ley by the quotient. 5. Is it necessary for the carbons of an arc lamp to come together to establish the arc? How is this done? A. Yes. They remain in contact until a current passes. The action of this then draws them apart. See our SUPPLEMENT, Nos. 694, 695, 696, 1047, 1048, 1049, 1050, 1051 and 1052, for full details on the action and mechanism of arc lamps. 6. Does the working current or the excess of current pass through the field winding of a compound dynamo? Is the compound coil wound in opposition to the main coil? How does this winding make the dynamo self-regulating? A. Almost any result may be brought about in compound winding. In the simplest case part of the entire current goes through the field coils in the same direction as the current of series connection. See our SUPPLEMENT, Nos. 600, 844, and 865, price 10 cents each.

(6984) C. N. H. says: 1. What is the formula for blue print paper? Does the addition of citric acid to the water in which the prints are washed have any beneficial effect upon them? Is there any modification of this process which will produce black or brown tones? A. Send 20 cents for papers giving formulas for blue print paper. We can see no advantage in using citric acid.

To Change Blue Prints to Brown.—

Borax	2½ oz.
Hot water	38 "

When cool add sulphuric acid in small quantities until blue litmus paper turns slightly red, then add a few drops of ammonia until the alkaline reaction appears and red litmus paper turns blue. Then add to the solution 154 grains of red crude gum catechu. Allow it to dissolve with occasional stirring. The solution will keep indefinitely. After the print has been washed out in the usual way, immerse it in the above bath a minute or so after the desired tone has been reached. An olive brown or a blackish brown is the result.

(6985) A. L. N. asks: 1 What is the best known filling for fireproof safes? A. Alum is one of the best known fireproofing substances. It gives off its water of crystallization, thereby absorbing heat. Slaked lime and sodium sulphate would be good substances. As non-conductors only, asbestos or any mineral boiler covering would be good. 2. What kind of primary batteries would be practical to use for four 8 candle lamps? A. Use bichromate batteries. They will entail expense and trouble. 3. In the science of to-day, is gold considered to be an element or a compound of some other elements? A. It is considered an element. 4. What is the cheapest way to produce X rays, and smallest coil one could use? A. Use a coil capable of giving a four inch spark. We have published a large number of excellent articles on this subject, to which we refer for details. 5. If I inscribe a polygon in the base of a cone, how can I find the angle subtended by radius of circle inscribed in polygon, the vertex of cone being vertex of angle? A. Let a=radius of inscribed circle of polygon, b = radius of base of cone and α = angle sought, B=angle of cone, then tan $\alpha = \frac{a}{b}$ tan B. The relation—may be found for each case by geometrical methods.

(6986) N. N. writes: 1. I have a series dynamo, 50 volt, one 32 candle power lamp; with the brushes on the commutator in a certain place, it lights the lamp. One more lamp in parallel, the lamps burn much brighter, and with three lamps it burns too bright, and with four lamps it will blow up one or two of the lamps. What is wrong with it, or do I have to shift the brushes for every lamp I add to it? A. Nothing is wrong with the dynamo. The lamps are of insufficient voltage. Try putting the lamps in series of two and then arrange the series in parallel. Or use lamps of higher resistance. You must not expect a plain series dynamo to be self-regulating. 2. What is the resistance of a 50 volt, 32 candle power lamp hot? A. About twenty-two ohms. 3. Is there a liquid or chemical, when placed in contact with nitroglycerine, that will explode it? A. Impurities will bring about slow decomposition and possible explosion. No practical way of exploding by contact with a liquid is known. 4. Please let me know of a powerful explosive, actuated by an electric spark. A. Gunpowder. The higher explosives are best exploded by a detonator, but gunpowder is very reliable for spark ignition. 5. Can resistance box be put in a series dynamo to advantage? A. A resistance box involves waste of energy, but it can be used with advantage in some respects.

TO INVENTORS.

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Cotton and linen goods, silks and woolens, J. Hirsch & Sons.. 28,895
Dried apples, Herndon-Carter Company.. 28,920
Elastic fabrics, Hub Gore Makers.. 28,894
Hats, caps and bonnets, W. Barnard.. 28,888
Horse clothing and lap and carriage robes, W. B. Riley & Company.. 28,893
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