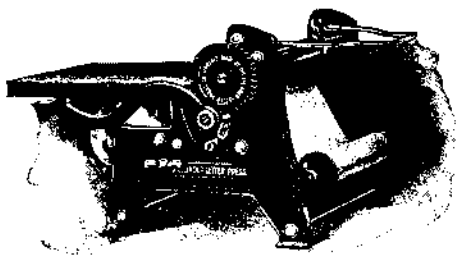


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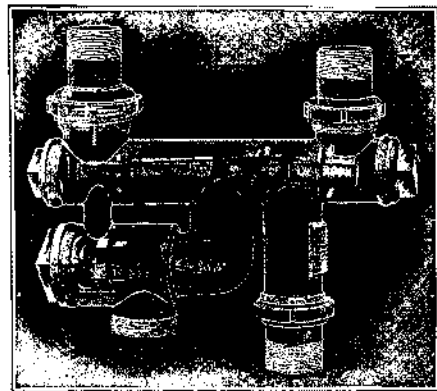
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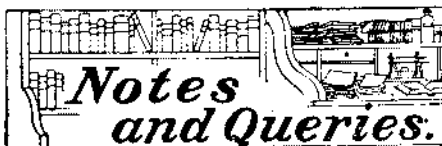
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References to former articles or answers should give date of paper and page or number of question. Inquiries not answered in reasonable time should be repeated; correspondents will bear in mind that some answers require not a little research, and, though we endeavor to reply to all either by letter or in this department, each must take his turn.

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(9238) E. C. H. says: My boat is 32 ft. x 4 ft. x 12 inches; engine, 3 1/2 x 6 x 6; revolutions, 380 to 420; steam, 125 pounds; wheel, 27 1/2 inches; pitch, 37 inches. Speed over measured mile in slack water, 11.39 miles with full stroke. Normal speed, 9 to 10 miles with 3/4 cut-off. I. H. P. (cards) under 9. Vol. 26 inches to 27 inches. This may interest E. T. R., No. 9225 of Notes and Queries, in SCIENTIFIC AMERICAN, November 14.

(9239) C. F. F. says: Have you any publication that gives a more explicit explanation of the Wimshurst induction machine than is to be found in Hopkins's "Experimental Science"? I regret to say a machine that I constructed according to his instructions refuses to work. Have made one radical change from his specifications, by using large gramophone disks in place of glass. Do you suppose that is the cause of my failure? Have used the rubber disks before, and obtained excellent results in condensers, and supposed that same could be used for the above purpose. A. We think it strange that you should say you have constructed a Wimshurst machine according to Hopkins's "Experimental Science," and it will not work, when in the next sentence you say you have used a very different plate from the directions in "Experimental Science." We think if you had used glass plates as directed, you would have had success. We see no reason why a smooth ebony plate might not be used on the machine, but should not expect success with a rough plate, as we suppose the gramophone plate to be. In condensers, the rubber plates act only as insulators. In a machine their office is very different. An induction takes place through them, and they are charged and discharged as they revolve. In making a new article from instructions, it is most desirable to follow the instructions implicitly. We recommend, and can supply at once, the new edition of Gray's "Electrical Influence Machines," which describes the construction of Holtz and Wimshurst machines. Price \$2 by mail.

(9240) J. E. H. says: As a constant reader of your valuable paper, I take the liberty of asking you the following questions, which I trust you will be willing to answer, not only for my own benefit, but for all your interested readers: Is there such a thing on the market as a perfect rotary engine? If so, kindly state wherein they are superior to the ordinary types of to-day. A. Replying to your question regarding a perfect rotary engine, we would say that there is no perfect engine of this character on the market. A rotary engine has the advantage of not requiring the reciprocating parts of the ordinary steam engine, and therefore may be perfectly balanced. In some cases this would be an undoubted advantage. No thoroughly successful engine of this type, however, has been placed on the market, owing to the difficulty of controlling the admission, expansion, and release of steam by means of simple mechanism. The steam turbine has the advantages of the rotary engine, and is now being built in this country.

(9241) W. A. A. says: Please give me rule for determining proportion of air and coal gas, for best results with atmospheric burner. A. A rule for determining the proportion of air for the perfect combustion of coal gas is as follows: It is first necessary to know the chemical analysis of the gas, because the combustion of coal gas varies much in different places. The three principal constituents which take part in the combustion are, first, hydrogen, second, carbon, third, carbon oxide (CO). In order to determine the amount of oxygen for each of these three constituents, multiply the number of parts of hydrogen by 8, multiply the number of parts of carbon by 32-12, multiply the number of parts of CO by 16-28; add these three quantities together, and it will give the weight of oxygen needed; then multiply this amount of oxygen by 5, and it will give the weight of air needed for the perfect combustion of the coal gas. As a rule, from 30 per cent to 50 per cent excess of air is required for the best results. At atmospheric pressure, one pound of air is equivalent approximately to 13 cubic feet.

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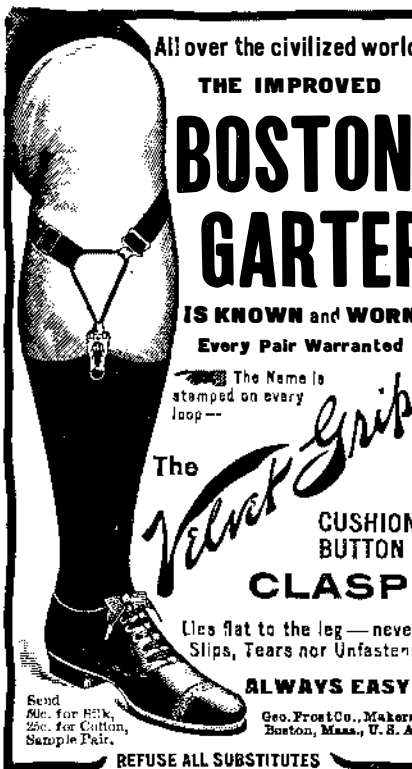
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