They are not recommended for protection along embankments on high-speed roadways, where safety requires the use of post and steel band guard rails or other barriers designed specifically for the purpose.

Wood

Wood, because of its adaptability to many design requirements, ease of fabrication and general availability, is used extensively for barriers. Unless made from species which are naturally durable, wood barriers must be considered temporary structures unless effectively treated with preservatives.

The common cause of wood deterioration is attack by fungi (decay) and insects. When wood is exposed to moisture, as commonly occurs in barriers, conditions become highly favorable for attack. Proper wood preservation treatment incorporates into the wood cells materials which are toxic to both fungi and insects.

The three principal classes of wood preservatives are: 1) creosote and solutions containing creosote, 2) oil-borne solutions in which petroleum oil acts as a vehicle for such toxic chemicals as copper napthenate and pentachlorophenol, and 3) water-borne solutions using such chemicals as chromated zinc chloride and zinc meta-arsenite.

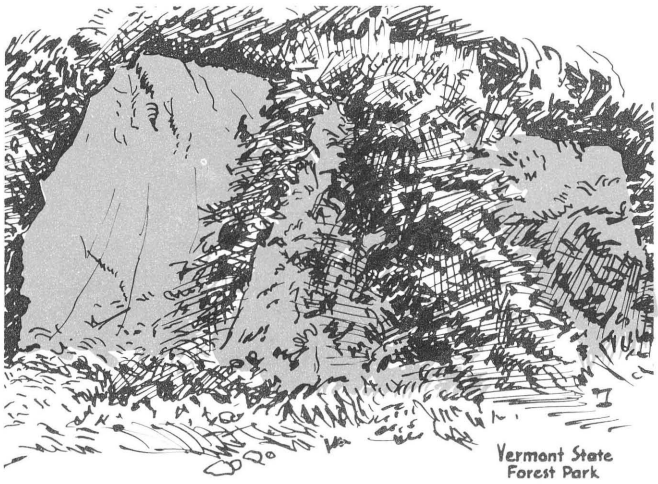
To insure successful preservative treatment for wooden barriers in contact with the ground, pressure treatment is most effective because it assures best penetration of the wood by an adequate amount of preservative. Pressure treatment should conform to current specifications of the American Wood-Preservers' Association,* covering the appropriate species of wood and type of preservative. Reliable wood preservation firms provide facilities for effective pressure treatment of wood barriers.

Less satisfactory preservative treatments, in decreasing order of effectiveness, are vacuum treatment, cold soaking, spraying and brushing. Both vacuum treatment and cold soaking, if applied according to reliable manufacturers' specifications, may be satisfactory under certain conditions. Spraying and brushing techniques are not recommended for effective preservation.

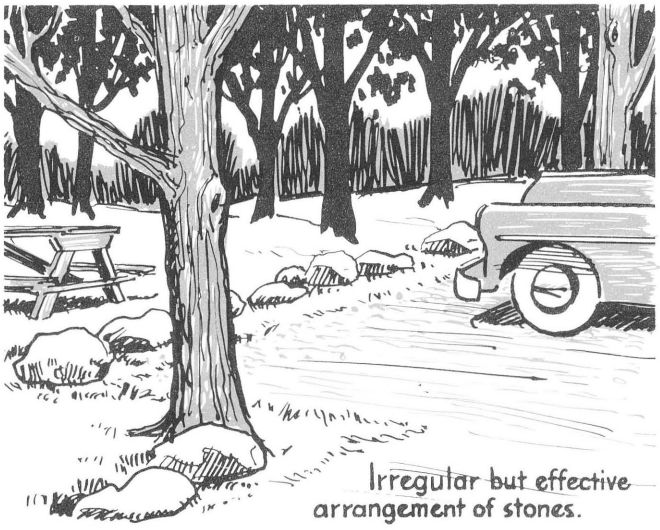
Creosote is undesirable where there is possibility of staining clothing. In such locations, the use of water-soluble toxic chemicals, properly applied, is recommended. The use of highly volatile vehicles such as mineral spirits will minimize objectionable bleeding when oil carried preservatives are used.

SINGLE WOODEN POSTS should be spaced not more than 5 feet apart and set deeply into the ground. The recent introduction of narrow foreign-type cars may necessitate closer spacing in some locations. Greater spacing encourages some drivers to try to squeeze through openings. Post height may vary from 15 to 18 inches above the ground line. Excessively high posts usually are objectionable in the landscape scene, waste material and require greater strength, yet perform no worthwhile function. Posts 6 to 8 inches in diameter are commonly used, although there may be instances in which larger sizes are appropriate.

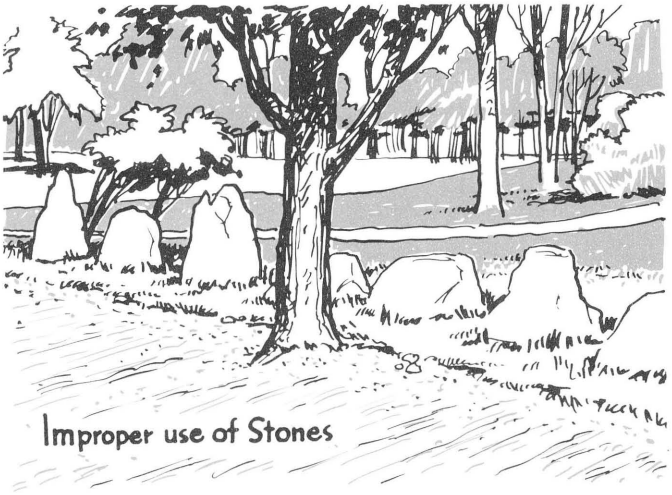
*American Wood-Preservers' Association, 839 Seventeenth Street, N.W., Washington, D. C.



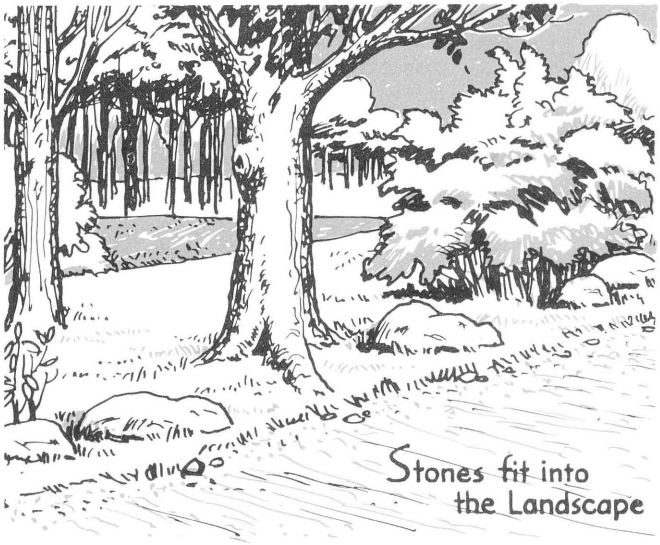
Good Stone Placement



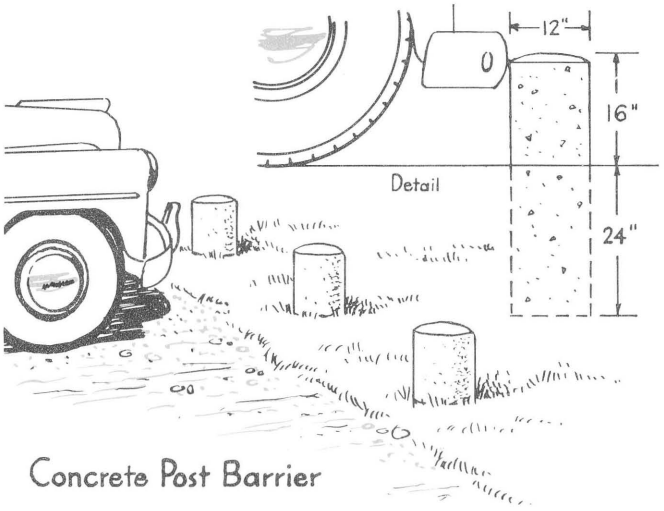
Irregular but effective arrangement of stones.



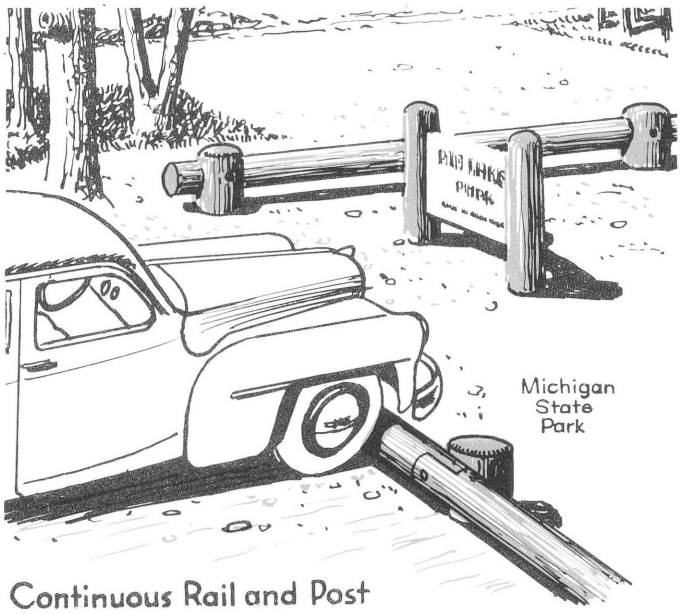
Improper use of Stones



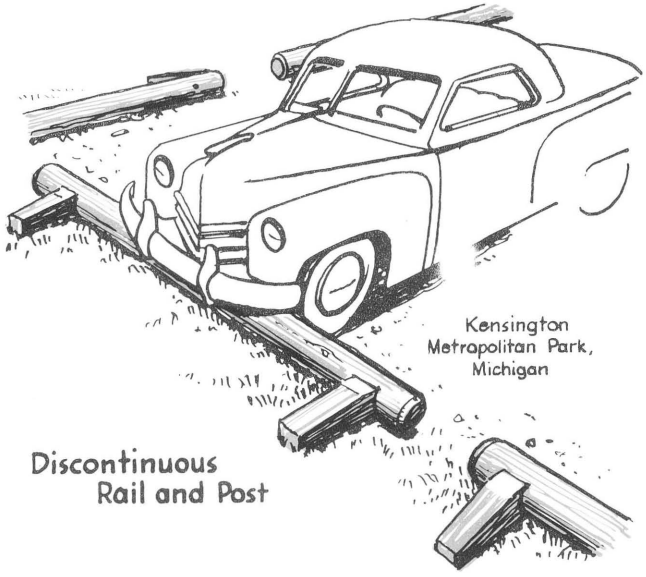
Stones fit into the Landscape



Concrete Post Barrier



Continuous Rail and Post



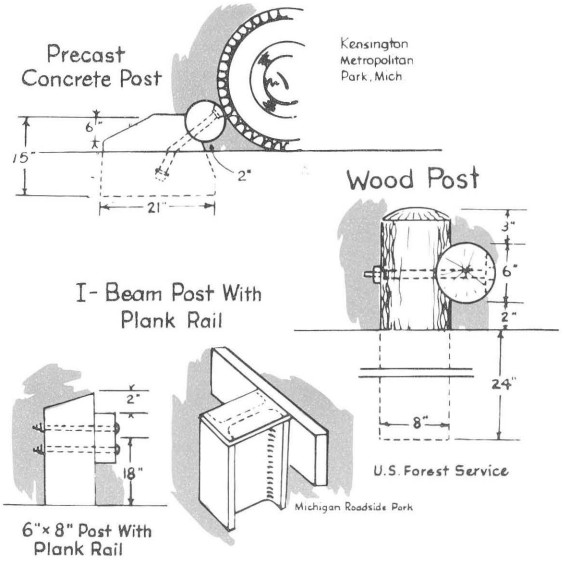
Discontinuous
Rail and Post

Post tops should be cut on an angle or rounded to assure run-off of water. Many kinds of reflecting devices for night use are available for placing on wooden posts as well as other types of barriers as a safety precaution.

STONES or BOULDERS make excellent barriers in many sections of the country. Stones, preferably native to the area, should be placed not more than 5 feet apart to control traffic effectively. When the stones are used in naturalistic groupings, the result is an irregular but effective spacing of very pleasing appearance. Artificial barriers of both wood and stone may be effectively combined with such natural barriers as trees, shrubs and natural rock outcrops.

Individual stones should be well embedded in the ground to insure stability and to make them blend with the surrounding landscape scene. They should be large enough to prevent their being moved, either by vehicles or park visitors. Stones should be laid according to their long dimensions and not on end unless local rock out-croppings indicate desirability of such placement. Vines and shrubbery, properly planted, aid in partially obscuring the stones and "tying" them to the surrounding scenery.

REINFORCED CONCRETE POSTS are used in many localities. To be fully satisfactory they should be substantially constructed and firmly set into the ground for stability. Heights similar to those recommended for wood posts are satisfactory. Use of dense, vibrated concrete is desirable. In the north, extremes of temperature and frost action must be taken into account. Impact by vehicles tends to open cracks and permit entry of moisture with subsequent breakage of the post.



Continuous Line Type Barriers

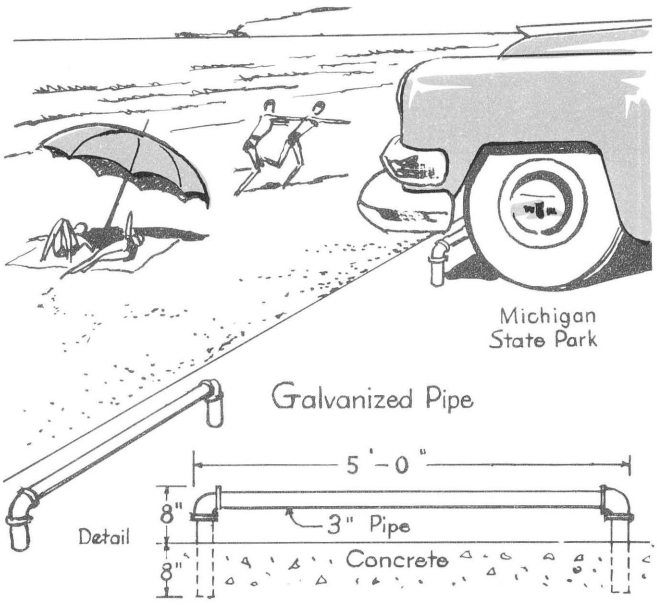
A CONTINUOUS RAIL AND POST BARRIER is seldom needed in most parks except when used as a safety guard rail. The splicing joints are costly to make and cause a structural point of weakness. Wooden rails, unless properly treated, tend to decay rapidly at the point of splicing.

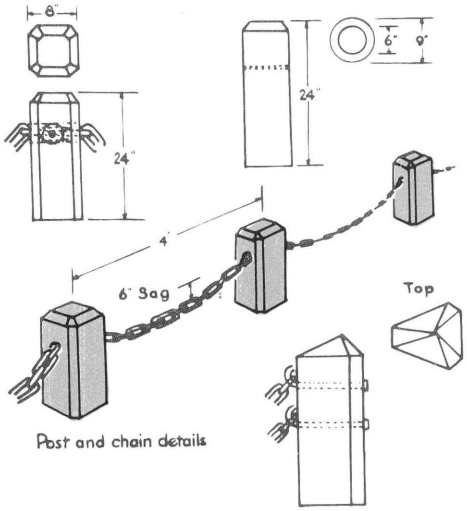
A DISCONTINUOUS RAIL AND POST BARRIER with a gap between rail lengths, is far superior. This barrier permits easy passage of pedestrians, an important consideration for the convenience of elderly people and those physically handicapped. It reduces the difficult repairs which are characteristic of the continuous rail. The principal value of a rail barrier is to clearly define the limits of a roadway or parking area and present a pleasing appearance.

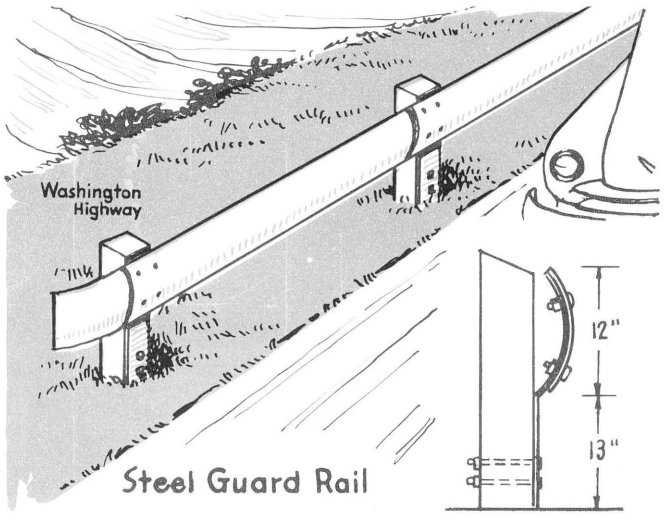
If a rail and post barrier is used, the rail should be low enough for automobile bumpers to clear the top and permit the rail to receive impact from the tires. The top of the rail should therefore be 8 inches or less above the pavement surface.

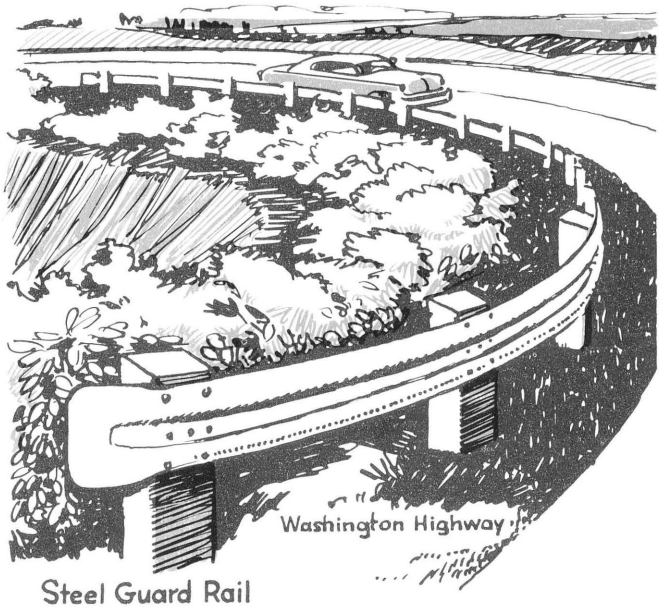
GALVANIZED PIPE BARRIERS are sometimes desirable. An excellent example may be found at beaches where shifting sand would be deposited against curbs. Three-inch diameter horizontal pipe rails are supported by legs of the same size pipe set in concrete. These legs may be bent to form an inverted "U" or fabricated with the use of standard pipe elbows. Five-foot horizontal members, placed not more than 8 inches above the road or parking area surface, with intervening spaces of 5 feet to permit free movement by pedestrians, are satisfactory.

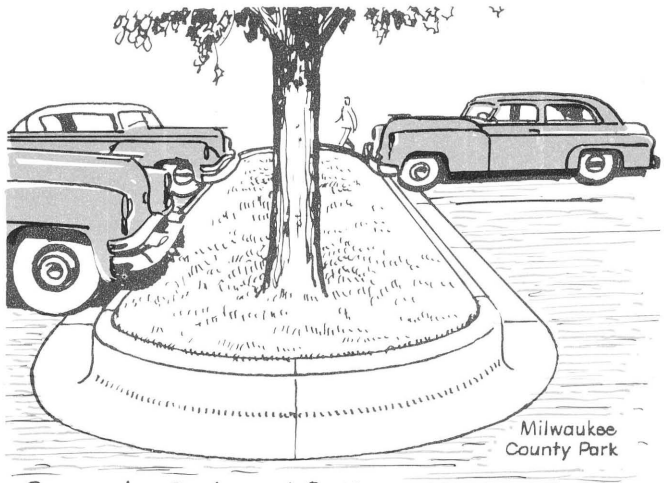
POST AND CABLE BARRIERS are undesirable in most park areas. They are difficult to see and are a menace to safety wherever pedestrians cross, especially at night. They are often unsightly, owing to



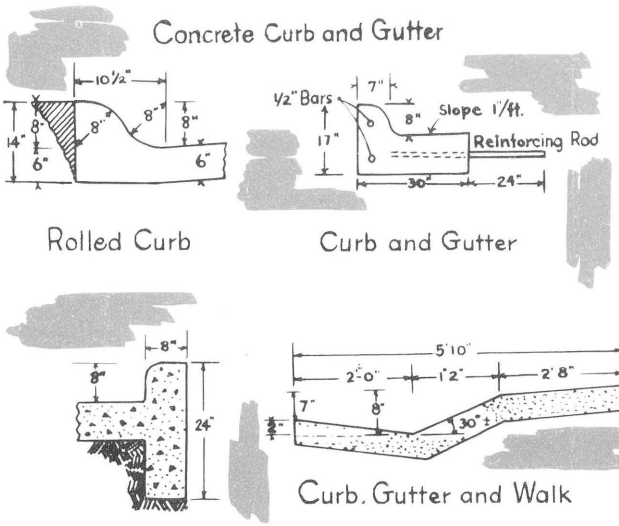








Concrete Curb and Gutter



Rolled Curb

Curb and Gutter

Curb, Gutter and Walk

the sagging of the cable between posts, and should be used only as a temporary measure until a safe and attractive type of barrier can be installed.

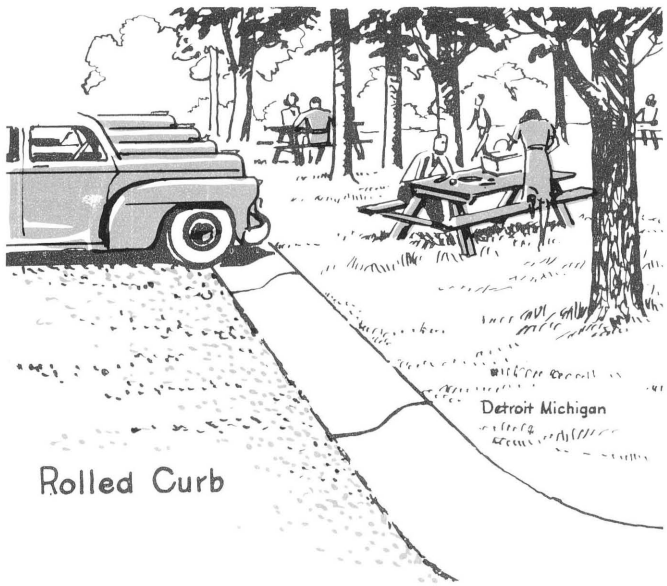
POST AND CHAIN BARRIERS are usually impracticable because they are costly and they, too, are a menace to pedestrian traffic. However, local design conditions may sometimes justify their use.

POSTS AND FLEXIBLE STEEL RAIL BARRIERS and other approved highway guard rails, although expensive, are fully justified along dangerous embankments, at sharp curves, and at locations where travel speeds or safety factors require carefully planned safety precautions. Modern commercially made barriers of this type offer many opportunities for the skillful designer of urban park facilities.

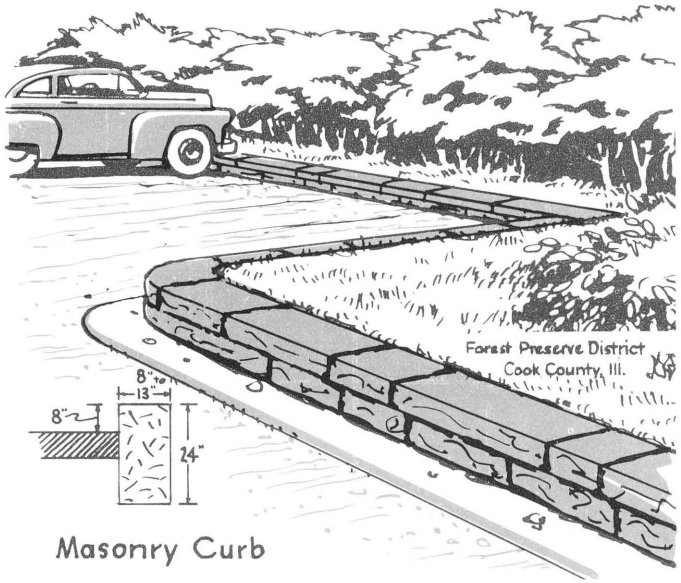
CONCRETE CURB AND THE MONOLITHIC CURB AND GUTTER are fast becoming the most popular of all permanent auto barriers. From the viewpoint of durability, simplicity, appearance, adaptability, general availability of materials and low maintenance cost, they rank high for general park use. Their use introduces problems of surface drainage, which can be met by properly installing inlets, "weep holes" or depressed outlets.

One form of concrete curb is the rolled curb, formed as an integral part of the gutter and pavement, without the use of face curb forms. A curb-shaping machine partially forms the curb, and final shape is secured with a manually operated shaping board.

As with other barriers, the top of the curb need be no more than 8 inches above the finished pavement surface.



Rolled Curb



Masonry Curb

Concrete

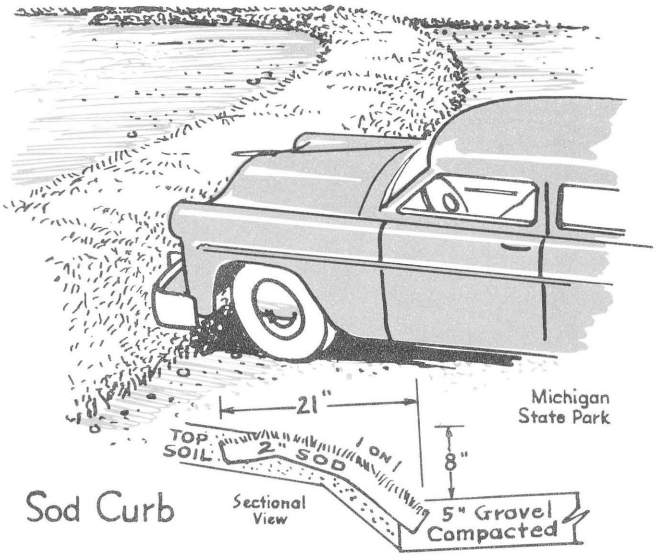
Concrete may be treated in a number of ways to alter its natural cold gray color. The use of colored pigments mixed in the cement paste or dusted on the fresh concrete surface may produce good color effects. Inorganic acid stains sprayed on the concrete surface can be used to produce attractive tones of brown, buff and green adapted to curbs and barriers in public parks.

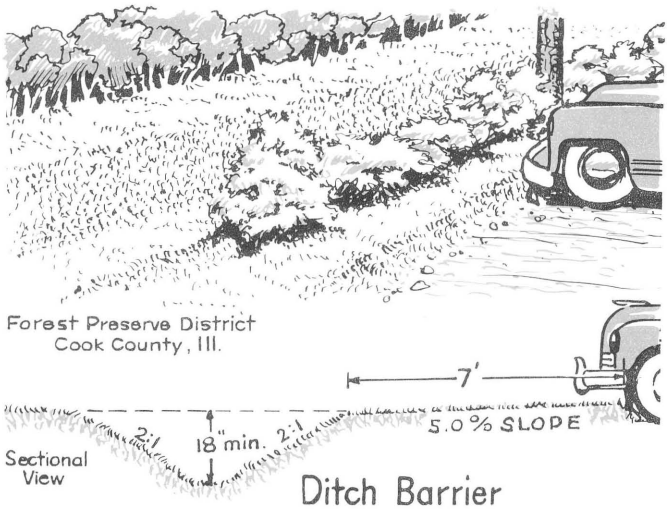
Pleasing texture and color can also be obtained by choosing aggregates of desirable color and form. A satisfactory effect is obtained by painting concrete forms with a chemical which temporarily retards the setting time of the concrete surface. Simple brushing of the surface then leaves a pleasing pebbly exposure. Selected aggregates may be troweled into the surface of fresh concrete and then partially exposed by washing and brushing the finished surface before it becomes too hard, thus producing a uniform, attractive textured surface.

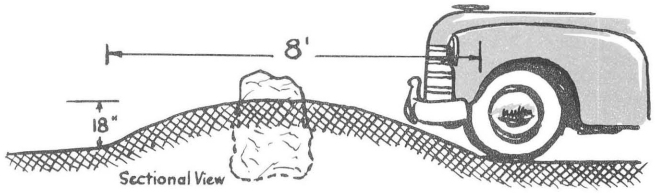
The wise park administrator will secure up-to-date information on the use of concrete from the Portland Cement Association.* He will consult his local highway engineers to determine what consideration, if any, should be given to local temperatures, frost action, and soil conditions.

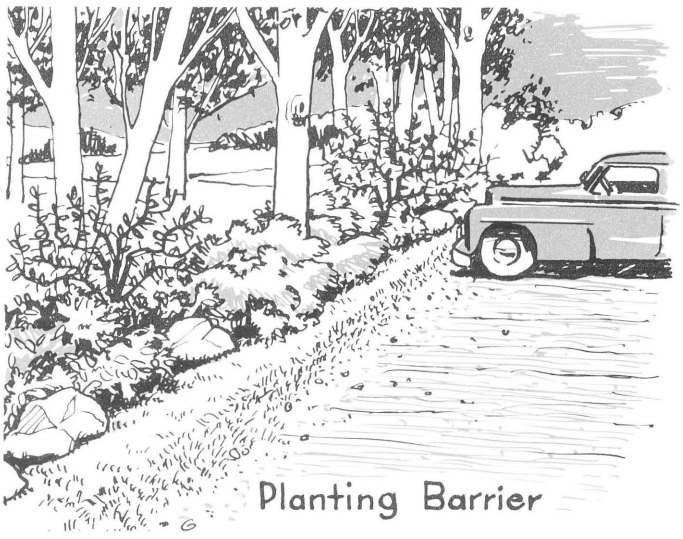
MASONRY CURBS, while attractive in appearance, have many disadvantages. Trained craftsmen are required to construct them, and construction costs are higher than for concrete curbs. Maintenance costs may also be higher unless the curbs are carefully constructed. However, local surroundings and available materials may justify the use of such curbs in many places. The use of large blocky stones will reduce maintenance costs caused by joint failure.

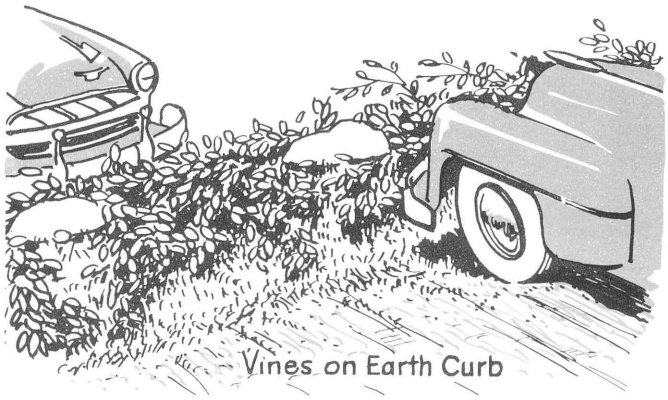
*Portland Cement Association, 33 West Grand Avenue, Chicago 10, Illinois.

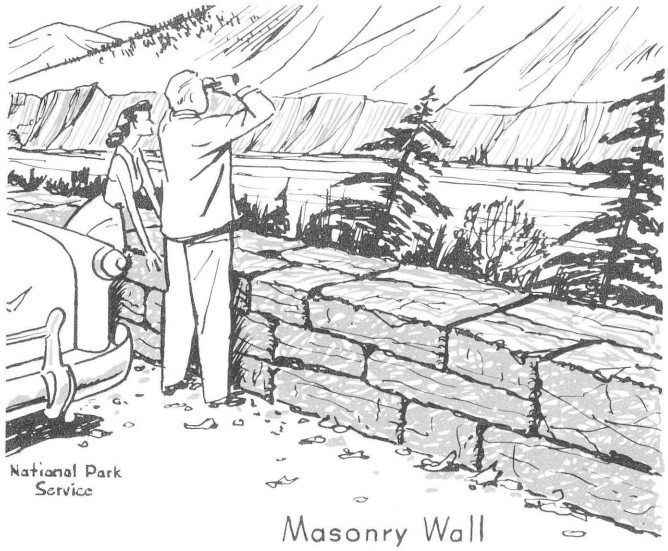




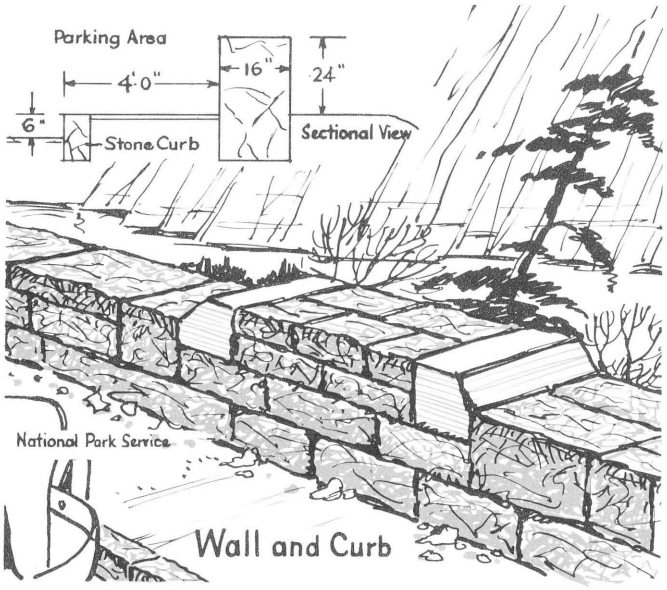




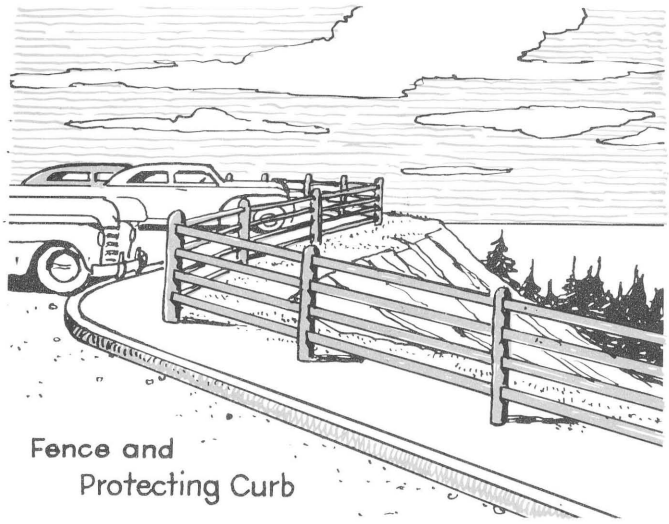




Masonry Wall



Wall and Curb



Fence and Protecting Curb

Other Barriers

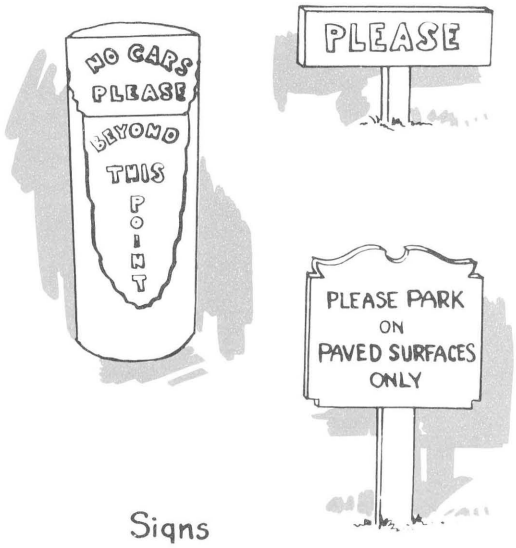
A SOD CURB, used as a barrier for a parking lot, is often considered as a temporary measure to serve until a more satisfactory type, such as a concrete curb, individual post or planting barrier can be installed. In naturalistic parks such barriers may be permanent and afford entirely satisfactory low-cost installations. The cross-sectional design of sod curb barriers must provide for efficient maintenance.

Satisfactory safety barriers at hazardous turns may be provided by widening the road shoulder and introducing an earth curb. This eliminates the periodic maintenance of wood and steel materials but necessitates a permanent investment in additional surface drainage and fill at time of construction.

DITCH BARRIERS, with relatively wide shoulders between them and the pavement edge, have been used successfully in some localities. They may perform the dual function of barrier and drainage ditch and, in many cases, control traffic until an effective planting is established. The grass surface of ditch barriers may be designed to be efficiently cut with power machinery. Such barriers may be criticized because of their large space requirements and, unless carefully designed, they will be unattractive.

PLANTING BARRIERS are successfully used to define traffic areas where the general landscape plan permits. Such barriers may also screen out views and control pedestrian traffic from parking lots to use areas. Thorny and rough-stemmed plants make excellent barriers in some situations.

Temporary artificial barriers are usually necessary to protect young plantings until they become large enough to be effective. Good designs will often employ combinations of planting and other barriers to blend facilities into the landscape scene.



Signs

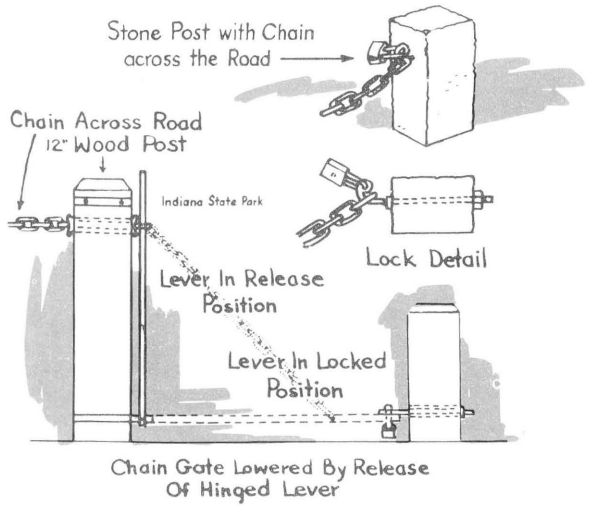
In some instances, low shrubs, ground covers or grass create a line between paved and planted areas and serve as effective psychological barriers.

WALLS AND AUTO BARRIERS, used in combination, may be effective. However, masonry and concrete walls are seldom used for parking barriers alone. Bumper action against masonry walls will tend to loosen the individual units and a low curb is therefore recommended to stop cars before they actually strike the wall which can then act as a secondary barrier.

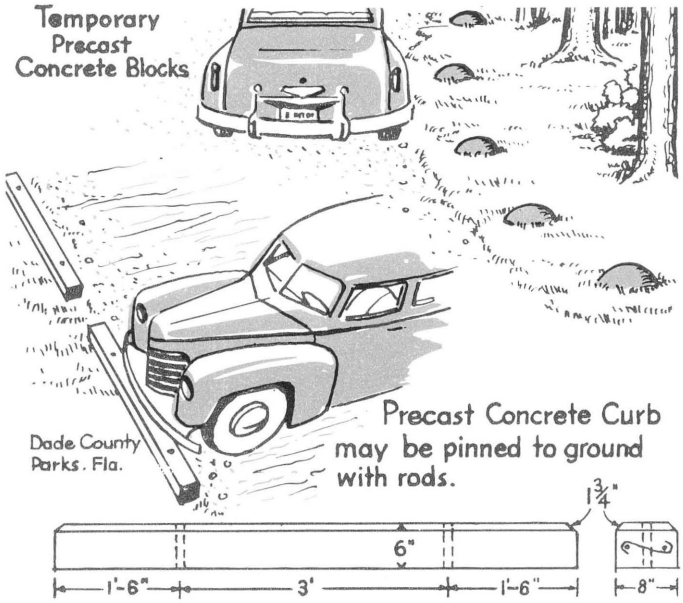
FENCES used with curbs are often desirable to enhance landscape values. Initial and maintenance costs, however, tend to discourage their use. The park with historical restoration as an important objective may logically use fences of appropriate design in place of modern auto barriers. On the other hand, under normal park conditions there is little need to use fences to control movement of automobiles. It is recommended that other types of barriers be considered because of their simplicity, low cost and ease of integrating into the landscape scene.

SIGNS. In some cases carefully placed signs make effective barriers. Occasionally they may fail to deter the motorist and violations will occur, but the cost of the original installation and the negligible damage from occasional violations will weigh in favor of this minimum obstacle to improper traffic movement. Where community spirit and appreciation for public property have reduced the need for artificial barriers, carefully worded signs are effective.

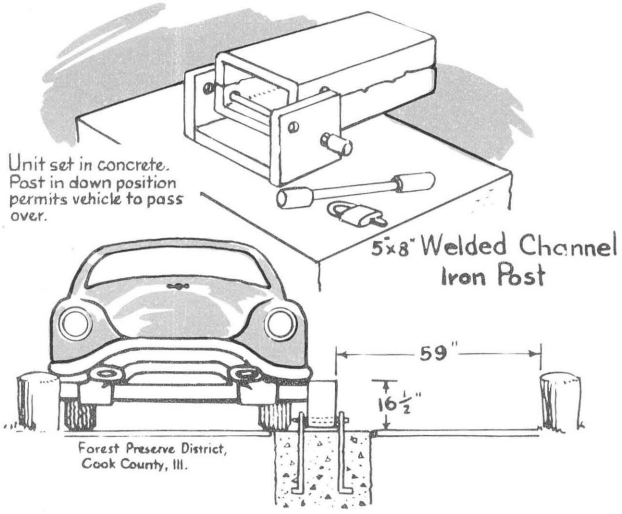
TEMPORARY BARRIERS have an important place in park operation, especially to regulate traffic in temporary and overflow parking lots. They are useful in making practical field experiments in traffic movement, and to supplement permanent planting barriers until they reach effective size.

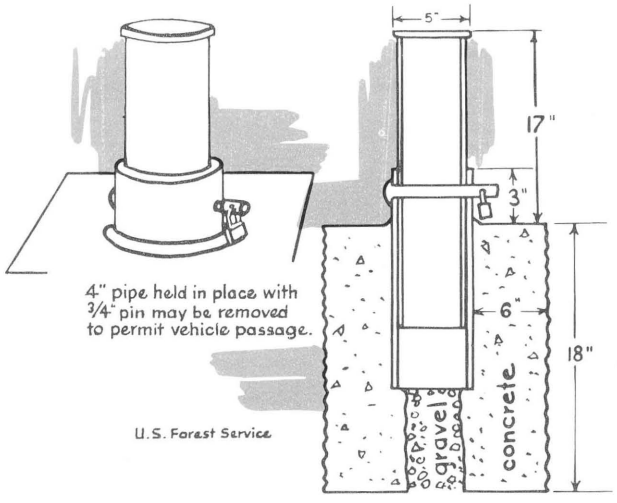


Chain or Cable Gates

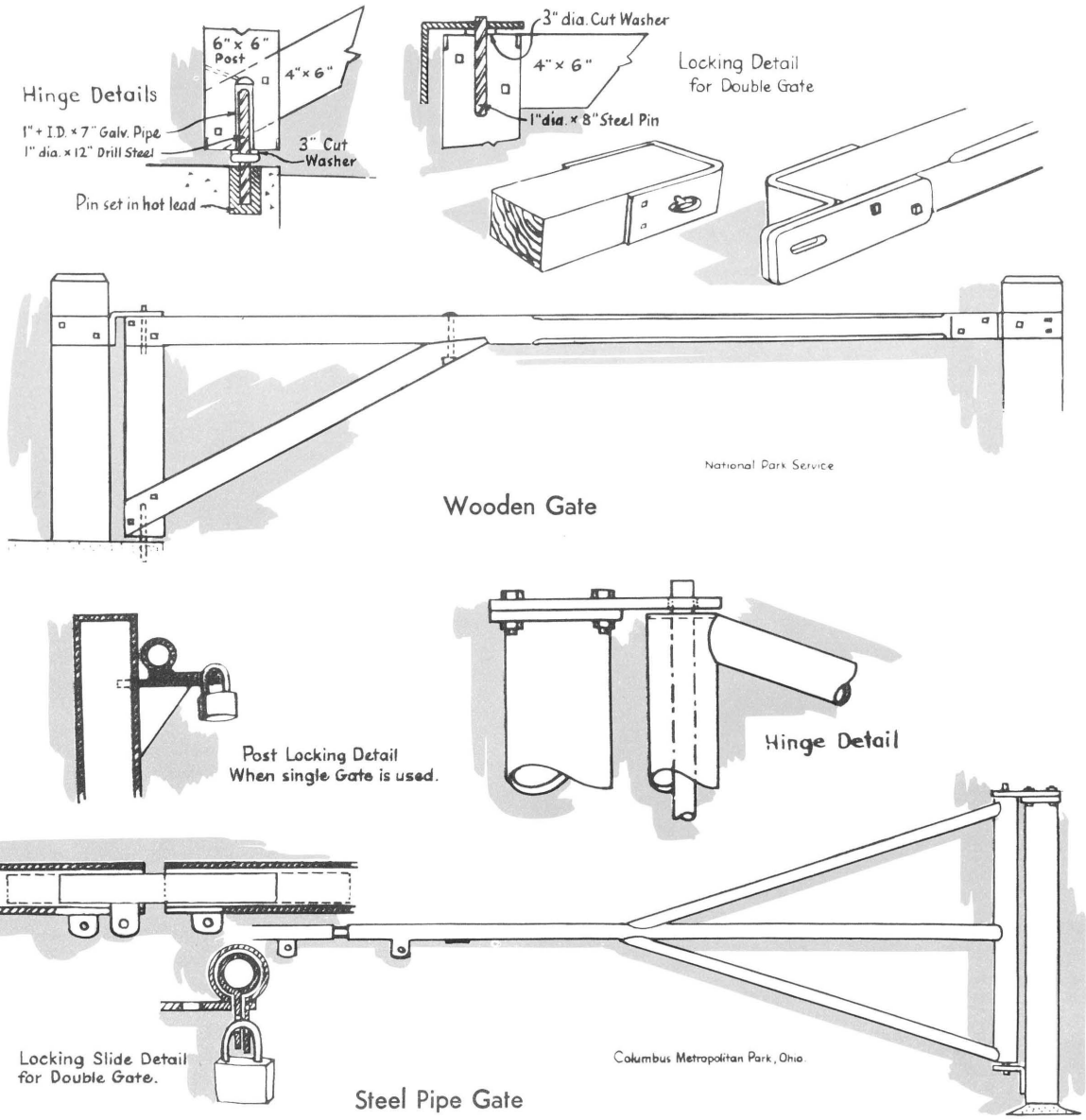


Hinged Post Barrier





Removable Pipe Barrier



Service Entrances

Many forms of gates and barriers have been developed to eliminate or control vehicular traffic at service entrances. Generally these barriers have taken the form of posts supporting wooden, metal or pipe gates, or cables or chains. Removable or collapsible posts, used in place of gates, are very effective at entrances to hiking and bridle trails.

In the selection of service entrance barriers careful consideration should be given to the original cost, degree of permanence desired, frequency of use, appearance with relation to surrounding facilities, and the necessity for positive control.

Under some conditions, barriers must be designed which will permit only pedestrian, bicycle, motor bike or animal traffic. Under those conditions a collapsible steel post or similar device is a safe and satisfactory arrangement. Sturdy materials and open, loose-fitting construction to guard against freezing and jamming of movable parts are important. The low automobile frames of today make it necessary that the top of such posts, when collapsed, be not more than 6 inches above the finished pavement.

* * *

Barriers are a necessity in modern parks. They more than justify their cost if properly designed and constructed and integrated into the park operation and maintenance program. A satisfactory automobile barrier must be efficient for the purpose, and easy to maintain. It must be properly designed, constructed of good materials, of pleasing proportions and well adapted to the landscape setting.

EDITOR'S NOTE

The American Institute of Park Executives and Michigan State College in 1952 entered upon a cooperative program for the preparation and dissemination of literature for the park profession. The Park Education Program was formally launched at the College in April 1953, with a workshop meeting of administrators, technicians and resource people. At that time material for this bulletin was prepared.

The workshop group and the park management staff of Michigan State College appreciate the contributions of those who gave technical assistance to the workshop group. Financial support from the Joslyn Foundation of Chicago is expressly noted. The editor wishes to thank Rhodell Owens, Walter Tucker and Roberts Mann for their vigorous assistance in final review of the manuscript.

Arthur T. Wilcox, Editor

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