Bulletin *of the* Green Section *of the* U. S. Golf Association

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A MONTHLY PERIODICAL TO PROMOTE THE BETTERMENT OF GOLF COURSES

CONTENTS.

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Some Suggestions for Beginners on the Vegetative Planting of Creeping Bent

By R. A. Oakley

If you intend to take up any feature of the vegetative planting of creeping bent this fall now is the time to start preparation. If you are a real novice and wish to make only a simple start you may do so with very little effort. While we think very highly of the vegetative method of producing creeping bent turf, we regard it as unwise for any club or individual to make even a very simple start with this method because he has been told it is the proper thing to do. Do not take the word of others. There are now examples enough close at hand so that you may see for yourself with relatively little expense or loss of time just what can be accomplished by this method in the making of bent greens. Really, when one stops to think of all the successes, it seems like a waste of good time to start in the simple way many have started—that is, by planting a row of stolons 100 feet long and waiting for enough material to develop to plant a green or a small practice green two years from the time the start is made; but it is a thoroughly safe way, and about all that is lost is a year's time. If a year's time means anything to you, take our advice and plant a nursery this fall sufficiently large to produce stolons for planting at least one green a year hence; or, if you wish to make even a shorter cut, buy stolons of a good strain from some reputable grower and start planting when the proper time comes this fall.

Knowing that there are many who have heard of vegetative greens, as they are called, but who are still more or less in the doubting class or think they can not afford such greens all at once, and therefore wish to feel their way along, we have thought it might be well worth while to make some suggestions that will start such individuals in the proper way. To you who are in this class we assume that the die is cast and that you have investigated the proposition to the extent that you have a very good comprehension of what it is all about and have decided to make a simple start in a garden or some other similar spot. Very well. Prepare a strip of your garden as you would for planting radishes or lettuce. Do this about the middle of August or the first of September. There are many strains of creeping bent; so it is up to you to choose one you like, or get the advice of some one who knows something about them. The Green Section will give you the names of several growers from whom stolons may be purchased. The selection of the strain is an important step.

For a start such as you have in mind, a row 100 feet long is ample. So order your planting material on this basis.

When the stolons arrive and you open the package you will probably find what looks like a rather rough piece of loose turf. Be ready to do the planting at once. Make a row or drill an inch deep, as suggested, and if your strip is not sufficiently long make as many more as you need, but make them at least 6 feet apart. After the rows have been prepared, tear the stolons or runners apart and lay them in strands of 2 or 3 end to end, or with the ends lapping somewhat in the drill. After this is done cover with a little less than a half-inch of soil, and press down with the foot, or you may use a roller, if you prefer. If the job is well done, parts of the stolons will stick up above the soil. They should not be buried completely. After planting, the rows should be kept moist until the new growth has made a good start. No cutting, dressing, or covering

of any kind will be needed during the fall or winter. What to do next spring is another chapter.

You will doubtless want to know what you may reasonably expect from a 100-foot nursery row if you plant one this fall. If the planting is done the latter part of August or the first part of September, and proper care is given, such as is suggested frequently in THE BULLETIN, you should have a row of a thick mat of stolons at least 3 feet in width the following August or September. The row in its actual width should be 4 or 5 feet wide, but the marginal one or two feet will be somewhat thin, and should be thrown in for good measure.

A row of a thick mat of stolons 3 feet wide will give you sufficient material to plant a row at least 25,000 feet long. In other words, a mat of stolons a foot square is sufficient for planting a row 75 to 100 feet long. This is a safe basis upon which to make an estimate.

The beginner who starts with a large nursery has the same problems of planting and care as those that confront the one who begins with a short row, but at the end of the first year he will have a sufficient quantity of stolons for planting one or more greens while the small beginner will have only enough to start a real nursery.

Assuming that you planted a good-sized nursery last fall and will be ready to plant your greens this fall, you will wish to make an estimate of the area your stolons will plant. The first thing to do is to measure the material and calculate the area of stolons that form a thick mat, leaving off the marginal fringes. Then consider that 1 square foot of such a mat of stolons will plant 6 to 10 square feet of green. Lean toward the safe side; for you are likely to be disappointed if you plant thinly. While it is possible to plant too thickly, your own good judgment will keep you from doing so.

As for preparation of the green for planting, this may be the same as for seeding; but don't use all of your available well-rotted manure in making the soil of the greens—you will need some for making compost for covering the chopped stolons at the time of planting. Furthermore, you will need compost for light top-dressings as the growth from the stolons develops. Better provide at least 1½ cubic yards of well-screened compost made of loam or clay loam, sand, and about 20 to 25 per cent by volume of well-rotted manure, as has been suggested many times in THE BULLETIN, for each 1,000 square feet to be planted. This will give you enough for covering the stolons and for the subsequent top-dressings that will be needed the first fall.

All preparations should be made by August 15, as the planting should be done between this date and September 15 in the latitude of Washington, D. C. When you are all ready for planting, lift the stolons and chop them by the method that is most convenient to you. A hand-operated fodder cutter is a good implement to use. Chop the stolons into lengths of about 3 inches or less. Some may tell you that it is economical to plant stolons without chopping them. This may be true, but chopped stolons produce more new plants than unchopped stolons. Don't go to the trouble of chopping stolons for planting nursery rows, but chop them for planting the green. Don't worry about chopping too finely, for it would be difficult to do so by any ordinary means. After you have progressed this far in your operations, the following are some very important suggestions to be considered: Chop the stolons as soon as possible after lifting them from the nursery and plant them as soon as possible after they are chopped. Scatter the chopped stolons evenly over the green and cover them evenly

with not more than 3/8-inch of compost—preferably less—and in such a way as not to disturb their even distribution. Water with a rose nozzle also in such a way as to avoid disturbing the chopped stolons. Keep the planted area moist until a good growth is made; this is very important. There are many other points involved in planting, but if you observe the ones here emphasized you may count very definitely upon success.

After growth has started from your plantings do not be afraid to cut and top-dress the greens the first fall. Top-dress every two or three weeks if possible. One cubic yard of compost is enough for 3,000 to 5,000 square feet for a single application. About the first of October you might add approximately 2 pounds of ammonium sulfate to each 1,000 square feet of green. Mix the ammonium sulfate well with the compost and water in thoroughly after applying it.

As for cutting, the evidence is in favor of relatively close and frequent cutting. Some allow their greens to grow long enough in the fall so that the cuttings may be used for planting other areas. This means that the cuttings must be sufficiently long to have one or more joints. Such cuttings make excellent planting material if used while fresh; but our advice is not to make nurseries out of your putting greens.

There will be some weeding to do from the time the greens are planted until winter arrives, and the best time to do it is when the weeds first appear. However, many of the weeds that are in evidence in the fall will winterkill and give no further trouble.

If planted properly at the time here suggested, your greens should turf over nearly completely the fall they are planted and be playable by the middle of the following May, but if they seem to cover over slowly do not worry. Give them good care, as advised in THE BULLETIN, and they will come out all right.

Just a word again about nurseries. Don't attempt to continue a nursery after it is one year old. Plant new rows every year, using fresh stolons for planting them. And when you plant your nursery be sure to hand-pick the stolons, otherwise mixtures of strains is nearly inevitable, which of course is undesirable.

The Drainage of Sand and Grass Traps

By Wendell P. Miller, Agricultural Engineering Department, Ohio State University

How to fix the tile-drains in sand and grass traps so that they will drain rapidly and yet not clog with sand is a question very often asked.

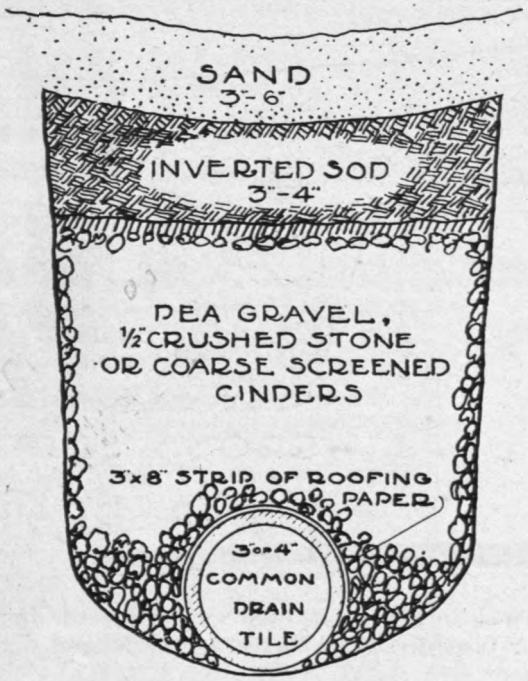
The tile-drains from traps should have outlets into the general fairway and green drainage system, but this often results in clogging the tiles because of the sand and sediment carried into the lines through poorly protected tile in traps. The tile must be buried under the sand if a dry bottom is to be obtained; but often the best depth for tile-drains in the fairways is not deep enough to allow much cover over the tile in deep traps. If the tile is placed with open ends at the surface level of the sand in the traps, there will be a continual loss of sand from the trap.

Two possible means of protecting the general drainage system from clogging and at the same time permitting the rapid entrance of water to the tile will be explained.

The first method is used where the tile under the trap can be placed at a depth of 12 inches or more below the bottom of the sand layer, and

the second method is used where the tile must be placed just under the bottom of the sand layer.

The illustration Fig. 1 gives all the details of construction. The tiles must have large openings between the joints, but the size of the pieces of porous material must be larger than the crack between the joints of the tiles. The material used for closing the crack over the top half of the tile should be a good heavy grade of asphalt felt roofing. If a positive permanent covering of this part of the tile joint is desired, a little cement can be spread over the roofing paper. The depth of porous material between the top of the tile and the bottom of the sod filter will depend on how deep it is possible to go with the trench and still get a good outlet. The thicker this porous layer the better, up to two feet. The sod filter layer is the important part of this trap drainage scheme. I tried several ways of keeping the coarse material from coming up into the sand layer. When clay was used the water would stand over the tile lines for several hours; when a wire screen divider was placed between the sand and the coarse material, the sand would go down and eventually find its way into the tile. But when sod is used it will remain in the ground for several years, and after the whole mass is well settled the rotting of the fibrous root mass will leave thousands of small pores through which the water will travel rapidly without carrying down any fine material to clog the tiles. The sods should be the heaviest-rooted bluegrass obtainable, with as many leaves and stems as possible. Cut the sod just thick enough to obtain the heavy part of the fibrous root system, and in any event never more than 4 inches thick. Sod grown on heavy clay soils should be cut thinner than sod grown on lighter, more porous soils.

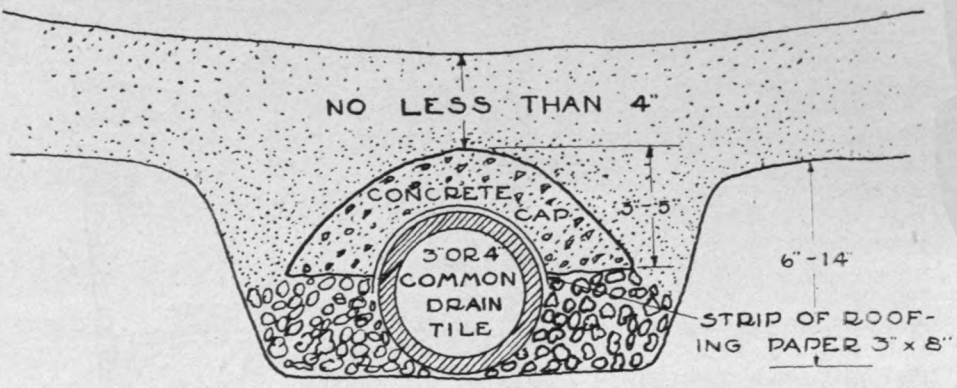


CROSS SECTION
OF
TRAP DRAIN
FIG. 1.

The second method of keeping the sand out of the general drainage system is illustrated in Fig. 2. This arrangement of the tile can be used whenever the tile in the trap must be placed less than 12 inches below the bottom of the sand layer. It can be safely used with only 4 inches of sand over the top of the concrete covering of the tile. The concrete cap is used to keep the tile from being heaved out of the ground by frost, from being rolled out of line when cultivating or raking the traps, and to prevent the mixing of the porous material with the sand. The "silt

well'' is necessary for the collection of the sand that is sure to be washed through the porous layer into the tile. The tile under the trap can also be flushed out with water, or cleaned with a sectional sewer cleaning rod from this opening.

The bottom of the trap should be graded to collect the water near the point where the drain will enter the trap. The slope should be at least



CROSS SECTION OF TRAP DRAIN

FIG. 2.

1 inch in 5 feet. Do not extend the tile into the trap more than 10 feet for traps less than 50 feet in the longest dimension, or 20 feet for longer traps.

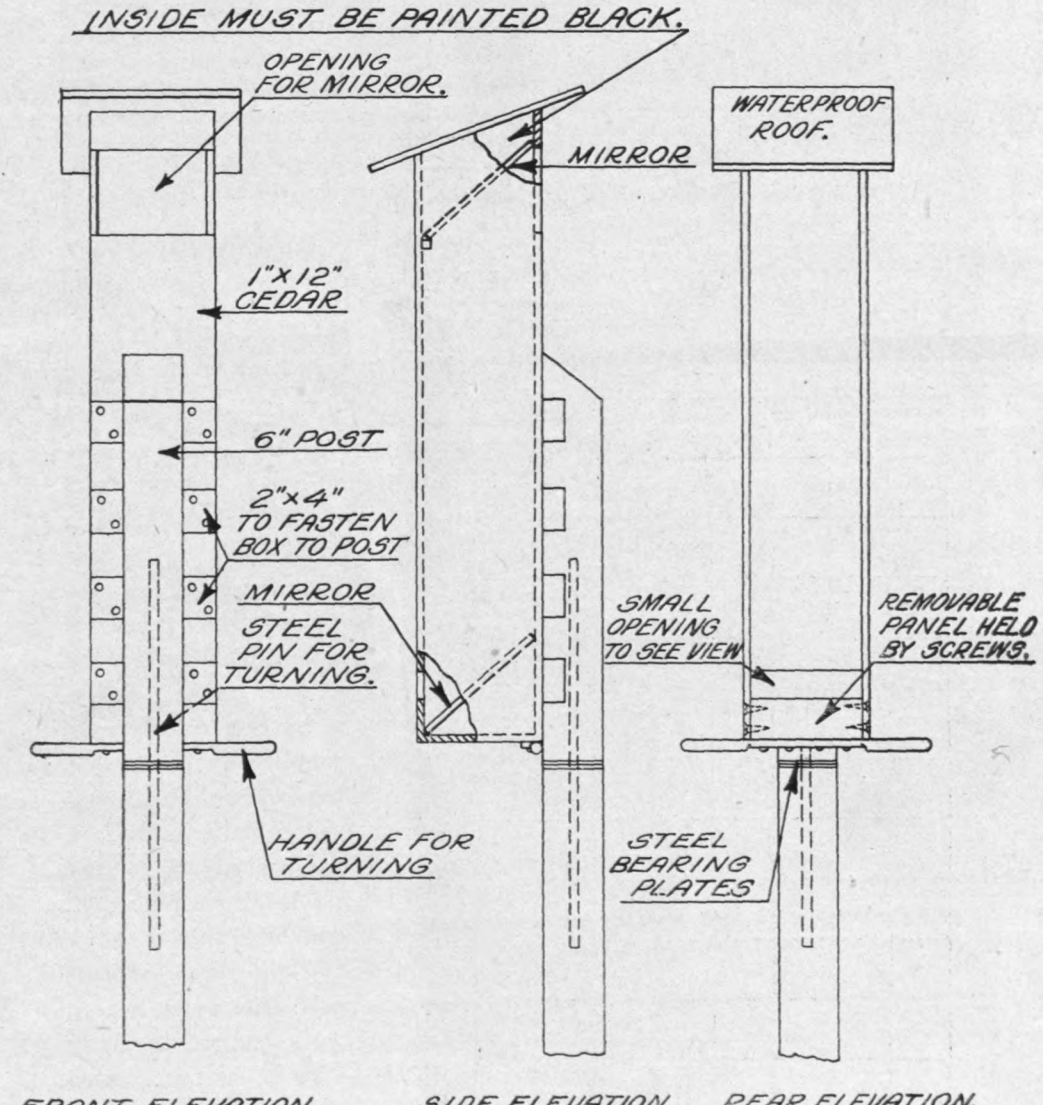
The depth at which the tile can be installed determines the method to use. The sod filter method is the cheaper, costing from $4 to $8 per trap for labor and material. The shallow drainage system costs from $8 to $12 per trap. The question at once arises whether this expense is justified. How much are dry traps worth? Added to the value of dry traps, you can credit the cost of from 2 to 5 hours labor, which is the average annual upkeep cost for unprotected tile drainage in traps. Add the cost of lost sand, and the damage to the general drainage system from sand clogging, and you get a conservative estimate of $2 per trap, per year, as the cost of upkeep. Two dollars per year saving is fine interest on an investment of $10, without placing a value on the pleasure of never playing from wet traps.

A Periscope for Use in Connection With Blind Holes

By E. F. McRae, Shaughnessy Heights Golf Club, Vancouver, B. C.

We have a blind hole on our course, and I have devised a periscope for use in connection with this hole which is giving us gratifying results. The general plan and important details of the apparatus are illustrated in the accompanying sketch.

The height above ground of the upper mirror and the angle at which the mirrors are set will of course have to depend upon local conditions, but the two mirrors will have to be adjusted to sit at the same angle. The top of our periscope box is 15 feet above the surface of the ground, and the lower mirror is 4½ feet above the ground, low enough for use by



Plans of Periscope for Use with Blind Holes

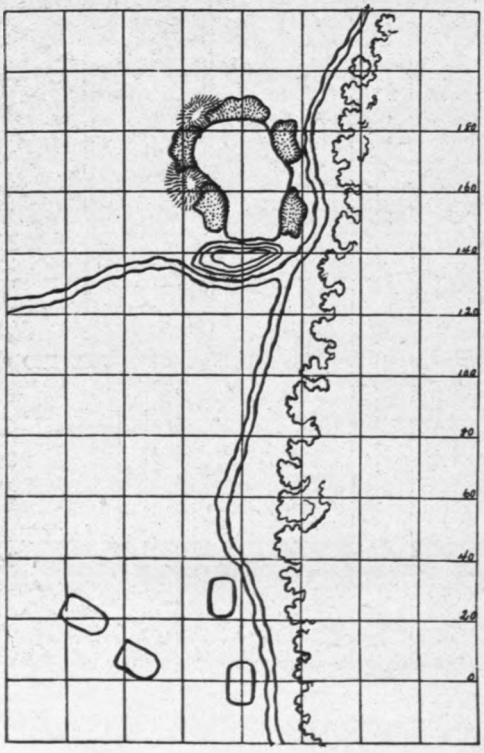
a boy in sighting but not so low that a tall man is unable to use it by bending down to sight. The fastened supporting post extends 3 feet under ground and 3½ feet above ground. The turning post, to which the periscope box is attached, is connected with the fastened post by means of a 1¼-inch by 40-inch steel pin, and the abutting faces of the two posts are fitted with steel bearing-plates. The pin should fit loosely enough to allow for a little play so as to permit of ease in turning the box. The periscope box is made of 1-inch by 12-inch cedar boards, and must be painted black inside. The upper mirror rests on a cleat, and the lower mirror on the bottom of the box. Holes may be bored in the bottom of the box to permit of drainage, if desired, although we have not found this necessary, as the overhang of the roof prevents most of the rain from blowing into the box. We, of course, had to have mirrors cut to fit our box. In order to preserve the back of the mirrors from the effects of dampness, I glued asbestos on the back of the mirrors, with waterproof glue, and shellacked the edges. For a turning handle I use a shovel handle fastened to the bottom of the box by means of screws.

Our periscope takes in the whole of a 360-yard hole.

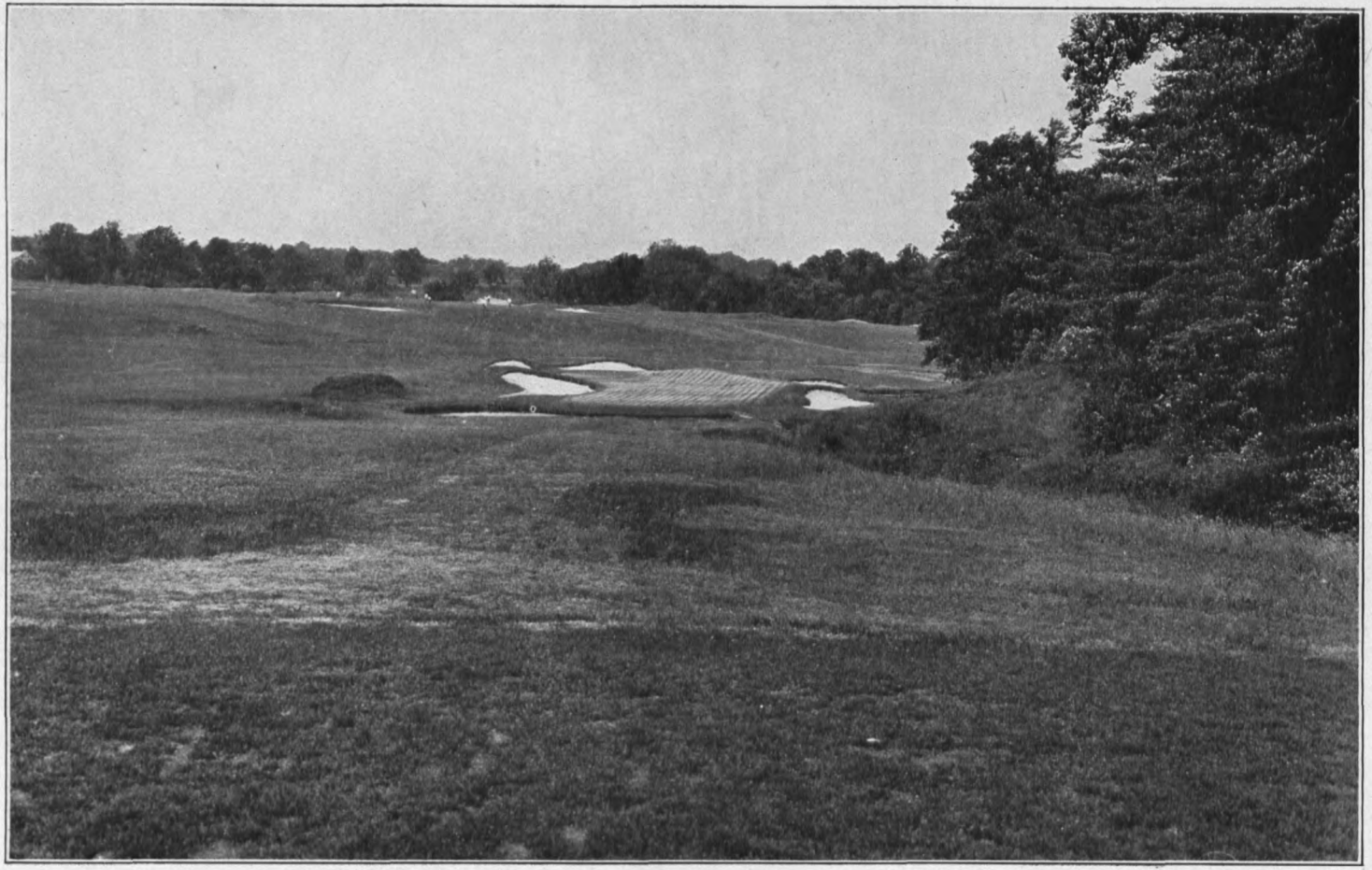
Greenkeepers' Register.—The editors of THE BULLETIN will be glad to receive letters from greenkeepers seeking employment and forward names and addresses to clubs in need of greenkeepers. Applicants should indicate their experience, age, and references.

Instructive Golf Holes XI

No. 9 Merion Cricket Club (East Course), Haverford, Pa., 160 to 180 Yards



This is an extremely fine "midiron" hole. It extends nearly due north, the way from the tee to the green being a gentle down-slope. On the right are woods, out of bounds. The front of the green is guarded by a pond formed by damming the small creek. While the putting sward is almost surrounded by bunkers, it is fairly generous in size, measuring about 7,500 square feet, and is well backed up, so that it is readily held by a high shot. Such a long high shot is, however, one of the really difficult shots in golf. The water hazard in front of the green might, where desirable, be represented by a sand bunker.



Hole No. 9, Merion Cricket Club (East Course). View from tee.

Hole No. 9, Merion Cricket Club (East Course). Close-up view of putting green.

UNITED STATES GOLF ASSOCIATION

110 East Forty-second Street, New York, N. Y.

A list of public golf courses in the United States with information concerning each

	Name of Park Where Located	No. of Holes	FEE Per Day	FEE Per Year	No. Rounds Played in 1923	Approximate Operating Expenses	When Opened	Course Operated by City Officials or Individuals	Population
New York City	Van Cortlandt	18	$1.00	$10	94,162	$16,000.00	1895	City Officials	5,621,000
	Mosholu	18	1.00	10	71,522	16,000.00	1914	----do----	
	Pelham	18	1.00	10	55,935	16,000.00	1899	----do----	
	Forest Park (Br'klyn)	18	1.00	10	65,000	27,931.76	1910	----do----	
Chicago, Ill.	Lincoln	9	.15		108,000	17,000.00	1916	City Officials	2,700,000
	Columbus	9	.15		90,000	12,000.00	1921	----do----	
	Garfield	9	.15		95,000	10,000.00	1914	----do----	
	Marquette	18	.25		rebuilding		1916	----do----	
	Jackson	9	.10		105,000	10,000.00	1896	----do----	
	Jackson	18	.25		118,000	19,000.00	1910	----do----	
	Edgebrook Forest	18	.50		60,000	24,000.00	1906	----do----	
	Palos Hills	18	.50		25,000	20,000.00	1917	----do----	
	Northwestern	18			no record	no record	1924	----do----	
	Glencoe	18		10	30,000	12,000.00	1922	----do----	
	Highland Park	9		10	25,000	7,000.00	1922	----do----	
	Evanston	18	.25		85,000	12,000.00	1916	Individuals	
	Winnetka	18		10	65,000	14,000.00	1917	----do----	
	Wilmette	18		100	45,000	18,000.00	1923	----do----	
	Dempster	18			no record	no record	1924	----do----	
	Mid-City	18			no record	no record	1924	----do----	
	Budlong Woods	18	1.50		55,000	18,000.00	1923	----do----	
	Big Oaks	18	1.50		55,000	18,000.00	1923	----do----	
	Oak Hills	18			no record	no record	1924	----do----	
	Hickory Hills	18	1.00		35,000	18,000.00	1923	----do----	
	Palos Hills C. C.	18	1.50		35,000	18,000.00	1923	----do----	
	Dixmoor	18	1.50		65,000	20,000.00	1923	----do----	
	Green View	18	1.50		60,000	18,000.00	1922	----do----	
	Green Valley	18		100	40,000	16,000.00	1900	----do----	
	Evergreen	18			no record	no record	1924	----do----	
Philadelphia, Pa.	Cobb's Creek	18	.50	3	73,901	30,000.00	1916	City Officials	2,000,000
Detroit, Mich.	Belle Isle	9	.25		60,000	self-	1922	City Officials	1,000,000
	Palmer	9	.25		17,000	supporting	1923		
Cleveland, Ohio	Highland	18	.75		50,000	21,000.00	1913	City Officials	900,000
St. Louis, Mo.	Forest	27	no charge		100,000	24,000.00	1913	City Officials	773,000
Boston, Mass.	Franklin	24	1.00	10	53,250	11,502.00	1896	City Officials	750,000
Los Angeles, Cal.	Griffith								750,000
	Course No. 1	18	.50	15	65,342	34,089.38	1914	City Officials	
	Course No. 2	18	1.00	5 mo.	87,032		1923		
Baltimore, Md.	Clifton	18	no charge		600 daily	no record	1916	City Officials	734,000

UNITED STATES GOLF ASSOCIATION—(Continued)

	Name of Park Where Located	No. of Holes	FEE Per Day	FEE Per Year	No. Rounds Played in 1923	Approximate Operating Expenses	When Opened	Course Operated by Officials or Individuals	Population
Pittsburgh, Pa.	Schenley	18		3	65,000	10,000.00	1912	City Officials	588,000
Buffalo, N. Y.	Delaware	18	no charge		100,000	16,000.00	1898	City Officials	592,000
	South	9			50,000		1917		
San Francisco, Cal.	Lincoln	18	.50	1 mo.	226,300	32,675.43	1916	City Officials	550,000
Minneapolis, Minn.	Columbia	18	.25		52,805	8,545.00	1919	City Officials	500,000
	Glenwood	18	.40		60,392	12,550.00	1916		
Milwaukee, Wis.	Grant	18	.35		59,897	16,517.11	1920		500,000
	Lincoln	9	.15				1922	County Officials	
	Lake	6	.10				1922		
	Greenfield	18	.35		11,778	building	1924		
Cincinnati, Ohio	Avon	18	.50	10	25,000	10,370.00			500,000
	Short Woods	9							
New Orleans, La.	City	18	.50		29,742	6,000.00	1905	City Officials	450,000
	Fair Grounds	9	.50		no record	no record	1924	Individuals	
Washington, D. C.	East Potomac	18	.25	20	65,000	Self-sustaining	1920	District Officials	438,000
	West Potomac	9			25,000		1920		
Newark, N. J.	Weequahic	9	.50		25,000	Self-sustaining	1914	County Officials	414,000
Kansas City, Mo.	Swope	18	.50	10	100,000	18,000.00	1917	City Officials	400,000
Seattle, Wash.	Jefferson	18	.40	10	125,251	28,462.67	1915	City Officials	315,500
	Jefferson	9					1923		
Indianapolis, Ind.	South Grove	18	.25	8	72,245	11,573.91	1903		315,000
	Riverside	18	.75	20	30,716	11,083.25	1898	City Officials	
	C. E. Coffin	18	.75	20	14,744	13,882.24	1922		
	Pleasant Run	18	.50	10	19,987	8,266.49	1922		
St. Paul, Minn.	Phalen	18	.20	10	42,606	11,811.10	1921	City Officials	313,000
Rochester, N. Y.	Genesee	18	.50	3	46,866	12,000.00	1923		
	Durand Eastman	9			17,155		1923	City Officials	300,000
Denver, Colo.	City	18	.50	6	60,000	Self-sustaining	1912	City Officials	275,000
Toledo, Ohio	Ottawa	18	.25		80,000	7,500.00	1899	City Officials	250,000
	Bay View	9	.25		10,000	2,500.00	1922		
Louisville, Ky.	Cherokee	18	no charge		40,000	4,000.00	1903	City Officials	250,000
Omaha, Nebr.	Elmwood	18	.25 per round		83,472	14,928.98	1916	City Officials	200,000
	Fontenelle	9					1921		
	Miller	9					1911		
Atlanta, Ga.	Piedmont	9	.25		36,291	6,000.00	1920	City Officials	200,000
	Jas. L. Key	9	.25		7,780	2,000.00	1921		
Worcester, Mass.	Lincoln	9	1.00	7	100,000	4,960.94	1914	City Officials	180,000
Syracuse, N. Y.	Burnet	9	.25	7.50	6,500	2,000.00	1908	City Officials	180,000
San Antonio, Texas	Brackenridge	18	.25		159,000	15,000.00	1914	City Officials	175,000

UNITED STATES GOLF ASSOCIATION—(Continued)

Name of Park Where Located	No. of Holes	FEE Per Day	FEE Per Year	No. Rounds Played in 1923	Approximate Operating Expenses	When Opened	Course Operated by Officials or Individuals	Population
Dayton, Ohio ——— Hills-Dales ——— (2 18-hole courses)	36	.75	12	50,000	17,000.00	1918	City Officials	160,000
Bridgeport, Conn. ——— Beardsley ———	9	.25	3-4	53,232	3,500.00	1915	City Officials	150,000
Hartford, Conn. ——— Goodwin ———	18	.10	9 holes	82,226	10,933.99	1906	City Officials	140,000
Des Moines, Iowa ——— Grand View ———	18	.25	5	40,000	5,100.00	1900	Grand View Golf Club	130,000
Waveland ———	18	.25	5	50,000	5,100.00	1900	Waveland Golf Club	
Spokane, Wash. ——— Down River ———	9	.25		42,366	7,496.22	1916	City Officials	130,000
South Bend, Ind. ——— Studebaker ———	9	.15		30,000	3,000.00	1919	City Officials	90,000
Erskine ———	18	(new)		no record	no record	1924		
St. Joseph, Mo. ——— Municipal ———	18	.25		no record	3,500.00	1922	City Officials	85,000
Long Beach, Cal. ——— Anaheim ———	18	.50	20	26,400	6,780.00	1920	City Officials	75,000
Springfield, Ill. ——— Bunn ———	18	no charge		no record	14,000.00	1908	City Officials	75,000
Bergen ———	9				5,000.00	1912		
Racine, Wis. ——— City ———	9	.10		22,000	5,000.00	1917	City Officials	60,000
Springfield, Ohio ——— City ———	9			no record		1920	City Officials	40,000
Sioux Falls, S. D. ——— Sherman ———	6	.10		15,700	1,000.00	1922		28,000
Sherman ———	9					1922		
Wilmington, Del. ——— Delaware ———	18	.50		25,000	5,000.00	1921	Individuals	115,000
Lancaster, Pa. ——— Long ———	9	no charge		no record	no record	1921	City Officials	55,000
Lansing, Mich. ——— City ———	18	(new)		no record	no record	1925	City Officials	
Portland, Ore. ——— Eastmoreland ———	18	.40		108,850	32,160.99	1918	City Officials	
Rose ———	9	.25		54,324	17,562.98	1923		
Frankfort, Ind. ——— City ———	9			no record		1912	City Officials	
Terre Haute, Ind. ——— City ———	18	(new)		no record		1924	City Officials	

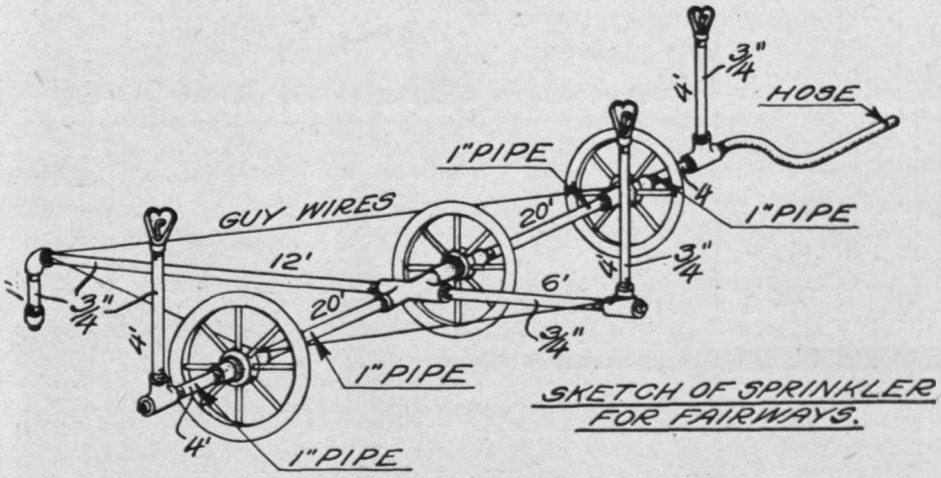
This list does not claim to be absolutely complete, and any additional data which will add to its usefulness will be much appreciated. Such information should be sent to Mr. James D. Standish, Jr., Chairman, Public Links Committee, United States Golf Association, No. 110 East Forty-second Street, New York, N. Y. The committee will be glad to assist the promoters of a public course at any time.

The club house of the Merion Cricket Club, where the Twenty-Eighth Amateur Golf Championship of the United States will be staged September 20 to 27.

A Serviceable Inexpensive Fairway Sprinkler

By R. S. Ludington, President, Wenatchee (Wash.) Golf and Country Club

Through the courtesy of Mr. W. W. Baker, chairman of the green committee of the Walla Walla Country Club, our club was furnished with a sketch and dimensions of what we are pleased to call our "Walla Walla Sprinkler." Mr. Baker has consented to my presenting to the readers of THE BULLETIN a description of this very satisfactory and inexpensive sprinkling device, which he worked out to meet his requirements, and which, with his approval, we have abundantly copied, for we now have 18 of these sprinklers in night and day service on our course.



Sketch of the Walla Walla Fairway Sprinkler.

The sprinkler consists of 3 twirlers about 6 feet above the ground fed by water through 1-inch galvanized iron pipe supported about 18 inches above ground by 3 old-style automobile wheels (with old casings) and by a ¾-inch galvanized-iron-pipe leg on a 12-foot handle of ¾-inch pipe extending from the cross at the middle of the stretch of 1-inch pipe. The center twirler, on a line with the handle, is advanced in front and 6 feet beyond the line of the end twirlers to permit the attendants to reach the handle and move the sprinkler about without getting wet. The supply hose can be attached at either end or at the center twirler. We have found that a greater reach of sprinkling can be obtained with the hose attached at the end. This arrangement also permits of the use of ¾-inch pipe in the handle and for the center twirler, whereas otherwise it would be necessary to use 1-inch pipe for these parts.

The underground supply pipes on our course are down the center of our fairways and are provided with risers every 100 feet. Probably risers every 150 feet would be ample, since, with 80-pounds pressure and 50 feet of hose, we actually cover a circle 240 feet in diameter without disconnecting the hose, by occasionally moving the sprinkler.

For the axles of the wheels we use 1½-inch galvanized iron pipe, on either end of which are reducers to 1 inch, which reducers hold the wheels in place. The inner wheel is off center, the cross being at the center and the wheel to the side of the cross.

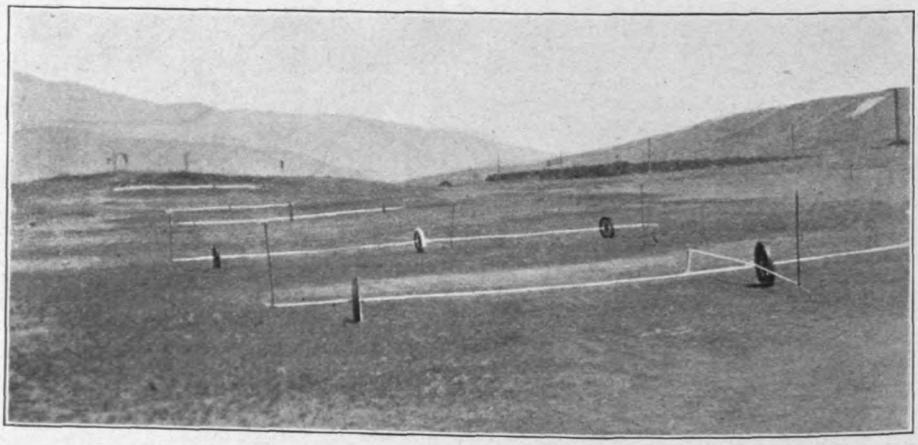
The material used in the construction of a single set of sprinklers is as follows:

3 old rimless automobile wheels with old casings and no inner tubes.

1½-inch galvanized iron pipe; 3 pieces each long enough to serve as axles for the wheels, extending on each side of hub far enough so that 1½-inch by 1-inch reducers may be firmly attached to the ends to hold the wheel in place. A total of about 17 inches of 1½-inch pipe is required.

1-inch galvanized iron pipe; 1 piece 19½ feet long and 1 piece 20 feet long, to serve as connections between the three wheels; 2 pieces each 4 feet long, to serve as extensions beyond the two outside wheels, for the twirlers; total, 47½ feet.

¾-inch galvanized iron pipe; 1 piece 12 feet long, to serve as handle; 1 piece 6 feet long, to serve as extension to supply middle twirler; 3 pieces each 4 feet long, to serve as risers for the twirlers; 1 piece 10 inches long, to serve as supporting leg for the handle; total, 30 feet and 10 inches.



A battery of fairway sprinklers in operation at the Wenatchee Golf and Country Club.

All pipe fully threaded at both ends.

Galvanized iron fittings as follows: 1½-inch by 1-inch reducers, 6 (for holding wheels); 1-inch by ¾-inch tees, 2 (for end risers); 1-inch by ¾-inch cross, 1 (at center); 1-inch plug, 1 (at end opposite hose connection); 1-inch to ¾-inch reducer, 1 (for hose connection); ¾-inch elbows (or tees with 2 plugs), 2; ¾-inch union, 1 (for foot of leg); ¾-inch plug, 1 (for foot of leg); 1-inch short nipple, 1 (to connect cross and reducer); ¾-inch nipple, 1 (for hose connection).

A ¾-inch cap may be used for the foot of the leg, but we find a plugged union much more satisfactory when it is desired to open the piping in order to drain it.

100 feet of heavy galvanized iron wire for stays.

¾-inch twirlers, 3.

Tools for assembling; 2 pipe wrenches and 1 combination pliers and wire cutter.

In assembling, plenty of axle grease should be put on the axles before the wheels are placed and the reducers screwed up, as the axles are not easily oiled and the sprinkler is much more easily moved with the axles well lubricated.

With our higher western prices, our sprinklers cost us complete on

the course about $15 each. Where freight rates and other items are not so high the price should be very much less. The 2 pipe wrenches, and the pliers for the guy wire, are the only tools needed in assembling the sprinkler. The first sprinkler we built had specially made iron wheels for 1-inch axles, each of which cost us $3 or $4 here; but this cost of wheels we practically eliminated by using old Ford wheels with old castings costing us next to nothing. The substitution of Ford for iron wheels is our modification of the sprinkler.

When not in use, the sprinklers can be run off in the rough, and should a ball stop under one it is not difficult to pull or push the sprinkler far enough out of the way to permit the ball to be played. Likewise should a ball stop under a sprinkler in use on the fairway, the sprinkler can be moved to permit playing the ball without cutting off the water or getting wet.

The advantages of this sprinkler are simplicity of design, cheapness of construction, ease of moving, large area watered at each setting, ease of keeping in order and repair, and the fact that less frequent connections of the hose have to be made, or shutting off of the water, since with each connection of the hose the sprinkler can be moved from six to ten times, depending on the width of the fairway, before it is necessary to make another connection. This saves the time of greenkeepers and the wear on valves and hose, and permits the maximum use of water, and also enables one man to look after the watering of more fairways than does any other device within our means that has come to our attention.

Twenty-Eighth Women's Amateur Golf Championship of the United States

The competition for the Women's Amateur Golf Championship of the United States, open to all women amateur golfers belonging to clubs which are members of the United States Golf Association, and to those foreigners visiting this country who may be invited by the Executive Committee of the Association, will be played on the course of the Rhode Island Country Club, Providence, R. I., commencing on Monday, September 1, when the Robert Cox Cup and four medals will be competed for under the Rules of the United States Golf Association. The winner of the competition shall be the Champion Woman Amateur Golfer for the year and the Robert Cox Cup shall be held for that year by the club from which the winner shall have entered.

The winner shall receive a gold medal, the runner-up a silver medal, and the other semi-finalists bronze medals.

Competitors shall enter for the championship through the secretaries of their respective clubs. An entrance fee of $5 must accompany each entry and must be received not later than 5 p. m. on Wednesday, August 20, at 110 East 42d Street, New York City, checks to be drawn to the order of the United States Golf Association.

In addition to the present qualifications, entries will be received only from women players having handicaps of 1 to 8. Any player whose name does not appear on the present Women's Sectional Handicap Lists and who desires to compete in the championship, must submit to Mrs. H. Arnold Jackson, Patterson Avenue, Greenwich, Conn., before August 16th, 1924, five best scores made during the current playing season over her club's course, duly certified to by the president or secretary of her club,

with a statement by the certifying officer of the par of such course. Upon the basis of the par and scores submitted, the player will be rated and notified at least one week prior to championship.

All entries are subject to the approval of the Executive Committee of the Association, and any entry may be rejected by the Committee. All disputes shall be settled by the Executive Committee, whose decision shall be final.

Any player who fails to appear at the tee within fifteen minutes of the time she is called to play by the Committee shall be disqualified unless reasons satisfactory to the officials in charge of the tournament be given.

Any person paying her entrance money shall be considered thereby to have submitted herself to the Rules of the Association, both as to restrictions enjoined and penalties imposed. On these conditions alone she is entitled to enjoy all the privileges and advantages of the Association competition.

Entries for the special events are opened only to contestants entered for the championship events. This applies also to the entries of women in the mixed foursome handicap.

All score cards in the medal play rounds must be kept in strict accordance with "Rule 5, Special Rules for Stroke Competitions." Competitors failing to comply with the requirements of this rule will be disqualified.

The privileges of the club house and the grounds are extended to all competitors in the championship for one week previous to the tournament.

The pairing and time of starting of each pair in the qualifying round will be announced through the press.

Monday, September 1. 10 a. m. Medal Play Round. 18 holes, best 32 scores to qualify. A prize is offered by the Association for the lowest score in this competition. In the event of a tie or ties for the last place on Monday, the contestants so tied shall continue to play until one of them shall have gained a lead by strokes at any hole.

Tuesday, September 2. 10 a. m. Women's Championship First Match Play Round. 18 holes. 1.30 p. m. Match Against Women's Par. 18 holes. Prize presented by the Rhode Island Country Club. Entries close for this event at 1 p. m.

Wednesday, September 3. 10 a. m. Women's Championship, Second Match Play Round. 18 holes. 1.30 p. m. Best Ball Foursome Scratch. 18 holes. Prize presented by the Rhode Island Country Club. Entries close for this event at 1 p. m.

Thursday, September 4. 10 a. m. Women's Championship, Third Match Play Round. 18 holes. 1.30 p. m. Mixed Foursome, Medal Play Handicap. 18 holes. Best gross and net prizes presented by the Rhode Island Country Club. Entries can be made at the time of the event.

Friday, September 5. 10 a. m. Women's Championship, Semi-Final Match Play Round. 18 holes.

Saturday, September 6. 10 a. m. Women's Championship, Final Match Play Round. 36 holes.

Each entry for the Handicap Event must be accompanied by certified handicap at the player's home club, and the scratch score from which such handicap is made.

In all special events, players must leave the first tee by 3 p. m.

CORNELIUS S. LEE, *Secretary.*

Twenty-Eighth Amateur Golf Championship of the United States

The competition for the Amateur Golf Championship of the United States, open to all golfers whose names appear on the Official 1924 Rating List of the United States Golf Association, and to those foreigners visiting this country who may be invited by the Executive Committee of the Association, will be played on the course of the Merion Cricket Club, Haverford, Pa., beginning Saturday, September 20, when the Havemeyer Cup and four medals will be competed for under the rules of the United States Golf Association. The winner of the competition shall be the Champion Amateur Golfer for the year, and the cup shall be held for that year by the club from which the winner shall have entered.

The winner shall receive a gold medal, the runner-up a silver medal, and the other semi-finalists bronze medals. The player making the lowest score in the 36-hole qualifying round shall receive a special prize.

All eligible competitors shall enter directly for the championship and not through the secretaries of their respective clubs. An entrance fee of $5 must accompany each entry and must be delivered to the United States Golf Association, 110 East 42d Street, New York City, not later than Saturday, September 6, 1924, checks to be drawn to the order of the United States Golf Association.

The Eligibility List of the United States Golf Association is compiled from the tournament records of the various players throughout the United States. Players whose names are in the official list are entitled to compete in the Amateur Championship of this Association. Any amateur golfer who belongs to a member club of the United States Golf Association may submit his entry to Mr. J. D. Standish, Jr., Chairman, Eligibility List Committee, 110 East 42nd Street, New York City, on or before August 20, 1924. The ability of all such entrants will be investigated and the player notified as to his acceptance or refusal at least one week before the championship. Positively no entry will be so considered which is not in the hands of the Eligibility List Committee on or before the above mentioned date.

All entries are subject to the approval of the Executive Committee of the Association, and any entry may be rejected by the Committee. All disputes shall be settled by the Executive Committee, whose decision shall be final.

Any player who fails to appear at the tee within fifteen minutes of the time he is called to play by the Committee shall be disqualified unless reasons satisfactory to the officials in charge of the tournament be given.

Any person paying his entrance money shall be considered thereby to have submitted himself to the rules of the Association both as to restrictions enjoined and penalties imposed. On these conditions alone he is entitled to enjoy all the privileges and advantages of the Association competition.

All score cards in the medal play round must be kept in strict accordance with "Rule 5, Special Rules for Stroke Competitions." Competitors failing to comply with the requirements of this rule will be disqualified.

The privileges of the club house and the grounds are extended to all competitors in the championship for one week previous to the tournament.

The pairing and starting time of each pair in the first qualifying round of 18 holes will be announced through the press.

Saturday, September 20. First Qualifying Round. (18 holes.)

Monday, September 22. Second Qualifying Round. (18 holes.) Lowest 32 aggregate scores for first and second qualifying rounds to qualify.

Tuesday, September 23. 9 a. m. Match Play Round. (36 holes.)

Wednesday, September 24. 9.30 a. m. Match Play Round. (36 holes.)

Thursday, September 25. 10.00 a. m. Match Play Round. (36 holes.)

Friday, September 26. 10.00 a. m. Match Play Round (semi-final). (36 holes.)

Saturday, September 27. 10.30 a. m. Final Match Play Round. (36 holes.)

In the event of a tie or ties for the 32nd place on Monday, the contestants so tied shall continue to play until one of them shall have gained a lead by strokes at any hole.

In the event of a halved match, the players shall continue to play until one of them shall have won a hole, which shall determine the winner of the match.

Some U. S. Golf Association Decisions on the Rules of Golf

QUESTION.—Four-ball match. A and B against C and D. All four balls on putting green, D's ball being farthest from the hole. D putts, his ball striking A's ball, knocking it into the hole. A claims to have holed on his last stroke and refuses to replace his ball, as provided in Rule 2 of Special Rules for Four-Ball Matches. Who is right?

ANSWER.—The rule you cite covers the point you bring up. A has no basis for his claim that he holed out on his last stroke, and under the rules must replace his ball.

QUESTION.—Is there any United States Golf Association rule against using drivers with iron heads? I have been informed that iron clubs are only permitted on tees of short holes. Please tell me whether there is any restriction on the use of iron clubs on tees of long holes.

ANSWER.—There is no United States Golf Association rule nor any rule in any other association that restricts a player in the use of any club he sees fit to use in making any shot. One of the prerogatives of a player is that he shall have his choice of the implements with which he wishes to play the game.

QUESTION.—In a handicap match tournament A had to concede three strokes to B. Their match was halved. Three strokes fall to be taken at the 1st, 7th, and 14th holes. A and B agreed to decide the match by playing the 19th hole on even terms. Were they within their right in making this arrangement?

ANSWER.—Yes. In the absence of any conditions for playing halved matches (see preface to "Decisions by the Rules of Golf Committee") the players are at liberty to make their own arrangements.

New Member Clubs of the Green Section.—Quebec Golf Club, Quebec; Los Serranos Country Club, Long Beach, Calif.; Homestead Farm Golf Club, Bethany, Pa.; Grove City Country Club, Grove City, Pa.; Eastridge Club, Lincoln, Nebr.; Seabright Lawn Tennis & Cricket Club, Seabright, N. J.; Monterrey Country Club, Monterrey, Mexico.

QUESTIONS AND ANSWERS

All questions sent to the Green Committee will be answered in a letter to the writer as promptly as possible. The more interesting of these questions, with concise answers, will appear in this column each month. If your experience leads you to disagree with any answer given in this column, it is your privilege and duty to write to the Green Committee.

While most of the answers are of general application, please bear in mind that each recommendation is intended specifically for the locality designated at the end of the question.

1. CLOVER FOR SOUTHERN FAIRWAYS IN WINTER.—We find that a number of golf courses in the South have clover on their fairways so that they may have a green turf during the winter and early spring before Bermuda starts to grow, and we are thinking of seeding our fairways with clover and Bermuda mixed. If you think this is a good idea, kindly advise us what kind of clover should be planted and when it should be seeded. (South Carolina.)

ANSWER.—Spotted bur clover is probably the commonest clover which appears in fairways in winter in your locality, but in addition there is more or less white clover and native Carolina clover. Bur clover is best seeded in early fall or as soon as the hot weather of summer is over. If hulled seed is used, it should be sown at the rate of not less than 15 pounds of seed per acre; if seed in the bur is sown, it will require 5 or 6 bushels of seed per acre. After the seed is sown it should be lightly harrowed in. The plant is an annual, but when once established it reseeds itself naturally from year to year. Bur clover is greatly helped by the addition of lime to the soil, and indeed it is commonly found in soil where there is a good deal of either lime or marl. To succeed with bur clover the soil should be inoculated with the proper bacteria for this plant. This inoculation may be effected by the use of either the pure culture sold in glass containers, or the soil from a field already growing bur clover, alfalfa, sweet clover, or yellow trefoil. The soil-transfer method is more dependable than the pure-culture method. In the soil-transfer method, soil from the top 8 inches of a field growing bur clover, alfalfa, sweet clover, or yellow trefoil should be broadcast at the rate of 500 pounds per acre over the area to be planted. On account of the expense involved, it is generally advised to sow but a small patch the first year, which should supply abundant soil to use as inoculation for more extensive plantings. Often when seed in the bur is sown there are enough bacteria in the dust on the burs to insure inoculation.

2. IMPROVING THE DRAINAGE OF A GREEN FLANKED BY A HILL AND OF A GREEN ON A CLAY SUBSOIL.—One of our greens is flanked by a steep hill. Its surface drainage is good. Two years ago in the fall it was in very poor condition. Last spring it was given the same treatment as the other greens with regard to weeding and top-dressing. It did not respond to this treatment, and as it became thickly infested with crab grass we decided to do nothing further with it that season but to returf it the following spring. Late last fall we plowed it, removed the top soil, remodelled it, and covered it with a fairly thick dressing of well-rotted manure. The green is not at the base of the hill, there being a 5-foot terrace in front of it, and the natural drainage should therefore be good;

nevertheless it certainly gets much seepage from the hill behind it. The high point of the green is directly in the back center and in a line with the crown of the hill, and there is therefore a perceptible fall both to the right and the left. In view of this we have thought that, rather than to lay a network of tile underneath the green it would suffice to lay one line of tile parallel with the back of the green, draining to both right and left.

Another of our greens is built on a pure clay foundation. The surface drainage can be easily corrected, although there are now some low places. The turf has showed signs of lack of proper drainage, but on account of the character of the subsoil we are afraid that subdrainage is imperative. The turf is by far the best we have on any of our greens; in fact, it is a beautiful piece of bent turf; and for that reason we hesitate to disturb the surface any more than necessary. (Pennsylvania.)

ANSWER.—We feel sure from what you say with regard to the hillside green that the trouble is due to poor drainage. The wettest place on a hill is often about half way down the side and not at its base. At that point water will continually seep out from the high ground in the rear; this we have noticed on many golf courses. The best remedy is to cut a grassy hollow back of the green, say 4 or more feet in depth, sloping the hollow so that it drains any seepage water that comes out of the hill, around the green. The same results can probably be obtained by the use of tile, if it is not desirable to construct the grassy hollow. If tile is used, we would advise sinking the tile at least 4 or 5 feet below the surface in order to be sure of catching any seepage water that is working toward the green. We see no reason why you should not take it to the right and left, as you suggest; in that case there would be no necessity for connecting the two drains.

The drainage of the other green you mention would probably be best effected by running two or three lines of 4-inch tile under the lower parts of the green. If care is used in taking up the turf, installing the drain, and relaying the turf, the green should not be out of play for any considerable time.

3. HOW TO SEED NEW GREENS.—A difference of opinion regarding the seeding of a new green has come up in our club. Our old plan was to level the green as truly as possible, seed on the top, and rake the seed in very lightly and carefully. We only raked a very little, so as to get the surface and the seed slightly mixed, and then rolled it. A new plan has been suggested, namely, to seed and then cover with anywhere from ½-inch to 4 inches of earth. The old-timers' view is that the seed would never grow up through this and that the seed should be as near the surface as possible. (New Brunswick.)

ANSWER.—In seeding a new green, the point to which most attention should be given is the even distribution of the seed. We recommend that 3 pounds of good bent seed be used in seeding each 1,000 square feet of surface. This is regarded as a sufficiently heavy rate if the seed is sown properly. It is usually much easier to get an even distribution by mixing the seed with top soil, as this gives a larger bulk, which is more easily distributed evenly than a small bulk. The late Fred W. Taylor, of Philadelphia, found it possible to get uniform and highly satisfactory stands of mixed bent grass on greens by mixing the seed with shredded peat moss. He used a very small quantity, probably not more than 1 pound to 3,000 square feet. His method was, however, expensive and the advantages gained by it were not in proportion to the cost. If the seed is sown alone

—that is, not mixed with top soil—it is easier to get a uniform stand by covering the seed evenly with top soil, say approximately 1 cubic yard to 5,000 square feet; but this, of course, is expensive, and unnecessary, provided rakes are used carefully for covering. Seed may be simply raked into the soil and sufficiently covered by the use of ordinary garden rakes or by an implement known as a weeder. The point to bear in mind in this case is to avoid the dragging of the seed into rows. There is also another point to watch carefully, and that is the watering of a newly sown green. Heavy watering has a tendency to wash the seed into waves and thus produce a very uneven stand. Water very slightly, simply enough to keep the surface moist, until the young plants have made a good start.

4. Grasses for Winter Greens in the South.—We expect to sow winter grass in the fall and wish you would give us an idea as to the best mixture to use. (Georgia.)

Answer.—Our information indicates that best results are obtained in the South by sowing a mixture consisting of 4 pounds Kentucky bluegrass, 1 pound recleaned redtop, and ¼-pound white clover, particularly inasmuch as the bluegrass and white clover are immune to brown-patch. It is possible that in Georgia you will not be troubled much with brown-patch in the winter, although this disease causes considerable damage to greens in the winter farther south, as around New Orleans and in southern Florida. If you are not troubled with brown-patch in winter, you will obtain best results with redtop alone, and next best results with Italian rye-grass alone, although both of these grasses suffer severely from brown-patch. We do not think it well to mix these two grasses, as they make somewhat different putting conditions, the rye-grass being a coarser grass than the redtop. Do not use fescue, as it will not do well under your conditions. White clover will grow nicely in your location in the winter. You may, however, not desire it from a putting standpoint. All of these grasses should disappear early in the summer, giving place to your Bermuda grass for your summer greens. In order that these winter grasses may have a fair start they should be seeded, in your latitude, about the middle of September. So that you may know definitely which grass is best for winter greens under your conditions it would be advisable for you to experiment with the different seedings, sowing a few of your greens to the Kentucky bluegrass and white clover mixture, a few to redtop, and a few to Italian rye-grass.

5. Eradicating Poison Ivy and Poison Sumac.—Please let us know how to exterminate poison ivy and poison sumac from our golf course. We are bothered very much with these pests around the fence lines and in the brush section of some of the small gullies. (Illinois.)

Answer.—The most rapid and effective way to deal with small isolated clumps of these plants is simply to pull or grub them out, taking care to remove thoroughly the running underground parts, since pieces of the plants left in the ground will soon produce another crop of plants. The plants are also killed by frequent mowing carried out persistently so as to prevent the roots from developing green growth above ground. Small patches may also be killed by covering them with tarred or other heavy paper, to the complete exclusion of light. The edges of the paper should be either pegged or well weighted down. Another good method, especially for killing vines of poison ivy on fence posts and on trees, is to cut the poison ivy below the ground and then saturate the soil around the cut bases of the plants with salt brine. A second dose of brine should be

applied about two weeks later if the roots show signs of putting forth new growth. Thorough wetting with kerosene oil, applied with a spraying pump or sprinkler, will kill the plants after one or two applications. The effectiveness of the treatment will be increased if the soil is disked or cut up slightly, so as to expose the roots to the action of the kerosene. As kerosene will injure or destroy all vegetation, it is, however, not safe to use around valuable trees and shrubs. One of the most useful methods of killing the leaves of these plants (and if the leaves are killed and not allowed to develop, the entire plant will die) is to spray them with a saturated salt solution prepared at the rate of 3½ pounds of common salt per gallon of water. For this purpose the spray should be applied as a fine, driving mist, which may be done by use of an air-pressure sprayer. Small, inexpensive hand sprayers suitable for this work are now on the market. As soon as a new crop of leaves appears the plants should be sprayed again. If this spraying method is persisted in, the plants will gradually disappear. Crude sulfuric acid also may be used, applying a few drops of the chemical to the bases of the plants at intervals of a week until they die. This may be done conveniently by means of a copper spring-bottom oil can, such as machinists use. Care must be taken to avoid spilling the chemical on the hands or clothing, as it is a dangerous caustic. In undertaking this work of eradication, the wearing of overalls and heavy gauntleted gloves is recommended. In case of contact with poison ivy or poison sumac, infection may be avoided by the use of a grain-alcohol wash to which lead acetate, a chemical obtainable at any drug store, is added, followed with a brisk treatment with strong soap and water. If these chemicals are not available, however, the affected skin should be washed thoroughly and as soon as possible with a heavy lather, preferably in running water. Hard scrubbing of the skin with a stiff brush should be avoided.

6. Fertilizing to Improve Fairways.—The base soil of our fairways is heavy clay and in our opinion inclined to sourness. The top soil is very thin and rests on top of the clay in an entirely separate stratum. Much of the fairway is covered by moss, in which there is some grass growing and a considerable amount of clover. Two years ago plant lime was liberally used for the purpose of sweetening, but there is considerable doubt as to whether any benefit was derived from this. We have had no practical experience in the use of ammonium sulfate, but our professional raises the point that this chemical will so kill or drive out the clover and moss that any benefit to the grass would not bring the surface to as satisfactory a playing condition as now exists. It may occur to you that our difficulties are a result of a basic condition which should be remedied by the use of sand or other substance to break the clay, and which would involve considerable expense. Because we are using leased land under such conditions as to make our continued use of the property uncertain, the club does not feel justified in undertaking expensive improvements. The policy of our green committee is to secure the best practical results from the course as it stands. In your opinion, from the facts given you, should ammonium sulfate be used, and, if so, should the mixture be heavier or lighter than that recommended by the Green Section? (Ohio.)

Answer.—We judge from your letter that the soil of your fairways is poor and also that there is a considerable amount of moss on it at the present time. As for using sulfate of ammonia under such conditions, we have not the slightest doubt but that an application of it at this time of the year (August 20) or a little later would be helpful for fall growth

Ammonium sulfate is an excellent quick-acting fertilizer, but unless it is applied carefully during the hot summer months it is likely to scorch the grass. In the summer 1 pound to 1½ pounds ammonium sulfate to 1,000 square feet can be used with reasonable safety. In the fall or spring double this quantity is recommended. As for doing away with moss and white clover, there is some evidence that ammonium sulfate will so promote the growth of grass as practically to dispose of moss, but it is only after repeated applications that it has this effect on white clover. Without knowing more specifically of your conditions, we would advise an application of ammonium sulfate at this time of the year (August 20), or possibly as late as September 15, and an application of bone meal at the rate of approximately 500 pounds per acre in the early spring, about the first of March. Since you do not own the land you occupy and do not wish to go to much expense in the matter of permanent improvement, top-dressing with compost would appear to be out of the question. However, if you can get well-rotted manure for top-dressing this winter, we think it might be a profitable investment. The bone meal will go far toward improving your turf, however, and with a little ammonium sulfate this fall and a liberal application of bone meal next spring you should have reasonably good turf for next season.

7. Controlling White Clover and Chickweed with Ammonium Sulfate.—This season our greens are badly infested with chickweed and white clover. We have been using ammonium sulfate on the greens at intervals of three weeks. We use 3½ pounds for a 4,000-foot green. Is this strong enough to discourage the clover and chickweed? Last year we used it stronger but it burnt the grass a little, which, however, soon recovered. It also burnt the clover and chickweed. (Pennsylvania.)

Answer.—We regard the rate you have used, 3½ pounds for 4,000 square feet, as a very light application. Our method of applying ammonium sulfate is to mix it with well-screened compost composed of loam or clay loam, well-rotted manure, and sand at the rate of approximately 12 to 15 pounds of ammonium sulfate to a cubic yard of compost. This cubic yard of compost is sufficient for top-dressing 5,000 square feet of green. In other words, by this method we apply approximately 2½ to 3 pounds of ammonium sulfate to each 1,000 square feet of surface. Where we can do so, we make applications of ammonium sulfate mixed with compost every month during the growing season. By applying ammonium sulfate mixed with compost and watering the greens thoroughly after the application is made, we have had practically no trouble from burning. During the hot weather we use only approximately 1½ pounds of ammonium sulfate to each 1,000 square feet. We realize that ammonium sulfate will burn grass, especially in the summer, if exceedingly great care is not taken. We believe that the continued use of ammonium sulfate in the manner here suggested will go far toward discouraging clover and chickweed, although this method is at times very slow in bringing about desired results.

8. Fertilizing and Cutting Greens Newly Planted with Creeping Bent Stolons.—We are preparing to plant a new green with creeping bent stolons from our nursery and should like to have your advice as to the cutting and fertilizing of the grass after the stolons have started new growth. (Indiana.)

Answer.—For greens planted in the late summer or fall, one application of a compost top-dressing containing ammonium sulfate, a short time after planting the stolons, should be sufficient for the remainder of

the year. If you have no compost for top-dressing, use good top soil. Top-dressing is something which is absolutely essential. We find in general that at the time of planting, a covering of approximately 1½ cubic yards, or somewhat less, of top-dressing to 1,000 square feet, is quite satisfactory. This should give a covering of approximately ⅜-inch. For top-dressing after planting, 1 cubic yard to 3,000 to 5,000 square feet is all that is needed. For full information regarding the use of compost top-dressing containing ammonium sulfate, read the article on page 111 of the May, 1924, number of THE BULLETIN.

Stolons, after being planted, should be cut before the grass attains a height of more than 2 inches.

9. REPLACING PATCHES OF FESCUE AND RENOVATING BARE SPOTS WITH CREEPING BENT STOLONS.—We have a problem to work out in regard to our patched greens. Could the fescue patches be successfully filled with creeping bent by using bent stolons? (Rhode Island.)

ANSWER.—We have been able to convert bare spots, thin spots, and poor turf into good creeping bent turf by punching stolons of a good strain of creeping bent into the spots by the means of a dibble, or by chopping up the stolons, spreading them over the surface, and then covering as in the case of new plantings. When planted in this way the introduced bent stolons should in time replace the fescue entirely. This work should be done, in your latitude, the latter part of August or the first of September, and, if possible, the greens should be withheld from play until the following May, especially if the cut stolons are scattered on the surface. If the stolons are simply dibbled in, the greens may be kept in play if this is absolutely necessary. The new growth from the stolons should be cut before it is over 2 inches high.

10. LENGTH OF TIME A CREEPING BENT NURSERY MAY BE EXPECTED TO BE USEFUL.—Is a nursery in its second year as good as one in its first year? (Pennsylvania.)

ANSWER.—A nursery in its second year does not provide as good material as in its first year. Plant the runners in the manner recommended in the March, 1924, BULLETIN, preferably in the fall or late summer. Use the material thus developed the next August or September—that is, one year from the time of planting the original row. No part of the old row should be left. A nursery one year old has served its usefulness, and if material is desired for next year's planting a new nursery should be started. This is an important matter.

11. FAILURE OF PLANTS TO DEVELOP FROM STOLONS IN VEGETATIVE PROPAGATION.—The latter part of May we got in enough stolons to enable us to plant at that time 200 linear feet of nursery row. With careful cultivating, weeding and watering they have by this time (September) developed into a matted row from 2½ to 3 feet wide. The several experiments that we have made in vegetative planting of these stolons would indicate that a very small percentage of the nodes make plants. Is this due to some fault on our part, or to the fact that the grass is not sufficiently mature? The variety of stolons we received produces a very fine stem with short internodes. (New York.)

ANSWER.—Doubtless the small percentage of the nodes that make plants must have been due to the bad condition of the material when it reached you. Under favorable circumstances practically every joint sends up a shoot. Your growth of 2½ feet to 3 feet wide since planting the latter part of May is a good growth.

12. YELLOWING OF TURF FROM POOR DRAINAGE.—Some of our greens

look so much greener than others. On some of the greens the grass has a yellowish appearance. What is the cause of this? What treatment would you suggest to correct this condition? (Missouri.)

ANSWER.—We are unable to determine, from your letter, the cause of your trouble, but it is possible that these greens have poor drainage, either poor surface drainage or poor under drainage, and possibly both. Poor drainage almost invariably causes yellowing, and the only method of overcoming this yellowing is to improve the drainage. We have found that top-dressing greens with good compost to which a little ammonium sulfate is added is an excellent method of keeping grass in good condition.

13. WEEDS IN BENT GREENS; NECESSITY FOR THEIR PROMPT REMOVAL. —We have five bent greens coming along nicely but they have a great many weeds from the manure we used in building them. We have been weeding these out, but are wondering whether there would be any danger in our letting them go, expecting that cutting and the growing bent will crowd them out. (Ohio.)

ANSWER.—We would advise you by all means to keep your greens thoroughly weeded. The growing bent will not crowd all of them out. Cutting will prevent a few kinds of weeds from producing seed, but even in the presence of such weeds the bent can not make its best growth. There is great danger of the weeds going to seed at any time and causing endless trouble.

14. PREPARATION OF THE SOIL IN RETURFING OLD GREENS WITH CREEPING BENT STOLONS.—We have one green of creeping bent planted vegetatively last fall, and it is indeed beautiful. It is our desire to convert all of our greens to this grass as rapidly as possible. Due to limitations in finances we have decided to do this on our old green beds without rebuilding them. Of course we expect to work up the surface of the greens in preparing for the planting of stolons and add such fertilizer as necessary. We should state in this connection that we have never been able to produce good greens on our soil from seeding. All of the soil in the greens, with the exception of some humus material and in some instances a little sand, is from our own course, and consists of a very heavy clay with very little top soil. None of our greens are tiled, but the surface drainage is pretty well provided for. (Kentucky.)

ANSWER.—Creeping bent can be successfully grown on clay soil of low fertility provided top-dressings of fairly good compost are applied at relatively frequent intervals. In your case we have the following suggestions to make: (1) Mix well-rotted manure and bone meal thoroughly with the top soil at the rate of about 1 ton of the former and 10 pounds of the latter to each 1,000 square feet. (2) If your top soil contains an appreciable proportion of commercial humus, this should be stripped off the green and replaced with new soil. In a great many cases, commercial humus has given very unsatisfactory results. (3) Above all things see that your greens are well drained, both on the surface and below. It is not always necessary to install tile, but good drainage is a necessity in all cases.

Meditations of a Peripatetic Golfer

If the turf on your fairways is not as good as that on nearby lawns and pastures, your greenkeeping methods are faulty.

On acid soils the bents and the fescues are the best of turf grasses.

"A stitch in time saves nine." Yes, but you don't sew a rent in your handkerchief with a gunny-sack needle.

Using too much of any good material is just about as harmful as using a bad substance.

Geological Ages of Golf Architecture:

I. The Old Pasture Epoch.

II. The Age of Straight Ridge Cops and Square Greens.

III. The Era of Chocolate Drops; also known as the Time of the Mound Builders.

IV. The Period of the Blind Bunkers.

V. The Epoch of Backed-Up Greens.

VI. Back to Nature as a Model.

A putter is the club used to play the last four strokes of a hole if the greens are bad—but only one or two strokes if the greens are good.

If a bunker is placed in a fairway it is wholly unfair to have it concealed.

Sand is expensive on many courses. Don't make sand hazards unless they can be seen. Grassy hollows are cheaper for concealed hazards.

Square, built-up tees are slowly going the way of the dodo.

A little care of putting greens week by week is infinitely better than great efforts after they have gone to the bad.

A hidden bunker is like a concealed weapon.

Never use acid phosphate alone or in mixed fertilizers on a putting green unless you want white clover. Nothing else encourages white clover so much as most of the phosphates.

Moss in turf is a sure sign that fertilizer is needed. Lime will NOT eradicate moss.