or fastened to the underside of the top by a wire. Sometimes an old paint bucket is used and sometimes a box made of heavy plank. The object is to use something that nobody wants to take away. It is almost impossible to maintain such vessels in the barrels, and the best way is to assume that the person who discovers the fire will use his hat, shoe or something else until organized help arrives. In studying the water barrel question the concrete barrel has come in for its share of discussion, and two experimental barrels were made two years ago. They have the self-feeding top—that is the top is depressed so as to catch the rain water. Neither has required refilling. Both have proved themselves to be proof against bullets fired from a 38-calibre revolver. Below is a table of the estimated cost of making these barrels:

## Covers:

Galvanized iron, 5 square feet at 3 cents \$0.15	
Hinge, bolts, rivets and wire, 5 cents05	
Cost of making, one man one hour20-\$	0.40
Barrel :	
17 square feet expanded metal (0.6 pound,	
4 feet) at 3 cents \$0.51	
10 cubic yards 1:2:4 concrete at \$2.4024	
Cost of forms (assuming twenty-five barrels	
to one set)	
Cost of labor for making barrels at 15 cents .30-	1.15
8	1.55
Add 10 per cent. for engineering and incidentals	.15
Total cost	1.70
Another opposite of her line ( i l energies of	

Another experiment has been tried, consisting of a concrete box let into the ground all but about one foot, this upper part being used for the number of the trestle.

It is believed that good concrete water barrels, with metal tops, can be made for \$1.30 each when made in large quantities. The wooden barrel is the most expensive of the two, considering its capitalized cost on a basis of six years' life, which is reasonable, leaving out all consideration of increased cost of maintenance.

Other experiments have been made, using galvanized iron forms, and poultry netting reinforcement. Plastering the mortar on has not resulted in tight barrels, but 1:2:4 concrete cast and rammed into forms has given good results. Experiment is also being made with joints of 24-in. clay pipe with concrete bottom, with the bell set upward and buried in the ground.

The bailasted deck trestle is rapidly becoming the standard on most roads, however, and it is thought that in the future the water barrel will seldom be needed.

## AMERICAN TEST OF WIRE ROPE.

The United States Bureau of Standards has decided to make a series of tests upon wire rope, and, in asking the cooperation of manufacturers, puts forward the following points:—(1) What should be proposed as a standard tensile test? (a) Proper length of specimen, taking account of that critical length over and above which the strands will act as a unit. (b) Type of end sockets or connection. (c) Elongation, etc. (2) What importance should attach to the torsion test? (Some authorities believe this to be superfluous) and what should be a standard test for torsion? (3) What is suggested in the way of cold bend test over the usual methods. (4) Little has been published in the matter of impact tests. It would seem as if this field is important and recommendations are desirable. (5) What should be done in the matter Volume 23

of abrasive tests? (6) Biggart, Stone and others have proposed and made tests in which the life of cables, and other properties, are investigated by passing them over a series of pulleys direct and reversed, the cables being subject to different direct tensions. What is the relative value of such tests, and how should they be carried out? (7) Samples of cables have been taken under actual service conditions after a number of years' usage in mine or elevator service, and tests compared with the unused original material. Is anything in this line desirable? (8) Are any other physical tests necessary (9) Chemical tests will be made. What are the suggestions in this respect (10) What number of duplicate tests is suggested for any one type or specimen? Tetmajer used two in his tests. Three would seem more desirable. For the individual wires he used eleven. Would not a lesser number, say six, be sufficient?

## SEWAGE DISPOSAL FOR COUNTRY HOMES.

The general use in country homes of the modern conveniences of the bath and toilet has made necessary some effective and inexpensive means of disposing of the sewage. Otherwise the drinking water will be polluted and the health of the family endangered. Entire satisfaction is obtained by the use of the septic tank, which is nothing but a long water-tight cistern through which the sewage passes very slowly and evenly. The purified sewage may be discharged into an ordinary farm drain tile.

Although the odor from a small septic tank is practically unnoticeable, yet it is best to locate it at least a hundred and fifty feet from the house. Choose a spot where it can be sunk to ground level and will be out of danger of flood waters. The tank should be large enough to hold the entire **sewage for one** day. For a family of eight to ten, plan a concrete tank of two compartments each 4 by 4 by 5 feet long. Since the top and bottom are each 4 inches thick and the division and sidewalls 8 inches, dig the pit 4 feet 8 inches deep, 5 feet 4 inches wide and 12 feet long.



Cross-Section Through Tank.

If the ground stands firm, only inside forms will be needed. Make two, each 4 by 4 by 5 feet long. Old 1-inch lumber will do for the siding. The compartment into which the sewage first enters is called the "charge tank." In each end of the wooden form for this tank cut openings for a 5inch tile with the lower edge of the hole 16 inches above the bottom of the form. Through each of the sidewalls of this same form, 18 inches from the inlet end and  $1\frac{1}{2}$  and 2 feet above bottom, bore 1-inch holes and insert in them greased wooden pegs extending 4 inches into the future sidewalls. Likewise, in the other form for the discharge tank, cut openings for a 5-inch tile, this time with the lower edge of the hole 2 feet above the bottom.

Mix the concrete one part Portland cement to two parts sand to four parts crushed rock, or one part cement to four parts pit gravel. Place the 4 inches of concrete in the bottom and trowel to an even surface. Immediately set the forms in