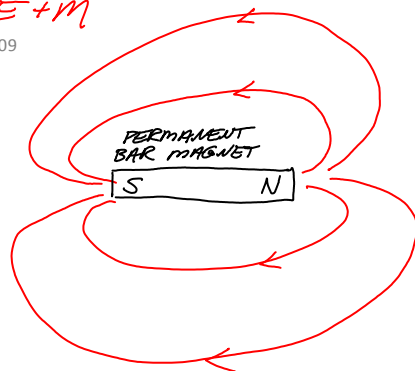


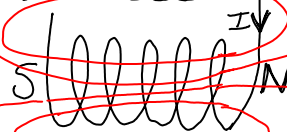
more E+M

Thursday, April 30, 2009
9:22 AM



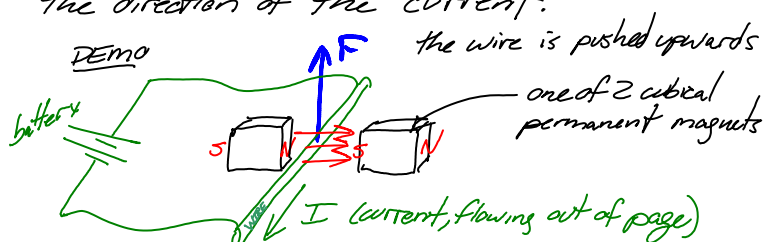
MAGNETIC FIELD LINES
go from N poles toward
S poles.

A COIL OF WIRE
(with current I) ACTS LIKE
A BAR MAGNET ALONG THE AXIS
OF THE COIL

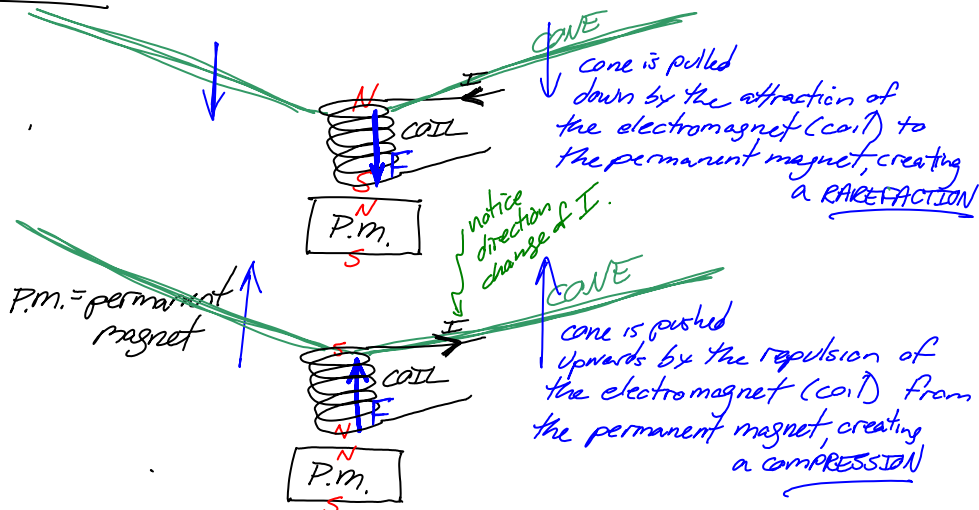


(IF YOU CHANGE THE
DIRECTION OF THE CURRENT,
THE N and S POLES FLIP
PLACES)

Magnetic Force exerted on a moving charge is
 $\perp$ to both the magnetic field and
the direction of the current.



SPEAKER



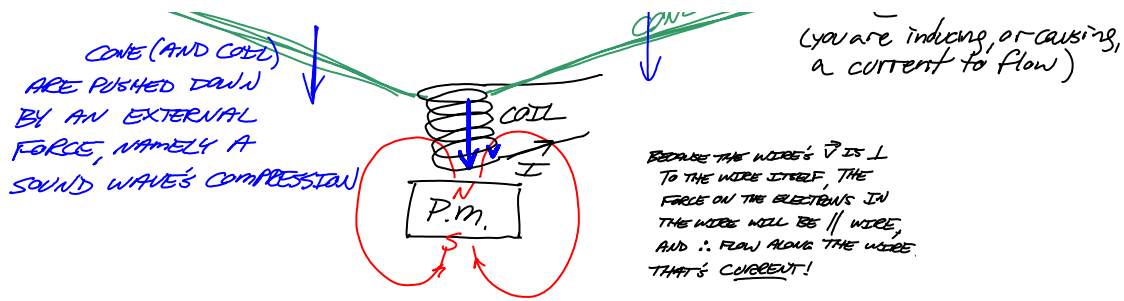
THE CONE MOVES UP + DOWN AS FREQUENTLY AS THE
INPUT CURRENT SWITCHES DIRECTION

I.E. SOUND OUTPUT FREQUENCY = INPUT AC FREQUENCY

MICROPHONE

IF A COIL OF WIRE NEAR A PERMANENT
MAGNET IS MOVED (SAY, BY BEING HIT
BY A SOUND WAVE'S COMPRESSION), THEN THE
STATIONARY CHARGES IN THE WIRE WILL
EXPERIENCE A FORCE AND START MOVING,
I.E. CURRENT.

THIS PROCESS IS CALLED
INDUCTION



WHEN THE SOUND WAVE'S RAREFACTION HITS THE CONE, IT IS PULLED UPWARDS, WHICH ALSO PRODUCES CURRENT, BUT IN THE OPPOSITE DIRECTION. $\rightarrow$ AC. THE FREQUENCY OF THE AC MATCHES THE FREQUENCY OF THE SOUND WAVE. (OR MORE REALISTICALLY, THE MIX OF FREQUENCIES.)

SPEAKERS + MICROPHONES COMPARED...

Notice that the speaker + microphone diagrams above look very similar. The same physical construction can be used for both purposes!

	<u>INPUT</u>	<u>OUTPUT</u>
SPEAKER:	CURRENT	MOTION
MICROPHONE:	MOTION	CURRENT