Magnets and how to use them

.5” by 1/8” thick neodymium disk magnets using super glue to hold 4 on a 5/16” by 1.5” finder washer. 5/16” nut and bolt were used to hold the two washers together and to mount the disk in a electric drill. Half of a 3/8” chain link was wound with 110 turns of 20 gage wire (18 ft approximately .5 Ohm) leaving about 8” leads. This was clamped in a vice and the drill with disk was put in contact with the magnets and rotated at about 2400 rpm. The diameter between centers of the magnets was about 1.12”.

The test setup produced a measured 2.2 V AC or full wave recertified 1.8 V DC at 1 amp. The diode drop in voltage when measuring the current was about .5 volts. Power output is I*(I*R +Diode voltage) or 1*(1*.5+.5) = 1 watt. The perimeter of a disk is = 3.14*D the diameter. Thus if we had something like a break disk or drum that was that was 8 times the diameter it would only need to rotate 1/8 as fast and hold 8x disk magnets. In this case we would have a diameter of about 9” running at 300 RPM holding 32 magnets one time around. If there were 3 rows each with a different phase to minimize cogging effects this would result in 96 magnets. For every two magnets we need one half of a chain link (48). Thus max power is about 48*1 = 48 watts. If of each of the 32 half are wired in parallel and the rest in series then the open circuit output AC voltage would be about 16*2.2 or 35 volts. This would give the short circuit amperage at about 3*2 = 6 amps. At 12 Volts one could at best expect about 2 amps with magnets touching chain link. At a small air gap maybe 1 amp.

Magnet flux is about 1 amp times 110 turns or 110 amp-turns for the area of this 3/8” chain link. Some is leaking out so the magnet has more capability. Is it better to have lots of little coils or bigger coils and more flux lines inside.