ing in the gas. It also absorbs and combines with a portion of the CO_2, which is very desirable, as one volume of this gas in 100 of illuminating gas will reduce the candle-power 5%. The liquor is collected in the bottom of the scrubber and is drained off by means of a special syphon connection which seals the apparatus and prevents the escape of the gas, at the same time allowing the liquor to escape. The liquor flowing from the condenser and scrubber is conveyed by means of a 3″ main to the tar and liquor separator. The gas then passes out of the condenser by means of a 12″ main and on to the purifiers, which are located just outside the condenser room.

It will be noted that the exhausters are in a room by themselves as are also the condensers and scrubbers, and these can only be reached from the retort room by going outside, there being no inner passageway. This arrangement reduces the risk of explosion due to leaking gas making an explosive mixture.

The purifiers are situated outside and consist of three steel boiler-plate boxes 11″ in diameter and 12′ high, the sides and bottom plates being ¼″ and the top plates 3/16″. Each box is equipped with two layers of oxide trays and a ½-ton duplex chain hoist for lifting cover. They are interconnected by means of valves and piping so that as flexible arrangement as possible was secured. The boxes were arranged so that the direction of the flow could be reversed in all the boxes and any two could be placed in series or any two in parallel with the third in series. The advantage of reversing the flow lies in the fact that when one side of the bed of oxide becomes clogged the other side may be used, thus extending the periods between revivifying. The oxide used in this particular case was made up by the following formula, and gave good satisfaction: 6 bbls. pine shavings, ½ bbl. lime, ½ bbl. copperas.

The principal impurities in the gas when it leaves the scrubbers are hydrogen sulphide, carbon dioxide and carbon bisulphide. Lime is very active in the removal of CO_2 and H_2S and after absorbing the H_2S it also requires the property of absorbing carbon bisulphide. It is the office of the purifiers to eliminate these objectionable compounds from the gas and the efficiency depends altogether

Summary of Costs—North Yakima Coal Gas Plant.

No.	Article.	Quantity.	—Unit— Used.	Cost.	Total.	Remarks.
						Grand total
I.	Buildings	204,755	C.F.	.10¼	$21,023.75	$21,959.72
II.	Wrecking old buildings.				935.97	On contract
						Total, $23,306.23
III.	Miscellaneous structures:					
	(a) Tar well				746.11	3,300 C.F. capacity.
	(b) Industrial track (installed)				923.59	860 ft. 20-lb. track and pressed steel ties.
	(c) Gas holder			.14		
	(installed)	150,000	C.F.	7.00	21,636.53	150,000 C.F. 305,166 lbs.
						Total, $37,600.86
IV.	Machinery & equipment:					
	(a) Benches (erected)	4 benches		2787.12	11,148.50	3 benches of 6's filled and one empty,
	(b) Gas machinery ...				20,145.77	capacity 60,000 C.F. each per 24 hours.
	1. Gas treating apparatus					Includes 2 condensers, 2 exhausters, 2 scrubbers, tar and ammonia separator. Works piping, yard piping, station meter, 2 purifiers, all erected on purchasers foundations (by contract).
	2. Compressors				344.17	Moving and changing to motor-drive.
	3. Boiler, 75 h.p.....				1,314.16	
	4. Boiler piping—exhaust head, etc.				101.35	4″ Burt exhaust head and piping.
	5. Coke pusker				1,083.40	Hand-operated discharge machine, including runway.
	6. Coke quenching chutes				1,264.08	8 McDonald & Mann coke-quenching chutes and motor-operated sump pump.
	7. Coke elevator				1,371.19	Two-ton motor-operated sidewalk elevator.
	8. Coke and coal cars	4	cars	$143.60	574.40	
	9. Miscellaneous ...				341.74	Includes labor moving compression tanks, cost of 3 ton track scales, etc.
V.	Overhead charges	14.5%			11,997.03	Includes 10% engineering fee, interest during construction, storeroom expense, superintendence, timekeeping, etc.
	Total.....				$94,951.74	Daily capacity 180,000 C.F. or 52c. per C.F. daily generating Capacity.