Gas *(continued)*
flue, analysis, 832
fuel,
manufactured, 182
natural, 182
properties of, 182
inflammability, 79
scrubbers, 84
toxicity of, 81
Gas-fired appliances, 226
automatic control of, 218
boilers, 226, 714
carbon monoxide produced by, 228
chimneys for, 202
classification, 226
combustion in, 228
control of, 229, 714
conversion burners, 228
furnace requirements for, 400, 839
heat from, 158
rate of gas consumption, 401
ratings of, 230
sizing, 230
types of space heaters, 227
used with unit heaters, 440
warm air furnaces, 226
Gaskets, 372
Glass,
heat transmitted through, 115, 150
Globe thermometer, 778
Glossary of terms, 835
Goitre, 617
Gonorrhea, 621
Grates, 840
areas of, 255, 389, 408, 421, 840
of furnaces, 255, 389, 408, 421
of stokers, 207
Gravity,
circulation, 351
convectors, 269, 759
heat emission of, 269
gravity-indirect heating systems, 279
pressure heads, 350
specific, 3
steam heating systems, 231, *(see also Steam Heating Systems)*
warm-air heating systems, design of, 383
Grille, grilles, *(see also Registers)*
anemometer readings through, 828
for concealed heaters, 276
recirculating, 387
of roof ventilators, 689
velocity through, 407
for warm air systems, 403

H

Hartford return connection, 264, 322
Hay fever, 622
Hazard of explosion, in operating rooms, 615
Health, 81, 617, *(see also Disease Treatment)*
Heart trouble, 623
Heat, 840
absorbed by building structure, 139
of adsorption, 42
air infiltration equivalent of, 128
capacity, 153
of leader pipes, 384
of condensation, 46
conduction, 837
content,
of air and water vapor, 2
of coal, 166
of dry air, 22
of gases, 679
of saturated water vapor, 23
convection, 837
conversion equations, 848
demand, factors governing, 131, 247
effects on human body, 52
electrical equivalents of, 766, 849
emission,
of convectors, 269, 276
Heat *(continued)*
emission
by radiation, 772
of radiators, 269, 276
equivalent, equivalents, 849
of air infiltration, 128
of brake horsepower, 138
electrical, 849
exchanger, 525, 526
shell and tube, 476
flow meter, 833
gain,
from fixtures and machinery, 158
for insulated pipe, 751
from outside air, 156
infiltration equivalent of, 128
latent, 31, 841
loss, 71, 74
of the liquid, 28, 840
loss,
from bare pipe, 735, 737
computation of, 87, 140, 766, 774
cost of, 736
determination of, 128, 138, 233, 769
from ducts, 746
effect of insulation on, 753
from human body, 71, 769, 770
by infiltration, 128, 233
latent, 128
from piping of gas-fired furnaces, 230
by radiation, 58, 769
sensible, 128
to unheated rooms, 116
maximum probable demand, 131, 247
of mixing, 45
mechanical equivalent of, 841
produced by cattle, 695
produced by human body, 51
pump, 466, 765
radiant, 769
calculation of, 774
measurement of, 777
types of, 772
radiation, 759, 769
regulation in man, 51, 55
requirements, 233
sensible, 145, 843
of air, 12
loss, 71, 772
of water, 31
solar, 149
other than heating plant, 138, 147
specific, 31
total, 22, 844
of saturated steam, 28
transfer, 87
coefficients, 88
coils, 493
rate, 253
transmission, 87, 771
through air spaces, 89
through building materials, 89
calculations, 87
coefficients, 87, 94
of ceilings, 109
combined, 116
of copper pipe, 737
of doors, 115
of floors, 109
of glass walls, 115
of insulation, 95
of partition walls, 108
of roofs, 112
of skylights, 115
of surface conductance, 90
of walls, 102
of windows, 115, 149
convection equation, 771
definition of terms used, 88
effects of solar radiation on, 149
formulae, 89
through glass, 115, 149
measurement of, 833
by surfaces not exposed to the sun, 147

Heat *(continued)*
transmission
symbols used in formulae, 88
tables, 87, 95
through ducts, 746
time lag, 153
utilization, 233
Heaters,
direct-fired, 440
for domestic hot water, 815
electric, 757
capacity of, 756
conduction, 758
convection, 759
radiant, 759
space, 227
unit, 759
Heating, *(see also Heat)*
auxiliary, 765
coils, 493, 510
construction, 494
district, 781
effect of radiators, 272
electrical, 757
elements, electric, 758
fundamentals of, 1
load, 131
medium, 840
radiant, 759, 769
railway air conditioning, 629
by reversed refrigeration, 489, 765
surface, 247, 840
square foot of, 843
symbols, 851
systems,
district, 781
electrical, 757
fan, 415
gravity warm air furnace, 383
hot water, 337, 840
mechanical warm air furnace, 399
radiant, 759, 769
steam, 307, 761
value, fuel oil, 678
water, 799
Henry and Dalton, law of, 381
Hoods,
axial velocity formula, 655
canopy, 657
for chemical laboratories, 658
design of, 652
for exhaust systems, 655
open, 657
suction pressures at, 653
velocity pressures at, 655
Horsepower, 840
boiler, 257
brake, heat equivalent of, 138
Hospital air conditioning, *(see Disease Treatment)*
Hot box, 833
Hot plate, 833
Hot water, domestic
control of, 716
load, 256
supply, 813
Hot water heaters, 251, 815
Hot water heating systems, 337, 840
forced circulation, 337, 343
gravity circulation, 337
installation of, 357
mechanical circulation, 339
Hot water piping, 337
Hotels,
steam consumption, 246
temperatures of, in winter, 132
water supply, 799
Humidification, 10, 517, 840
apparatus for, 521
atomization for, 522
effective temperatures for, 63
relative humidities for, 66
for residences, 409
systems of, 521
with washer, 519
Humidifier, humidifiers, 461
atomizing, 522
with fan systems, 415
high-duty, 522
self-contained, 523
spray, 523
types of, 461, 521
Humidistat, 405, 840
Humidity, 8, 840
absolute, 8, 835
control, 701
railway air conditioning, 630
in drying, 670
in hospitals, 615
for industrial processing, 623, 640, 641
measurement of, 830
optimum, 66
relative, 9, 842, *(see also Relative Humidity)*
in comfort zone, 61
effect on moisture regain, 643
relation to dew-point, 9
specific, 8, 840
Hygroscopic materials, 644
moisture content, 643
processing of, 645
regain, 644
Hygrostat, 841
Hypertension, 625
Hyperthyroidism, 625

I

Ice, in air conditioning, 412, 450, 490
control of, 717
Inch of water, 841
Induction motor, 722, 726, *(see also Motors)*
Industrial,
air conditioning, 639
apparatus for, 445, 521
calculations, 647
air pollution, 77
control,
biochemical reactions, 646
chemical reactions, 646
crystallization, 647
moisture content, 643
of regain, 642
cooling systems, 493
design conditions, 639
drying, 645
electrical heating systems, 765
exhaust systems, 651, *(see also Exhaust Systems)*
general requirements, 642
heat sources, 139
temperatures and humidities for processing, 640, 641
unit heaters, 440
Infants, premature, 61, 63, 618
Infiltration, 119
average, 124
fuel utilization, 203
heat equivalent, 128
through shingles, 121
through walls, 120
through windows, 122, 124
Inflammability of gases, 79
Institutions, water supply to, 821
Instruments, 823
Insulation, 841
asbestos type,
corrugated, 741, 742
laminated, 743, 744
of boilers, 247
bright metal foil, 92, 93
characteristics of, 95
of conduits, 754
of ducts, 748
economical thickness, 753
heat transmission through, 95, 739
for low temperatures, 749
magnesia type, 740
of piping, 735