fungi. For this reason the material should be carefully inspected and all pieces bearing incipient rot rejected. Likewise, it may prove advisable to inspect the yard where the purchase is made. Upon delivery of the material it should not be thrown about on the ground, but should be carefully placed on skids and kept dry. The soil is often a prolific source of infection.

Such timbers as are to be placed in situations favorable to decay should either be select grades of naturally durable stock or else treated with a good wood preservative. Neither non-durable timber or sapwood is objectionable when used in a dry condition and kept dry. Hence, every effort should be made during construction to keep moisture away from the timbers, and especially the joints.

Moist timbers should never be cased in, nor should timber of any sort be embedded in concrete or brick walls without boxing. In all cases thorough ventilation of moist, stagnant basements should be provided.

Whenever timbers begin to fail, the need of a thorough inspection of the building is indicated. If poor ventilation is the cause, the building should be opened up to secure rapid drying of the timbers. At the same time tests should be made to determine whether the wood contains living fungus. In is also important to know what species the fungus is, as further control measures may hinge on its identity. For instance, the true dry-rot fungus, *merulius lachrymans*, being a low-temperature organism, can be controlled by the application of heat, while such a procedure would be useless with most other species. Some fungi may prove susceptible to a certain amount of drying, where others would not.

Where serious and active decay exists, without the exact method of control being indicated, the timbers should be carefully removed and replaced with select durable stock or with lower grade material treated with antiseptics. Likewise all incipient infection which appears in timbers which it is not considered necessary to remove should be given two or three applications of a wood preservative. Either a hot 3 to 4 per cent. water solution of sodium fluoride or a cold 1 per cent. alcoholic solution of mercuric chloride is well suited to interior timbers. Exterior timbers, where odor and color are not objectionable, can be satisfactorily treated with a good grade of hot coal tar creosote.

CABLE STREET RAILWAYS.

Cable street railways, which came into extensive use in American cities to replace horse cars in the '80's and early '90's, but were superseded almost everywhere by the electric railway in the next decade, are still in extended use in San Francisco, Calif., and Edinburgh, Scotland. The cable lines that still remain in San Francisco are those which run on streets crossing the San Francisco hills with grades so steep that electric operation would not be possible. In Edinburgh, however, the entire city street-railway system is operated by cable. The Edinburgh system was built by the city in 1898 and leased for 21 years to a private company at an annual rental of 7 per cent. The lease expires on June 30, 1919. The cars used are of small size and are operated at very low speed. The city plans to take over the system on the expiration of the lease and operate it by electric traction. A commission has reported in favor of operation by the overhead-trolley system, and the work of reconstruction is likely to be undertaken shortly, so that electric cars can begin running as soon as the lease expires.

The Russian Government is reported to have ordered 50,000 tons of steel rails in the United States for the Trans-Siberian Railway.

WATER FILTRATION EXPERIENCE.

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(Concluded from last week's issue.)

Air for agitating the sand previous to washing should be supplied under a pressure of from 3½ to 4 pounds per square inch. The quantity of air should be not less than 3 cubic feet of free air per square foot per minute. A proper wash of a filter bed is often accomplished by agitating with air for two minutes and washing with water for four minutes.

Where air and water is adopted to wash filters, the wash water and air agitating equipment must be arranged to meet conditions. On small plants, that is, beds having an area of sixty-five square feet, or less, the wash water may be obtained direct from the mains, without dropping the pressure enough to cause annoyance. On plants larger than this, and up to filters having a capacity of 1,000,000 gallons, a wash water pump is usually used.

This pump should have sufficient capacity to furnish the required amount of wash water and be able to lift this water against a head equal to 16 ft. above the lip of the gutter. The most convenient power to drive the pump is electricity and where electricity is used, the starting device should be installed at a convenient point on the operating floor. Where units of a million gallons capacity or more are used and particularly in plants of ten million gallons or greater capacity, it is probable that a wash water tower will work out to be more economical in operation and more efficient in service. The capacity of a wash water tank should be sufficient to wash one-quarter of the filter units in succession. The storage capacity, necessary for this quantity of water, should be a point 16 ft. above the lip of the gutter. In connection with the storage tank, there should be a regulating tank, or regulating device, that will drop the pressure of the water above the 16-ft. level to 16 ft. and maintain it at this level. Another factor that may work in and make a wash water tank desirable is the load that can be thrown on to the power available.

A centrifugal wash water pump for a million-gallon unit will usually require a 50-h.p. motor. This load of 50 h.p. may be thrown on at any time during the day, for a matter of four or five minutes. When using a wash water tank, a very small pump and motor is required. This pump and motor should have a capacity to restore in six hours, the amount of water estimated for washing. This pump is started and stopped automatically by the pressure of water in the wash water tower, or by a float. Filtered water should always be used for washing.

The air for agitating in all plants up to one million gallons capacity, may be supplied direct from a rotary blower. Electric current is the most convenient for the motive power. The blower should deliver the air against a pressure of 3½ to 4 pounds. A blower of sufficient capacity to agitate a million-gallon unit, will require practically a 50-h.p. motor and it may be, as stated above, that the available power will not permit of throwing as great a load as this on to the power. In connection with the wash water tower, an air storage tank can be arranged. This tank is simply an inverted tank, similar to the arrangement for a gasometer, in the wash water tower. The air is supplied to this tank by rotary blowers of small capacity, working the same as the smaller wash