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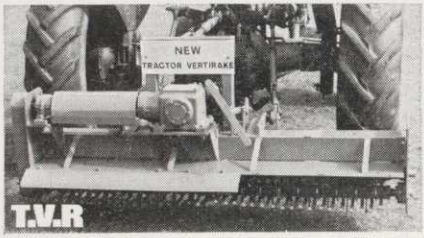
– for Golf course fairways, Municipal Parks, Sports pitches.



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BGGA JOURNAL

FOUNDED 1912

Published monthly for the benefit of greenkeepers, greenkeeping and the game of golf on behalf of the British Golf Greenkeepers' Association



# The British Golf Greenkeeper

HON. EDITOR: F. W. HAWTREE
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## CONTENTS



Front Cover Picture

Photograph of A. F. Trenchers 'G' Series Scoop Trencher fitted with soil conveyor excavating 2" wide trench and loading soil onto Tractor Trailer.

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# TEE SHOTS

A Public Enquiry in Torquay last week produced 1,547 signatures in favour of a new site for the Churston Golf Clubhouse. The present Clubhouse is on the edge of the main road between Paignton and Brixham and widening will remove more than half of it.

The new site will be magnificently situated with glorious views over Torbay but has to be approached through a conservation area. Hence the enquiry.

---

The Editor is going to the American Golf Course Superintendents' Association Conference and Exhibition at Anaheim and hopes to have discussions on international co-operation to the mutual benefit of Greenkeepers' Associations. He will be going on to Australia and New Zealand and meeting Greenkeepers in both these countries for further discussions. He is looking particularly for new ideas on training.

Recent articles by golf correspondents in the press have taken up this Association's plaintive cry over the last four or five years and it seems likely that money and help will be forthcoming at last.

---

Talking to Donald Harradine from Switzerland the other day we gather that his European Greenkeepers' Association's visit to St. Andrews this year is well supported and he anticipates a plane load of 100 or more.

---

The Executive Committee will be meeting in Birmingham on March 23rd. One of the subjects under discussion will be the replacement for Mr. Dix who expressed his desire to retire over a year ago. In view of the resistance in certain Sections to subscription increases last year, it is difficult to see how the job can be made attractive to anybody lacking the dedication and public spirit of our present Hon. Secretary.

# INTRODUCTION TO AUTOMATIC WATERING

**R. W. SITWELL**

Watermation

(Continued from February issue)

To control when and for how long the sprinklers are to operate, some form of automatic valve and control system is required. There are automatic valves available that operate either electrically or hydraulically. Both these are controlled from a programmer which has the following features:

(1) A clock easily adjusted for cycling the system daily, or every other day as required, over a weekly or 2 weekly period at any time during the day or night.

(2) Sufficient number of stations so that the valves used need not be ganged together and can be operated independently of one another.

(3) A sequence timer with a variable time that can easily be adjusted from a minimum of 5 minutes to a maximum of 60 minutes per station. The sequence time to be so arranged that each station can be timed independently.

(4) A semi-automatic performance so that the watering cycle can be started without disturbing the clock setting, thence progress through each station in sequence with automatic shut off at the end of the cycle.

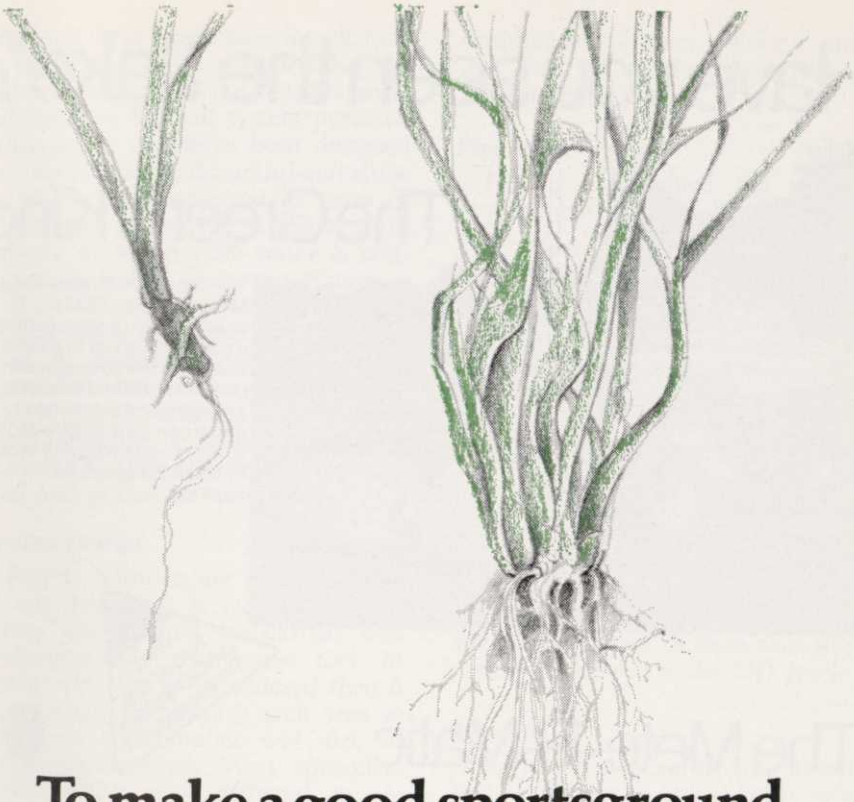
(5) Switch or other form of selector for manual operation of each circuit at random or in sequence independent of the automatic valves.

And

(6) In the case of hydraulically operated valves which are normally open, a safety device to shut off the system in the event of a power failure.

Generally the operation of an automatic valve which is electrically operated is similar to a valve which is hydraulically operated. The disadvantage of the latter is that it is expensive to install as a small bore tube has to be laid between each valve and the controller. With an electrically operated valve a pair of cables is all that is necessary. A further possible problem is that the controller for an hydraulically operated valve contains water and electricity in one cabinet and in the event of a major leak in the hydraulic system a potentially dangerous situation can arise.

The valves used in these systems need to be carefully selected. With any valve a very quick closing action should be avoided as this is likely to cause stress in the pipelines due to surge pressures. A majority of automatic valves are of the diaphragm



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type and here again care in selection is imperative as in certain cases the flexible portion of the diaphragm is subjected to the full system pressure. Although it will have been designed for this condition, the additional stress to which it is subjected in cases of surge may cause the diaphragm to rupture in which case water is continuously leaked from the system.

With electrically operated valves it is imperative to ensure that the solenoid is designed for underground operation where it may be buried in wet or damp soil. Its coil winding must therefore be watertight and to achieve this they are usually impregnated and potted in epoxy resin.

**System Design**

Before commencing on the design of any system it is essential that a survey should first be carried out. Assuming only greens and tees, or just greens, are to be watered then it is necessary to measure each area to determine the number and size of sprinklers required. Most sprinklers are available with different nozzle sets which given different ranges and precipitation rates. It is therefore suggested that when examining the areas to be watered one should decide the maximum as well as the minimum requirements in respect of each so that should the conditions vary when the installation is carried out the system allows sufficient margin to cater accordingly. Although the size and shape of each green or tee will to some extent determine the sprinkler requirements there are cases where slope will play an important part, for example, if a green has a distinct slope it may be necessary to deliver a different quantity of water to one side than the other. In this case the sprinklers on one side of the green should be controlled from a separate valve to the sprinklers on the other. Alternatively if it is decided that the green can be successfully watered by running three or more sprinklers simultaneously then differing nozzle sets may be necessary to overcome the different contours.

**Pipe work**

Having determined the sprinkler requirements at each area it is then necessary to design a suitable network of pipelines. Although these will be determined to some extent by the nature of the ground, density of wooded areas, etc., it is essential that the sprinkler flow and pressure requirements at each green and tee be the paramount factor in finalising pipe routes. An accurate drawing of the course is therefore essential as very few systems can be designed by just walking round the course and taking a few measurements. A normal approach is to mark on a course drawing the sprinkler requirements as well as the height of each area above mean sea level, i.e. the OD level.

**Pumping**

As it is not permitted to install a pop-up system in this country which is directly connected to the Water Board supply it is necessary, assuming no natural sources are available, for the water to pass through a break tank and then be boosted through the system. The site of the break tank and pumping equipment on many installations is governed by the availability of water and electricity supplies. This should not however be allowed to be the paramount consideration as in many cases both services can be supplied to a site which will offer ideal hydraulic conditions for the system. To achieve this the tank and pumping equipment should either be placed at the centre of the pipework network or at the highest point on the course. By adopting this procedure the system losses can be kept to a minimum which will result in the pump power requirements being kept down; thus saving capital as well as running costs.

Having decided upon the site for the pump and break tank and therefore normally the control equipment it is a straightforward matter to calculate the losses in the system until one is left in the position where it is known that a pump that will deliver x gpm against y feet head will meet the system requirements. Knowledge of pumping equipment and what is available from which manufacturer is now essential as the success or failure of the system can hang on the correct selection of the pumping plant. The final procedure in the design of a water system is the signal cable layout which involves following the pipelines, the cable and pipe being laid simultaneously. However, in a similar way to water flowing through pipes, there is a loss as electricity flows through cables. In order to ensure that there is sufficient voltage available at each solenoid it is often necessary to make adjustments to the cable network.

If the system is to include approach watering then allowance must be made for one or more sprinklers which can either be run concurrently with the sprinklers around the green or can be operated from their own control valve.

If fairway watering is also necessary then the fairways should be shown accurately on the drawing and then depending upon the width and degree of watering required, the number of sprinkler rows on each fairway must be settled. In this country a single row should be quite satisfactory but in hot and tropical climates two, three or even four rows may be required.

In designing any system the fewer the number of sprinklers operated at one time the greater the degree of control which can be obtained. The designer in deciding how many sprinklers can be operated simultaneously has to weigh up the relative merits of separately valved sprinklers to meet the watering requirements against the capital cost involved. A system with each head separately valved, whilst offering precise control, would cost up to twice that of a system which is conventionally valved, i.e. 3, 4, or 5 sprinklers operating simultaneously. When analysing cost against efficiency it becomes quickly apparent that on a financial basis such an arrangement could not be justified.

## INSTALLATION

### Method of Pipe Laying

Until fairly recently all pipes were layed in open trenches. In the very early days these were all dug by hand but in recent years more advanced techniques have been developed.

The most common machine being the J.C.B. or heavy tractor with front or back digging machine. These machines have the disadvantage of being slow and untidy, the narrowest practical trench width being about 12″.

More recently chain diggers have been developed which will cut a neat 4 to 8″ wide trench to a depth of up to 3 feet. These are either self driven on tracks or wheels, or contain a built in winch from which traction is obtained. These machines will handle most ground conditions including chalk and gravel, but when it is required to trench in rocky ground a heavier type chain is required. This chain has the digging teeth replaced by small percussion hammers. This type of machine has been successfully used in ground which contains rocks which easily shatter. When it comes to hard work such as Bath stone and the like, it has been found that this can be neatly trenched by using a very recent development which is the earth saw. This was originally designed for cutting narrow trenches quickly and neatly across motorways and the like.