

Gates, Elmer. "New Augmentation of X-Ray." *Popular Science*
(New York: October 1900), p. 183.

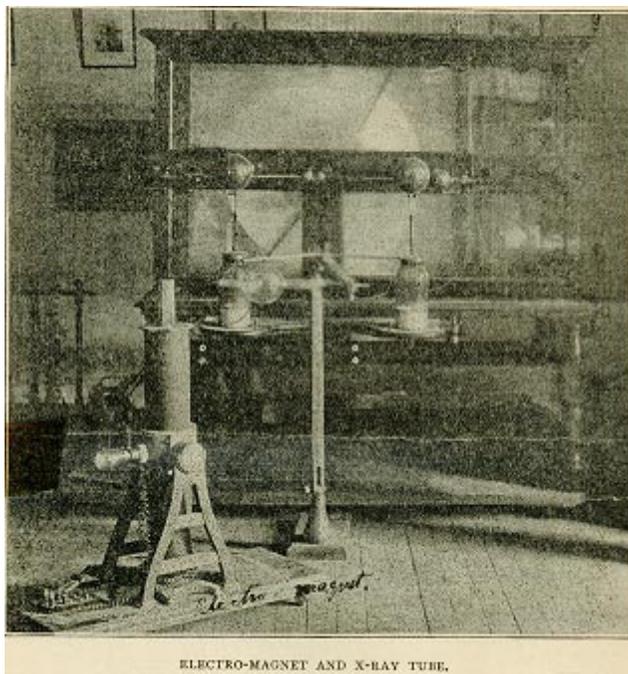
NEW AUGMENTATION OF X-RAY

by
Elmer Gates

I recently placed a powerful electro-magnet near one end of an X-ray tube, and found that when the magnet was excited it produced a very conspicuous augmentation of the intensity of the X-ray luminosity. The bones of the hand could be distinctly seen through a fluoroscope at a much greater distance when the magnet was charged than when it was not. By interposing books between a key and the fluoroscope so as to make the key quite invisible, owing to the thickness of the books, I could easily distinguish the key when the magnet was charged, and it could not be seen when the magnet was not charged. The old X-ray tubes which were considered worthless were quickly rejuvenated by a few minutes' action of the electro-magnet.

I used a thirty-two inch ten-plate static machine, and when running at full capacity it keeps the platinum in the tube slightly red-hot at one particular point. When the magnet is charged this platinum electrode immediately becomes glowingly incandescent. In working with this static machine and with these same bulbs none of us had ever before been burned, it being perfectly safe to expose any part two or three hours to the action of the X-rays; but when this electro-magnet experiment was made on the X-ray tube, we all felt a decided burning of the skin of our hands and faces after six or eight minutes' experimentation.

I enclose a picture of the magnet in its proper position with reference to the bulb. The core of the magnet is thirty-six inches long and two inches in diameter; and the coil requires 110 volts and eight amperes. The effects, while noticeable with a weak magnet, were not conspicuous except when I used a powerful coil; the dimensions of which, given above, somewhat underestimate the current. I now find it takes 110 volts and twelve amperes.



When Mr. Clinton P. Townsend, the electro-chemical expert of the U. S. Patent Office, was here, Aug. 31, I repeated the experiment in his presence; I can refer to him. The apple-green luminosity of the tube is four or five times, possibly ten times, augmented when the current is on the coil. The core is placed somewhat nearer the anode than is shown in the picture.

On the same day I studied the effect of the magnet upon the stratification phenomenon of a Geisler tube. I have a long Geisler tube in which my machine gives the stratified appearance of waves, being at least three-fourths of an inch long; but when the core of the magnetized coil is close to the tube these waves become about one-eighth of an inch long, or shorter, and the rate correspondingly increased.

The electro-magnet has a good effect in steadying the illumination of the Roentgen tube; holding it so that it does not shift its focus, which is an important matter.

A letter just received from Dr J. Rudis-Jicinsky, Sec'y of the Roentgen Society of the U. S., at Cedar Rapids, Iowa, states that the experiment is new to him and he thinks that it will shorten the X-ray exposure and serve to prevent the flickering which makes indistinctness of image.

While showing the phenomenon to Mr. Townsend, I noticed that I could get the apple-green radiation at great intensity, and, by a little change in the position and distance of the electro-magnet from the machine, I got an entire absence of the apple-green radiation and in its place a most intense purely violet radiation from the anode. I shall determine the photo-chemical effect of these rays.