

— PATENTED —

Kaddie Kart

NOW READY FOR DELIVERY!
Including All Repair Parts

Ball Bearing wheels, grease reservoirs good for 2 to 5 years. Light durable construction capable of withstanding hard use, neglect and abuse. All parts interchangeable and easily repaired. Ideal for rental fleets. Long axles, 28½" wheel base for hilly courses and 22½" for flat courses. Feather tip patented balance. Proven invincible and the choice of nearly every golfer. Write for full details including price and state number you want. *We will finance your fleet if necessary.*



NEW KARTS
NOW READY FOR DELIVERY

In any quantity on 24-hour notice

**BUY
DIRECT
FROM
FACTORY**

GOLF CART SUPPLY CO.

Manufacturers of Kaddie Kart Products

OFFICE
82 W. WASHINGTON ST.

CHICAGO, ILL.

FACTORY
1466 W. MADISON ST.

PATENTS

Kaddie Kart patents cover the principle of balancing the weight of the clubs and bag over the axle. No other device can use this principle and you can get this balance that eliminates all weight carrying only in a genuine Kaddie Kart.

Patent suits are now pending in the Federal Courts to protect these principles.

GOLF CART SUPPLY CO.
1466 W. MADISON ST.
CHICAGO 7, ILL.

Please send me information about Kaddie Karts for Club Use,
for Individual Use.

Name.....

Address.....

City..... Club Name.....

Outlines Training Program for Course Apprentices

By JOHN E. MORLEY

Club officials seldom realize the extent to which greenkeepers are planning training of young men needed by the increase of golf and the high maintenance standards today's greenkeepers have provided for golfers.

The PGA also is concerned about the problem of training young pros competent to serve the expected increase of clubs and golfers.

John E. Morley, son of the late founder of the National Association of Greenkeepers, spoke before the GSA convention on possibilities of a tie-up between the greenkeepers' national organization and the Dept. of Labor Apprentice Training Service. His remarks outline the job that will have to be done by greenkeeper and pro organizations in fitting into the GI Bill of Rights training projects.



PASSAGE OF THE so-called G. I. Bill of Rights has made America conscious of its responsibility to its returned soldiers, their rehabilitation, readjustment, and training for a worth-while vocation.

Schools, colleges, state and federal agencies are called upon to assist in this program. One of these agencies, the Apprentice Training Service of the United States Department of Labor, has been charged with the responsibility for the promotion and establishment of training programs for recognized skilled trades. It is also the duty of this organization to assist in the establishing of new trades by careful study of their work processes and the required related instruction necessary to make an efficient artisan.

There are today about 150 skilled trades and occupations recognized by the Federal Committee on Apprenticeship, which is the approving body for apprenticeable trades within the Department of Labor. The majority of these trades were formerly in the manufacturing and construction industry, but today an ever increasing number are to be found in the service fields.

While greenkeeping was established in some European countries as a skilled occupation and the recognized approach for preparing a man for this vocation was through apprenticeship, it has never been so established in this country. Whether one should serve an apprenticeship or pursue a course of academic training to

qualify as a greenkeeper has been a question of diversified opinion. A tremendous increase in the number of golfers and golf courses has caused the maintenance factor to become more and more important.

Many greenkeepers have given freely of their time and efforts and passed on to others in the profession the knowledge gained by their experiences. The skills and knowledge of all greenkeepers should be preserved and passed on to those who so ably defended our way of living, many of whom are greenkeepers' sons and grandsons.

Need of Greenkeepers Grows

In order to keep abreast of the ever increasing popularity of golf it is necessary to have available personnel with the skill and technique at all times and under all conditions and courses upon which the golfer may demonstrate his skill and interest in the game. A badly kept course has caused more than one golfer to swear off the game, so to speak, while even a dub gets a thrill from putting on a piece of green velvet. Only the greenkeepers know the answers to the problems of their vocation, and perhaps by working through their own committee in cooperation with the Apprentice Training Service, a plan could be developed by which all embryo greenkeepers would progress step by step in acquiring the knowledge and experience so essential in this field.

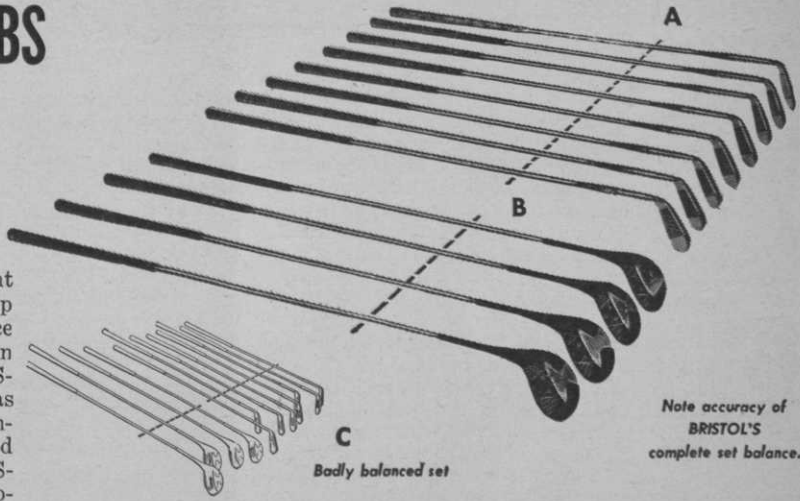
There are three methods of approach to the greenkeeper training problem.

1. College training that might leave the learner deficient in the practical part of the work.
2. An on-the-job training plan which would allow the learner to progress only on a catch-as-catch-can basis without the technical knowledge which is fundamental.
3. Through a systematic apprenticeship program which would include both the practical manipulative skills and the technical related instructions, which could be acquired during the winter months at school. This method to be used only if the greenkeepers' group desires to be classified among the skilled artisans and be recognized as a skilled craft, the same as the cutters of fine gems.

If it is the wish of the Greenkeeping Superintendents Assn. to become recognized as a skilled craft, these steps should be followed:

PUT A "FEEL" OF RHYTHM IN YOUR SWING with these NEW PERFECTLY-BALANCED BRISTOL CLUBS

SEE to what a high point of accuracy . . . to help your golf game . . . balance has now been developed in these handsome, new BRISTOL Clubs. Each club has a feather-fine balance. Complete sets, too, are balanced to hairline nicety. BRISTOL'S high-precision production practices now *in-build* this balance with extreme accuracy. The first time you swing one of these new BRISTOL Beauties on tee or fairway, you'll thrill to this big golf-club-making achievement. Your club has just the "feel" you've always longed for. The "feel" of controlled power! The "feel" that helps put more rhythm in your swing! Waggle one of these new BRISTOL advanced-type clubs at your first opportunity. You're sure to agree that it can add a lot to your golfing pleasure.



Note accuracy of BRISTOL'S complete set balance.

Badly balanced set

Again BRISTOL contributes importantly to fine golf club making. The "swing-weight" balance of BRISTOL Clubs is a notable precision-manufacturing accomplishment. "Swing-weight" balance is worked out through an intricate mathematical formula based upon club weight and length. A club's perfect "feel" in the hands of the player . . . that "feel" which inspires confidence for better shots . . . arises from the nicety of its "swing-weight" balancing by its makers.

For example: Witness the even alignment of the club heads as BRISTOL iron clubs in the illustration above are placed across balance line (A) and BRISTOL wood clubs across balance line (B). This illustrates graphically how BRISTOL, with micrometer exactness, gives every club its own proper weight and length to produce correct "swing-weight," not only for each club, but for the entire set. (Ragged alignment of club heads in diagram (C) indicates absence of such careful balancing.)

Hit
Better Shots
with the
NEW

Bristol
THE HORTON MANUFACTURING CO.
BRISTOL, CONNECTICUT
GOLF CLUBS



Also Makers of
BRISTOL
FISHING RODS • REELS • LINES

● Advertisements with messages such as that on this page now feature regularly the many superiorities of BRISTOL'S handsome new sets of matched golf clubs before the more than 5,000,000 habitual weekly purchasers of LIFE.

1. Select a small committee of competent greenkeepers that will draft a plan which will apply to the over-all coverage and training by which a greenkeeper may be trained to the point where the members of the Association would be proud to say, "We trained that man."

2. The GSA committee would then submit its plan to the Federal Committee on Apprenticeship with a resolution from the GSA membership, stating that this was the practical way to train greenkeepers.

3. The GSA would then be informed if the Federal Committee on Apprenticeship recognized this occupation as apprenticeable. It is possible, however, that they may decide that this type of work falls within the jurisdiction of the professional fields and would not be considered as an apprenticeable trade, and that one of the other methods of training would be more suitable.

Should this be found to be an apprenticeable occupation, all graduates from the plan would receive a certificate of completion of apprenticeship issued by the Federal Committee on Apprenticeship as evidence that they had learned their trade successfully from a plan developed by the best possible knowledge within the Greenkeepers organization. With that thought in mind, I present a suggested schedule of work processes and related instructions for the training of greenkeepers, as developed by field representatives Baxter and Ferguson of the Federal Committee on Apprenticeship Youngstown office, after consultation with a number of GSA members.

Maintenance and Repairing

all Machinery	10 Months
Sharpening of Tools.....	1 Month
Maintenance and Repairing	
Water System	1 Month

Golf course drainage.....	3 Months
Analyzing of Soil.....	2 Months
Grasses and Soil they are adaptable to	6 Months
Fertilizers and their uses.....	6 Months
Eliminate Weeds and Foreign Grasses	1 Month
Disease and cures.....	4 Months
Supervision of Personnel	1 Month
Maintenance of Greens and Fairway	1 Month
Trees and Shrubs.....	2 Months
Making compost and topdressing	3 Months
Nursery	3 Months
Maintenance of Tennis Courts.	1 Month
Maintenance of Roads.....	1 Month
Spraying of Trees and Shrubs..	1 Month
Painting	1 Month

RELATED INSTRUCTION

Kinds of grasses
Analyzing of Soil
Difference in Fertilizer
Landscape Design
Kinds of Chemicals and Uses
Kinds of Weeds
Use and Care of Tools
Maintenance of Motor Equipment.

I believe there are hundreds of young men coming out of the service and wondering about some of the occupations they have heard about. All of us realize there are only a certain number of courses that have the equipment to train a competent greenkeeper. I believe we also realize that if we were to overcrowd this profession we would be doing it an injustice, for the simple reason that the overcrowding of any profession brings about a very bad condition. Therefore, in adopting a program such as this, greenkeepers would also set up the number of greenkeepers they felt should be trained in this industry.

Relation Between Nozzle Orifice, Pressure, and Speed For Large Scale Equipment

(The figures are based on information included in the mimeographed paper by Dr. W. A. Harvey, Botany Dept., Calif. Agr. College, Davis, Calif., entitled "Equipment for Spraying Weeds" Nov. 1945.)

Distance between tips on boom	Required discharge in gallons per nozzle per minute to deliver 200 gallons per acre at varying speeds			
	1 mile/hr.	4 miles/hr.	5 miles/hr.	10 miles/hr.
12 inches.....	0.4	1.6	2.0	4.0
14 inches.....	0.468	1.872	2.34	4.68
16 inches.....	0.532	2.128	2.66	5.32
18 inches.....	0.6	2.4	3.0	6.0
20 inches.....	0.668	2.672	3.34	6.68

Diameter of orifice in inches	Pressure in pounds per square inch required to discharge varying quantities (in gallons) per minute								
	0.4	1.0	1.6	2.0	2.4	2.8	3.2	4.0	5.0
0.039 in.....	±80								
0.046 in.....	>50								
0.059 in.....	—	100							
0.078 in.....	—	<50	±105	±170					
0.099 in.....	—	—	<50	±65	±100	±135	>170		
0.116 in.....	—	—	—	—	<50	±58	±75	±115	
0.147 in.....	—	—	—	—	—	—	—	<50	±68

LOUISVILLE
POWER-BILT
GOLF CLUBS

BUILT
RIGHT TO
PLAY RIGHT

FOR
EXCLUSIVE
PRO SALE

FINER
THAN EVER

THE strict adherence to one policy in the sale of Power-Bilts has established Hillerich & Bradsby in the pro-sale field. *A quality product made to exacting specifications by masters in the golf club art—sold only by professionals.*

As materials become more plentiful, your Power-Bilts will be coming through faster—but now as always before—only so many will and can be made as the available materials of Power-Bilt standard can be obtained.

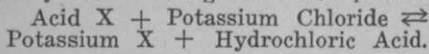
HILLERICH & BRADSBY CO., Inc.
LOUISVILLE, KENTUCKY

Effect of Acidity

(Continued from Page 44)

insoluble, and less readily available, than any of the calcium phosphates. That is the reason acid soils reduce the efficiency of applied phosphates, other than organic forms such as bone meal.

Muriate and sulphate of potash are the sources of potash used as fertilizers. The muriate (called potassium chloride by the chemist) is slightly cheaper than the sulphate. It is the one used on grass and most crops. The effect of either one when used on an acid soil is to increase the active acidity temporarily, but the final effect is to reduce the acidity, as illustrated by the following chemical equation:

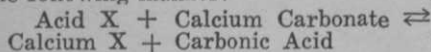


The hydrochloric acid (the chemical term for muriatic acid) is soluble and leaches out in the drainage water. So the final effect of the potash fertilizer is to change Acid X to Potassium X and thereby reduce soil acidity.

Lime and gypsum are commonly called soil amendments because they are not considered as essential plant nutrient materials. Their function is an indirect one, to make conditions favorable for growth. The mechanism involved when used on an acid soil, is not generally understood.

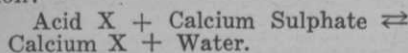
Ground limestone, hydrated lime, and quicklime are the three forms of lime which can be used to correct soil acidity. Calcium carbonate is the active ingredient in limestone. The other two forms of lime are derived from it. Quicklime (calcium oxide to the chemist) is formed when limestone is subjected to intense heat in a kiln. The residue is calcium oxide, or quicklime. It reacts with water to form hydrated lime or calcium hydroxide. Calcium Oxide + Water = Calcium Hydroxide.

When ground limestone is applied to an acid soil, it reacts with soil acids in the following manner:



The carbonic acid is a very feeble and unstable acid. It breaks down into water and carbon dioxide gas, which escapes into the air. Thus there is an immediate reduction in the active acidity.

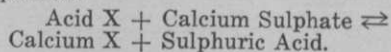
Hydrated lime and quicklime are more soluble than limestone and act faster. Quicklime combines with water when added to a moist soil and becomes hydrate. The hydrate reacts with the acid clay complex according to the following equation:



Since water is the by-product of the reaction, the reduction in active acidity begins promptly after hydrate or quicklime are applied.

Understanding Alters Use

Gypsum or calcium sulphate were used extensively as a soil amendment before the chemistry of acid soil was well understood. It is not a satisfactory material to use when the sole purpose is to reduce soil acidity. The first effect produced by it is to increase the active acidity. The after effect following the disappearance of the active acid, usually as a result of leaching, is to reduce the potential acidity because Acid X becomes Calcium X. The reaction is exactly similar to the one shown for potash fertilizer salts. The only difference is that a calcium clay is formed instead of potassium clay. The action of gypsum is illustrated in the following equation:



The mineral clay and silt complex is a great soil stabilizer. Because it has acidic and basic properties, the tendency is for soils containing it to resist change. It is the principal reason why change in reaction is gradual following the use of acid-forming fertilizer or lime. This property is usually referred to as the "buffer" capacity of the soil by the chemist, and is a wise provision of nature. Except for this buffering capacity, plant and crop production would be a more trying and difficult task. Some of the soil fluctuations, either from natural forces or the foolhardiness of man, might be too violent for the plant to survive.

The soil humus, or organic matter has chemical and buffer properties from the reaction standpoint which are similar to those of the mineral fraction. This fact is often overlooked. Other effects on the physical condition and water-holding capacity of the soil are the ones usually stressed.

Modern practice is to express soil reaction in terms of pH. It is a measure of "active" acidity, but does not give a true picture of the quantity of lime needed to produce a given change in reaction. In the pH scale the figure 7 represents neutrality. Lower figures represent increasing acidity, and higher ones increasing alkalinity. Each figure differs by a multiple of 10, so pH 6 is 10 times, pH 5 is 100 times, and pH 4 is 1,000 times more acid than neutral. Similar differences apply in the alkaline range. Soils usually fall in the range of pH 4.0 to 8.5, but more commonly within the narrower limit pH 5.0 to 7.5.

Acid soils are confined to the humid regions, that is in areas where the annual rainfall is 20 inches or more. Lime is gradually leached out of the soil by the percolating water.

The practical aspects of lime and its use on golf course turf will be discussed later.

*To My Fellow
Professionals:*

My personal thanks to all of you for your immediate and enthusiastic response to the new Hagen "Pro-only" policy. It's a grand record for my book. Our production is increasing and with the entire output of our complete line going to Pro shops exclusively, we hope to catch up with orders soon.

Golfingly yours,

Walter Hagen



"in the Name of Perfection"

WALTER HAGEN GOLF

Grand Rapids 2, Michigan

Division of Wilson Sporting Goods Co.

The Only Complete Golf Line made exclusively for Pro Shops

Small Town Chairman Does Big League Job

★ Casey Williams is green-chm., Indianola (Ia.) G&CC. What's been done with that course to bring it along to good playing condition with only a modest budget to operate with, will give many readers of GOLFDOM a tip of what's ahead in improvement of turf of the smaller town courses.

Indianola's course is one that in some respects stacks up very well alongside metropolitan courses. They can't do the job completely on their budget but what they have done reflects the great contribution metropolitan district expert greenkeepers and turf research men have done in raising the standard of golf playing conditions all over the country.

Williams' letter gives you a close-up. He wrote GOLFDOM:

"In case no one has written to say they have tried spotting dandelions and pepper grass on bent greens with 2, 4-D, here is our experience:

During 3 years that I have been green chairman we have continually improved our bent turf. We had almost none to start with. Now we have quite a bit. Our budget does not allow a real greenskeeper. Just a man who can and will do the mowing, topdressing and other jobs. Those things are greenkeeping if they are done according to experience and knowledge. Our man was new and none of us members knew any more.

"Now, after reading GOLFDOM, Experiment Station reports, Association reports, and asking a lot of questions of Dr. Noer, Harvey Lantz, professional greenkeepers, and attending meetings and a short course at Ames, I believe that in another 10 years I will qualify as a good green chairman.

"I tried Ammate on the greens 2 years ago. Applied dry to the weeds' crown in the fall the kill was beautiful. In the spring the spots were still too acid and it took lime in a dust gun to get them going again.

"That same fall our number 8 green was taken over by crabgrass. It appeared to have killed out all the bent and I followed a suggestion of Noer by dumping on 10 pounds of Milarsenite per 1000 square feet. This did a fair job. I took the same point of view as the little boy with the apples and did it again. This was 10 days after the first and was applied when the dew was on.

"Later the same day I had 5 pounds of hydrated lime per 1000 sq. ft. put on

top. The next day it was dragged with a mat. Soon most all the grass of any kind was gone. I told the boys that the crabgrass and brown patch had played hell, and kept my fingers crossed.

"The next spring it was treated with the same fertilizers as the others. AND WHAT A BEAUTIFUL STAND OF BENT! I let the boys in on it then.

"Then we went back to cussing dandelions and writing Ames, Milwaukee, and Beltsville about 2, 4-D. I was tempted to try it on all the greens, but all told me not to do it.

"This year I decided some way would work so Weedone mixed to manufacturer's specifications has been put on individual plants on all greens with an oil can. About the time we started the weather cooled off and I feared that time and money had been wasted. They were not wasted. The effect was longer in taking but it has taken.

"The first application was made just after mowing. A week earlier the mower had been off 3 days and the weeds were big. As the kill began to show, new seedlings appeared from seed, and now there is application to each plant that is showing after Monday mowings.

"On some greens we have pepper grass that had become 2 to 4 inches in diameter. As fast as these begin to curl they, along with the larger dandelions, are cut with a knife and lifted. None have come back and the grass moves in that much quicker.

"I may have to tell the boys that the crabgrass and brown patch are at us again before long. I plan to give Paul Burdett's Lawn Sinox a whirl when the crabgrass germinates. I'll either be the Crown Prince or the other extreme. Paul and I think I'll be the Prince.

"For courses that do not have the equipment and/or the money to put 2, 4-D on their fairways, our system will help: put in shoulder tank spray and spray the fairways around each green about 60 to 80 feet out. This will keep some seed off the greens and save playing time by eliminating hunting 'too short,' approaches."

D'YA DRAW FLIES?—Chandler Chemical Corp., New York, has a new insect repellent called d-Ter, based on Repellent 448 which was developed by the Naval Medical Research institute for use in the tropics. The material is colorless, stainless and relatively odorless. It repels insects for as long as 36 hours in temperate climates. Chandler says it's great for golfing with comfort where mosquitoes and flies usually interfere with the pleasure of golf.

First Flight SCORES AGAIN!



**ANOTHER FIRST
ANOTHER
REVOLUTIONARY
IMPROVEMENT**

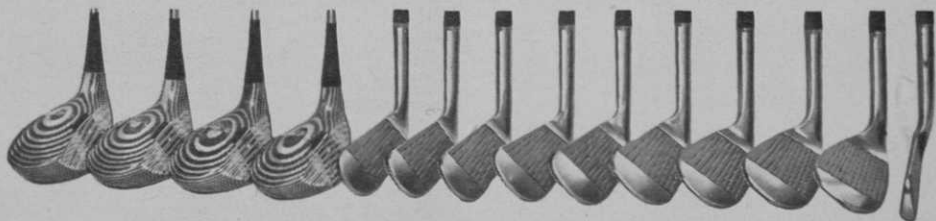
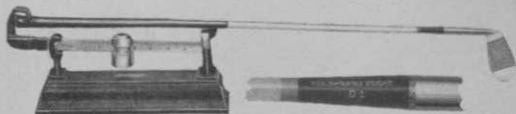
AVAILABLE ONLY THRU YOUR PRO

First Flight—THE ORIGINAL REGISTERED SWINGING WEIGHT CLUBS are so perfectly matched that every club in the set will balance at exactly the same point on the Swinging Weight Matching Scale. This insures a uniform swinging feel that improves timing, and better timing means lower scores.

**SWINGING WEIGHT
ELECTRONICALLY
LAMINATED WOODS**

- Lifetime bonded by electronic induction heat—the same process that made laminated wood advantageous for airplane building. Gives the strength of steel, the weight and feel of wood.

These lifetime bonded woods are more beautiful, more durable. The solid, perfectly modeled head gives you more solid contact with the ball, thus gives you extra distance. There is no other wood like it. Available only through your Golf Pro.



First Flight CLUBS ARE NOT SOLD IN STORES

**PROFESSIONAL GOLF COMPANY
OF AMERICA, Inc.**

CHATTANOOGA, TENNESSEE

First Flight

WOODS AND IRONS
WOODS, retail:

True Temper Stepdown Shafts... \$16.50

True Temper Dynamic Shafts... 17.50

IRONS, retail:

True Temper Stepdown Shafts... 9.50

True Temper Dynamic Shafts... 10.50

Pro Shops Are Blindspots

(Continued from Page 20)

usually owns his display cases and other fixtures and unless he is pretty solidly set on the job he is reluctant to invest heavily in display furniture that fits into a handsomely constructed shop. He moves in what cases he had on his previous job and makes them fit as best he can.

In display fixtures pro shops are beginning to go more for showing of merchandise, especially balls, gloves and other apparel, and accessories, on tables. At the recent National Open at Canterbury I had a discussion about this sort of display with Matt Kiernan and Gene Dahlbender of Spaldings. Matt long has been an advocate of the tables for pro shop selling. He maintains that when club members handle goods they are readier buyers, often apparently unable to resist buying anything new.

Further, he declares, there is a danger of installing fancy specialty store type of show cases in pro shops so selling gets on a too restrained basis. I said that quite a number of pros had told me that members picking up merchandise from these tables and walking away without signing for it had cost them a lot of money, especially at shops where the pro had to be out on the lesson tee a good part of the

time and the assistants were not the most vigilant. Dahlbender pointed out that stores did considerable merchandising of lower priced items from tables and didn't suffer undue losses although they were exposed to the operations of shoplifters and the pro shop loss was due simply to haste or carelessness of members.

Reluctantly I had to concede their case for tables listened stronger than mine for showcases, although Matt and Gene by no means were for the complete elimination of showcases. In checking up, later, with some pros at the open I learned that their experience with table display had been quite successful in pushing some items, especially gloves, hats, shirts and shoes.

Where to put the ball case is often a perplexing subject. In normal times balls constitute a large percentage of the pros' total sales and a steady staple business. Whether to locate the ball case right by the door where the players will rush in, grab a few balls and rush out without giving much attention to the rest of the merchandise, or to put the ball case back where the members will have to walk past displays of other goods is debatable. Some pros have changed ball case locations with surprising results in total sales volume.

But, here again, the space and window and wall arrangement of many pro shops don't allow much latitude for thoughtful

Special built display case that solves part of pro shop problem of display and storage, attractively and with convenience and compactness.

