

SUGGESTIONS TO ENGINEERS ON TENDING DYNAMOS—ELECTRICAL TERMS EXPLAINED.

Place the oil-catchers under the drip of the dynamo bearings, and never allow them to overflow on the floor.

Keep the floor of the dynamo room swept clean, so that no nails or other small pieces of metal can be drawn into the armature.

Never use or leave iron or steel tools near the machine, while at work, as these are also likely to be drawn into the armature if left too near it.

Oil cans made of copper or zinc are best for use about electrical apparatus.

Never allow oil to accumulate on the armature or shafts of the dynamo.

When the wires coming out of the shaft to the commutator become bare from cleaning, they should be recovered with kerite or okonite tape, or gum cloth, and shellaced, and allowed to dry for about eight or ten hours before being used.

If the shellac on armature bobbins or field magnets becomes worn off, these parts should be reshellaced.

A good bellows will be of service in getting dirt out of the crevices of the armature, and around the commutator and rockers.

If the rocker springs are fastened to a wood base, see that the screws which hold them are kept tight as the wood dries.

See that all thumb screws in the binding posts are kept screwed down tight on the wires. Special care should be exercised in regard to this in the case of incandescence machines.

In placing brushes, take pains to clamp them firmly in position, allowing them to rest squarely and evenly on the commutator. Be very careful not to screw down one side of the clamp tighter than the other, but clamp them evenly, so that both edges of the brushes will be held in place.

The clamps holding the brushes must be perfectly clean, so as to make good contact.

Brushes must bear on the commutator with a reasonable pressure, not too hard, nor so lightly as to allow them to flap or chatter. Occasionally, by accident or otherwise, the brushes will get bent, or sprung, and bear too lightly on the commutator. This condition of affairs is always attended with many sparks, and a very rapid cutting, or wearing of commutator segments. In fact, segments may be worn out in a few days, in this way.

If brushes are perfectly straight when put into the clamps, sufficient pressure will usually be obtained.

In an arc light, or high tension machine, if the brushes are rocked too far forward in the direction of rotation of the commutator, the sparking will quite disappear, but the lights will go out occasionally, each extinction being attended by a few very long sparks on the commutator. This trouble may be corrected by rocking the brushes backward a short distance. If brushes are moved too far back, there will be sparking, and a consequent diminution of light in the lamps, and occasionally extinctions of the lamps, similar to those which occur when the brushes are too far forward.

The proper point for the brushes is as far forward as possible, so as to make the sparks small, and yet back of the point where flashing will occur. In low tension, or incandescence machines, the brushes should be adjusted to show no spark, or only a very minute one, otherwise the wear on the commutator and brushes will be very heavy.

Too much oil on the commutator will cause sparks similar to those which appear when the brushes are not properly adjusted.

When brushes are worn neatly through, clip them off squarely at the worn ends, and move them up to the same position as before.

Cleanliness is absolutely necessary to the successful operation of an electric lighting plant. Too often the salesmen of manufacturing concerns give the impression that an electrical plant will almost take care of itself, and that it does not matter where you put it, whether in some out-of-the-way corner, on a shelf, or anywhere, so that it is not in the way. It is not reasonable to expect this of a dynamo machine, any more than of any other fine piece of machinery. Treat your electrical apparatus fairly; give it a location that shall be as clean as possible; grant it some attention, and you will be better satisfied. Poor and dirty oil will cause hot bearings, rapid wear, etc., and is, of course, much more expensive in the long run.

The commutator is a very important part of a dynamo, and should be given special care. It is well to wipe it off frequently with an oiled cloth, and whenever the machine is shut down, carefully brush off any particles of dust or copper which may have collected about the connecting wires, or other parts of the commutator. Should your brushes be of the style composed of a number of wires, soldered or bound together at one end, you will find that they have a great tendency to collect dust, copper filings and oil, which must be cleaned out. If they are attended to immediately after shutting down the dynamo, boiling water will generally clean them nicely. If, however, the oil and dirt are allowed to become dry and hard, it may, perhaps, be necessary to soak the brushes in kerosene oil for several hours. Care should be used in handling these wire brushes to avoid bending, as when bent, some parts of the brush do not do their work, and others are obliged to do much more than their share.

There are some places about a dynamo where oil will do more harm than good, as, for instance, the connections of the fields, and in and around the armature. It will sometimes work its way into the latter place, if care is not used to prevent same. In time oil is apt to rot the insulation, and the constant collecting on this sticky surface of dust and metal particles, tempt the current to break through the rotten insulation, resulting in a burned-out magnet, armature bobbin, or perhaps the entire armature.

Contacts of all kinds should be examined occasionally to see that they are bright and clean, as poor contacts make high resistance, and hence call for more power. They are also liable to heat up sometimes to a dangerous degree, this heating sometimes being so great as to cause a fire.

It is hardly necessary, we presume, to mention the fact that to obtain a clear and steady light from arc lamps, the carbon rods, as well as all other working parts of the lamps, must be kept perfectly clean, and in condition to work freely and promptly. The contact points in the cut-out mechanism should always be bright, so that in case they are called into action, a good firm contact will be made. A clean globe may, perhaps, not be absolutely necessary to the proper working of a lamp, but it certainly looks much better and offers no obstruction to the light.

No sooner has a dynamo been installed in a factory, or, we may say that as soon as its installation is completed and negotiations opened, we begin to hear about amperes, volts, ohms, megohms, etc., etc. It may, therefore, be of interest and profit to consider, briefly and simply, the meaning of these terms, as, when they are clearly understood, other matters are grasped more readily.

E. J. Houston, in his "Dictionary of Electrical Words, Terms and Phrases," states: "The ampere is the practical unit of electric current. Each a current (or rate of flow or transmission of electricity) as would pass with an electro-motive force of one volt, through a circuit whose resistance is equal to one ohm. That is to say, a current of the definite strength that would flow through a circuit of a certain resistance and with a certain electro-motive force. Since the ohm is the practical unit of resistance, and the volt the practical unit of electro-motive force, the ampere, or the practical unit of current, is the current that would flow against unit resistance under unit pressure or electro-motive force."

The ohm, as mentioned above, is the unit of resistance, and the volt the unit of force or pressure. A very simple and easy way to fix in one's mind these terms and their meanings, is to take the common illustration of the flow of water through a pipe. We will assume, for convenience, that we have a pipe one inch in diameter, and, say, five feet long, offering to whatever liquid is to be put through it, a friction of resistance of one ounce. We now wish to put through this pipe one gallon of water, and therefore must have a certain amount of pressure to accomplish this result. Let us say that it requires a pressure of one pound to push the one gallon of water through the pipe mentioned, the friction resistance of the pipe being one ounce. Transpose this case into an electrical question, and it would be about as follows. The one gallon of water would represent one ampere of current. The friction resistance in the pipe would represent one ohm, and the one pound pressure would represent the electro-motive force (e. m. f.) necessary to drive the one ampere of current through a given length of wire having a resistance of one ohm.

The term megohm is formed simply by the addition of the prefix meg, or million, meaning, therefore, one million ohms.—*Scientific Machinist.*