sorbs the energy of the balls and drops them into a collector.

The performance of the machine is simple. Balls are dropped into a hopper and they are not touched again until picked from the collector. A ball is lifted from the hopper by a notched rotating disk which carries it to a runway. The ball rolls on to a moving chain which carries it to a pair of fingers. These fingers, which have very soft pads to hold the ball, are attached to a second chain which moves in front of the clubhead.

The clubhead is rigidly attached to a heavy disk which revolves at 1800 revolutions per minute and a linear speed of 145 feet per second. Through a system of gearing, the chain carrying the ball to the driving hammer is synchronized to the motion of the hammer so that the ball is in the center of the clubhead when it is hit.

After leaving the face of the clubhead, the ball passes through the tube. On its way to the receiver two beams of light are momentarily interrupted and it is this interruption which measures the time of flight of the ball through the tube.

Since golf balls are of varying degrees of hardness, it is necessary to take into account the trajectories which they make. Thus, it is possible for a ball to climb rapidly or for a different ball to have a low angle of climb. In order to have all balls break the beams of light, two mirrors are set up facing each other. A beam of light is focused on the first mirror which reflects the beam to the second and so on down the mirrors until the beam is finally focused on the photoelectric cell. No matter where the ball moves in the tube the beam of light is broken and the timing apparatus set in motion. A sensitive galvanometer is connected to the electrical measuring equipment, and by noting the swing of the armature coil which is produced by the interruption of the two light beams one can determine the time required for the ball to pass over a known distance.

The third unit consists of a series of baffle plates which absorb the energy of the ball and finally drop it into a collector.

The average time of flight for the ball to pass between the two beams is less than 0.045 seconds. With this machine it is possible to determine the performance characteristics of balls at the rate of one ball per minute. The machine is not used for production purposes but only for laboratory investigations.

New Bermuda Strains for South

By D. L. HALL

Greenkeeper, Savannah (Ga.) GC

PROBABLY in no other section of the country are there such diverse opinions about greenkeeping methods as in the South. The variety of climate, particularly with respect to the winter season, and the great diversity in soils may be responsible. In the extreme South winters are balmy and bermuda stays vegetative all winter; farther north it goes off color with the first heavy frost and stays dormant until warmer weather appears in early or late sping.

There are outstanding differences in the playing quality of greens. In the main these differences are due principally to maintenance practices. However, in no case does the greenkeeper in charge feel himself duly rewarded for the amount of effort put into them. Failure to achieve really good putting quality is due to inherent limitations of common bermuda grass. Leaf blades and stems are altogether too coarse for putting green use.

As a rule it is customary practice to topdress heavily at rather frequent intervals to bury stems and to fill cavities. In this way surfaces are kept reasonably smooth. Enough nitrogen is used to encourage growth of young shoots and new leaves. Even so, despite every effort greens are rather slow and are nothing like bent greens or even the South's winter greens which are seeded with rye.

The limited possibility of bermuda grass prompted me in 1931 to start what later turned out to be a fascinating series of experiments. Instead of trying to grow bent grasses, I decided to search for a more suitable bermuda—a dwarf variety, so to speak; in other words one possessing finer textured leaves and a more compact habit of growth. This looked feasible because the bermuda in some of the very old greens at our club was definitely superior to common bermuda in every respect.

My first thought was to make selections of the most desirable strains and propagate

Among those attending tea rally given for sponsors of the one day National Handicap golf tournament sponsored by the British War Relief Society, Inc., were: (L. to R.) Mrs. Sidney C. Borg, H. Boardman Spalding, Mrs. Charles F. Robbins, Robert T. Jones, Jr., Mrs. William Armour and Alden S. Blodget. The tournament, which will be held on June 14 at leading golf clubs in the U. S., will provide funds for the relief and rehabilitation of British civilian air raid victims.

An entrance fee of $2.00 will entitle each golfer at every participating club to play 18 holes of golf, and to receive one golf ball in a specially wrapped box on which the British War Relief emblem will be imprinted, as well as a greens marker, which will carry the Society's emblem. Prize will also be awarded for the low net score at every club competing.

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these. By repeating the process before the new selection fully matured I hoped a dwarf plant would eventually develop. While I did not accomplish much in this way, I did learn that I was dealing with different and distinct strains of bermuda. For simplicity's sake they will be referred to as A, B, C, D and E. The first three resembled common bermuda, but the other two were very different and possessed desirable qualities for putting green use. A brief description of each follows.

Strains Differ in Color

Strains A and B were both rather coarse textured. They differed principally in color. A varied from a light to a dark brownish green, whereas B shaded from a light to a bluish green. When allowed to develop both possessed coarse long-jointed stems. Under close mowing and heavy fertilization to get density these undesirable features were reduced. But even with improved density, there was still a noticeable surface nap and grass did not develop a compact turf.

When fully developed strain C is fine textured and of good density, especially as compared with ordinary native bermuda. Generally speaking, its root system is meager and poor; furthermore, this selection is highly sensitive to low temperature and other unfavorable conditions.

Strains D and E are newer ones. D appears to be a mutation resulting from our experiments. It resembles B in color —that is, it varies from light to dark bluish green. Where there is a nitrogen deficiency it has a noticeably lighter blue cast than B. This strain is lighter textured, denser and more compact, and has a deeper and better root system than A, B or C. No doubt its superior root system is responsible for its ability to withstand the effects of abnormal treatment, as well as unfavorable climatic changes. The leaves of this strain do not lose chlorophyl from the effect of frost like other bermuda. Its aggressiveness gives it a longer playing season where this is desired. It also shows less kill due to incorporating rye grass with it in the winter for play then.

Strain E appears to be a cross between C and D, possibly through a process of inter-breeding. It possesses the desirable qualities of both. Although this strain is not quite so aggressive as strain D, it is exceedingly fine textured with a very strong good root system. Top growth is firm, dense and compact. Strain E holds its color exceptionally well; it is less sensitive to cold and other unfavorable physiological conditions than any of the strains. When O. J. Noer visited our course in January he expressed the opinion that this strain appeared to possess more of the characteristics of bent grass than any other bermuda he had seen.

Seed Attempts Not Successful

Our experiments so far have been confined primarily to vegetative propagation with stolons. But we have attempted (not by scientific methods) to produce these grasses from seed. Up to now attempts have not been successful.

Strain D is not inclined to seed. Seed bearing stalks appear very sparingly. Although Strain E produces ample seed, they appear to be sterile.

The experiment of reproduction of both strains from seeds is still in its infancy. Should further experiments in production

of viable seed prove successful it would probably necessitate devising new methods of harvesting seed. Seed bearing stems are very short so seed is borne very close to the ground.

We have tested different methods of introducing these grasses into greens. The most successful has been to produce sod in a nursery and transfer to the green. Sod which can be lifted and rolled without breaking can be produced in one year. It is almost impossible to accomplish this feat with ordinary bermuda.

We will be glad to show these difficult strains to greenkeepers, or others in authority, from any Southern course where existing bermuda is not producing greens to satisfy discriminating members. It is our belief that much can be done to develop and produce bermuda grass which is better for putting greens. Should anyone decide to inspect above grasses for the purpose of comparing them with the grass on their greens we suggest that they bring samples of their own grass. A sod cutter should be used to take samples, in order to compare root systems as well as top growth.

Steel District's Industrial League Tourney Is Major Amateur Event

By GUNNAR OLSENIUS as told to ALEX PENDLETON

AUGUST in the Calumet Region (northwestern Indiana district) sees the playing of the comprehensive golf event known as the Calumet Industrial League annual golf tournament. The championship goes to the league member represented by the best aggregate 4-man team. This is followed by second and third places, as well as individual awards.

This event had its inception several years ago when the industries began to realize the popularity of golf among their thousands of employees. Its promotion and operation is unique and simple.

All industries in the region were contacted and invited to join the league, and to sponsor a team. The 1940 league boasted an entry in the tournament of 24 teams, representative of every kind of industrial plant in the region. Each of these industries had selected their teams by a series of elimination events throughout the summer, which events were conducted within their own plant league. In

'Driving off' at 1940 tourney, held at Turkey Creek CC, Gary.

a number of cases these plant leagues were in fact important leagues within themselves, and their own tournaments were major amateur events.

From year to year different industries are asked to serve as the sponsor. This makes for greater efficiency as it centralizes all the work of fixing the details of selection of course, purchasing of prizes,

Field at 1940 event keeps close check on tourney's progress.

checking entries, determining questions of rules, and special ground rules; and handling the sale of tickets for the banquet, etc.

The distribution of awards which has proved most popular is to have the award of champion go to the industry represented by the best aggregate 4-man team, with second and third places; and also to have three classes, A, B and C, selected with A class being the best, and B class representing the team which placed in ninth place, and C class representing the team which placed in 17th place. This introduces the element of luck in the tournament, but still gives other than the best teams an opportunity to secure recognition as a winning team. In addition to these, there are numerous blind bogey,