

Electric Lighting Plants.

A great many towns and villages are discussing the question of introducing an electric street lighting plant, and if possible, to utilize the light and power for private purposes if it can be produced at a reasonable price. We have considered it advisable to discuss the difference between the two classes—incandescent and arc lights. And also whether the plant should be owned by the municipality or by a private company. The incandescent lamp depends for its light-giving power upon a carbon conductor heated to whiteness by an electric current. The carbon is protected from oxidation by being in an exhausted glass receptacle. The lamp has been handicapped for street lighting by the great size of wire needed to carry the current any considerable distance. This light is especially adapted to small cities and towns that do not wish to go to the expense of the more brilliant arc lamps. They are also useful in conjunction with systems of arc lighting in dark but small corners where a powerful lamp could hardly be afforded. These lamps are always placed on posts on the curb line and are covered with a unique hood which also acts as a reflector to disperse the light in different directions. For general distribution and for neat and artistic affect, the incandescent has no rival.

The arc lamps depend for light-giving properties upon the light emitted by an electric current passing through a small space between two carbon electrodes and also upon the incandescence of these electrodes heated by the arc. It may be added that the high efficiency of the arc lamps, viz., nine hundred to one thousand actual candle power per horse power, is due to the intense heat to which these carbon points are subjected. The great brilliancy and high efficiency of the arc lamp make it especially adapted to street lighting.

In suspending arc lamps much judgment should be used both as to the position and height. Authorities differ as to the proper height of an arc lamp. Some advocate as low as fifteen feet, others place them at one hundred and fifty. In the latter, the tower system, usually a cluster of from three to six lamps is placed in a tower. One of these clusters disperses a soft mellow light over a considerable area. They light alleys and yards and greatly aid the police. The objections are to the waste light and the necessity of clustering the lights together. The other system suspends the lamps singly on low supports. The height should depend upon the distance between lamps—the farther apart the higher. When from eight hundred to one thousand feet apart they should be at least thirty-five feet high and when suspended above the street a greater height should be insisted upon than when on the curb lines, on account of the dazzling effect upon persons driving. Placing lamps on posts on the curb line

is quite practical where the lamps are close together—say two in each block—so that they may be placed on low supports but otherwise they should be placed at the intersection of the streets either by suspending them from a wire stretched from poles set at diagonally opposite intersections of curb lines or preferably by suspending from a mast arm. The latter method is quite as cheap, much better and more durable, and by elevating these arms to an angle of thirty-five degrees with the horizon, we can raise the lamp ten or twelve feet higher than otherwise.

The line should be erected in a substantial manner. The wire outside of the station should touch nothing but glass insulators, placed right end up, and the lamps. Insulated wire is useful in protecting line men from day light circuits while at work on the poles and to protect the line from telephone and other wires which may accidentally be crossed with it. A line, however well insulated the wire may be, should be erected with the same care that would be used with bare wire.

A dynamo is a machine to change force from one form to another, to change mechanical to electrical energy. The one that does this with the least loss requires the minimum repairs and attendance, and is commercially the most efficient. The automatic regulation of dynamos is not to be insisted upon when running a circuit of differential lamps. This is especially the case on street lighting circuits where the load is practically constant. The appliances require a certain amount of attention and must be adjusted with considerable skill. Unless they are in competent hands, endless trouble will result. The care that these devices require if directed to hand regulation will keep the current on any street circuit of differential lamps practically constant.

None but the steadiest and most reliable power should be used, whether steam or water. The choice of engines should be governed by local circumstances, such as the price of coal, room, etc. Where fuel is cheap good results have been obtained by throttling engines. An almost constant speed must be insisted upon, for as the current varies directly as the speed, not only minute by minute but throughout each revolution, we cannot expect good results where the motion is pulsating or wavering.

In locating the position of the station where steam is used, the convenience to fuel and water must be taken into consideration, although the interest on the additional cost of land on a railroad may pay for the coal hauling for the proposed plant. It has been the universal history of electric plants to far out grow the original designs, and for this reason enough land should be purchased to allow for growth.

Finally, the points to be kept constantly in view in the entire installation are, reliability, durability, simplicity, economy in operation, first cost. The first three are so intimately connected that they are

almost synonymous and the fourth depends greatly upon them. When we take into consideration the amount of money required to operate a plant throughout its life in comparison with the first cost, it is readily seen why that should come last on the list. It should be remembered that these few remarks apply to the entire installation from the boiler room to the farthest lamp on the line, and the more we invest intelligently, the less will be required for repairs, and the liability for annoying shut-downs will be decreased. Nor should we stop here. After the plant is properly installed it must be handled with intelligent care. We cannot expect any system to give satisfaction when handled by inexperienced men any more than we should expect a fine engine to work smoothly when run by one unacquainted with machinery. But we would say that the greater part of our trouble is mechanical rather than electrical and any man who is really capable of handling an engine can soon master a dynamo.

On or before the 15th day of December township councils are required by section 118 of the Public School Act to pay to the secretary-treasurer of the board of trustees of each section, without any deduction whatever, all sums levied and collected for public school purposes in said section. To secure correctness in this matter, the clerk should mail each secretary-treasurer an order filled in with the correct amount due the section, to be signed by at least a majority of the trustees and sealed before being presented to the council or treasurer. The amounts to be paid to the trustees as above referred to are those mentioned in section 109 of the Public Schools Act.

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Section 489, subsection 2, of the Consolidated Assessment Act, gives the council of every local municipality authority to pass by-laws disqualifying any elector from voting at municipal elections, who has not paid all the municipal taxes due by him on or before the 14th day of December next preceding the election. A by-law under this subsection should be passed a sufficient time before the election to give persons in default an opportunity to obtain the restoration of their franchise under the provision of section 81 of the said Act.

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The reeve of every municipality should make it his duty before the 15th of December to see that the collector pays over to the treasurer all moneys collected as required by the Assessment Amendment, Act 1894.

The collectors of towns and villages are required to pay total amount collected weekly, and collectors of townships every two weeks.