

M

Machinery.
 as heat source, 140, 159
 mountings vibration, 587
 sound insulation of, 587
Magnesia insulation, 724
Manometer, 811, 826
Manual control, (see Controls)
Masonry materials, heat transmission through, 97
Mass, 826
Mb, 331, 826
Mbh, 331, 826
Mean radiant temperature, 754, 758
Mechanical,
 draft towers, 515
 equivalent of heat, 826, 834
 fuel burning equipment, 201
 refrigeration, 35
 ventilation, 77
 warm air furnace systems, 391
 air distribution, 397
 design of, 400
 register and grille locations, 397
Medical treatment, (see Diseases)
Mental trouble, 605
Mercurial thermometer, 809
Metabolism, 53, 73
Meters,
 choice of, 774
 condensation, 771
 fluid, 774
 Nicholls heat flow, 817
 steam flow, 776
 types of, 774
 water, disc, 789
Methyl chloride, 37, 42, 511
Metric units, 835
Micromanometers, 808
Micron, 79, 826
Mixture, air and water vapor, 12
Modulating control, 687
Moisture,
 content,
 of air, 72, 147, 503, 625
 capillary or free, 651
 of hygroscopic materials, 626, 651
 loss by human body, 76
 from outside air, 158
 produced by cattle, 679
 regain, 625
Mol, 826
Monitor openings, 672
Monofluorotrichloromethane, 37, 44
Motive power, 703
Motors, electric, 703
 adjustable speed, 704, 709
 adjustable varying speed, 704
 alternating current, 705
 application of, 708
 capacitor type, 706
 characteristics of, 708
 classification of, 708
 compound wound, 703
 constant speed, 704, 708
 control equipment for, 711
 automatic, 712
 manual, 711
 multispeed, 714
 pilot, 712
 single phase, 716
 slip ring, 715
 damper, 685
 direct current, 703
 control of, 713
 speed characteristics, 704, 708
 as heat source, 159
 induction,
 automatic start, 710
 capacitor start, 706
 repulsion, 706
 repulsion start, 707
 slip-ring wound rotor, 710
 squirrel cage, 707

Motors, electric (continued)

polyphase, 707
 selection of, 645
 series wound, 703
 shunt wound, 703
 single phase, 706
 special applications, 711
 split phase, 707
 synchronous, 711
 varying speed, 705
MRT, mean radiant temperature, 754, 758

N

Natural draft towers, 515
Natural ventilation, 72, 689
Nervous instability, 607
Neurosyphilis, 603
Nicholls heat flow meter, 817
Noise, (see also Sound)
 air outlet, 554
 in buildings, 584, 587
 control of, 584
 through ducts, 592
 through room wall surface, 591
 with warm air systems, 396
 equipment, 586
 kinds of, 586
 level,
 acceptable, 585
 of compressors, 471
 of fans, 539
 of unit heaters, 442
 measurement of 584
 through building construction 587
Nozzle, 499
 air spray, 499
 oil atomizer, 214
 water spray, 499
Nurseries, 600
 equipment for, 602
 requirements for, 601
 ventilation rate, 602

O

Odors, 69
 of human origin, 51
 concentration 70
 removed by outside air, 71
Off peak heating, 748
Oil, oils,
 atomization of, 507
 burner, burners,
 air for combustion, 214
 air supply for, 214, 219
 boilers, 216, 218
 burning rate chart, 238
 classification, 215
 combustion, 218
 for commercial use, 216
 control of, 220, 698
 design considerations, 219
 for domestic use, classification, 214
 efficiency of combustion, 220
 flame with, 214
 furnace requirements, 246, 394
 ignition, 214
 oil consumption, 229, 238
 operation, 214
 Orsat test, 220
 specifications, 173
 types of, 215
 calorific value of, 174
 classifications, 171
 as corrosion inhibitor, 375
 cost of, 175
 gages, 221
 ignition of, 174, 214
 preheating, 217
 specifications, 174

One-pipe steam heating systems, 275, 826 (see also Steam Heating Systems)
Openings, 670
 air inlet, 672
 monitor, 672
 for natural ventilation,
 location of, 675
 resistance offered to flow, 676
 size of, 669
 types of, 670
Operating rooms,
 anesthesia, 597
 explosion hazard, 597
 humidification, 598
 static electricity, 598
 ventilation, 598
Office, offices,
 friction heads, 612
 steam heating systems, (see Steam Heating Systems)
Orsat test apparatus, 212, 220, 224, 816
Outlets, (see also Registers, Grilles)
 design and location of, 559
Oxygen, 375, 559
Oxygen therapy,
 diseases treated, 605
 oxygen chambers, 606
 oxygen tents, 605
Ozone, 77

P

Paint,
 effect on radiators, 265
 spray booths, 640
 temperatures and humidities for processing, 623
Panel radiation, 826
Panel warming, 827
Partial pressures, Dalton's law of, 1
Perspiration, 51, 54, 73, 75
Peterson-Palmquist apparatus, 815
Pipe, piping, 355
 bare, heat loss from, 719
 bends, 315, 362
 capacities, (see Pipe, Sizes)
 coil radiators, 263
 conduit, 738, 767
 connections, 316, 770, (see also Connections)
 copper, 356
 corrosion of, 374
 district steam, 765
 dimensions of, 359 (see also Pipe Sizes)
 expansion of, 315, 359, 767
 fittings, 364, (see also Connections, Fittings)
 for water supply, 788
 welding fittings, 366
 flanges, 370, 723
 flexibility of, 359
 freezing,
 prevention of, 733
 friction, 791
 of air in, 566, 567
 heads in, 336
 gaskets, 366
 hangers, 364
 heat loss from 225, 719
 cost of, 720
 for hot water heating systems, 331, 351
 insulation of, 719
 joints, 315, 769
 leaders, 378
 radiating surface, 722
 radiators, 263
 refrigerant, 484
 scale in, 374
 sizes,
 for boiler runouts, 318, 766
 for central fan systems, 323
 for convector connections, 322
 dimensions, 356, 359
 for district heating, 766
 for domestic hot water, 795

Pipe, piping, sizes (continued)

elbow equivalents, 340
 equivalent length of run, 305
 friction head, 337, 791
 of orifices in unions, 343
 for Hartford return connection, 318
 for hot water heating systems, 335
 for black iron, 337, 338
 for copper tube, 337, 339
 forced circulation systems, 337
 gravity circulation systems, 345
 for indirect heating units, 325
 mains, 790
 for pipe coil connections, 323
 for radiator connections, 320
 refrigerant, 484, 486
 return, capacity of, 308, 767
 steam, 302, 306, 307
 underground, 767
 tables, 306, 655
 tees, 364
 for underground steam, 767
 for water supply, 787
 weights, 361
 steam, capacity of, 304
 for steam heating systems, 275, 301, (see also Steam Heating Systems)
 supports, 364
 sweating, 734
 tax, 253
 tees, dimensions of, 367
 threads, 363, 365
 tunnels, 767
 types of, 355
 underground,
 insulation of, 737
 steam, 767
 for unit heaters, 442
 valves, 370
 water supply, 783
 weights of, 356
 welding, 366
Pitot tube, 811
Plastering materials, heat transmission through, 101
Plenum,
 chamber, 827
 systems, automatic control of, 688
Plumbing fixtures, 377
Pneumatic control system, 286
Pneumonia, 52, 599, 605, 607
Pollen, 605
Pollution of air, 83
Polyphase motors, 707
Ponds, cooling, 512
Positive acting control, 686
Post-operative pneumonia, 599
Potassium permanganate, 514
Potentiometer, 827
Power, 827
 conversion equations, 833
 electric, 750
 supply for controls, 686
 railway air conditioning, 613
Precipitators, dust, 527
Premature infants, 600
 humidity of, 601
 mortality of, 602
 requirements of, 601
Pressure, pressures,
 absolute, 819
 air,
 in heating unit, 412
 measurement of, 811
 atmospheric, 807, 820
 for atomization, 504
 automatic control, 685
 barometric, 183, 807
 basic, 3
 controllers, 685
 conversion equations, 833
 drop, 566, 791
 drop through refrigerant pipe, 486
 dynamic, 823
 gage, 808
 loss in copper pipe, 339, 486
 loss through ducts, 563, 643