

AUTOMATIC RAIN SHELTER FOR SMALL OUTDOOR PLOTS

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INTRODUCTION

Precise control of water application is desirable in many irrigation studies. Under field conditions, differences otherwise obtainable from various irrigation schedules are often negated by rainfall. Results obtained from controlled conditions in a greenhouse or growth chamber cannot always be projected safely to field conditions because of differences in soil volumes involved and in climate. This gap that exists between experiments conducted in a controlled environment and those in the field can be largely overcome by sheltering field plots from rains.

Stansell and Sparrow (2) devised a battery-operated, automatic shelter. Fletcher and Maurer (1) built a plastic-covered shelter that was partially automatic. In 1966 a shelter was constructed at Lethbridge that was:

1. Completely automatic with provision for manual operation;
2. Strong and rigid to withstand high winds and to ensure permanence;
3. High enough to accommodate all field crops;
4. Large enough to provide appreciable space for plot area or lysimeters;
5. Made largely of prefabricated or readily available materials;
6. Relatively simple to operate.

EQUIPMENT AND PROCEDURE

Twin, simultaneously operating, automatic shelters were built over two 20-foot by 40-foot plots (figure 1). Concrete foundations and shallow concrete walls bordered the sides of each plot. In these foundations were anchored 3-inch-diameter

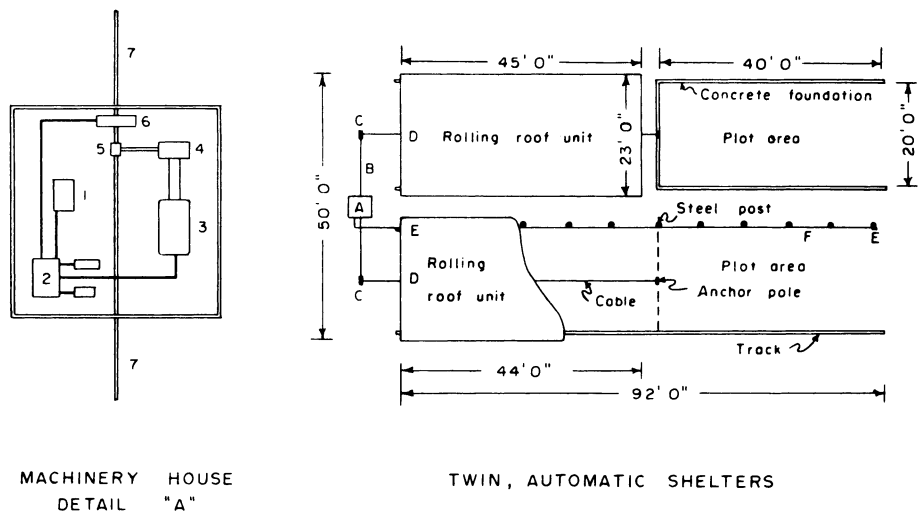


Figure 1. Plan of plot area, shelter assembly, and machinery house.

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|---------------------------------------|---|
| A - Machinery house | 1 - Circuit breaker |
| B - Main drive shaft to drum assembly | 2 - Reversing magnetic switch and controls |
| C - Cable drum assembly | 3 - Three-phase (1½ hp) electric motor |
| D - Top cable attachment to shelter | 4 - Gear reduction box (50:1) |
| E - Limit cancelling switch | 5 - Main sprocket drive |
| F - Conduit for limit switch | 6 - Single-throat, double-switch, float control |
| | 7 - Main drive shaft to drum assembly |

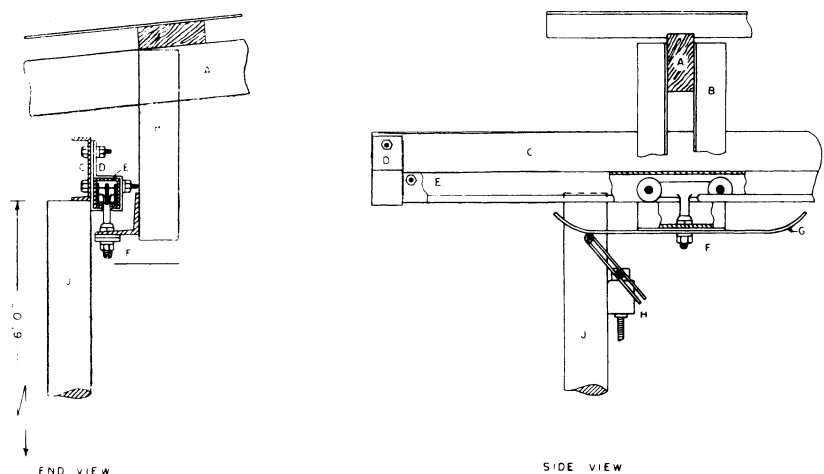


Figure 2. Detail of track mechanism.

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|--------------------------------------|---------------------------------|
| A - Roof truss | F - Roller unit |
| B - Roof truss anchor | G - Cancelling switch bracket |
| C - Four-inch standard steel channel | H - Limit cancelling switch |
| D - Track hanger | J - Steel pipe, 3-inch diameter |
| E - Barn-door track | |

