

Reel 2 shows loading of coal; cars on way to rotary dump where coal is fed on slope conveyor for transportation to tippie; rotary dump where coal is dumped without uncoupling cars; slope conveyor transporting coal to tippie; continuous stream of coal passing over 4-inch screens; plus-4-inch coal being carried over picking tables; and minus-4-inch coal being run through cleaning plant.

Reel 3 includes views of air-cleaning plant; conveyors for carrying cleaned coal to storage bins for sizing and remixing; retail bins; coal being loaded onto railroad cars; sampling of each car of coal and analysis in laboratory; material and machinery hoist; fanhouse; repair shops; storerooms; first-aid instructions being given employees; and first-aid and mine rescue teams.

## INDEX OF SUBJECTS

A	Item No.	Item No.	
Accidents, bituminous-coal mines, underground, study.....	282	Anthracite region, research laboratory, legislation providing.....	19, 21
coal-mine, annual data.....	462-467, 488, 489, 491-493	safety cars, work.....	161
Tennessee.....	150	water problems.....	296
coke-oven, annual data.....	468-472	Anthraxylon, from solid fuels, hydrogenation.....	399
mineral industries, annual data.....	478	Appalachian region, splint coal, occurrence and properties.....	60
Acetic anhydride, ignition temperatures.....	112	Ash, fly, emission from chimneys, reduction in coal, high in calcite and pyrite, determination.....	458
Inflammability limits.....	112	in metallurgical coal, control.....	45
Acetylene-air and acetylene-oxygen mixtures, ignition temperatures.....	103	Assay oils, characterization.....	147
Acetylene generators, medium-pressure, explosions in.....	114	Atlas mine, Ky., coal, carbonizing properties and petrography.....	332
Acrylonitrile, in air, inflammability limits.....	107	Atlas No. 2 mine, Okla., coal, carbonizing properties.....	349
Agglutinating-value test, coal, inert material for.....	47	B	
Air, coal-mine, conditioning, review of literature.....	178	Bakerstown bed, coal, blends with Pittsburgh-bed coal, effect.....	331
pollution, determination, papers on, bibliographies.....	461	carbonizing properties and petrography.....	331
measurement, methods.....	460	Barley anthracite, combustion, discussion.....	425
Air-benzene explosions, prevention, by nitrogen and carbon dioxide.....	100	Barriades, after mine fires and explosions, importance.....	185
Air-butadiene explosions, prevention by nitrogen and carbon dioxide.....	102	Bartoy mine, Wash., coal, carbonizing properties and petrography.....	336
Air conditioning, with water sprays, in coal mine.....	148	Beattie-Bridgman constants, determination, from critical data.....	248
Airdox, blasting with, hazards.....	250	Beech Bottom mine, W. Va., roof falls, prevention, by water sprays.....	145
Air flow, in coal mines, discharge of fan-plp lines.....	176, 177	Beehive coke, manufacture.....	369
Alabama, bituminous coal, analysis, data book.....	65	Beehive-coke industry, revival.....	368
coals, analysis.....	79	Beehive-coke ovens, modern practice.....	365
carbonization assays.....	79	Beehive coking, Washington, data.....	360
drainage characteristics.....	303	Belgium, gassy coal mines, Diesel locomotives in.....	258
properties.....	79	sheathed explosives, use.....	213
coal-mine explosions.....	189	Bell No. 1 mine, Ky., coal, blends with Peachontas No. 3- and No. 4- bed coals, effect.....	334
coal-mine fatalities, from electric contacts.....	272	carbonizing properties and petrography.....	334
Alaska, coal, low-temperature carbonization, coal fields, Matanuska, Moose Creek district, description.....	67	Benzene, in medium-temperature light oils, determining.....	421
Alkalis, effect on carbonization products of coal.....	343	Benzene-air explosions, prevention, by nitrogen and carbon dioxide.....	100
Aluminum industry, carbon electrodes for, coke for, from low-ash coals.....	416	Bevier bed, coal, carbonization.....	373
American Gas Association—Bureau of Mines tests, coke from, properties.....	415	Bituminous coal, analyses, Alabama, data book.....	65
correlation with coal analyses, discussion.....	353	Illinois.....	51
American Society for Testing Materials, Coal and Coke Committee, report.....	44	data book.....	66
Anesthetics, combustible, explosion hazards.....	93	Indiana, data book.....	66
other-helium-oxygen mixtures for, inflammability.....	109	Kentucky.....	52
explosions, prevention by addition of helium.....	125, 128-130	data book.....	62
Anion exchangers, carbonaceous, use in water treatment.....	418	Ohio, data book.....	66
Anthracene, hydrogenation, by tetralin.....	405	Pennsylvania.....	54
Anthracite, annual data.....	480	data books.....	63, 64
anthraxylon from, hydrogenation.....	399	Tennessee, data book.....	65
barley, combustion, discussion.....	425	United States.....	50
dredging.....	160	Virginia.....	55
oxidation, effect of particle size.....	319	data book.....	62
prolonged, phenomena.....	320	Washington.....	56
prices, unfavorable.....	510	West Virginia.....	57
production, increase.....	510	data books.....	62, 64
small, increasing use.....	427	annual data.....	483
strip mining, output.....	511	anthraxylon from, hydrogenation.....	399
supplementing, for domestic heating.....	433	assays, liquid-phase.....	382
volatile matter determination, precision.....	37	summary.....	402
Anthracite industry, annual review.....	513	carbonaceous zeolites from.....	85
Anthracite mines, inspection standards.....	158, 159	high-volatile, hydrogenation.....	492
Anthracite mine fires, behavior and control.....	183, 207	products, analysis and character.....	493
Anthracite refuse-bank fire, extinguishing.....	201	storage problems.....	325
		Western States, hydrogenation and petrography.....	398

Item No.	Item No.	Item No.	Item No.
Bituminous-coal dust, explosibility.....	95	Caps, blasting, accidents to children from.....	240
Bituminous-coal mines, accidents, under-ground, nonfatal, study.....	282	Cap lamps, permissible electric, field performance.....	281
safety catches, tests.....	288	Cars, for transporting explosives, description.....	247
employment, monthly trend.....	485	mine, automatic coupling, description.....	286
explosions, rock dusting to prevent.....	484, 490, 494	Carbides, metal, preparation, relation to Fischer-Tropsch synthesis.....	300
inspection standards.....	145, 156	Carbon, activated, for decolorizing sugar.....	88
multiple-shift mechanical mining methods.....	165, 166	from coal refuse, for purifying water.....	81
occupations, survey.....	487	gasification rate, pressure dependence.....	377
permissible explosives, use.....	486	Carbon electrodes, for aluminum industry, coke for, from low-ash coals.....	416
Bituminous coking coals, plastic and swelling properties.....	78	Carbon monoxide, in Holland tunnel.....	98
Black powder, sensitivity and dispersion, effect of humidity.....	220	in home, danger.....	139
Blast furnaces, western, coke for, problems.....	354	in New York City.....	90
Blasting, cushioned, studies.....	214, 215	Carbon monoxide bacteria, growth, effect of hydrogen-ion concentration.....	91
on shift, State regulations.....	237	Carbonization, coal.....	355-357, 359
Blasting accessories, carbonaceous, effects on gaseous products from explosives.....	222	effect of physical constitution.....	76
Blasting caps, accidents to children from.....	240	handbook article.....	355
Blasting devices, Bureau of Mines tests.....	212	Heliopore process, tests.....	371
Cardox, confinement in boreholes, methods, permissible, lists.....	229-235	investigations, summary.....	348
Blasting units, permissible, lists.....	228	low-temperature.....	370
single-shot, permissibility requirements.....	255	Carbonization products, coal, effect of acids and alkalis.....	343
Boilers, embrittlement detector, tests.....	455	in externally heated retorts, relation to coal analysis.....	345
Twin Branch, performance, factors affecting, discussion.....	433	Carbonization tests, BAM-AGA, correlation with coal analyses, discussion.....	353
Boiler feed water, conditioning, questions and answers, handbook.....	446	yields of light oil and tar.....	420
Boiler furnaces, coal-oil mixtures in, use.....	428, 429, 438	Carbonizing plants, war activities.....	362
Boiler steel, intercrystalline cracking, prevention.....	445	Carbonizing properties, American coals, studies.....	330-342, 344, 346, 349, 350
Boiler water, tannins in, determination.....	451	coking coals, effect of oxidation.....	323
treatment, carbonaceous cation and anion exchangers in, use.....	448	medium-volatile coals.....	340
Bombs, incendiary, fires, extinguishing.....	117, 118, 120, 131	Cardox, blasting with, hazards.....	250
Brazil, coals, washing.....	309	Cardox blasting devices, confinement in boreholes, methods.....	220
Brigquets, fuel, annual data.....	482	Cartridges, individual, variations in oxygen condition.....	231
specifications, handbook article.....	314	Casings, drill-hole, ground-resistance measurements.....	219
subbituminous coal, manufacture.....	305	Catalysis, contact, in hydrogenation of coal, coal tar, and oil.....	407
Brown coal, anthraxylon from, hydrogenation.....	359	reactions, in coal hydrogenation.....	391, 411
B. t. u. value, coal.....	68, 71	Cation exchangers, carbonaceous, from coal and coal refuse.....	450
Buckeye No. 3 mine, W. Va., coal, carbonizing properties and petrography.....	340	use in water treatment.....	448
Bureau of Mines, annual reports.....	3-6	Children, accidents to, from blasting caps.....	240
blasting devices, tests.....	212	Chimneys, fly-ash emission from, reduction.....	458
coal hydrogenation, experimental plant.....	382	Chimney gases, dust removal.....	456
Coal-Mine Inspection Division, organization and work.....	155	Cleaning equipment, coal mines, sales.....	515
explosives, tests.....	212	Cleaning plant, coal dust in, allaying methods.....	200
investigations, coal, bibliography.....	1	Coal, agglutinating-value test, inert material for.....	47
Mining Division, annual reports.....	7-9	American, carbonizing properties, studies.....	330-342
Nonmetals Division, annual reports.....	10-12	hydrogenation and liquefaction.....	344, 346, 349, 350
research, coal hydrogenation and liquefaction.....	378-382	analyses, Alabama, data book.....	65
respiratory protective devices, list.....	139	correlation with BAM-AGA assay tests, discussion.....	383
safety cars, work, in anthracite region.....	161	correction with carbonizing products, externally heated retorts.....	345
scientific and technologic investigations, statement.....	20	Illinois, data book.....	61
survey of carbonizing properties, American coals, index.....	342	Indiana, data book.....	66
Bureau of Mines-American Gas Association tests, coke from, properties.....	415	Kentucky, data book.....	62
correlation with coal analyses, discussion.....	353	Ohio, data book.....	66
burner flame, stability and structure.....	127	Pennsylvania, data book.....	53, 64
burning rate, of fuse.....	241	Tennessee, data book.....	65
butadiene, in air, inflammability limits.....	101	United States.....	50
butadiene-air explosions, prevention, by nitrogen and carbon dioxide.....	102	Virginia, data book.....	55
butane, as engine fuel, hazards, in mining and tunneling.....	271	Washington, data book.....	62
Byproduct-coke ovens, coal charge, bulk density, control.....	363	West Virginia, data book.....	67
high-temperature tar from, hydrogenation.....	413	data books.....	62, 64
Byproduct-coking, Washington, data.....	359, 358	analysis, relation to properties and uses.....	42
		proximate, discussion.....	43
		anthracite, analyses, Pennsylvania.....	53
		as chemical raw material.....	385
		as source of liquid fuels and coke.....	394
		as source of oil and gasoline.....	395
		as source of synthetic rubber.....	391
		ash-fusion temperatures.....	70
		Coal, B. t. u. value.....	68, 71
		burning, on domestic stokers.....	444
		carbonaceous cation exchangers from carbonization.....	28, 355-357, 359
		handbook article.....	358
		Heliopore process, tests.....	371
		low-temperature.....	370
		products, effect of acids and alkalis.....	343
		characteristics, handbook article.....	316
		chemical elements.....	58
		classification for standard.....	72
		cleaning, at truck mines, by ligs.....	302
		by float-and-sink methods, results.....	416
		by Trent process, results.....	416
		coke and byproducts yields.....	347
		combustion.....	28
		comparison with competitive power.....	503, 505
		concentrating table, handbook article.....	311
		constitution, effect on chemical, hydrogenation, and carbonization properties.....	76
		crucible swelling test, investigation, discussion.....	40, 46
		developments.....	25
		expansion during coking.....	362
		exports, shifts.....	506
		for coke making, selection.....	361
		fusin in, determination, by oxidation and petrographic methods.....	48
		gasification.....	28
		handbook article.....	374
		gasoline from, production, Congressional bearings.....	363, 368-368
		handbook article.....	23
		high in calcite and pyrite, ash determination.....	45
		hydrogenation.....	28
		catalytic reactions, nature.....	411
		chemistry.....	407
		contact catalysis.....	407
		effect of petrographic composition.....	370
		effect of rank.....	379, 399, 401
		experimental plant.....	382
		handbook article.....	408
		kinetics of hydrogen consumption, oxygen removal, and liquefaction.....	397, 401, 411, 412
		neutral oils from.....	392
		reactions, effect of catalyst.....	391
		effect of rank.....	391
		effect of temperature.....	381
		research.....	378-382
		review of literature.....	382
		round-table discussion.....	409
		impurities in, characteristics, handbook article.....	316
		liquefaction, effect of rank.....	379
		research.....	378-382
		review of literature.....	382
		loading, handbook article.....	308
		low-electrodes.....	416
		low-rank, Western States, hydrogenation and petrography.....	389
		low-temperature distillation yields, tar and light oil.....	372
		medium-volatile, carbonizing properties.....	348
		metallurgical, sulfur and ash in, control.....	147
		mineral matter in.....	59
		moisture, determining.....	39
		oxidation, atmospheric, at moderate temperatures.....	327, 328
		paleobotany.....	61
		petrography, effect on liquefaction.....	379
		plants for producing synthetic liquid fuels.....	385
		from act authorizing construction and operation.....	385
		plastic properties.....	83, 84
		preparation.....	28
		methods, handbook article.....	315
		processing.....	355-358
		production, comparison with extent of mechanization.....	512
		research and progress.....	28, 172
		"world," B. t. u. value, constants.....	509
		"pure," B. t. u. value, constants.....	68
		rank, effect on hydrogenation.....	379, 399, 401
		relation to energy trends, in Western States.....	60
		research, value to small business.....	26
		salvage, from mine refuse.....	301
		Coal, sampling, moisture losses.....	36
		sawing, by smoke regulations.....	457
		screened, missing sizes in, application of Rosin-Rammler law.....	306
		screening, handbook article.....	310
		storage, effect on caking and coking properties.....	321, 322
		pointers.....	321, 322
		Rocky Mountain area.....	322
		stored, spontaneous combustion, prevention.....	324
		transportation, underground.....	268, 269
		uses, new.....	30
		research and progress.....	23, 172
		See also Anthracite; Bituminous coal; Brown coal; Cannel coal; Lignite; Peat, Splint coal; Subbituminous coal.....	
		Coal and Coke Committee, A. S. T. M., report.....	44
		Coal ash, fusibility, effect of furnace type and atmosphere.....	35
		properties, status of knowledge.....	74
		Coal-ash slag, flow, on furnace walls.....	424
		flow characteristics, in solidification range.....	436
		on furnace-wall tubes, thickness, factors affecting.....	435
		viscosity.....	75
		Coal charge, for byproduct ovens, bulk density, control.....	363
		Coal deposits, conservation, effects of mechanization.....	173
		Coal dust, in tipplies and cleaning plants, allaying, methods.....	200
		Coal-dust explosive, prevention, by rock dusting.....	187
		by salt, tests.....	96
		Coal industry, United States, annual review.....	507, 508
		Coal-in-oil fuel, substitution for oil fuel.....	428, 429, 438
		Coal mines, air conditioning, review of literature.....	178
		Alabama, fatalities caused by electric contacts.....	272
		auxiliary fans, hazards.....	179
		boreholes, confining Cardox in, methods.....	220
		dust, allaying, by wetting agents.....	199
		dust explosive, prevention, by rock dusting.....	204-206
		by salt, tests.....	96
		electrical equipment, grounding.....	261
		electricity, use, analysis.....	267
		employment, annual review.....	488, 489, 491-493
		explosives, use and handling, care in.....	216
		fan-pipe lines in, discharge of, air flow at.....	176, 177
		gassy, Bureau of Mines definition.....	188
		hazards, avoiding.....	204
		Indiana, fatalities.....	167
		inspection standards.....	145, 156-159
		lubricants for, transportation, storage, and handling.....	164
		maintenance, importance.....	168
		mechanical equipment, sales, activity.....	515
		decrease.....	514
		mechanization, increase.....	512, 516, 517
		pillar and tunnel problems, application of photoelasticity, discussion.....	171
		rock-dusting investigations, stoppage, war-time.....	203
		roof, sealing to prevent slate falls.....	169
		roof movement, studies.....	152
		slope, hoisting-signal code.....	180
		surface buildings, fires in.....	193
		timber decay, studies.....	151, 154
		transportation, importance.....	168
		ventilating doors, construction.....	180
		ventilation, data for miners on.....	181
		importance.....	168
		inadequate, health hazards.....	182
		Coal-mine accidents, annual data.....	462-
		Tennessee.....	467, 488, 489, 491-493
		Virginia.....	190
		Coal-mine dusts, sampling and analyzing, for incombustible content.....	38
		Coal-mine explosions, Alabama.....	189
		annual review.....	195-197
		barriendes after, importance.....	185
		prevention, by miners.....	191

Item No.	Item No.
Coal-mine explosions, smoking as cause..... 198	Crucible swelling test, for coal, investigation, discussion..... 40, 46
Coal-mine fires, annual review..... 195-197	Cyclohexylamine, use in steam-heating systems..... 447
barricades after, importance..... 185	Cyclopropane, explosibility..... 103
Coal Mine Inspection Division, organization and work..... 155	Cyclopropane-oxygen-helium mixtures, clinical and laboratory data..... 129
Coal-mine roof, changes in moisture and temperature, effect..... 150	Cyclopropane-oxygen explosions, prevention, by dilution with helium..... 125, 128
Coal-mine waste, use, for darkening light-color soils..... 80	
Coal miners, safety manual for..... 146	<b>D</b>
Coal mining, ground movement and subsidence studies, review..... 174	Data books, bituminous coals, analyses..... 62-66
handbook article..... 172	Detonators, American, commercial, structural features..... 217
mechanized, dust hazards, control methods..... 293	construction, determination..... 218
safety, status..... 192	safe opening..... 218
underground, dust, allying..... 186	Deviates, respiratory protective, approval tests..... 149
Coal pillars, Pittsburgh bed, strength test..... 149	Bureau of Mines list..... 139
Coal products, investigations, bibliography..... 1	selection, use, and maintenance..... 141
Coal pulverizer, for measuring net power, description..... 41	Diesel engines, combustion in, effect of gaseous combustibles..... 273
Coal refuse, activated carbon from, for purifying water..... 81	exhaust gas, analysis, significance..... 202, 235
carbonaceous cation exchangers from..... 450	underground use, effect of adding exhaust gas to intake air..... 256
Coal research, developments..... 2, 14-18	exhaust gas, composition..... 202, 235
Coal sampling, fundamentals..... 32	effect of operation in normal air and natural gas..... 259
Coal tar, hydrogenation, contact catalysis..... 407	effect of sulfur content of fuel..... 257
pitch from, extinguishing magnesium fires with..... 94	Diesel locomotives, mine, permissibility tests, use, in gassy coal mines, Belgium..... 254
Coal technology, developments..... 2, 14-18	in tunnels..... 270
Coal washeries, water, clarification, by flocculation..... 307	underground, recommendations..... 254
Coke, annual data..... 481	Disasters, surface, gases and vapors at, hazards..... 115
ash-fusion temperatures..... 70	Diseases, pulmonary, in mining industry..... 138
beehive, manufacture..... 360	Distillation yields, low-temperature, tar and light oil, various coals..... 372
byproduct ovens, additional requirements..... 355	District of Columbia, coal developments..... 25
coal as source, outlook..... 391	Dogs, exposure to methanol vapor, results..... 135, 142
combustibility, in air..... 417	Doors, ventilating, coal-mine, construction..... 180
encyclopedia article..... 501	Dow No. 10 mine, Okla., coal, carbonizing properties..... 350
from BM-AGA tests, properties..... 415	Drainage characteristics, coals, Alabama..... 303
from low-ash Appalachian coals, for carbon electrodes..... 416	Drill holes, springing, premature shots, prevention..... 239
handbook article..... 418	Drill-hole casings, ground-resistance measurements..... 219
improved, increased pig-iron output from..... 304, 367	Ducts, vertical, effect on ventilation of man-holes..... 175
low-temperature, volatile-matter determination, precision..... 37	Dusts, atmospheric, determination, papers on, bibliographies..... 161
metallurgical, for western furnaces, problems..... 354	coal-mine, allying..... 188
shrinkage..... 414	by wetting agents..... 199
yields, from various coals..... 347	sampling and analyzing, for incombustible content..... 38
See also Beehive coke; Byproduct coke.	determination, by filter-paper method..... 89
Coke and Coal Committee, A. S. T. M. report..... 481	by microrprojector..... 89
Coke byproducts, annual data..... 347	removal from chimney gases..... 456
yields, from various coals..... 368	Dust explosions, in plastics industry, prevention, code..... 122
Coke industry, beehive, revival..... 365	Dust hazards, in mechanized coal mining, control..... 202
Coke ovens, beehive, modern practice..... 365	
byproduct, coal charge, bulk density, control..... 363	<b>E</b>
high-temperature tar, hydrogenation..... 413	Electric cap lamps, permissible, field performance..... 281
Coke-oven accidents, annual data..... 468-472	Electric spark, ignition of gases and vapors by, minimum energies for..... 97
Coking, beehive and byproduct, Washington, data..... 360, 366	Electrical equipment, coal-mine, grounding..... 201
expansion of coal during..... 382	Electricity, comparison with competitive power..... 503
Coking coal, bituminous, plasticity..... 78, 84	fatalities caused by, Alabama coal mines..... 272
swelling properties..... 78	in mechanized mining, hazards..... 272
oxidation, effect on carbonizing properties..... 327	static, dissipation, effect of humidity..... 273
reaction rates..... 361	use in coal mines, analysis..... 207
selection..... 351	Electrodes, carbon, for aluminum industry, coke for, from low-ash coals..... 416
Coking properties, coal, effect of resins..... 326	Elements, chemical, in coal..... 58
effect of oxidation..... 326	Elk Creek No. 1 mine, W. Va., coal, carbonizing properties and petrography..... 333
effect of storage..... 326, 329	Embrittlement, detecting..... 454, 455
Colorado, Denver region, subbituminous slack, properties..... 82	symposium on..... 453
Combustibles, in manholes, investigations..... 423	intercrystalline, boiler steel, prevention..... 415
Combustion, handbook article..... 324	Embrittlement cracking, prevention..... 462
spontaneous, stored coal, prevention..... 126	
Combustion research, in engines, experiments on..... 311	
Concentrating table, coal, handbook article..... 512, 516, 517	
Conveyors, coal-mine, sales, increased..... 286	
Coupling, automatic, mine cars, information on..... 454, 455	
Cracking, embrittlement, detecting, tests..... 452	
prevention..... 453	
symposium on..... 415	
intercrystalline, boiler steel, prevention..... 415	
Crucible mine, Pa., timber decay, study..... 151	

Item No.	Item No.
Employment, bituminous-coal mines, monthly trend..... 485	Fires, anthracite mine, behavior and control..... 183, 207
mineral industries, annual data..... 478	anthracite refuse bank, extinguishing..... 201
Engines, butane fuel for, hazards in mining and tunneling..... 271	coal, extinguishing with carbon dioxide, danger from electric shock..... 230
combustion research on, experiments..... 126	coal-mine, annual review..... 195-197
compression ignition, performance at different intake and exhaust conditions..... 290	barricades after, importance..... 185
Ether-cyclopropane-oxygen-helium mixtures, clinical and laboratory data..... 129	in surface buildings..... 193
Ether-nitrous oxide-oxygen mixtures, explosibility..... 124	magnesium, extinguishing..... 117, 118
Ether-oxygen-helium mixtures, inflammability..... 109	with pitch..... 116
Ethyl mercaptan in air, ignition temperature and inflammability limits..... 105	Fireclump, ignition by explosives..... 211
Exhaust gas, Diesel engines, addition to intake air, effect..... 256	Fire gases, Universal gas mask in, use..... 144
analysis, significance..... 292, 295	Fireman, home, questions and answers, handbook..... 439
composition..... 262, 263	Fire retardants, application to liquid-oxygen explosives..... 208, 216, 249
effect of operation in normal air and natural gas..... 250	Fischer-Tropsch synthesis, relation of preparation and properties of metal carbides to..... 390
sulfur in, effect of fuel..... 257	Flames, burner stability and structure..... 127
Explosions, anesthetics, prevention by helium..... 128-130	Flame safety lamps, permissible, construction, care, and use..... 253
annual report..... 227	use and misuse..... 280
benzene-air, prevention by nitrogen and bituminous-mine, use of rock dust to prevent..... 484, 490, 494	Fleissner process, for drying lignite and subbituminous coal, study..... 297
butadiene-air, prevention by nitrogen and carbon dioxide..... 102	Float-and-sink. See also Sink-float.
coal-dust, prevention, by rock dusting..... 187	Float-and-sink concentration, suspension medium for, properties..... 299
by salt, tests..... 96	Float-and-sink methods, for cleaning coal, results..... 416
coal-mine, Alabama..... 189	Flocculation, use, in clarifying coal in washery water..... 307
annual review..... 105-197	Flow characteristics, coal-ash, slugs, in solidification ranges..... 436
barricades after, importance..... 185	Fluy ash, emission from chimneys, reduction, methods..... 458
prevention, by miners..... 191	Friedel-Crafts catalysts, tellurium compounds as..... 396
smoking as cause..... 193	Fuel, colloidal, substitution for oil fuel..... 428, 429, 438
cyclopropane-oxygen, prevention, by dilution with helium..... 125, 128	domestic use, economy..... 441
dust, in plastics industry, prevention, code..... 108	gaseous, handbook articles..... 24, 419
explosion hazards, combustible anesthetics..... 93	handbook article..... 27
ether-nitrous oxide-oxygen mixtures..... 124	liquid, handbook article..... 29
storage-battery rooms..... 184	nonslacking, preparation by steam-drying subbituminous coal and lignite..... 313
Explosion limit, third, kinetics..... 123	packaged, annual data..... 482
Upper, reaction in vicinity..... 133	technical and economic study..... 304, 312
Explosion pressures, data..... 210	solid, miscellaneous, handbook article..... 22
Explosives, annual report..... 227	supply and demand, development..... 13
Bureau of Mines tests..... 212	Fuel briquets, annual data..... 482
carbonaceous material, changes in, effects..... 209	specifications, handbook article..... 314
coal-mine, care in use and handling..... 211	Fuel consumption, refinery, annual survey..... 500-502
detonation, particles from..... 210	Fuel Efficiency Program, National, work..... 430, 432
explosion pressures..... 209	Fuel pitches, characteristics..... 92
explosion temperatures..... 209	pulverized, explosibility..... 92
gaseous products..... 222	Fuel research, Great Britain..... 31
carbonaceous blasting accessories, effects..... 221	Fuel waste, checking, guide for..... 431
tests, factors affecting..... 211	prevention, for war..... 426
ignition of fireproof by..... 473-477	Furnace, hand-fired, subbituminous coal as fuel..... 317
liquid-oxygen, fire-retardant treatment..... 210, 249	type, effect on fusibility of coal ash..... 35
misuse, accidents due to..... 238	Furnace walls, flow of coal-ash slag on..... 421
permissible, gaseous products from, effect of stenosis..... 230	Furnace-wall tubes, coal-ash slag on, thickness, factors affecting..... 435
of stenosis..... 232-235	Fusain, in coal, determination, by oxidation and petrographic methods..... 48
use, in bituminous-coal mines..... 231	Fuse, burning rate..... 241
variations in oxygen conditions..... 476, 477	
production, annual data..... 212	<b>G</b>
sheathed, Bureau of Mines tests..... 213	Galvanometer, electric contacting, for temperature control..... 434
use in Belgium..... 242-246	Gases, at surface disasters, hazards..... 115
State laws, summary..... 209, 210	chimney, dust removal from..... 450
theoretical calculations..... 247	combustible, addition to intake air, effect on combustion in Diesel engines..... 291
transporting, cars for..... 223-227	fire, Universal gas mask in, use, flammable, electric-spark ignition, minimum energies for..... 97
Explosives Division, annual reports..... 223-227	from permissible explosives, effect of stenosis..... 230
	halide, in atmosphere, device for detecting..... 108
<b>F</b>	inert, prevention of explosions by..... 419
Fans, auxiliary, coal-mine, hazards..... 170	Gas fuels, handbook article..... 144
mine, signal alarms and power releases for..... 275	Gas masks, Universal, use, in fire gases..... 144
Fan-pipe lines, coal-mine, discharge of, air flow at..... 176, 177	Gaseous products, from explosives, effect of carbonaceous accessories..... 209, 222
Feed water, boiler, conditioning, questions and answers, handbook..... 446	
Filter-paper method, for dust determination..... 88	

Item No.	Item No.
Gasification, carbon, rate, pressure dependence	377
coal, handbook article	374
Gasoline, production, from coal	395
Congressional hearings	383, 394
Generators, acetylene, medium-pressure, explosions in	395
Gibson mine, Pa., roof movement, studies	152
Grades, haulage on, safety devices	252
Great Britain, fuel research	31
Grinding characteristics, mineral products	34
Ground movement, coal mines, work, review	174
Ground-resistance measurements, drill-hole casings	219
<b>I</b>	
Ignition temperatures, acetone anhydride	112
acetylene-air and acetylene-oxygen mixtures	103
ethyl mercaptan in air	105
nicotine in air	110
styrene in air	111
Illinois, bituminous coal, analyses	61
data book	60
Indiana, bituminous coal, analyses, data book	68
coal mines, fatalities	197
Indiana County, Pa., coal, carbonizing properties and petrography	341
Inflammability limits, acetone anhydride	112
acrylonitrile in air	107
butadiene in air	101
ethyl mercaptan in air	105
nicotine in air	110
styrene in air	111
Inspection standards, coal-mine, explanation	146
156-159	
Insulation, home, with mineral products	442
Interior Province coals, western region, carbonizing properties	338
<b>J</b>	
Jigs, for cleaning coal, at truck mines	302
Jigging, precision, as substitute for laboratory sink-hoat	298
<b>K</b>	
Kansas, coal, carbonization	373
Keen Mountain mine, Va., coal, blends with Warden mine coal, effect	339
carbonizing properties and petrography	339
Kentucky, Atlas mine, coal, blends with Pocahontas No. 3 and No. 4-bed coals, effect	332
carbonizing properties and petrography	332
Bell No. 1 mine, coal, blends with Pocahontas No. 3 and No. 4-bed coals, effect	334
carbonizing properties and petrography	334
bituminous coal, analyses	62
data book	62
mines 30 and 31, coal, blends with Pocahontas No. 3 and No. 4-bed coal, effect	335
carbonizing properties and petrography	335
<b>L</b>	
Lamps, cap, permissible, electric, field performance	281
flame safety, permissible, construction, care, and use	253
use and misuse	289
permissible, electric, investigation	251
Light oil, low-temperature distillation yields, inflammability	372
medium-temperature, benzene in, determination	421
yields, from carbonization tests	420
Lignite, annual data	482
anthraxylon from, hydrogenation	380
assays, liquid-phase	382
summary	402
drying, by Flessner process, study	297
hydrogenation	404
research	378
liquefaction, research	378
liquid fuels from, Congressional hearings	387
petrography	404
preparing nonslaeking fuel from, by steam drying	313
Western States, hydrogenation and petrography	398
Lignite mines, inspection standards	146, 158

Item No.	Item No.
Liquefaction, coal, American	410
effect of petrography	379
effect of rank	379
research	378-382
review of literature	382
in coal hydrogenation, kinetics	397, 401, 411, 412
Liquid fuels, coal as source, outlook	394
production, research	356
synthetic, Congressional hearings	383, 384, 386-388
plants producing, act authorizing construction and operation	385
Liquid-oxygen explosives, fire-retardant treatment	208, 249
fire sensitivity	246
Loaders, coal-mine, sales, increased	512, 516, 517
Loading, coal, handbook article	308
Loading equipment, coal-mine, sales	515
Locomotives, Diesel, mine, permissibility tests	254
use, in gassy coal mines, Belgium	258
in tunnels	270
underground, recommendations	254
mine, quartz-free material under, use	137
Lower Banter bed, coal, blends with Pittsburgh-bed coal, effect	339
carbonizing properties and petrography	339
Lower Precept bed, coal, carbonizing properties and petrography	341
Lower Hignite bed, coal, blends with Pocahontas No. 3 and No. 4-bed coals, effect	332
carbonizing properties and petrography	332
Lubricants, coal-mine, transportation, storage, and handling	164
<b>M</b>	
Magnesium dust, plants producing, explosion and fire protection, code	119
Magnesium fire, extinguishing	117, 118
with pitch	94, 116
Magnesium powder, plants producing, explosion and fire protection, code	119
Maintenance, coal-mine, importance	168
Manholes, combustibles in, investigations	113
ventilation, studies	175
Manhole covers, openings in, combination with vertical ducts, effect on ventilation	175
Matanuska coal fields, Moose Creek district, description	67
McAlester bed, coal, carbonizing properties	359
Mechanization, coal mines, decrease, wartime status	514
effect on conservation of coal deposits	173
historical summary	293
Metal carbides, preparation, relation to Fischer-Tropsch synthesis	390
Metal powders, explosibility	99, 121
inflammability	99
Metal working, with oxyacetylene flame, motion picture	518
Metallurgical Division, Ore-Dressing Section, ore-testing studies	300
Methane detector, permissible, description	204
Methanol poisoning, study	135, 142
Methanol vapor, exposure to, control	143
in air, exposure of dogs to, results	135, 142
Methylene chloride-oxygen-nitrogen mixtures, inflammability	106
Microprojector, nidget, for determining dust	89
Mines, western, haulage and hoisting hazards	274
Mine air, cooling, to prevent roof falls	163
Mine cages, safety catches on, tests	288
Mine cars, automatic coupling, information on	286
Mine equipment, electrical, permissibility tests	287
permissible, lists	276-278, 283, 284
Mine fans, signal alarms and power releases for	275
Mine lamps, permissible electric, investigations	251
Mine locomotives, Diesel, permissibility tests	251
quartz-free material under, use	137
Mine workings, old, precautions with	162
Mines 30 and 31, Ky., coal, blends with Pocahontas No. 3 and No. 4-bed coal, effect	335

Mines 30 and 31, Ky., coal, carbonizing properties and petrography	335
Mineral industries, accidents and employment, annual data	478
Mineral matter, in coal	59
Mineral products, grinding characteristics	34
home insulation with	442
Mining, mechanized, electrical hazards	279
permissible equipment for	285
review of progress	7-9
Mining Division, annual reports	138
Mining industry, pulmonary disease in	150
Moisture, changes in, effect on mine roof	39
in coal, determining losses, in sampling coal	36
Montana, solid fuels, hydrogenation and petrography	398
Morgantown district, W. Va., coal, carbonizing properties and petrography	341
<b>N</b>	
National Safety Competition, annual reports	495-499
Natural gas, comparison with competitive power	503
New York, atmosphere, characteristics	90
Nicotine, in air, ignition temperature and inflammability limits	110
Nitrates, uses, in national defense	422
Nonmetals, needed for national defense, review	422
softening water with	449
Nonmetals Division, annual reports	10-12
North Dakota, solid fuels, hydrogenation and petrography	398
No. 1 bed, Ky., coal, blends with Pocahontas No. 3 and No. 4-bed coal, effect	334
carbonizing properties and petrography	334
No. 2 bed, Wash., coal, carbonizing properties and petrography	336
No. 5 bed, Wash., coal, carbonizing properties and petrography	336
No. 4 mine, W. Va., coal, carbonizing properties and petrography	340
No. 23 mine, W. Va., coal, blends with Warden mine, Pa., coal, effect	331
carbonizing properties and petrography	331
<b>O</b>	
Ohio, bituminous coal, analyses, data book	64
Oil, from oil shale and coal, production	395
hydrogenation, contact catalysis	407
neutral, from coal hydrogenation	392
See also Light oil.	
Oil fuel, substitution of colloidal fuel for	428, 429, 438
Oil shale, as source of oil and gasoline	395
plants for producing synthetic liquid fuels from, act authorizing construction and operation	385
Oklahoma, Atlas No. 2 mine, coal, carbonizing properties	349
Dow No. 10 mine, coal, carbonizing properties	350
Open pits, drill holes, premature shots, prevention	239
Oregon, coal, analyses	77
properties, relation to use	77
Oxidation, atmospheric, coal, at moderate temperatures	327, 328
coal, effect on coking properties	326
coking coals, effect on carbonizing properties	328
reaction rate	327
Oxyacetylene flame, metal working with, motion picture	518
Oxygen, removal, in coal hydrogenation, kinetics	397, 401, 411, 412
<b>P</b>	
Packaged fuel, annual data	482
technical and economic study	304, 312
Paleobotany, coal	61
Pent, annual data	479
anthraxylon from, hydrogenation	399
handbook article	22

Item No.		Item No.
250	Pollet powder, blasting with, hazards	333
480	Pennsylvania, anthracite, annual data	335
160	anthracite region, research laboratory, legislation providing	337
19, 21	safety cars, work	330
161	water problems	340
296	anthracite coals, analyses	332
53	bituminous coals, analyses	334
54	data books	333
63, 64	bituminous-coal mines, nonfatal underground accidents, study	333
282	Cribbie mine, timber decay	333
151	Gibson mine, roof movement, studies	333
152	Indiana County, coal, carbonizing properties and petrography	337
341	Mahanoy City, anthracite refuse-bank fire, extinguishing	340
201	Pittsburgh district, mine refuse, salvage of coal from	333
301	Warden mine, coal, blends with Keen Mountain, Va., coal, effect	332
339	blends with No. 23 mine, W. Va., coal, effect	333
331	Wildwood mine, mechanized, motion picture	99, 121
520	Permissible blasting devices, lists	99
232-235	Permissible blasting units, lists	250
228	Permissible electric cap lamps, field performance	275
281	Permissible electric mine lamps, investigations	315
251	Permissible electric pumps, description	266
265	Permissible explosives, gaseous products from, effect of sheaths	49
230	lists	355-357
232-235	use, in bituminous-coal mines	352
486	variations in oxygen condition	41
231	Permissible flame safety lamps, construction, care, and use	265
253	Permissible methane detector, description	45
264	Permissible mine equipment, lists	
276-278, 283, 284	mechanized mining	
285	Permissible powder, blasting with, hazards	
250	Permissibility tests, blasting units, single-shot	
255	electric mine equipment	
287	Petrography of canal coal	
400	coal, American studies and liquefaction	
331-337, 339-341	effect on hydrogenation and liquefaction	
379	low-rank, Western States	
389	lignite	
404	solid fuels, Western States	
398	subbituminous coal	
404	Petroleum, as source of synthetic rubber	
391	comparison with competitive power	
503, 505	handbook article	
29	Phosphorus, in Washington coal, removal	
73	Photoelasticity, application to mine pillar and tunnel problems, discussion	
171	Pig iron, increased output, from improved coke	
384, 387	Pillars, extraction, with mechanized equipment	
160	Pitch, coal-tar, extinguishing magnesium fires with	
94, 116	fuel, characteristics and explosibility	
92	Pittsburgh bed, coal, blends with Bakerstown-bed coal, effect	
331	blends with Lower Banner-bed coal, effect	
339	blends with Pocahontas No. 3-bed coal, effect	
330	hydrogenation	
412	coal pillars, strength test	
149	strata above, effect of changes in moisture and temperature	
150	Pittsburgh district, mine refuse, salvage of coal from	
301	Plastics industry, dust explosions in, prevention, code	
122	powders used in, inflammability and explosibility	
98	Plasticity, coals	
83, 84	Pocahontas No. 3 bed, coal, blends with Lower Hignite-bed coal, effect	
332	blends with No. 1-bed coal, effect	
334	blends with Pocahontas No. 3-bed coal, effect	
330	blends with Pittsburgh-bed coal, effect	

## Item No.

333	Pocahontas No. 3 bed, coal, blends with Powellton-bed coal, effect
335	blends with Taggart-bed coal, effect
337	blends with Thick Freepport-bed coal, effect
330	carbonizing properties and petrography
340	Pocahontas No. 4 bed, coal, blends with Lower Hignite-bed coal, effect
332	blends with No. 1-bed coal, effect
334	blends with Powellton-bed coal, effect
333	blends with Taggart-bed coal, effect
333	blends with Thick Freepport-bed coal, effect
337	carbonizing properties and petrography
340	Powellton bed, coal, blends with Pocahontas No. 3- and No. 4-bed coals, effect
333	Pocahontas No. 4 bed, coal, blends with Lower Hignite-bed coal, effect
332	carbonizing properties and petrography
333	Powder, granular, blasting with, hazards
250	metal, explosibility
99, 121	Inflammability
99	permissible, blasting with, hazards
250	plastics industry, inflammability and explosibility
98	Power releases, mine-fan, description
275	Preparation methods, coal, handbook article
315	Power consumption, coal-mine, analysis
266	Pressure-regulating device, improved, description
49	Processing, coal
355-357	Processing plants, war activities
352	Pulverizer, coal, for measuring net power, description
41	Pumps, permissible electric, description
265	Pyrite, coal high in, ash determination
45	

## Q

239	Quarries, drill holes, premature shots, prevention
-----	----------------------------------------------------

## R

379	Rank, coal, effect on hydrogenation
391, 393	effect on liquefaction
379	Refineries, fuel consumption, annual survey
500-502	Refuse, coal-mine, salvage of coal from
301	Resins, in Utah coal, effect on coking properties
351	Retorts, externally heated, carbonizing products, relation to coal analysis
245	Rock dust, use, to prevent bituminous-coal-mine explosions
204-206, 484, 490, 494	Rock dusting, investigations, stoppage
253	prevention of coal-dust explosions by
187	Rocky Mountain area, coal, storage
323	Roots, coal-mine, sealing, to prevent slate falls
169	prevention, by cooling mine air
148, 170	by water sprays
149	Roof movement, coal-mine, studies
152, 153	Rosin-Rammer law, application to missing sizes in screened coal
306	Rubber, synthetic, coal as source
25, 391	petroleum as source
391	

## S

182	Safety, in coal mining, status
161	Safety cars, work, in anthracite region
288	Safety catches, for mine cages, bituminous-coal mines, tests
495-499	Safety Competition, National, annual reports
273	Safety lamps, flame, permissible, construction, care, and use
140	Safety manual, for coal miners
10	Salt, use, in preventing coal-dust explosions
310	Screening, coal, handbook article
95	Semianthracite dust, explosibility
253	Shifts, inclined, haulage on, safety devices
280	Shaft mine, one-level, hoisting-signal code

Item No.	T	Item No.
395	Shale, oil, as source of oil and gasoline	335
385	plants for producing synthetic liquid fuels from, act authorizing construction and operation	335
230	Sheaths, effect on gases from permissible explosives	451
260	Shock, electric, danger from, in extinguishing fires with carbon dioxide	413
275	Signal alarms, mine-fan, description	372
137	Silicosis, in mines, prevention	420
255	Single-shot blasting units, permissibility requirements	398
298	Sink-float, laboratory, precision jigging as substitute	396
82	See also Float-shik	150
424	Slack, subbituminous, Denver region, properties	434
436	Slag, coal-ash, flow, characteristics, in solidification range	391
424	on furnace walls	437
435	on furnace-wall tubes, thickness, factors affecting	65
169, 170	Slate, falls, sealing mine roof to prevent	190
252	Slopes, haulage on, safety devices	33
459, 460	Smoke abatement, fundamentals	405
457	Smoke regulations, enforcement, saving coal by	337
198	Smoking, as cause of coal-mine explosions	337
80	Soils, light-color, darkening with coal-mine waste	151, 154
60	Spint coals, Appalachian region, occurrence and properties	200
393	North America, hydrogenation	268, 259
87	Stack effluents, dilution	168
375, 376	Steam-carbon reaction, mechanism	416
447	Steam-heating systems, cyclohexylamine in, use	104
445	Steel, boiler, intercrystalline cracking, prevention	392
519	making and shaping, raw materials, motion picture	270
440	Stoker, domestic underfeed, subbituminous coal as fuel	433
444	domestic underfeed and overfeed, burning Washington coal on	144
325	Storage, bituminous coal, problems	282
329	coal, effect on caking properties	342
326, 329	effect on caking properties	330-342, 344, 346, 349, 350
321, 322	pointers	50
324	preventing spontaneous combustion	341
323	Rocky Mountain area	341
317	subbituminous coal, domestic	351
317	in bins	398
184	Storage-battery rooms, explosion hazards	116
511	Strip mining, anthracite, output	97
111	Styrene, in air, ignition temperature and inflammability limits	181
309	Subbituminous coal, anthraxylon from, hydrogenation	168
382	assays, liquid-phase	182
402	summary	175
305	bridgeting	404
297	drying, by Fleissner process, study	404
404	hydrogenation	404
404	in underfeed domestic stoker, performance	62
404	petrography	55
313	preparing nonslacking fuel from, by steam drying	62
317, 318	storage	55
37	volatile-matter determination, precision	339
398	Western States, hydrogenation and petrography	339
174	Subsidence, coal mines, studies, review	339
86	Sugar, decolorizing, by activated carbon	339
147	Sulfur, control, in metallurgical coal	37
401	Sulfur dioxide, atmospheric, determination, papers on, bibliographies	37
392	Sulfuric acid, action in production of neutral oils in coal hydrogenation	37
115	Surface distillers, gases and vapors at, hazards	37
383, 384, 385	Synthetic liquid fuels, Congressional hearings	37
385	Synthetic-liquid-fuel plants, act authorizing construction and operation	37
25, 391	Synthetic rubber, preparation from petroleum and coal	37

## W

335	Taggart bed, coal, blends with Pocahontas No. 3- and No. 4-bed coal, effect
335	carbonizing properties and petrography
451	Tannins, in boiler water, determination
413	Tar, high-temperature, from byproduct coke ovens, hydrogenation
372	low-temperature distillation yields, various coals
420	yields, from carbonization tests
398	Tellurium compounds, as Friedel-Crafts catalysts
396	Tellurium dioxide, oxidation of organic compounds with
150	Temperature, changes in, effect on mine roof control, by electronic contacting galvanometer
434	effect on coal-hydrogenation reactions
391	measurements, by radiometric methods, errors
437	Tennessee, bituminous coal, analyses, data book
65	coal mines, accidents
190	Test sieves, wire, square-mesh, comparison
33	Tetralin, hydrogenation of anthracene by
405	Thick Freepport bed, coal, blends with Pocahontas No. 3- and No. 4-bed coal, effect
337	carbonizing properties and petrography
151, 154	Timber decay, coal-mine, study
200	Tipples, coal dust in, allaying, methods
268, 259	Transportation, coal, underground coal-mine, importance
168	Trent process, for cleaning coal, results
416	Trichloroethylene-oxygen-nitrogen mixtures, inflammability
104	Truck mines, cleaning coal at, by jigs
392	Tunnels, Diesel locomotives in, use
270	Twain Branch boiler, performance, factors affecting, discussion
433	Type N gas mask, use, in fire gases
144	

## U

282	Underground accidents, bituminous-coal mines, nonfatal, study
342	United States, coals, carbonizing properties, Bureau of Mines survey, index
330-342, 344, 346, 349, 350	structure
50	typical analyses
341	Upper Freepport bed, coal, carbonizing properties and petrography
341	Utah, coal, resins in, effect on coking properties
351	solid fuels, hydrogenation and petrography
398	

## V

116	Vapors, at surface disasters, hazards
97	flammable, electric-spark ignition, minimum energies for
181	Ventilation, coal-mine, data for miners on importance
168	inadequate, health hazards
175	manholes, studies
62	Virginia, bituminous coal, analyses, data book
55	coals, analyses
339	Warden mine, coal, blends with Keen Mountain mine, coal, effect
339	carbonizing properties and petrography
339	Vitrinite, hydrogenation, from solid fuels
37	Volatile matter, solid fuels, determination

## W

339	Warden mine, Pa., coal, blends with Keen Mountain mine, Va., coal, effect
331	blends with No. 23 mine, W. Va., coal, effect
307	Washeries, coal, water, clarification by flocculation
73	phosphorus in, removal
360, 366	caking, beehive and byproduct
336	Wilkeson-Miller mine, coal, carbonizing properties and petrography

Item No.		Item No.	
333	Washington, Bartoy mine, coal, carbonizing properties and petrography	330	West Virginia, McDowell County, Pocahontas No. 3-bed coal, carbonizing properties
56	coals, analyses	341	Morgantown district, coal, carbonizing properties and petrography
444	burning, on domestic stokers	340	No. 4 mine, coal, carbonizing properties and petrography
595	Water, comparison with competitive power purification, by activated carbon from coal refuse	331	No. 23 mine, coal, blends with Warden mine, Pa., coal, effect
81	softening, with nonmetallies	331	carbonizing properties and petrography
449	treatment, carbonaceous cation and anion exchangers in, use	60	Western States, energy, trends, with reference to coal
448	Water gas, blue, production, from Kansas coal	389	low-rank coals, hydrogenation and petrography
373	Water problems, anthracite mines	190	Wetting agents, allaying dust in coal mine by
296	Water sprays, air conditioning with, in coal mine	520	Wildwood mine, Pa., mechanized equipment, motion picture
148	West Virginia, Beech Bottom mine, roof falls, prevention, by water sprays	335	Wilkeson-Miller mine, Wash., coal, carbonizing properties and petrography
148	bituminous coal, analyses, data books	22	Wood, as fuel, handbook article
62, 61	coals, analyses	398	Wyoming, solid fuels, hydrogenation and petrography
57	Buckeye No. 3 mine, coal, carbonizing properties and petrography		
340	Elk Creek No. 1 mine, coal, blends with Pocahontas No. 3- and No. 4-bed coal, effect	Z	
333	carbonizing properties and petrography	85	Zoolites, carbonaceous, from bituminous coal
333	Hersmar mine, coal, blends with Pocahontas No. 3- and No. 4-bed coal, effect		
237	carbonizing properties and petrography		
337			

## INDEX OF AUTHORS

## A

- Abernethy, R. F. See Cooper, H. M., 35, 36; Hirst, L. L., 390.
- Adams, W. W. Employment and accidents in minerals industries, 478; increasing use of rock dust as preventive of explosions at bituminous-coal mines, 484; monthly trend of employment at bituminous-coal mines in the United States during 1943, 485; use of rock dust in bituminous-coal mines, 1930-38, 494.
- and Geyer, L. E. Coal-mine accidents in the United States, 462, 463.
- and Lawrence, T. D. National safety competition, 495, 496, 497, 498, 499.
- and Wrenn, V. E. Coke-oven accidents in the United States, 468, 469, 470, 471, 472; production of industrial explosives in the United States, 473, 474, 475.
- Geyer, L. E., and Parry, M. G. Coal-mine accidents in the United States, 464, 465, 466, 467.
- Wrenn, V. E., and Horton, L. S. Production of explosives in the United States, 476, 477.
- See Geyer, L. E., 400.
- Anderson, R. L. See Young, W. H., 483, 514, 515, 516, 517.
- Ankeny, M. J. See Forbes, J. J., 146.
- Apell, G. A. Moose Creek district of Matanuska coal fields, Alaska, 67.
- Ash, S. H. Water problem in Pennsylvania anthracite mining region, 296.
- and Naus, L. L. Use of Diesel locomotives in tunnels, 270.
- See Grove, G. W., 252.
- Auvil, H. S., Davis, J. D., and McCartney, J. T. Shrinkage of coke, 414.

## B

- Barkley, J. F. Determining moisture content of coal; 39; discussion of paper entitled "Combustion of barley anthracite," 425; dust removal from chimney gases, 456; how to save fuel at home, 441; how smoke-regulation departments can assist in war project of control, allotment and conservation of the nation's coal, 457; methods employed in reducing fly-ash emission from chimneys, 458; pointers on storage of coal, 321; prevent fuel waste for war, 426; preventing spontaneous combustion in stored coal, 324; problems encountered in storage of bituminous coal, 325; questions and answers on boiler feed-water conditioning, 446; questions and answers for the home fireman, 439; some fundamentals of smoke abatement, 459; standard methods for measurement of extent of atmospheric pollution, 460; storage of coal, 322.
- and Burdick, L. R. Bibliographies of papers on determination of dust fall, atmospheric dusts and atmospheric sulfur dioxide, 461; constancy of B. t. u. value of "pure" coal, 68; various B. t. u. values of coal, 71.
- and Rice, W. E. Peat, wood and miscellaneous solid fuels, 22.
- and Selvig, W. A. Coal, 23.
- and Seymour, William. Increasing use of small anthracite sizes, 427.
- Burdick, L. R., and Hershberger, A. B. Coloidal fuel substituted for oil fuel, 428.
- Hershberger, A. B., and Burdick, L. R. Laboratory and field tests on coal-in-oil fuels, 429.
- See Nicholls, P., 423.

- Bator, G. T. See Gandrud, B. W., 302.
- Beltz, J. C. See Fieldner, A. C., 18.
- Benson, O. B. See Jones, G. W., 184.
- Berger, L. B., and Schrenk, H. H. Danger from carbon monoxide in the home, 136; possible hazards attending use of engines operated on butane fuel in mining and tunneling, 371.
- Elliot, M. A., Holtz, J. C., and Schrenk, H. H. Diesel engines underground—effect of adding exhaust gas to intake air, 256; Diesel engines underground—effect of sulfur content of fuel on composition of exhaust gas, 257.
- See Elliott, M. A., 259, 291; Holtz, J. C., 262, 263; McElroy, G. E., 87; Schrenk, H. H., 295.
- Berk, A. A. Observations on use of cyclohexylamine in steam-heating systems, 447.
- and Schroeder, W. C. Determination of tannin substance in boiler waters, 451; practical way to prevent embrittlement cracking, 452.
- See Schroeder, W. C., 445, 453, 454, 455.
- Birge, G. W. See Reynolds, D. A., 359.
- Bituminous Coal Consumers' Counsel, and Bureau of Mines. Typical analyses of bituminous coals produced in districts 1-8, 10, 11 and 13, 62, 63, 64, 65, 66.
- Bogard, Dale. See Broderick, S. J., 85, 450.
- Boland, P. J. See Sayers, R. R., 21.
- Bowles, Oliver. Home insulation with mineral products—conservation of fuel for war, 442.
- Boyer, B. L. See Hirst, L. L., 402.
- Bradley, J. R. Coal, petroleum, natural gas and electricity in the United States, 1929-40, 503; coke, 504; power—importance of coal, oil and water in this modern age of mechanisation, 505; shifting channels of export coal trade, 506; United States coal industry, 507; United States coal industry in 1940—defense activity increases demand for industrial coal, exports up sharply, 508; world production of coal, 500.
- and van Sien, M. Anthracite output increases but prices unfavorable, 610.
- Brewer, R. E. Comparison of fine-series, square-mesh-wire test sieves of different countries, 33; discussion of paper entitled "Experimental investigation of the British standard method for crucible swelling test for coal," 40; effect of acids and alkalis upon carbonization products of coal, 343; plastic characteristics of coal, 83; plastic and swelling properties of bituminous coking coals, 78.
- Holmes, C. R., and Davis, J. D. Plastic properties of bituminous coking coals—effect of petrographic composition, 84.
- See Davis, J. D., 334; Fieldner, A. C., 14, 339, 340, 341.
- Breyre, Ad. Twenty years' survey of use of sheathed explosives in Belgium, 213.
- and Fripiat, J. Diesel locomotives in gassy mine workings of Belgium, 258.
- Broderick, S. J. Carbonaceous cation and anion exchangers in water treatment, 448; darkening light-color soils with coal-mine waste, 80; softening ing water with nonmetallic minerals, 439.
- and Bogard, Dale. Carbonaceous cation exchangers from coal and coal refuse, 450; carbonaceous zeolites from bituminous coal, 85.
- and Hertzog, E. S. Activated carbon from coal refuse for water purification, 81.
- See Hertzog, E. S., 86.
- Brown, C. E. Filter-paper method for obtaining dust-concentration results comparable to Impinger results, 88; midjet microprojector for dust determinations, 89.

- Brown, C. E. and Schronk, H. R. Control of silicosis hazard by substitution of quartz-free or low-quartz material for sand under mine locomotives, 137.  
— See McElroy, G. E., 87; Yant, W. P., 90.
- Brown, F. W. Determination of the Beattie-Bridgman constants from critical data, 248; theoretical calculations for explosives—explosion pressures, 210; theoretical calculations for explosives—explosion temperatures and gaseous products and effects of changes in carbonaceous material, 209.
- Brown, H. R., and Hartmann, Irving. Pitch for extinguishing magnesium fires, 110.  
— Greenwood, H. P., Parry, V. F., Jones, W. H., and Hirst, I. L. Coal for explosion and fire protection in plants producing or handling magnesium powder or dust, 119.  
— Hartmann, Irving, and Greenwood, H. P. Extinguishing industrial magnesium fires and incendiary bombs, 117; methods of extinguishing magnesium fires and incendiary bombs composed mainly of magnesium, 118.  
— Hartmann, Irving, and Nagy, John. Extinguishing magnesium fires with hard pitch derived from coal tar, 94.  
— See Hartmann, Irving, 90, 121.
- Brunot, H. B. See Gleim, E. J., 279; Hsley, L. C., 265, 287.
- Buch, J. W. Transportation, maintenance, and ventilation got increasing attention, 168.  
— See Corgan, J. A., 480; De Carlo, J. A., 481; Young, W. H., 514, 515.
- Burdick, L. R. See Barkley, J. F., 68, 71, 428, 429, 461.
- Bureau of Mines. Explanation and justification of tentative inspection standards for bituminous-mineral and lignite mines, 145; first organization and work of the Coal-Mine Inspection Division, 155; Fuel Efficiency Program, 430; guide for checking fuel waste, 431; Mine Safety Board decision, 32—prevention of coal-dust explosions by rock dusting, 187; Mine Safety Board decision 33—Bureau of Mines definition of a gassy coal mine, 188; more than 78 percent of bituminous coal produced in mines using permissible explosives, 480; preliminary survey of bituminous-coal-mine occupations on a typical workday in 1940, 457; procedure for applying for tests made on explosives (including sheathed explosives) and blasting devices by the Bureau of Mines, 212; procedure for testing Diesel mine locomotives for permissibility and recommendations on use of Diesel locomotives underground, 254; production of gasoline from coal and other products—hearings before House of Representatives subcommittee, 383; single-shot blasting units, 255; synthetic liquid fuels—hearings before Senate subcommittee, 384; tentative bituminous and lignite-mine inspection standards, 156; tentative coal-mine inspection standards, 157; tentative inspection standards for anthracite mines, 158, 159.  
— and Linde Air Products Co. Modern metal-working with the oxyacetylene flame (film), 518.  
— and United States Steel Corp. Making and shipping of steel—raw materials (film), 519.  
— and Westinghouse Electric and Manufacturing Co. "Wildwood"—a 100-percent mechanized mine (film), 520.  
— See Bituminous Coal Consumers' Council, 62, 63, 64, 65, 66.
- Campbell, John. See Jones, G. W., 175, 184.
- Cannarella, J. T. H. See Yancey, H. F., 307.
- Cash, F. E. Explosions in Alabama coal mines, 189; fatalities caused by electric contacts in Alabama coal mines, 272.  
— and Dempsey, C. P. Accidents in Tennessee coal mines 1891-1910, 180.
- Cheasley, T. G. Work of National Fuel Efficiency Program, 432.
- Chorvack, John. See Sayers, R. R., 135, 142.
- Clarke, Loyal. See Eisner, Abner, 380, 303; Fisher, C. H., 307, 308, 309, 400, 401; Storch, H. H., 412, 412.
- Coates, A. B. See Grant, R. L., 218.

- Coe, G. D., and Coghill, W. H. Contrasts in grinding characteristics of mineral products, 34; precision jiggling as substitute for laboratory sink-float, 236.  
— Delano, P. H., and Coghill, W. H. A continuously operating laboratory coal pulverizer that measures net power, 41.  
— See Gandrud, B. W., 303.
- Coghlin, W. H. See Coe, G. D., 34, 41, 298.
- Cohen, F., and Reid, W. T. Flow of coal-nash slag on furnace walls, 424.  
— See Reid, W. T., 425, 436.
- Cohn, E. M., and Quest, P. G. Influence of humidity upon resistivity of solid dielectrics and upon dissipation of static electricity, 273.
- Congress, U. S. Act authorizing construction and operation of demonstration plants to produce synthetic liquid fuels, 385; act to provide for establishment and operation of a research laboratory in the Pennsylvania anthracite region, 19.
- Conley, J. C. See Ralston, O. C., 10.
- Cooke, M. I. See Corgan, J. A., 480.
- Cooper, H. M., and Abernethy, R. F. Cooperative investigation of the effect of furnace type and atmosphere on fusibility of coal ash, 35.  
— Snyder, N. H., and Abernethy, R. F. Moisture losses in sampling coal, 36.  
— Snyder, N. H., and others. Analyses of Illinois coals, 51; analyses of Kentucky coals, 52; analyses of Pennsylvania anthracite coals, 53; analyses of Pennsylvania bituminous coals, 54; analyses of Virginia coals, 55; analyses of Washington coals, 56; analyses of West Virginia coals, 57.  
— See Hirst, I. L., 380.
- Cordner, J. F., Jr. See Yancey, H. F., 444.
- Corey, R. C. See Reid, W. T., 437.
- Corgan, J. A. Anthracite strip exceeds 9 million tons, 511; dredging Pennsylvania anthracite, 160; pear, 470.  
— Buch, J. W., and Cooke, M. I. Pennsylvania anthracite, 480.  
— See Shore, F. M., 513.
- Cudworth, J. R. See Herzog, E. S., 79.

## D

- Daniels, Joseph. Beehive and byproduct coking in Washington, 360.  
— See Yancey, H. F., 360.
- Davenport, Sara J. See Harrington, D., 178.
- Davis, F. T. See Geer, M. R., 73.
- Davis, J. D. Coke, 418; coke and byproduct yields from various coals, 347; selection of coals for coke-making, 361; summary of investigations for fiscal year ended June 30, 1943, 348.  
— and Reynolds, D. A. Carbonizing properties of Henryetta-bed coal from Atlas No. 2 mine, Henryetta, Okmulgee County, Okla. (preliminary report), 349; carbonizing properties of Moa-Baker-bed coal from Dow No. 10 mine, Dow, Pittsburg County, Okla. (preliminary report), 350; influence of resins in a Utah coal on its coking properties, 351; work of survey of carbonizing properties of American coals, 344.  
— Reynolds, D. A., Brewer, R. E., Sprunk, G. C., and Schmidt, L. D. Carbonizing properties and petrographic composition of No. 1-bed coal from Bell No. 1 mine, Sturgis, Crittenden County, Ky., and effect of blending this coal with Pocahontas No. 3- and No. 4-bed coals, 333.  
— Reynolds, D. A., Ode, W. H., Ode, W. H., Holmes, C. R., and McCartney, J. T. Carbonizing properties of western region Interior Province coals and certain blends of these coals, 338.  
— Reynolds, D. A., Ode, W. H., and Holmes, C. R. Carbonizing properties of Pocahontas No. 3-bed coal from Kimball, McDowell County, W. Va., and effect of blending this coal with Pittsburgh-bed coal, 330.  
— Reynolds, D. A., Sprunk, G. C., and Holmes, C. R. Carbonizing properties and petrographic composition of Bakerstown-bed coal from No. 23 mine, Coketon, Tucker County, W. Va., and effect of blending this coal with Pittsburgh-bed (Warden mine) coal, 331; carbonizing properties and petrographic composition of Lower Illigante-bed coal from Atlas line, Mu-

## F

- desboro, Bell County, Ky., and effect of blending this coal with Pocahontas No. 3- and No. 4-bed coals, 332; carbonizing properties and petrographic composition of Powellton-bed coal from Elk Creek No. 1 mine, Emmet, Logan County, W. Va., and effect of blending this coal with Pocahontas No. 3- and No. 4-bed coals, 333.  
— Reynolds, D. A., Sprunk, G. C., Holmes, C. R., and Fieldner, A. C. Carbonizing properties and petrographic composition of Taggart-bed coal from mines 30 and 31, Lynch, Harlan County, Ky., and effect of blending this coal with Pocahontas No. 3- and No. 4-bed coals, 335.  
— Reynolds, D. A., Sprunk, G. C., Holmes, C. R., and McCartney, J. T. Carbonizing properties and petrographic composition of No. 2-bed coal from Bartoy mine and No. 5-bed coal from Wilkeson-Miller mine, Wilkeson, Pierce County, Wash., 336; carbonizing properties and petrographic composition of Thicket Freepport-bed coal from Harmar mine, Harmarville, Allegheny County, Pa., and effect of blending this coal with Pocahontas No. 3- and No. 4-bed coals, 337.  
— See Auvil, H. S., 414; Brewer, R. E., 84; Fieldner, A. C., 339, 340, 341, 371, 388; Holmes, C. R., 420; McCartney, J. T., 362; Reynolds, D. A., 346; Schmidt, L. D., 328, 332; Selvig, W. A., 370, 416; Wilson, E. E., 512; Yancey, H. F., 316.
- Davis, J. J. See Sayers, R. R., 21.
- De Carlo, J. A., Otero, M. M., and Buch, J. W. Coke and byproducts, 481.
- De Kay, H. E., Jr., Turnbull, L. A., Scudder, J. N., and Toenges, A. L. Control of sulfur and ash in mine-run metallurgical coal—report 1, 147.  
— See Scudder, J. N., 154.
- Delano, P. H. See Coe, G. D., 41.
- Dempsey, C. P. See Cash, F. E., 190.
- Denny, E. H., and Humphrey, H. B. Some haulage and hoisting hazards in western mines, 274.
- Dennes, A. R. T. Cushioned blasting—preliminary studies, 214; cushioned blasting—preliminary studies of gallery testing, 215; fire-retardant treatments of liquid-oxygen explosives, 203; practical fire-sensitivity of liquid-oxygen explosives treated with fire-retardants, 215.  
— and Huff, W. J. Application of fire retardants to a liquid-oxygen explosive, 249.  
— See Elliott, M. A., 24; Murphy, E. J., 230; Rowles, A. P., 231.
- De Vaney, F. D., and Shelton, S. M. Progress reports, Metallurgical Division—ore-dressing studies—properties of suspension mediums for float-and-sink concentration, 299.
- Dillon, E. E. See Jones, G. W., 184.

## E

- Eiser, J. H., Jr. See Harrington, D., 193, 238, 280.
- Eisner, Abner. Fein, M. L., and Fisher, C. H. Neutral oils from coal hydrogenation—action of sulfuric acid, 392.  
— Sprunk, G. C., Clarke, Loyal, Fein, M. L., Fisher, C. H., and Storch, H. H. Hydrogenation and petrography of some low-rank coals from Western United States, 389.  
— Sprunk, G. C., Clarke, Loyal, Fisher, C. H., and Storch, H. H. Hydrogenation of typical North American split coals, 393.  
— See Fisher, C. H., 379, 386, 397, 398, 399, 400, 401; Hirst, I. L., 380, 402; Storch, H. H., 381, 412.
- Elder, J. D. See Davis, J. D., 338; Fieldner, A. C., 371; Schmidt, L. D., 327, 328, 329.
- Elliott, M. A. Gasification, 374; rational basis for correlating data on compression-ignition engine performance at different intake and exhaust conditions, 290.  
— and Berger, L. B. Combustion in Diesel engines—effect of adding gaseous combustibles to intake air, 291.  
— and Dennes, A. R. T. Gaseous fuels, 24.  
— and Holtz, J. C., Berger, L. B., and Schrenk, H. H. Diesel engines underground—effect on exhaust-gas composition of operating engines in mixtures of normal air and natural gas, 259.  
— See Berger, L. B., 256, 257; Holtz, J. C., 262, 263, 292.
- Engel, A. L., and Shelton, S. M. Progress reports, Metallurgical Division—ore-testing studies of ore-dressing section, 1941, 300.

- Feehan, Francis. See Forbes, J. J., 146.
- Fein, M. L. See Eisner, Abner, 389, 302; Fisher, C. H., 307, 308, 309, 400, 401.
- Fene, W. J., and Weaver, H. F. Mine-fan signal alarms and power releases, 275.  
— See Harrington, D., 185, 194, 195, 196, 197.
- Fenton, J. D. See Sayers, R. R., 21.
- Ferry, B. M. See Brown, H. R., 110.
- Fild, J. H. See Hirst, I. L., 364.
- Fieldner, A. C. Analysis and testing of coal in relation to its properties and utilization (Melchett lecture), 42; better coke for more pig-iron production, 367; bibliography of Bureau of Mines investigations of coal and its products, 1; coal developments in Washington, D. C., 25; coal processing and carbonization plants working at capacity—some improvements made, 352; developments in coal research and technology in 1937 and 1938, 2; discussion of paper entitled "Correlation of Bureau of Mines—American Gas Association carbonization assay tests with coal analysis," 353; fourth standard completes classification of coals, 23; outlook for coal in supplying liquid fuels and coke, 304; problems of metallurgical coke for Western furnaces being solved; byproducts in demand, 351; processing and carbonization—additional byproduct ovens required—wider use of coal as a chemical raw material noted, 355; processing and carbonization but little new construction seen—some research on liquid-fuel production, 356; recent developments in coal, 357; recent developments in fuels supply and demand, 13; research by government and its value to small business, 28; rubber from coal, 25; statement on gasoline substitutes from coal and possibilities of making synthetic gasoline from coal—hearings before House of Representatives subcommittee, 335; statement on production of liquid fuels from coal and lignite—hearings before Senate subcommittee, 387; statement on scientific and technologic investigations of Bureau of Mines—hearings before Senate subcommittee, 20.  
— and associates. Fuels, 27.  
— and Brewer, R. E. Annual report of research and technologic work on coal, fiscal year 1939, 14.  
— and Rice, W. E. Annual reports on research and technologic work on coal, fiscal years 1940 and 1942, 15, 16; research and progress in the production and use of coal, 28.  
— and Schmidt, L. D. Annual report of research and technologic work on coal, fiscal year 1941, 17.  
— and Schroeder, W. C. Oil and gasoline from oil shale and coal, 395.  
— and Selvig, W. A. Discussion of paper entitled "The proximate analysis of coal," 43; report of Committee D-5 on coal and coke, 44.  
— Beltz, J. O., and Fisher, P. L. Annual report of research and technologic work on coal, fiscal year 1943, 18.  
— Davis, J. D., Parry, V. F., Schmidt, L. D., Elder, J. D., Goodman, J. B., Landers, W. S., and Goodwin, E. Tests of hettipore coal-carbonization power-plant process, 371.  
— Davis, J. D., Reynolds, D. A., Brewer, R. E., Sprunk, G. C., and Schmidt, L. D. Carbonizing properties and petrographic composition of Lower Banner-bed coal from Keen Mountain mine, Buchanan County, Va., and effect of blending this coal with Pittsburg-bed (Warden mine) coal, 330.  
— Davis, J. D., Reynolds, D. A., Schmidt, L. D., Brewer, R. E., Sprunk, G. C., and Holmes, C. R. Carbonizing properties and petrographic composition of Pocahontas No. 3-bed coal from Buckeye No. 3 mine, Wyoming County, W. Va., and of Pocahontas No. 4-bed coal from No. 4 mine, Raleigh County, W. Va., 340.  
— Davis, J. D., Selvig, W. A., Reynolds, D. A., Brewer, R. E., Sprunk, G. C., and Holmes, C. R. Carbonizing properties and petrographic composition of Upper Freepport coal from Mor-

- gantown district, Monongalia County, W. Va., and of Lower Freeport coal from eastern Indiana County near Cambria County, Pa., 341.
- Davis, J. D., and Storch, H. H. Gasoline substitutes from coal—hearings before House of Representatives subcommittee, 388.
- Rice, W. E., and Moran, H. E. Typical analyses of coals of the United States, 50.
- Storch, H. H., and Hirst, L. L. Bureau of Mines research on hydrogenation and liquefaction of coal and lignite, 378.
- See Bureau of Mines, 383, 384; Davis, J. D., 335; Schmidt, L. D., 364; Storch, H. H., 410.
- Fish, E. L., Turnbull, J. A., and Toenges, A. L., appendix by Hartmann, Irving. Study of summer air conditioning with water sprays to prevent roof falls at Beech Bottom coal mine West Virginia, 148.
- See Scott, G. S., 365.
- Fisher, C. H., and Eisner, Abner. Tellurium compounds as Friedel-Crafts catalysts—oxidation of organic compounds with tellurium dioxide, 398.
- Eisner, Abner, Clarke, Loyal, Fein, M. L., and Storch, H. H. Kinetics of hydrogen consumption, oxygen removal, and liquefaction in coal hydrogenation, 397.
- Sprunk, G. C., Eisner, Abner, Clarke, Loyal, Fein, M. L., and Storch, H. H. Hydrogenation of anthraxylon (vitamin) from peat, brown coal, lignite, subbituminous coal, bituminous coal, and anthracite—effect of rank in coal hydrogenation, 399; hydrogenation of canal coals and their petrographic constituents, 400; kinetics of hydrogen consumption, oxygen removal and liquefaction in coal hydrogenation—effect of rank, 401.
- Sprunk, G. C., Eisner, Abner, Fein, M. L., and Storch, H. H. Hydrogenation and petrography of lignites, subbituminous coals and bituminous coals from North Dakota, Wyoming, Utah, and Montana, 398.
- Sprunk, G. C., Eisner, Abner, O'Donnell, H. J., Clarke, Loyal, and Storch, H. H. Hydrogenation and liquefaction of coal—effect of petrographic composition and rank of coal, 379.
- See Eisner, Abner, 389, 392, 393; Hirst, L. L., 403, 404; Storch, H. H., 381, 382, 412, 413.
- Fisher, P. L. See Fieldner, A. C., 18.
- Fitzgerald, L. G. Some suggestions on care in use and handling of explosives in coal mines, 236.
- Forbes, J. J., and Natus, L. L. Work of Bureau of Mines safety cars in Pennsylvania anthracite region 1934-1939, 161.
- Ankeny, M. J., and Feehan, Francis. Coal miners' safety manual, 146.
- Forney, R. L. See Hartmann, Irving, 122.
- Fraser, Thomas. Loading, 308.
- and Abreu, Alvaro de Paiva. Lavabilidade de carvões do Brasil (washing of Brazilian coals), 309.
- and Johnson, J. S. Screening, 310.
- Kelley, J. A., and Graham, H. G. Salvage of coal from mine refuse in Pittsburgh district, 301.
- Tryon, F. G., Gallagher, J. J., and van Sieten, M. Mechanization of mines—more than output with rises in both loaders and conveyors, 512.
- Frevert, H. W. See Yant, W. P., 90.
- Friplatt, J. See Broeyer, Ad., 258.
- G
- Gallagher, J. J. See Fraser, Thomas, 512.
- Gaudrud, B. W. Concentrating tables, 311.
- and Bator, G. T. Some small coal lifts for mechanical cleaning of coal at truck mines and other low-tonnage operations, 302.
- and Coe, G. D. Drainage characteristics of Alabama coals, 303.
- Gaugler, Z. C. See Tiffany, J. E., 232, 233, 234, 235.
- Geer, M. R., Davis, F. T., and Yancey, H. P. Occurrence of phosphorus in Washington coal and its removal, 73.
- See Yancey, H. P., 77, 316, 360.
- Gerhard, S. L., and Huff, W. J. Phenomena in ignition of reclamation by explosives—particles from detonation, 211.
- Geyer, L. E. Employment and accidents at coal mines in the United States, 488, 489.
- and Adams, W. W. Rock dust used in bituminous-coal mines in 1941 (with summary data covering 1930-41), 490.
- and Parry, M. G. Employment and accidents at coal mines in the United States, 491, 492, 493.
- See Adams, W. W., 462, 463, 464, 465, 466, 467.
- Gibson, F. H., and Selvig, W. A. Rare and uncommon chemical elements in coal, 58.
- See Selvig, W. A., 416.
- Gleim, E. J. Lists of permissible mine equipment, 276, 277, 278; State regulations pertaining to blasting on shift, 237.
- and Brunot, H. B. Mechanized mining brings new electrical hazards, 279.
- See Griffith, F. E., 219, 261; Hsley, L. C., 265, 286, 287.
- Goodman, G. S. Fuel briquets and packed coal, 482.
- Goodman, J. B. See Fieldner, A. C., 371; Parry, V. F., 305, 318.
- Goodwin, E. W. See Fieldner, A. C., 371.
- Graham, H. G. See Fraser, Thomas, 301.
- Grant, R. L. Hazards due to electric shock transmitted across discharge spray of compressed carbon dioxide, experiment with coal fire, 260; structural features of typical American commercial detonators, 217.
- and Coates, A. B. Safe opening and determination of construction of detonators, 218.
- Greenwald, H. P. Explosibility of semianthracite, low-volatile bituminous-coal and medium-volatile bituminous-coal dusts, 95; mine roof scaling to prevent slate falls, 169; progress in rock-dusting investigations halted for duration of war, 203; recent trends in rock-dusting to prevent dust explosions in coal mines, 204; statistics show rock-dusting gains slowly in American coal mines, 205; use of rock dust to prevent dust explosions in coal mines, 206.
- Howarth, H. C., and Hartmann, Irving. Progress report: experiments on strength of small pillars of coal in the Pittsburgh bed, 149; tests of salt as substitute for rock dust in prevention of coal-dust explosions in mines, 96.
- Smith, F. G., Long, A. E., Northover, W. D., Price, P. H., Spott, A. E., and White, J. Mine roof scaling to prevent slate falls, 170.
- See Brown, H. H., 117, 118, 119; Hartmann, Irving, 92, 180, 171, 199; Matze, E. R., 151, 152, 153; Owings, C. W., 38.
- Griffith, F. E., and Gleim, E. J. Ground-resistance measurements of drill-hole casings, 219; grounding electrical equipment in and about coal mines, 261.
- and Seeling, C. H. Some information from an investigation on methods of confining Cardox blasting devices in boreholes in certain coal mines, 220.
- Grove, G. W., Ash, S. H., and Ristedt, E. J. Some haulage safety devices for use on grades, slopes, and inclined shafts, 252.
- Guest, P. G. Apparatus for determining minimum energies for electric-spark ignition of flammable gases and vapors, 97.
- See Cohn, E. M., 273.
- Guffey, J. F. See Sayers, R. R., 21.
- H
- Haines, T. H. See Jones, G. W., 113.
- Harrington, D. How mine workers can help to prevent mine explosions, 191; status of safety in mining, 192.
- and Davenport, Sara J. Review of literature on conditioning air for advancement of health and safety in mines—need for air conditioning indicated by physical quality of underground air, 178.
- and East, J. H., Jr. Accidents due to misfires of explosives, 238; fires in surface mining and milling structures, 193; suggested hoisting-signal code for slope coal mines and for shaft mines having only one level, 280.
- and Fene, W. J. Are new hazards being introduced in coal mines faster than existing hazards are eliminated? 194; barricading as life-saving measure in connection with mine fires and explosions, 185; coal-mine explosions and coal-and metal-mine fires in the United States, 195, 196, 197.
- and Owings, C. W. Prevention of premature shots during springing of deep drill holes in quarries and open-pit workings, 230.
- and Parker, D. J. Explosions in coal mines caused by smoking, 198.
- and Warneke, R. G. Accidents to children from blasting caps, 240; burning rate of fuse, 241; precautions to be taken when approaching old mine workings, 162; some of the hazards of auxiliary fans in coal mines, 179.
- Harrington, L. C., Parry, V. F., and Koth, Arthur. Technical and economic study of drying lignite and subbituminous coal by the Fleissner process, 237.
- See Parry, V. F., 313.
- Hartley, J. C., and Moschetti, A. C. Standardized construction of mine ventilating doors, 180.
- Hartmann, Irving. Control of incendiaries, 120.
- and Greenwald, H. P. Discussion of paper entitled "Photoelasticity and its application to mine-pillar and tunnel problems," 171; effect of changes in moisture and temperature on mine roof—first report on strata overlying the Pittsburgh coal bed, 160; use of wetting agents for allaying coal dust in mines, 199.
- and Nagy, John. Inflammability and explosibility of powders used in plastics industry, 98.
- Howarth, H. C., and Greenwald, H. P. Characteristics of fuel pitches and their explosibility in pulverized form, 92.
- Jones, W. M., Forney, R. L., Hirst, H. S., and Merrill, J. W. Code for prevention of dust explosions in plastics industry, 122.
- Nagy, John, and Brown, H. R. Explosibility of metal powders, 121; inflammability and explosibility of metal powders, 99.
- See Brown, H. R., 94, 116, 117, 118; Fish, E. L., 148; Greenwald, H. P., 96, 149.
- Hawk, C. O. See Storch, H. H., 381, 441.
- Heple, H. R., and Lewis, Bernard. Reaction between hydrogen and oxygen: kinetics of third explosion limit, 123.
- Herbert, C. A. Cooling mine air during summer months to prevent roof falls, 163.
- Hersberger, A. B. See Barkley, J. F., 428, 429.
- Hertzog, E. S., and Broderick, S. J. Activated carbon for sugar decolorization, 86.
- Cudworth, J. R., Selvig, W. A., and Ode, W. H. Friability, grindability, chemical analyses, and high- and low-temperature carbonization assays of Alabama coals, 79.
- See Broderick, S. J., 81.
- Hirst, H. S. See Brown, H. R., 119; Hartmann, Irving, 122.
- Hirst, L. L., Boyer, R. L., Eisner, Abner, Pinkel, I. L., and Storch, H. H. Hydrogenation of high-volatile bituminous coals—summary of assays of bituminous, subbituminous coals, and lignites, 402.
- Eisner, Abner, Field, J. H., Cooper, H. M., Abernethy, R. F., and Storch, H. H. Hydrogenation and liquefaction of coal—characterization of assay oils, 380.
- Storch, H. H., Fisher, C. H., and Sprunk, G. C. Hydrogenation of high-volatile bituminous coals—proximate analysis and characterization of products, 403; hydrogenation and petrography of subbituminous coals and lignites, 404.
- See Fieldner, A. C., 378; Storch, H. H., 382, 413.
- Hofer, L. J. E. Preparation and properties of metal carbides with critical comment as to their significance in Fischer-Tropsch synthesis, 399.
- Holliman, W. C. Synthetic rubber—its production from petroleum, coal and other materials, 391.
- Holmes, C. R., Wilson, J. E., and Davis, J. D. Comparative yields of light oil, tar and constituents from carbonization tests at 800°, 900°, and 1,000° C., 420.
- See Brower, R. E., 81; Davis, J. D., 330, 331, 332, 333, 335, 336, 337, 338; Fieldner, A. C., 340, 341; Reynolds, D. A., 415.
- Holtz, J. C. Gaseous products from explosives—some factors affecting test results, 221; petroleum and other liquid fuels, 29.
- and Elliott, M. A. Significance of Diesel exhaust gas analysis, 292.
- and Murphy, F. J. Effects of carbonaceous blasting accessories on gaseous products from explosives, 222.
- Berger, I. B., Elliott, M. A., and Schrenk, H. H. Diesel engines underground—composition of exhaust gas from engines in proper mechanical condition, 262; Diesel engines underground—effect on composition of exhaust gas of variables influencing fuel injection, 263.
- See Berger, I. B., 256, 257; Elliott, M. A., 259; Murphy, H. J., 230.
- Hooker, A. B. Construction, care, and use of permissible flame safety lamps, 253; field performance of permissible electric cap lamps, 281.
- See Hsley, L. C., 228, 251, 264.
- Hopkins, G. E. Surveys of fuel consumption at refineries, 500, 501, 502.
- Horton, L. S. See Adams, W. W., 476, 477.
- Howarth, H. C. See Greenwald, H. P., 96, 149; Hartmann, Irving, 92.
- Huff, W. J. Annual reports, Explosives Division, 223, 224, 225, 226, 227; gaseous fuels, 419.
- See Dennes, A. R. T., 249; Gerhard, S. L., 211; Jones, G. W., 113, 114; Moore, R. H., 223.
- Humphrey, H. B. See Denny, E. H., 274.
- I
- Ickes, Harold L. Coal's new horizons, 30.
- See Bureau of Mines, 384.
- Hsley, L. C. Detailed study of 60-day nonfatal underground accidents in Pennsylvania bituminous-coal mines during 1939, 282; lists of permissible mine equipment, 283, 284; mechanization—what is it?, 293; quarter century of mechanized mining—notes on permissibility, 285; stop-look—listen, 204.
- and Gleim, E. J. Some information on automatic coupling of mine cars, 286.
- and Hooker, A. B. Permissible blasting units, 228; permissible methane detectors, 264.
- Gleim, E. J., and Brunot, H. B. Inspection and testing of mine-type electrical equipment for permissibility, 287; permissible electrically operated pumps, 265.
- Hooker, A. B., and Roadstrum, W. H. Investigations of permissible electric mine lamps, 251.
- Isaac, L. H. See Young, W. H., 483.
- J
- Jackson, C. F. Annual reports, Mining Division, 7, 8, 9.
- Johnson, J. S. See Fraser, Thomas, 310.
- Johnson, K. A. See Yancey, H. P., 444.
- Jones, F. A., Thomas, Edward, Matze, E. R., and Toenges, A. L. Analysis of power consumption at coal mines—preliminary study, 268.
- Thomas, Edward, Toenges, A. L., Matze, E. R., and Sandler, J. N. Analysis of use of electricity at coal mines—progress report, 267.
- See Toenges, A. L., 166, 268, 269.
- Jones, G. W. Hazards from common gases and vapors encountered at surface disasters, 115; prevention of benzene-air explosions by addition of nitrogen and carbon dioxide, 100.
- and Kennedy, R. E. Limits of inflammability of butadiene in air, 101; prevention of butadiene-air explosions by addition of nitrogen and carbon dioxide, 102; simple device for detecting small concentration of organic halide gases in atmosphere, 134.
- and Miller, W. E. Ignition temperatures of acetylene-air and acetylene-oxygen mixtures, 103.
- and Scott, G. S. Effect of hydrogen-ion concentration on the growth of hydrogen and carbon monoxide bacteria, 91; inflammability of trichloroethylene-oxygen-nitrogen mixtures, 104.



- Jones, G. W., and Thomas, G. J. Explosion hazards of ether-nitrous oxide-oxygen mixtures, 124; prevention of cyclopropane-oxygen explosions by dilution with helium, 125.
- Campbell, John, Dillon, R. E., and Benson, O. B. Explosion hazards in storage-battery rooms, 184.
- Haines, T. H., Smith, T. F., and Huff, W. J. Investigations during 1938, 1939, and 1940 of combustibles in manholes in Boston, Mass., 113.
- Kennedy, R. E., and Miller, W. E. Limits of inflammability and ignition temperature of ethyl mercaptan in air, 105.
- Kennedy, R. E., and Scott, F. E. Inflammability of methylene chloride-oxygen-nitrogen mixtures, 106.
- Kennedy, R. E., and Scott, G. S. Limits of inflammability of acrylonitrile in air, 107.
- Kennedy, R. E., and Thomas, G. J. Explosion hazards of combustible anesthetics, 93; explosive properties of cyclopropane; prevention of explosions by dilution with inert gases, 103; inflammability of ether-oxygen-helium mixtures; application in anesthesia, 100.
- Miller, W. E., and Campbell, John. Ventilation of manholes—effect of vertical ducts in combination with openings in manhole covers on the natural ventilation, 175.
- Scott, F. E., and Scott, G. S. Limits of inflammability and ignition temperatures of acetic anhydride, 112.
- Scott, G. S., Kennedy, R. E., and Huff, W. J. Explosions in medium-pressure acetylene generators, 114.
- Scott, G. S., and Miller, W. E. Limits of inflammability and ignition temperature of nicotine in air, 110; limits of inflammability and ignition temperature of styrene in air, 111.
- See Scott, G. S., 207, 319, 320; Thomas, G. J., 128, 129, 130.
- Jones, W. M. See Brown, H. R., 119; Hartmann, Irving, 122.
- K
- Kelley, J. A. Beehive coke industry revived, 368; manufacture of beehive coke, 369.
- See Fraser, Thomas, 301; Scott, G. S., 305.
- Kennedy, R. E. See Jones, G. W., 93, 101, 102, 105, 106, 107, 108, 109, 114, 134.
- Kingery, D. S. Some information on transportation, storage and handling of lubricants in and about coal mines, 164; some preliminary data on methods for allaying coal dust in tipples and cleaning plants, 200.
- Koth, Arthur. See Harrington, L. C., 297; Parry, V. F., 313.
- L
- Lamb, G. A. See Young, W. H., 514, 515, 516, 517.
- Landers, W. S., and Parry, V. F. Domestic storage of subbituminous lump coal and its performance in a hand-fired furnace, 317.
- See Fieldner, A. C., 371; Parry, V. F., 82.
- Landry, B. A. Fundamentals of coal sampling, 32.
- Lawrence, T. D. See Adams, W. W., 493, 496, 497, 498, 499.
- Leitch, R. D. Some information on extinguishing an anthracite refuse-bank fire near Mahanoy City, Pa., 201.
- Levinson, D. H. See Newburg, B. M., 242, 243, 244, 245, 246.
- Lewy, Edward. See Yant, W. P., 90.
- Lewis, Bernard. Experimental side of combustion research in engines, 126.
- and von Elbo, Guenther. Stability and structure of burner flames, 127.
- See Heiple, H. R., 123; von Elbo, Guenther, 132, 133.
- Lewis, E. I. See Sayers, R. R., 21.
- Linde Air Products Co. See Bureau of Mines, 518.
- Linn, J. G. See Sayers, R. R., 135, 142.
- Lloyd, Charlotte T. See Newburg, B. M., 242, 243, 244, 245, 246.
- Long, A. E. See Greenwald, H. P., 170.

## M

- Maize, E. R., Scheffer, T. C., and Greenwald, H. P. Study of timber decay in Crucible mine of Crucible Fuel Co., 151.
- Thomas, Edward, and Greenwald, H. P. Studies of roof movement in coal mines—Gibson mine of Illinois Coal & Coke Co., 153; studies of roof movement in coal mines—study of subsidence of highway caused by mining coal beneath, 153.
- See Jones, F. A., 266, 267; Toenges, A. L., 185, 189.
- Marshall, K. L. See Yant, W. P., 90.
- McCartney, J. T., and Davis, J. D. Expansion of coal during coking, 362.
- See Auvil, H. S., 414; Davis, J. D., 336, 337, 338.
- McElroy G. E. Air flow at discharge of fan-pipe lines in mines, part I—10-inch line in development end, 178; air flow at discharge of fan-pipe lines in mines, part II—effect of size and shape of pipe and of adjacent walls on velocity and entrainment ratios, 177.
- Brown, C. E., Berger, L. B., and Schrenk, H. H. Dilution of stack effluents, 87.
- McMillan, E. R. See Yancey, H. F., 356.
- Merrill, J. W. See Hartmann, Irving, 122.
- Miller, A. U. Some information for miners about coal-mine ventilation, 181.
- Miller, W. E. See Jones, G. W., 103, 105, 110, 111, 173.
- Moore, R. H., and Huff, W. J. Studies on effect of humidity on sensitivity and dispersion of black powder, 239.
- Moran, H. E. See Fieldner, A. C., 50.
- Moschetti, A. C. See Hartley, J. C., 180.
- Murphy, E. J., Rowles, A. P., Holt, J. C., and Dennes, A. R. T. Effects of sheaths on gaseous products from permissible explosives, 230.
- See Holtz, J. C., 222.

## N

- Nagy, John. See Brown, H. R., 94; Hartmann, Irving, 93, 99, 121.
- Nass, L. S. See Ash, S. H., 270; Forbes, J. J., 181.
- Newburg, B. M., Levinson, B. H., and Lloyd, Charlotte T. Summaries of State laws pertaining to explosives, 242, 243, 244, 245, 246.
- Nicholls, P., and Barkley, J. F. Combustion, 423.
- and Reid, W. T. Status of knowledge on properties of coal ash, 74; viscosity of coal-ash slags, 75.
- Northover, W. D. See Greenwald, H. P., 170.

## O

- O'Brien, R. A. See Schroeder, W. C., 454.
- Ode, W. H., and Selvig, W. A. Low-temperature distillation yields of primary tar and light oil from coals of various ranks and types, 372.
- See Davis, J. D., 330, 338; Hertzog, E. S., 79; Selvig, W. A., 46, 47, 48, 370, 416; Sprunk, G. C., 60.
- Odell, W. W. Carbonization of Beaver-bed coal from Kansas and production of blue water gas from resulting coke, 373.
- O'Donnell, H. J. See Fisher, C. H., 379; Sprunk, G. C., 59, 60.
- O'Neill, W. E. See Storch, H. H., 411.
- Orehin, Milton. Hydrogenation of anthracene by tetralin, 403.
- See De Carlo, J. A., 481.
- Otero, M. M. Cars for transporting explosives, 217.
- Owings, G. W. Cars for transporting explosives, 217; methods of allaying dust in underground mining operations, 186; some preliminary data on methods for controlling dust hazards in mechanical mining, 202.
- Selvig, W. A., and Greenwald, H. P. Methods of sampling and analyzing coal-mine dusts for incombustible content, 88.
- See Harrington, D., 239.

## P

- Parker, D. J. See Harrington, D., 198.
- Parry, M. G. See Adams, W. W., 464, 465, 466, 467; Goyer, L. E., 491, 492, 493.
- Parry, V. F. Correlation of analysis of coal with products of carbonization in externally heated retorts, 345; packaged fuel, 312; questions and answers on storage of coal in the Rocky Mountain area, 323; technical and economic study of packaged fuel, 304; trends in use of energy in Western States with particular reference to coal, 69.
- and Goodman, J. B. Briquetting subbituminous coal, 305; storage of subbituminous coal in bins, 318.
- and Landers, W. S. Size consist, chemical analysis and physical properties of 2½-inch subbituminous slack from Denver, Colo., region, 82.
- and Segur, R. D. Performance of subbituminous coal in a typical underfed domestic stoker, 440.
- Harrington, L. C., and Koth, Arthur. Preparation of stable nonslacking fuel by steam-drying subbituminous coal and lignite, 313.
- See Fieldner, A. C., 371; Harrington, L. C., 297; Landers, W. S., 317.
- Patty, F. A. See Sayers, R. R., 135, 142.
- Pearce, S. J. See Sayers, R. R., 135; 142; Schrenk, H. H., 141.
- Pinkel, I. I. See Hirst, J. L., 402.
- Price, P. H. See Greenwald, H. P., 170.

## R

- Ralston, O. C., and Conley, J. O. Annual report, Nonmetals Division, 1640, 10.
- and Stera, G. A. Annual reports, Nonmetals Division, 11, 12.
- Rees, O. W., and Selvig, W. A. Determination of ash in coals unusually high in calcite and pyrite, 45.
- Reid, W. T. Discussion of paper entitled "Distribution of heat absorption and factors affecting performance of twin branch 2,500-psi boiler," 433; electronic-contacting galvanometer for temperature control, 434; supplementing anthracite with other fuels for home heating, 443.
- and Cohen, P. Factors affecting thickness of coal-ash slag on furnace-wall tubes, 435; Flow characteristics of coal-ash slags in solidification range, 436.
- and Corey, R. C. Errors in temperature measurements by radiometric methods, 437.
- See Cohen, P., 424; Nicholls, P., 74, 75.
- Reynolds, D. A. Carbonization, 358; relationship of ash-fusion temperatures of coal and coke, 70.
- and Hinge, G. W. Coal carbonization—gas pressures within uncarbonized part of a charge, 359.
- and Davis, J. D. Coal carbonization: carbonizing properties of medium-volatile coals of different types, 346.
- and Holmes, C. R. Physical properties of cokes from Bureau of Mines—American Gas Association tests at 800° and 900° C., 415.
- See Davis, J. D., 330, 331, 332, 333, 334, 335, 336, 337, 338, 344, 349, 350, 351; Fieldner, A. C., 339, 340, 341; Rothenbach, L. P., 421.
- Rice, G. S. Ground movement and subsidence studies in mining coal, ores and nonmetallic minerals—review of work, 174.
- Rice, W. E. See Barkley, J. F., 22; Fieldner, A. C., 15, 16, 28, 60.
- Rietveld, E. J. See Grova, G. W., 252.
- Roadstrum, W. H. See Hsley, L. C., 251.
- Rothenbach, L. P., and Reynolds, D. A. Improved method of determining benzene in medium-temperature light oils, 421.
- Rowles, A. P., and Dennes, A. R. T. Variations in oxygen condition between individual cartridges and between cases of permissible explosives, 231.
- See Murphy, E. J., 230.

## S

- Sayers, R. E. Annual reports, Bureau of Mines, 3, 4, 5, 6; health hazards from inadequate coal-mine ventilation, 182; pulmonary diseases in mining industry, 138.
- Bland, P. J., Guffey, J. F., Davis, J. J., Fenton, I. D., Lewis, E. I., and Watkins, R. J. Letter from Federal Anthracite Coal Commission transmitting pursuant to Public Law No. 335, 21.
- Yant, W. P., Schrenk, H. H., Chornyak, John, Pearce, S. J., Patty, F. A., and Linn, J. G. Methanol poisoning II—exposure of dogs for brief periods eight times daily to high concentrations of methanol vapor in air, 142; methanol poisoning I—exposure of dogs to 450-500 p.p.m. methanol vapor in air, 135.
- See Bureau of Mines, 384; Yant, W. P., 90.
- Schallia, A. H. Nonmetallic minerals needed for national defense—nitrates, 422.
- Scheffer, T. C. See Maize, E. R., 151.
- Schmidt, L. D. Effects of storage and oxidation of coal upon coking properties, 326.
- and Elder, J. L. Atmospheric oxidation of coal at moderate temperatures—rates of oxidation reaction for representative coking coals, 327.
- Elder, J. L., and Davis, J. D. Atmospheric oxidation of coal at moderate temperatures—effect of oxidation on carbonizing properties of representative coking coals, 328; influence of storage on caking and coking properties of coal, 329.
- Schroeder, W. C., and Fieldner, A. C. Increased pig-iron output through improved coke, 364.
- See Davis, J. D., 334; Fieldner, A. C., 17, 339, 340, 371; Seymour, William, 363; Scott, G. S., 365.
- Schrenk, H. H. List of respiratory protective devices approved by Bureau of Mines, 139; standard helps control methanol exposure, 143; testing respiratory protective equipment for approval, 140; universal (type-N) gas mask for protection against gases encountered at fires, 144.
- and Berger, L. B. Composition of Diesel-engine exhaust gas, 295.
- and Pearce, S. J. Selection, use, and maintenance of respiratory protective devices, 151.
- See Berger, L. B., 136, 250, 257, 271; Brown, C. E., 137; Elliott, M. A., 259; Holtz, J. C., 262, 263; McElroy, G. E., 87; Sayers, R. R., 135, 142.
- Schroeder, W. C. Fuels and fuel research in Great Britain, 31; use of mixtures of oil and coal in boiler furnaces, 438.
- and Berk, A. A. Inter-crystalline cracking of boiler steel and its prevention, 415; summary of papers composing symposium on embrittlement, 451.
- Berk, A. A., and O'Brien, R. A. Embrittlement detector, 451.
- Berk, A. A., and Stoddard, C. C. Embrittlement detector testing on boilers, 455.
- See Berk, A. A., 451, 452; Bureau of Mines, 384; Fieldner, A. C., 395; Schmidt, L. D., 364.
- Scott, F. E. See Jones, G. W., 106, 112.
- Scott, G. S. Anthracite mine fires—their behavior and control, 183; application of Rosin-Kammer law to "missing sizes" in screened coal, 306; mechanism of steam-carbon reaction, 375.
- and Jones, G. W. Application of chemistry in combating anthracite mine fires, 207; effect of particle size on rate of oxidation of anthracite, 319; phenomenon observed during prolonged oxidation of anthracite, 320.
- Kelley, J. A., Fish, E. L., and Schmidt, L. D. Modern beehive-coke-oven practice—preliminary report, 365.
- See Jones, G. W., 91, 104, 107, 110, 111, 112, 114.
- Seudder, J. N., De Kay, H. E., Jr., and Toenges, A. L. Study of decay of mine timbers, 145.
- See De Kay, H. E., Jr., 147; Jones, F. A., 267.

- Seeling, C. H. See Griffith, F. E., 220.
- Sogur, R. D. See Parry, V. R., 450.
- Selvig, W. A. Precision of volatile-matter determination for anthracite, low-temperature coals, and subbituminous coal. Discussion of paper entitled "An experimental investigation of the British standard method for the crucible swelling test for coal," 46; inert material for agglutinating-value test of coal, 47.
- Ode, W. H., and Davis, J. D. Low-temperature carbonization of Alaskan coals, 370.
- Ode, W. H., and Gibson, F. H. Coke from low-ash Appalachian coals for carbon electrodes in aluminum industry, with chapter on comparison of results obtained by "float process for cleaning coal with those by float-and-sink methods," by J. D. Davis, 416.
- Ode, W. H., and Sprunk, G. C. Comparison of the determination of fusain in coal by chemical oxidation and petrographic methods, 48.
- See Barkley, J. F., 23; Fichtner, A. C., 43, 44, 341; Gibson, F. H., 58; Hertzog, E. S., 79; Ode, W. H., 372; Owings, C. W., 38; Rees, O. W., 45; Sprunk, G. C., 60.
- Seymour, William, and Schmidt, L. D. Control of bulk density of coal charge in byproduct coke ovens, 283.
- See Barkley, J. F., 427.
- Shelton, S. M. See De Vancy, F. D., 290; Engle, A. L., 300.
- Shore, F. M., and Corgan, J. A. Anthracite industry in 1940, 513.
- See Young, W. H., 516, 517.
- Sloman, H. J. Testing safety catches on mine cages at some eastern bituminous-coal mines, 288.
- Smith, F. G. See Greenwald, H. P., 170.
- Smith, T. E. See Jones, G. W., 113.
- Snyder, N. H. See Cooper, H. M., 36, 51, 52, 53, 54, 55, 56, 57.
- Spotti, A. E. See Greenwald, H. P., 170.
- Sprunk, G. C. Influence of physical constitution of coal upon its chemical, hydrogenation, and carbonization properties, 76.
- and O'Donnell, H. J. Mineral matter in coal, 60.
- Ode, W. H., Selvig, W. A., and O'Donnell, H. J. Splint coals of the Appalachian region—their occurrence, petrography, and comparison of chemical and physical properties with associated bright coals, 59.
- See Davis, J. D., 331, 332, 333, 334, 335, 336, 337; Eisner, Abner, 380, 393; Fieldner, A. C., 339, 340, 341; Fisher, C. H., 379, 398, 399, 400, 401; Hirst, L. L., 403, 404; Selvig, W. A., 48; Storch, H. H., 382; Thiessen, Reinhardt, 51.
- Stern, G. A. See Ralston, O. C., 11, 12.
- Stoddard, C. K. See Schroeder, W. C., 455.
- Storch, H. H. Chemistry of coal hydrogenation, 406; contact catalysis in hydrogenation of coal, coal tar and oil, 407; hydrogenation, 408; hydrogenation of coal, 409.
- and Fieldner, A. C. Hydrogenation and liquefaction of American coals, 410.
- Fisher, C. H., Eisner, Abner, and Clarke, Loyal. Hydrogenation of a Pittsburgh seam coal—kinetics of hydrogen consumption, oxygen removal, and liquefaction, 412.
- Fisher, C. H., Hawk, C. O., and Eisner, Abner. Hydrogenation and liquefaction of coal—effect of temperature, catalyst, and rank of coal on rates of coal-hydrogenation reactions, 381.
- Hawk, C. O., and O'Neill, W. E. Kinetics of hydrogen consumption, oxygen elimination, and liquefaction in coal hydrogenation, 411.
- Hirst, L. L., Fisher, C. H., and Sprunk, G. C. Hydrogenation and liquefaction of coal—review of literature, description of experimental plant, and liquid-phase assays of some typical bituminous, subbituminous, and lignitic coals, 382.
- Hirst, L. L., Fisher, C. H., Work, H. K., and Wagner, F. W. Hydrogenation of high-

temperature tar from byproduct coke ovens, 413.

— See Bureau of Mines, 383, 384; Eisner, Abner, 389, 393; Fieldner, A. C., 378, 384; Fisher, C. H., 379, 397, 398, 399, 400, 401; Hirst, L. L., 380, 402, 403, 404.

Straus, Michael. See Bureau of Mines, 384.

## T

Thiessen, Reinhardt, and Sprunk, G. C. Coal paleobotany, 61.

Thomas, Edward. See Jones, F. A., 266, 267; Matze, E. R., 152, 153; Toenges, A. L., 269.

Thomas, G. J., and Jones, G. W. Clinical experiences in prevention of cyclopropane-oxygen explosions by addition of helium, 128; clinical and laboratory data on ether-cyclopropane-oxygen helium mixtures, 129; value of helium in prevention of explosions of anesthetic mixtures, 130.

— See Jones, G. W., 93, 108, 100, 124, 125.

Tiffany, J. E. Blasting with permissible powder, carbox, airbox, pellet powder and granular powder and hazards incident to each, 250; extinguishing fires set by incendiary bombs, 131.

— and Gaugler, Z. C. Active lists of permissible explosives and blasting devices, 232, 233, 234, 235.

Toenges, A. L. Mining, 172; some effects of mechanization upon conservation of coal deposits, 173.

— and Jones, F. A. Underground transportation of coal—progress report 1, 268.

— and Matze, E. R. Multiple-shift mechanical mining in some bituminous-coal mines—progress report 3, 165.

— Jones, F. A., and Thomas, Edward. Underground transportation of coal—progress report 2, 260.

— Matze, E. R., and Jones, F. A. Multiple-shift mechanical mining in some bituminous-coal mines—progress report 4, extraction of pillars with mechanized equipment, 166.

— See De Kay, H. E., Jr., 147; Fish, E. L., 148; Jones, F. A., 266, 267; Scudder, J. N., 154.

Tomlinson, W. H. Fatalities at Indiana coal mines, 167; use and misuse of flame safety lamps, 289.

Traubert, C. E. See Yant, W. P., 90.

Tryon, F. G. See Fraser, Thomas, 512.

Turnbull, L. A. See De Kay, H. E., Jr., 147; Fish, E. L., 148.

## U

United States Steel Corp. See Bureau of Mines, 510.

## V

van Sclen, M. See Bradley, J. R., 510; Fraser, Thomas, 512.

von Elbe, Guenther, and Lewis, Bernard. Mechanism of thermal reaction between hydrogen and oxygen, 132; reaction between hydrogen and oxygen: upper explosion limit and reaction in its vicinity, 133.

— See Lewis, Bernard, 127.

## W

Wagner, F. W. See Storch, H. H., 413.

Warnke, R. G. See Harrington, D., 162, 179, 240, 241.

Warner, B. R. Improved pressure-regulating device, 49; mechanism of steam-carbon reaction, 376; pressure dependence of rate of gasification of carbon, 377.

Watkins, R. J. See Sayers, R. R., 21.

Weaver, H. F. See Fene, W. J., 275.

Westinghouse Electric & Manufacturing Co. See Bureau of Mines, 520.

White, J. See Greenwald, H. P., 170.

Wilson, J. E., and Davis, J. D. Index of coals tested in Bureau of Mines survey of carbonizing properties of American coals, 342.

- Wilson, J. E. See Holmes, C. R., 420.
- Wood, Walter. See Yancey, H. F., 307.
- Work, H. K. See Storch, H. H., 413.
- Wrenn, V. E. See Adams, W. W., 468, 469, 470, 471, 472, 473, 474, 475, 476, 477.

## Y

Yancey, H. F. Briquetting, 314; preparation, 315.

— and Geer, M. R. Analyses and other properties of Oregon coals as related to their utilization, 77.

— Daniels, Joseph, McMillan, E. R., and Geer, M. R. Byproduct coke-oven tests of Washington coals, 360.

— Geer, M. R., and Davis, J. D. Characteristics of coal and its associated impurities, 316.

— Johnson, K. A., and Cordner, J. F., Jr. Burning characteristics of Washington coals on domestic overfeed and underfeed stokers, 444.

— Zane, R. E., Wood, Walter, and Cannarella, J. T. H. Flocculation as an aid in clarification of coal washery water, 307.

— See Geer, M. R., 73; Zane, R. E., 417.

Yant, W. P., Levy, Edward, Sayers, R. R., Brown, C. E., Traubert, C. E., Prevett, H. W., and Marshall, K. L. Carbon monoxide and particulate matter in air of Holland Tunnel and metropolitan New York, 90.

— See Sayers, R. R., 135, 142.

Young, W. H., Anderson, R. L., and Isaac, L. H. Bituminous coal and lignite, 483.

— Anderson, R. L., Lamb, G. A., and Ruch, J. W. Mechanical equipment shows sales drop while tonnage rises, 514; mechanical-equipment sales activity, 515.

— Anderson, R. L., Lamb, G. A., and Shore, F. M. Mechanical loading and cleaning capacity up in 1940—conveyor equipment hits new high in sales, 516; mechanical mining and cleaning capacity rise in 1941—loader and conveyor sales hit new high, 517.

## Z

Zane, R. E., and Yancey, H. F. Combustibility of coke in air, 417.

— See Yancey, H. F., 307.