

$$C = \frac{T_1^2 \times 10^{14}}{4 L} \dots\dots\dots (2)$$

Introducing jars for C we have $C = n \times 0.003$

$$\text{therefore } n = \frac{T_1^2 \times 10^{17}}{12 L} \dots\dots\dots (3)$$

Introducing again λ in miles in place of T_1

$$T_1 \text{ being } = \frac{\lambda}{187,000} \text{ we have:}$$

$$\lambda = \frac{374}{10^4} \sqrt{LC} \text{ or, since usually } \frac{\lambda}{4} \text{ is needed}$$

$$\frac{\lambda}{4} = \frac{93.5}{10^4} \sqrt{LC} \dots\dots\dots (4)$$

Observations made in experiments with oscillators, 36 1/2 turns and additional coil:

The additional coil is, as observed in the New York apparatus, an excellent means of obtaining excessive electromotive force. But it is peculiar that to properly develop the independent vibration of such a coil its momentum should be very great with respect to the impressed vibration. When such a relation exists the free vibration asserts itself easily and prominently. But when the impressed vibration is very large and the coil's own momentum small, the free vibration can not assert itself readily. It is exactly as in mechanics. A pendulum with great momentum relative to the impressed momentum swings rigorously through its own period but when impressed momentum is very large relatively it is hampered, for then the impressed dominates more or less. This I look upon as distinct from the magnifying factor which depends on $\frac{pL}{R}$.

It was evident that in such excitation of the additional coil there should be, for the best result, three vibrations falling together: that of the coil, that of the secondary and that of the combined system. In view of the above it is of advantage to place inductance between the secondary and additional coil to free the latter, when impressed vibration is too powerful to allow the intended vibration of the coil to take place readily.

From experiments it further appeared as though it would be of advantage to have some self-induction in the primary spark gap. This is to be ascertained. The use of condensers in series with the supply secondary is sometimes of advantage but little so when the vibration of the secondary is in resonance with the primary. Then there is less short circuiting of the secondary of the supply transformer and sparks are loud and sharp.