purposes of street watering and cleansing, sewer flushing, public fountains, baths and wash-houses, etc.—and in many towns where the limit imposed by parliament has been reached a "rate in aid" is made.

I am in favor of a public water rate varying in amount according to local conditions; of the rateable value being the basis of the minimum charge, and that the charges for trade supplies should be an addition to the minimum charge. I do not agree with differential rates, or, in other words, the rebates on higher-rated properties, opposed as they are to the fundamental principles of local taxation for public services.

To many, I am sure, some of my proposals will appear to be drastic. But if you look the problems before you calmly in the face, can you frankly say that the haphazard increase of this or that particular charge, based on narrow views, and without any reference to basic principles, is at all likely to be adequate in the solving of those problems?

## FLEX-OR-CRETE NAILING COMPOSITION

A new nailing composition called Flex-or-crete is being marketed by the Flexner-Taylor Company, South Boston, Mass. It is a concrete through which nails can be driven, which is about half the weight of Portland cement concrete. It is being largely used as a sub-floor to which the top floor boards can be nailed, and as a sub-roof to which slate, copper or other material can be nailed.

The material is being used for the roof of the Parliament Buildings at Ottawa, sheet copper being nailed on top of it. At the Military Hospital, Whitby, Ontario, the material was used as flooring, on top of which linoleum was glued and nailed. The manufacturers state that they expect to put on the market partition blocks made of this material to which all woodwork, door trim, baseboards, etc., can be nailed without wood grounds. The material is also being used for wall plugging, replacing wooden plugs. It can be applied in plastic state over metal reinforcement for roof construction or wall construction.

In a test made last year for the Stone & Webster Engineering Corporation at the Massachusetts Institute of Technology, a small test slab of Flex-or-crete withstood a maximum load of 2,550 pounds, although a bad crack developed at 2,100 pounds. The load was concentrated at the centre of the slab, distributed to the slab by means of damp sand under a metal bar 2 inches wide. The slab was supported at the ends by metal bars 2 inches wide. The width of the span was 24 inches, length 30 inches and thickness 3¼ inches.

On compression tests of two cubes, each 8 inches x 8 inches x 8 inches, maximum loads of 116,600 pounds and 116,800 pounds respectively were withstood without cracks of any amount appearing before these loads were reached.

The manufacturers publish a table showing that the safe superimposed loads for flex-or-crete vary from 59 pounds per square foot for an 8-foot span (using 3 inches of flex-or-crete above the mesh, with steel of 0.173 cross-section area) up to 597 pounds per square foot for a 4-foot span (with 4 inches of flex-or-crete on steel of 0.277 cross-section area). Flex-or-crete slabs as thin as 2 inches can be used for 6½-ft. spans to carry 43 pounds per square foot, using steel of 0.173 cross-section area, while a similar slab of 4-ft. span will carry 104 pounds per square foot. The weight of one square foot of flex-or-crete one inch thick is six pounds.

## METHOD AND COST OF CLEARING CUT-OVER LAND WITH POWDER*

UNDER a co-operative plan with the Land Department of the Potlatch Lumber Company, the Forestry Department of the University of Idaho has been carrying out extensive land clearing operations with a view of determining the most efficient methods.

The site selected for the operations was on level bottom land in the valley of the Palouse River, Idaho. The soil is classified by the U.S. Bureau of Soils as "potlatch silty clay loam with a tendency to be clayey." The soil was underlaid with a hardpan formation at an average depth of about 3½ ft. It had been covered formerly with a dense stand of western yellow pine. Douglas fir and western larch, in approximately equal proportions, as shown in the following table:

**Percentage of Timber**
(Ft. diameter)

| Plot No. | Red fir. | Yellow pine. | Tamarack. |
|---|---|---|---|
| 1 | 35·7 | 30·5 | 34·7 |
| 2 | 49·3 | 23 | 27·7 |

Some of the pine had been cut eight years. Most of the tamarack and fir had been logged more recently; some only two years before. All except the smaller stumps were sound.

Two working plots each of five acres were carefully selected with the view of securing representative cost figures. Each plot was handled in exactly the same manner as regards preliminary work, the making of holes, piling and burning logs, brush and stumps, and leveling the ground after all clearing work had been done. The explosive used in Plot No. 1 was a 20 per cent. stumping powder; on Plot No. 2 a potassium chlorate powder equivalent to 60 per cent. dynamite was employed.

The number and per cent. of sound stumps in each plot were as follows:

**Number and Per Cent. of Sound Stumps**

| Diameter. | Plot No. 1 | | Plot No. 2 | |
|---|---|---|---|---|
| | Feet diam. | Per cent. | Feet diam. | Per cent. |
| 6-in. | 26 | 5 | 4 | 1 |
| 8-in. | 12.8 | 2.4 | 7.8 | 1.7 |
| 10-in. | 19.1 | 3.7 | 12.5 | 2.8 |
| 12-in. | 3.1 | 6 | 2.0 | 4.7 |
| 14-in. | 22.2 | 4.2 | 11.8 | 2.7 |
| 16-in. | 38.8 | 7.1 | 40 | 9 |
| 18-in. | 28.5 | 5.4 | 28.5 | 6.4 |
| 20-in. | 48.4 | 9 | 26.6 | 6 |
| 22-in. | 57 | 11 | 55 | 12 |
| 24-in. | 46 | 8.4 | 24 | 5.4 |
| 26-in. | 39 | 7.3 | 32.5 | 8 |
| 28-in. | 30.4 | 5.7 | 21 | 4.8 |
| 30-in. | 12.5 | 2.3 | 17.5 | 4 |
| 32-in. | 21.4 | 4 | 26.7 | 6 |
| 34-in. | 14.1 | 2.6 | 21.6 | 4.8 |
| 36-in. | 24 | 4.5 | 15 | 3.4 |
| 38-in. | 12.6 | 2.3 | 12.6 | 2.8 |
| 40-in. | 6.7 | 1.2 | 6.7 | 1.5 |
| 42-in. | 10.5 | 2 | 14 | 3.1 |
| 44-in. | 18.3 | 3.4 | 29.3 | 6.6 |
| 48-in. | 8 | 1.5 | 8 | 1.8 |
| 56-in. | 4.6 | 0.7 | 9.3 | 2.1 |

*Abstracted from Bulletin of the University Agricultural Experiment Station.