## INDEX

Absorption of SO2, equipment, 134	Beater knives
Acid, recovery system, 142	Beater roll, 2
Acid, sulphate process, chemistry,	bandless, 26
126	Beater room,
strength advisable, 140	nance,
Acid plant, sulphite process, 126	record, 471
Acid resisting material, 126	Beating, 221
Acid room, record, 467	Bed-plate, be
Acidity, boiler feed water, 409	Bellmer blead
Agalite, 241	Beech, cellulo
Agave, 24	Belts, 395
Air, to burn sulphur to SO <sub>3</sub> , 132	Bennett l'elt
Air, moisture content, 403	Birch, cellulo
Alum, 247	Bird continuo
amount required, 251	266
analyses, 248	Bird inward f
function, 218	"Black ash,"
hardening effect, 249	causticizing
Alumina, in clay, determination,	loss from
237	loss iti
Animal size, 242	174
Antichlor, 216	recovery fr
Apron, Fourdrinier machine, 294,	Bleach room,
348	Bleaching, 20
specifications, 359	acid, 217
Aspen, II	continuous
Auxiliaries, steam plant, 429	electrolytic,
Backfall, in beater, 225	ground wo
Bag, paper, 48	hot, 215
Bagasse, 31	Bleaching liq
Bagasse, 31 Balanced draft, 433	215
Balanced draft gauge, 436	preparation
Balsam, 8	testing, 206
cellulose percentage, 6	Bleaching po
Bamboo, 22	deterioratio
Bark removal, 77	Blotting pape
Barker, 82	Blow-pipe, si
refuse, value as fuel, 428	Blow pit, 11:
Barker milk-of-lime system, 135	Boiler, auxili
Barking drum, 81	capacity re
Beater, 221	foaming, 4
capacity, 222	rags, 28, 2
Clastin continuous, 266	rating for
continuous, 265	straw, 20
dimensions, 222	Boiler feed
emptying, 225	Boiler feed r
function. 226	Boiler plant,
Miller duples, 263	Boiler pressu
specifications, 271	Boiler room
••	

Umpherston, 265

```
s, 268
       268
       69
       , equipment, mainte-
       ater, 270
       ching process, 210
      ose percentage, 6
       Cleanser, 325
       ose percentage, 6
       ous beater attachment,
       flow rotary screen, 280
       154
       g, 160
       rotaries, 175
       stack, determination.
      from stack, 172
       , ventilation, 402
      02, 207
       system, 211
      c, 217
ood, 217
      quor, amount required,
       1, 205
      owder, 203
      on, 204
       er, 50
       ulphite digester, 104
      liaries 429
equired, 428
       109
       heating surface, 424
       pumps, 431
      regulator, 432
       411
       ure chart, 455
     om, dimensions per ton
paper, 428
```

	_
Boiling, rags, 27	Coal, 419
straw, 21	Coal bunker, capacity per ton pa-
Book paper, 40	per, 428
	Coating, 41
grades, 43	Coating mill interior view 42
"Breaking up" engine, waste paper,	Coating mill, interior view, 42
38	Color, 253
Breaks, causes, 349	Conveyor, chip, 93
Breast roll, Fourdrinier machine,	wood storage, 73
	Cooking, Morterud process, 110
349	soda process, 148
Bronze pipe, use of, 391	
Building paper, 53	American practice, 150-153
Bundle finishing, 382	sulphate process, 177
Burgess milk-of-lime system, 135	sulphite, 105
Burring 188	pressure, 107
Burring, 188	relieving, 108
Burrs, 189	
"Butchers" paper, 45	temperature, 108
•	Cooler, sulphur dioxide, 132
Canadian woods, composition, 6	Cord, pulpwood, weight, 79
CO recorder 475	Cotton wool, analysis, 5
CO2 recorder, 415	
Calcium oxide, in clay, determina-	Cottrell electrical precipitation
tion, 238	"black ash" recovery, 173
Calender See also Super-calender	Couch rolls, Fourdrinier machine,
Calender doctor, 336	306, 350
Calendar11- and	specifications, 360, 374
Calender rolls, 335	
specifications, 367, 373	suction, 311
Camel hair belting, 396	Couch roll Jacket, 307, 308, 351
Car loading, 387	Crown filler, 241
Carloon and Wasen supposed as	Crusher, 88
Carlson and Waern evaporator, 157	Cutlery paper, 45
Cast iron pipe, use of, 390	Cutting some of
Causticizing, 160	Cutting rags, 26
Dorr system, 161	Cylinder machine, 340
Causticizing systems, efficiency, 168	
Callulana #	Dandy roll, Fourdrinier machine,
Cellulose, 5	304, 351
Cement, digester lining, 101	
Chain, log haul, 55	specifications, 361, 373
Chain, slasher, 59	Decker, 121
Chemical control amportance of	Deckered stock chest, 122
Chemical control, importance of,	Deckle straps, Fourdrinier machine,
sulphate process, 183	302, 350
value, 458	approfestions of and
Chestnut, cellulose percentage, 6	specifications, 361, 372
Chip bin, 92	De-fibering, waste paper, Winestock
Chip converse or	process, 36
Chip conveyor, 93	De-inking, waste paper, 35
Chip inspection, 94	Winestock process, 36
Chip screen, 89	Diaphragm screen, 282
Chipper, 85	Degenter observed and
efficiency, 465	Digester, chip capacity, 106
Chlarina anadahla an blastana	operation, effect on steam plant,
Chlorine, available in bleaching	414
powder, corresponding to	power required, 429
French degrees, 204	
liquid, for bleaching, 206	soda process, 146
Cigarette paper 46	straw, 20, 22
Classic paper 40	sulphate process, 177
Classin continuous beater, 266	sulphite process, 97
Clay, 231	filling, 106
American versus British, 233	heating rob
analusas and	heating, 106
allalyses 232 232 227	
analyses, 232, 233, 237	rotary, 110
Canadian, analysis, 235	rotary, 110 steam supply, 103
Canadian, analysis, 235 preparation, 233	rotary, 110 steam supply, 103
Canadian, analysis, 235 preparation, 233 production in U.S., 233	rotary, 110 steam supply, 103 welded, 147
Canadian, analysis, 235 preparation, 233 production in U.S., 233	rotary, 110 steam supply, 103 welded, 147 Direct cooking, sulphite, 105
Canadian, analysis, 235 preparation, 233	rotary, 110 steam supply, 103 welded, 147

Dolomite, for sulphite process, 129,	Fire protection, water supply for
138	410
Dorr causticizing system, 161	wood pile, 74
flow sheet, 166	Flax, cellulose percentage, 6
Draft, balanced, 432	Flax fibre, waste, 32
forced, equipment for, 426	Flow box See Head box
Draft recording gauge, 436	Flue gas analysis, CO: recorder, 415
Drip systems, steam mains, 439	Orsat apparatus, 415
Drive, Fourdrinier machine, 343,	I lue temperature recorder, 436
446	Fly-bar, 268
specifications, 369	Foaming, boiler, 409
Dryer, arrangement, 327	Forced draft, equipment for, 426
heating, 328	Fourdrinier machine, 281
specifications, 364, 374	drive, 343 440
water removal, 328	friction load, 450
Dryer cylinders, 326.	specifications, 358
Dryer felt, 317, 330	starting, 345
care, 321, 322	Fourdriner wire, 296
mending, 324	deterioration, 298
replacing, 331	loads, 450
seam, 332	putting on machine, 300, 350
washing, 325	starting, 301
Dryer felt See also Wet felt	Friction load, Fourdrinier machine,
Dryer felt roll, 334	450
specifications, 367	Fuel, steam plant, 419
Dryer gears, 335	Furnace, rotary, soda recovery, 158
Dusting, rags, 25	"Furnish," 224
Dyestuffs, 254	
Ebony, cellulose percentage, 6	Gas, natural, fuel, 420
Electric drive, beater room, 267	Gas analysis, Orsat apparatus, 415
Fourdrinier machine, 446	Gauges, 435
	Grinder, pressure regulation, 193
Emptying valve, beater, 225	specifications, 199
Enclosed loop trap system, steam	Ground wood, 1, 184
mains, 439	bleaching, 217
Engine, Beater See Beater	quality, determination, 198
Esparto, 11	Ground wood mill, 184
analyses, II	Guard board, couch rolls, 308
cellulose percentage, 6	specifications, 360
Evaporator, Carlson and Waern,	
157	Guide roll, antomatic, for Fourdri-
disc, 157	mer wire, specifications, 359,
multiple effect, soda process, 154	372
Yaryan, 157	dryer felt, 333
_ ` `. ``.	"Gypsum," 134
Farnsworth system, steam distribu-	Gypsum, ground, as filler, 241
tion, 440	WTT 15 . CT !!
Feed chains, slasher, 59	"Half stuff," 30
Feed water, purification, 407	Hangings, 52
Feed water regulator, 432	Harper Fourdrinier machine, 341
Felt, dryer See Dryer felt	Head, sulphite digester, 103
Felt, papermakers' See Dryer felt,	Head box, Fourdrinier machine,
Wet felt	<b>293</b> , <b>348</b>
Felt, wet Sec Wet felt	specifications, 359, 372
Fibre, varieties, 8	Heat conservation, 453
vulcanized, 49	Heating system, 453
Filler, 231	Hemlock, 11
Filter paper, 51	Hemlock, cellulose percentage, 6
Filtration, causticizing soda ash, 161	Hemp, Italian, 23
water 252 406	Manila, 23
water, 353. 406	
Finish, machine, 43 Finishing room 278	cellulose percentage, 6
CINISTIN TOOM 278	Junii 23

Herreshoff pyrites furnace, 144 Hollander, 30, 31, 208, 223 Holly drip system, 439 Horsepower, boiler, definition, 424 Hosing, blow pit, 112

Intermediate tank, 112 Iron, in clay, determination, 237, 238

Jenssen system, SO<sub>2</sub> absorption, 136 Jordan engine, 261 maintenance, 270 power requirement, 261 split shell, 262 Jute, 23 cellulose percentage, 6, 23

Kaolin, 231 Knives, barking machine, care, 83 Knotter screen, 113 Kraft paper, 3, 44, 176

Labor requirement, slasher, 60
Laps, 123
reason for making, 121
"Lay-boy," 384
Lead pipe, use of, 391
Lead digester lining, disadvantages, 101
Leather, best belt material, 395
Lenix idler pulley, 398
Lighting, 404
Limestone, 128
Linden, cellulose percentage, 6
Linen, cellulose percentage, 6
Linen finish, 44
Lining, digester, 101
Load, Fourdrimer machine, 450
Log counters, 55
Log haul up, 54
Log kicker, 56
Log splitter, 67

Machine room, 281
Mantla See Hemp, Mantla
Mantla wrapping paper, 45
Marshall engine, 263
Matherkier, 30
Midfeather, beater, 223
Milk-of-lime system, SO, absorption, 133, 135
power requirement, 140
versus tower system, 138
Miller duplex beater, 263
Mills, paper and pulp, number in
U S A, 1918, 40
Mitscherlick process, sulphite, 105
Morterud sulphate process, 177
Morterud sulphite process, 110
Mullen paper tester, 462

Natural gas, 420
Newspapers, American, statistics, 50
Newsprint, 50
acid strength required, sulphite process, 141
sizing of, 246

Oil fuel, 420
Orsat apparatus, 415
weight percentage calculation,
417

Paper, bag, 48 blotting, 50 book, 40 book, grades, 43 cigarette, 46 coated, 41 cutlery, 45 exports, 1918, 40 filter, 51 imports, 1918, 40 Manila, 45 machine finish, 43 newsprint, 50 parchment, 49 production in U S A, 1918, 40 roofing, 53 testing, 458, 461 tissue, 46 varieties, 40 wall, 52 waste paper wrapping, 44 "Butchers," 45 Kraft, 44 Manila, 45 writing, 40, 43 rag stock for, 24 Paper and pulp mills, number in U S A, 1918, 40 Sec Four-Paper making machine

Paper making machine Sec Fourdrinier machine Cylinder machine, Harper Fourdrinier machine "Paper stock," defined, 24 Parchment paper, 49

Pearl hardening, 241
Pigments, 254
Pine, Jack, cellulose percentage, 6
Scotch, cellulose percentage, 6
yellow, 12
Pipe covering, 445
Piping, 300
Plate, diaphragm screen, 285
Plant, arrangement of buildings,

389 design, general considerations, 388 lighting, 404

## **INDEX**

th	The same areas officer an areas
Plant, location, 388	Pulp stone, speed, effect on prod-
steam supply, 389	uct, 191
ventilation, 400	Pulp thickener, ground wood mill,
water supply, 406	121, 187
'Pocher," 208	Pulpwood See Wood
Pony dryer, 334	Pump, 393
Poplar, 11	boiler feed, 431
cellulose percentage, 6	boiler feed, piston speed, 432
Power, ground wood mill, 184	turbine-driven, specifications, 431
Power plant, 411	Pyrites burning, 143
	Pyrites burning, costs, 145
Power requirement, 456	1 Jines Darning, costs; 143
acid pump for digester, 106	Down or
agitator in intermediate tank,	Rags, 24
113	grades, 25
centrifugal screen, 118	boiling, 20
chip conveyor, 93	Rag cutter, 20
chipper, 88	Rail shipment, 387
ground wood mill water supply,	Railroad facilities, paper plant, 390
188	Re-chipper, 92
ground wood mill, per ton pulp,	Recovery systems, soda process.
192	154
Jordan engine, 261	efficiency, 170
knotter screen, 114	sulphate process, 180
	Recovery tower, 142
log splitter, 68	Reel, 337
milk-of-lime system, 140	
pulp grinder, 187	specifications, 368
re-chipper, 92	Relieving, sulphite digester, 108
slasher, bo	Return wire roll, Fourdrimer ma-
stock pump, 187	chine, specifications, 359
stock pump to beater, 259	Rewinding, 379
sulphite digester, 104	Riffler, 114
tower system, 140	Riffler pump, 114
tumbling drum, 82	Roll, finishing, 378
Power yield, refuse from barker	Roll-bars, 268
as fuel, 428	Roofing paper, 53
Press rolls, Fourdrinier machine,	Rope drive, 399
308	Rosin size, 242
	varieties, 245
crowning, 310	Rubber belting, 395
specifications, 363, 374	Rubber berting, 393
suction, 314	Cand tran in heater 224
Press room, record, 469	Sand trap, in beater 224
Pressure, grinder, 190	Jordan engine, 202
Pressure versus vacuum, acid ab-	Sandberg cooler, 133
sorption systems, 143	Satin white, 211
Pressure gauge, boiler, 430, 435	Save-all, 353
Pressure regulator, electric, for	Save-all box, Fourdrinier machine,
grinder, 193	specifications, 362, 364
Pulleys, idler, 398	Saw, 57
Pulp, bleaching, 202	adjustment, 66
chemical, I	care of, 63
Kraft process, 3	collars for, 66
manufacture,	speed, 66
	Saw frame, construction, 65
materials, 5	Saw mill, 54
mechanical See Ground wood	construction, 65
soda process, 3	Schooner namer tester 462
straw, manufacture, 20	Schopper paper tester, 462
strawboard, manufacture, 21	Schweitzer's reagent, 5
gulphate process, 3	Score cutter, 380
sulphite process, 2	Screen, 117, 282, 348
yield from various materials, 7	centrifugal, 117
Pulp grinder, 186	cleaning, 118

598 INDEX

Screen, installation, 120	Steam, use in bleaching, 215
chip, 89	Steam mains, 438
diaphragm, 282	repairs, 443
rotary, 289	Steam plant, 389, 411
Screen plate, screwless, 288	Steam supply, sulphite digester, 103
Screen plate fastener, 287	Stebbins milk-of-lime system, 135
Screen room, record, 468	Stock chest, 257
Screenings chest, 119	Stock pump, 187
Screenings grinder, 119	power requirement, 259
Screenings press, 119	Stoker, automatic, 421
Seam, dryer felt, 332	advantages, 423
Settling tank save-all, 354	capacity required, 428
Shake, Fourdrinier machine, speci-	engine for driving, 425
fications, 362	Storage, 385
Shake rail, specifications, 361	"Strainers, 282
Shaker chip screen, 91	Straw, 11, 20
Sheet cutter, 383	analyses, 20
Chinment 187	
Shipment, 387	cellulose percentage, 6, 20
Showers, Fourdrinier machine,	Strawboard, manufacture, 21
specifications, 362	String catcher, in beater, 225
Silica, in clay, determination, 237	Suction box, Fourdrinier machine,
Silicate of soda, 252	304, 351
Sizing, 241, 245	specifications, 361, 373
Slasher, 57	Suction couch rolls, Fourdrinier
labor required, bo	machine, 311
performance, 60	Suction press rolls, Fourdrinier
power requirement, 60	machine, 314
Slasher chain, 59	Sulphate liquor, composition, 176,
Slices, apron, Fourdrmier machine,	182
294	Sulphate mill, interior, 178
"Slip," strength of, 234	Sulphate process, 3, 176
Slitter, 339	Sulphite process, 2, 95
specifications, 368	acıd plant, 1 <i>2</i> 6
Slitting, 379	acid strength required, 140
Sliver screen, 187	chemistry, 97
Smith forced draft equipment, 426	cooking, 13, 105
Smoothing press rolls, Fourdrinier	experimental cooks, 13-19
machine, 314	Morterud method, 110
Soda process, 3, 146	Sulphur, 127
recovery systems, 154	per ton sulphite pulp, 142
recovery systems, efficiency, 170	Sulphur burner, 129
Softening, waste paper, 38	rotary, 130
Soot blower, 432	Sulphur dioxide, absorption, 134
Sorting, rags, 24	comparison of systems, 138
waste paper, 33	solubility in water, 143
Speed, pulp stone, effect on prod-	Surge tank, on hydraulic system,
uct, 191	ground wood mill, 197
Splitter, 67	Swing saw, 62
Spruce, 8	Owing saw, oz
cellulose percentage, 6	
Stacker, wood storage, 75	Table rolls, Fourdrinier machine,
Starch aca	
Starch, 253	303, 349
Steam, books on, 411	specifications, 359
distribution system, 438	Talc, 240
Farnsworth, 439	Target, blow pit, 111
flow meter, 436	Taylor stoker, 423
piping for, 391	Temperature, influence on quality
pressure, 436	of ground wood, 189
pressure gauge, 430, 435	Temperature recorder, feed water,
superheated, sulphite digesters,	436
142	Testing, sulphite process, 109

Tests, paper and paper materials, 458 recording, 464 I hrasher, rag dusting machine, 25 I'llghman patent, sulphite process, Lissue paper, 46 Tower system, SO, absorption, 136 power requirement, 140 Towers, Jenssen, 136 Tromblee and Paul sulphur burner, 130 Tube rolls, Fourdrinier machine, 303, 349 specifications, 359, 372 Tumbling drum, 79 Turbine, steam, individual drive for Fourdrinier machine, 448

## Umpherston beater, 265

Valves, in piping system, 392 Ventilation, 400 Venturi meter, 436 Vesuvius sulphur burner, 131 Vomit pipe, blow pit, 111

Wall paper, 52 weights, 53 Walpole outward flow rotary screen, 292 Washing, in blow pit, 112 rags, 30 soda process, 149 sulphate process, 180 Waste material, for paper stock, Waste paper, de-inking, 35 for paper stock, 32 grades, 33 re-manufacture, 34 softening, 38 sorting, 33 Water, purification, 406
Water glass, 252
Water pipe, Fourdrinier machine, specifications, 362 Water supply, ground wood mill, 188

Water supply, paper plant, 406 Weaving devices, 348 Webb paper tester, 464 Wedge pyrites furnace, 144 Wet felt, 308, 317 Wet machine, 123
White liquor." See White water
White water," stock in, record, 470 use, 236 Widney paper testing machine, 403 Willesden paper, 49 Willow, cellulose percentage, 6
Willow," rag dusting machine, 25 Wmestock process, 36 Winder, 339 specifications, 368 Wire, Fourdrimer See Fourdrin-Witham paper testing machine, 463 Witham screwless screen plate fastener, 288 Witham-Mchwen save-all, 355 Wood, cellulose percentage, 5 consumption, paper making, 9-10 by States 1918, 10 Wood, ground See Ground Wood Wood pulp, per ton paper, 70 weight of cord, 79 yield per tree, 71 pulp making properties, 13-19 quality, for mechanical pulp, 185 storage, 72 protection from flood, 389 varieties for various papers, 8 Wood pile, 72 Wood pond, 79 Wood pulp Sec Pulp Wood room, 72 Wrapping, paper bundles, 381 Wrapping paper, 11 Writing paper, 40, 43

Yankee machine, 342 Yarvan evaporator, 157

Zeolite process, water purification, 409