

# Around the Office Desk

## Hubbard On Food Values

Ashtabula, Ohio.  
October 26, 1928.

Dear Mr. Morley:

After reading your genial letter, "Mac and I go East" the summing up of the brown patch problem being in a more confusing state than anticipated, suggests a thought to me that may have some value.

My reading on the nutrition question of the human animal is clarifying one cardinal principle on food values. For maintenance of health there must be an alkaline reserve. Diseased tissues are always bathed in acid surroundings. The vitamin is the actuating force that sets up chemical action necessary to making the new combinations from vegetable life into food combinations for animal life. Most or all diseases are preventable.

Now if health is only maintained where there is an alkaline reserve and if all animal life is either directly or indirectly dependent on the chemical laboratory of vegetable life it would follow that vegetable life must supply sufficient alkaline properties to support animal life, and, therefore the alkaline element in vegetable life should predominate also.

There is an old horticulturist in England that has maintained a fine nursery of fruits on just pulverized rocks, naturally several different stone formations are used. He does not use manure or manufactured products. He does not spray, neither does he have to combat parasites or fungi, and always has a clean fruit. An Oregon man is growing fruits on this principle.

Why is it that in every district there are plants that are indigenous and immune to destroying forces? In Brazil the home of insects and fungi there are delicate and luscious fruits in their forests free from blemishes. (I know.) My reading leads me to conclude that it is the presence of one of the elements that makes it unsuitable for insects or micro-organism to live on and sulphur has a conspicuous place in this. It may be that our grasses are getting too much nitrogenous food and too little alkaline mineral elements.

Formal education too often leads to rules of thought

that closes the mind to anything that is not orthodox. Look at the doctors, not one in twenty insists in curing constipation with natural foods, but rely on pills. They suggest some right foods, but do not insist on them. Constipation is unknown to all other animals than those that are house broken. It may be that our scientific agriculturists are like the doctors. Their principal aim has been to increase production and doubtless have made much progress in this, but at the expense of a well balanced plant.

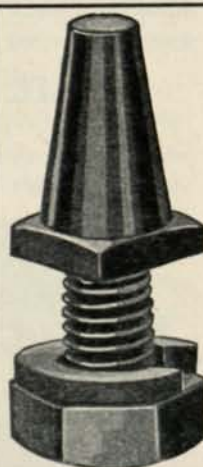
I like your thought of not forcing grass during the hot months. It fits in with mine. Nature intended that plants should undergo some drying up in hot weather and probably it knits the fibre into something stronger and better balanced for this change.

My reading is along the line of food suitable for us. It has been interesting and profitable. I have no training for scientific observations in actual practice only a taste for analytical deductions of its laws.

Dr. Amos F. Hubbard.

## Burkhardt Re-Elected

All retiring officers were re-elected at the annual meeting of the Cleveland District Association of Greenkeepers, November 5. Fred A. Burkhardt is president, Bert Sheldin, vice-president and Frank Ermer, secretary-treasurer. The association will give a dinner January 21 to green committee chairmen of the district.



## TRACTOR WHEEL SPUDS

The R. H. wheel spuds save time installing and removing, they are made in many sizes for any type tractor or purpose. Low price and quality has been welcomed by Golf Clubs, in use on 1000 clubs.

Sample spud and circular on request; advise make of tractor and purpose used for.

(If your Ford or Equipment dealer cannot supply, write direct).

**R. S. HORNER - Geneva, O.**

Manufacturer of  
Wheel Spuds, Golf Tractor, Golf Wheels  
for Fordson and Trucks

## FOR HEALTHY GREENS

Cleve-Brand Special Granulated

## CHARCOAL

Retains Moisture-Makes Soil Porous

**THE CLEVELAND CHARCOAL SUPPLY CO.**  
1125 Denison Avenue - - - Cleveland, Ohio

Get Our Prices On....

## Tractors - Mowers - Hitches

**E. G. STAUDE, MAK-A-TRACTOR CO.**  
2630 University Avenue St. Paul, Minn.



# Market Place and Buyers' Guide

Where reputable manufacturers and dealers list and describe their products. Greenkeepers are requested to write the Market Place for any special information they desire about supplies or equipment

## Ball Locators

Worthington Mower Company

## Ball Washers

J. Oliver Johnson, Inc.  
Worthington Mower Company

## Bent Stolons

Hubbard Nurseries  
O. M. Scott & Sons Co.  
Stumpp & Walter Co.

## Brown-Patch Control

E. I. Du Pont de Nemours & Co.

## Brown-Patch Disinfectants

E. I. Du Pont de Nemours & Co.

## Charcoal

Cleveland Charcoal Supply Co.

## Compost Distributors

Toro Mfg. Company

## Compost Mixers

Toro Mfg. Company

## Drainage Engineers

Wendell P. Miller and Associates

## Dump Carts

Toro Mfg. Company  
Worthington Mower Company

## Fairway Rollers

Toro Mfg. Company

## Fertilizers

Milwaukee Sewerage Commission  
Golf Course Supply Company  
J. Oliver Johnson, Inc.  
Lyman Carrier, Inc.  
R. L. Skove  
Virginia-Carolina Chemical Corp.

## Fairway Mowers

Pennsylvania Lawn Mower Works  
Toro Mfg. Company  
E. G. Staude Mak-A-Tractor Co.  
Worthington Mower Company

## Flags and Poles

J. Oliver Johnson, Inc.

## Flexible Steel Mats

J. Oliver Johnson, Inc.

## Hole Cups

J. Oliver Johnson, Inc.  
Golf Course Supply Co.

## Horse Drawn Mowers

Pennsylvania Lawn Mower Works  
Roseman Tractor Mower Co.

## Hose

Republic Rubber Company

## Humus

Hyper-Humus Company

## Lawn Mowers

Pennsylvania Lawn Mower Works  
Toro Manufacturing Company

## Manure

R. L. Skove

## Mole Traps

J. Oliver Johnson, Inc.

## Mowing Equipment

E. G. Staude Mak-A-Tractor Co.  
Toro Mfg. Company  
Pennsylvania Lawn Mower Works  
Worthington Mower Company  
Jacobsen Mfg. Co.  
Roseman Tractor Mower Co.

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## Mower Sharpeners

Fate-Root-Heath Company  
Toro Manufacturing Company

## Power Mowers

Toro Mfg. Company  
Golf Course Supply Co.  
Worthington Mower Company  
Jacobsen Mfg. Co.  
Roseman Tractor Mower Co.

## Putting Green Mowers

Toro Mfg. Company  
Pennsylvania Lawn Mower Works  
Worthington Mower Company  
Jacobsen Mfg. Co.  
Roseman Tractor Mower Co.

## Rakes

Pennsylvania Lawn Mower Works

## Rough Mowers

Toro Manufacturing Company  
Jacobsen Mfg. Co.  
Roseman Tractor Mower Co.

## Seed

Lyman Carrier, Inc.  
O. M. Scott & Sons  
Golf Course Supply Company  
J. Oliver Johnson, Inc.  
J. L. Radwaner Seed Co., Inc.  
Robert F. Leesley Co.

## Sod Cutters

J. Oliver Johnson, Inc.

## Sprinklers

L. R. Nelson Mfg. Co.  
Buckner Mfg. Co.

## Sprinkling Carts

Reade Mfg. Company

## Tee Markers

Worthington Mower Company

## Tractors

R. S. Horner  
E. G. Staude Mak-A-Tractor Co.  
Toro Mfg. Company  
Worthington Mower Company  
Roseman Tractor Mower Co.

## Tee Mowers

Toro Mfg. Company  
Jacobsen Mfg. Co.

## Tractor Wheels and Spuds

R. S. Horner

## Water Systems

W. A. Buckner Mfg. Company

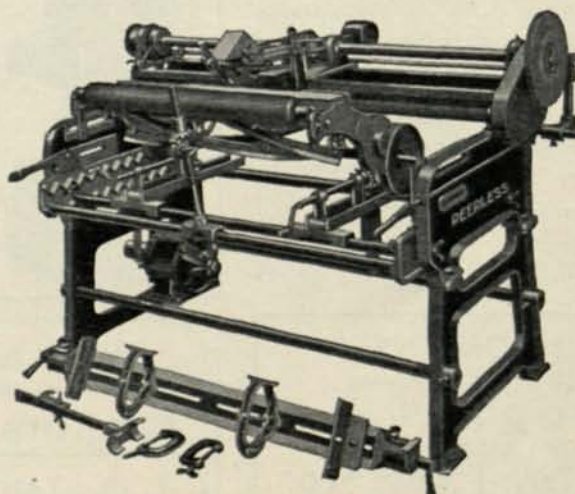
## Worm Eradicators

Reade Mfg. Company

## Care of Grass-Cutting Units

In this age of machinery the greenkeeper and Green committee of every progressive golf club should be interested in equipment which will make theirs one of the popular golf courses in their district.

One of the important things in golf course maintenance is the care of grass cutting units. Mowers should be kept in condition at all times, and adjusted to cut the same length which means uniform greens. Badly



PEERLESS MOWER SHARPENER



set and dull mowers will do great damage to the turf, especially in hot weather, as they bruise the grass instead of cutting it clean, and then the sun will burn more readily.

The Peerless Lawnmower Sharpener is claimed to be an efficient, economical, durable and dependable machine which will keep cutting implements in first-class condition. The spiral knives of hand mowers and 30-inch units are sharpened without removing them from the mower, and to conform with the lower blade. This means that mowers sharpened by our method are given a razor-like edge in 15 to 20 minutes and can be correctly adjusted in the mower. The revolving cutter knives can be set to close even contact with the cutter bar, which gives a clean smooth grass clip and will not bruise the grass or injure the roots.

The Peerless is equipped with rapid traverse reversing screw which returns the grinding head to the left side or starting point thus saving time in grinding. A new supporting rest has been added for holding putting green mowers with 8-inch rollers placed behind the cutting reel. The main shaft is carried on New Departure ball bearings. The grinding wheel has special ball bearings and is driven with roller block chain. All parts are interchangeable.

Practical demonstration of this Peerless lawnmower sharpener manufactured by the Fate-Root-Heath Company of Plymouth, Ohio, will be given at the Annual National Greenkeepers Golf Show to be held in Hotel Statler, Buffalo, February 13 to 16, 1929.

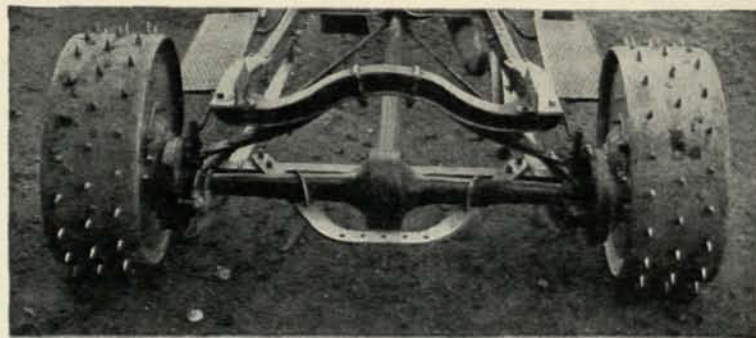
## Grass Seed of Known Quality

TESTED for PURITY and GERMINATION

Prices and information on request

*Stump & Walter Co.*

Specialists in Golf Grass Seeds and Equipment  
30-32 Barclay St., New York



ROSEMAN'S NEW TRACTOR ATTACHMENT

### *Roseman's New Attachment For Ford Chassis*

The Roseman Tractor Mower Company have just announced a new and improved tractor attachment for the new Model "A" Ford, whereby a very serviceable and economical tractor can be had at an inexpensive price.

Electric self-starter, electric lights for night work when desired, four wheel brakes, oil pump, self-contained water pump, Houdaille shock absorbers, speedometer, latest improved gasoline saving carburetor and an exceptionally powerful motor are found in the Ford chassis. To this has been added extra wide 12-inch convex face and extra stout steel wheels having an internal steel gearing and flanged pinions which assure noiseless traction, 25 per cent increase in speed, 20 per cent increase in power and positive alignment.

All four wheels operate on roller bearings especially built for this type of tractor, and since the entire tractor may be serviced by your local Ford dealer, there will be no occasion for loss of time; however, it is doubtful that any service of a serious nature will ever be required inasmuch as the Ford power plant is worked to only 50 per cent of its capacity.

The Model "A" tractor is equipped with either pneumatic tires or 6-inch convex face steel wheels in the front, while the rear wheels are spudded to insure traction, prevent slippage and aerate the soil.

When equipped with a dump body this Model "A" tractor becomes a

golf course utility which the makers claim has no equal; it will save the price of itself every season through elimination of labor when hauling sand for the traps, greens, tees, hose, seed, fertilizer, top dressing, putting green clippings or any other material or tools on the course. It is also used to transport coal, ashes, garbage or clubhouse supplies.

### *Night Mowing*

The Worthington Mower Co., at Stroudsburg, Pa., has just published a circular entitled, "Some Interesting Comments from the Walker Cup Matches at Chicago."

This little circular describes the night mowing operations whereby the entire fairways of this long championship course were cut every night by two Worthington Quints in about seven hours. Illustrations of this work are shown.

Anyone interested in night mowing next year would do well to get a copy of this circular which will be sent free upon request.

### *Control of Brown Patch*

In considering plans for turf culture next season no subject is of more importance than that of controlling both small and large brown patch. Provision for such control must be made in the budgets you are now making up. When considering ways and means, it will be well worthwhile to look into the merits of Turf-calomel, which, brought out last year, won the interest of many prominent in the control of brown patch. It



followed close upon knowledge gained from practical experiments.

Turfcalomel is a mixture of Calomel and Corrosive Sublimate of special bulkiness, blended with a material, particularly adapted for making a finished product with special spreading properties, and one which will not burn the turf. The same results cannot be obtained with the chemicals alone or with the chemicals mixed with sand or compost.

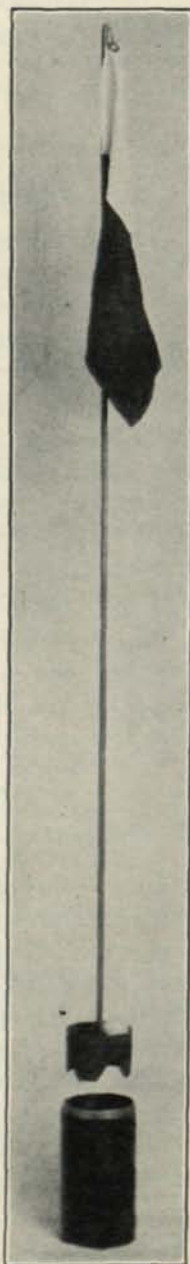
A bulletin fully descriptive of Turfcalomel, and methods of applying, will be sent to any one interested, free, on request made to Merck & Co., Inc., Rahway, N. J.

### Sparks Patented Cup

Don Sparks, 1302 South 18th, Chickasha, Okla., is offering to the public a patented putting green cup designed especially for sand greens on Southern courses.

One of the objects of the invention is to facilitate the removal of sand which may drift into and accumulate in the cup. The ball may enter the hole from any direction while the flagstaff is in place, and may be lifted from the hole with the flagstaff, if desired.

The base of the flagstaff consists of a circular casting, having a forward extending peripheral flange with a steel flagstaff which is permanently attached to the center of the casting, thus causing the flagstaff to stand erect and vertical at all times when in place.



### Natural Fertilizers

"The use of natural fertilizers" writes R. L. Skove of the R. L. Skove Co., at 17014 Maple Heights Blvd., Bedford, Ohio, "has played a very large part for quick and permanent results in landscapes and golf courses in and around Cleveland this year."

When the park department of the city landscaped and beautified Wade Park they chose natural fertilizers for the foundation of all the plantings and lawns, which was mostly cow manure furnished by the Skove Co.

For the new Willowick and Country Clubs, the former designed by Koss and the latter by Flynn, the Skove Co. furnished over two thousand cubic yards of manure, which was worked into the fairways and greens.

"A two-ton load of cow manure or horse manure," continues Mr. Skove, "costs less than one-half the price of one ton of the average commercial fertilizer. In addition, it holds one hundred per cent more moisture by forming humus as it further decays, helping drainage and adding plant food over a period of years instead of months. These are just a few of the vital factors you should think about when buying plant food for your shrubbery, garden and lawn."

### Sports Turf

It is very pleasing to mention a very handsome catalog entitled, "Sports Turf" issued by Peter Henderson & Co., 35-37 Cortlandt Street, New York City. This company has been closely associated with everything pertaining to turf production for over eighty years. In fact, the first golf course laid down in America, the old St. Andrews, was seeded with a special mixture of Henderson's grass seed under their own personal supervision.

"Sports Turf," says Mr. H. M. Henderson, vice president of the company, "is a complete history of turf production from its inception, to the final cutting, for all types of athletic



## Another Advancement

### In Fairway Mowing

Although, from the first, the PENNSYLVANIA "New" Fairway Quint and Trio had fewer parts than any other machine of its type on the market, PENNSYLVANIA engineers have succeeded in still further simplifying it and thus in reducing still further its operating and maintenance cost.

In addition, several important refinements have been added to the "New" Fairway, including an improved throw-out clutch and a higher speed cylinder which insures smoother, truer cutting than ever.

Write for complete details and for literature describing the other mowers in the complete PENNSYLVANIA Quality line for Golf Courses.

PENNSYLVANIA  
LAWN MOWER WORKS

1645 North 23rd Street  
Philadelphia, Pa.

**PENNSYLVANIA**  
Quality  
**LAWN MOWERS**

sports, giving in detail the method of preparation of the ground, drainage, kinds of seed and fertilizer required and also the quantity; how and when to seed, care, upkeep, etc. In short, we have endeavored to make it a reference book for all those interested in the production of the finest turf for golf and athletic fields."

The company states that they will be able to furnish a copy free to any greenkeeper or Green committee chairman upon request.



## Poa Bulbosa

A new circular describing the much discussed grass, *Poa Bulbosa* has just been issued by the Stumpp & Walter Co., grass specialists, 30-32 Barclay Street, New York City. This is the only grass known which grows from bulbs and is strictly a winter grass. When planted with Bermuda grass it thrives and stays green through the winter dying down when the hot suns of spring come along.

In other words *Poa Bulbosa* gives a green, velvety turf during the winter when Bermuda grass is brown, but instead of dying out in the summer like redtop and rye grass it comes again in the fall without replanting so when combined with Bermuda it furnishes a permanent all the year round turf.

It is only recently that the commercial supply of *Poa Bulbosa* could be had. Anyone interested should write immediately to the Stumpp & Walter Co., and get a copy of this interesting circular which gives prices and all details.

## Jacobsen Improves Mower

A new catalog which is to feature the Jacobsen line of power putting green mowers is just going to press. It will describe the Jacobsen line of equipment, give some interesting figures and reports on putting green upkeep costs from different courses throughout the country, and will contain much other information of interest to golf clubs and to greenkeepers especially.

Again the Jacobsen line for 1928 will introduce some new features. Heretofore they have built a 19-inch power putting green mower and a 24-inch mower each differing somewhat



**JACOBSEN PUTTING GREEN MOWER**

in design. The best features of each mower have now been combined to make one standard design which will be supplied either with a 19-inch or a 24-inch cutting width.

This procedure will reduce the cost of production and naturally result in advantages to Golf Courses, particularly those using batteries of one or more mowers.

Having for years closely followed the problem of cutting putting greens, the Jacobsen Company exerts its efforts along consistent and practical lines. From the beginning their mowers have been a success, but they have never been content to "rest on their oars." Continual improvement in their line and the introduction of new features have kept pace with changing conditions in greens.

The present year saw a marked trend toward greater efficiency in green upkeep, and this trend made itself felt in the sale of Jacobsen mowers. Every indication points to still greater interest during the coming year.

Some recent developments of the Jacobsen Company are a greens brush that is easily attached to or detached from the power mower, and a transport cart which carries the mower from job to job under its own power but without wear and tear on the mower.

Plans have been made for a complete exhibit of the Jacobsen line at the National Greenkeepers Golf Show, Buffalo, February 13 to 16.

## Cocoos Bent Greens

The Wichita Country Club of Wichita, Kansas, claim to be the first club east of the Rocky Mountains to have 18 Cocoos Greens.

These greens were planted March 15, 1927, seeded at the rate of 30 pounds to 6,000 sq. ft. and were put in play three and one half months after planting.

The manager of the club, Mr. F. F. Bergier, reports they had a little small brown patch this season but recovered quickly. Cocoos stands the dry hot weather of Kansas in fine shape and Mr. Bergier claims Cocoos bent to be the best of all grasses for putting greens in their section.

Edward O'Brien, greenkeeper of the Fresh Meadow Country Club of Flushing, Long Island, introduced Cocoos Bent seed into his greens in August, 1924, at the rate of 20 pounds to 5,000 sq. ft. and claims there is nothing better for putting greens.

## Creeping Bent Stolons

"Your magazine has brought many inquiries," writes A. F. Hubbard of Ashtabula, O., "and I esteem your valuable publication very highly."

Mr. Hubbard raises creeping bent stolons and says that the confusion of the Washington strain has caused much perplexity.

"Some of this arises from the fact" continues Mr. Hubbard "that it varies according to soil on which it is grown, and so it is not easily compared, but certain it is that at one time the Arlington nursery sent out samples of strains other than the one requested and the recipient not being alert took

## ELECTRIC WORM ERADICATOR

**Eliminates Worm Casts  
Prevents Brown Patch  
Stimulates the Greens**

Every gallon of "ELECTRIC" makes 250 gallons of solution, enough to cover 3,000 sq. ft. Price, \$3 per gallon. Shipped in 5, 10, 15 and 50 gallon containers. Measure and glass jugs for handling, supplied free.

Write for free folder—today

**READE MFG. COMPANY**  
195 Hoboken Ave. Jersey City, N. J.

## Greener Greens

### Try This Top Dressing

Mix sharp sand, good top soil and Hyper-Humus, equal parts by volume. Hyper-Humus supplies the necessary organic matter in convenient and economical form.

Write for prices and FREE Booklet

**HYPER-HUMUS COMPANY**  
48 Park Place Newton, N. J.

**Hyper-Humus**  
TRADE MARK REGISTERED  
"Puts the Top in Top Soil"





**NOW!**  
for that  
long  
needed

## DRAINAGE

No need for next season to be another struggle to maintain playable greens and fairways at extraordinary expense. Courses serviced by our specialized drainage engineering have extended their playing seasons three and four months and also reduced maintenance cost 25% to 75%. Now is the time. We work co-operatively with the architect or local contractor.

**WENDELL P. MILLER**

*and Associates*

GOLF COURSE DRAINAGE

Engineers - - Constructors

208 So. La Salle St., Chicago

85 East Gay St., Columbus, O.

it for granted that it was what he expected and so perpetuated an error. I know for I raised one field of Columbia Number 9 thinking it to be Washington, this was in 1923. I have correspondence from many sources and have almost come to the conclusion that Arlington has mixed things up.

"Should anyone be interested I have now under cultivation five distinct strains of Washington. 1 from Arlington in 1922, another from there in 1925; 1 from Cherrydale, Va.; 1 from Scott; 1 from Carrier.

"These plots are being mowed and being planted on the same soil so a comparison can be made. Also there are several plots of other bent strains. My nursery is in fine shape and is kept free of weeds."

### *The Value of Humus*

The chief value of humus as all authorities agree lies in the nice texture it gives to soil. Among the brands of humus which also have a mineral value is Soilife, which is manufactured by the Soilife Humus Co., Inc., 721 Genesee Bldg., Buffalo, N. Y. We publish herewith a condensed report of this product from the most reliable analyses, including those from such well known chemists as Gascoyne, Textor and Wiley.

Nitrogen .....	2.55	3.01
Ammonia equivalent ....	3.10	3.66
Available phosphoric acid. .	.45	.48
Insoluble phosphoric acid .	.07	.16
Total phosphoric acid ....	.52	.64
Potash—water soluble ...	.11	.20
Calcium oxide .....	12.40	9.55
Magnesium oxide .....	.10	.08

Soilife so the makers claim, is mined from deep deposits of decayed plant life, which has been buried and accumulating for thousands of years. After being taken out the surplus of water is removed by special machinery and then before it is ready for shipment it is further refined by grinding and screening. After being thus concentrated Soilife is now equal to many times its original bulk, and is pleasant and easy to handle because of its dry and uniform state.

For new construction Soilife is highly recommended. After rough grading has been finished the Soilife should be spread at the rate of from 500 to 600 pounds to the thousand square feet, and raked enough so as to have nice mixture with the surface soil. Then proceed in the usual manner with leveling, raking, seeding, light rolling, and thorough watering with a fine spray.

Soilife is sold in the east by the I. L. Radwaner Seed Co., 115 Broad St., New York City, and in the west by the Mid-West Sales Co., 30 North Michigan Ave., Chicago, Ill.

### *Ferguson Moves To Chicago*

L. A. Ferguson, who for the past ten years has been factory Sales Manager of the Ideal Power Lawn Mower Company of Lansing, Michigan, recently withdrew from his duties at the manufacturing plant to assume charge of the company's branch office at 413 West Chicago Avenue, Chicago, Illinois.

Under Mr. Ferguson's management the sales territory of the Chicago branch is to be considerably enlarged to include the states of Indiana, Tennessee, Iowa, Missouri, Kentucky, Il-



**L. A. FERGUSON**

*New Chicago manager of Ideal Power Lawn Mower Company*

linois, Minnesota, Wisconsin, and eastern Kansas and Nebraska.

Less than a year ago the Chicago branch of the Ideal Company took over their present quarters to give more space and better facilities and during the past season the progress made in the Chicago district and territory handled from Chicago has warranted the enlarged territory arrangement and increased activities in this big, wealthy, fast growing middle west section.

Mr. Ferguson announces that the personnel of the Ideal Chicago branch will include Joe M. Egloff, Charles P. Dabbs, H. O. Erickson, R. E. Hebbeler and Ed Beuscher.

Charles S. Smith, secretary of the Ideal Power Lawn Mower Company, will take over Mr. Ferguson's duties as Sales Manager, and will be assisted by William L. Austin, Assistant Sales Manager.

### *Worthington Opens Office*

J. B. Hurlock of the Worthington Mower Company, Stroudsburg, Pa., has opened a new office for his company at 1101 Hippodrome Bldg., Cleveland, Ohio. Mr. Hurlock will handle all of the Worthington business in the Middle West, east of the Chicago district. Mr. Hurlock is well-known in the trade and his coming to Ohio is welcomed by greenkeepers and golf club officials.



# Attention Southern Greenskeepers

## GREENS FLAGS



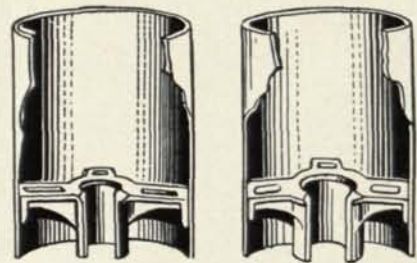
Numbered - - - \$ .55  
Plain - - - .40  
Red, White or Orange

## HOLE CUTTERS



Each - \$7.50

## RUSTLESS HOLE RIMS



For 3/8" Pole - - \$1.25  
For 1" Pole - - 1.25  
For 1 1/2" Pole - - 1.25

*Grass Seed  
Fertilizers Equipment*

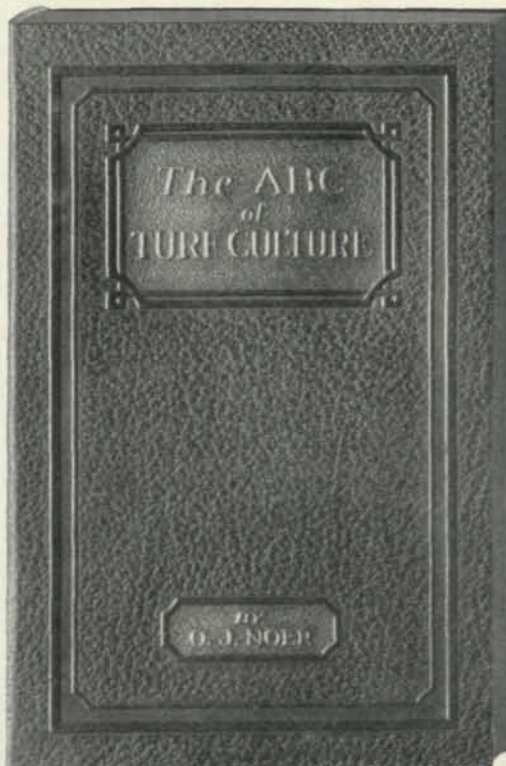
# J. OLIVER JOHNSON, Inc.

*World's Largest Golf Course Equipment House*

MORGAN, HURON AND SUPERIOR STS.

CHICAGO, ILL.

© Reg. JOJ Inc. 1928



*Embossed Art Leather Binding—  
Pocket Size*

*Price—\$3.00 Postpaid*

# ABC of Turf Culture

by O. J. NOER

The most practical and complete treatise on the growing of turf grasses ever published. Written in simple language which the layman can understand. A textbook on turf culture and soil chemistry.

The author combines a university education on this intricate subject with an intensely practical experience in golf course maintenance work throughout the United States.

## A Reference Book for Every Day Use

### CHAPTER HEADINGS

Factors Affecting Turf Growth  
Effect of Size and Arrangement  
of Soil Particles on Turf  
Growth

The Part Water Plays in the  
Growth of Turf

The Functions of Organic Mat-  
ter in the Soil

Soil Composition and How  
Plant Food Becomes Avail-  
able

The Nature of Soil Acidity  
and Effect of Fertilizer Ma-  
terials on Soil Reaction

Lime in Sand, Soil or Water  
Often Overcomes Acidic  
Properties of Sulphate of  
Ammonia

Essential Plant Food Elements  
and How Plants Feed

Elements and Characteristics  
of Various Groups of Fer-  
tilizer Materials

Composition and Properties of  
Individual Fertilizer Ma-  
terials

Principles Underlying the  
Practical Use of Fertilizers  
on Greens and Fairways

## The National Greenkeeper, Inc.

405 Caxton Bldg. - - Cleveland, Ohio