

8 ft. above the floor. In the main entry, the function of light is not so much to illuminate as to silhouette objects which may obstruct the passageway. With silhouette lighting a comparatively small amount of light is needed to obtain the effect desired, which is to see objects outlined against something that is lighted. For instance, white-washed doors or walls reflecting the light toward the observer's eye are excellent backgrounds against which objects form silhouettes when in the line of vision of the observer. The glint of the light on the rails forms another good surface from which silhouette lighting may be obtained. With 25-watt tungsten lamps in shallow dome reflectors, spaced at intervals of about 300 ft., the height depending upon the height of the entry, the silhouette lighting is excellent. Two units, one to illuminate the switch and the junction and the other illuminating a portion of both the main and side entries, help to eliminate collisions and by the increased light warn the trip driver that his train is approaching such a junction.

The mule stables with their low roofs may be effectively lighted with 40-watt tungsten lamps equipped with angle reflectors placed along the back wall and as high as possible one unit to each two stalls. In front of the stalls and opposite the angle units, 25-watt tungsten lamps with deep bowl reflectors may be used to illuminate the feed boxes and passageway.

The mine offices need but one 25-watt tungsten lamp equipped with a shallow dome reflector. The fireboard at the bottom should be well illuminated with one or more 25-watt lamps of this type equipped with angle reflectors, depending upon the size of the board, while the pump rooms and storage rooms may be lighted in the same manner as offices. The first-aid rooms, in order that the best attention be given the injured, should not only be well lighted, but should have the walls well whitewashed, thereby obtaining well diffused and distributed light. Frequent whitewashing of the walls of the bottom, offices, mule stables, etc., and the walls of the entries for 20 ft. each side of the units, will greatly increase the illumination in these parts of the mine. Carbon lamps are generally used in mines, but to keep the load on the generator as low as possible and maintain the most constant illumination in spite of voltage fluctuation, and to direct the light where wall and ceiling reflection cannot be relied upon, tungsten-filament lamps with weatherproof enameled reflectors in my opinion will be found most satisfactory.

A few comparative cost figures in connection with the problem of more efficient illumination follow. Consider for example, an installation where twenty-six 40-watt tungsten lamps and reflectors and thirty-one 25-watt tungsten lamps and reflectors are to replace the same number of 32-cp. and lamps, respectively. During a period of 300 days, at 10 hr. a day, the tungsten lamps would consume about 5,440 kw-hr., while the carbon lamps would consume about 14,940 kw-hr. With the cost of current at 0.5 c. per kilowatt-hour, the saving in cost of power with the use of tungsten lamps would be about \$50 a year. From this must be subtracted about \$17 for the difference between the cost of the carbon lamps and the tungsten lamps. This will leave about \$23 net saving. With the reflectors costing \$60, the installation would be paid for in three years.

These figures tend to show that if dollars and cents alone were considered, it would be more profitable to use the higher efficiency lamps. This is even more marked when the illumination of the working place is considered, because with the use of reflectors this illumination is more than double that obtained with carbon lamps.

There are many other places where special applications of lighting would tend to increase efficiency and convenience; for instance, trip-lights—now as a rule simply oil torches on the end of the train—could be easily replaced

by small storage-battery outfits showing a red light. Locomotive headlights can be equipped with low-voltage concentrated-filament tungsten lamps in parabolic reflectors, with a decrease in trouble, increased light, and decreased breakage over the present carbon or regular tungsten filament. Two 30-volt, 100-watt tungsten-filament locomotive-headlight lamps can be burned in series with a resistance. The loss in current through the resistance is a small factor as compared with the gain in steadiness and brilliancy of illumination from the parabolic headlights. The construction of this lamp is such that maximum strength of filament is obtained, which is an essential feature where the service is as severe as on a locomotive. Another possible consideration is the placing of distinctive lights where telephones are located, or where first-aid equipment may be obtained. This could be accomplished by the use of red lights on the power circuit installed in connection with a small primary-battery system, which would operate a miniature lamp in place of the large lamp should the power circuit for any reason fail. This system has been successfully worked out in theatres where the same principle is involved.

It is hoped that, from the few figures given in this paper, it will be seen that the application of the latest scientific knowledge to the lighting of mines is not so expensive as it is generally thought to be, and should be considered as a means of increasing safety, bettering working conditions, increasing production, and at the same time decreasing the cost of operation.

THE NOVA SCOTIA MINING SOCIETY

The Council of the Nova Scotia Mining Society have decided not to hold the Annual Meeting and Dinner in April of next year. The decision of the Council not to hold the Annual Meeting last April met with the general approval of the members. It was then felt that a meeting without the usual social functions and without the dispensing of the usual hospitality to the Society's guests would not be as successful as could be wished, and these reasons appear not less cogent at the present time. In lieu of expenditure on the Annual Dinner the Council decided to make a donation of one hundred dollars to the Nova Scotia Red Cross Society. Since the last annual meeting a welcome change has come over the mining industry of Nova Scotia. A year ago, trade conditions were gloomy, and the mines were working irregularly. The prospect for the future both in the coal and iron industries was uncertain. Today, however, the members of the Society are all hard at work producing coal and making steel to help the general cause. The membership and finances of the Mining Society are in excellent condition. The decision to defer the holding of functions of a semi-festive nature, such as the annual dinner of a healthy mining society, is in consonance with the action of other mining societies throughout the Empire, and is commendable.—F. W. G.

NOVA SCOTIA STEEL

Nova Scotia Steel & Coal Co., Ltd., has sold to New York interests \$1,500,000 of its common and \$1,000,000 of its 6% debenture stock, according to an official announcement.

The new working capital obtained by the sale of the securities will greatly strengthen the financial position of the company and permit it to accept business which it is not able now to take care of. Nova Scotia Steel already has large orders for munitions and other material on hand.

Nova Scotia Steel & Coal's capital is now as follows:

Common stock, \$7,500,000; Preferred stock (8%), \$1,030,000; Debenture stock (6%), \$4,000,000; Bonds (5%), \$5,873,809; Total, \$18,403,809.