This is simply due to the fact that during the post discriminator interval the length of the pulses is cut, thereby adding to and subtracting from the true number of any particular length. Since in our case the number-of-recoils-versus-length curve drops very strongly, more pulses are thrown out of an interval than are thrown in. We therefore expect the counting rate to increase as one lengthens the post discriminator interval until the interval becomes longer than a collection time. From then on the rate should be constant since all the extra pulses are rejected by the post discrimination. This behavior has indeed been observed. For the high pressure chamber the counting rate increased from post-discrimination time zero to 2 milliseconds by a factor 3 and then stayed practically constant. Measurements were taken up to 3 milliseconds. The length of the post discriminator interval was therefore set to 2.17 milliseconds.

Testing of amplifier performance.

In order to measure the amplification and the linearity of the amplifier an artificial pulse generator was built generating reproducible pulses of well determined size. Previous experiments involving similar measurements[7] had shown that mechanical switches for this purpose are not reliable since they frequently lead to oscillating breaks or closings of the contact. Therefore a thyratron was used for closing the circuit which, once fired, stays conducting. The breaking of the current was performed by a relay but no use was made of this pulse. Fig. 6 shows the arrangement of the pulse generator. Suppose the thyratron is conducting whereas the capacity feeding the 75-volt neon tube is below its flash voltage. After sufficient time the voltage rises to the flash point, the neon tube flashes, thereby operating the relay and interrupting the plate current of the thyratron. At the same time the grid of the thyratron becomes charged negatively due to the capacitive coupling between plate and grid circuit.