



than a good lease with no investment, no ownership risks and no worry?

#### ABOUT MONEY

So far, we have avoided facing head-on the issue of finance. The club has figured in dollars and cents the following way: expected rental life and depreciation; interest on investment; car maintenance man salary; insurance premiums; battery or engine replacement costs; minor repair parts such as seat covers, paint and tires (which turn out to be not so minor). The club can now compare its net income figure to the figure the lessor proposes. Now let's take a look at your prospective lessor.

The lessor of golf cars is no magician. In most cases he is a heads-up businessman who realizes that the leasing of golf cars can be profitable. He is definitely no longer the sporty playboy who wanted to own a bunch of go-cars.

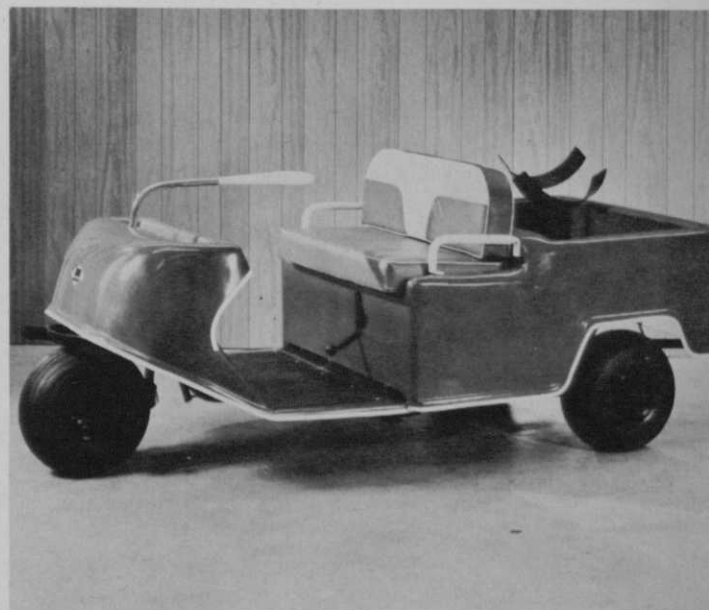
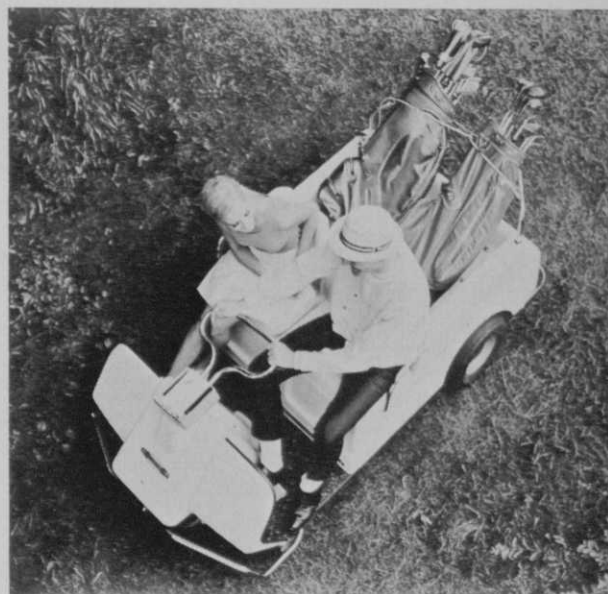
Most lessors are also franchised dealers for some brand of golf car. Therefore, they have the basic mechanical and electrical knowledge not only of the car they are merchandising but of their competition. A club wishing to discuss lease vs. purchase can usually obtain information from the local dealer or factory representative. It is best to contact two or three of these people, eliminate non-essential information, and put together the best plan for the club.

When talking to the dealer here are some tips that might help.

The lessor makes money by dealing in volume. Instead of running a fleet of thirty or forty cars he perhaps is running four or five hundred. The combination of knowledge, purchasing power, skill and service is his profit-maker.

The lessor's stability and community standing should of course be known to the club. One of the best gauges for his stability is to find out what kind of cars he leases and sells. Remember the dealer must have the advice, counsel and backing of the

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Above left, Allis-Chalmers' golf car, available in both gasoline and electric with all white fiberglass body. Both models feature coil spring and shock absorber suspension, black enameled front and rear bumpers.

Above right, Harley-Davidson's new gasoline golf car featuring Dynastart, which starts the engine when the pedal is depressed. An electric model is also available which can run all day without a recharge and has an exclusive two year warranty on all components of the electrical system.

Above, Vibo's gasoline golf car with tiller steering.

# Keep those engines purring

*Regular maintenance will protect your investment, keep your car operation in the black—and your members happy.*

by E. L. Fisher

**D**o your golf car engines purr after two seasons? If not, can it be that you don't take the few minutes necessary to get top performance.

Preventive maintenance is the key to long life for golf car engines, and 99 per cent of this is routine servicing, the daily check any reliable attendant can make to see that engines get a proper diet of gasoline, oil, and clean air.

Like an automobile engine, a golf car engine is built for hard work and long hours. It needs no more attention than your car gets or should get at the corner filling station—a quick check of the oil level, an oil change periodically, a quick cleaning to free the engine of dirt and chaff, and a change of spark plugs and air filters when needed.

Simple? Yes. Time-consuming? No. Whether you have five cars in your fleet, or 50, each car needs only minutes of attention a day. With a minimum of care, the engine in a golf car will give top performance week after week and season after season. Without daily servicing, on the other hand, you jeopardize your entire investment.

Neglect ruins engines a thousand times faster than hard use, as anyone who has burned up an engine for lack of oil will testify. Remember, the investment you are protecting by routine maintenance of the engines in your fleet is an investment that may total many thousands of dollars.

Daily servicing keeps a new engine in top condition. It does not keep an engine forever new, of course, and sooner or later engines must be repaired or replaced. Most golf car engines will operate for 1000 hours or more without overhaul. By that time the engines have paid for themselves several times over, and the logical question becomes: Do I overhaul the engines or buy new ones?

Large fleets of golf cars may justify the hiring of a competent mechanic and the setting up of shop facilities for engine overhaul. Most golf course operators, however, prefer to work with a nearby

engine dealer who can keep parts and replacement engines in stock and who is skilled in engine repair. Such a dealer can determine quickly whether it is more economical to repair an engine or more economical to replace it with a new engine.

One factor which influences the decision to repair or replace is the labor rate in the area. In those parts of the country where labor rates are low, extensive overhauling of an engine may be feasible. Where labor rates are high, buying a replacement engine may be more economical than an extensive engine overhaul.

An engine dealer is helpful in another way also. If an engine was defective when it left the factory, the dealer is authorized by the engine manufacturer to handle warranty work on the engine.

Major maintenance aside, it is still the routine servicing day by day that spells dividends or deficits

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Above, the new Gran Cushman, available in both gas and electric models. It features heavy wall steel frame, and individual sports car style bucket seats.

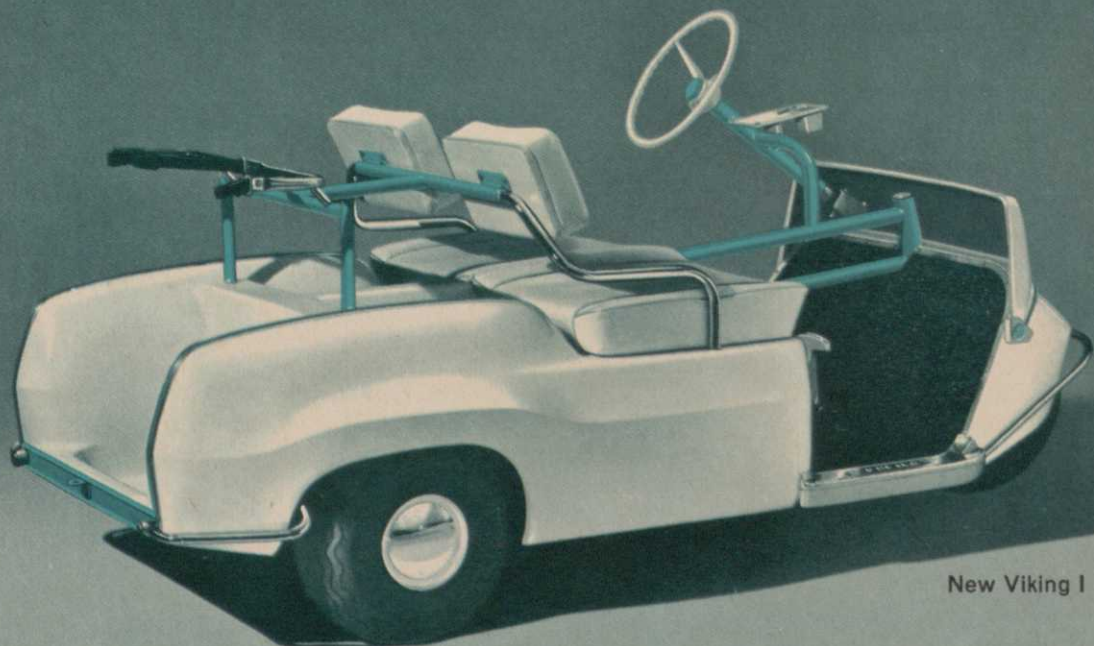




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with golf car engines. Maintenance instructions come with each engine in a manual supplied by the engine manufacturer. The following check list is typical:

**Each Day**

- a) Check fuel supply and oil level in crankcase. Add oil only as needed to keep the level between the marks on the dipstick. (Use type of oil specified on engine instruction plate.)
- b) Clean oil and dirt from external surfaces. On air-cooled engines, it is especially important that the rotating air screen, fly-wheel fins, and cooling fins on the cylinder head and block are maintained in clean condition at all times to ensure proper air circulation.
- c) If necessary, clean or replace the filter element in the air cleaner. Dirt is the No. 1 enemy of engines, and the filter keeps dirt out. When the engine loses power or runs erratically, chances are that the filter is clogged. Under extremely dusty conditions, it may be necessary to clean or replace the filter daily. Even on a clean, green course, a filter may need replacing once a month.

**Every 25 Operating Hours**

- a) Change oil in crankcase. (Change more often under extremely dusty conditions.) Be sure that there are no air leaks at gasket joints between air cleaner, carburetor and cylinder block.
- b) Remove, clean, and replace sediment bowl.

- c) Wipe oil and dirt from engine block, spark plug, and oil fill.

**Every 100 Operating Hours**

- a) Perform usual 25-hour maintenance.
- b) Check spark plug and reset gap to .025. If plug is dirty, replace it instead of trying to clean it.

Your instruction manual includes a check list for 500-hour maintenance also. It is more comprehensive and should be done by a competent mechanic. Most golf car owners rely on authorized engine dealers for this service.

Here are some additional helpful tips:

- a) Keep a separate maintenance record on each golf car to ensure regular maintenance and help you spot trouble before it becomes serious.
- b) If oil consumption increases suddenly, have the engine reconditioned immediately. Otherwise, the engine may run out of oil on the course and be ruined.
- c) Newer engines are equipped with automatic compression releases for easy starting. When an old engine is reconditioned, have the dealer add an automatic compression release.
- d) Clean air is so important to an internal combustion engine that it deserves extra emphasis. The filter in dry element-type air cleaners is vital protection against dirt. Learn to recognize when a filter needs replacing. Learn to replace it properly. Remember that more engines are wrecked by dirt getting into the combustion chamber than by lack of oil.

Take time to service our golf car engine—just a few minutes a day. Follow the instructions in your engine manual. Your golf car operation will be in the black—and your golfers will be happy. □



Above, Stevens "Four-Bagger" golf car made of fiberglass. An aluminum bracket was mounted on both the right and left rear fenders to the standard Club Car allowing easy access to golf clubs in both bags.

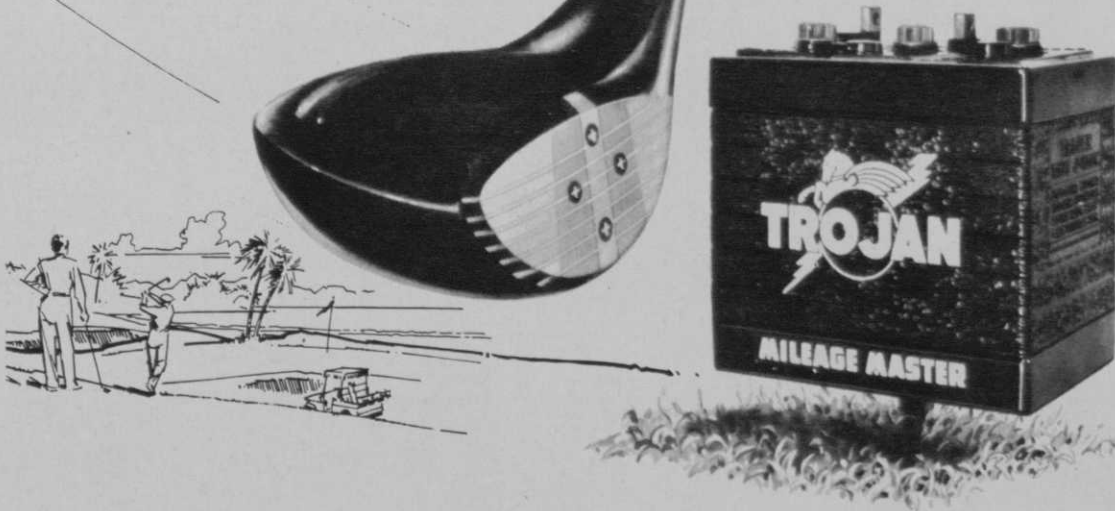


Above, Taylor-Dunn's new electric golf car. The Tee-Bird features tiller or wheel steering, six 170 amp hour electric vehicle batteries, mechanical brakes and a wide choice of colors.



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# THE ALUMINUM SHAFT DILEMMA

*Will golfers go with Arnie and aluminum or stay with steel or fiberglass? The club manufacturers are prepared for any eventuality.*

by Roger Ganem

It is known throughout the golfing fraternity that the aluminum shaft golf clubs are lighter in over-all weight, can be swung faster with less effort and, because of the additional clubhead speed all this provides, the ball will travel farther. And don't forget this free extra feature: the aluminum shafts, according to tests, do not twist as much as the steel shafts, reducing the tendency to hook or slice because of clubhead torque.

In the 42-year span the steel shafts have been ruled to be legal (in the United States), scores have steadily become more spectacular, sub-par rounds more common-place, and pin-point precision more routine, by professionals and amateurs alike.

Still, the demands for the aluminum shafts are exceeding the ability to supply and who knows why? Is it because they are new and therefore desirable? Or because they came through for Arnold Palmer, and others on the tour?

What are some of the known facts about this new shaft?

Presently, there are two major manufacturers of aluminum shafts: True Temper Corporation, Geneva, Ohio, long a leading supplier of golf shafts for the golf equipment industry, and the LeFiell Sport Products, Inc., of Santa Fe Springs, California, manufacturers of golf

shafts, billiard cues, ski poles and sports accessories.

True Temper's aluminum shaft is identifiable by the familiar "steps"; LeFiell's shaft, by the straight taper.

The present-day aluminum shaft is an offspring of the aerospace alloys. Previous attempts to use aluminum in golf shafts met with failure because the flex points and head torsion could not be controlled. The new alloys developed have provided the necessary strength, stiffness, performance and life of the aluminum shafts so that they compare favorably with steel shafts in these important respects.

The aluminum shaft is lighter by half an ounce. This means it will be easier to manipulate on the back nine, when many golfers start to tire and begin to slug at the ball.

The flex is controlled by a combination of wall thickness and outside diameter. You can order the exact "feel" you want. Although the aluminum shafts are generally thicker than the steel shafts, and therefore are not interchangeable, this doesn't influence the results.

There was concern that the larger diameter of the aluminum shaft would be a drawback to sales, since the ultimate success of this innovation rests in the hands (and eyes) of the buyer; but all records show

that the present trend is definitely toward aluminum.

The one man most responsible for the excitement of the new shaft is, of course, Arnold Palmer. With shafts from LeFiell, he whipped the pack at the 1967 Los Angeles and Tucson Opens and finished high in the money in so many of the others that, up to the USGA Open in June, he had won over \$90,000 for one of his fastest starts on record.

It was quite natural that the Arnold Palmer Company would break just as fast in introducing this shaft to the general public. A \$30,000 sales pitch was carried nation-wide and the result was a preponderance of new customers, most of them asking for the aluminum shaft.

What does Robbie Robinson, vice president of the Arnold Palmer Company, say about all this? Simply that, "this shaft could become the greatest contribution to the golf industry since the introduction of the steel shaft, and it could be a tremendous boon to golfers."

And so the aluminum shaft received its initial push toward widespread acceptance. Little did it matter that Arnie could probably bring any course to its knees using garden tools. The truth was that he did use aluminum, and, if it was good enough for him, it was good enough

*Continued on next page*

## ALUMINUM SHAFT Continued from preceding page

for the army of golfers who are always looking for that extra edge.

Speaking of garden tools, the aluminum used in golf shafts is not even remotely similar to the aluminum found in tools, toys, furniture, even structural buildings. Initially, the aluminum golf shaft was weak and soft with too much torque. Its modules being one-third that of steel, its ability to resist taking a set was one-third less than that of the steel. Also, the aluminum shafts were originally made to the same specifications (outside diameter) as steel. These lacked the strength and stability of steel, and soon a permanent set took away all control and most of the feel. Not anymore.

Spalding executive, Jim Long, who guided his company's venture into aluminum, explains that a new alloy, never before used and coupled with their step-down shaft and a slightly larger wall thickness, provided a shaft that plays like steel, deflects like steel, and is step-tapered for the same response as steel, but with less torque.

How are Spalding's sales? "Tremendous," says John St. Clair. "The volume of orders in our Custom Built Department has shown an amazing surge, all because of the acceptance of the aluminum shaft."

Incidentally, Spalding guarantees that their aluminum shaft clubs will make you hit the ball farther, whether you like it or not, by a

mathematical formula: Energy equals Mass times Velocity squared divided by two, which they translate into Distance equals Clubhead weight times clubhead speed squared.

By decreasing the total weight and at the same time increasing clubhead weight, Spalding has increased both the Mass and the Velocity in the above formula. Extra distance is mathematically assured, says the company.

Golfers will like the lighter overall weight, the extra weight in the clubhead and the control and distance this combination carries.

Tom Walsh, assistant to Joe Wolfe of Wilson, relates that "the step placement in the Wilson aluminum shaft is about the same as with steel, because we are now able to control the flex. The lighter weight to the shaft permits us to add more weight to the head and to keep the flex point much lower, where it'll do the majority of golfers the most good. The trend? It appears that aluminum is more popular at this time. The feature of less torque? Yes, we've long been concerned with this problem. In fact, we introduced the "flutes" on the steel shafts in our X-31 models for the purpose of helping to eliminate torsion or toe flutter. This predated our entering the aluminum golf shaft field."

But this optimism is not shared by the entire industry at present. One executive said, "It is doubted at this time whether aluminum will supply the answer to those who are looking for a panacea to their problems. It may help the elderly and the ladies, but we're not sure it is going to help too many others. Nor will it improve the play of the tournament golfer. At least they are not clamoring for it yet."

"The aluminum shaft has forced us into designing new iron and wood heads and at this point we don't know enough about it. The steel shaft has been engineered into the finest shaft possible. It has helped set an awful lot of scoring records all over the world. The



aluminum shaft has a tough act to follow, in my opinion.

"To me, it's like the rookie touring professional. His credentials are excellent, but he still has to prove himself under the fire of tournament competition."

Still, the demands keep pouring in and the suppliers are hardpressed to keep up. The LeFiell Company is no longer making clubs but now are concentrating on manufacturing their tapered aluminum shafts for the industry. And True Temper is ready "to provide whatever facilities are necessary to supply our customers with as many golf shafts of any material they may want and that will meet our standards."

The companies that have yet to introduce aluminum shafts are busy experimenting. Their engineers are hard at work at the plants and their golf consultants are testing sample clubs on the nation's courses.

Bill Kaiser of Hillerich & Bradsby says, "We are spending a lot of time, money and effort to engineer and produce a golf shaft of aluminum that will give the golfer the best results possible."

Paul MacDonald and Vaughn Clay of Dunlop have been on top of this new approach to golf for many years, as has Gene Sheeley of the Ben Hogan Company. The Pedersen Company has aluminum shafts in its line and MacGregor, which feature a steel shaft of straight taper, offers both the straight taper LeFiell shaft and the step-down taper True Temper aluminum to their

*Continued on page 40*







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## ALUMINUM SHAFT Continued from page 38

customers on special order only. "We have a policy of making whatever the customer wants," says Leon Nelson, MacGregor's promotional manager.

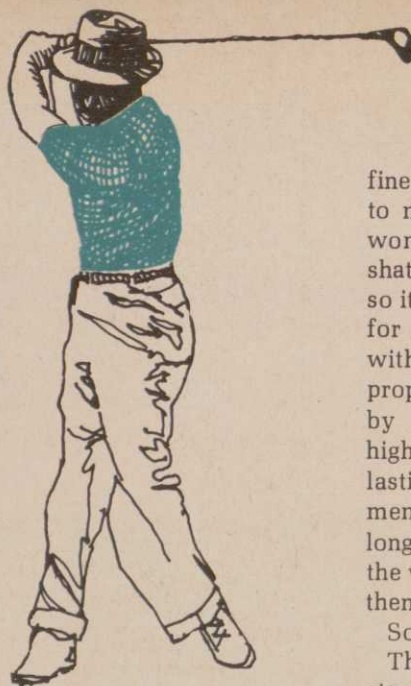
Thus, the golfer has two styles of aluminum shafts to select from—the straight taper of LeFiell or the step-down shaft that True Temper makes to the specifications of various companies.

Craig Walsh of LeFiell claims superiority of their shaft's physical properties, materials used, hitting benefits and the lighter weight. "Our shafts weigh 3½ ounces, the lightest now being offered. And our know-how in using alloys in the aerospace program gives our craftsmen the experience needed in handling the slim tolerance required by this product. The machines used to make the LeFiell shaft are patented and the straight taper is produced under a special formula. Our aluminum is furnished by Alcoa. We offer shafts in all flexes."

George Manning, of True Temper states, "We feel we have engineered and developed the True Temper step-down aluminum golf shaft to meet our quality requirements and our customers' desires for a half-ounce lighter golf shaft. The only people we are willing to share credit with in this development are some technical assistance related to selection and fabrication of aluminum alloys from Reynolds Metals Company and establishment of specifications in conjunction with our customers, the golf club manufacturers."

"No one manufacturer caused us to make aluminum shafts. It didn't just happen this year. It has been a continuous development over the past 20 years; but up until the new aerospace alloys came along, we couldn't satisfy our quality standards. Some of the processing is done on machines similar to those used on steel shafts and some on equipment completely different.

"Flexibility is controlled by the proper combination of wall thickness and outside diameter. At a



given weight distribution and overall weight, there is only one combination of wall and diameter that can result in a given flexibility.

"We have over the years developed a process that gives precise control of both factors so that we can make shaft after shaft with the deflection characteristics and overall weight desired within very small tolerances. For instance, a tolerance of only .001 inch in the wall thickness of a steel golf shaft would mean the deflection characteristics and weight would vary about 15 per cent. To stay within our production tolerances, we must control the wall thickness close to .0001 inch."

With the initial success of the aluminum shaft, it might be feared that the steel shaft is going to go the way of the hickory. Not so.

Since the Bristol Company won the patent on a locked-seam shaft in the early 1920's and the Union Hardware Company in Torrington, Conn., in 1924, drew a seamless shaft of high carbon steel capable of being heat-treated and tempered, and True Temper, in 1927, developed the stepped-down steel shaft, the evolutionary process in steel manufacturing has made continuous improvement in steel shafts possible through the years.

Gurdon Leslie, vice president of True Temper says, "Today's steel shaft meets the requirements of a

fine golf shaft. We've learned how to make it strong so it'll flex but won't bend, and tough so it doesn't shatter under impact. We've got it so it meets the club designer's needs for a club that hits true and far, with the proper swingweight and proper feel. We turn out steel shafts by the hundred thousand to the highest standards of reliability and lasting appearance. The golf equipment industry, in our opinion, is a long way from turning its back on the versatile metal which has helped them create the modern game."

So now, where do we stand?

There are those who no doubt will stay with steel shafts, while others will at least try aluminum, and a goodly number will continue using the fiberglass shaft.

Speaking of fiberglass, let's review this interesting material. It, too, is a product of the space age. Fowler Blauvelt, vice president of marketing, Owens-Corning Fiberglass Corporation, says, "The construction of a Fiberglass (trade name) golf shaft is unusual in that it permits the designer to locate and orient the glass fibers to provide high tensile and flexural strength for maximum efficiency. High speed stroboscopic photographs of actual golf swings have shown that the heads of Fiberglass shafts apparently have less tendency to flutter."

Dick Pietschmann, an agency spokesman, says that, "Fiberglass offers the advantages of totally inorganic glass; non-corrosive, non-rotting, non-mildewing, non-absorbent, ease of maintenance and strength. Helicopter rotor blades are made of Fiberglass, and they have demanding flex properties." And Bill Laurent, Shakespeare advertising manager, says, "Our customers like the Shakespeare Wondershaft because it lets them stay with the shot longer, get better control, plus it gives off a cushiony feel. There's never any recoil shock in your hands. Our shafts reduce torque, too."

Golfcraft, another user of Owens-Corning Fiberglass, but with a dif-

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