

veloped to such a point as to be considered commercial. The usual method with these maximum demand meters is to make a certain charge per kilowatt of maximum demand plus a small charge per kilowatt hour of consumption.

Various methods of determining service charges have been used, but the usual one is to base the charge upon the installed capacity of apparatus, varying the amount with the various types of installations and based upon previous experience. It is difficult to convince a customer of the justice of such a charge and the method of arriving at it. It is at times necessary to limit the hours run by a factory or other user during the winter months, in order that they shall not be run during times of peak load on the station. This point will be taken up later, in connection with "Second Class Power."

#### THE SLIDING SCALE.

This form of contract is based upon the customer's load factor solely, but the power is sold on a maximum demand basis, the rate per h.p. per year varying between fixed limits in each particular case corresponding to the load factor. The load factor is based on a 24 hour day, and is taken over the period for which charge is made (usually one month). The average demand is the total kilowatt hours, or h.p. hours consumed during the month, divided by the number of hours in the month. The maximum demand for one day is the maximum peak lasting for a period of one minute or more, and as shown by a curve drawing wattmeter. The maximum demand for one month is taken as the average of the daily one minute peaks during the month.

A series of curves is drawn up for each particular locality based on a flat rate curve, "C," which, in this particular case reaches \$15 per h.p. per year, at 1,000 h.p. This flat rate curve is arrived at by adding together all the various factors entering into the cost of delivering power to the locality in question, taking into account the decrease in cost per h.p. per year, as the amount consumed increases, and assuming that power sold on the flat rate basis would have a load factor of approximately 100 per cent. Should the customer's load factor be low the power company may overcall its plant capacity, as previously mentioned, to an extent which can only be arrived at by experience, but, in general, it will increase as the number of comparatively small installations connected to it increases.

The maximum rate curve "B" and the minimum rate curve "A" are arrived at from experience and by the "law of probability," the one being above and the other below the \$15 base curve.

Thus assuming, referring to these curves, that the customer wishes to contract for 500 h.p. his flat rate will be \$16 per h.p. per year, his minimum rate \$10, and his maximum rate, \$20. If during any one month his maximum demand (or the average of his daily one-minute peaks) has been 510 h.p. and his average demand 204 h.p., then his load factor for the month would be 204 divided by 510 = .4, and the rate per h.p. per year would be  $\$10 + \$10 \times .4 = \$14$ , and the monthly bill would be  $510 \times \$14 \div 12 = \$505$ —or, in other words, the rate per h.p. per year is determined by adding to the minimum rate (or the rate at zero load

factor) the load factor times the difference between the minimum and maximum rates. Supposing the month in question to have been one of 31 days, the average demand would correspond to a consumption of 151,776 h.p. hours, which would cost him 0.39 cents per h.p. hour or 0.52 cents per kilowatt hour.

Now, suppose that in another month the maximum demand remained 510 h.p. as before, while the average demand increased to 408 h.p., thus making his load factor .8 instead of .4, the rate per h.p. per year would then be \$18 and the monthly bill \$765. This is at the rate of 0.25 cents per h.p. hour, or 0.34 cents per kilowatt hour, thus showing conclusively that, under this method of charge, there is a strong inducement for the customer to increase his load factor.

#### "SECOND CLASS POWER."

Certain manufacturing processes lend themselves readily to intermittent service, although having a high load factor while in operation. In this class are certain electrolytic and smelting processes. One method of handling this business is to contract with them for certain minimum amount of power to be used 24 hours per day (so-called First Class Power), and then during certain hours when the remainder of the power station load is light allow them to take a much larger amount, paying for both kinds of power on the flat rate basis. This latter excess has been called "Second Class Power," and it is evident that a very low rate per h.p. hour or per kilowatt hour can be made for it, where the conditions are otherwise favorable.

Although heretofore there has existed a wide diversity of opinion among the various companies in regard to the manner of charging for power, it is the writer's opinion that this is fast disappearing and that power customers are becoming divided naturally into certain definite classes, based upon experience with similar cases, and for each of which a definite method of charging can be arranged so that the income to the central station will be as nearly as possible proportional to the actual cost of supplying them with power. The writer holds no brief for any particular method of charging, but prefers what has been described as the "Sliding Scale" contract, especially where power is derived from waterfalls, on the ground that it offers greater inducements to raising the load factor.

Fortunately there has, so far, been no legislation in the Dominion of Canada regarding rates for electric light or power, and it would seem that the various members of the Canadian Electrical Association should be on the alert to forestall and prevent such legislation, by so adjusting their rates of charging that no inequality or unfairness can be claimed. Such a course will in a large measure forestall any legislation, which is almost certain to be detrimental to the power companies.

The Otis-Fensom Elevator Co., of Toronto and Hamilton, are moving a portion of their designing department to the head office in Toronto. The works are in the latter city, but owing to the delay and expense involved in sending drawings and estimates back and forth between the two offices the firm intend assembling one section of their designing staff at the head office.

## MACHINERY AND EQUIPMENT FOR SALE.

### BOILERS AND ENGINES

**BOILERS.**—For special quotations on boilers and sheet iron work, write Park Bros., Chatham, Ont.

### BUILDERS' SUPPLIES

**OUR SPECIALTIES — LIME, CEMENT,** sewer pipe, plaster Paris, fire brick and fire clay. **ONTARIO LIME ASSOCIATION,** 118 Esplanade Street East, Toronto.

### FOR SALE

**ONE CANADIAN GENERAL GENERATOR:** 2 phase, 75 kilowatt, complete with exciter. Has never been in use. Full information on request. **GUNNE, Limited, West Toronto, Ont.**

### PATENT RIGHTS FOR SALE

**A TELESCOPE CAR STAKE,** patented in United States and Canada, to be used on flat cars, or made in smaller size for wagons, sleds, etc. U.S. Patent No. 870,123; Canadian Patent No. 108,976. Will sell separately or collectively; outright sale or part cash and royalty basis. A fortune for some hustling manufacturer. Write or call on Jere D. Perry, Lincoln, Maine, U.S.A.

### RUBBER STAMPS

**B. CAIRNS, 77 QUEEN STREET EAST,** Toronto—Rubber Stamps, Seals, Name Plates, Stencils.

### SCRAP METALS, PAPER, ETC.

**E. PULLAN, TORONTO,** positively the largest dealer in paper stock in the Dominion. Also buys rags, iron, metals, etc. Corner Adelaide and Maud. Phone Main 4693, Toronto.

### BUSINESS CHANCES

**WANTED**—To get one or more persons interested in the manufacture of an Improved Eliminator for Steam Boilers. Can be manufactured in any machine shop and foundry. The Eliminator's object is to remove moisture from steam and return same direct to boiler, without other contrivances. It is a meritorious contrivance and will stand investigation. Canadian patent No. 111,162. For further information address Patent Owner, Canadian Manufacturer, Toronto.

## JULY BOOK

Now Ready

You can get them in sections to suit your various travellers.

**R. G. DUN & CO.**

## WOOD ENGRAVING PHOTO ENGRAVING HALF TONES

OR ANY CLASS OF ENGRAVING  
FOR ADVERTISING PURPOSES  
CATALOGUES, MAGAZINES, &c.

**J. L. JONES ENG. CO.**  
168 BAY ST.—TORONTO