

Pipe lines may be laid six inches or so underground or on top of the ground, partly submerged in places. Adequate valves and hose connections should be available at each green, and such other places on the course as necessary.

Types of design of nozzles for greens use on sprinklers are as many as they are varied. One point must be remembered—the size of the orifice of whatever type of nozzle is used has a direct bearing on the volume of water delivered and the pressure available.

Planning for Fairway Watering

Watering of fairways may be done by placing lines of pipe in each fairway, sufficiently distanced, based on width of fairway. The width of spray from the nozzle at a given pressure determines how far apart the lines should be spaced. And, if watering of the fairways is a consideration likely to be important some time in the future after an installation has been made to care for the greens only, it is more economical to provide the proper size pump in the first place to care for this additional consideration, even though the actual watering of the fairways may be delayed indefinitely.

Fourth—Storage Tanks.—Two methods are used for storage of water. Pneumatic tanks and open tanks. Pneumatic tanks combine the use of air and water and produce pressure on the pipe lines and should have an adequate supply of air. Pumps, of course, can be equipped to supply both air and water to this tank at one and the same time. Tanks of at least five hundred gallon capacity, preferably larger, should be used, and if the tank will be an eye sore above ground, it can be buried.

Open tanks should be elevated as much higher than the highest green on the course as will equal the pounds pressure desired at that highest green. Sometimes an open tank in the form of an open reservoir situated on top of a high hill is used, and then the water flows by gravity to the several points on the course.

If an electric motor is used to drive the pump, regardless of what type of storage tank is used, the whole outfit can be made automatic by means of either a pressure or float-switch. If the water supply for the course is to be used in the clubhouse and is not fit for drinking or cooking, it will, of course, be necessary to arrange for a separate supply for this service.

In conclusion, much time, money and

Make Water Your Servant and not a nuisance

The distribution of water on the golf course should be a well ordered part of the upkeep instead of a bothersome, time-eating and expensive routine. The correct equipment for the type of water system—each equipment modern, sturdy and wear-proof is the answer.

Nearly half the golf courses in the U. S. use Economy Sprinklers. Sold for 15 years, this equipment has been constantly improved for the changing conditions. It makes all water systems adequate.

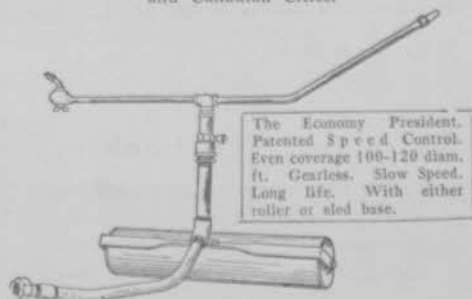
The Economy Traveller is a familiar sight on thousands of courses—the only sprinkler in the world that moves itself. Two types—for day and for night watering. Covers an area up to 160 diam. feet—almost double that of any other sprinkler. Allows for slower application of water.

The President (illustrated below), the Super-Simplex, the Spectacular—each is fitted to its specific job and is of the same rugged construction that characterizes all Economy Sprinklers. Write us for name of our agent near you. He can give you worth while watering information.

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ECONOMY SPRINKLERS



when you use

Calo-Clor or Calogreen

Your greens are longer
protected from re-
newed attacks of
Brown-Patch.

Other Advantages

1. Cheaper to use—only 3 oz. per 1000 sq. ft. of turf required.
2. Cost per pound about the same as other remedies requiring 1 lb. to 1000 sq. ft.
3. Fewer applications are required.
4. Easier and quicker to apply.
5. Does not burn.

Write for free booklet

describing the United States Department of Agriculture tests leading to the development of Calo-Clor and Calogreen. It also gives full directions for use.

Mallinckrodt Chemical Works
ST. LOUIS, MO.

Branches
New York Montreal Philadelphia

effort have been wasted in installing equipment entirely inadequate. We must have golf courses and we must have water for them. Let us give the turf a chance by supplying sufficient water at all times, and let us go about the job with intelligence so that once we have made the installation, we have the job licked for all time.

How I Make and Use Our Compost

By A. J. GILLET

Greenkeeper, Harlem Hills G. C.

MY early experience on the edge of the market garden district of Bedfordshire, which supplies London with a large proportion of its vegetables and where perhaps more fertilizer, both manure and commercial, per acre is used than in any other part of the world, has led me to look upon organic matter as the main source from which to obtain this fertility. In this early training I was taught to look upon the quick acting chemical fertilizers as stimulants, pure and simple. Nitro soda was then the chief one used. Its use meant large yields, but, if used alone, the soil would be impoverished and left in bad physical condition. On heavier soils its action is to make them sad, to "plow like liver" as we called it, instead of the mellow granular condition Mr. Noer lays great stress upon.

Writers on the soil seem agreed that even with fully qualified chemists it is difficult, if not impossible, to maintain soil fertility by chemical means alone. The beneficial effect of organic matter is needed.

As our club is still in the happy position of being able to obtain stable manure, I have made use of this for the organic supply, trusting to the compost heap for humus, phosphorus and potash, supplemented with ammonium sulphate for a greater nitrogen supply.

Compost Method

My method of composting is to use the manure fresh, as hauled from the stable. It saves handling; the truck, a Ford with Jumbo gear shift, backs up onto the pile and dumps. Soil is handled the same way, the front of the pile being kept low, and the back, high. The layers of manure are about 18 in. thick, and the dirt, about 6 in. The manure will compress to 3 or 4 in. Putting the manure on thick allows heating and fermentation to kill some of the weed seed.

Another reason for using manure fresh is that, if left to rot, manure loses about half its fertility content in a year or less. By composting as brought from the stable, we save much of this in the soil of the compost heap, also much of the urine content.

I top off the heap with the strawiest and poorest manure I have, and thus prevent the water, either from rain or melting, from running off. When grass and weeds begin to grow on the pile it is an easy mulch to pull or cut them out of.

Turning a compost pile is the deadiest dead job on a golf course. My 1927 pile has not been turned. I have kept it disced with a Fordson, letting weeds sprout, then running over it every now and then, putting plow wheels on the Fordson and plowing as deep as possible. Of course, the packed mass, excluded from air, will develop an acidity in which bacteria cannot work very actively; when a certain degree of acidity is reached Mr. Mike quits his job of decomposing. Others of the tribe require oxygen to carry on. But little loss and some chemical changes will take place on the whole. The mulched and aerated top will be run through a compost shredder, broken up and thus further aerated, left until needed and then screened, and the exposed top further disced. I don't believe the weeds brought in the manure cause much trouble, and any that survive the compost pile and germicide on the green will not stand the close mowing, shepherd's-purse being a possible exception. The greater part of the weeds that show up on the pile are, in my opinion, blown there. Even when manure fresh from the stable is scattered on the fairway an increase of weeds is not noticeable, but a marked improvement of turf is.

Removing Straw

It is not much trouble to get rid of straw residue. Our method is to take some old fence wire about 4 ft. wide with a 6 or 8-in. mesh, lay four pieces 30 or 40 ft. long side by side and fasten some slabs or 4x4's the width of each piece 6 or 8 ft. apart with wire staples. Fasten to a piece of 2-in. gas pipe for evenness, and hitch behind the tractor; run this over a few times at a good gait in the spring and there will not be much left to rake up. I know there are objections to the use of manure on a golf course—worms, grubs, etc.—but there is no proof as yet that fungus diseases are caused by it.

At the Water Hole --Two Lewis Washers help relieve the Tension!

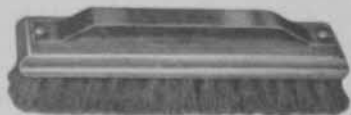
NO one enjoys waiting two or three foursomes to tee off—just step over to the side and see how much enjoyment it really is to give the whole lot of golf balls a Lewis bath. But, Mr. Pro or Greens Committeeman, don't let there be congestion about the Lewis. Provide two or three. Your members will appreciate the thoughtfulness.

Don't wait any longer. Order more Lewis Washers today. The patented automatic spring adjustment for the brushes makes Lewis Washers last twice as long. We gladly furnish information as to how the new adjustment can be installed on last year's washers.

"It's
a Lewis
Golf Ball
Washer"



Showing how the ball is washed in a Lewis Golf Ball Washer.



Showing brush with new self-adjusting spring

G. B. LEWIS COMPANY
Dept. No. 6D529 Watertown, Wis.

GOLF SHOWS

Yes! - - - - - or - - - - - No!

By "A MANUFACTURER"

CONSIDERING that we have in our U. S. A. 3,000,000 men and women who play golf to the extent of, conservatively, 120,000,000 games per season; no less than 300 manufacturers who produce golf course and clubhouse equipment, golf clubs, golf balls, etc., and that the game of golf in our country is contributing 50% of the support or not less than 120,000 families or 500,000 people, may it not be proper to ask that some organization give thought to the future promotion of golf in all its branches?

Recent golf shows in Chicago, New York and Buffalo, insofar as the experience of golf supply manufacturers, greenkeepers, professionals, and playing public are concerned, suggest the question.

Shall we continue to hold golf shows,

and should they be promoted by individual capital for profit, or would golf shows promoted by golf associations, by manufacturers of golf equipment, by employees of golf clubs or by the support of 3,000,000 golf players produce more interest and results? There may be a thousand different reasons suggested by a thousand different people why, with the exception of the 1927 Greenkeepers' exposition, none of the last three or four golf shows have been much of a success "as shows go" in creating additional interest and advancement for the game, its players and its workers.

Inasmuch as the functioning of the various golf associations has been, up to this time, rather exclusively in sections, lacking 100% private club co-operation in every section, and limited to executive



Have a Yellow Jacket in Every Locker

All over the United States "pros" and locker room stewards are making their club members feel as though they've broken par with the unique Yellow Jacket Shoe Trees. Folding, adjustable, finest aluminum, weigh hardly more than a score pad. Shoes as wet as the water hazard dry out in perfect

shape with Yellow Jackets. Your members' old brogans will last as long as their favorite putters, and always be comfortable. There's a nice profit in handling them. Write today for attractive terms. Paul & Beekman Mfg. Co., 1722 N. Fifth St., Philadelphia, Pa.

Sturdy Yellow Jacket Shoe Horns are fitting companions to the Yellow Jacket Shoe Trees. Colors from golf ball white to bunker green.



business meetings and the Green Section sessions insofar as the U. S. G. A. is concerned, it is hardly possible that a satisfactory arrangement could be made by such associations to promote the exhibitions called "Golf Shows," which would receive the financial support and undivided interest of the manufacturers and our 3,000,000 golf players.

The situation, as the writer sees golf shows today, is that we have, as before stated, 300 or more manufacturers of golf supplies who are vitally interested. We also have approximately 4,000 greenkeepers, 3,000 or more golf pros, and about 2,000 clubhouse managers, all of whom are very much interested, since their employment depends upon the interest of these 3,000,000 golf players and 50 or more established golf course architects.

Associations in the Picture

The house managers have an association; the pros, likewise, and in the past three years the greenkeepers have formed active sectional groups and a national organization. Now, it does not seem necessary that any one of these organizations should work at odds with any other since there appears to be a well-defined and

distinct line of demarcation between the duties of each, whether the club be large or small. Golf shows should not be retarded in golf promotion because of fancied differences as between pros and greenkeepers, house managers and pros, or any differences in views between these associations.

Personally, the writer cannot conceive how it would be possible for the Club Managers' association to endorse any program or policy which might work to the detriment of P. G. A. or the Greenkeepers' association. The other associations must also be given credit for a like policy inasmuch as all three of these bodies are devoting their efforts to the uplift and individual interests of each of their members, as they see it in their particular line of duty.

"Rag-chewing" Is Personal

We must admit there is, in certain clubs and in certain sections, a feeling of jealousy or animosity, and sometimes enmity, as between the greenkeeper and the pro or the pro and the house manager or the greenkeeper and the house manager, but these are to be considered only as personal differences.

DECREASE THE COST PER PLAYING DAY BY

Better Drainage

A season's overhead and maintenance expense can be spread over more playing days by perfecting the drainage of greens and fairways. Our study of soil types and topographical aspect leads to results that have lengthened the playing season clubs we have served three and four months.

We work co-operatively with architect or local contractor.



Better Irrigation

We are eastern representatives of the Buckner California System which has done so much to condition dry, arid courses and make games better and more enjoyable. Maintenance expense after installations engineered by us have been reduced 25 to 50%. Get ready for the sunbaked days now.

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Drainage — GOLF COURSE — Irrigation
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The Peerless Mower Sharpener



HUNDREDS OF GOLF CLUBS, large and small, now use the Peerless Lawnmower Sharpener.

It Perfects the cutting edges of any make of Mower

And That Means Perfect Turfs

The Peerless Mower Sharpener is the only machine that sharpens all makes of Power, Horse and Hand Mowers *scientifically—quickly—perfectly*—does the work as nothing else can. Operated by 1/3 H. P. Motor—attach it to your lamp socket. Special Grinding Wheel for sickles, scythes, etc. Skate sharpening attachment included. Will save its cost the first season. Write for catalog and list of users.

THE FATE-ROOT-HEATH CO.
988 Bell St., Plymouth, Ohio

The Peerless Mower Sharpener

It seems that, in justice to all, the associations, as legislative bodies, should not be condemned for the activities or personal animosities of an individual member of that association, and further, that the differences between certain individuals in certain clubs should not enter into the activities of associations.

Hundreds of cases of unfortunate personal differences may be cited by those intimately acquainted with golf club activities, which, of course, do not help anyone for any length of time, but do an irreparable damage to everyone concerned.

It seems obvious, however, that it is but a simple matter for the greenkeepers, house managers and professionals to forget personal animosities and admit to themselves that their own personal differences at their own clubs have nothing to do with their associations so that if it were possible to have the directorates of these three associations call a meeting for the promotion of golf, with the idea of staging golf shows, the interest, attendance and value of these shows could not be over-estimated.

Mixed-up Displays

Heretofore, Golf Show booths have been lined up approximately as follows:

- Booth No. 1—Lawn Mowers, etc.
- Booth No. 2—Golf Balls or Tees.
- Booth No. 3—Sports Clothing.
- Booth No. 4—Golf Magazines.
- Booth No. 5—Soil Fertilizers.
- Booth No. 6—Grass Seed.
- Booth No. 7—Kitchen Equipment.
- Booth No. 8—Moving Picture Projector.
- Booth No. 9—A New Golf Club Promotion Project or a Real Estate Subdivision.
- Booth No. 10—Another Fertilizer.


And so on with a heterogeneous mix-up of products which interest the player and something the player never hopes to see or learn about, and in the next booth displaying something not at all interesting to the man who paid an admission price to that golf show, which, in part, accounts for the lack of patronage and poor reports from past golf shows.

If it were possible for the above-mentioned three associations to arrange for a joint meeting and invite representatives from the 300 or so manufacturers of golf supplies for course, clubhouse and pro shop, the writer believes a golf show may be promoted which will attract interest from hundreds of thousands.

It is natural that each man should have

his own ideas on the best policy or layout or operation of a golf show, but a well-selected group of exhibitors plus the congenial co-operation of the greenkeepers', house managers', and professionals' association directorates would be the means of accomplishing a very important promotional exhibition, which should be worked out with the idea in mind, whatever profit might be made from such a show should be equally distributed to the three named associations. The charge of admittance, instead of being \$1.00, should be made approximately 25 cents in order to secure the largest possible patronage from the public, and the space rental for the manufacturers will be reduced to the minimum that every manufacturer may well afford all the necessary space to display his entire line of products and so equip his booth as to give each inquiry a satisfactory explanation of the use for which this product is intended.

There should be three distinct and separate divisions of a well-managed golf show in that the golf course equipment, house equipment and supplies shall all be so separated from the products in which the public are interested that there will



"The worms speedily come to the surface where they are removed without any damage to turf whatever."—James D. Young, Supt., Orchards Golf Club, South Hadley, Mass.

Get the Worms—
The superiority of Electric Worm Eradicator is demonstrated on more than 500 golf courses. It has a positive action in protecting the green and the turf.

ELECTRIC WORM ERADICATOR

Combination Offer No. 1 (Enough for 9-Hole Course)

25 gallons "ELECTRIC" Worm Eradicator;
1 READE 50-Gallon Sprinkling Cart;
3 1-Gallon Jugs, 1 Pint Measure;
1 Faucet.—\$105.00.

Combination Offer No. 2 (Enough for 18-Hole Course)

50 gallons "ELECTRIC" Worm Eradicator;

as questions arise, and a certain time could be allotted to each greenkeeper, or a set schedule for explaining his ideas on how to secure a perfect turf and economical maintenance. Golf course architects could have displays of courses they have built, and discuss, with club officers, the details and advisability of improvements on their courses.

The house managers should have many things to discuss with the visiting players to show how it is possible to eliminate dining room losses through increased patronage, and further, holding a question box for the managers to the end that a better service might be given from a well-regulated kitchen; methods of operating the locker room, grill service and such other branches of the house activities, which would be interesting to thousands of golf club members as well as house managers themselves.

Bookkeepers and auditors might find it well worth their time to set up a few booths for the explanation of simplifying house accounting and arrive at better systems for collecting house accounts from the members.

A real golf show should cover practically every detail, and if such a show were promoted by the three named associations with the assistance of manufacturers who sell to golf clubs, it would be a real place of education and entertainment which would attract the attention of practically every man and woman who is interested in golf.

We must appreciate the fact that the Greenkeepers' association has promoted and gone through with two exhibitions at Detroit and Buffalo.

THE modern green is marked by undulations which, however, have been often carried to harmful extremes. Undulations of a natural and easy type add to the appearance and sporting character of a putting surface. On the other hand, there are those greens which are so pitted and bumped with all manner of "terraces," "knobs," "hickeys," etc., that they have degenerated into the "freak" class.

**TO YOUR OWN CLUB BE TRUE
AND IT WILL FOLLOW**—that before ordering Charge Checks, Score Cards, Guest Registers, Caddie Cards and other forms you will first see our line of standardized golf printed matter.

JOHN H. VESTAL COMPANY
703 South La Salle Street - - Chicago

GREENKEEPING PROBLEMS in LEACH'S MAIL BAG

Arsenate on Fescue

Sir:

Have you ever experimented with arsenate of lead on fescue grass, especially Chewing's fescue?

We in the Northwest are in a district which is very favorable to fescue greens. Very good greens may be obtained with it very reasonably.

A. S. (Seattle).

Reply:

In the early days of my experimental work with lead arsenate, we had some very beautiful plats of Chewing's fescue growing in soil treated with very heavy doses of lead arsenate. Under the circumstances, I believe you will be entirely safe in treating this grass with arsenate of lead.

After satisfying ourselves that most grasses did well in arsenated soil, we discontinued the experimental work with many of these grasses, including fescues, simply because they are not used to any great extent in the East, their place having been usurped by the bent grasses.

B. R. Leach.

This Combination O. K.

Sir:

I have been using an application of sulphate of ammonia regularly on my greens once a month. This year I intend to experiment with arsenate of lead as a weed and worm eradicator. Would there be any danger in using both these chemicals on a green?

J. N. (New York).

Reply:

There will be no ill effects following the use of a combination of ammonium sul-

FRANK P. MACDONALD GOLF ARCHITECT

53 W. Jackson Blvd. Chicago, Ill.

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The Lark



A Sprinkler Which Gives EVEN DISTRIBUTION on any pressure

You will find the Lark an ideal sprinkler in every way. The far-throwing, slow-moving main stream is broken to prevent big drops which dig out the top dressing. Wind won't stop this sprinkler. A Lark is perfectly safe to set for an all-night run.

Try one 10 days at our expense. If you are not completely satisfied, return it to us.



\$15.00 Each

The "Lark" Sprinkles Evenly

- 125 ft. on 50 lbs. pressure
- 100 ft. on 40 lbs. pressure
- 90 ft. on 35 lbs. pressure
- 80 ft. on 25 lbs. pressure
- 60 ft. on 15 lbs. pressure

(Pressure readings at the sprinkler)

There is no other Sprinkler that gives such **even** coverage, from center to outside circumference regardless of pressure.

All parts brass, except the roller and the hose pipe.

L. R. NELSON MFG. CO.
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up these drains
for the
last time"**



(Photo of removal of broken rigid drain. Armco pipe ready to be installed.)

THERE is an answer to broken drains—a pipe that will not crack or break in spite of trucks, rollers, freezing water and heaving and swelling soils. Armco Perforated Iron Pipe cannot break *because it is flexible*. Put your drains down once and for all. Stop replacement annoyance and expense. Complete information on request. Write today.

Armco Culverts and drains are manufactured from the Armco Ingot Iron of The American Rolling Mill Company and always bear its brand.



Armco Culvert Mfrs. Association
Middletown, Ohio

ARMCO
Perforated
PIPE

phate and lead arsenate on turf. The two chemicals are entirely compatible.

B. R. Leach.

Chickweed; Top-dressing Sir:

(1) In using lead arsenate for weed control, how early would you start the treatment? One of our blue-grass and red-top greens has chickweed coming in pretty fast. How much should we apply per 1,000 sq. ft.? Would you recommend a second treatment; if so, how long after the first and how much?

(2) We fertilize during the month of May with milorganite, 300 lbs. to each green, which average 5,000 sq. ft. Would you split up that amount into more than one application? If you recommend sulphate of ammonia in the spring, how much and when should it be put on?

(3) We have never had any manure to put on our greens until last summer, when I used some soil from a field I plowed the year before. I took some wild land, manured it, raised a crop of rye, plowed it under, sowed buckwheat and soy beans the last of June, and plowed them under also. What do you think of this way to fix up dirt for applying to greens?

(4) Is it practical to change a blue-grass into bent gradually by the use of stolons each spring when top-dressing?

(5) On a 5,000-sq. ft. green, what is a light top-dressing, a medium one, a heavy one? Would you clip greens close in the spring?

A. S. (Wisconsin).

Reply:

There is a decided difference of opinion in some of the matters you bring up, and my replies, in last analysis, are simply my personal opinions.

(1) For chickweed control, apply lead arsenate as soon as growth starts, 5 lbs. per 1,000 sq. ft. If, after three weeks, small spots of the weed still persist, give them an additional treatment with the chemical, but not the green as a whole.

(2) Put all the milorganite on the green in one application in early spring or late fall. During the cooler growing season 30 lbs. per 1,000 sq. ft. is a good application; half this amount during hot weather.

(3) Your method of preparing top-dressing is O. K.; much better in my