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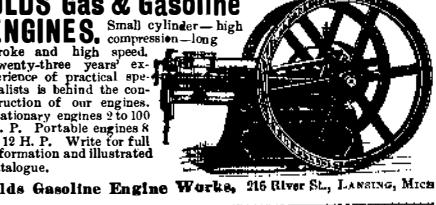
- (9408) M. H. M. says: 1. Please explain how the current of a magneto generator rings the bells on the telephone. A. When the armature of a magneto generator of a telephone is rotated the current of electricity is produced in exactly the same manner as in any other dynamo. This current passes over the line, through the bell attached to the box within which the magneto is placed, through the bell also at the station which is to be called up, and also through all other bells upon the same line. The bells at present used are of the kind known as polarized bells. That is, the cores of the electro-magnets of these bells are themselves permanent magnets, and the effect of an electrical current passing through the coils wound upon these magnets is to vary their magnetism slightly, making it greater and less, alternately. The armature of the bell therefore moves very quickly to one side and the other, striking the bell upon each side as it moves to and fro. 2. When the diaphragm of the transmitter of a telephone moves inward does the diaphragm of the receiver move outward? A. When the diaphragm of the telephone transmitter moves inward it produces an intensification of the electrical current which is passing at that time through the coils of the magnet in the transmitter, if a magnetic transmitter is employed. This increase of the current on reaching the receiver to which it is directed, would in turn produce an increase of magnetism in the receiver, which would cause the diaphragm of the receiver to be very strongly attracted, and thus cause it to move inward in the same direction as the diaphragm of the transmitter is moving. The two would thus move in the same direction from the same impulse, and not in opposite directions. If a carbon transmitter is used, a somewhat different action takes place, but the result is substantially the same.
- (9409) F. B. C. says: Please send me some information in regard to taking the temperature of conductors, for accurate resistance tests; I have volumes of electrical engineering, but there seems to be nothing definite about it in them. The books I have recommend a thermometer and do not state how it shall be applied. A. The apparatus for determining the temperature coefficient of a wire as ordinarily constructed for measurement, consists of an outer copper vessel containing water. Within this is another copper vessel which contains a frame of insulating material over which the wire to be tested is wound. The ends of the wire are connected to binding posts upon the outside. A thermometer passes through the center of the inner vessel for the purpose of measuring the temperature. This inner vessel is usually filled with oil, in which the coil of wire is immersed. Of course a volatile oil should not be employed for this purpose. Any other oil may be used. The whole apparatus may be supported in any manner so that the heat can be applied to the outer dish. The water in the outer dish being hot, heats the inner dish with its contents. The temperature is quite easily controlled.
- (9410) H. L. asks: Could atmospheric electricity (lightning) and the electricity in the ground be classed as opposite currents, that is, if a storage cell could be made large and strong enough and one pole of said cell were connected with the earth and the other pole connected to a rod on the top of a tower, would a discharge of lightning coming in contact with the rod in the air, charge the battery or would the current run right through the battery into the ground? A. The electricity in the atmosphere and that in the earth below at any moment are of opposite sign; that is, if one is plus the other is minus. The air between is an insulator, keeping these charges separate. When the charge in the atmosphere rises very high, as in a thunder-storm, the air breaks down and the two electricities rush together, making a flash of lightning. There is an enormous potential, but nothing which could charge a storage cell, even if one were built strong enough to stand the strain. You see there are charges and not currents here and no cell could be made strong enough to withstand a charge which had pierced so great a distance through the air.



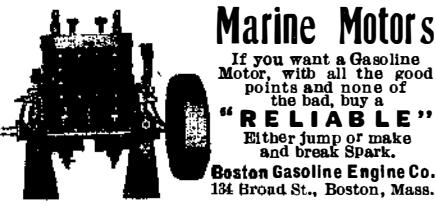
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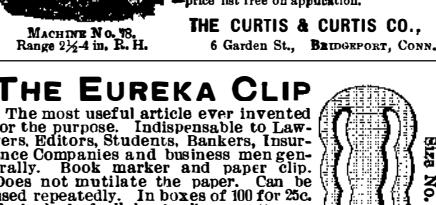
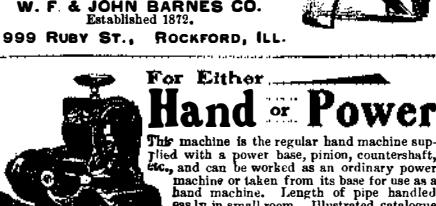
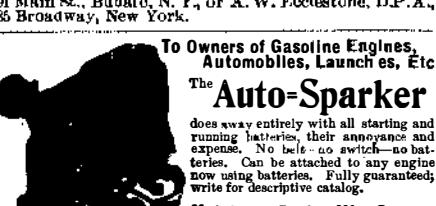
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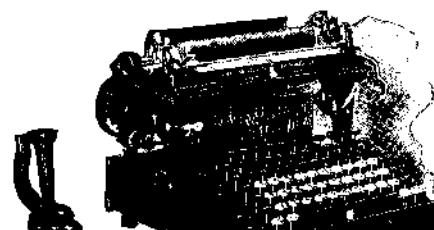
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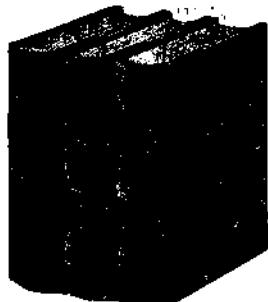
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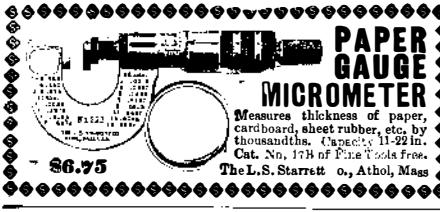
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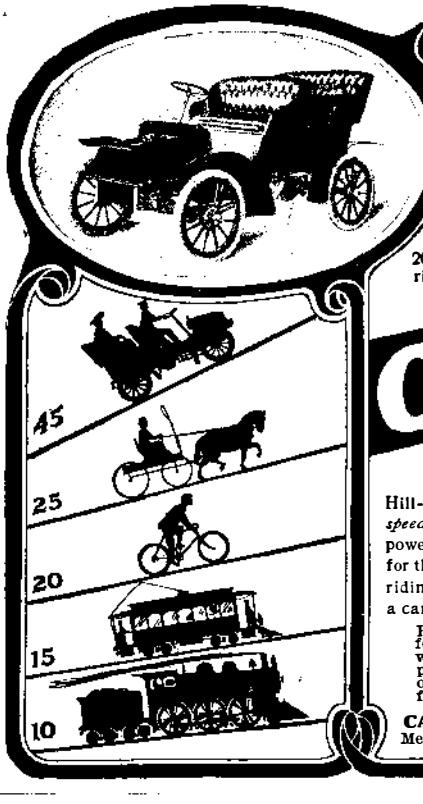
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