QUARTERLY

OF THE

COLORADO

SCHOOL OF MINES

OCTOBER, 1920

SUPPLEMENT

Issued Quarterly by the Colorado School of Mines
Golden, Colorado

Entered as Second-Class Mail Matter, July 10, 1906, at the Postoffice at
Copyrighted, 1920
By
Victor C. Alderson

COLORADO SC
Volume Fifteen

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OF OIL SH

WITH

VICTOR
President, Colo

(NOTE.—The facts given in
ventors or owners, so that responsi

ANDER
Name of Owner
Address
Type
Material of Construction
Method of advancing shale through the retort
Throughput (24 hours)
Dimensions
Feed
Discharge
Size of shale treated
Fuel Used
How Applied

Temperature Required
Withdrawal of Gas and Oil Vapor
(how conducted)

Use of Steam
Stage of Development
### A DIRECTORY OF OIL SHALE RETORTS

**SUPPLEMENT**

**WITH BIBLIOGRAPHY**

By

**VICTOR C. ALDERSON**  
President, Colorado School of Mines

*(NOTE.—The facts given in this list have been submitted by the inventors or owners, so that responsibility for accuracy devolves upon them)*

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#### ANDERSON RETORT

<table>
<thead>
<tr>
<th>Name of Owner</th>
<th>Anderson Shale Oil Co.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>160 South Broadway, Denver, Colo.</td>
</tr>
<tr>
<td>Type</td>
<td>Horizontal</td>
</tr>
<tr>
<td>Material of Construction</td>
<td>Iron and fire clay</td>
</tr>
<tr>
<td>Method of advancing shale through the retort</td>
<td>A series of movable rakes</td>
</tr>
<tr>
<td>Throughput (24 hours)</td>
<td>Five tons a day</td>
</tr>
<tr>
<td>Dimensions</td>
<td>16 ft. long, 2 ft. wide, 2½ ft. high</td>
</tr>
<tr>
<td>Feed</td>
<td>Continuous</td>
</tr>
<tr>
<td>Discharge</td>
<td>Continuous</td>
</tr>
<tr>
<td>Size of shale treated</td>
<td>20 mesh</td>
</tr>
<tr>
<td>Fuel Used</td>
<td>Gas from distillation of shale</td>
</tr>
<tr>
<td>How Applied</td>
<td>Gas is used in an internal combustion engine to generate electricity which is applied under the furnace to distill the shale</td>
</tr>
<tr>
<td>Temperature Required</td>
<td>First zone 365° F. Last zone 1350° F.</td>
</tr>
<tr>
<td>Withdrawal of Gas and Oil Vapors (how conducted)</td>
<td>Under slight suction from different zones</td>
</tr>
<tr>
<td>Use of Steam</td>
<td>None used</td>
</tr>
<tr>
<td>Stage of Development</td>
<td>Erected and under test at the present time</td>
</tr>
</tbody>
</table>
**BALCOM PROCESS**

Name of Inventor and Owner: Patents, Balcom Rite-Wa Engineering Co., Owner.
Address: Boston, Mass., and St. John, N. B.
Type: Horizontal.
Material of Construction: Steel, Cast Iron, Fire Clay and Brick.

Method of advancing shale through the retort: Revolving endless chain sweeps the ore across the floor at any speed desired by automatic equipment.

Throughput (24 hours): 175 tons.
Dimensions: Six floors, three for oil, 60 linear feet; 50 feet, three floors for de-carbonizing.
Feed: Automatic; automatically distributes the ore over the surface.
Discharge: Automatic.
Size of Shale Treated: Twenty mesh.
Fuel Used: Gas from the retort fed into the burners by automatic machinery; covered by patents.

How Applied: With automatic equipment and pressure blowers all covered by patents.
Temperature Required: The temperature required is a secret. Furnished to no one until the machine is installed.
Withdrawal of Gas and Oil Vapors (how conducted): With suction fan into a triple effect dry vacuum.
Stage of Development: Commercial demonstration. Car load lots; 2,500 ton plant now building.

**THE BISHOP CONTINUOUS PROCESS**

Name of Inventor and Owner: James A. Bishop.
Address: 1265 Lafayette St., Denver, Colo.
Type: Horizontal.
Material of Construction: Brick and Iron.
Method of advancing shale through the retort: Fed in by archimedes screw. Transferred across floor by rotating rabbles.

Throughput (24 hours): Fifty to seventy-five tons.
Dimensions: Outside, 20 feet; inside diameter, 16 feet.
Feed: Automatic.
Discharge: Automatic. Spent shale while hot lies in annealing chamber and goes through secondary distilling process, 2 to 4 hours.
Size of Shale Treated: Half-inch down to fines, mixed.
**CHEW PROCESS**

Name of Owner: L. F. Chew  
Address: 18th and Blake, Denver, Colo.  
Type: Vertical  
Material of Construction: Cast iron and steel sheet  
Method of advancing shale through the retort: Gravity brings down the charge continuously as the ash is discharged by the rake on the furnace grate.  
Throughput (24 hours): About 20 tons with standard distillation unit  
Dimensions: 6 ft. diameter, 10 ft. high in retort proper  
Feed: Gravity, continuous  
Discharge: Mechanical, continuous  
Size of Shale Treated: About ¾-inch mesh
Residual coke from the shale treated.

Retort suspended in fire brick flue above furnace; coke feeds from bottom of retort into furnace; positive air pump supplies measured volumes of air to furnace; products of combustion drawn upward through flue in contact with progressively cooler walls of retort.

Final temperature about 850°F.

By positive air pump.

The work to date has indicated more disadvantages than advantages from use of steam in retort.

1-ton plant operated several months. 5-ton plant in course of construction at present time.

Shale is treated in thin sheet, about 2 inches thick. The thin sheet descends continuously in contact with progressively hotter walls of the retort. Vapors and gases all taken from retort at definite region and temperature in the retort. Remaining coke supplies the heat for distillation. Uncondensable gas, after scrubbing, drives engine furnishing all power for crushers, screens, blowers, grates, pumps and lights.

E. L. Kruvshnic
421 Cooper Building, Denver, Colo.
Vertical.
Cast iron.
Helical Conveyor.
50 tons.
Retort 2' x 22'; Stack 7 ft. 2 in. outside diameter.
Gravity.
Gravity.
3/4-inch.
Oil and gas.
Air pressure burner.
1000 degrees F.
With a series of outlet pipes at different elevations, through air condensers and water condensers. Uncondensed gas carried to retort furnace by exhauster.
Use of Steam. Water seal in bottom provides steam at extremely hot zone. No live steam admitted.

Stage of Development. Erected and under test. Erected in the fall of 1919; tests carried on through open season of 1920. The second retort is now under construction for handling oil sand in Routt County, Colo.

Remarks. This retort complete and including the elevator when required, can be operated easily by one man. Water required is limited to evaporation from the water seal at the bottom of the retort.

**DAY PROCESS**

Name of Inventor. David T. Day.
Address. 715 19th Street, Washington, D. C.
Type. Horizontal.
Material of Construction. Steel.
Method of advancing shale through the retort. Screw conveyor.
Throughput (24 hours). 20 tons per tube.
Size of Shale Treated. Egg size.
Fuel Used. Waste gas.
How Applied. By burners through Dutch oven.
Temperature Required. 700° F.
Withdrawal of Gas and Oil Vapors (how conducted). As in an oil still.
Use of Steam. For ejecting shale.

**ERICKSON PROCESS**

Name of Inventor. Rainbow Petroleum Product Co.
Address. 419 Judge Bldg., Salt Lake, Utah.
Type. Vertical.
Material of Construction. Cast iron, common brick and fire brick.
Method of advancing shale through the retort. Gravity.
Throughput (24 hours). 24 tons per retort.
Dimensions. Cast iron shell, 20x30 at top, 15 ft. long; 30x48 at bottom; 30 ft. fire brick below.
Feed. From large hopper at top.
Discharge. Continuous.
Size of Shale Treated. From 1 to 2 in. preferable.
Fuel Used. Gas.
Temperature Required. Top retort 250° to 1300° at discharge.
Withdrawal of Gas and Oil Vapors (how conducted). Through perforated pipes in the retort and through the shale.
Use of Steam. For the recovery of ammonia sulphate.
Stage of Development. Have built one-half size unit.

GALLOUPE SHALE PROCESS CO.
Name of Inventor. J. H. Galloupe.
Address. 323 Chamber of Commerce Building, Denver, Colo.
Type. Vertical.
Method of advancing shale through the retort. Agitation.
Throughput (24 hours). High grade eight tons. Low grade twelve tons.
Dimensions. Inner cyl. 16", outer 24", height 18 to 21 feet, according to distillation requirements.
Feed. Continuous.
Discharge. Continuous.
Size of Shale Treated. One-fourth inch and finer.
Fuel Used. Fuel values contained in residue augmented by a small portion of fixed gases.
How Applied. Conducted through center and around outside of retort proper.
Temperature Required. Graduates from 212° F. at top, gradually increasing downward to a maximum of 1100-1340° F. at discharge, according to physical requirements of shales being treated.
Withdrawal of Gas and Oil Vapors (how conducted). Air cooled condensers, with a multiplicity of outlets for the removal of the gases immediately upon generation thus preventing diffusion of gases generated at different temperatures.
Use of Steam. None whatever.
Stage of Development. Two units in successful operation.

Remarks

JENSON STAGE
Name of Inventor and Owner. A. J. Jenson.
Address. 
Type. 
Material of Construction. 
Method of advancing shale through the retort. 
Throughput (24 hours) 
Feed. 
Discharge. 
Size of Shale Treated. 
Fuel Used. 
How Applied. 
Temperature Required. 
Withdrawal of Gas and Oil Vapors (how conducted) 
Use of Steam. 
Stage of Development. 

Erected and under test beginning March 15th, 1919, initial retort having been erected and tested out at Grand Junction. Dragon unit now in complete operation. Dillon unit intermittently operated.
Special Features..........................Economically installed and operated. Product low in unsaturated compounds. Minimum of fixed gases and maximum of oil. No wearing parts in heated zone. Wholly automatic in operation, even to stoking apparatus which has no moving parts. After utilizing the fuel content of the spent shale, the ash is conducted outwardly through a channel through which the air is carried inwardly to furnace, thus recovering more than 90% of the heat contained in residue at discharge. In some cases the fixed carbon content of the residue supplies required heat, and the uncondensed gases are available for power uses.

Remarks ..................................Designed especially for the highest economy in the extraction of all the oil from the shales, and the production of the highest grade of oil.

JENSON STAGE EDUCATION PROCESS

Name of Inventor and Owner..............J. B. Jenson.
Address....................................823-824 McIntyre Bldg., Salt Lake, Utah.

Type.......................................Horizontal.

Material of Construction..................Special Cast Iron and Fire Brick.

Method of advancing shale through the retort..................Conveyors and gravity.

Throughput (24 hours).....................Junior type, 10 tons per unit; no limit to number of units. Commercial type 50 tons per unit.

Feed......................................Screw conveyor.

Discharge..................................Screw conveyor in water.

Size of Shale Treated.....................Maximum ½-inch down to fines.

Fuel Used..................................Gas and spent shale.

How Applied..............................Under lower chamber.

Temperature Required.....................250° F. at introduction and 900° to 1200° F. at discharge, depending on structure of shale.

Withdrawal of Gas and Oil Vapors (how conducted)..............Exhauster from retort.

Use of Steam.............................When water is available, otherwise not.

Stage of Development.....................First plant 1902 operated until 1905; present plant built summer of 1917 is still being operated; capacity 5 tons per day.
JOHNS RETORT

Name of Owner: Industrial Process Engineering Co.
Address: 50811 Rialto Theatre Bldg., St. Louis, Mo.
Type: Inclined.
Material of Construction: Fire brick and cement.
Method of advancing shale through the retort: Scraper system.
Throughput (24 hours): Ten-ton units (approx.).
Feed: Automatic.
Discharge: Gravity.
Size of Shale Treated: 50% to 90% through 100 mesh.
Fuel Used: Spent or fresh pulverized shale, air and gas.
How Applied: Automatic mixture and burners.
Temperature Required: Outside retort 1800° F.
Withdrawal of Gas and Oil Vapors: Shift movement take off with partial vacuum.
Use of Steam: None used.
Special Features: Pulverization. Time controlled operation. Quantity controlled feed and thickness of material above heat. Special condenser system.

PORTER PROCESS

Name of Owners: John Porter and John Russell.
Address: 409 Symes Bldg., Denver, Colo.
Type: Vertical.
Material of Construction: Metal and brick.
Method of advancing shale through the retort: Gravity and agitation.
Throughput (24 hours): Fifty tons.
Dimensions: Retort is 12 inches across.
Feed: Continuous.
Discharge: Continuous.
Size of Shale Treated: About one inch.

RANDALL ROTARY


Name of Inventor or Owner: Address:
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Fuel Used........................................ Water gas from spent shale.
How Applied........................................ At bottom of retort.
Temperature Required............................. From 500° to 1400° F.
Use of Steam........................................ Steam used.
Withdrawal of Gas and Oil Vapors
(how conducted).................................... From top of retort into a series of condensers and patent scrubbers.
Special Remarks.................................... The Porter Process plant claims not only to recover the oil from the shale, but also the ammonia sulphate and benzol, and further refines the oil into gasoline, kerosene, naphtha and lubricating distillates.

RANDALL ROTARY RETORT AND PROCESS

Name of Inventor.................................. J. W. H. Randall.
Address............................................. 15 East 40th Street, New York, N. Y.
Type................................................. Inclined.
Material of Construction........................ Steel.
Method of advancing shale through the retort........................................ By gravity and speed of rotation.
Throughput (24 hours)................................ Minimum of two hundred tons.
Dimensions......................................... Six by one hundred and ten feet.
Feed.................................................. Continuous.
Discharge............................................ Continuous.
Size of Shale Treated.............................. About half inch.
Fuel Used........................................... Gas.
How Applied........................................ Externally within suitable fire box along full length of retort.
Temperature Required............................ Maximum about 800° F.
Withdrawal of Gas and Oil Vapors
(how conducted).................................... By partial vacuum.
Use of Steam........................................ Yes.
Special Features................................... Obtaining of a crude oil with minimum unsaturated oil content at low temperature. Large throughput per dollar invested in plant. Small amount of labor required to operate. All feed, transit of shale of spent material automatic and continuous. Ability to completely control temperature at different points along the length of retort.

SCOTT PROCESS

Name of Inventor or Owner........................ Scott (inventor) General Education Corporation (owner).
Address............................................. 674 Woodward Ave., Detroit, or Exchange Nat'l Bank Bldg., Colorado Springs, Colo.
**SEAMAN ROTARY RETORT PROCESS**

**Name of Inventor and Owner** — Seaman Waste Wood Chemical Co.
**Address** — 17 Battery Place, N. Y.
**Type** — Horizontal, pitch \( \frac{1}{2} \)" per foot.
**Material of Construction** — Steel shell, cast iron heads, brick setting.

**Special Features**

Complete recovery of all hydrocarbons and a maximum recovery of nitrogen in form of ammonium sulphate, also potash. This is made possible by variations of temperature from 900° F. to 1500° F.; maximum throughput due to pre-heating of shale before entering retort whereby specific heat of shale is satisfied and latent heat of vaporization of moisture in the shale supplied, all from inert products of combustion.

**COLORADO SCHOOL OF MINES QUARTERLY—Supplement**

**Type** — Vertical. Now being re-designed to include 4, 6 or 8 retorts in single bench, each bench to have respectively a capacity of 20, 30 or 40 tons daily capacity.

**Material of Construction** — Steel, silica, carborundum, brick, and concrete.

**Method of advancing shale through the retort** — By gravity from hopper and magazines.

**Dimensions** — 20, 30 or 40 tons each 24 hours.

**Feed** — Each three hours from magazine.

**Discharge** — Through water seal into chain conveyor.

**Size of Shale Treated** — 1 inch to \( \frac{1}{2} \) inch.

**Fuel Used** — Gas from shale and coal producer.

**How Applied** — By flow to combustion chambers through pipes.

**Temperature Required** — Temperatures variable from 900° F. to 1800° F.

**Withdrawal of Gas and Oil Vapors (how conducted)** — By pipe to our special rotary jet condenser.

**Use of Steam** — Superheated up to 900° at atmospheric pressure or about 637° of superheat.

**Stage of Development** — Designed four years ago after several years of experimental research work and after construction of large retort for experimental work. In an advanced experimental stage. To be erected and under test in Kentucky, this year (1920).

**LOUIS SIMPSON**

**Name of Inventor** — Louis Simpson
**Address** — 17 Battery Place, N. Y.
**Type** — Horizontal, pitch \( \frac{1}{2} \)" per foot.
**Material of Construction** — Steel shell, cast iron heads, brick setting.

**Method of advancing shale through the retort** — By gravity from hopper and magazines.

**Throughput (24 hours)** — 20, 30 or 40 tons each 24 hours.

**Feed** — Each three hours from magazine.

**Discharge** — Through water seal into chain conveyor.

**Size of Shale Treated** — 1 inch to \( \frac{1}{2} \) inch.

**Fuel Used** — Gas from shale and coal producer.

**How Applied** — By flow to combustion chambers through pipes.

**Temperature Required** — Temperatures variable from 900° F. to 1800° F.

**Withdrawal of Gas and Oil Vapors (how conducted)** — By pipe to our special rotary jet condenser.

**Use of Steam** — Superheated up to 900° at atmospheric pressure or about 637° of superheat.

**Stage of Development** — Designed four years ago after several years of experimental research work and after construction of large retort for experimental work. In an advanced experimental stage. To be erected and under test in Kentucky, this year (1920).
Method of advancing shale through the retort. Rotation of retort which is pitched 1/2" per foot.

Throughput (24 hours)............. 20 tons per 24 hrs. per retort, 3 ft. dia. x 30' long.

Dimensions........................ Retorts 3 ft. dia., 30 ft. long.

Feed.................................. Special air excluding seal.

Discharge............................ Special air excluding seal.

Size of Shale Treated............... Through 1/2" mesh.

Fuel Used............................ Solid, liquid or gas.

How Applied.......................... Burned in standard design of combustion chamber.

Temperature Required............. 600 to 700 deg. F.

Withdrawal of Gas and Oil Vapors (how conducted).......... Cast iron riser pipe, cast iron retort head.

Use of Steam.......................... Incidentally only.

Stage of Development............... Commercial sized unit designed for distillation of hard wood waste was successfully run on sample shipments of shale. Best operating temperatures, etc., have been noted and yields measured.

LOUIS SIMPSON RETORT AND PROCESS

Name of Inventor................... Louis Simpson.

Address............................... 173 O'Connor St., Ottawa, Canada.

Type.................................. Vertical.

Material of Construction........ Steel Plates.

Method of advancing shale through the retort.......................... Burden resting on two revolving rollers of special construction. From shape of this chamber the movement is regular and continuous.

Throughput (24 hours)............... 250 tons each double retort.

Dimensions.......................... 8 feet long, 5 feet wide and 33 feet high, each double retort.

Feed.................................. Special continuous feed.

Discharge............................ Special conveyors of special construction taking shale to the by-product plant.

Size of Shale Treated............... About one inch.

Fuel Used............................ Uncondensible gas, the product of a previous operation.

How Applied.......................... Used to preheat gas of a similar character and production. Gas preheated in a special constructed preheater.

Temperature Required............. 700° to 750° Fahr.

Withdrawal of Gas and Oil Vapors (how conducted)........ By chambers through a central chamber, through specially constructed outlets.
Use of Steam: In full details for a thorough test of 2000 tons shale per day.
Stage of Development: To produce electric power for mining, crushing, etc., and to provide steam for by-product plant.
Special Features: The above retort and system was designed so that material, readily procurable, could be used in its construction; also so that it could be erected quickly and at a low cost. The eduction is secured by the use of preheated gas, preheated outside the retort, under conditions that secure great economy of that unit. The bulk of the heat units, contained in the educed oil gases, are also recovered, while the whole plant is self-contained in a fireproof and substantial building. The heavy oil gases are condensed through one condensor, while the light oil gases are condensed through another, and arrangements are made by which the oil yields from each double retort can be ascertained every hour, if desired. The fractionation of the educed gases is also specially provided for. The cost of labor is reduced to a minimum.

**STALMAN-WELLS PROCESS**

**Name of Owner**: Stalman for Distillation, Wells for Refining.
**Address**: 319 Ness Bldg., Salt Lake City, Utah.
**Type**: Vertical.
**Material of Construction**: Iron-Steel Mixture.
**Method of advancing shale through the retort**: Automatically by means of a turntable near bottom of retort.
**Throughput (24 hours)**: 9 tons (for 4 hours distillation per charge.)
**Dimensions**: 1' 6" diam. at top, inside; 3' 3" diam. at bottom, inside; 18' long.
**Feed**: Automatic by gravity induced by discharge turntable at the bottom of the retort.
**Size of Shale Treated**: 6-inch (all material passing a 6-inch screen.)
**Fuel Used**: Gas produced from operation.
**How Applied**: By gas burners.
**Temperature Required**: Differs with the character of shale, within 600° F. and 850° F. (at bottom of retort).
**Withdrawal of Gas and Oil Vapors (how conducted)**: Through pipes, induced by a fan.

**STALMAN-WELLS PROCESS**

**Name of Owner**: Stalman for Distillation, Wells for Refining.
**Address**: 319 Ness Bldg., Salt Lake City, Utah.
**Type**: Vertical.
**Material of Construction**: Iron-Steel Mixture.
**Method of advancing shale through the retort**: Automatically by means of a turntable near bottom of retort.
**Throughput (24 hours)**: 9 tons (for 4 hours distillation per charge.)
**Dimensions**: 1' 6" diam. at top, inside; 3' 3" diam. at bottom, inside; 18' long.
**Feed**: Automatic by gravity induced by discharge turntable at the bottom of the retort.
**Size of Shale Treated**: 6-inch (all material passing a 6-inch screen.)
**Fuel Used**: Gas produced from operation.
**How Applied**: By gas burners.
**Temperature Required**: Differs with the character of shale, within 600° F. and 850° F. (at bottom of retort).
**Withdrawal of Gas and Oil Vapors (how conducted)**: Through pipes, induced by a fan.

**WALL**

**Name of Owner**: Stalman for Distillation, Wells for Refining.
**Address**: 319 Ness Bldg., Salt Lake City, Utah.
**Type**: Vertical.
**Material of Construction**: Iron-Steel Mixture.
**Method of advancing shale through the retort**: Automatically by means of a turntable near bottom of retort.
**Throughput (24 hours)**: 9 tons (for 4 hours distillation per charge.)
**Dimensions**: 1' 6" diam. at top, inside; 3' 3" diam. at bottom, inside; 18' long.
**Feed**: Automatic by gravity induced by discharge turntable at the bottom of the retort.
**Size of Shale Treated**: 6-inch (all material passing a 6-inch screen.)
**Fuel Used**: Gas produced from operation.
**How Applied**: By gas burners.
**Temperature Required**: Differs with the character of shale, within 600° F. and 850° F. (at bottom of retort).
**Withdrawal of Gas and Oil Vapors (how conducted)**: Through pipes, induced by a fan.

**WING**

**Name of Owner**: Stalman for Distillation, Wells for Refining.
**Address**: 319 Ness Bldg., Salt Lake City, Utah.
**Type**: Vertical.
**Material of Construction**: Iron-Steel Mixture.
**Method of advancing shale through the retort**: Automatically by means of a turntable near bottom of retort.
**Throughput (24 hours)**: 9 tons (for 4 hours distillation per charge.)
**Dimensions**: 1' 6" diam. at top, inside; 3' 3" diam. at bottom, inside; 18' long.
**Feed**: Automatic by gravity induced by discharge turntable at the bottom of the retort.
**Size of Shale Treated**: 6-inch (all material passing a 6-inch screen.)
**Fuel Used**: Gas produced from operation.
**How Applied**: By gas burners.
**Temperature Required**: Differs with the character of shale, within 600° F. and 850° F. (at bottom of retort).
**Withdrawal of Gas and Oil Vapors (how conducted)**: Through pipes, induced by a fan.
Use of Steam........................................Yes.
Stage of Development................................Experimental stage has now been passed, except as experiments may seem advisable in the commercial plant now being erected at Grand Valley, Colo.

WALLACE PROCESS

Name of Owner........................................Wallace Coke Oil & By-Products Co.
Address..................................................412 Missouri Ave., E. St. Louis, Ill.
Type......................................................Vertical ovens; rectangular; oval; capacity about 50 cubic feet.
Material of Construction.............................Silica or Cast Iron.
Method of advancing shale through the retort............Intermittent, advocated; continuous being experimented with.
Throughput (24 hours)..................................48 tons per oven.
Dimensions..............................................7' long, 15'' wide, 14' high, thickness of shale charge around center duct 3⅛'.
Feed......................................................Electrically operated, charging and discharging machine.
Discharge................................................Continuous conveyor.
Size of Shale Treated..................................Run of crusher up to 2⅛''.
Fuel Used................................................Gas.
Temperature Required...................................1400° F. preferable. System limits decomposition of shale to primary reactions. No secondary decomposition taking place.
Withdrawal of Gas and Oil Vapors (how conducted)............Slight vacuum. Standard gas works control.
Use of Steam............................................Not advocated. feasible if required.
Special Features.......................................Primary decomposition only. Low cost of initial construction, maintenance, and operation.

WINGETT PROCESS

Name of Owner........................................Troy-American Petroleum Corporation.
Address..................................................1214 First National Bank Bldgs., Denver, Colo.
Type......................................................Vertical.
Material of Construction.............................Cast Iron, Steel and Fire Brick.
Method of advancing shale through the retort............Screw propeller; gravity and rake system.
Throughput (24 hours) ........................................ 150 tons.
Dimensions ........................................... 36 ft. height, 24 ft. circumference.
Feed .................................................. Automatic.
Discharge ........................................... Automatic.
Size of Shale Treated ................................. 20 mesh.
Fuel Used ............................................ Crude oil and fixed gas.
How Applied ........................................ Burner.
Temperature Required ................................. 650° F.
Withdrawal of gas and oil vapors
(low conducted) ................................ Pipe system.
Use of Steam ........................................ None.
Special Features ...................................... Retort on ground ready for erection.

BROWN PROCESS—H. L. Bro
CATLIN PROCESS—Catlin Sh
vada; Franklin, New Jerse
GINET PROCESS—J. H. Ginet
Colorado.
PEARCE PROCESS—Arthur L
York, N. Y.
RYAN PROCESS—Kileen-Reif
Denver, Colorado.
SIMPLEX PROCESS—Mt. Logs
YOUNG PROCESS—A. V. Youn
BROWN PROCESS—H. L. Brown, 265 Washington Ave., Newark, N. J.
CATLIN PROCESS—Catlin Shale Products Co., R. M. Catlin, Elko, Ne-
vada; Franklin, New Jersey.
GINET PROCESS—J. H. Ginet, 211-212 Temple Court Building, Denver,
Colorado.
PEARCE PROCESS—Arthur L. Pearce & Co., 43 Exchange Place, New
York, N. Y.
RYAN PROCESS—Killen-Reinert Co., 412 Tabor Opera House Block,
Denver, Colorado.
SIMPLEX PROCESS—Mt. Logan Oil Shale Co., Debeque, Colorado.
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