

the cylinder head unless some indication is given that trouble exists. Grind the valves only when there are external indications that grinding is necessary or when for some other reason the valves are accessible. Defer the tearing open of the motor until such time as trouble may develop or until the motor is thoroughly overhauled by the manufacturer, his agent, or his representative. More troubles develop with gasoline motors from operators trying to improve them than from all the faults of design and manufacture put together.

The pouring of oil into the radiator is of very questionable value. In the first place, radiators are made of copper or terne-plate, which will not rust; in the second place, oil will rot the rubber hose connections and thus cause trouble; and in the third place, the oil is liable to settle in the pockets of the circulation system, there to dry and become gummy and sooner or later to stop up the radiator. Drain the water from the circulation system and leave the outlets open so that air can circulate and thus dry the interior.

A half-pint of oil in each piston is not only more than is necessary to prevent winter rust but is so much that it is likely to cause trouble. It would be better to limit the quantity of oil to about two tablespoonfuls.

In the magneto breaker box use the vaseline sparingly. Only a thin coating on the bright metallic parts is necessary to prevent rust, and, even at that, when spring comes it may be necessary to wipe the parts clean before the distributor will function properly.

In addition to the other precautions mentioned by Mr. Clapper, it is well to slush all bare metal with grease and store the machine in a clean, dry place. A tarpaulin covering of the equipment is also well worth while.

Construction Costs of the Nine-Hole Course of the Ashtabula Country Club, Ashtabula, Ohio

A. F. HUBBARD

Our course is built on 70 acres of just fair agricultural land, with a creek valley 30 feet in depth having three laterals of 1 to 500 yards in length, which give hazards to all the holes except one, each one much different from the others. Two of the greens which lie on the crest of a hill required much grading, and two which are in low spots required raising. These cost about \$400 each to grade; the others cost from \$100 to \$250 each. Most of the greens have raised and undulating borders and surfaces varying from 18 inches to 3 feet, but none are built up high above the surrounding land, so that the natural moisture relations are not much changed. Three greens are well underdrained with 3-inch tile.

The fairways were plowed in the fall and were disk-harrowed every week from April to seeding time. The grading of all but two of the fairways consisted in leveling the old dead furrows. The two fairways in the valley required changing the brook and bringing them up to a surface drainage, as well as extensive subdrainage.

The water system connects with city water, and the pipe is 2 inches. Smaller pipe is unsatisfactory, unless the pressure is very high.

The actual work of construction commenced the middle of April, with about 18 men, 5 teams and 2 tractors, and the work of grading, installing the water system, draining, and sanding was completed by July 15. Then 6 men continued through until November 1, preparing the seed beds, seeding, watering, mowing, etc. The greens were seeded August 20, and by September 15 the fairways were completed. The covering was done by a gang-plank with coke forks attached—a home-made and most satisfactory machine. We found the coke fork with a 2-inch spread between the tines worked best. South German bent was used on the greens, and Kentucky bluegrass, redtop, and fescue on the fairways.

The stand is exceedingly thick and fine, and the greens were mowed many times, and the fairways some. The prospects are favorable for opening early in April—and not winter golf either. Some rain-washed spots will have to be sodded. We think that the splendid stand of grass is due to summer disking, a firm seed bed, and manure, and the almost complete absence of weeds—due especially to the disking, and we are prepared to maintain that it is superior to a cover crop.

Having felt the need of this kind of information when studying up the question of costs and essentials in our organization, we hope the publication of this may be useful to others, and we would be pleased to answer any question concerning plans of organization and the details of the statement of costs appended.

Apportionment of Construction Costs

Architect and supervision		\$1,100.00	
Clearing; about 5 acres		1,125.00	
Draining; about 13,000 feet		2,185.00	
Equipment; mowing machine, tractor, etc.		1,494.00	
Water system; city connection cost \$550.00.....		1,973.00	
Oil and gas		539.00	
Grading:			
Fairways, Nos. 2 and 5	\$1,238.00		
Fairways—the others	295.00		
Greens	2,700.00		
Tees	450.00		
Traps—11 on the fairways	275.00		
			4,958.00
Fertilizers:			
Fairways:			
Bone	\$296.00		
Manure, 450 tons	1,191.00		
Lime, 25 tons	187.00		
Hauling	433.00		
		2,107.00	
Greens:			
200 tons mushroom soil	600.00		
200 tons greenhouse soil		
Hauling	400.00		
		1,000.00	
Seeds:			3,107.00
Fairways, 4,140 lbs.	1,651.00		
Greens, 350 lbs.	612.00		
			2,263.00

Sand; for traps, 200 cubic yards.....	200.00
Labor, after July 15, in preparing seed beds, seeding, mowing, etc.....	1,835.00
Miscellaneous expenses	256.00
Building shed	400.00
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	\$21,435.00
Uncompleted work, about	2,000.00
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Total	\$23,435.00
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Total cost of labor	\$11,500.00

The Need of Criticism in Golf Architecture

There is a positive if indefinable relation between the character of a golf course and the pleasure derived by the golfer. The character or degree of excellence of a course depends on three things: First, its architecture; second, its standard of maintenance; and third, its landscape beauty. In the betterment of any golf course, all three of these elements are essential, and the excellence of golf courses will improve in proportion as golfers realize their importance. It is true that golfers get a lot of fun out of a simple course laid out in an old pasture; but it does not follow that such a course is to be considered a model.

In promoting the movement for better golf courses, the Green Section is concerned not only with turf, but also with landscape beautification and with quality of architecture.

There was a time when the professional golfer was supposed to be a Pooh Bah who knew all about playing the game, everything about green-keeping, and the whole subject of golf architecture. Today nearly everyone recognizes these three things as distinct though interrelated subjects, and justly distrusts the man who claims to be proficient in all three or even in two of them. In other words, specialization has entered golf as in other fields where progress is usually in proportion to intensive studies of limited scope. The day of the man who assumed expertness in all phases of golf has gone the way of the Ichthyosaurus.

In the evolution of any particular subject, frank discussion of principles and methods helps to promote advancement. There certainly has been and still is abundant discussion as to playing the game of golf, and usually with the assumption that the form of the latest champion is the best. Every one has perfect freedom to present his experience and theories on how to grow grass. When it comes to golf architecture, however, there is practically nothing in print, but by word of mouth one often hears violent expressions of opinion in which the word "rotten" is frequently used. The relative immunity of golf architecture to critical discussion is partly due to the fact that it involves the architect himself, or in other words is likely to be taken as personal criticism. There is likewise a vague sort of unwritten law akin to lese majesty which to a great extent absolves artists (including architects) from criticism. Finally the architects themselves maintain a sort of guild—they do not publicly discuss or criticize each other's ideas, nor do they write books or articles for the education of the golfing world. This condition of affairs is not a healthful one for the progress of golf architecture.