portant, the hanger should be flatter. Even more head room will be gained by using a hanger bolted to the side of the timber, as in Fig. 2.

I-Beam Hangers

When steel I-beams are used to support the roof, it becomes necessary to change the method of support. This can be done either in the hanger itself or by using a separate clamp, to attach a standard hanger to the beam. You can obtain an I-beam hanger in

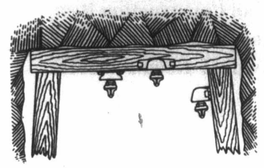


Fig. 2—Three different methods for attaching hangers to wood members are illustrated. Notice that the hanger, on the right, requires no headroom at all.

which the clamping member is an integral part of the assembly. The body is made with a hook, while a separable clamping piece slides along a threaded stud. The hanger is clamped to the beam by tightening the nut. Attachment to beams of various sizes or widths is accomplished by using longer studs to get a greater width between clamping pieces or hooks. This construction is shown in Fig. 3.

The separate clamping member employs practically the same idea with provision for the insertion of a

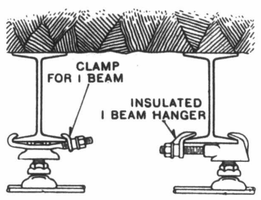


Fig. 3—Where I-beams are used, either the I-beam hanger, shown at the right, or the I-beam clamp, at the left, which utilizes a regular flat top hanger, may be employed satisfactorily.

standard flat top timber hanger. By using this type of clamp it is possible to reduce the number of hangers regularly stocked.

Grounded I-Beams

Where I-beams are grounded, it becomes necessary to provide additional insulation. Experience has proved that one hanger is not sufficient to give the required insulation. This is due, probably, to the fact that when an arc is formed, as the collector passes under the ear, the resistance of air is reduced and a flashover is likely to occur. The insulation may be increased by the addition of a second insulator screwed to the hanger stud. This increases the leakage distance sufficiently to provide an installation which will not permit a flash to ground.

Trolley Clamp

To complete the installation, it will be nesessary to attach a trolley clamp to support the wire. The clamp should have ample strength and gripping power and yet provide good clearance for the current collector. It should also be easy to install. Clamps with self-opening jaws are much easier to install than the type having jaws which must be held open while inserting the wire.

Information contained in the article is based on the experience of Canadian Ohio Brass Co. engineers.

H.E.P.C. Specifications for Rural Line Construction

The distribution department of the Hydro-Electric Power Commission of Ontario recently released the 1934 specifications for rural line construction. These specifications contain probably the most complete set of standard drawings for rural line construction that are available anywhere in the world. Of great importance are the rules and regulations governing installation of service lines on property in rural districts, and this particular section of the specifications should be in the hands of all engineers and contractors making such installations in Ontario.

Following are some of the changes in the specifications made since 1931 issue:

Treated poles may be supplied. The treated outside of these poles must not be cut for gains.

The thorough tamping of poles is of the greatest importance.

The standard spacings for primary pole lines are 250 feet and 150 feet with the option of 200 feet where special conditions warrant this.

The standard primary pole framing is triangular, use a long top pin and a bracket. Under certain conditions the old form of flat construction may be used.

The erection of rural equipment on transmission poles has been standardized.

Copper conductors are hard drawn solid for No. 6 and No. 4, hard drawn stranded for No. 2, and medium hard stranded for larger sizes. This applies to both bare and weatherproof conductors.

For dead-ending conductors on clevis clamps may be used instead of sleeves.

All primary conductors are to be tied in the top groove of the insulator, except at angles.

New ties have been designed for copper conductors.

Conductors of 6,900 volts and higher are supported on larger insulators than formerly.

All sectionalizing switches are open type.

Grounding specifications are included.

Transformers have the fuse-cutout on the line arm with the arrester below beside the transformer. This cutout must be suitable for stick operation.

The two ground wires at each transformer are interconnected at the transformer and at the ground-rod.

Transformers of 4,600 volts and less are erected on metal mounting plates.

On weatherproof conductors all clamps and service connectors must be taped.

A special extension bracket is available for attaching service wires to a telephone pole.

The size of service wires has been increased.

Considerable credit is due to **A. G. Lang,** distribution engineer and to his department attached to the electrical engineering department, for compiling such valuable standards in a loose-leaf reference book.

DIESEL ENGINES

in the Mining Field

Small Diesel Engine Installations Provide Cheap Power in Many Canadian Mining Fields

DIESEL engines have been used for supplying power in mines in Canada for a considerable number of years, but it is only recently that mining men have realized the very considerable economy of operation to be had with this type of power when compared with steam.

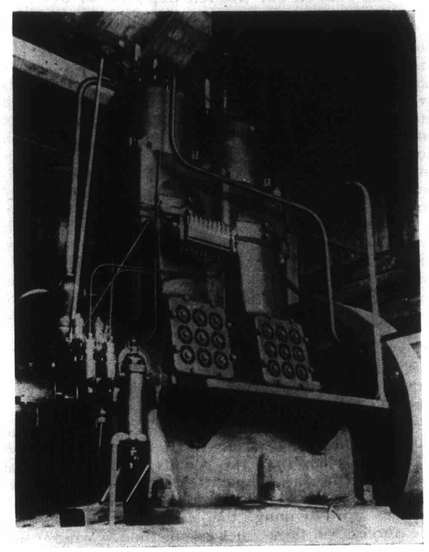
Even if wood can be obtained for $4.00 a cord fired into the boilers, it is claimed that steam will be more expensive than diesel power obtained with fuel oil at 30c a gallon. For instance, a modern efficient engine running at an average load of 100 b.hp. would consume approximately 100 gallons of fuel oil per 24-hour day.

A fair average for a hand-fired boiler of the type used in the mining districts is 4 lbs. of coal per horsepower per hour, and similarly since the heating value of wood is approximately one-half that of coal, it will take then 8 lbs. of wood per horsepower per hour. Consequently, for a 24-hour-day operation with a steady load of 100 hp., coal works out at 6 tons per day and wood at 7½ cords per day.

A fair average for coal in the mining districts is around $7.00 a ton, which gives a daily operating cost of $42.00, and with wood at $5.00 a cord this works out at $37.50.

On the other hand diesel fuel oil runs in the neighborhood of 14c per gallon, and therefore the cost of the diesel power is $14.00 per day plus the cost of lubricating oil, of which approximately 1½ gallons might be consumed, thus giving a total operating cost for the diesel plant of approximately $15.00 per day.

Diesel power also has excellent advantages for standby purposes for mines in case of power breakdowns where favorable hydro-electric power rates are obtainable. Such an instance is the Polar engine of 580 b.hp. direct connected to a generator at the Lake Shore Mines, which in case of power failure provides current to the agitators in the cyanide tanks, thus preventing the very considerable loss of gold which occurs in the event of power interruption. It has been stated that this engine saved its cost in the first year after installation in this way.



Seal Harbour Gold Mines Ltd., Seal Harbour, N.S., showing a 140 b.hp. diesel engine driving compressor.

Engines From 5 Hp. Up

Needless to state, it is not necessary for a mine to wait until they require 100 b.hp. or so before they install diesel power. Diesel engines are now produced in sizes from 5 b.hp. up which give all the satisfaction and fuel economy of the larger types. Complete diesel-generator plants are made for lighting the camps and one of the Bramor Mills is at present in actual operation with a 25 b.hp., 750 r.p.m., Deutz diesel engine, direct-connected.

Due to the introduction of higher speed diesels with a lower weight per b.hp., it is now possible for mines, which can only be reached by air, to obtain the economy of diesel operation. Many such mines in the past have had to use gasoline, the operating cost being about five times as much as diesel power.

There is no limit to the application of diesel power and, with the number of low grade mines being developed, economy in operation is all-important.