

INDEX

- Alternating fields, 144 ff.
- Anisotropy constant
 - measurement, 36 ff.
 - values, 9, 40
- Approach to saturation, 34 ff.
- Barkhausen effect, 92
- 'Bitter patterns', 81 ff.
- Closure, domains of, 70 ff.
 - energy in, 76 ff.
- Coercive force, 116, 121, 126, 129, 132
- Curie point, temperature, 3
- Distortion of crystals, 42
- 'Easy directions', 6, 18, 48, 74
- Eddy currents, 147 ff., 158, 164
- Elastic properties, effect of magnetostriction on, 64 ff.
- Ferrimagnetism, 5
- Field, demagnetizing, effects on
 - cylindrical rods, 12, 30
 - disk specimens, 17, 25 ff.
 - domain boundaries, 67 ff., 105, 114, 119, 131
 - external field, 7
 - free energy, 68, 73
 - grains in polycrystals, 32
 - iron under tension, 60
 - magnetostriction, 53
 - spheres, 10
- Field, internal (or molecular), 3, 4
- Hysteresis, 161 ff.
 - in low fields, 137 ff.
- Imperfections, effects of, 14, 108 ff.
- Inclusions, 112 ff., 167
 - distribution, 131
- Internal stresses, *see* Stresses
- 'Knee' of magnetization curve, 16, 31, 142
- Loss in alternating fields, 145, 147 ff., 154, 164
- Magnetization,
 - micro- or intrinsic, spontaneous, 2 ff., 23, 35, 42, 170
 - macro-, 2
 - rate of change, 144 ff.
 - rotation, 9, 13, 18, 34, 55, 118, 124, 127, 170
 - thermal effects, 161, 168
 - work of, 18, 38, 125, 129
- Magnetization curves
 - for polycrystals, 33
 - for single crystals, 8, 18 ff.
 - for stressed materials, 55 ff.
 - in low fields, 137 ff.
 - near saturation, 34
- Magnetocrystalline anisotropy, 8, 17 ff., 59, 73, 76, 95, 118, 140, 156
 - coefficients, 19
 - measurement of constants, 36 ff.
 - physical origin, 24
- Magnetostriction, 9, 41 ff., 73, 81, 94, 101, 110, 119, 124, 128, 140, 155
 - coefficients, 46
 - dependence on magnetization, 48 ff.
 - effect on elasticity, 64 ff.
 - effect of tension, 58
 - physical interpretation, 66
- Patterns, domain
 - 'fir tree', 85
 - in '[110] rod', 74 ff.
 - in low fields, 80
 - in uniaxial crystal, 71
 - mechanism of formation, 89 ff.
 - near inclusions, 116, 167
 - observation, 81 ff., 92
 - on cobalt, 92
 - on iron, 83 ff.
 - on nickel, 91
- Permanent magnets, 143
- Permeability, 15, 140
 - at high frequencies, 149
 - initial, 121, 128, 138
 - time change, 146
- Plastic deformation, 17, 82, 128
- Polishing of specimens, 82, 83
- Polycrystals
 - magnetization curves, 32 ff.
 - work of magnetization, 38

176

INDEX

- Remanence, 125
Resonance, ferromagnetic, 40, 146
- Shape, effect of, 17, 53, 119
Single crystals
 experiments, 17 ff., 49 ff., 83, 86,
 103, 157, 165
 initial susceptibility, 135
 magnetization curves, 18, 25
 magnetostriction, 48 ff.
 production, 17
 torque, 39, 136
- Single-domain particles, 118, 156
- Stress anisotropy, 9
- Stress
 distortion of crystal by, 42
 effect on magnetic properties, 53 ff.
 effect on wall energy, 101, 110
Stress, internal, 22, 34, 64, 65, 81, 155
 effect on domain arrangements,
 109 ff.
 effect on permeability, 127, 129
 lowest value, 128
- Susceptibility, initial, 56, 121, 128
 anisotropy of, 134
- Temperature changes during magnetization, 168
- Tension, effect of
 on iron, 60 ff.
 on magnetostriction, 58
 on nickel, 54 ff.
 on Permalloy, 57
- Thermoremanence, 156
- Time constants for magnetic change,
 144 ff.
- Torque on crystals, 39, 136
- Villari reversal, 51
- Viscosity, magnetic, 150 ff., 164
- Volume, variation of, with magnetization, 44, 52
- Walls, domain, 6, 93 ff.
 deformation, 131
 effect on domain spacing, 72
 energy of, 99, 103
 hindrances to movement, 13,
 108 ff.
 measurement of surface energy,
 103 ff.
 movement, 151, 165, 170
 orientation, 67 ff.
 velocity of movement, 151 ff.,
 158
 width, 100