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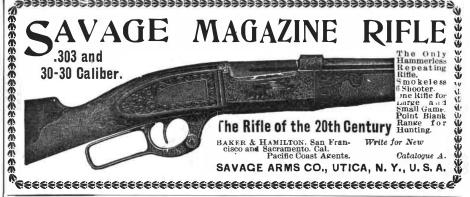
Minerals sent for examination should be distinctly marked or labeled.

(8444) F. W. T. writes: I have been informed by lightning-rod men that if a rod be strapped to a roof (wooden or metal) it absorbs all electricity on the roof or in its neighborhood and prevents a discharge of light ning striking roof or rod (wooden or metal) Is this a fact? Is a circuit necessary? A We think a lightning rod should be attached to a roof at many points, though it is not for the reason that iron absorbs electricity, but because the iron conducts the electricity away. A rod should always go to the ground and ter minate in moist earth.

(8445) C. W. B. writes: In your reply to J. G. B. (8379), October 12, "What causes the humming of telephone and telegraph wires?" you say, "The humming of wires is due to the vibration of the wires. The vibration is caused principally by the friction of the wind." Now I have many times heard them hum the loudest when there was, apparently no wind or slightest breeze whatever Do you not think sudden changing of temperature from warm to colder will cause them to hum? A. When the wind blows hard the wires do not hum to any degree. A very gentle draught of air is best adapted to give a rapid vibration, just as is the case with an Eolian harp. We have often heard them hum when there was no wind at the ground, but there was a breeze at the tops of the poles. somewhere not far away, we are sure. Tem perature could not change in iron fast enough to produce a note.

(8446) R. H. asks: 1. The tendency of an electric current is to place a magnetic needle at right angles to it. Why does not the needle ever attain this angle? A. Because the earth's magnetic force tends to pull the needle back into a north and south direction again. The position taken by the needle at any time is such that the force of the current is exactly equal to that of the earth. If the needle is controlled by a magnet, the reason ing is the same as above, only substitute the force of the magnet in place of the force of the earth. An astatic needle will turn so that it stands at right angles to an electric cur-2. Please tell me how to make a preparation which will stain the skin about the color of a Spaniard. I would prefer a compound which will not produce any injurious effects on the skin and wash off easily. A. The pastes and powders used by actors in their making-up will do what you desire. They can be purchased from costumers. 3. I wish to make a scale for a galvanometer; how can I make the scale? A. A scale of degrees is used when the reading of the needle is taken directly. When a beam of light is reflected from a mirror attached to the needle, a scale of equal divisions of any sort may be used and the value of one division found by comparison with a standard instrument. 4. I have heard that an iron bar increases slightly in length on magnetizing. Can you describe to me an apparatus which will show this? Preferably simple. A. A lever which will greatly multiply the motion of the end of the bar will accomplish this. There is no special apparatus for the experiment. The iron core of an electro-magnet is used, and the short end of the lever bears against the end of the core. When the core is magnetized, the long end of the lever moves far enough to be seen, if the apparatus is properly arranged.

(8447) E. R. H. asks: 1. Is liquid air obtainable for experimental and demonstration purposes, and if so, where may it be procured? A. We do not know. Very recently none could be had. If any machine is running we are not aware of the fact. 2. In operating a small hand-power dynamo, the current fluctuates every few seconds, the minimum current being less than one-half the maximum. The speed and the resistance remain constant, the dynamo being connected in shunt. What is the cause and how may it be remedied? suspect that your speed is not as constant as you think. We do not know any other reason a drop in the action of the machine. 3. What is the minimum spark gap of an induction coil which will operate an X-ray tube and what primary current is required? A. The spark gap depends upon the size and exhaustion of the tube. For the highest effects a coil giving 14 inches spark is required.





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