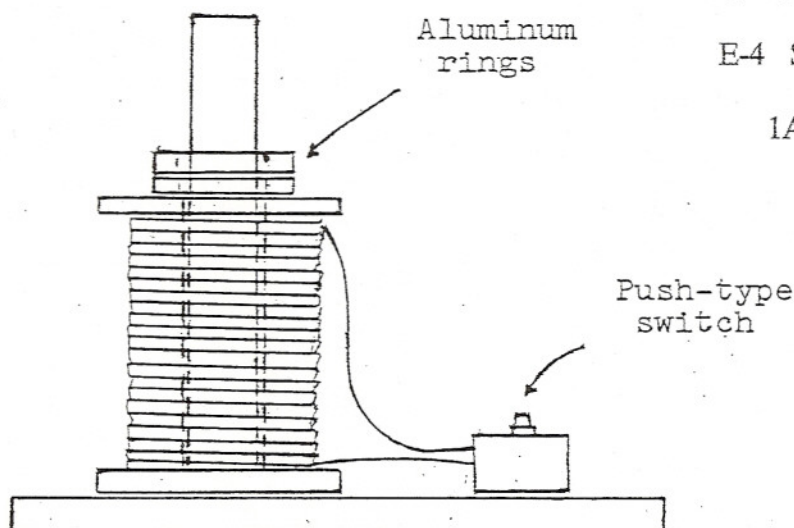


Jumping Ring

E-4 S-2

1A



One of the two aluminum rings is slotted, but do not inform the students of this fact at the start.

With wire laminated iron core in solenoid, place unslotted ring over core, push switch, and observe that the ring jumps high off the iron core. Repeat two or three times if you wish.

Place the slotted ring over the iron core, push the switch, and observe that there is no tendency for the ring to jump. Examine the rings, find that one is slotted whereas the other is not, and explain the difference in behavior.

Remark that it is difficult to hold the unslotted ring down on the core very long with the switch closed. Within 8 to 10 seconds the ring becomes entirely too hot to hold. **But, do not challenge a student to hold down the ring.** Instead of holding the aluminum ring, hold down the protective rubber that has been introduced to keep from burning one's fingers. There is a groove cut into the new ring for pouring water into to demonstrate how hot the ring gets and to watch it dissipate as the ring gets hotter and hotter.

It is also pertinent to show that, and explain why, the unslotted ring is held stationary near the top of the core as long as the switch remains closed, provided one places his hand on top of the core to keep the ring from jumping entirely off when the switch is closed initially.

The emf induced in either ring is of the order of 0.15 volt. The current induced in the unslotted ring is of the order of 1500 amperes.