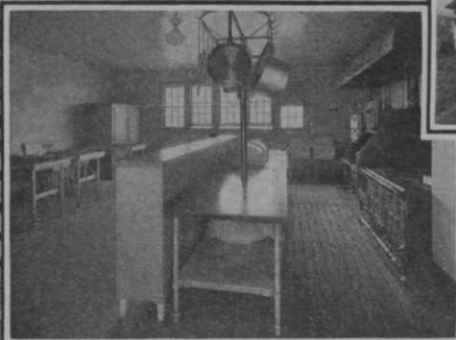


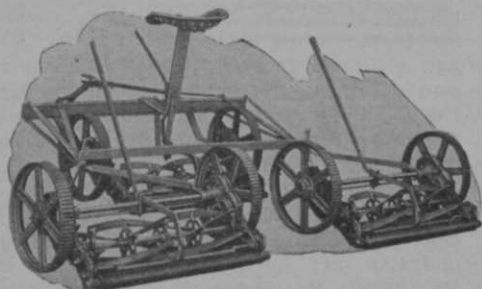
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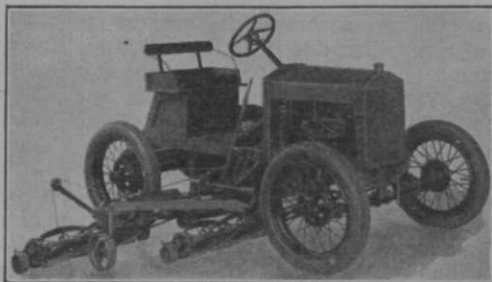
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(Continued from page 96)

removal of the grease before it is discharged into the septic tank. Grease seriously interferes with septic action if present in large proportions.

After the treatment of the sewage in the septic tank whereby the solid particles of sewage are removed, the sanitary disposal of the clarified effluent is of importance. Although the solids have been removed from the sewage, it must be remembered that the waste is not necessarily pure and in any installation of this sort the sanitary disposal of these wastes is of great importance. If there is a stream which is not used for recreational purposes or as a source of water supply and where the flow during the dry weather is large as compared to the flow of sewage so that the dilution of the tank effluent is many-fold, the effluent from the tank may be discharged into this stream. If, however, the stream meanders through the golf course or if there is a lake nearby which is used for bathing, some further treatment of the effluent will be required.

In country clubs and rural residences, where the soil conditions are such that the water is readily absorbed, the disposal may be done by absorbing it in the upper layers of the earth. This is accomplished by means of a series of tile lines laid with open joints. This method of disposal applies whether the flow is one of gravity or if the tank effluent must be pumped.

In some locations, where the supply of water, particularly during the summer season, greatly falls off, the absorption field may be laid on the golf course in the fairways or such other locations where the texture of the grass need not necessarily be fine.

A Typical Installation

The diagram accompanying serves to give a comprehensible idea of a sewage treatment plant installed at a clubhouse in New York state. You will note the location of the tank, the by-passing of the shower bath water around the tank and its being conducted into a sump tank. The electric pump is situated in the basement of the club, under the shower room. By this arrangement it is accessible during all seasons of the year. From the tank the settled sewage is pumped up the hill, where it is discharged into the absorption bed situated under the golf course.

The foregoing descriptions and illustrations are some of the tentative arrangements for club layouts.

Honor Ross. 30 Years at Pinehurst

ONE of the most unusual golf gatherings in American history of the sport was that which met at the Pinehurst C. C. on the night of March 20 for a complimentary banquet to Donald J. Ross, noted golf architect, who this season is rounding out 30 years as head of Pinehurst's golf department.

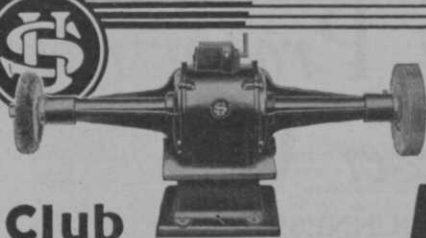
Nearly two hundred prominent linksmen gathered at the Ross testimonial banquet.

Rev. T. A. Cheatham of Pinehurst, himself an ardent linksman, was toastmaster, and seated at the banquet tables were many of the Tin Whistle club, Pinehurst's famous organization of golfers formed there more than 26 years ago. The general chairman was Mr. George W. Statzell of Philadelphia. With him on the committee were Mr. Henry C. Fownes of Pittsburgh, member of one of the country's oldest golfing families; Mr. Charles B. Hudson of North Fork, L. I., secretary and treasurer of the Tin Whistles club; Charton L. Becker of Philadelphia, captain and manager of the Tin Whistles club, and John J. Fitzgerald of Osterville, Mass.

Donald Ross has made many notable friends in his time, and they did not forget that they knew him, though they were far distant, when the banquet was on. Edgar A. Guest, Detroit's homespun "Homer," sent a touching telegram of congratulation. So did Frank B. Kellogg, Frank Presbrey, Professor John Bassett Moore and numerous others not so well known.

The principal speaker at the banquet was John H. Fahey of Boston, former president of the United States Chamber of Commerce, a very old friend and comrade of Mr. Ross. Mr. Fahey declared emphatically that the game never would have been what it is today in America but for the pioneering of Donald Ross. He recalled how Ross had built the No. 2 championship course of Pinehurst and how its trapping had set the golf world bubbling over. He lauded the geniality of the veteran Scotchman, declaring that it was the winning Ross smile that had added to the happiness of the country by helping the cause of golf.

Mr. Arthur S. Creamer of Southern Pines said that the building of great courses was only secondary when thinking of Donald Ross. It was, he declared, the great modesty and fine character of the man that was of the most importance.



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How to Make Proportioner for Fertilizer Use

By PROF. C. I. GUNNESS

(Massachusetts Agricultural College)

DURING the last few years there has been a great deal of interest in the application of liquid fertilizers to greens. Various methods have been used for applying these fertilizers. One method is to use a fairly strong solution and apply by means of a hose from a barrel or tank. After the solution has been applied the green is given a liberal watering. This method is rather clumsy and slow, and requires the transportation of a barrel and other equipment. Another method involves the use of a power spraying outfit. This method is very effective although it requires heavy and expensive equipment. Still another type of equipment which has been used is known as a proportioner.

The standard type of proportioner utilizes the energy of water flowing through a hose to suck a solution from a barrel and mix the solution with the water flowing through the hose. A proportioner is a type of ejector and looks somewhat like a pipe tee. Water from a hose enters the

tee through a nozzle and leaves through a larger orifice at the opposite end of the tee and discharges into a hose. Water rushing through these orifices creates a suction effect in the body of the tee, and the solution is sucked in at the side outlet of the tee, a pipe from this connection being run into a barrel containing the solution. The chief difficulty with the ordinary proportioner lies in the fact that it is difficult to control the rate of flow of solution. The rate of flow varies with a change in water pressure, and a change in the height of the liquid in the barrel.

Describes Construction.

An improved type of proportioner is shown in the diagram. It consists of a 10-gallon tank (A) for holding the solution. A Model T Ford gasoline tank serves the purpose very well. A stop cock (B) serves to turn on and off the solution but is not used for regulating the rate of flow. The union (C) is a packed $\frac{1}{2}$ in. union. In it is placed a metal disc with a small orifice. A rubber gasket is placed

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"I would like to advise you that after discing your 'Hardwood' humus into our greens thoroughly, their character was entirely changed both in the growth of turf and their ability to hold pitch shots. We now consider this necessary equipment and this spring we expect to disc and incorporate humus into the greens' surface as regularly as we do any of the other necessary work on the course."

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Pro-greenkeeper,
Belmont Hills C. C.,
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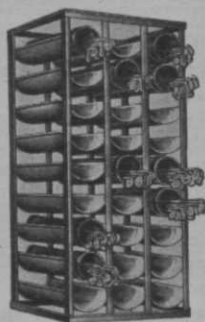
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Cost no more than wood racks—last longer—shipped knock down—easy to assemble—start with small installation which can be added to as additional bags are needed—write for prices.

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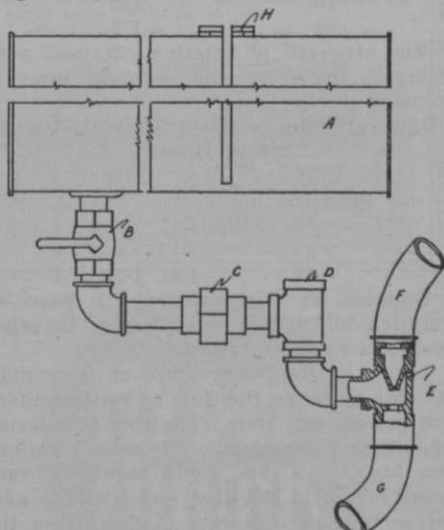
Tee Stands

Markers

on either side of the disc. The disc is used to regulate the rate of flow from the tank, and discs having different sized openings are provided to obtain different rates

solution flows to the ejector (E), shown in section, where it mixes with the water from the hose (F), and flows out through the hose (G) leading to the sprinkler.

A gasket is placed between the filling cap (H) and the tank. A vent pipe extends from the filling cap to a point within $\frac{1}{2}$ inch from the bottom of the tank. The purpose of this special vent pipe is to obtain the same rate of flow from the tank when it is nearly empty as when it is full. If the tank were vented at the top, the rate of flow would vary with the amount of solution in the tank. The purpose of the vent (D) is to make the rate of flow independent of the suction created in the proportioner. In the proportioner, the suction varies with the water pressure, and if the vent (D) were not provided, the rate of flow from the tank would vary with the water pressure. The proportioner is placed below the level of the union (C) and disc, in order that the solution may run away freely and the rate of flow not be influenced by water standing in the pipe leading to the proportioner. The proportioner has an inlet nozzle $\frac{1}{8}$ inch in diameter and an outlet orifice $\frac{9}{32}$ inch in diameter. The space between the two openings is $\frac{7}{16}$ of an inch.



Showing construction of proportioner.

of flow from the tank. As the solution leaves the disc, it flows into a $\frac{1}{2}$ in. tee, giving a vent at (D). From there the

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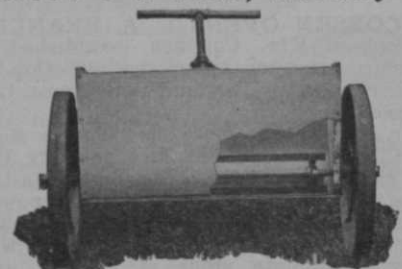
FERTILIZING — TOP-DRESSING — SANDING

Feed adjustment— $\frac{1}{4}$ lb. to 12 lbs. per 10 sq. yards.

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This proportioner will operate on a water pressure as low as 10 pounds and with increasing efficiency at higher pressures. With an inlet pressure of 40 pounds, it can operate against a discharge pressure of 10 pounds. For best service, however, a $\frac{3}{4}$ inch hose with a relatively large nozzle should be used from the proportioner to the sprinkler. Any attempt to obtain fine sprinkling will cause the proportioner to back up through the vent (D) and overflow. With 50 feet of $\frac{3}{4}$ inch hose, the nozzle can be restricted so as to give fairly fine sprinkling but if 100 feet are used, the nozzle will have to be quite large.

Using the Proportioner.

In using this device for fertilizing a green, the operator may use a rotating sprinkler or a hand nozzle. For most purposes the latter will be found more practical. It is first necessary to decide on the length of time which is to be allowed for covering the green. The proper amount of solution for the green is then put in the tank and a disc selected which will discharge the solution in the proper time. As an example, let us assume that we wish to apply 4 pounds of sulphate of ammonia per 1000 sq. feet of green. We would then proceed as follows:

1. Prepare a stock solution, using 4 pounds of sulphate of ammonia to one gallon of water.
2. Use a disc which will flow one gallon of solution per hour.
3. Put as many gallons of stock solution in the tank as there are 1000 sq. ft. in the green. Add enough water to fill the tank.
4. Divide the green into quarters and sprinkle for 15 minutes on each quarter.

Obviously, if we wish to cover the green in less than one hour, we will use a larger disc.

In order to give some idea as to the rate of flow from the tank, the following table is given. The rates of flow are for water. Solutions of different viscosities will flow at different rates. Ordinary solutions of sulphate of ammonia will flow at the same rate as water. Where other solutions are used it will be necessary to determine the actual rate of flow.

Rate of Flow from Tank.

Disc	Size	Gals. hour	Time required to empty tank
1	$\frac{1}{8}$	8.2	1 hr. 13 min.
2	$\frac{3}{16}$	15.4	39 min.

3	$\frac{1}{4}$	25.5	23½ min.
10	$\frac{9}{64}$	10.0	1 hr.
20	$\frac{7}{32}$	20.0	30 min.

In some cases the greenkeeper may wish to apply a solution of given strength. In this case it is merely necessary to know the rate at which water is supplied by the hose from the hydrant, and then use a disc which will supply the proper amount of solution. The rate of flow through the hose is as given below, with a $\frac{1}{2}$ inch nozzle in the proportioner. The pressure is taken at the proportioner. It will be noticed that a change in pressure from 30 to 50 pounds makes only a small change in rate of flow.

Quantity of Water Supplied by Hose.

Pressure, lbs.	Gals. per hour
30	140
40	155
50	175

The strength of solution obtained with different pressures and different discs is given below.

Ratio of Solution from Tank to Water from Hose.

Pressure, lbs.	Disc		
	1	2	3
30	1-17	1-9	1-5
40	1-19	1-10	1-6
50	1-21	1-11	1-7

Suppose we wish to apply 1 quart of solution to 50 gallons of water; in other words, a ratio of 1 to 200.

Let us assume a pressure of 40 pounds. At this pressure the flow of water will be 155 gallons per hour. The flow of solution should then equal $155 \div 200$ or .77 gallons per hour. As this would require a very small orifice in the disc, water will be added to increase the rate of flow from the tank. Let us assume that we wish to sprinkle for 30 minutes. We would then put one-half of .77 gallons or 3 pints of solution in the tank and add enough water to fill the tank. Then use disc No. 20 which will empty the tank in 30 minutes.

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Jacobsen Mfg. Co. has established a warehouse branch under the direction of K. L. Barnes, at Westland Warehouse, Los Angeles.

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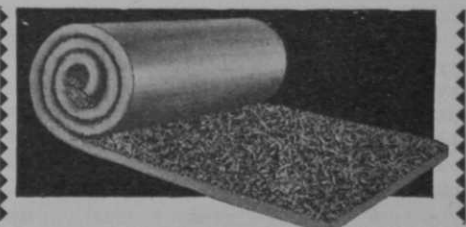
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Conditioning Course With Simple Thrifty Methods

By J. C. JENKINS

Pro-Greenkeeper, Temple (Tex.) Country Club

INTEREST shown by southern greenkeepers in articles on making and upkeep of Bermuda greens prompts me to relate my experience here in Temple, Texas, where I have nine greens and an 18-hole putting course. All my greens are approximately between four and five thousand square feet in size.

I am going to make my letter consist of four points, namely: Building a green and caring for it until ready to play, care of greens during the spring and summer, treatment of greens in early fall and care of greens during winter when the weather permits.

My club being a small one, we do not have too much money to go in for extensive alterations, but the club gives me a free hand to make any alterations I care to that will improve the course and not involve any extra expense, with the outcome that I have built five new greens, made extensive alterations to two, and now building a new 18-hole putting course in front of the club house. I may mention all the land here is black land.

In building a new green I usually plan on paper the size and shape, then go to the location and drive stakes in the four corners approximately to the height the green is to be at each stake, and then I drive three lines of stakes to approximate heights inside the corner ones, dividing the green as it were into four strips, filling in same with soil until the top of the stakes are covered.

I then start and put top of green as it will look when finished; after which I start and haul loads of sod ploughed from around the edge of the lake which our nine holes surround, placing all the clods by hand until the green is sodded. Then I get a few loads of stock-pen fertilizer and cover the surface of the green 3 or 4 inches thick. All holes and crevices between the clods of Bermuda root are filled up. I then take a heavy mule roller and roll the green well,

then water it well and re-roll. Then finally I get some good light soil mixed with good sharp sand and put about an inch coating over the green and roll well with a 500-lb. hand-roller. All this work is started in the fall and continued to December as the Bermuda is usually alive until December.

Spring Maintenance

When the green starts to grow in the Spring I keep it well watered and rolled. The watering on the thick layer of fertilizer makes the Bermuda grow much quicker. I top-dress it with sand soil and stock-pen fertilizer, which is well rotted and keep cutting until the green is entirely covered, at which time I give it another light top-dressing and then put it in play.

During playing season Bermuda greens should be top-dressed every four or five weeks, so as to keep the runners covered and not let the texture of the grass grow rank and have a heavy hard stubble after being cut, which makes putting very uncertain.

I dress my greens all the time with stock-pen fertilizer soil and sand, and I have never used any chemicals since I began looking after Bermuda greens. Of course, some may say I am too old-fashioned in my ideas, but I have always had the very best results. My members are satisfied and hundreds of visitors who come and play from large clubs from all over the 48 states congratulate me on the condition of my greens. I have had many calls for my advice from them as to how I get my results.

Dressing greens in early spring I put a heavy coat on, more fertilizer than soil and sand, and as the warmer weather comes I dress with very little fertilizer and mostly soil and sand, and in the fall, August and September, when the greens show signs of the hard play on them, I put a dressing the same as in early spring, mixed with flue-soot. This I believe, helps to keep out the

brown-patch fungus, and if I find large patches of brown-patch fungus showing I usually cut out and replace with new turf. Another thing I notice helps brown-patch is in the early morning wash the affected parts well before the sun gets on it and dress with a little compost from a pile kept handy to the green.

I don't water my green every day; usually 2 or 3 times a week, as I see they need it. I water both at night and early morning and during the day I have to do some watering too, as we can't afford a man all night. But during watering I keep the sprinkler going all day, so as the sun won't burn the green.

Top-Dressing After Frost

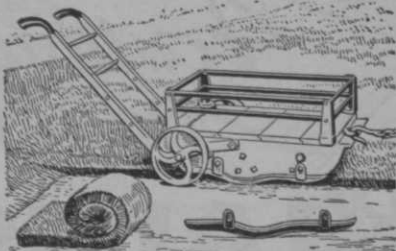
After the first frosts have killed the grass, I usually put a heavy top-dressing and cover all the dead grass, which in time rots and becomes food in itself for the green, and the heavy top-dressing gives me a better chance to keep winter weeds off the green, as you can drag the greens with a mat or use wooden spreaders which usually kills the weeds. This gives a reasonable surface for winter golf and at the same time protects the roots from heavy freezes.

I also do quite a little rolling of greens in winter, as the black soil puffs up with rain and frost and the rolling keeps it much firmer. Don't use too heavy a roller, as you may pack the green too firm and keep the oxygen from getting to the roots when the grass starts to grow. In cases when my greens get packed too firmly I usually get round-tooth forks and push them into greens about 6 inches in depth and pry up lightly all over the green. You will find it loosens up your green and the grass grows more rapidly. I prefer this method better than the spiked roller. Of course, it is much slower, but I think the better of the two methods.

This I usually do in early spring and after loosening the green I top-dress it preferably with sand only, but I can't always get sand, owing to the expense, and then I usually use two yards of light soil and one of sand, which makes a fairly light sharp dressing. But if anyone cares to try my methods and can get sand easily, use sand only as it goes down into the holes the fork makes and keeps the green open, allowing plenty of oxygen to get to the roots.

Regarding my top-dressing I usually start to haul the stock-pen fertilizer during the very hot weather every year (about 100 cubic yards), as my fairways don't need so much cutting. We have no fairway sprink-

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ling system. When I have the fertilizer all piled up at the barn out in the open, stacked about 2 feet high, I usually get a good rain on it. If not, I put a sprinkler on it and after I get it nicely moistened I go round the edges of the lake, which has been reduced in area owing to the hot weather and I plough up all the silt and cover my fertilizer about 6 inches thick and let it lie there until the next spring. In fact, I don't even use it then, but I turn it over as I usually have enough compost lying there ready for next summer. That means my dressing has lain for two years, which gives it a good chance to root well and let all weed and seed sprouts get killed.

I am not in the least sensitive to any severe criticism by any of the readers who have Bermuda greens and if they see any weak spots in my methods, will be glad to hear their ways, as it may help me greatly, and I will welcome and appreciate such criticism.

PUSH FERTILIZER DISTRIBUTOR

Salem, O.—The Salem Tool Co. is meeting with success in its extension of Hoffman, Jr., fertilizer distributor in the golf field, says J. Wilson, Salem's secretary, who attributes the reception to the ease of controlling the feed, a wide range of feed adjustment, minimum of strength demand on the operator, and sturdy construction.

The Hoffman, Jr., outfit is of all metal construction. It has a ratchet driven shaft which is automatically thrown out of gear and a scatterboard that promotes even seed and fertilizer distribution. The hopper capacity is approximately 60 lbs. of lime or equal capacity of pulverized fertilizer, seed, etc.

IDEAL ISSUES 1930 CATALOG

Lansing, Mich.—Ideal Power Lawn Mower Co. 1930 catalog is a handsome and helpful book that presents the details of Ideal's extensive line of power equipment and the Ideal roller greens mower in such plain and specific fashion that it answers questions coming to the mind of the searching prospective purchaser. The book will be supplied free by Ideal headquarters or any of the Ideal branches.

"PETE'S" PURCHASING GUIDE

New York City.—Arthur D. Peterson, Inc., 11 E. 44th St., has issued its 1930 catalog of course maintenance items. The attractive and informing book features Worthington cutting equipment and tractors, seed, fertilizer, Royer compost mixers and gives details of much other material for maintenance and construction use.