

1911-1912

BIENNIAL REPORT

OF THE

STATE INSPECTOR OF COAL MINES

COLORADO

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Fifteenth Biennial Report

OF THE

State Inspector of Coal Mines

Compliments of

JAMES DALRYMPLE

State Inspector of Coal Mines, Colorado



DENVER, COLORADO THE SMITH-BROOKS PRINTING CO., STATE PRINTERS 1913

NOTICE

Copies of the Mining Law and of this Biennial Report may be obtained by addressing this department.

PERSONNEL OF THE STATE COAL MINING DEPARTMENT

JAMES DALRYMPLEChie	f Inspector
Denver, Colorado	
FRANK N. OBERDING Deputy	v Inspector
Louisville, Colorado	
HENRY P. KINGDeputy	y Inspector
Denver, Colorado	
JAMES W. GRAHAMDeput	y Inspector
Lafayette, Colorado	
DOROTHY GUNN	Clerk

Denver, Colorado

LETTER OF TRANSMITTAL

HON. ELIAS M. AMMONS, Governor of Colorado.

Sir: In compliance with section 17 of an act entitled "Coal Mines," I have the honor of submitting to you the Fifteenth Biennial Report of this department, covering the two years ending December 31, 1912, giving the annual production by mines and by counties, a list of the fatal accidents, the number of nonfatal accidents and their causes, the number of persons employed, the number of mines in operation, new mines opened up, and improvements made in some of the older mines.

Respectfully submitted,

JAMES DALRYMPLE, State Inspector of Coal Mines.

SUMMARY OF THE COAL PRODUCTION OF COLORADO IN 1911 AND 1912

	1911	1912
Number of mines in operation	164	160
Number of new mines opened	5	5
Number of old mines reopened	11	5
Number of mines closed or abandoned	14	5
Tons of lignite coal produced	1, 766, 353	1,967,797
Tons of semi-bituminous coal produced	758, 587	922, 552
Tons of bituminous coal produced	7, 538, 657	7,982,562
Tons of anthracite coal produced	63,998	69,037
Tons of unclassified coal produced (estimated)	70,000	75,000
Total number of tons produced	10, 197, 595	11,016,948
Increase, 1912		819, 353
Tons of coal mined by hand	9, 998, 702.67	8,751,979.42
Tons of coal mined by machines	1,198,892.33	2,264,968.58
Total number of mining machines used	241	320
Total number of tons of coke produced	937, 952	972, 539
Total number of coke ovens in operation	2,464	1,751
Total number of employes in and about the mines	. 14, 315.2	13,980.6
Total number of employes at the coke ovens	952	674
Average number of days worked for all producing		
mines	173.8	191.7
Number of men killed, underground	86	95
Number of men killed, surface	5	3
Number of men injured	305	356
Tons of coal mined to each life lost	122, 862.2	112, 417.84
Tons of coal mined to each man injured	33, 434.73	30, 946.46
Number of killed per 1,000 employes	6.35	7.055
Number of injured per 1,000 employes	21.3	25.6
Number of employes to each life lost	166.45	142.66
Number of employes to each man injured	46.9	39.3
Number of widows left	43	51
Number of children left fatherless	114	134

The Fifteenth Biennial Report

OF THE

State Inspector of Coal Mines

ERRATA

Pages 18 and 19. Second line from top should have the year "1911" added. Page 37. Last paragraph should be placed at the top of page 38.

Page 86. Head page "Mine Fires" and change heading "Mine Fires" to "Monarch No. 1 Mine".

Page 96. Last paragraph, change to top of page 97.

Page 117. Readings taken at Crested Butte mine should have head line of "Relative Humidity".

Our means of producing has grown much more rapidly than the demand. I do not anticipate any material increase in the production in the near future, unless new manufacturing industries start up, either in Colorado or some of the States adjoining us on the east.

NUMBER EMPLOYED

In 1911 there were 14,315.2 people employed in and around the coal mines; in 1912 there were 13,980.6.

NEW MINES AND OLD MINES REOPENED

During the biennial period ten new mines were opened and sixteen old mines reopened, and considerable improvements were made in some of the older mines.

MINES CLOSED OR ABANDONED

In the two years nineteen mines were abandoned.

SHORTAGE OF CARS

The usual shortage of cars prevailed during the fall and early winter of both years, but in 1912 the shortage was the

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Tons of coal mined to each man injured	33, 434.73	30, 916.46
Number of killed per 1,000 employes	6.35	7.055
Number of injured per 1,000 employes	21.3	25.6
Number of employes to each life lost	166.45	142,66
Number of employes to each man injured	46.9	39.3
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State Inspector of Coal Mines 1911-1912

INTRODUCTION

The coal industry of Colorado for the two years just passed, as compared with that of 1909-1910, shows a decrease in production of 1,692,520 tons. The principal reason for this decrease was the abnormal demand for Colorado coal in 1910, during labor troubles in some of the other coal-producing states, and the adverse financial conditions in 1911. The production in 1911 was .10.127,595 short tons; in 1912 it was 11.016,948 short tons; making a total production for the biennial period of 21.214,543 short tons.

Our means of producing has grown much more rapidly than the demand. I do not anticipate any material increase in the production in the near future, unless new manufacturing industries start up, either in Colorado or some of the States adjoining us on the east.

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The usual shortage of cars prevailed during the fall and early winter of both years, but in 1912 the shortage was the worst the state has ever experienced, which was due to the bountiful crops throughout the country.

FATALITIES

In 1911 ninety-one (91) lives were lost, and two deaths occurred from natural causes. Three hundred and five (305) people were injured. One mine disaster occurred—the dust explosion at the Cokedale mine, where seventeen (17) men lost their lives.

In 1912 ninety-eight (98) lives were lost and three hundred and fifty-six (356) persons were injured. One mine disaster occurred—the gas explosion at the Hastings mine, where twelve (12) men met their death.

AVOIDABLE ACCIDENTS

On January 1, 1913, I requested the deputy inspectors, while invetigating fatal accidents, to form an opinion, based upon their own observations, as to whether or not the accidents were avoidable. In going over the reports of fatalities made by the deputies and myself, our opinion is that over 50 per cent of all the fatal accidents were avoidable. This is especially so with the accidents from falls of rock and coal.

In the majority of accidents the deceased or injured person is held responsible, because of negligence on his part. I do not agree with this, because I believe incompetence, and not negligence, is the cause, and the person who is so incompetent that he knows practically nothing about the business in which he is engaged, and is unable to understand what is being said to him by those in charge, should not be held responsible for any accident to himself or others through his actions.

The responsibility in preventing accidents is about equally divided between the official in charge and the individual worker. And in order to reduce accidents to the minimum, it is necessary that the official have the co-operation of the worker and that the worker have the co-operation of the official, so that the co-operation existing will be proportionate to the competency of all concerned. In any case, where the worker or the official is entirely incompetent no co-operation can exist.

This being the case, it is very desirable that competent menbe employed as workers and officials, and this can be accomplished by compelling the incompetent workman to serve an apprenticeship under the supervision of a competent person, and by compelling the official to successfully pass a practical and technical examination.

INSTALLATION OF RADIATORS

In September, 1911, this department recommended the installation of radiators and the injecting of steam into the intake air at all mines south of Aguilar, known as the coking coal mines.

In less than three months the Colorado Fuel and Iron Company had complied with the recommendation. It was in those



ILLUSTRATION NO. 1

Machine Installed by Victor-American Fuel Company at Their Delagua Mine for Treating All Exposed Parts of Mine with Adobe or Stone Dust.



ILLUSTRATION NO. 2 A Coal Rib Untreated and Treated with Stone or Adobe Dust. mines, south of Aguilar, that nearly all of the large explosions occurred, and nearly all of them in which dust took a prominent part occurred during the cold weather; so the above recommendation was made in order to try to obtain summer conditions underground during cold weather, by raising the temperature of the ingoing air as high as, or higher than, the temperature of the interior of the mine, and by furnishing it with all the moisture it is capable of carrying, thereby preventing the moisture from being carried out of the mine.

The results obtained are beyond the expectations of this department and of the officials of the company. While this may not render these mines immune from dust explosions, or dust from taking part in an explosion of gas, I believe it will, to a great extent, prevent them. (For relative humidity readings, see pages 117 to 121.)

The Victor-American Fuel Company is using adobe dust at its Delagua and Bowen mines, the object in view being the same as that expected from the use of radiators and steam; namely, to prevent coal dust from propagating an explosion by the presence of this incombustible dust when thrown into suspension.

At the Delagua mine a compressor for applying this dust has been put on trucks, so that any working part of the mine may be treated. The manner in which it is applied is the same as that of applying water from a nozzle. (See illustrations Nos. 1 and 2.)

At the Altofts Experimental Station in England numerous experiments have been made with this dust in experimental explosions of dust, and it has proved to be very effective in such cases.

The Victor-American Fuel Company, at its Hastings mine, is using an electric lamp exclusively for general purposes. This lamp was designed by employes of the company, and is known as the Victor lamp. Its illuminative power is about five candlepower, it carries two volts, is built of good material, and is well inished.

I saw this lamp tested in an explosive mixture at a temperature of 240 F., by short-circuiting the current and by breaking the bulb. The test was made with two, four, six, eight, and ten volts. With ten volts ignition was obtained, which was five times the voltage carried by the lamp. Some of the other coal companies are trying this lamp in some of their mines. I consider this a very suitable lamp.

Generally, the companies are doing all they can to interest their employes in first aid and helmet work, by allowing full pay for time spent in training, and by holding contests and giving substantial prizes to the successful competitors.

In southern Colorado a voluntary increase in wages was granted amounting to about 10 per cent to the miners and 5 per cent to the company men.

STRIKES

The strike in northern Colorado, which was declared March 1, 1910, has been partly settled by the American Fuel Company, the Louisville Coal & Land Company, the Big Six Coal Company, and Cannon & Co. complying with the demands of the miners. The strike is still on at the mines of the Rocky Mountain Fuel Company. The National Fuel Company, the Frederick Fuel Company, the Brooks-Harrison Fuel Company, and the Consolidated Coal and Coke Company. Otherwise there was no trouble between the employers and employes that interfered with the production.

NEW MINING LAWS

In 1910 Governor Shafroth appointed a commission to investigate the cause of the great loss of life in our mines, and to prepare a new mining bill to be presented to the Eighteenth General Assembly. This was done, but the bill was so changed and mutilated in the Senate that the Governor vetoed it.

In an effort to better protect the lives of those employed in the coal mines in this state, this department found it necessary to recommend a great many improvements not required by law; and in such cases we were successful with some of the companies. with others not so successful, and with some we failed to make an impression.

I believe it is fair to give credit to those operators who have co-operated with this department in making improvements recommended beyond the requirements of the present mining law. In acknowledging the concessions made by them, it must be further added that there is no authority embodied in the law by which these conceded improvements could have been enforced, no matter how essential they were to protect the life and health of the employes. The Colorado Fuel & Iron Company ranks first in making improvements not compulsory or demanded by the law; it complied cheerfully with most of our recommendations. The Utah Fuel Company, also the Leyden Coal and the Moffat Coal Companies responded very freely. The Victor-American Fuel Company, while not so ready to comply, yet did respond to some extent; this applies also to the National Fuel and the American Fuel Companies. The latter company is a new organization, having effected a merger of several different companies operating small mines. The Rocky Monntain Fuel Company carried out some improvements recommended in its southern and western properties, and a few of the operators of small mines did likewise. However, the latter, in general, gave little or no heed to either the recommendations within or beyond the law.

There are more mines in Boulder County, where the sanitary conditions are not up to the requirements of the law, than there are in all other coal producing counties of the state. This is especially true of the numerons mines operated now by the Rocky Mountain Fuel Company. These mines had been operated by the Northern Coal & Coke Company until October, 1911, when the former company took them over, all in more or less bad condition, and possibly the failure of the Rocky Mountain Fuel Company to place these mines on a safe and sanitary basis can be attributed to some extent on the grounds of reorganization, the still pending strike in these mines and the great outlay of capital that had already been spent in the purchase of these properties. Yet the safety of life and health of the employes should be the first consideration, and for three years the officials of both the former and the present owners have ignored the urgent recommendations made repeatedly by this department. These adverse conditions are brought about chiefly by improperly conducting the air current and failure to drive cross cuts, and the fact that blasting is allowed at all times during working hours.

The Rocky Mountain Fuel Company also added to its holdings, in the fall of 1912, the Forbes mine, operated by the Chicosa Fuel Company in Las Animas County. I would here like to state that in computing the fatal and non-fatal accident tables for the year 1911, the Rocky Mountain Fuel Company is charged with both tonnage and accidents belonging to the Northern Coal & Coke Company prior to the time the company took charge of the mines it purchased.

I wish to thank the three deputy inspectors—Frank N. Oberding, Henry P. King, and James W. Graham—for their valuable services and their assistance in helping me to perform the duties of this department.

Yours respectfully,

JAMES DALRYMPLE, State Inspector of Coal Mines.

To the Nineteenth General Assembly, Now in Session, Denver, Colorado.

Gentlemen: In preparing the Biennial Report of this department, it has been customary to make recommendations to you for the purpose of amending our present and inadequate mining law; but, for some reason, in the past those recommendations received little or no consideration. The result is that those employed in our coal mines—one of the most hazardous occupations known, as well as one of the leading industries of our state—have had less consideration than the wild deer of the forest or the trout in the stream.

Knowing that a new mining bill is to be introduced at this session, I will not at this time make any recommendations to you, but will, by stating a few facts, endeavor to show you some of the reasons why our present coal-mining laws are inadequate.

Our present law, with a few minor amendments, is the same as it was nearly thirty years ago. At that time we had what was considered a very intelligent and competent class of miners; nearly all of them were English-speaking people, capable of taking care of themselves under all reasonable conditions which might arise. Our haulage was principally animal haulage, traveling at a moderate rate of speed. A mine producing five hundred tons a day was considered a large producer. A mine foreman, and fire bosses when necessary, were employed to look after the property and those employed therein, which was not so difficult to do with an intelligent class of employes.

Today we have a very incompetent class of miners, few of them ever having seen a coal mine until they started work in ours, and very few of them understanding the English language. This is a very serious handicap, because they cannot read our mining law or understand what is being said to them by the officials in charge. They know practically nothing about the mining of coal or the dangers connected therewith.

Our haulage today is done by machinery, traveling at a high rate of speed, which greatly increases the dangers. Where electricity is used for haulage power, there is danger of coming in contact with the trolley wires.

A mine today, to be considered a large producer, has to produce about one thousand tons per day, or double that produced thirty years ago. The increase in the area being worked is equal to the increase in production. The attention to the individual worker has increased enormously, as compared with that given his more competent brother of thirty years ago. These attentions have increased the duties of the underground officials, and the increase in officials has not been equal to the increased duties.

In concluding, I wish to draw your attention to the high rate in our mines of deaths and injuries, which is double that of the United States taken as a whole. This is positive proof that something is wrong.

Hoping that I have made these matters clear to you, and that you will give the mining bill, which is coming before you, your careful consideration, I remain,

Yours respectfully,

JAMES DALRYMPLE. State Inspector of Coal Mines.

Denver, Colorado, September 19, 1911.

To the Operators of Southern Colorado,

Operating Mines South of Aguilar:

Believing it to be the duty of this office to use all reasonable means at its command to protect life and limb of those engaged in the production of coal, as well as the properties of the companies, and believing the mines in southern Colorado to be amongst the most dangerons coal mines in the world, owing to, first, the very high altitude; second, the low percentage of moisture in the coal; third, the very inflammable character of the dust; fourth, the dust's refusal to absorb water, unless great quantities are used. I desire to call your attention to the following: This department has observed, in examining these mines, that during the summer months, wherever dust is found, it is generally in a pasty condition. In the winter months, wherever dust is found, it is generally in a very dry condition. These reverse conditions are caused by the outside atmospheric conditions. In the summer months the outside temperature is greater than the inside temperature; consequently, under these conditions, every cubic foot of air that enters the mine deposits a certain amount of moisture, this amount being determined by the difference between the inside and outside temperatures.

In the winter months the conditions are reversed, as the outside temperature is lower than the inside temperature, so that every cubic foot of air that enters the mine carries out a certain amount of moisture, this amount being determined by the difference between the outside and inside temperatures.

I believe, if we can maintain summer conditions in the mines during the winter months, that, as far as the dangers from the coal dust are concerned, we shall be reasonably safe. While I realize that to accomplish this means the expenditure of considerable money, still, when compared with the lives lost last winter and the amount needed to put the mines in operation again, the consideration is small.

In order to obtain the above-described conditions, it will be necessary to install heaters or radiators in the intake air-course. to raise the temperature of the intake above—or, at least, equal to—the temperature of the interior of the mine; accompanied by steam or water sprays, or both, to furnish the necessary moisture.

The Colorado Fuel and Iron Company some time ago put in, at the main North Primero mine, two radiators, accompanied by steam and water sprays, which, in my opinion, were very satisfactory in obtaining the desired results.

I, therefore, recommend that heaters, or radiators, or other means, be used, accompanied by the necessary moisture, in the form of either water or steam, or both. This is not to apply to mines that are already equipped with effective devices to take care of the dust.

In asking you to comply with this letter, I realize that I am asking you to do something which the law does not require; but, believing you have the welfare of your employes, as well as the protection of your property, at heart, I sincerely hope that you will look upon this letter favorably, and that you will do everything in your power to carry out the recommendations.

Yours very truly,

JAMES DALRYMPLE, State Inspector of Coal Mines. Denver, Colorado, December 13, 1911.

Mr. W. J. Murray,

Vice-President Victor-American Fuel Company, Denver, Colorado.

Dear Sir: On December 6, accompanied by Mr. Griffith, Mr. Dean, and Deputy King, I visited your Delagua mine to learn something about the application of stone or adobe dust as a preventive of coal-dust explosions. This is the first place where I have seen it used, and all I know of it is what I have read about it being used at the Altofts Station in England, where the records show, with stone-dust zones, they have stopped coal-dust explosions.

As I told Mr. Deau, it is natural to believe that if it will stop an explosion after it has started, by using it in zones on haulage ways, it should prevent them from starting if applied at the working faces, as well as haulage ways.

However, I believe better results will be gotten from its use in a mine like Delagua, which is naturally damp, than in a mine like the Bowen, which is naturally dry. Of course, this is only my humble opinion.

Yours very truly,

JAMES DALRYMPLE, State Inspector of Coal Mines.

Denver, Colorado, July 11, 1911.

To the Coal Operators of the State of Colorado.

Gentlemen: As a safety measure, both to life and property, 1 wish to make the following recommendation:

In all cases where rooms or entries are driven to a fault, or to their distance or land line, and where the pillars are to be left for any length of time, I recommend that crosscuts be driven at the faces of such rooms or entries.

Hoping you will comply with this suggestion, I am,

Very truly yours,

JAMES DALRYMPLE, State Inspector of Coal Mines.

TABLE 1

SHOWING BY COMPANIES TOTAL PRODUCTION AND NUMBER OF MEN EMPLOYED FOR EACH FATAL AND NON-FATAL ACCIDENT DURING THE YEAR 1911

Name of Company or Operator	No. Men Employed	Total Production	No. Fatal Accidents	No. Men Employed per Fatal Accident	No. Non-Fatal Accidents No. Men	Employed per Non-Fatal Accident
Alliance Coal Co	56.1	22, 926	1	56.1	2	28
Alpha Coal Co	53	1,160	••	••	2	26.5
American Fuel Co	13	3,000	•••	••	1	13
Baldy Coal Co	8.8	5,909	••	• •	2	4.4
Big Four Coal Co	64.9	49, 967	1	64.9	9	7.2
Black Canon Coal Co	27.4	8,624	• •	••	1	27.4
Brooks-Harrison Fuel Co	26.1	26,846	1	26.1	••	••
Calumet Fuel Co	79	54,094		••	1	79
Canon Coal Co	26	8,878	••	••	1	26
Carbon Coal & Coke Co	280.3	31 2, 344	18	15.6	3	93.4
Cardiff Coal Co	7.2	3,103	••		1	7.2
Cedar Hill Coal & Coke Co.	249.8	244,458	б	50	13	19.2
Centennial Coal Co	28	14,124	1	28	1	28
Chicosa Fuel Co	211.9	182, 543	3	70.3	10	21.1
Colorado Fuel & Iron Co	5, 410	3, 285, 431	19	284.2	46	111.1
Congo Coal Co	20.4	1,684	1	20.4	2	10.2
Consolidated Coal & Coke Co.	136.9	106, 455	1	136.9		••
Coryell Mining & Leasing Co.	45.1	38, 216			3	15.3
Donnelly Coal Co	8	3,263	••	••	2	4
Empire Coal Co	75.3	75,220	••		3	25.1
Fox Coal Mining Co	47.3	25,663	••	• •	2	23.6
Frederick Coal Co	83.5	46, 499	••	••	2	41.7
Fruth & Autrey	87	47, 445	••	••	3	29
Garfield Coal Mining Co	7.5	5, 515	1	7.5		
Gordon Coal Co	50.5	22, 959	••	••	1	50.5
Grand Junction Mining &						
Fuel Co	55.5	46, 457	••	••	2	27.7
Huerfano Coal Co	215.5	108,447	4	53.7	3	72
Ideal Fuel Co	47	20,656			2	23.5
Juanita Coal & Coke Co	66.4	54,695	•••		1	66.4
Littell Coal & Mining Co	51.2	55,510			1	51.2

TABLE 1—Concluded

SHOWING BY COMPANIES TOTAL PRODUCTION AND NUMBER OF MEN EMPLOYED FOR EACH FATAL AND NON-FATAL ACCIDENT DURING THE YEAR 1911

Name of Company or Operator	No. Men Employed	Total Production.	No. Fatal Accidents	No. Men Employed per Fatal Accident	No. Non-Fatal Accidents No. Men	Employed per Non-Fatal Accident
		No pro)-			
Leyden Coal Co	120	duction	1	120	••	• •
Matchless Coal Co	40.6	14,647	• •		1	40.6
McLaughlin Bros. Coal Co	37.5	17,609	• •	• •	2	18.7
New Maitland Coal Co	23.5	9, 305			1	23.3
Minnequa Coal Co	62.2	41,132	1	62.2	1	62.2
Midvale Coal Co	36	16,076	• •		2	18
Moffat Coal Co	104.3	118, 210	1	104.3	6	17.5
National Fuel Co	626.8	526,357	7	89.5	45	14
Oakdale Coal Co	186.5	192, 963	1	186.5	-1	46.5
Palisade Coal Co	18.9	12,011		* *	1	18.9
Pike's Peak Fuel Co	150.5	157, 570			7	21.5
Primrose Coal Co	62.2	29,561			3	21
Rapson Coal Mining Co	112.1	86, 506	1	112.1		
Rocky Mountain Fuel Co	1,265	1,001,418	4	316.2	19	66.6
Royal Coal Co	35.2	5, 883	1	35.2		
Routt County Fuel Co	\$7.2	117, 828			11	8
Rugby Fuel Co	58.9	41,333			1	58.9
South Canon Coal Co	57.6	49, 360	1	57.6	1	57.6
Southwestern Fuel Co	81.5	37, 542	1	81.5	4	20
Standard Coal & Land Co	118.6	133,653			12	9.9
Star Mining Co	17	949			1	17
Sunnyside Coal Co	69.2	39,768			1	69.2
Union Coal & Coke Co	131	80, 906	1	131	9	14.5
Utah Fuel Co	197	274,528			9	22
Victor-American Fuel Co	1,773.6	1, 438, 247	5	355	28	63.3
Walsenburg Fuel Co	40	500			2	20
Wootton Land & Fuel Co	134.5	128,731	1	134.5	10	67.7
Yampa Valley Coal Co	50.2	63,022	1	50.2	4	Б
	_			-		
State of Colorado 1-	1, 315.2	10, 197, 595	91	166.45	356	46.9

INSPECTOR OF COAL MINES, COLORADO

TABLE 2

NUMBER OF FATAL ACCIDENTS IN 1911 CLASSIFICATION

Chargeable to mines	91
Underground 8	6
Surface	5

CAUSES AND PERCENTAGE

	N	0.	Per
Causes	of Acc	eidents (Cent
Fall of rock and coal	4	6	50.6
Mine cars and motors	1	.0	11
Gas and dust explosions	1	7	18.6
Miscellaneous	1	.8	19.8
Total	8	91	100.0
Number of widows left			43
Number of children left			114

TABLE 3

NUMBER OF NON-FATAL ACCIDENTS IN AND AROUND MINES IN 1911 CAUSES AND PERCENTAGE

	No.	Per
Causes	of Accidents	Cent
Fall of rock and coal	129	42.5
Mine cars and motors	87	28.5
Gas and dust explosions	12	3.9
Miscellaneous	77	25.1
Total	305	100.0

CLASSIFICATION

Serious	Minor	Trivial
100	140	65
	No. Killed	No. Injured
No. Men	per 1,000	per 1,000
Employed	Employed	Employed
14, 315	6.35	21.30

TABLE 4

SHOWING BY COMPANIES NUMBER OF MEN EMPLOYED, NUMBER KILLED, AND NUMBER INJURED PER 1,000 EMPLOYED, 1911

		No. Killed	No. Injured
No	. Men	per 1,000	per 1,000
Name of Company Em	ployed	Employed	Employed
Alliance Coal Co	56.1	17.8	35.6
Alpha Coal Co	53		37.74
American Fuel Co	13		77
Baldy Coal Co	8.8		. 227.27
Big Four Coal Co	64.9	15.40	138.67
Black Canon Coal Co	27.4	* *	36.50
Brooks-Harrison Fuel Co	26.1	38,30	
Calumet Fuel Co	79	+ +	12.65
Canon Coal Co	26		38.50
Carbon Coal & Coke Co	280.3	64.22	10.70
Cardiff Coal Co	7.2		139
Cedar Hill Coal Co	249,8	20	52.04
Centennial Coal Co	28	35.70	35.70
Chicosa Fuel Co	211.9	14.20	47.20
Colorado Fuel & Iron Co	5,410.6	3.51	8,50
Congo Coal Co	20.4	49	98
Consolidated Coal Co	136.9	7.30	
Coryell Mine Leasing Co	45.1		66.52
Donnelly Coal Co	8		250
Empire Coal Co	75.3		39.8
Fox Coal Mining Co	47.3		42.3
Frederick Coal Co	83.5		24
Fruith & Autrey	87		34.5
Garfield Coal Mining Co	7.5	133	
Gordon Coal Co	50.5		20
Grand Junction Minlng Communication	55.5		36
Huerfano Coal Co	215.5	18.5	13.7
Ideal Fuel Co	47		42.5
Juanita Coal & Coke Co	66.4		15
Littell Coal & Mining Co	51.2		19.5
Leyden Coal Co	96	10.4 ,	
Matchless Coal Commune-	10.6	••	24.6
McLaughlin Bros.' Coal Co	37.5		53.3
Midvale Coal Communication and the second communication of	36		55.5

TABLE 4—Concluded

SHOWING BY COMPANIES NUMBER OF MEN EMPLOYED, NUMBER KILLED, AND NUMBER INJURED PER 1,000 EMPLOYED, 1911

		No. Killed	No. Injured
Ne	o. Men	per 1,000	per 1,000
Name of Company Em	ployed	Employed	Employed
Minnequa Coal Co	62.2	16	16
Moffat Coal Co	104.3	9.5	57.5
National Fuel Co	626.8	• 11.2	71.8
New Maitland Coal Co	23.5		42.5
Oakdale Coal Co	186.5	5,36	21.44
Palisade Coal Co	18.9		53
Pike's Peak Fuel Co	150.5		46.50
Primrose Coal Co	62.2		48.20
Rapson Coal Mining Co	112.1	8.92	
Rocky Mountain Fuel Co	1,265	3.16	15
Routt County Fuel Co	87.2		126
Royal Coal Co	35.2	28.40	
Rugby Fuel Co	58.9		16.90
South Canon Coal Co	57.6	17.34	17.34
Southwestern Fuel Co	81.5	12.27	49
Standard Coal & Land Co	118.6		101.20
Star Mining Co	17		59
Sunnyside Coal Co	69.2		14.45
Union Coal & Coke Co	131	7.60	68
Utah Fuel Co	197		45.70
Victor-American Fuel Co	1,773.6	2.82	15.80
Walsenburg Fuel Co	40	·	50
Wootton Land & Fuel Co	134.5	7.44	74.35
Yampa Valley Coal Co	50.2	19.91	79.68
-			
State of Colorado1	4,315	6.35	21.30

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TABLE 5

TONNAGE BY COMPANIES PER FATAL AND NON-FATAL ACCIDENT

		Tons
	Tons	Produced per
	Produced per	Non-Fatal
	Fatal Accident	Accident in
	Chargeable	and Around
Name of Company	to Mines	Mines
Alliance Coal Co		11,463
Alpha Coal Co		550
American Fuel Co		3,000
Baldy Coal Co		2,954 5-10
Big Four Coal Co	49,967	5,551 8-9
Black Canon Coal Co		8,624
Brooks-Harrison Fuel Co		
Calumet Fuel Co		54,094
Canon Coal Co		8,878
Carbon Coal & Coke Co	17,352 8-18	104, 114 2-3
Cardiff Coal Co		3,103
Cedar Hill Coal Co	48,891 3-5	18,804 6-13
Centennial Coal Co	14,124	14,124
Chicosa Fuel Co	60, 847 2-3	18,254 3-10
Colorado Fuel & Iron Co		71,422 19-46
Congo Coal Co	1,684	842
Consolidated Coal Co		
Coryell Mine Leasing Co		12,738 2-3
Donnelly Coal Co		1,632 5-10
Empire Coal Co		25,073 1-3
Fox Coal Mining Co		12,831 5-10
Frederick Coal Co		23, 249 5-10
Fruith & Autrey		15, 815
Garfield Coal Co		
Gordon Coal Co		22, 959
Grand Junction Mining & Fuel Co		23, 228 5-10
Huerfano Coal Co	-1	36, 149
Ideal Fuel Co		10, 328
Juanita Coal & Coke Co	Second to be	54,695
Littell Coal & Mining Co		55, 510
Leyden Coal Co	None	
Matchless Coal Co		14,647

TABLE 5—Concluded

TONNAGE BY COMPANIES PER FATAL AND NON-FATAL ACCIDENT

		Tons
	Tons	Produced per
	Produced per	Non-Fatal
	Fatal Accident	Accident in
	Chargeable	and Around
Name of Company	to Mines	Mines
McLaughlin Bros.' Coal Co	•••••	8,804 5-10
Midvale Coal Co		8,038
Minnequa Coal Co	41,132	41,132
Moffat Coal Co		19,701 2-3
National Fuel Co		11,696 37-45
New Maitland Coal Co		9,305
Oakdale Coal Co		48,240 3-4
Palisade Coal Co		12,011
Pike's Peak Fuel Co		22,510
Primrose Coal Co		9,853 2-3
Rapson Coal Mining Co	86,506	
Rocky Mountain Fuel Co		52,706 4-19
Routt County Fuel Co		10,711 7-11
Royal Coal Co	5,833	
Rugby Fuel Co		41,333
South Canon Coal Co	49, 360	49,360
Southwestern Fuel Co	37, 542	9,385 5-10
Standard Coal & Land Co		11,137 3-14
Star Mining Co		949
Sunnyside Coal Co	•••••	39,768
Union Coal & Coke Co	80,906	8,989 5-9
Utah Fuel Co		30,503 1-9
Victor-American Fuel Co		51,365 27-28
Walsenburg Fuel Co	•••••	250
Wootton Land & Fuel Co		12,873 1-10
Yampa Valley Coal Co	63, 022	15,755 5-10
State of Colorado		33, 434 4-10

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FATAL ACCIDENT RATE PER 1,000 EMPLOYES AND NUMBER OF LIVES LOST PER MILLION TONS OF COAL MINED IN NORTH AMERICA, BY STATES AND PROVINCES, 1866 TO 1908

						Lost per
						1,000,000
	Years	Tons of		No. F	atal	Tons
State or Province Co	nsidered	Coal Produced	Employes	Accidents Per 1,(00 Employes	Mined
Alabama	16	142, 592, 400	227, 828	1,037	4.55	7.27
Arkansas .	6	12, 307, 804	25, 651	76	2.96	6.17
Colorado	25	117,663,271	188, 054	1, 0.74	5.71	9.13
Illinois	26	611,071,223	1,030,800	2,407	2.34	3.94
Indiana	24	146, 490, 472	245, 115	547	2.23	3.73
Iowa	21	109,736,706	264,400	573	2.17	5.22
Kansas	22	86, 096, 365	184, 895	415	2.24	4.82
Kentucky	22	112, 218, 992	218, 866	375	1.70	3.34
Maryland	19	84, 322, 336	93, 269	165	1.77	1.96
Michigan	10	13,081,027	23, 356	68	2.91	5.20
Missouri	19	61,065,829	151, 444	261	1.72	4.27
Montana	18	24, 464, 869	37,557	138	3.67	5.64
New Mexico	14	19, 243, 519	29, 325	212	7.23	11.02
North Dakota	1	320, 742	631	4	6.34	12.47
Ohio	34	467, 312, 293	863, 812	1,845	2.14	3.95
Oklahoma	15	33, 906, 783	90, 774	460	5.07	13.57

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Pennsylvania-						
Anthracite	39	1, 782, 024, 124	4, 344, 074	14, 625	3.37	8.21
Bituminous	32	1, 806, 371, 376	2, 729, 155	6,919	2.54	3.83
Tennessee	18	69, 368, 153	143, 029	627	4.38	9.04
Utah	16	17, 754, 456	24, 424	285	11.67	16.05
Washington	17	38, 231, 315	68, 645	464	6.76	12.14
West Virginia	25	453, 581, 594	625, 566	2,887	4.62	6.36
Wyoming	6	26, 140, 782	29, 227	339	11.60	12.97
	I				Annual III Annual	
Totals	•	6, 235, 366, 431	11, 639, 897	35, 803	3.08	5.74
British Columbia	•	22,106,271	68, 698	497	7.23	22.48
Nova Scotia	:	90, 512, 879	236, 998	720	3.04	7.95
Totals	:	112, 619, 150	305, 696	1,217	3.98	10.81
	1					
Grand Totals	:	6, 347, 985, 581	11, 945, 593	37,020	3.10	5.83
STATE OF C	OLORADO-	-LIVES LOST PE	R 1,000 EMPLOYI	TD		
1909	•			6.8		
1910	•			21.6		
1911	• • • • • • • • • • • •	• • • • • • • • • • • • • • • • • • •		6.35		
1912	• • • • • • • • • • • • • • • • • • • •			7.10		
				onna di muno		
Total	•	* * * * * * * * * * * * * * * * * * * *	• • • • • • • • • • • • • • • • • • •	41.85		
Average		• • • • • • • • • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·	10.46		

INSPECTOR OF COAL MINES, COLORADO

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FATAL ACCIDENTS IN 1911-UNDERGROUND

Single NidwayHuerfanoFall of rock Single MorlevI.as AnimasRun over by motor	19	Pete MarteryItalianRope-rider See report on Cokedale explosion American American Ninner	31	Feb.
Single BerwindLas AnimasFall of coal	25	Angelo ArcoMiner	5	Jan.
Married 3 RobinsonHuerfanoFall of rock	60	C. StrombaughFuglishFire boss	16	Jan.
Married 4Forbes No. 6Las AnimasIfall of rock	34	Sam BaratonaItalianMiner	16	Jan.
Married 4 TollerLas AnimasFall of rock	42	Joe VidaMiner	ant T	Jan.
Single Fugle FugleFall of slate	26	Procoro EliesMexicanMiner	13	Jan.
Single SouthwesternLas AnimasCaught by cars	49	John ShortSlavMiner	13	Jan.
Single PinonIluerfanoFall of rock	41	William AmbroseGerman PoleMiner	9	Jan.
Widower 4 WoottonLas AnimasFall of rock	40	Barclio ArmerigoMexicanMiner	-alis	Jan.
Married 3 SouthwesternLas AnimasHeart failure	24	Barney MadonnaItalianMiner	~	Jan.
Married 2 HeclaBoulderFall of rock	28	Jordan EnoknioffBulgarianMachine helper	C1	Jan.
arried Children Mine County Cause of Accident	Age M	Name of Person Nationality Occupation	e	Da
Igle OF NUMBER OF NAME OF	ñ			

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...... Cass....Las Animas......Fall of coal Beacon....l.as Animas......Blectrocuted

C4 2 60

Single....

2650 23

John GesperMustrianMiner Guiseppi Petre.....AustrianMiner

51 0 Mch. 1S 53

Feb.

Mch.

John MortonAmerican...Company man Rafael GusmanMexicanMiner Chas NormanAmericanTimberman

Married....

32

Married

R

Apr. 8

Mch.

Married.... Married....

1Fall of rock Morley....Las Animas......Fall of coa

single GarfieldNesaFall of coal	22	Nic GouyouchMontenegrinMiner	4
Married 8 GreenvilleLas AnimasFall of rock	43 I	Mike KresinPoleMiner	
single	27 8	Ralph MorganAmericanDriver	6.5
Single HastingsLas AnimasFall of coal	42 8	Peter CinccuhoItalianMiner	
Single IdealHuerfanoFall of rock	22	John SzarnosSlavMiner	-
Single ChandlerFremontFall of slate	23 23	Venisiani ColomboItalianMiner	
Married 5 LeydenJeffersonHit by rock	51	Stephen FisherAmericanSinker	
Married 1 CentennialBoulderCaught by cage	68 1	Arthur LathamAmerican.General manager	
Single MorleyLas AnimasFall of rock	24 8	Gaudulupe GuiterrezMexicanMiner	Ū
SingleDelagua No. 2Las AnimasFall of rock	29	Rada LoncarSlavMiner	
Married 3RelianceHuerfanoFall of rock	:	John SebedMiner	
single OakdaleHuerfanoSevered intestine	26	William YoungAmericanhelper	-
		Track-layer	
Single Gulch Gulch Pitkin Crushed between cars	26	Stanley James CornishEnglishhelper	
		Boiler-maker	
BerwindLas AnimasFall of rock	35 .	Ignesio RamerizMexIcanMiner	_
Single JValsenHuerfanoFall of slate	30 8	Alberto GuigliItalianMiner	1
SingleRerryRouttRun over by cars	34 8	Joe ParinaItalianMiner	
Single GlobeHuerfanoFall of rock	40 8	Carmela LeorosiItalianMiner	:
Married 2 GreenvilleLas AnimasFall of rock	27 I	Mike NaglaichAustrianMiner	
Single KennethLas AnimasFall of rock	22 8	Ismel CastioMexicanMiner	
Married 1 ParkdaleWeldFall of coal	45	Henry KraushopeGermanMiner	
Married 4 PryorHuerfanoFall of rock	36 1	Tom SumskySlavMiner	
Single Monarch No. 2BoulderFall of sandstone.	22	Frank BrodnyAustrianMiner	~

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FATAL ACCIDENTS IN 1911-UNDERGROUND

er Number of Name of	ied Children Mine County Cause of Acelde	urried 2	ngleSouth CanonGarfieldSmothered by g	ngleBig FourItuerfanoHit by ca	arried 4	ngle NonparellBoulderFell down sh	arried 4 DelaguaLas AnimasBrights Disea	idower 3 TabascoLas AnimasMissed sh	ngle RouseRouse	arried HuerfanoffuerfanoStruck by ca	arried 1PictoultuerfanoPall of ro	ngle	arried 4 HuerfanoHuerfanoFall of ro	idower 1Fall of ro	agle TiogaHuerfanoFall of draw sla	arried 1 Cokedalelas Animas	arried FarkdaleWeldFell off c	ngle IndustrialBoulderFall of ro	ngle InudlowI.as AnimasFall of ro	ngle ForbesLas AnimasFall of sto
Single	Marr	Ma	Sin	Sin	Ma	Sir	Ma	11.1	Siri	Ma	Ma	Sir	Ma	117	Sir	Ma	Ma	Sir	Sir	Sin
	Age	29	30	10	40	12	45	39	39	•	35	25	55	45	30	34	22	24	20	30
	cupation	. Miner	.Miner	Miner	Miner	None	liner	Miner	vliner	rider	liner	liner	Miner	Miner	Vliner	liner	river	Miner	Miner	Miner
	Name of Person Nationality Occ	Emmanuel TeetterTyrolian	P.te Martino Italian	Harry Crist	Joe Vilentio	Edgar Viggers American	Peter MckrovichMontenegrinM	Joe Bertok	B. Kerotti	Charles ReedRobe-	Robert LarsonSwedish	Joseph Buic	John DraspaPole	George TakakiJapanese	Wogan AgganTurk	Albino RizzeAustrian	Fiddle MontoyaMexicanD	Alexander JukoverzkRussian	Frank SlakAustrian	Tony Gadritis
	ate Name of Person Nationality Oce	t. 6 Emmanuel TeetterTyrolian	t. 5 P te Martino	t. 19 Harry Crist	t. 22 Joe VilentioSlav	5 Edgar Viggers American	. 6 Peter MckrovichMontenegrinM	. 9 Joe Bertok	. 18 B. Kerotti	. 26 Charles ReedRope-	. 27 Robert LarsonSwedish	. 30 Joseph Buic	v. 9 John DraspaPole	v. 17 George Takaki Japanese	v. 🛎 Kogan AgganTurk	v. Z Albino RizzeAustrian	V. 30 Fiddle MontoyaMexicanD	2. 1 Alexander Jukoverzk	2. 1 Frank SlakAustrian	r. 1 Tony GadritisPole

rried PictouHuerfanoFall of ro	rried 2	lower	gle PiedmontLas AnimasFall of ro	rried 5 RobinsonHuerfanoFall of siz	rried 4	gleYampa ValleyRouttHit by e	rried 4	rried 3 SuffieldLas AnimasFall of ro	gle MorleyI.as AnimasFall of ro	gleMonarch No. 1BoulderRun over by c	1911-SURFACE	gle TabascoLas AnimasRun on	by railroad cars	gle McKinleyRouttStruck by tramway ro	rried 2RocklandHuerfanoFell into chi	gle GreenvilleLas AnimasBridge collaps	gle GreenvilleLas AnimasBridge collaps
Ma	Ma	Wi	\sin	Ma	Ma	\sin	Ma	Ma	\sin	\sin	NI S	Sin		Sin	Ma	Sin	\sin
39	44	55	31	09	44	28	35	42	22	21	ENE	26		16	45	16	19
liner	0SS	ler	ler	ler	er	nt	H	L.	5	5	1	5		۰.		ы	\mathbf{er}
Rafael QuintannoMexican	Frank PeduciItalian	Paul DrumsackAustrianMir	Matt MalezvockAustrianMin	Thomas J. KnoxAmericanMir	R. A. OliverMmericanMin	E. S. McKinleyAmericanSuperintender	Mike PinchakSlavMine	W. B. BucknerColoredMine	Luigi D. GregoriaItalianMine	Richard A. FlinnAmericanDrive	FATAL ACC	Mile IvansevicSlavCar-droppe		Tony VelatteItalianLaborel	Martin AtidaMexicanBucket-dumper	Paul TennantMmericanWeighe	Ben FallattiItalianMin
2 Rafael QuintannoMexican	4 Frank PeduciItalianIvire b	6 Paul DrumsackAustrianMir	11 Matt MalezvockAustrianMin	. 12 Thomas J. KnoxAmericanMir	15 R. A. OliverMmericanMin	. 15 E. S. McKinleyAmericanSuperintender	15 Mike PinchakSlavMine	19 W. B. BucknerColoredMine	27 Luigi D. GregoriaItalianMine	30 Richard A. FlinnAmericanDrive	FATAL ACC	. 25 Mile IvansevicSlavCar-droppe		. 25 Tony VelatteItalianLaborel	. 17 Martin AtidaMexicanBucket-dumper	28 Paul TennantAmericanWeighe	28 Ben FallattiItalianMin

REPORT ON COKEDALE EXPLOSION

Denver, Colorado, March 20, 1911.

Hon. John F. Shafroth,

Governor of Colorado.

Dear Sir: Herewith I beg to submit to you my report covering the findings of my investigation of the Cokedale explosion, which occurred on February 9, 1911, at 9 p. m. I arrived at the scene of the disaster on the 11th, and, accompanied by Messrs. Oberding and King, proceeded to make a careful examination of the workings of the mine, to ascertain the probable cause of the explosion, which cost the lives of seventeen men.

LOCATION OF MINE

The Cokedale property is situated in what is known as the Reilly Canon, nine miles west of the town of Trinidad, Las Animas County, and is connected by a spur with the main line of the Denver & Rio Grande Railroad. It is owned and operated by the Carbon Coal and Coke Company, with Mr. Frank Guiterman in charge as general manager and Mr. F. P. Bayles, as superintendent.

DESCRIPTION OF MINE AND MODE OF WORKING

The coal seam of this mine is of the bituminous coking variety, averages about six feet in thickness, and is very impure. The mine has been operated about four years, and at the time of the accident had a daily producing capacity of 1,200 tons. The mine is opened by a slope and air-course, and is worked by the double entry room and pillar method. The workings are laid out in blocks or sections, named alphabetically, and three sections are being worked; to-wit, A, B, and C. There are three pairs of entries working in C, which are being pushed to the boundary line of this section. The idea is to do all the development work in Section C while the coal in Sections A and B is being worked out. Thus the innermost rooms are started first, thereby allowing the extraction of the coal mon the retreating instead of the advancing system. The surface being very irregular, the seam crops out in some parts of the canon, and two entries are driven to the surface on the seam.

The slope is equipped with an endless chain for hoisting purposes, electric motors delivering the coal at the bottom of the slope, the electric power being shut off at night before the shotfirers enter the mine.

VENTILATION

There are three intakes; namely, the fifth east, the third south, and the main slope, with a $15' \ge 7'$ exhaust fan. When I inspected the mine on November 7, 1910, I considered it in

a safe and sanitary condition. The ventilation was good and the mine free from explosive gas. The sprinkling system in practice is from pipes under pressure, and in some parts of the mine, where the pipes do not extend, a hose is attached to the end of the water pipe, and the sprinkling is conducted in this manner to points where it is desired. I further considered the hygrometric conditions very favorable. At this time the company had installed a shot-firing system by an electric battery, whereby all shots were fired when all the employes had left the mine, and it was in use when I made my inspection. It seems, however, that there was considerable trouble with this sytem of firing from missed shots, and it was abandoned and shot-firers installed again; and apparently shots were fired when other employes were in the mine.

CHECKING IN AND OUT SYSTEM

At the entrance to the fifth east, where all employes pass, a checking in and out station is situated, and as the men enter the mine, each one is given a check, which he returns to the checkman when he comes out.

CHARACTER OF EXPLOSION AND RESCUING

When the explosion occurred, it was heard very distinctly in Trinidad. Deputy Inspector King, who happened to be there, hurried at once to Cokedale, and found that the fan was not damaged, although part of the force came out through the aircourse and the fan-house. He immediately, accompanied by others, entered the eighth west, reaching the inner workings of Section C about 1:30 a. m. This fact leads me to believe that, if the eight miners working in this section had remained in their working places, they would have been saved. Deputy Inspector Oberding was in Walsenburg. When he heard of the explosion, he too hastened to Cokedale; but I was not notified, and learned of it only the next day through the morning papers. I took the first train out from Denver and, upon arriving there, accompanied by Superintendent Bayles, Firebosses Jones and Brown, and Deputy Inspectors King and Oberding, entered the mine, and found that very little damage had been done to the property. We made good progress, exploring the entire mine in three days. l returned to Denver on the 14th, but on the 15th I received a telephone message from Mr. Bayles, asking me to return to make a further examination of the mine before preparing my report. I complied with his request and returned at once. This time I was accompanied by Deputy Inspectors Douthwaite and King. and the mine was again carefully examined.

METHOD OF HANDLING POWDER AND PRIMERS, AND THE FIRING OF SHOTS

Powder and primers were handled exclusively by the shotfirer—a corps consisting of nine men. The powder was taken into

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the mine in a car, under the supervision of the chief shot-firer. Upon reaching the different sections where shots were to be fired, part of the powder was taken out and loaded into other cars, and one was hauled to each district. The amount of powder carried into the mine on the night of the explosion was 2,157 sticks, or about 540 pounds. Part of it was No. 2 Hercules 40 per cent Giant; and part of it consisted of Aetna B—a permissible powder, with which it seems they were experimenting, with the intention of using it exclusively if it proved satisfactory. The shotfirers' records show that they had refused to fire some shots, because the miners had not cleaned out the drillings in the holes, and in some cases because of dependent shots. I found many blown-out shots.

FIRE BOSSES AND COMPANY INSPECTORS AND THEIR DUTIES

There were three men employed as fire bosses and company inspectors. Two acted in both capacities, the other only as inspector. Two of these men examined the mine in the morning before the other employes entered for their day's work. Then one acted as inspector from 7 a.m. until noon, the other as fire boss, while the third started at 7 a. m. and worked until quitting time as inspector. The inspectors had the authority to suspend any miner for disobeying their orders, and before being reinstated the delinquent had to promise to obey in the future. However, notwithstanding the authority of the inspectors, the record of their findings showed that a dangerous rock had been reported for several days, and when I examined the mine 1 found it still hanging. The record of the fire bosses showed that a little gas had been found in the entries of Section C between the third and the sixth of the month. The accumulation of this gas was caused by too great a distance between crosscuts.

CAUSE AND ORIGIN OF EXPLOSION

Although two of the shot-firers escaped from the mine after the explosion, they could give no information relating to its cause, or in what part of the mine it started. Therefore, in determining the point or origin, I had to be guided entirely by the directions the forces traveled, which were indicated by the strewn timbers, the source from which they came, and the direction in which they were blown. While the forces were conflicting in some parts of the mine, it is my opinion—concurred in by Messrs. Oberding, King, and Donthwaite—that the initial point was a working cross cut between Rooms 16 and 17 on the fourth west B, which was being driven from Room 17. The force radiated from here, traveling south to the entry, and east into Rooms 18, 19, 20, 21, and 22. In Room 21 there was evidently an explosion of powder that had been left in the gob. There was a radiation of the force from this point also. Room
22 was the last room shot in the district. The bodies of two shot-firers were found in Room 24. They had tamped two shots in this room, and were preparing the third when the explosion occurred. They were the only ones found near where they were supposed to be when the explosion took place. Therefore, I believe these men were nearer the initial point than any of the other employes. On one side from Room 18 to 22, and on the other side to Room 11, there was evidence of an intense heat having existed, as was shown by the timbers in this locality, which were heavily coked on all sides. The force, going south, divided when it struck the entry, part of it going east, the course of which has already been described above, and the other part west. The latter split at Room 10, which is connected with the fifth west B. It traveled northward up this room, displaced the timbers, allowing the roof to fall. When it reached the haulage cross-cut between the fifth and sixth B, it struck a car that evidently had contained a considerable amount of powder, which it exploded, turning the car upside down and wrecking it. The force from this point traveled north, south, east, and west. The south force, which traveled back through Room 10 toward the fourth west B, carried one of the wheels of the car found on the haulage cross-cut between the fifth and sixth west B. This wheel was found on top of the roof which had fallen after the first force passed through this room. This proves that the wheel was placed there by the last force. Another car was found on the fourth west B entry, at the entrance to Room 8. This car also had powder in it at the time of the explosion, as it was badly wrecked and turned upside down. The door of this car was found in an entry cross-cut about 100 feet east of the car, while one of the hubs was found at Room 6, seventytwo feet west of the car. The fourth west B entry from Room 13 dips west at the rate of 4 per cent, and it is my opinion that this car was left standing on the grade and set in motion probably by the concussion of the explosion, and the powder it had contained exploded while it was in transit. Another car was found on the third south that had had powder in it, which the force exploded. The drawbar of this car was bent downward at both ends until the bumpers rested on the floor, indicating that it had been struck by a straight-downward force. The body of the car was badly wrecked. At the junction of the first and second west B a mule was found, badly singed. He had been hitched to a car containing fourteen sticks of powder, to which the tail chain was still attached, but the mule had broken loose. Twenty-five feet west of this car was a sack, slightly singed, with forty pounds of powder still intact. We discovered numerous blown-out shots, caused by either the shots being too large or the charge too small. Some parts of the mine were found in a very dusty condition; namely, the first, second, and third west B entries, and the rooms off the Japan entry.

CONCLUSION

I believe it was a dust explosion, caused by a blown-out shot and accompanied by an overcharged shot. The force of the explosion was augmented by at least five powder explosions in different parts of the mine. The overcharging of the shot was probably due to an irregularity in the roof, which in this instance came down very precipitately, but uniformly, thereby reducing materially the amount of work necessary for the charge of powder.

All the victims died from suffocation. Two of them were not in the mine at the time of the explosion, but lost their lives in an effort to rescue their fellow-men. One was E. A. Sutton, assistant superintendent of the Cokedale mine, and the other Robert Meek, a resident from Starkville who came to Cokedale to aid in the work of rescue.

Below is a table giving the names, etc., of the persons killed:

No. of

		Single or	Chil
Name of Person Nationality Occupation	Age	Married	dren
Rudolph SeligaPoleMiner		Married	
Andy PodzorskyPoleMiner		Married	3
B. HodbodPoleMiner		Married	3
Likas GozndekPoleMiner		Married	4
Joe MalachPoleHead shot-firer		Married	2
Ludwig KlapuchPoleShot-firer		Married	1
Karl PiechaPoleShot-firer		Married	
Karl FrancisPoleShot-firer		Married	3
Andy RanevskyPoleShot-firer		Married	
John FreischPoleShot-firer	35	Married	2
Joseph MakroshPoleShot-firer	35	Married	• •
Doniono TabarelliTyroleseMiner	37	Single	
Fortunato ZanotItalianMiner	33	Married	21
Valantine TretterAustrianMiner	35	Married	4
Joe GhezziAustrianMiner		Single	
E. A. SuttonAmericanAssistant Superintendent		Single	
Robert MeekAmericanMiner	48	Married	5

Respectfully submitted,

[Signed]

] JAMES DALRYMPLE, State Coal Mine Inspector.

IMPROVEMENTS IN 1911

BOULDER COUNTY

Monarch No. 2: Improvements in tipple. Scales were moved back near the shaft, and two sets of goose-necks put in where there was only one set before; into the coal chute, two shaker screens and lengthened the chute. Improvements at bottom of shaft. Took three feet of rock down in roof and raised the cage rest three feet, reducing the grade of track at bottom of shaft 2 per cent.

Centennial: Entry awning; building five houses for men employed in and about the mine; extending electric power in mine for light, pumps, and hoist, and for lighting and wiring the houses.

Nonpareil: Nothing but entry work, which blue-print to be filed January 1 will show.

Standard: New houses built on top. Electric haulage system, electric lights, and running water installed. New five-foot Booster fan installed in pit. New rails, mules, pit cars, etc., purchased. New development work pushed on new lease of 320 acres.

Senator: New boiler and new well. We have also done about 600 feet on entry.

Matchless: Only the work of regularly opening up works. An attempt was made to work long wall, but it did not prove feasible. Room and pillar work was resumed.

Capitol: New overcast in fifth northwest entry. This increases the area from six square feet to twenty-two square feet. All airways timbered; slate falls cleaned up; haulage roads timbered and brushed; all tracks repaired. Bottom of downcast shaft repaired, mechanical alterations made, and the steam from the fan turned into the downcast shaft, thereby keeping it from freezing and causing the air to retain a certain amount of moisture, which keeps the coal dust damp. Fourth southeast entry cleaned up and brushed. New track laid and new air lines put in for a distance of 800 feet. This will open up a new coal district. The boilers on the surface repaired, new combustion chambers and fire grate walls built, and new tracks made to take coal into the boiler-house. Various rooms and pillars, that were lost by caves, opened up and worked. Repairs in progress to open up first southeast. These improvements were all made since October 9, 1911.

DELTA COUNTY

Farmers' (Paonia Coal Company): Completed air-course; built chimney and furnace; driven main entry about 200 feet, and turned six new rooms. Black Diamond: 572 feet of entry work done Room 14; turned ready to pull coal out when needed.

King: Stone stoppings, stone and cement overcasts; fan sixteen feet; sprinkling system; two boilers; railroad-track scale. Cedaredge: Eighty feet of entry driven.

EL PASO COUNTY

Curtis: Only usual developments. Keystone: 1,708 feet of entry; 50 feet of cross-cuts. Rapson No. 2: Only usual development work. Patterson: New air-shift.

FREMONT COUNTY

Royal Gorge: Drift 192 feet west from four-foot vein on fifth level, opening up new six-foot vein; 400 feet of entry north and 400 feet south driven on six-foot vein; 250 feet of entry on four-foot vein, seventh level.

Nonac: None.

Rockvale: Sprinkling car; 7,398 feet of entry driven.

Coal Creek: New boiler installed; sprinkling car; fan, fanhouse, and engine; power lines, etc.; 5,608 feet of entry driven.

Fremont: Sprinkling car; 3,150 feet of entry driven.

Willie: Wagon road to mine and bridge, amounting to \$200.

Chandler: Fireproof underground stable, steel head frame over air-shaft, mine telephone, and other mining machinery, \$9,000.

Radiant: Well and pipe lines for water supply; mine pump; shop buildings, tramways, and mining machinery; \$10,000.

Colorado Central: Air-shaft sunk to depth of 800 feet; entries driven continuously to form connection with air-shaft when completed.

Emerald: Opened up two entries in bottom of slope; graded slope; built dirt dump car; installed engine for hauling same; cleaned up entry that had fallen in for several years.

Magnet: Installed electric mine hoist.

GARFIELD COUNTY

Sunshine Canon: No development work; new tifteen-ton locomotive.

Vulcan: Completed equipment; opened up the No. 3 level by driving through fire in the Wheeler seam.

Midland: Completed installing new plant and driving new slope entry.

GUNNISON COUNTY

Bulkley: Drove about 3,000 feet of new entries and aircourses. Crested Butte: Sprinkling system, two hydraulic cartridges, 862 feet of entry driven, \$6,000.

Floresta: 2,378 feet of entry driven.

Porter: A lower vein being opened by drift.

Horace: An air-shift completed.

HUERFANO COUNTY

Rockland: Delayed in development by immense flow of water. Drove entries about 800 feet.

Turner: Built tipple 200 feet long; put in boiler and engine.

Pryor: Electric hoist underground; new fan; new coal-cutting machine.

Pictou: Sprinkling system, turbine pump, small electric hoist, \$4,800; 5,658 feet of entry driven.

Big Four: Installed coal conveyor to boiler-house; one eighty-ton coal bunker; one pea-coal elevator with eighty-ton bunker; one 25-H.P. engine for above; one steam heater for heating water for boilers.

Beacon: New tipple.

Robinson: Sprinkling car; 6,066 feet of entry driven.

Ideal: Ventilating fan and motor, barn and corral, office and warehouse, water system, sprinkling system, power plant, mining machinery, \$23,000; 3,262 feet of entry driven.

Cameron: Barn and hay storage, \$800; 2,468 feet of entry driven.

Walsen: Two Sullivan mining machines, sprinkling system, fifty pit cars, hydraulic cartridges, \$14,000; 5,183 feet of entry driven.

Hezron: Sprinkling system; no entry driven.

Lester: Sprinkling system; exciter for power plant; thirty tons of twenty-five-pound rails; 10,638 feet of entry driven.

Rouse: Power line to Hezron, \$2,000; 5,333 feet of entry driven.

Maitland: Tanks and pipe lines for sprinkling system, electric mine lamps, and other mining machinery, \$5,000.

Sunnyside: New conveyor; relaid track in mine with heavier steel; new rooms; track scales; continued entry and started fifth and sixth dips.

Pinon: Circular picking-table.

Loma: 2,000 feet of entry driven; one tipple for wagon mine; one Jeffery short wall mining machine.

Breen: 100 feet of entry; one pneumatic mining machine; one Jeffrey mining machine; one motor generator set; one new tipple; one new railroad track; one new railroad-track scale.

Rugby: Commenced work on new seam of coal and equipped same; installed electric hoist.

Reliance: Main slope driven 550 feet; slope air-course, 500 feet right side; slope air-course, 150 feet left side; first west en-

try, 500 feet; first west entry air-course, 500 feet; first east entry, 400 feet; first east entry air-course, 375 feet. Installed temporary tipple, boiler, hoist.

Ravenwood: Tenant-houses, wells and pipe lines for water suply, wagons, fire apparatus, pit cars, and other machinery, \$415,000.

Oakdale: 4,900 feet of entry; put in 4,000 feet of pipe line for sprinkling purposes, and one pump; made new man-way to slope workings. Both mines have now four escape-ways for the men.

Black Canon: 100 feet of entry. Gordon: New slope, about 600 feet. Globe: New fan installed.

JEFFERSON COUNTY

Leyden: The shaft and plant destroyed are being completely rebuilt. An entirely new shaft and plant are also under construction.

LAS ANIMAS COUNTY

Thor: Tail rope haulage system.

Beacon: Installed five small electric pumps for gathering water to main pump. Also, Deming triplex in new slope, which is being opened; same motor-driven. Also 375 H. P. capacity for slope hoisting, and 50 H. P. capacity hoist for handling coal on the outside tram; both of above motor-driven. 5 x 10 Jeffrey fan, motor-driven.

McLaughlin: Two new railroad tracks, \$2,200; new pass-by, \$325; new furnace, \$125; electric motor, \$290; new pit cars, \$300; steel rails, \$700; development work driving entries, \$9,000.

Empire: Slope and entries driven steadily; box-car loader and additional pump installed.

Morley: One Worthington pump, \$500; sprinkling system, \$6,000; lathe for machine shop, \$800; sixty tons of twenty-fivepound rails for entries, and 7,850 feet of entry driven.

Ludlow: Electric power plant erected.

Wootton: New opening Turner No. 2.

Primero: Sprinkling system, \$5,600; ten tons of twenty-fivepound rails, \$350; 7,863 feet of entry driven.

Sopris: Wiring buildings for lights, \$600; thirty-five tons of forty-pound rails, \$1,100; 50-II.P. motor for washery, \$600; fifty pit cars, \$4,700; sprinkling system, \$4,000; 3,819 feet of entry driven.

Engle: 696 feet of entry driven.

Viola: 1,600 feet of entry.

Starkville: Ventilating fan and motor, \$5,500. No entry driven.

Bowen: Locomotives, pit cars, and other mining equipment, \$5,000. Gray Creek: Mine fan, Larry cars, pumps, laboratory and equipment, and other mining machinery, \$12,000.

Delagua: Electric power plant and building; tipple and tipple machinery; four sets of track scales; blacksmith shop, tools, and equipment; pit-car scales; addition to stable; doctor's office; sprinkling system; two box-car loaders, and other tools and equipment; \$76,500.

Jewel: Have driven 1,000 feet of entry; installed one Jeffrey mining machine.

Tercio: Sprinkling system, \$3,000; 2,019 feet of entry driven. Piedmont: Extended electric haulage system.

Cass: Mine office; blacksmith shop, tools, equipment; powder-house; fire apparatus; locomotive; pit cars, and other mining equipment; \$6,000.

Hastings: Fan, electric safety lamps, instruction car, helmets, reviving apparatus, water tank surplus, patrolman clock system, and mining machinery, \$15,000.

Frederick: 9,390 feet of entry driven; sprinkling system, \$1,500.

Berwind: Sprinkling system, \$4,500; Stine fan and motor, \$1,500; fifty pit cars, \$4,000; water tank, \$1,200; electric hoist, \$6,500; 15,395 feet of entry driven.

Tabasco: Sprinkling system; sinking pump; station pump and pipe lines; trap to dump; coke braize; 4,148 feet of entry driven.

Cokedale: Installation of a foreign coal-handling plant; capacity, 1,000 tons per day. Started to open up new mine, to be known as Mine No. 3. The introduction of coal-cutting machines.

Forbes: New screens; 2,000 feet of new entries.

Black Diamond: The improvements and development work done during the year were prospecting for the upper veins by putting upraises; also by putting manholes on the slope and having them whitewashed.

Greenville: Opened same vein across canon in $SW^{1/4}$, $SW^{1/4}$, Sec. 31. Land belonging to D. M. H. Installed electricity for fan power and new mine hoist. Installed 3 x 10 Cole fan, driven by 15-H.P. motor. Sunk airshaft face eleventh east entry as air intake.

Toller: Drove third slope parallel to main slope, to be used as air-split and man-way. Equipped main shaft hoist to work with electricity in conjunction with steam. Equipped electric hoist 30-H.P. to pull coal from dip entries off fifth north. Installed electric safety lamps.

Southwestern: Water-pumping and filtration plant installed, supplying water for camp and steam plant. Three electric hoisting engines installed: one 60-H.P. hoist on the outside, and two 50-H.P. hoists inside mine workings. New shaking screens, electrically driven, installed. Two new openings made; one on the lower vein and one on the upper vein. Coal being taken from both openings at present time.

Baldy: New air-shaft finished.

Alta: Main entry driven 600 feet. Plane and tipple built in December, 1910. Cost of improvements, about \$10,000.

Brodhead No. 9: Two and one-half mile tram; 2,000 feet of main entry; change in hauling from steam to electric.

Royal: Reopening the main shaft and air-shaft; pumped the water out of mine; cleaned the old entries and air-courses, and cleaned the mine of gas; drove new slopes and entries; installed a powerful fan; built a tipple; put in scales; built a boiler- and engine-house.

LA PLATA COUNTY

Hesperus: Installation of mine telephone system; $246\frac{1}{2}$ yards of main entry.

City: Upraise to old workings for ventilation and escapeway.

Perin's Peak: Installed small fifteen-horsepower hoist; also electric drill for rock.

MESA COUNTY

Nearing: Some entry work; about 100 feet of tunnel.

P. V.: Drove new slope 500 feet.

Palisade: None, except regular entry driving and the construction of incline plane to lower coal from hill works.

Stokes: Driving down slope 100 feet.

Grandview: One cross-entry for air, almost completed; one twenty-foot air-stack.

Garfield: Main slope extended; new rooms opened; new air-course to outside, now almost completed.

PITKIN COUNTY

Gulch: Sprinkling system; 1,845 feet of entry driven.

ROUTT COUNTY

Juniper: Electric plant; new compressor; new fan; new inside electric hoist; 100 new pit cars; new blacksmith shop; new wash-house; ten new cottages; concrete water tank, holding 35,000 gallons, for domestic use and fire protection.

Electric: A double entry has been driven in the ten-foot seam 600 feet, and is abandoned in the meantime. Five hundred feet of entry has been driven in the seven-foot seam, and have now four rooms.

WELD COUNTY

Alpha: Shaft sunk 200 feet, and about 2,000 feet of en tries and cross cuts driven.

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Parkdale: Installed new electric pump; electric lights in buildings.

Warwick: Built a mine bath-house; also a terrace and cook-house.

Firestone: 500 feet of entry driven; eleven rooms turned; new shaft commenced November 16; top work done and down twelve feet.

Andrew: About 1,000 feet of underground development; sunk shaft, 8 x 16 feet, 340 feet depth; and, in fact, done all the greater part of our necessary development work, with exception of big machinery, railroad scales, and equipment for large shaft.

Shamrock: 300 feet of entry, and opened six rooms.

Tables 8 to 24, inclusive, show by counties the names of mines and operators, the post-office addresses of the mines, the thickness of the coal-beds under operation, the kind of openings, the character of the coal, the total number of days worked, the average number of men employed, and the total production of each mine for the year of 1911.

Name of Mine Name of Operator	Post-Office Station of Lacation of Mine Mine	Thickness of Coal-Bed Under Operation	fo bniM gnin9qO	Character of Coal	Xo. of Days Worked	Агетаде Хо. 01 Меп Етрјоуед	Total Produc- tion. (Tons.) of 2,000 lbs.)
SimpsonRocky Mountain Fuel Co	Lafayette	71/2 ft.	Shaft	Lignite	149	119.6	122, 386
VulcarRocky Mountain Fuel Co	Lafayette	6 ft.	Shaft	Lignite	138	51.4	57,541
MitchellRocky Mountain Fuel Co	Lafayette	6 ft.	Shaft	Lignite	35	38.5	6,016
Rex No. 1Rocky Mountain Fuel Co	I.ouisville	61/2 ft.	Shaft	Lignite	165	81.6	79,077
Rex No. 2Rocky Mountain Fuel Co	Louisville	5 ft.	Shaft	Lignite	206	21.2	20,549
Heela Rocky Mountain Fuel Co	Louisville	5 ft.	Shaft	Lignite	168	74.3	52, 641
IndustrialRocky Mountain Fuel Co	Superior	6 ft.	Shaft	Lignite	214.5	115.1	82, 961
GolhamRocky Mountain Fuel Co	Gorhanı	6 ft.	Slope	Lignite	212.5	91.2	71, 975
StandardStandard Coal & Land Co	Iafayette	6 to 9 ft.	Shaft	Lignite	214	118.6	133, 653
Monarch No. 1National Fuel Co	Downer	$\overline{3}^{1/2}$ to 7 ft.	Shaft	Lignite	249	128.2	96,361
Monarch No. 2National Fuel Co	Broomfield	41/2 to 9 ft.	Shaft	Lignite	197.5	50.6	42, 566
CapitolColorado Capitol Coal Mining (Co. Lafayette	6 ft.	Shaft	Lignite	232.5	85.5	54,519
NonpareilBrooks-Harrison Fuel Co	I.ouisville	9 to 10 ft.	Shaft	Lignite	275	26.1	26, 316
FoxFox Coal Mining Co	Corham	8 ft.	Shaft	Lignite	226	47.3	25,663
CentennialCentennial Coal Co	Louisville	6 ft.	Shaft	Lignite	250	28	14,121
Summit	I.afayette	5 ft.	Shaft	Lignite	257	22.3	13, 158

BOULDER COUNTY

FIFTEENTH BIENNIAL REPORT

Matchless	Matchless Coal Co	Louisville	4 to 6 ft.	Shaft	Lignite	219	40.6	14, 647
Sunnyside	Big Six Coal Co	Louisville	5 ft.	Shaft	Lignite	291.5	23.2	10, 208
Strathmore	Strathmore Fuel Co	Lafayette	6 to 10 ft.	Shaft	Lignite	273	26	8,878
Senator	American Fuel Co	Lafayette	7½ ft.	Shaft	Lignite	135	13	3, 000
							-	
Total number o	f mines in operation	20				206.9	1,208.3	936, 802
		TABL	E 9					
			[
		DELTA CO	YTNUC					
		nce To noi Tce	fo sse b98 noit	.Su	ri ter	ba Says	oV e n No.	oduc- (Tons.) (Ibs.)
Name of Mine	Name of Operator	tO-faoq bAddre tsool aniM	Thicknee Coal-J Dader Opera	îo bni≯ in∍qO	torract 60D 10	No. of I Worke	olqmU SACTAE M To M To M	Total P: tion. 00,2 lo
King	Juanita Coal & Coke Co	Bowie	9 to 14 ft.	Slope	Bituminous	177	66.4	54,695
Farmer	Paonia Coal Co	Paonia	7 to 9 ft.	Drift	Bituminous	237	6.8	4,230
Cedaredge	Surface Creek Co-Operative							
	Coal Co.	Cedaredge	7 to 8 ft.	Slope	Bituminous	318	10	4,078
Black Diamond	Cowan Coal Co	Paonia	16 ft.	Drift	Bituminous	150.5	-71	2,952
Leroux Creek	Leroux Creek Coal Co	Hotchkiss	• • • • • • • •	Slope	Bituminous	35	¢1	350
Hotchkiss	Hotchkiss Fuel & Supply Co	Hotchkiss	• • • • • • •	Drift	Bituminous	65	сı	255
Total number o	f mines in operation	6				163.7	86.2	66, 630

INSPECTOR OF COAL MINES, COLORADO

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	EL PASO COUNTY					(S
vame of Operator	Post-Office Address or Location (f Mine Mine Coal-Bed Under Under	fo briiX Znin9qO	Character of Coal	No. of Days Worked	Average Xo. of Men Employed	Total Produc tion. (Tons of 2,000 lbs.)
a's Peak Fuel Co		t. Shaft	Lignite	239	120.3	120, 313
e's Peak Fuel Co	Colorado Springs6 to 181	t. Slope	lignite	271	30.2	37, 257
tis Coal Mining Co	Colorado Springs 9 to 12 f	t. Shaft	Lignite	277	71.4	74,646
sson Coal Mining Co	Colorado Springs7 f	t. Shaft	Lignite	241	60.5	56, 651
xander Patterson	Colorado Springs18	ft Shaft	Lignite	259	48	21,848
vstone Fuel Co	Colorado Springs	t. Slope	Lignite	307	25	21,240
				82 Marcon 1997	83 merenen	Ì
mines in operation	9			265.6	355.4	331, 995

FREMONT COUNTY

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T'otal Production (Tor	5 193, 287	116, 620	2 101, 722	5 75, 853	33, 859	38,687	4 19,407	3 18, 321	16,076	3, 2, 3	3,047	2.9.2	
Average No. of Men Joyolamy	4.10.	220	276.1	172.(69.8	91.	48.	34.(36	80	19.	6.	
No. of Days Worked	187.7	203.3	139.6	156.1	184	163.2	200	277	203	154	107	201	
Character 01 Coal	Semi-bituminous	Semi-bituminous	Semi-bituminous	Semi-bituminous	Semi-bituminous	Semi-bituminous	Semi-bituminous	Semi-bituminous	Semi-bituminous	Semi-bituminous	Semi-bituminous	Semi-bituminous	
to bniX zninsqO	Shaft	Slope	Shaft	Shaft	Slope	Slope	Slope	Shaft	Slope	Slope	Slope	Slope	
Thickness o Coal-Bed Under Operation	3½ to 4 ft.	3 to 3½ ft.	5 to51/2 ft.	4½ to 5 ft.	3 ft. 10 in.	4½ ft.	$\dots 2^{1/2}$ to $3^{1/4}$ ft.	5 ft.	$\operatorname{veins}_{t \in \mathcal{C}} \underbrace{31/2}_{t \in \mathcal{L}} \operatorname{ft}_{t \in \mathcal{L}}.$	10 0 1 L. 1 111.			
Post-Office Adtess of Location of Mine	CoRockvale	CoCoal Creek	CoWilliamsburg	CoChandler	CoRadiant	CoWilliamsburg	al CoWilliamsburg	& Mining Co., Canon City .	Canon City (4	Florence	Canon City	Florence	
Name of Operator	Colorado Fuel & Iron	Colorado Fuel & Iron	Colorado Fuel & Iron	Victor-American Fuel	Victor-American Fuel	Rocky Mountain Fuel	Williamsburg Slope Co	alColorado Central Coal		ope. Donnelly Coal Co	Brookside Coal Co	Samuel Petry	
Name of Mine	tockvale	Coal Creek	Tremont	Chandler	tadiant	Magnet	Gmerald	Jolorado Centra	toyal Gorge	Villiamsburg Slo	Brookside	Willie	

INSPECTOR OF COAL MINES, COLORADO

623, 044

181.3 1,422.9

Total number of mines in operation..... 12

		GARFIELD COUN	TT		-			
Name of Mine	Name of Operator	Post-Office Address or Location of Snild	Thickness of Coal-Bed Under Operation	to bniM Znin9qO	Character of Coal	Xo. of Days Worked	Average Xo. of Men Employed	Total Produc- tion. (Tons.) of 2,000 lbs.)
MidlandRock	y Mountain Fuel Co	Sunlight		Drift	Bituminous	194	63.5	76,007
VulcanCorye	ell Mining & Leasing Co	Newcastle	14 ft.	Drift	Bituminous	299	45.1	38, 216
South CanonSouth	1 Canon Coal Co.	South Canon	15 ft.	Drift	Bituminous	300	57.6	49, 360
DiamondCardi	iff Coal Co	Sunlight(3 veins)	4, 16 and 12 ft.	Drift	Bituminous	137	7.2	3, 103
						-		
Total number of n ines	s in operation	4				232.5	173.1	166 686

FIFTEENTH BIENNIAL REPORT

GUNNISON COUNTY					
Name of Mine of Mine Post-Office Address or Location of Mine Mine Under Under	to bniX gnin9qO	Tatastad Danagan TaoD To	No. of Days Worked	Averase No. of Men Employed	Total Produc- tion. (Tons of 2,000 lbs.)
SomersetUtah Fuel CoSomerset	Slope	Bituminous	271.5	197	274, 528
Crested Butte Colorado Fuel & Iron Co Crested Butte5 to 14 ft.	Drift	Bituminous	187.1	180.2	107, 255
Florester	Slope	Anthracite	165.7	132.8	54, 613
KublerBaldwin Rocky Mountain Fuel CoBaldwin5½ ft.	Drift	Semi-bituminous	102.2	45.4	18, 795
AlpineRocky Mountain Fuel CoBaldwin51/2 to 7 ft.	Shaft	Semi-bituminous	ŝ	74	920
Upper, 15 ft.;					
Porter	Drift	Bituminous	258	51.2	55, 510
Horace	Slope	Anthracite	155	23.7	9, 385
BulkleyCrested Butte Coal Co Crested Butte ft.	Slope	Bituminous	217	35	47,288
		•			
Total number of mines in operation			169.9	739.3	568, 294

Name of Mine	Name of Operator	Post-Office Address or Location of Mine Cosl-Bed Cosl-Bed Under Under	to brii BrinsqO	Character of Coal	No. of Days Worked	Averase No. Fmployed of Men	Total Produc- tion. (Tons of 2,000 lbs.)
Robinson	Colorado Fuel & Iron Co	Walsen	Slope	Bituminous	190.4	294.4	207, 520
Walsen	Colorado Fuel & Iron Co	5 to 6 ft.	Slope	Bituminous	126.1	187	101,998
Rouse	Colorado Fuel & Iron Co	Rouse6 to 7 ft.	Slope	Bituminous	176.6	266	189, 206
Lester	Colorado Fuel & Iron Co	l.ester	Slope	Bituminous	168.6	270.5	144, 750
Pictou	Colorado Fuel & Iron Co	Pictou	Slope	Bituminous	196.8	197.2	102, 551
Ideal	Colorado Fuel & Iron Co	Ideal to 4 ft.	Slope	Bituminous	166	134	73, 897
Cameron	Colorado Fuel & Iron Co	Farr $^{21/2}$ to 5 ft.	Slope	Bituminous	218.4	93.8	46,011
Hezron	Colorado Fuel & Iron Co	Hezron5 ft.	Slope	Bituminous	120.8	73.8	38,101
Ravenwood	Victor-American Fuel Co	Ravenwood $\dots 2^{1/2}$ to 3 ft.	Slope	Bituminous	249	125.5	68, 967
Maitland	.Victor-American Fuel Co	Maitland4½ ft.	Slope	Bituminous	193	86.6	55, 805
Oakdale	Oakdale Coal Co	Oakview14 ft.	Slope	Bituminous	210	186.5	192, 963
Pryor	Union Coal & Coke Co	Pryor (2 veins).4 ft. & 6 to 7 ft	Slope	Bituminous	133.9	131	80,906
Big Four	Big Four Coal Co	Tioga to 8 ft.	Slope	Bituminous	150.5	64.9	49,967
Tolter	Fruith & Autrey	Walsenburg31/2 ft.	Slope	Bituminous	166.5	87	47, 445
Huerfano	Ifuerfano Coal Co	Walsenburgf1/2 ft.	Shaft	Bituminous	152.3	86.4	47,298
Pinon	Rocky Mountain Fuel Co	McGuire	Shaft	Bituminous	118	58.8	41,800

HUERFANO COUNTY

FIFTEENTH BIENNIAL REPORT

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RugbyRugby Fuel CoRugby Fuel Co	Slope	Bituminous	215	58.9	41, 333
TiogaTioga Coal Coal CoTioga	Slope	Bituminous	136.8	62.2	41, 132
SunnysideSunnyside M. Coal CoStrong51/2 ft.	Slope	Bituminous	117	69.2	39,768
Globe	Shaft	Bituminous	189	77.4	24,070
GordonGordon Coal Co	Slope	Bituminous	133	50.5	22, 959
Round OakAlliance Coal CoRavenwood3 ft. 2 in. & 41/2 ft.	Slope	Bituminous	113.4	38,3	17, 625
Reliance	Slope	Bituminous	289.5	18.1	5, 301
LomaLoma Fuel Co	Slope	Bituminous	146	40.4	10, 522
BreenBreen Coal Mining Co	Slope	Bituminous	137	20.8	10,415
Black CanonNew Maitland Coal Co	Slope	Bituminous	87.4	23.5	9, 305
CaddellBlack Canon Fuel CoWalsenburg41/2 ft.	Slope	Bituminous	110.4	27.4	8, 624
BeaconColorado Coal Selling CoStrong6 ft.	Slope	Bituminous	64	19	2, 775
TurnerTurner Coal Co Strong 8 ft.	Slope	Bituminous	42	32.5	2,600
Bunker HillBunker Hill Coal CoRouse ft.	Drift	Bituminous	25	45	2, 303
RocklandWalsenburg Fuel Co	Shaft	Bituminous	20	40	200
Total number of mines in operation 31			147.5	2,996.6	1,728.420

INSPECTOR OF COAL MINES, COLORADO 45

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FIFTEENTH BIENNIAL REPORT

		TABLE 15							
		JACKSON COUNTY							
Name of Mine	Name of Operator	Post-Office Address or Location of Mine Mine	Thickness of Coal-Bed Under Operation	to briM Znin9qO	Сһатасtег	1800 10	No. of Days Worked	Average No. of Men Employed	Total Produc- tion. (Tons of 2,000 lbs.)
Coalmont	Northern Colorado Coal Co	Hebron	65 ft.	Slope	Semi-bit	tuminous	40	57	1,000
Total number of 1	mines in operation						40	- 52	1,000
		1.A 51.E 10							
		JEFFERSON COUNTY							
Name of Mine	Name of Operator	Post-Office Address or Location of Mine		Thickness of Coal-Bed Under Operation	to briX BrinsqO	Character of Coal	Xo. of Days Worked	Average No. of Men Employed	-pubort 1510 t tion. (Tons (.sdl 000 15s.)
White Ash1	Rooney White Ash Coal Co.	Morrison	* * * * * * * * * * * *	11 ft.	Shaft	I.ignite	151	6.3	935
							-	1	Ì
Total number of r	nines in operation	1					151	6.3	935

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Name of Mine	Name of	Operator	Post-Office Address or Location of Mine	Thickness of Coal-Bed Under Operation	to bniX znin9qO	Tharacter Iso') to	X0. of Days Worked	Average No. of Men boyolqmA	Total Produce tion, (Tons (12,000 lbs.)
BerwindCo	lorado Fuel &	Iron Co	Berwind	2 to 6½ ft.	Drift	Bituminous	270	525.4	372, 130
FrederickCo	lorado Fuel &	Iron Co	Valdez	5 to 9 ft.	Drift	Bituminous	202.3	378.9	335,011
MorleyCo	lorado Fuel &	Iron Co	Morley	4½ to 8 ft.	Slope	Bituminous	209.5	355.7	234,785
PrimeroCo	orado Fuel &	Iron Co	Primero	6 to 9 ft.	Drift	Bituminous	213.5	321.8	233, 349
StarkvilleCo	orado Fuel.&	Iron Co	Starkville	6 to 7 ft.	Drift	Bituminous	213	325.6	168,301
SoprisGo	orado Fuel &	Iron Co	Sopris31/	2 to 4½ ft.	Drift	Bituminous	281.7	207.5	151,155
TercioCo	orado Fuel &	Iron Co	Tercio	4 to 6 ft.	Drift	Bituminous	213	139.3	102, 266
TobascoCo	orado Fuel &	Iron Co	Tabasco	6 to 8 ft.	Slope	Bituminous	274.5	96.8	91,164
Engle	lorado Fuel &	Iron Co	Engleville	5 to 7 ft.	Drift	Bituminous	17.6	154	14.5:0
DelaguaVi	stor-American	Fuel Co	Delagua	5 to 7 ft.	Slope	Bituminous	252	611.3	494, 548
HastingsVi	stor-American	Fuel Co	Hastings	4 to 9 ft.	Slope	Bituminous	284.9	250.4	286, 259
BowenVi	stor-American	Fuel Co	Bowen	5 to 6 ft.	Drift	Bituminous	242	208.5	249, 197
Gray CreekVi	stor-American	Fuel Co	Gray Creek	3 to 5 ft.	Drift	Bituminous	275.7	187.3	159, 271
CassVi	stor-American	Fuel Co	Delagua	5 ft.	Drift	Bituminous	2.9	61.6	14,388
PiedmontRo	cky Mountain	Fuel Co	Piedmont	31/2 to 7 ft.	Slope	Bituminous	264	196.9	228, 346
MajesticRo	cky Mountain	Fuel Co	Majestic4 ft. 6 i	in. to 9 ft.	Drift	Bituminous	300	87.1	S6, 1SS

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TABLE 17

IAS ANIMAS COUNTY

INSPECTOR OF COAL MINES, COLORADO

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V (true of Mirie	Name of Opera of	Post-Office Address or Location of Aline Coal-Ded Coal-Ded Under	to briz zninsqO	'haracter of Coal	Vo. of Days Worked	Verage Xo. of Men Employed	Total Produc- tion. (Tons of 2,000 lbs.)
Cokedale	Carbon Coal & Coke Co		Slope	Bituminous	209	263.6	295, 925
Toller	Cedar Hill Coal & Coke Co	Tollerburg 5 to 6 ft.	Shaft	Bituminous	260	130	145, 158
Greenville	Cedar Hill Coal & Coke Co	Ludlow5 to 6 ft.	Slope	Bituminous	212	50.6 -	91, 815
Block Dinmond	Cedar Hill Coal & Coke Co	Cedarhurst3 ft. 8 in.	Slope	Bituminous	68.9	29.2	7,485
Forbes	Chicosa Fuel Co	Forbesfft.	Drift	Bituminous	200.5	155.6	108,119
Kenneth	Chicosa Fuel Co	Tabasco fft.	Drift	Bituminous	250	56.3	74, 414
W + tton-Turner	Wootton Land & Fuel Co	Wootton5 ft.	Drift	Bituminous	272.4	134.5	128, 731
Beacon	National Fuel Co	Beacon3 ft. 8 in. to 4 ft. 8 in.	Slope	Bituminous	186	94.8	53, 357
Thor	National Fuel Co	Bowen5 to 6 ft.	Drift	Bituminous	160	90.1	52, 641
Empire	Empire Coal Mining Co	Aguilar5 to 7 ft.	Slope	Bituminous	268.7	75.3	75, 2.0
Ludlow	Huerfano Coal Co	Ludlow4 to 5 ft.	Drift	Bituminous	181.8	129.1	61,149
S thwestern	Southwestern Fuel Co	Aguilar4 and 3 ft.	Slope	Bituminous	196.5	81.5	37,542
Rapson No. 1	Itapson Coal Mining Co	Rugby3½ to 4 ft.	Slope	Bituminous	152	51.6	29, 855
Primrose	Primrose Coal Co	Rugby3 ft. 4 in.	Slope	Bituminous	168	62.2	29, 561
Viola	Johnston Coal & Coke Co	Trinidad3 ft.	Drift	Bituminous	211	24.7	27,540
Bloom	Jeffreys Coal Mining Co	7'rinidad5 ft.	Drift	Bituminous	298	21.1	24, 214

TABLE 17-Concluded

LAS ANIMAS COUNTY

ewel	Slope	Bituminous	169.7	47	20, 656
leLaughlin	Slope	Bituminous	230.5	37.5	17,609
srodhead No. 9Rider Coal Co Brodhead to 41/2 ft.	Slope	Bituminous	107	43.3	8,780
	Drift	Bituminous	26	17.6	6, 730
aldyBaldy Coal Communication Communication and Communication and Communication of ft.	Slope	Bituminous	213	8.8	6,909
oyalRoyal Fuel Co6½ ft.	Shaft	Bituminous	122	35.2	5,883
ongoCongo Coal Mining CoAguilar2 ft. 4 in.	Drift	Bituminous	54	20.4	1.684
tarStar Coal Mining CoCedarhurst3 ft. 3 in.	Drift	Bituminous	26	17	949
rodhead No. 4Las Animas Coal CoBrodhead4ft.	Slope	Bituminous	27	14	640
Total number of mines in operation 41			197	5.839.1	4 532 664

INSPECTOR OF COAL MINES, COLORADO 49

		TA.TG A.T	A COUNTY					
me of Mine	Name of Operator	Post-Office Address or Location of Mine	Thickness of Coal-Bed Under Operation	îo briM BringO	Character of Coal	Xo. of Days Worked	Average No. of Men Employed	Total Produc- tion, (Tons of 2,000 lbs.)
's Peak	Calumet Fuel Co	Durango	5 ft	Drift	Bituminous	207.6	62	54,094
rus	Porter Fuel Co	Durango	5 ft.	Drift	Semi-bituminous	127.2	37.2	22, 414
uan	Carbon Coal & Coke Co	Durango	5 ft.	Drift & Sl	ope Bituminous	157	16.7	16, 419
	. Royal Coal & Coke o	Durango		Tunnel	Bituminous	2.49	24.3	14, 279
					2	-		
Total mumbon of	f mines in onerstion		4			185.2	157.2	107, 236

FIFTEENTH BIENNIAL REPORT

MESA COUNT	ΥŢ				
Name of Mine Name Name of Operiator Nine Mine Mine Nine	Coal-Bed Under Vperation Kind of	Teterator IsoD to	No. of Days Worked	Average No. of Men Employed	Total Produc- tion, (Total (.zdl 000 (2 20
Cameo Grand Junction Mining & Fuel Co.Cameo	6 ft. Drift	Semi-bituminous	159	55.5	46, 457
PalisadePalisade Coal & Supply CoPalisade3ft.	10 in. Drift	Semi-bituminous	165.3	18.9	12,011
Book CliffBook Cliff Railroad CoGrand Junction	.14 ft. Drift	Semi-bituminous	66 .	10.5	10, 268
P. VCameo Plateau Valley Coal CoCameo	6 ft. Drift	Semi-bituminous	151	10	8,732
GarfieldGarfield Coal Mining CoGrand Junction	8 ft. Slope	Semi-bituminous	236	7.5	5,515
Stokes	. 8 in. Slope	Semi-bituminous	226	5.6	4,691
GrandViewGrandview Coal Co Palisade4 t	o 5 ft. Drift	Semi-bituminous	189	5.7	2,785
Nearing	41/2 ft. Slope	Semi-bituminous	134	4	1,500
New Mesa GrandNew Mesa Grand Coal CoPalisade5ft.	10 in. Drift	Semi-bituminous	82	\$	425
		I		1	
Total number of mines in operation			160.1	1 20 7	128 06

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INSPECTOR OF COAL MINES, COLORADO

		Character of Coal Wo, of Days Mo, of Days of Men Finployed fion, (Tons fion, (Tons	t Lignite 160 5 1,255	150 5 1, 265			Character of Coal Worked Morked Morked Morked fion. (Tons tion. (Tons tion.	Bituminous 199 120 102,059	190 120 120 1050
		fo bui ZningO	Drift				to bniN znin9qO	Slope	
0	ALN110,	Phickness of Coal-Bed Under Operation	ft. 4 in. to 4 ft.		21	. KLN.	Thickness of Coal-Bed Under Operation	5½ to 10 ft.	
TABLE 2	MONTEZUMA C	ost-Office Address or Location of June	H Mancos3	1	TABLE :	PITKIN COU	Post-Office Address or Lasstion of June	Spring Gulch	
		Name of Operator	Mancos Fuel Co	f mines in operation			Name of Operator	. Colorado Fuel & Iron Co	:
		Name of Mine	Spencer	Total number of			Name of Mine	Spring Gulch	





FIFTEENTH	I BIENNIA	AL REPORT
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	1	ATVUOJ TTUO						
Name of Mine	Name of Operator	Post-Office Address or Location of Mine Mine	Thickness of Coal-Bed Under Operation	lo bniM Znin9qO	Character of Coal	No. of Days Worked	Average Xo. of Men Employed	Total Produc- tion. (Tons of 2,000 lbs.)
Jak Hills	loffat Coal CoC	ak Hill	.7 to 10 ft.	Slope	Bituminous	- 259	104.3	118, 215
Pinnacle	toutt County Fuel CoC	ak Creek	16 ft.	Drift	Bituminous	182	87.2	117,82%
Tuniner	uniper Coal CoC	ak Creek	f to 11 ft.	Slope	Bituminous	282	65.2	67, 038
Vamna Vallev	ampa Valley Coal Co	ak Creek	2 to 14 ft.	Drift	Bituminous	259	50.2	63, 022
Electric	unction City Coal CoC	ak Creek	6 ft.	Drift	Bituminous	911	21	5,954
No. One	V. J. Schnessler	ak Creek	5 to 12 ft.	Drift	Bituminous	35	2	273
							and the second	
Total number of n	aines in operation	9				189.3	329.9	372, 325

Total Production tion. (Ton of 2,000 lbs.	161, 665	95, 697	106, 455	46, 499	32, 135	19,496	10, 734	8,206	6, 752	4,248	2, 319	1,160	-
Average No. of Men Employed	102	83.7	136.9	83.5	47.2	18.9	15.7	10	10.7	19.2	9	53	
No. of Days Worked	259	275	246	213	269	235	213	2.85	290	125	155	50 70 70	
Character of Coal	Lignite	Lignite	Lignite	Lignite	Lignite	Lignite	Lignite	Lignite	I.ignite	I.ignite	I.ignite	Lignite	
lo briM ZninsqO	Shaft	Slope	Shaft	Slope	Shaft	Shaft	Slope	Shaft	Shaft	Shaft	Shaft	Shaft	
Thickness of Coal-Bed Under Under		to 10 ft.				5 ft.		11 ft.	6½ ft.	11 ft.		ton6 ft.	
or to to to to to to to to to to to to to	Erie	Lafayette	l & Coke CoDacona	JoFrederick	and CoFrederick	Fuel CoFrederick	Erie	JoErie	0Firestone	Erie	Erie	Fort Lupt	
ine Name of Op	National Fuel Co.	National Fuel Co.	Consolidated Coal	Frederick Coal C	Evans Coal & La	Rocky Mountain	Ideal Fuel Co	Shamrock Coal C	Firestone Coal Co	State Coal Co	David Brimble	Alpha Coal Co	
Name of M	Puritan	Parkdale	Golden Ash	Frederick	Evans	Warwick	Ideal	Shamrock	Firestone	Andrew	Washington	Alpha	

INSPECTOR OF COAL MINES, COLORADO

TABLE 24

WELD COUNTY

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728.1 495,366

215.6

Total number of mines in operation..... 12

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	Total Tonnage	916, 949	21,003	8 8 9 9	937, 952
	-muX IstoT anevO to red	2, 310	154		2,464
GITT MOOD ANT	Counties	Las Animas	Gunnison		
COMPLEXIVE TWO	lsioT 938nnoT	734, 443	144, 412	59, 097	937, 952
101, 1101	-muN lstoT ber of Ovens	1,828	350	286	2, 464
COMP FRODUCTION,	Companies	Colorado Fuel & Iron Co	Carbon Coal & Coke Co	Victor-American Fuel Co	

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COKE PRODUCTION, 1911, BY COMPANIES AND COUNTIES

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FIFTEENTH BIENNIAL REPORT

TABLE 26 _____

PRODUCTION BY COUNTIES FOR 1911 AND 1912, SHOWING INCREASE AND DECREASE

Counties	1911	1912	Increase	Decrease
Boulder	936, 802	1,053,091	116, 289	
Delta	66, 630	65,218		1,412
El Paso	331, 995	341,885	9,890	
Fremont	623,044	733,188	110,144	
Garfield	166,686	178,456	11,770	
Gunnison	568, 294	559,127		9,167
Huerfano	1,728,420	1,889,300	160, 880	
Jackson	1,000	38,799	37, 799	
Jefferson	935	83,442	82, 507	
Las Animas	4, 532, 664	4, 770, 292	237, 628	
La Plata	107, 236	121,111	13,875	
Mesa	92.384	103, 476	11,092	
Montezuma	1,255		• • • • • • • • • •	1,255
Pitkin	102, 059	74, 182	• • • • • • • •	27,877
Routt	372, 325	441, 002	68,677	
Rio Blanco	500	• • • • • • • • •		500
Weld	495, 366	489, 379		5,987
Mines not reporting, prod-				
uct estimated	70,000	75,000	5,000	
Total tonnage	10,197,595	11,016,948		
Increase in 1912,			819, 353	

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SHOWING BY COMPANIES TOTAL PRODUCTION AND NUMBER OF MEN EMPLOYED FOR EACH FATAL AND NON-FATAL

ACCIDENT DURING THE YEAR 1912

Name of Company or Operator	Fmployed Fotal Yotal		No. Fatal StrebicoA.	Xo, Men Employed per Fatal Accident	Xo. Xon- Fatal Acci- dents	Employed Fatal Acci- dent
lliance Coal Co	63 30, 6	25	•	:	2	31.5
Ipha Coal Co	19.1 5,4	60		•	:	:
Ita Coal Co	12.4 6, 8	35	1	12.4	2	6.2
mador Fuel Co	5.1 2,8	53	1	5.1	:	:
merican Fuel Co	466.3 274, 4	54	1	466.3	10	65
aldy Coal Co	7.6 5,4	60	:		2	3.8
aldwin Star Coal Co	7.5 4,5	31		:	:	
lettis, E. G	58 34, 8	33	:	•	:	:
ig Four Coal Co	47.9 55,8	26	:		6	5.3
dg Slx Coal Co	34 19, 2	72			1	34
lack Canon Coal Co	24.4 18,7	S	2	12.2		:
ook Cliff Coal Commence	11.6 11.6	2.1		:	:	:
reen Coal Co	26.8 23, 1	33	:		1	26.8
rooks-Harrison Fuel Co	27 30, 6					:
rookside Coal Co	10.8 4,2	22	:	•	:	:

FIFTEENTH BIENNIAL REPORT

	29	4, 750	:	:	:	:
	72.1 65	2, 309	1	72.1	:	:
	31.1 2	3, 066	:	:	:	:
• • • • • • • • • • • • • • • • • • •	22.4	4,710	•	:	:	:
* * * * * * * * * * * * * * * * * * * *	224.8 27	8, 528	2	112.4	6	25
- - - - - - - - - - - - - - - - - - -	235 22	5, 994	5	47	00	29.4
	45 5	2, 163	1	45	11	4.5
- - - - - - - - - - - - - - - - - - -	28.3	7,191	2	14.1	:	:
5,	033.8 3,51	6, 103	17	296.1	64	78.7
	181 14	1,323	:	:	9	30
	54.4	2, 955	:	:	:	:
	5.6	3, 663	•	:	:	:
• • • • • • • • • • • • • • • • • • •	27.3	5, 218	1	27.3	44	6.3
	59.5 4	6, 086	:	•	:	:
	6	5, 020	•	*	•	:
	57.7 6	0,472	•	•	мфi	14.4
	45.5	4,649	•	:	:	:
	43.8 1	9, 355	:	:	*	:
* * * * * * * * * * * *	51.5 47	(,999	•	:	:	:
	73.9 5	2,003	1	73.9	1	73.9
- - - - - - - - - - - - - - - - - - -	t-	4, 503	:	•	1	2
* * * * * * * * * * *	6.9	5, 786	•	•	:	:
* * * * * * * * * * * * *	43.9 2	5,507	:	:	:	:
	51.9 6	2, 226	1	51.9	1	51.9

TABLE 27—Continued

SHOWING BY COMPANIES TOTAL PRODUCTION AND NUMBER OF MEN EMPLOYED FOR EACH FATAL AND NON-FATAL

ACCIDENT DURING THE YEAR 1912

Name of Company or Operator	vo, Men Employed	otal Production	o. Fatal Accidents	Vo. Men Employed per Fatal Accident	.o. Non- Fatal Acci- dents	Co. Men Employed Fatal Acci- dent
dotchkiss Fuel & Supply Co	r2 12	T 270	:	:	:	:
fuerfano Coal Co	199.1	125, 492	33	66.3	2	99.5
deal Coal Co	14.9	14,107	•	•	:	:
deal Fuel Co	36.8	15, 586	1	36.8	2	5.3
effryes Coal & Mining Co	14.7	16, 243	:	•	:	:
ohnston Coal & Coke Co	32.6	12, 230	:	:	•	:
uanita Coal & Coke Co	63.5	56, 733	:	:	1	63.5
uniper Coal Co	67.1	59, 090	2	33.5	00 ::	:
a Veta Coal Co	10	1,400	•	•	•	
eroux Creek Coal Co	1	253		:	•	:
eyden Coal Co	214.3	52, 336	1	214.3	2	107
Jittell Coal & Mining Co	53.5	45, 026	:	:	1	53.5
oma Fuel Co	16.6	13, 465	•	:	•	1
felaughlin Bros.' Coal Co	71.2	45, 365	•	:	2	35.2
finnequa Coal Co	49.7	44,219	:	:	ru.	10

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loffat Coal Co	212.8	191, 732	2	106.4	15	14.1
fonument Valley Coal Co	3.7	1,638	:	•	•	:
lational Fuel Co	509.8	462, 981	ŝ	169.9	52	9.8
tew Grand Mesa Coal Co	12.5	1,179	•	:	:	
tew Maitland Coal Co	21.6	15, 889	*	:	:	•
Jorthern Colorado Coal Co	53.2	38, 799	•	:	3	17.7
akdale Coal Co	202.7	222, 364	co Co	67.6	67	101.3
alisade Coal & Supply Co	19.2	10, 313	*	:		:
atterson Coal Co	27.5	23, 117	:	:	:	:
amuel Petry	9	3, 142	•	:	•	:
ike's Peak Fuel Co	140.1	153, 847	•	:	en	47
orter Fuel Co	37.9	25, 066	•	:	:	:
rimrose Coal Co	85.7	48,004	1	85.7	61	42.3
ueblo Fuel & Mining Co	30.5	13, 996	•	:	•	:
. V. Coal Co	5.8	3, 427	:	:		:
apson Coal Mining Co	90.4	68, 369	•	:	ĿQ	18.8
ilder Coal Co	80.8	51, 970	:	:	:	:
ocky Mountain Fuel Co1	, 376.6	1, 189, 424	14	98.3	53	26
coney White Ash	6.3	1,106	:	:	:	:
toutt County Fuel Co	78.1	109, 549	1	78.1	8	9.8
toyal Fuel Co	41	45,050	2	20.5	53	20.5
toyal Coal & Coke Co	21	12, 704	:	:	:	
tugby Fuel Co	56.2	48, 973	:	:	10	11.2
tussell Gates Mining Co	27.5	22, 509	¢1	13.7		

INSPECTOR OF COAL MINES, COLORADO

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FIFTEENTH BIENNIAL REPORT

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SHOWING BY COMPANIES TOTAL PRODUCTION AND NUMBER OF MEN EMPLOYED FOR EACH FATAL AND NON-FATAL

ACCIDENT DURING THE YEAR 1912

Name of Company or Operator	No. Men Moloyed	Total noiteµbor4	Xo. Fatal Accidenta	No. Men Fomployed per Fatal Accident	Vo. Non- Fatal Acci- dents No. Men	Employed Per Non- Fatal Acci- dent
Shamrock Coal Co	12.6	10, 346	:	:	:	•
South Canon Coal Co	71	32, 514	2	35.5	1	71
Southern Colorado Coal Co	\$0.8	51,970	1	80.8	:	:
Southwestern Fuel Co	63	32, S36	1	63	10	13
Star Mining Co	15	1,400	:	•	:	:
State Coal Co	22.6	5, 694	:	:	•	•
Stokes, Walter	8.5	4, 365	•	•	:	:
Sunnyside Coal Mining Co	70.5	50, 119	•	:	0	23.5
Surface Creek Co-Operative Coal Co	10	3, 886	:	:	2	2.5
Tudor Coal Co.	13.2	10,720	:			
Turner Coal Co	8	3,000	:	:	:	:
Union Coal & Coke Co	102.2	100, 440	*	:	3	34
Utah Fuel Co	212	266, 504	•	:	9	24
Victor-American Fuel Co1	720 1,	526, 877	23	75	31	55.5

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Walsenburg Fuel Co	40.5	22, 780		:	:	:
Williamsburg Slope Coal Co	60.5	20, 174	:	:	:	:
Wootton Land & Fuel Co	161.3	138, 666	:	:	:	:
Yampa Valley Coal Co	89.1	80, 625	:	:	1	89.1
					-	-
State of Colorado13,	9:036	11, 016, 948	98	142.66	326	39.3

INSPECTOR OF COAL MINES, COLORADO

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PRODUCTION BY COMPANIES-FATAL AND NON-FATAL ACCIDENTS, 1912

	Tons per	Tons per
	Fatal	Non-Fatal
Name of Company	Accident	Accident
Alpha Coal Co		27,095
Alliance Coal Co		15,300.33
Amador Fuel Co	2, 853	
American Fuel Co	274, 424	54, 885
Baldy Coal Co		2,749.5
Big Four Coal Co		6,203
Big Six Coal Co.		19, 272
Black Canon Coal Co	9, 389	
Breen Coal Co		23,133
Calumet Fuel Co	62, 309	
Carbon Coal & Coke Co	139, 264	27,853
Cedar Hill Coal & Coke Co	45, 199	28, 299. 2
Chicaso Fuel Co	52,163	5,216.3
Colorado Central Coal & Mining Co	3, 595.5	
Colorado Fuel & Iron Co	206, 829.6	54,939.1
Consolidated Coal & Coke Co		23, 554
Crested Butte Coal Co	35, 218	8,804.5
El Paso County Land & Fuel Co		15,118
Fruith & Autrey	52,003	52,003
Grand Junction Mining & Supply Co	62, 226	62, 226
Huerfano Coal Co	41,830	62, 746
Ideal Fuel Co	15,586	2, 226.6
Juanita Coal & Coke Co		56,733
Juniper Coal Co	29, 548	
Leyden Coal Co	82,336	41,168
Littell Coal & Mining Co		45, 026
McLaughlin Bros.' Coal Co		22,682.5
Minnequa Coal Co		8, 944
Moffat Coal Co	95, 866	12, 782.1
National Fuel Co	154, 327	8,903
Northern Colorado Coal Co		12, 933
Oakdale Coal Co	74,121.3	111, 182,5
Pike's Peak Fuel Co		51,282.3
Primrose Coal Co.	48,004	24,002
TABLE 28-Concluded

PRODUCTION BY COMPANIES—FATAL AND NON-FATAL ACCIDENTS, 1912

	Tons per	Tons per
	Fatal	Non-Fatal
Name of Company	Accident	Accider*
Rapson Coal Mining Co		13, 674
Rocky Mountain Fuel Co	84, 244. 4	22,612
Routt County Fuel Co	109, 549	13,693.6
Royal Fuel Co	22,525	
Royal Coal & Coke Co		6,252
Rugby Fuel Co		9, 795
Russell Gates Mining Co	11,254.5	
South Canon Coal Co	16, 257	32, 514
Southwestern Fuel Go	32, 83 6	6,567
Sunnyside Coal Mining Co	• • • • • • • •	16,706.3
Surface Creek Co-operative Coal Co		1,943
Union Coal & Coke Co		33, 480
Utah Fuel Co		29,611.5
Victor-American Fuel Co	66,342.5	49,254.1
Yampa Valley Coal Co	• • • • • • • • •	80, 625
State of Colorado	112, 417.84	30,946.45

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FIFTEENTH BIENNIAL REPORT

• TABLE 29

SHOWING BY COMPANIES NUMBER KILLED AND INJURED PER 1,000 EMPLOYED

No. In-

		No. Killed	jured
	No. Men	per 1,000	per 1,000
Name of Company	Employed	Employed	Employed
Alta Coal Co.	12.4	50.6	161.2
Amador Fuel Co	5.1	196	
American Fuel Co	400.3	2.1	
Black Canon Fuel Co	. 24.4	82	
Calumet Fuel Co	72.1	13.9	
Cedar Hill Coal & Coke Co	235	11.4	38.3
Colorado Central Coal & Mining Co	. 28.3	70.7	
Colorado Fuel & Iron Co	5,033.8	3.4	12.7
Chicosa Fuel Co	45	22.2	000 0
Carbon Coal & Coke Co	. 224.8	8.9	41.2
Crested Butte Coal Co	27.3	36.6	146.5
Grand Junction Mining & Supply Co	. 51.9	19.3	19.3
duerfano Coal Co	. 199.1	15.1	10.4
Ideal Fuel Co.	36.8	27.2	190.2
Juniper Coal Co	. 63.5	31.5	
Leyden Coal Co	. 214.3	46.6	9.3
Moffat Coal Co.	. 212.8	9.4	70.5
National Fuel Co.	509.8	5.9	102
Oakdale Coal Co	. 202.7	14.8	9.8
Primrose Coal Co	. \$5.7	11.7	23.3
Rocky Mountain Fuel Co	1,376.6	10.2	38.5
Routt County Fuel Co	. 78.1	13	102.4
Royal Fuel Co.	. 41	49	
Russell Gates Mining Co	. 27.5	72.7	
Southern Colorado Coal Co	. 80.8	12.4	
Southwestern Fuel Co	. 63	16	79.4
Victor-American Fuel Co	. 1,720.6	13.4	18
South Canon Coal Co	. 71	. 28.2	
Fruith & Autrey	. 73.9	13,5	13.5
Utah Fuel Co	. 212		42.4
Union Coal & Coke Co	. 102.2		29.3
Rugby Fuel Co	56.2		88.9
Pike's Peak Fuel Co.	. 140.1		21.4

TABLE 29—Concluded

SHOWING BY COMPANIES NUMBER KILLED AND INJURED PER 1,000 EMPLOYED

			NO. 111-
		No. Killed	jured
	No. Men	per 1,000	per 1,000
Name of Company	Employed	Employed	Employed
Grand View Coal Co	ĩ		143
Frederick Fuel Co	57.5		17.4
Minnequa Coal Co	49.7		100.6
McLaughlin Bros.' Coal Co	71.2		28
El Paso County Land & Fuel Co	57.7		69.3
Alliance Coal Co	63		31.6
Surface Creek Co-operative Coal Co	5		400
Littell Coal & Mining Co	53.5		18.7
Baldy Coal Co	7.6		263
Consolidated Coal & Coke Co	181		33.2
Sunnyside Coal Mining Co	70.5		42.5
Royal Coal & Coke Co	21	•••••	95.2
Northern Colorado Coal Co	53.2		56.4
Yampa Valley Coal Co	89.1		11.2
Big Four Coal Co	47.9	•••••	187.1
Rapson Coal Mining Co	90.4		55.3
Big Six Coal Co	34	· · · · · · · ·	29.4
Breen Coal Co	26.8		37.3
Juanita Coal & Coke Co	63.5		15.7
State of Colorado	13,980.06	7.055	25.6

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FIFTEENTH BIENNIAL REPORT

TABLE 30

NUMBER OF FATAL ACCIDENTS IN 1912-CLASSIFICATION

Chargeable to mines	98
Underground	5
Surface	2
	-
Total	98
NUMBER OF FATAL ACCIDENTS-CAUSES AND PERCENT	TAGE
No. of	
Causes Accident's	Per Cent
Fall of rock and coal 51	52.0
Mine cars and motors 13	13.3
Gas and dust explosions 17	17.3
Miscellaneous 17	17.4
Total 98	100.0
Number of widows left	

TABLE 31

Number of children left..... 134

NUMBER OF NON-FATAL ACCIDENTS IN AND AROUND THE MINES IN 1912 CAUSES AND PERCENTAGE

Causes	Accidents	Per Cent
Fall of rock and coal	159	44.6
Mine cars and motors	96	27.0
Gas and dust explosions	6	1.7
Miscellaneous	95	26.7
(Defect	050	100.0

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CLASSIFICATION

Serious	Minor	Trivial
167		33
No. Men	No. Killed per 1,000	No. Injured per 1,000
Employed	Employed	Employed
13,890.6		35.6

TABLE 32

FATAL ACCIDENTS IN 1912

of Name of	an Mine County Cause of Accident	HastingsLas AnimasFall of coal	RockvaleFremontFall of coa	StarkvilleLas AnimasFall of coa	OakdaleHuerfanoFall of rock	HuerfanoHuerfanoFall of top coa	RoyalLas AnimasFall of rock	.Black DiamondLas AnimasFall of rock	DelaguaLas AnimasElectrocuted	RoyalLas AnimasFalling down shaft	Perry Perry	HeclaBoulderFall of rock	RobinsonHuerfanoFall of rock	LudlowLas AnimasFall of rock	HastingsLas AnimasFall of rock	SouthwesternLas AnimasCrushed between	HastingsLas AnimasFall of rock	FremontFremontFall of rock	PinonHuerfanoFall of rock	BulkleyGunnisonShowslide falling on him while placing tram car
mber	uildre	:	١Ō	ŗO	:	:	:	:	гo	:	:	:	ŗ0	:	:	:	:	:	ro	3
ingle or Nur	Married Ch	Married	Married	Married	Single	Single	Single	Single	Married	Single	Single	Single	Married	Single	Married	Single	Single	Single	Married	Married
N	Age 1	35	43	44	22	21	54	26	44	23	46	32	45	27	22	32	28	25	33	45
	Name of Person Nationality Occupation	George BurkeColoredMiner	Jos AnizoItalianMiner	Narcisco GarciaMexicanMiner	Henry BeckAmericanTrack-layer	Amthon AthisGreekMachine-helper	John SmithMiner	Matt GregorichAustrianMiner	Abram LubiciAustrianMiner	Rafael SaccomoniItalianNot employed	Frank AnthonyAmericanTop-man	Petco Evanoff PitticoffBulgarianMiner	Guiseppi SassatelliItalianMiner	Jake BollerSlavTimberman	Carmello CincioItalianMiner	John McElweeAmericanRope-runner	Dominic PainchiItalianMiner	Griffith PowellWelshMiner	Ernest MorfordAmericanMiner	Frank OraznerAustrianTram-car loader
	hate Name of Person Nationality Occupation	1. 5 George BurkeColoredMiner	1. 15 Jos AnizoItalianMiner	1. 19 Narcisco GarciaMexicanMiner	1. 22 Henry BeckAmericanTrack-layer	1. 23 Amthon AthisGreekMachine-helper	1. 24 John SmithMiner	1. 27 Matt GregorichAustrianMiner	1. 27 Abram LubiciAustrianMiner	1. 31 Rafael SaccomoniItalianNot employed	9. 1 Frank AnthonyAmericanTop-man	9. 6 Petco Evanoff PitticoffBulgarianMiner	b. 8 Guiseppi SassatelliItalianMiner	9. 16 Jake BollerSlavTimberman	5. 17 Carmello CincioItalianMiner	o. 19 John McElweeAmericanRope-runner	p. 21 Dominic PainchiItalianMiner	o. 25 Griffith PowellWelshMiner	p. 27 Ernest MorfordAmericanMiner	h. 6 Frank OraznerAustrianTram-car loader

INSPECTOR OF COAL MINES, COLORADO

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FATAL ACCIDENTS IN 1912

Date	Name of Person Nationality Occupation /	Age 1	ngle or Number of Name farried Children Min	of e County Cause of Accident
h. `	John KeithMinericanMiner	68	Widower 6 Majes	ticFall of rock
10.10	Wilham HillierMelshMiner	59	Married 6Juni	berRouttFall of rock
11. 2	Fred AcostaMexicanWeigh-boss	35	Single Primr	DseLas AnimasRun over by
di. 15	William GriffithWelshMiner		Single Frem	IntFremont
AL 24	Frank StabingerMustrianMiner	14 1	Married 1 For	JesI.as AnimasRun over by a
h. J	Mik. FergellioMinerMiner	¢1	Single Piedm	ontlas AnimasIslectrocuted
11- 10	Toth Irwin	26	Single Juni	berRouttleall of coal
21	Peter PhyanSlavSlav	66	Married 1 Berw	indI.as AnimasFall of rock
1. 4	Frick ZewerdowskiPoleTrack-layer	51	Married 6 Prim	eroI.as AnimasFall of rock
r 12	Robert ListerScotchMiner	36	Married 3 Coked	aleI.as AnimasIfall of rock
M	Emolis GemezMexicanTimberman	1	Married 3A	ItaLas AnmaisFall of top coal
-	Giocomo Tornuvaceo ltulianMiner	23	Single Mor	leyLas AnimasLeg cut off by heing caught in colls of rope
+ 1	Steve TrifenoffBulgarianCager	21	Single Puri	an
y 14	Chris JacobsonSwedeBox-car man	41	Married 2Monarch No	. 1BoulderRun over by a trip
N 17	Louie Kalh Austrian Machine-runner	.13	Married 1 Matchl	ess
V 21	Silverio VeloMexicanMiner	33	Married Delag	uaLas AnmiasCrushed between
N 25	Kuruchi OkimotoJapaneseMiner	27	Single Lud	owFall of rock
1. 27	John Davis	52	Married Wul	derGunnison Fall of top coal

FIFTEENTH BIENNIAL REPORT

21 Single Toller Las Animas 30 Married 1 Prop. and loaded ca 28 Single Royal Las Animas 25 Single Torrib Las Animas	30 Married 1 Tollerl.as AnimasCrus 28 Single prop and loaded ca 25 Single TorreioRoyalLas Animas	28 Single Royal Royal Las Animas ²⁵ Single Tercio Las Animas	25 Single Terciò Las Animas		47 Married 5 HastingsLas AnimasG	25 Single HastingsLas AnimasG	25 Single IIastingsI.as AnimasG	36 Single HastingsI.as AnimasG	²⁸ Married 1 Hastingsl.as AnimasG	30 Married 1 HastingsLas AnimasG	31 Married 1 HastingsLas AnimasG	3) Married 1 HastingsI.as AnimasG	40 Married 1 Hastingslas AnimasG	36 Married 4 Hastingslas AnimasG	24 Single HastingsI.as AnimasG	40 Married 3 HastingsLas AnimasG	46 Married	27 Single Central Fremont	22 Married Berwindl.as Animas	43 Married 1 Ideal Huerfano	40 Single HastingsLas Animas	21 Single Piedmont I as Animas
SlavDriver MexicanDriver AustrianMiner ItalianMiner	MexicanDriver	AustrianMiner			ettiAustro-TyrolesePumper	Austro-TyroleseMiner	azo Austro-TyroleseMiner	Austro-TyroleseMiner	ItalianDriver	ItalianMiner	1talianMiner	azzoItalianMiner	Slav		itosRock-man	asRireboss	s	neghiniAustro-Tyrolese laborer	oMiner	anMinetrianMiner	miJapaneseMiner	wskiPoleMiner
Joe Drab	Alex Tafoya		Antonio Smell	Silvio Gresselin	Lorenz Springh	Ben Bendetti .	Emanuel Fera	Jim Velottie	Louis Asti	Pete Serteri	Joe Mattina	Pietro Dichi	Bude Orlich	Pete Millirh	George Cgoi	John Thoma	Albert Pott	Amabile Mo	Mike Albric	Andre Krip	B. Kawaka	Tom Kroko

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FATAL ACCIDENTS IN 1912

arle or Number of Name o

Married Chidren Mine County Cause of Accident Married 2 Brodhead No. 9 9 Electrocuted Single 2 Brodhead No. 9 1 Flectrocuted Single 2 Brodhead No. 9 1 Flectrocuted Single 4 Oak Hills No. 1 Run over by mine car Married 1 Cause of Accident Animas Married 1 Boulder Fall of rock Married 5 Piedmont Las Animas Gas explosion Married 5 Piedmont Las Animas Gas explosion Single 5 Piedmont Las Animas Fall of rock Single 6 Piedmont Las Animas Fall of rock Single 1 Boulder Fall of rock Single Single 1 Boulder Fall of rock Single Single 1 Boulder Fall of rock Single Single 1 Boulder Boulder Fall of rock Single 1 Boulder	on Age 1 er 32 er 32 er 45 er 45 er 32 er 32 er 23 er 23 er 26 er 33 er 35 er 35 er 35 er 35 er 35 er 35	Nationality Occupati Montenegrin Cocupati Austrian Mine Austrian Mine Austrian Mine Bulgarian Mine bos Scotch Superintender Austrian Mine Greek Timberma Greek Timberma Italian Mine Austrian Mine	Name of Person Mike Medenica Joe Brasch Joseph Vidic Joseph Vidic John Pachoff Alfred Rubin William Tweedle Rocco Glovanelli Angelo Siminoff John Carros Mike Carstos Mike Carstos John Roy Tony Puk Tony Puk Corge Lacy	kte 17, 24 18, 24 18, 25 19, 14 11, 1
Single Ravenwood HuerfanoFall of rock	er 22	SlavMine	Chris Beljan	it. 11
Single Ravenwood HuerfanoFall of rock	er 22	SlavMine	Chris Beljan	t. 11
Married 1South CanonGarfieldGas and dust explosion	1n 48	AustrianTimberma	George Lacy	:t. 1
SingleSouth CanonGarfieldGas and dust explosion	er 30	AustrianShotfire	Anton Zitz	t. 1
Married 2 Oakdale IluerfanoFall of top coal	er 32	AustrianMine	Tony Puk	pt. 30
Single Jewel Jewel BoulderFall of rock	er 26	ItalianMine	John Roy	pt. 30
Single RouseI.as Animas.Struck by loaded car	er 22	ItalianMine	Antonio Banoni	pt. 33
Single Summit Iluerfano.Struck by fall of slate	1n 34	GreekTimberma	Mike Carstos	pt. 14
Single Fall of slate	1n 32	. GreekTimberma	John Carros	pt. 14
Single IndustrialBoulderFall of rock	er 22	BulgarianMine	Angelo Siminoff	pt. 9
Single Central Premont Heart failure in mine	er 32	AustrianIabore	Rocco Glovanelli	pt. 4
Married 5 Piedmont Las AnimasGas explosion	nt 53	ScotchSuperintender	William Tweedle	B. 33
Married 5 Piedmont Las AnimasGas explosion	ss 48	GermanMine bos	Alfred Rubin	18. 3
Married 1 Industrial Boulder Powder Fxplosion	er 29	BulgarianMine	John Dachoff	16. 3
Married 4 Oak Hills No. 1 Routt Run over by mine car	er 45	Austrian Mine	Joseph Vidic	R 34
Married	er 46	AustrianMine	Mich Sudan	83 04
Single I.eydenJeffersonFall of rock	er 32	.AustrianMine	Joe Brasch	15. 12
Married 2 .Brodhead No. 9Las AnimasElectrocuted	er 33	MontenegrinMine	Mike Medenica	IN 24
Married Children Mine County Cause of Accident	on Age	Nationality Occupatio	Name of Person	alm
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REPORT OF THE HASTINGS EXPLOSION

Denver, Colorado, July 13, 1912.

Hon. John F. Shafroth,

Governor of Colorado.

Sir: I herewith submit my report to you on the Hastings explosion:

The Hastings explosion occurred on the 18th of June, 1912, at 9:30 p. m., and caused the death of twelve men and injured one man badly.

The mine is situated two miles from Ludlow and fifteen miles nearly due north from the town of Trinidad, Las Animas County, on the Colorado Southeastern Railroad. The property is owned and operated by the Victor-American Fuel Company, with head offices in Denver: W. J. Murray, general manager; William McDermott, division superintendent, and James Cameron, local superintendent; with John Yates as mine boss.

MANNER OF OPENING BY SLOPES

The Hastings mine is opened by three parallel openings. Two of the openings are used as return airways. One of the return airways is the main handage road, and the other return airway is used as a traveling-way by the men in going to and coming from their work. One of the openings is used as an intake airway.

The new slope to the B seam turns off the main slope at an angle of 35° , 1,300 feet from the surface. The dip of the new slope varies from 5 to 7 per cent, and at a distance of 850 feet off the main slope a rock tunnel is driven down into the lower seam, known as the B seam. The stratum between A and B seams is forty feet.

In this section of the mine the explosion occurred. From the inside of the rock tunnel two parallel entries are driven down the dip a distance of 3,400 feet, from the junction with the third south and main slope. Three pairs of entries are turned off on each side of the slope. The distance of these entries is approximately 500 feet.

Cross-entries are driven to the raise in the second south, also the second north, up a distance of 200 feet. On the third north no cross-entries have yet been started, but on the third south two cross-entries have been driven up a distance of 200 feet. The two parallel slopes are driven below the third north 250 feet.

VENTILATION

The ventilation is produced by a $94'' \ge 72''$ Sirocco fan. This fan is driven by electric power from Trinidad. The lower speed of the fan is 117 revolutions per minute, producing from 93,000 to 95,000 cubic feet per minute; the higher speed, 220 revolutions per minute, producing from 110,000 to 115,000 cubic feet of air per minute. The fan-house stands 100 feet north of the main haulage slope, and is built of concrete floor, sides, and roof; in fact, it is fireproof. The fan is run as a blowing fan, but can be changed in a few minutes to an exhaust fan.

Two electric motors are installed, and in case anything should go wrong with the electric power applied, or the working motor injured in any way during the day, a change can be made to the other motor, or a different electric power applied, in a few minutes.

A going at the blacksmith shop gives notice to the men on top whenever the fan stops, and they at once make the change necessary. During the night the fan is visited once every hour by the night watchman, who records his visits. The night engineer also visits the fan every hour.

The new slope, or B seam, is ventilated by a split of air from the main intake at the sixth south, main slope, and the air travels south to a point where the two parallel dip entries begin. On the lower, or B, seam a shaft forty feet in depth is put down, which forms the intake for the B seam. This intake airway lies to the north of the new slope, which is the return airway for the B seam.

MANNER OF CONDUCTING THE AIR ON THE B SEAM

The air is split at the first south. An overcast is built by six twenty-four-inch galvanized pipes, with concrete walls. The air continues down the intake, and at each pair of entries goes in one entry, returning to the main intake on the other entry, and in this manner all the other entries are ventilated; that is to say, only one continuous current around the workings. After the air passes the first south, it returns to the main haulage road to the surface.

MODE OF WORKING

The B seam, or lower seam, is what is known as the Berwind seam. It is five feet thick and is a coking coal. At present the workings in the B seam are not extensive. So far, only entry work has been done, except that on the first south four rooms were turned off; but on account of the coal being bad and faulty, the first and second south, as also the first north, have been abandoned.

MANNER OF HAULAGE

Mules are used in taking coal from the working face to the double partings at the slope. An electric hoist, situated between the second and third south entries, delivers coal to this point, wherefrom the surface engine takes it to the tipple.

NUMBER OF MEN AT WORK THE NIGHT OF THE EXPLOSION

Thirty men were working in the A seam, or upper seam, the night of the explosion, but only two men felt the shock of the explosion. All the men in the A seam got out of the mine in safety.

On the lower, or B, seam thirteen men were at work that night, and twelve men met death from the effect of the explosion. One man, whose name is George Pappas, a rock man, who was working on the slope near the first north entry, was taken out alive.

PRECAUTIONS TAKEN BY THE COMPANY

Only safety and electric lamps were used in the mine in both seams. Safety lamps were used by the fire bosses and the company's inspectors. Electric lamps were used by the workmen. Permissible powder was used in the mine exclusively. Clay only was used for tamping the holes. Shots were fired by an electric hand battery.

Two fire bosses were employed in the lower, or B, seam. One fire boss inspected the places before the day shift went to work; the other fire boss inspected the places before the night shift went to work.

The company employed an inspector, whose duty it was to inspect the B seam once a day. The company also employed a chief inspector, who inspected the mine two or three times a month.

When the news of the catastrophe reached me at 7:45 a.m. on the morning of the 19th of June, 1912, I was in Trinidad, and, making all possible haste, took the first train and reached the scene of the distaster at 9 o'clock a.m. In company with Mr. McDermott and Mr. Griffith, we entered the mine about 9:30 a.m. and went, by way of the intake, down as far as the third north entry. The helmet men had explored the third north and had located some of the bodies, but the air was so feeble that it could not remove the gas, so the brattice men had to go over the brattice stoppings again. After some time we were able to get into the third north.

Near the inside cross cut we found Pietro Dictuazzo and Joe Mattina, who were burned a little. Going through the crosscut, we discovered a light burning. Thinking it might be a feeder burning, for a moment we stopped while Messrs. Reese and Griffith went to the light, and found it was an electric lamp still burning. An electric lamp had been found burning in the third north by the previous shift.

In turning to the left to go out of the back entry of the third north, I found three bodies about four feet apart, and farther out the back entry, outside the haulage cross-cut, 1 found another body; these being all of the bodies of the men found, who had been working in the third north.

I went down into the slopes, as far as I could get for the water, but found nothing there. We then proceeded to the third south entry, to get into which we had to put up a curtain between the third south main and back entries. Getting the gas diluted to the first cross-cut, or run-around, we there found a great quantity of smoke, and, thinking there might be feeders of gas burning under some coal (as this section of the mine gives off gas from feeders in the bottom), we again raised the curtain on the slope, to allow the air to go up the slope, instead of forcing it into the third south.

We then sent the helmet men to make a run into the entries, to ascertain if there was any fire. After waiting some time, the helmet men made the run of the two main entries to the face. In doing so, two of the men were overcome by the exertion of the work.

Not being satisfied, I asked Mr. D. Reese to make the run of the cross-entries; which was done, no fire being discovered.

We again turned the air into the third south back entry, but, the ventilation being feeble, the removal of the gas was very slow. We knew there were yet four bodies to be removed, they having been located by the helmet men. Before the other shift came on, we reached as far into the back entry as the second inside cross-cut. We then returned to the surface at 5:45 p. m. to get our dinner. Before 3 o'clock the next morning the rest of the bodies were found and taken to the surface.

NAMES, NUMBERS, AND LOCATIONS WHERE BODIES WERE FOUND

No. 10, George Cgontos, a rock man; in a cross-cut at the first north back entry; burned on head.

No. 6, Lorenz Springhetti, pump man; near the pump station at the mouth of the return of the third north; badly burned.

No. 3, Pietro Dictuazzo; body found thirty feet outside the inside cross-cut of the third north main entry; burned slightly.

No. 2, Joe Mattina, miner; body found ten feet outside the inside cross-cut of the third north main entry; burned slightly.

No. 4, Ben Benedetto, miner; body found five feet outside the inside cross-cut on the back or return air-way of the third north; very slightly burned.

No. 7, Pete Sertori, miner; body found nine feet outside the inside cross-cut on the back or return airway of the third north; very slightly burned.

No. 1, Jim Vellotti, miner; found fourteen feet outside the inside cross-cut on the back or return airway of the third north; very slightly burned. No. 5, Emanuel Ferazzo, miner; body found five feet outside from hanlage cross-cut on third north back entry; very slightly burned.

No. 9, Pete Milirh, miner; body found in corner of inside cross-cut on third south main entry; badly mangled and burned.

No. 8, Louis Asti, driver; body found at face of third sonth entry; mangled, but not badly burned.

No. 11, Bude Orlich, miner; body found close to the coal face on the lower side of the third south entry; mangled and burned.

No. 12, John Thomas, fire boss; body found at the mouth of the second cross-cut, off the second cross-entry, off third south; badly burned.

A mule was found twenty feet outside the inside cross-cut on the third south entry, badly burned and the entrails torn out of the body, driven under a rail for ten feet.

EFFECTS OF THE EXPLOSION

On the morning of the 20th of June, in company with the manager of the Victor-American Fuel Company, Mr. W. J. Murray; Mr. McDermott, Mr. Griffith, the company's inspector; Mr. Dalrymple, State Inspector of Coal Mines; Messrs. Oberding and Graham, deputy state inspectors of coal mines; also Mr. Roberts, of the United States rescue car, I entered the mine for the purpose of finding, if possible, the cause of the explosion.

In going down the intake, the effect of the explosion was very slight, except where there was a cross-cut between the intake and the return airways. At all such cross-cuts the force came through, but seemed to be spent on the intake. Very little coking was found on the intake airways, but the force seemed to pass across the intake airway, going into the first north, a distance of 200 feet, with slight coking.

The force of the explosion again crossed the intake at the second north, traveling into the second north 500 feet, going up the first cross-entry to the first cross-cut, and back down the second cross. Force was spent at the bottom of the second crossentry on the second north entry, slightly coking for the first 300 feet. The force and flame again passed through the intake air, going into the third north main entry to the parting, where some of the cars were thrown from the track. The force seemed to come off the slope, traveling into the third north at a point 200 feet from the slope. A place is turned off to the right and driven a distance of forty feet, and twenty feet from the face we found coke on the roof-not cakes, but in small grainswhere it would seem the force had been cushioned with the compressed air and there left its deposit of coke. Stoppings between the third north entries were blown out for a distance of 300 feet from the slope.

At the inside cross-cut the force went into the back entry, returning to the slope intake. The force and flame seemed to travel down the slope for 125 feet, here again spending itself, when nearing the face of the slopes. On the main slope, between the third north main entry and the third south back entry, we found three cars badly smashed, and that the force had driven those cars to the north side of the main slope. The cars were turned around by the force.

It would seem to me that the cars must have been standing on the third south run-around (or the back or intake entry of the third south), and were blown toward the third north, which is nearly opposite at this point. It appears the strongest force came out of the third south intake airway. The force seemed to split here, one part going into the third north, and the other part going up the main slope or the main return.

We then traveled into the third south by way of the intake airway to the face of the entry, and went through the inside eross-cut, which is twenty feet from the face of the third south. At this point the forces seemed to be great, as the men found here were badly mangled and burned, and about twenty feet outside this inside cross-cut the mule was also burned and driven under the track for ten feet. There must have been a shot fired that night in this entry, as the coal was thrown against a car which was standing near the face, and on each side the coal was thrown out past the car for ten feet. Yet it would seem that the explosion must have taken place after this shot was fired, because of the fact that the two entry-men and driver were found close against the coal face, and that some of the drilling tools must have been driven out of the crosscut onto the main road, showing that the force came from the back entry to the main entry; also because of another fact. namely, that the shots in this section are fired by a hand electric battery, and, according to evidence, that electric battery was found in the first cross-cut on the second cross-entry, off the main third south. The fire boss, as a rule, fires the shots, but on the night shift the mule-driver sometimes fired shots.

The gas was so strong that we could not get any farther on the main third south entry. We started to go out by way of the main slope, but, not being able to get over the falls, we turned back, going out by way of the intake airway to the surface.

On the 21st day of June the gas was not removed from the third south cross-entries, and on the 22nd day of June we again entered the mine. The gas was then removed, so that we could get into the cross-entries off the third south entry. There we found flame marks, up near the face of the entry, and a little coking. It was in the second cross-cut of this entry that the fire boss was found. (This entry is called the second cross entry.) He went up to this cross-cut, apparently to put up a brattice to clean out some gas that was found by the company mine inspector that day.

The lamp which was found near the body of John Thomas must be considered a defective lamp, inasmuch as the asbestos washer on top of the glass cylinder was turned or doubled to the inside a distance of one and one-half inches, which caused an open space between the washer and glass cylinder.

We went up the main slope, which was very badly torn up by the force of the explosion, out to the surface. The force terminated about 150 feet above the fourth south of the A seam. This fourth south is used as a return for a part of the air from the A seam, and this increased volume of air may have been the cause of the termination of the force.

THE CAUSE OF THE EXPLOSION

To my mind, the explosion was caused by gas. Dust did not play much of a part in the explosion, because of the wet condition of the mine. The mine inspector for the company stated that he found a small quantity of gas that day in the blind cross-cut on the second cross of the third south entry. A small quantity of gas might start an explosion with a defective safety lamp placed in it, but a small quantity of gas could not cause such a violent explosion unless the air current was at the explosive point, which could be caused by a derangement of the air current, or by a sudden increase of gas due to a fall of the barometric pressure, or by an outburst of gas, or by encountering a large feeder of gas.

A derangement of the air current could be caused by a door being left open or a canvas curtain torn down, which would prevent the air from going into that section.

Any of the above-stated causes might have occurred the night of the explosion, and the gas might have been of sufficient quantity to have been ignited by John Thomas' defective lamp. I think the defective lamp might have ignited the fire-damp, but I also believe the condition of the air current at the time of the explosion was not due to the negligence of Fire Boss Thomas, as this place was stopped that day on account of gas by the company inspector.

The quantity of air in that section of the new slope was, at the time of the explosion, inadequate to dilute the gases given off and render such gases harmless.

REMARKS

In a mine such as the new slope at Hastings, where such a quantity of gas is generated, the air current should be at all times uniform and continuous. Doors and curtains should be used when it is impossible to conduct the air current otherwise.

I last inspected this mine on May 11, 1912, and at that time I considered the mine in fair condition, but found the quantity of air was less than on my previous visit. I ordered the cloth curtains repaired at several places, and waited until they were repaired.

The new slope has always generated considerable gas, and I thought it was as well handled as was possible under the system of ventilation in the mine. This mine was inspected by Deputy Inspector Oberding, accompanied by Al Thompson, company inspector, on August 9, 1911. During this inspection the second south entries of the new slope were visited twice. On the first visit no explosive gas was found. Thirty minutes later, upon re-entering those two entries, they discovered fire-damp back to the inner cross-cut—a distance of from fifty to sixty feet from the face. This accumulation was due to a door hvaing been left open, which caused a short circuit in the ventilation. Recommendations were made at this time to have all shooting done by shot-firers after all other employes had left the mine, and that double doors be used to prevent the air from being short-circuited.

Here I wish to thank David Reese and his helmet crew, of the Victor-American Fuel Company instruction car, for the advance runs they made into the third south entries.

> [Signed] HENRY P. KING, Deputy State Coal Mine Inspector.

Approved:

JAMES DALRYMPLE,

State Inspector of Coal Mines.

		Married	Numb	er
		or	of	
Age	Occupation Nationality	Single	Childre	∋n
47	PumperAustrian-Tyrolese	Marrie	d	5
25	MinerAustrian-Tyrolese	Single		
25	MinerAustrian-Tyrolese	Single		
36	MinerAustrian-Tyrolese	Single		
28	DriverItalian	Marrie	d	1
30	MinerItalian	Marrie	d	2
31	MinerItalian	Marrie	d	1
30	MinerItalian	Marrie	d	1
40	MinerSlav	Marrie	d	1
36	MinerSlav	Marri	ed	4
24	RockmanGreek	Single		
40	Fire bossWelsh	Marrie	d	3
	Age 47 25 25 36 28 30 31 30 40 36 24 40	Age Occupation Nationality 47 PumperAustrian-Tyrolese 25 Miner Austrian-Tyrolese 25 Miner Austrian-Tyrolese 26 Miner Austrian-Tyrolese 27 Miner Austrian-Tyrolese 28 DriverItalian. Miner 30 Miner Italian. 40 Miner Slav. 36 Miner	Married or Age Occupation Nationality Single 47PumperAustrian-TyroleseMarrie 25MinerAustrian-TyroleseSingle 25MinerAustrian-TyroleseSingle 36MinerAustrian-TyroleseSingle 38DriverItalianMarrie 30MinerItalianMarrie 30MinerItalianMarrie 31MinerItalianMarrie 30MinerItalianMarrie 31MinerItalianMarrie 32MinerItalianMarrie 33MinerItalianMarrie 34MinerSlavMarrie 35MinerSlavMarrie 36MinerSlavMarrie	Married Numb or of Age Occupation Nationality Single Childre 47PumperAustrian-TyroleseMarried 25MinerAustrian-TyroleseSingle 25MinerAustrian-TyroleseSingle 36MinerItalianMarried 30MinerItalianMarried 30MinerItalianMarried 30MinerItalianMarried 30MinerItalianMarried 31MinerItalianMarried 32MinerItalianMarried 33MinerItalianMarried 34MinerSlavMarried 35MinerSingle 36MinerSingle 37Married 38MinerSingle 39MinerSlavMarried 30MinerSlavMarried 30MinerSlavMarried 31Married 32MinerSingle

VERDICT OF JURY

State of Colorado, County of Las Animas, ss.

An inquisition holden at Trinidad, in Las Animas County, State of Colorado, on the 26th day of June, A. D. 1912, before B. B. Sipe, coroner of said county, upon the bodies of (see list attached), there lying dead, by the jurors whose names are hereto subscribed: Said jurors upon their oaths do say that the above-named persons, whose bodies were taken from the Hastings mine of the Victor-American Fuel Company at Hastings, in said county and state, on or about the 19th day of June, A. D. 1912, came to their death as the result of an explosion in said mine about 9:30 o'clock on the night of June 18, 1912.

From the evidence adduced the cause of said explosion cannot be positively determined. The mine was known to generate explosive gas, but not in dangerous quantities. We further find that the mine was well ventilated. On the afternoon of June 18 a small feeder of gas was discovered in one of the working places in said mine, and the fire boss was ordered to increase the ventilation at that point. It is possible that in doing so he ignited the gas from his lamp. This is made plausible from the fact that after the explosion the lamp of the fire boss was found improperly put together. The explosion might have been the result of any one of several other possible causes, but the present condition of the lamp of the fire boss is the only fact ascertainable which affords any basis for a conclusion as the possible cause of the disaster. The lamp of the fire boss, unlike those of the other employes of the company, which are inspected daily, was entirely in his keeping, and the company is in no wise culpable. As a matter of fact, it was not properly put together and was the real cause of the explosion.

In Testimony Whercof, The said jurors have hercunto set their hands, the day and year aforesaid.

> JOHN C. BALDWIN, Foreman; HENRY ANDREWS, W. W. JONES, GABRICK NICCOLI, PETER J. BACCO, REIEL MILLER,

> > Jurors.

Attest.

B. B. SIPE,

Deputy Coroner of Las Animas County.

REPORT ON THE PIEDMONT EXPLOSION

In the Piedmont mine, owned by the Rocky Mountain Fuel Company, a gas explosion occurred August 29, 1912, m which two men lost their lives: William Tweedale and Alfred Rubin.

The explosion occurred in the part of the Piedmont mine known as the "Frisco," in the first and second south entries, off the Frisco main haulage road and 2,700 fect from the mouth of the Frisco opening. The first and second south entries were driven a distance of 2,000 feet from the main haulage road.

Near the face of these entries the coal became bad and very faulty, and for this reason the entries were stopped. The company then came back 189 feet from the face of the said entries and worked it out to its present distance of 286 feet back from the face.

This procedure caused an open space ninety-seven by ninetyfive feet. Inside this open space the two entries are solid, except the three cross-cuts—one at the face and the other two, respectively, 100 and 165 feet back from the face. This large space inside of the pillar was without air, and gas must have accumulated at or near the face of the second south entry.

For some unknown cause, Superintendent Tweedale and Mine Boss Rubin, the former with a carbide lamp and the latter with a safety lamp, went into the inner part of the second south entry. How near to the face of this entry they had gone before the explosion occurred is not known.

On the morning after the explosion, in company with the fire boss, I went into the first and second south entries. I found the safety lamp of the mine boss 165 feet back from the face of the second south entry, and the carbide lamp of the superintendent twenty-three feet nearer to the face.

The bodies had been found where I discovered the lamps. Carlo Bartolo and Lessi Angelini were working in the first south, taking out the pillar between the first and second south. Emil Bessover and Frank Lumcancio were working opposite to the above-mentioned men, taking a skip off the pillar below the second south entry. Carlo Bartolo was blown down, and he stated that he felt a hot wave pass over him. He and the other three men were not injured in any way, but all their lights were extinguished by the force of the explosion. Consequently, they were obliged to walk out in the dark. They stated that they saw the superintendent and the mine boss pass by where they were working a few minutes before the explosion occurred.

As the flame of the gas did not travel out to where these men were working, and the force of the explosion did not extend beyond the first and second south entries, I am of the opinion that the large open space outside of the initial point gave the ignited gas ample room for expansion, and the fact that the dust and the workings of that part of the mine were naturally humid prevented a general dust explosion.

> [Signed] HENRY KING, Deputy State Inspector of Coal Mines.

THE SOUTH CANON EXPLOSION

At the South Canon mine, in Garfield County, owned by the South Canon Coal Company, on October 1, 1912, Anton Zitz and George Lacy lost their lives by a gas and dust explosion, which was caused either by the ignition of fire-damp in Upraise No. 33, Upper East Wheeler, or by blown-out shots fired in Rooms Nos. 7 and 9 in U seam. Dust was the predominating factor in the explosion.

The explosion took place while the shot-firer, Anton Zitz, was in Upraise No. 33, the body of deceased being found in a pit car standing under the chute, and being covered with coal from the upraise shots.

On January 16, 1912, this mine was inspected by F. N. Oberding, deputy inspector, and found in a dusty condition, with fire-damp in Room No. 26. The following recommendations were made at that time:

1. That a sprinkling system be installed, whereby dust can be laid and kept damp on haulage roads, sides, and roof.

2. That fire-damp in Room No. 26 be removed as soon as possible.

3. That air volume be increased.

4. That another door be put on main haulage-way.

On May 8, 1912, this mine was again inspected by Deputy Oberding, and recommendation made that water line be extended and kept near the face of U seam, and that sprinkling should be done diligently.

On September 18, 1912, Deputy Oberding and Chief Inspector Dalrymple inspected the mine and found fire-damp in two inside upraises, ventilation destroyed by motor breaking one door, and the other door being in very poor condition. The mine was considered dangerous.

The recommendations of January 16 and May 8, with reference to wetting down the dust, had not been carried out when Anton Zitz and George Lacy met their death.

> JAMES DALRYMPLE, State Inspector of Coal Mines.

THE SIMPSON MINE

A fatal accident occurred in the Simpson mine, November 8, 1912, in which John Higgins, night foreman, lost his life.

The accident occurred in Room No. 3 on main back south entry. Deceased and four other men were fighting a gob fire, which broke out in the above room, generating an explosive gas, carbon monoxide, CO, which exploded, seriously burning I. W. Griffith, mine foreman, John Thompson, and John D. Smith; also burning William Powell slightly, and causing the death of John W. Higgins.

The gas may have ignited from the lamps, as they were using a naked light; or it may have been caused by a fall of rock, which drove the gas on gob fire, thereby igniting it and causing an explosion. This part of the mine has not been worked for several years.

Statement of I. W. Griffith, mine foreman: "I believe that the gob fire was in Room No. 3, on main back south entry; that the fire generated a gas which exploded, the gas being ignited by the gob fire."

Statement of William Powell: "I think the fire was in Room No. 2, main back south entry, and that the explosion was caused by Marsh gas, CH₄, being ignited by gob fire."

In my opinion, naked lights should not be used in fighting gob fires, as under certain conditions these fires generate an explosive mixture.

[Signed] JAMES W. GRATIAM,

Deputy State Inspector of Coal Mines.

MINE FIRE

On Saturday morning, April 13, 1912, at 10 o'clock, a tire occurred at the Monarch No. 1 mine, belonging to the National Fnel Company, at which the fau, the fan-house, and about sixty feet of trestle work were destroyed.

At the time of the fire there were five men and twenty nucles in the mine. The men got out safely, but the nucles were all suffocated by the smoke from the fire.

The fan house is located about fifty feet from the ashes and cinder piles which are dumped from the boiler-house. It is supposed that some hot ashes or cinders were blown and lodged in the fan house which caused the fire.

> JAMES W. GRAHAM, Deputy,

IMPROVEMENTS IN 1912

BOULDER COUNTY

Nonpareil: Nothing but narrow work.

Sunnyside: Installed one sixteen-foot fan, with engine and covering. Underground development: entry, 3,389 feet; room turn, 639 feet; cross-cut, 757 feet; narrow work, 4,785 feet. Rebarred shaft bottom with sixty-five-pound rails; laid diamond switch (south side); retimbered main south entry; purchased ten new pit cars and one mule; erected new rock trestle and dump, also new top landing; erected new custom chute; crected new slack hopper under main chutes to catch boiler coal; repaired old boiler, welded steam cylinder on compressor, and overhauled air end on same; purchased one Ingersoll puncher. Would state a large portion of our narrow work has been driven for haulage-ways; the hard bottom has been graded from 20 to 30 inches and coal roof has been left.

Fox: Extended south entry, first, second and third west entries, and first southeast entry.

Centennial: Installed single-motion engine, a Norwalk compressor, and one boiler. Development: general extension in entries and clearing up old rooms.

Capitol: 1,955 feet of entries driven; 8,300 feet of narrow room work; 1,465 feet of entry caves cleaned up and timbered; two overcasts built; one barn, 19 x 112 feet. timbered and partitioned into stalls.

Senator: Putting down new slope to make new opening escape for mine.

Monarch No. 2: Box-car loader installed, and new bunkhouse.

Summit: Installed one portable compressor; capacity, 175 feet per minute. Drove 2.515 feet of entry and 610 feet of west entry.

Standard: Several thousand feet of development work done in the southwest and southeast parts of the mine; new fourteenfoot fan installed; motor generator; six-ton electric haulage.

Gorham: Normal amount of development work.

Industrial: Normal amount of narrow work.

Hecla: Normal amount of narrow work; new rock dump, at expense of \$750.

Mitchell: New boarding-house and wash-house.

Rex No. 1: No special improvements.

Rex No. 2: Driving one pair of exploration entries.

Vulcan: Normal amount of narrow work.

Simpson: Grade drainage from the south boundary to foot of shaft; replacing block stoppings with concrete and stone stoppings; headframe and tipple entirely rebuilt; self-dumping cages; car haul at bottom of shaft.

DELTA COUNTY

Black Diamond: One tramway half-mile long; one large bridge 541 feet long and seventy feet high; one Lorring drum; 5,000 feet of rope.

Cedaredge: Main entry driven 140 feet; upraise, $4 \ge 4$, driven forty feet to surface for air-shaft.

Leroux Creek: Driving entries and turnings rooms.

King: Built stone archway to protect pit mouth; installed telephone in mine; ordinary work of driving entries and turning rooms.

EL PASO COUNTY

Williamsville: None reported.

Patterson: 300 feet of entry work.

El Paso: 5,522 feet of entry; 2,061 feet of cross-cut; timbering.

Danville: No report.

Pikeview: Building and plant, miners' cottages, and about \$18,500 development work. Total cost of improvements, \$33,-865.88.

FREMONT COUNTY

Emerald: 200 feet opened up, two more entries from slope. Radiant: Installed one mine ventilating fan; painted all houses inside and out; mine development pushed. Entire cost

of improvements and mine development, \$10,000. Chandler: Four-room tenant-house; one mine ventilating fan; improvements and addition to tipple and tipple machinery; painting tenant-houses inside and out; mine development. Cost of improvements and developments, \$20,000.

Coal Creek: Sunk shaft 412 feet, and have almost completed installation of machinery to hoist coal through shaft instead of slope; 9,700 feet of entry driven. Equipment consists of electrical hoist, fan motor, new headframe, tipple, shaking screens, weight basket, four railroad scales, office, five tenanthonses, Bishop, car-shop, storehouse, transformer, and power lines.

Fremont: Twenty-five more pit cars; 4,170 feet of entry driven.

Rockvale: Heavier power line in mine; new slope for manway and air-course; new fan; 8,550 feet of entry driven.

Royal Gorge: 350 feet of new slope, new tipple, and wagon chute.

Magnet: Installed complete mine telephone system and electric-lighted traveling way, and installed new electric pumps. On surface a bath-house, to accommodate seventy-five men, was built, equipped with hot and cold sprays; also three new tenement-houses have been erected. Development work equal to amount of coal extracted.

GARFIELD COUNTY

South Canon: Slope started on pitch of vein in middle of canon, driven down ninety feet on Wheeler vein. Stopped for the winter. Rock cross-cut from Wheeler vein on east upper lift to get around No. 56 from the old works. This tunnel is 430 feet long from point where we left Wheeler vein to point where we again struck it. Also extended the E vein on the west side to 1,000 feet from entry mouth.

Vulcan: Development of Allen vein both east and west for about 1,500 feet; new 125-H.P. boiler; motor generator; sixton electric locomotive; shaking screens; four four-room houses; new office.

GUNNISON COUNTY

Baldwin Star: Drove entries and air-courses, aggregating about 300 feet. This is a "wagon mine" and employs an average of only about eight men.

Bulkley: Drove about 2,000 feet of new entries and air courses, including opening of new vein. No. 3 vein nearly exhausted. Will file map of work in new vein (No. 4) as soon as survey can be made.

Floresta: Twenty-five additional pit cars; two gasoline locomotives; telephone system; new haulage engine and compressor; 1,640 feet of entry driven.

Crested Butte: New tipple and slack bin to replace old; 770 feet of entry driven.

Kubler: Development work done equal to amount of coal extracted.

Somerset: Escape-way driven to surface from face of sixth east entry; concrete pump station constructed at foot of slope; concrete overcasts erected at seventh, eighth, and ninth east entries; twenty concrete and three rock stoppings erected at various points; five steel doors with concrete frames erected on manway; 8,403 feet of double entry driven, with attendant crosscuts.

HUERFANO COUNTY

Toltec: 4,000 feet of entry work; tipple remodeled.

Primrose: New opening one-half mile above old mine, and tramway to same (electric); drift in 500 feet—parallel air-course.

Loma: 2,000 feet of entry driven; one seven-foot Stine fan.

Reliance: Built twenty houses, fan-house, boiler- and engine-room; installed air compressor, hoist, three boilers, fan; drove slope 400 feet, with air-course; drove manway 400 feet; drove about 3,500 feet of entry and air-courses. Pryor: Electric pump.

Oakdale: Drove 2,000 feet of entry; sunk slope 320 feet. Turner: Ladder in air-shaft; 400 feet of entry work.

Black Canon: We sunk the slope 260 feet; drove one entry 400 feet; have put in a new pump; also telephone.

Carbonado: Sinking shaft; depth, fifty-two feet; dimensions, 7.8" x 6'. Planning all equipment and six houses. Installing machinery; one 82-ff.P. Leyner electric hoist ap.! one coal-cutting electric machine installed November, 1912. Names of seams: Lennox and Maitland. Commenced producing coal August 2, 1912.

Sunnyside: Removed and reconstructed fan-house and fan engine; new shaft to discharge air by fan in new location; fiftycight feet of new entry; reconstructed water tank; new Sullivan coal-cutting machine; \$4,500 on buildings.

Rugby: Installed a seven-foot disc fan at Opening No. 3.

Caddell: Main slope driven 780 feet; second north entry driven 300 feet; third north entry driven 200 feet; fourth north entry driven 500 feet; placed overcast on main slope for air; turned thirty new rooms.

Maitland: Miners' electric safety lamps; new opening; mine telephone; electric haulage engine; electric boxcar loader; electric fan; substation building; substation equipment; mine development. Cost of improvements and developments, \$40,000.

Ravenwood: Eight four-room tenant-houses; one five-room tenant-house; one six-room tenant-house; mine telephone; electric hoist; electric signal system; tipple improvements; development work; substation building and equipment. Cost of improvements and development, \$15,000.

Rockland: Drove about 6,000 feet of entries and air-courses; sunk air-shaft 640 feet; crected fan-house and new fan, etc.

Walsen: Shaking screens and motor; one more railroadtrack scale; box-car loader; hoist motor and coupling; transformers and switchboard; two mining machines; power lines, and 600 feet of entry driven. Cost, \$26,000.

Cameron: New mule barn and corral; forty additional pit cars; 7,400 feet of entry driven.

Robinson: Slack conveyor and elevator, and 4,900 feet of entry driven.

Picton: Three inside electric hoists installed; now installing electrical machinery and equipment to run entire plant with power from Trinidad Power Company, and do away with present boiler plant and steam equipment; 12,000 feet of entry driven.

Ideal: 3,900 feet of entry driven.

Lester: 3,600 feet of entry driven.

Breen: Installed a Jeffrey 5-A mining machine, a pneumelectric puncher, railway spur to mine, and set of Fairbanks scales. Tioga: 630 feet of development work; are installing two 125-H.P. boilers.

Pinion: Installed, in mine, fire protection; on surface, "first aid to injured" equipment; also electric lighting system on surface.

Big Four: Installed a large mine pump to take care of water in main slope; also a slack blower to carry the slack coal away.

JACKSON COUNTY

The Coalmont: This property was opened some time in the summer of 1909, and since then until June, 1912, its operations have been confined chiefly to development work. It is owned and operated by the Northern Colorado Coal Company. Mr. E. R. Miller is president of the company, and Mr. Donald B. Cameron superintendent. The post-office address of the mine is Coalmont. The property is situated in North Park, Jackson County, 112 miles southwest of the town of Laramie, Wyoming, and is connected with the Laramie, Hahn's Peak & Pacific Railroad. It consists of 4,080 acres, located in Sections 10, 11, 12, 14, 15, 21, 22, 23, 24, and 26, Range 7 North, 81 West; Range 7 North, 80 West. It contains four workable seams or coalbeds, as follows: Upper or Mammoth seam, sixty-five feet thick; No. 2 seam, twelve feet thick and at a depth of 650 feet below the upper seam; No. 3 seam, eighteen feet thick and 600 feet below No. 2 seam; and No. 4 seam, twenty feet thick and 350 feet below No. 3 seam. The character of the coal is semi-bituminous, and the measures dip northeast on an agle of twentysix degrees. The mine is opened by a slope, and is worked on the "room and pillar" method, with centers of fifty feet. The ventilation is natural. The coal is shot off the solid, and black powder is used. The opening and all development work are on the southeast quarter of Section 24. The surface improvements consists of a store, a warehouse, an amusement hall, a boardinghouse, a doctor's office, a superintendent's dwelling, and thirtytwo other houses. The equipment of the mine comprises one second-motion Ottumwa hoist of 100-H.P.: two boilers of 100 H.P. each; one link-belt coal conveyor of 200 tons' capacity per hour; one Phillips' kick-back tipple endless chain haulage, to convey the empty cars back to the slope. The mine is equipped for a capacity of 1,200 tons daily. The scale of wages paid is classified as follows: outside work, 28 cents per hour, and inside work, 30 cents per hour. The coal is shipped to Denver, Wyoming, and Nebraska. The following is an analysis of the Mammoth seam:

Fixed	ł	C	a	ľ	b	0	1	1													44.22
Volat	i	16	ž	1)	n	a	t	t	91	a.											43.18
Moist	u	ľ	e							• }											8.50
Λsh	•			•		•	•		•		•	•						•	•		4.10

1,850 feet of entry driven; sunk air-shaft, and equipped same with ladders and stack; installed pump at bottom of slope; also mine telephone and electric signals. Surface developments and improvements included erecting tipple, with conveyor and conveyor engine, car-haul and car-haul engine.

JEFFERSON COUNTY

Leyden No. 2: This shaft, which was destroyed by fire, has been recovered. The upper and lower parts are lined with concrete, making the shaft practically fireproof. Shaft bottom is lined with concrete. Surface plant has been reconstructed and is fireproof. Buildings, including headframe and tipple, are constructed of concrete and steel.

Leyden No. 3: This shaft, sunk since the fire, is 791 feet deep and $21'2'' \ge 9'$ clear. Top and bottom are lined with reinforced concrete, making the shaft substantially fireproof. Shaft bottom will also be lined with concrete and steel. Surface plant is entirely fireproof. All building, including headframe and tipple, being constructed of reinforced concrete and steel. Equipment includes a 1,000-H.P. boiler plant, a $24'' \ge 42''$ hoisting engine, with 9' drum, large air compressor, generator, etc. Shaft airway is equipped with a 96'' $\le 68''$ Sirocco fan. General equipment: For the storage of rescue equipment and the training of rescue corps, a fireproof concrete building has been built; rescue equipment consists of oxygen helmets, pulmotor, storage battery, electric lamps, etc.

Rooney White Ash: Sunk main shaft fifty-five feet deeper; air-shift 4' x 6'; two dwellings; 240-foot bridge, and grading for railroad connection with Colorado & Southern.

LA PLATA COUNTY

Perin's Peak: Extended main entry and parallel 1,500 feet; opening up new territory as needed; installed new hoist, transformer house, escape-way, and air-shaft; new school building.

City: 400 feet of entry; 300 feet of airway.

Hesperns: 200 yards of main entry work.

San Juan: About 700 feet of double entry in new territory.

LAS ANIMAS COUNTY

Cokedale: Opening up a new mine on the east side of Reilly Canon, to be known as Cokedale Mine No. 2. Constructing electric haulage tracks from said mine to new tipple. This installation will be equipped for a daily production of 1,000 tons per day.

Alta: First north entry driven about 300 feet, and new air-course constructed.

Empire: Additional pnmps and pipe lines installed; new steam hoist installed; addition built to power-house; slope and entries driven.

Jewel: 600 feet of entry.

McLaughlin: New fan; 30-H.P. D. C. motor; Saderan A. C. mining machinery; four tenement-houses.

Wootton & Turner: 5,000 feet of entry and development work.

Hastings: Substation building, pumps, and additional drainage system; changing large proportion of steam-driven machinery to electric; straightened slope to B seam; installed safety lamps; extensive development on B or lower seam. Total cost of improvements, approximately \$30,000.

Bowen: Fireproof substation; fireproof electric shop; double track in main entry; painting tenant-houses; mine development; established adobe dust treatment. Cost of improvement and development, \$5,000.

Gray Creek: One Stine fan; electric machine and hoist; fireproof substation; also electric lighting for mine and camp; extensive development of new mine opening. Cost of total improvement, \$25,000.

Delagua: Carpenter shop, tools, and equipment; mine telephone; dust-blower and motor; addition and improvement on tenement-houses; adobe shelves in mine to hold dust. Cost of development work, \$10,000.

Black Diamond: Drove upcast 125 feet to upper vein, and sunk shaft on surface to same vein.

Toller: Set Stearn engine to act as auxiliary to motor for fan drive; set double drum hoist at fifth north entry for haulage; set hoist to sink slope.

Morley: 8,700 feet of entry driven. No additional equipment installed.

Starkville: One fifteen-ton electric locomotive.

Sopris: Completed opening of new slope; installed new fan to replace old one at old mine; also new fan at new slope; 5,200 feet of entry driven.

Tercio: One six-ton gas locomotive in mine; disintegrator engine in washery; addition to sprinkling system in mine; 5,650 feet of entry driven.

Amador: During six months ending November 30, 1912, 200 feet of main entry.

Primero: New fan installed at east side of mine; partial installment of electric lamps for miners; 4,200 feet of entry driven.

Tabasco: Completed opening up new slope; installed main haulage engine and one inside electric hoist; 6,000 feet of entry driven.

Berwind: Two electric pumps and motors; additional fan; 15,000 feet of entry driven.

Frederick: Forty-eight additional pit cars; 10,600 feet of entry driven.

Segundo: Two bins for rewashed washer waste, and rebuilt old larry bins. Southwestern: Motor generator set, and two electric machines installed; seventy-five new pit cars placed in service.

Royal: Box-car loader installed; improvements on shaft and air-shaft; cage put in air-shaft to hoist men out.

Beacon: Slope of No. eleven mine driven; camp-houses repainted; four new houses built.

Brodhead No. 9: About 2,000 feet-of narrow work.

Ludlow: About 8,000 feet of entry work.

Wootton (Turner): 5,000 feet of entry and development.

Forbes: Installed mine telephone system; new stable on surface; installed two gasoline hauling motors, and five electricdriven Morgan-Gardner mining machines.

Piedmont: Installed complete mine telephone system and fire-extinguisher for fire protection in the mine; installed "first aid to the injured" equipment and rescue apparatus on surface.

MESA COUNTY

Stokes: One new shoot; one new screen; two double partings.

Garfield: Air-courses and main slope extended.

Grand View: Air-course 300 feet.

Cameo: Retimbered tunnel, and put on concrete portal; installed 75-H.P. motor for fan; widened air-shaft and air course, and put ladder in shaft.

Palisade: Finished incline 800 feet long in mine.

PITKIN COUNTY

Gulch: 1,360 feet of entry driven.

ROUTT COUNTY

Yampa Valley No. 1: Main plane hoisting engine or drum installed outside, and new rope for plane; drum-house; snowsheds over plane; sidetrack at top of plane; sixty new pit cars; new work in mines, etc. Fotal cost, \$20,000.

Yampa Valley No. 2: Installed 2,000 feet of tramway from mine to top of plane, with two large trestles; two hoisting engines; two parallel entries in mine, 500 feet each; and prospecting other veins; at total cost of \$15,000.

Oak Hills (1): Underground development shown by maps. Argo (2): Underground development shown by maps.

Pinnacle: Opened up No. 3 Mine; installed electric plant, and installed revolving screen.

Juniper: Installed two 150 H.P. tubular boilers and slack conveyor; built ten new houses for miners; 1,400 foot tunnel, developing upper veins; developed 1,000 feet on main slope, and opened 1,200 feet of entries.

Routt-Electric: Installation of power plant, steam, 150-H.P. capacity; tipple; shaking and revolving screen; storage bins; railroad connection and trackage; system of water works; office and store buildings; scales; 400-foot escape-way, and ventilating shaft to surface.

WELD COUNTY

Baum: Entries, cross-cuts, and room necks.

Ideal: Put in 80-H.P. boiler; put down a well for water 400 feet; built scale-house, and covered the tipple.

Shamrock: 500 feet of entry.

Evans: Built new engine-room and boiler-room; installed one compressor and one boiler; 1,000 feet of entry; one new pump.

Firestone: Sunk new hoisting shaft, 107 feet deep, 14' x 7'; installed ventilating fan.

Frederick: New tipple hoisting engine.

A BRIEF DESCRIPTION OF SOME OF THE NEW MINES OPENED IN 1911 AND 1912

Star: Located between Rugby and Rapson mines on outcrop, Las Animas County. Drift opening at right angle from true dip. Walsen seam, lower portion three feet three inches. Coal: non-coking bituminous. Colorado & Southern Railway connection one-fourth mile from tipple. Ventilated by furnace. Volume of air, 4,000 feet.

Breen: This mine is located about one-half mile west of the town of Walsenburg, in Section 8, Township 28 South, Range 66 West. It contains eighty acres, and is connected with the Colorado & Southern Railway. The property is operated by the Breen Coal Company. The mine is opened by a slope, driven on the Walsen seam which is six feet thick. The character of the coal is non-coking bituminous. The coal is undercut by machines, operated by electricity, and the mine is ventilated by furnace.

Carbonado: Is located in Huerfano County, and is operated by the Carbonado Coal Mining Company. Shaft: depth, 52 feet; dimensions, 7.8" x 6'. Planning all equipment and six houses. Installing machinery; one 82-H.P. Leyner electric hoist and one coal-cutting electric machine installed November, 1912. Names of seams: Lennox and Maitland. Commenced producing coal August 2, 1912.

Loma: Hnerfano County. Opened 1911, and is situated one mile west of Walsenburg; is a wagon mine. Slope opening on Cameron seam. Furnace ventilation.

Alpha: Weld County. Opened in 1911, and is situated one and one-half miles west of Fort Lupton, on the Denver, Laramie & Northwestern Railway. Shaft opening to seam. Natural ventilation.

Tables 33 to 47, inclusive, show, by counties, the names of mines and operators, the post-office addresses of the mines, the thickness of the coal-beds under operation, the kind of openings, the character of the coal, the total number of days worked, the average number of men employed, and the total production of each mine for the year of 1912.

, Name of Mine	Name of Operator	Post-Office Address or Location of Mine Mine	Thickness of Coal-Bed Under Operation	to baiX SainsqO	character IsoO fo	Xo. of Days Worked	oV Stage Xo. of Men b9YolqmH	Total Production (Tons.) tion, (Tons.) of 2,000 lbs.)
StandardRock	y Mountain Fuel Co	Lafayette	6 to 9 ft.	Shaft	Lignite	224	109.1	106,981
SimpsonRock	y Mountain Fuel Co	Lafayette	7½ ft.	Shaft	Lignite	97	102.6	81, 599
VulcanRock	y Mountain Fuel Co	Lafayette	6 ft.	Shaft	Lignite	1961	45.8	51, 348
MitchellRock	y Mountain Fuel Co	Lafayette	6 ft.	Shaft	Lignite	210	45.8	46, 095
Rex No. 1Rock	y Mountain Fuel Co	Louisville	$\dots 6^{1/2}$ ft.	Shaft	Lignite	168.5	79.8	85,693
Rex No. 2Rock	y Mountain Fuel Co	Louisville	5 ft.	Shaft	Lignite	239	20.6	15, 826
HeclaRock	y Mountain Fuel Co	I.ouisville	5 ft.	Shaft	Lignite	173	73.5	49,411
AcmeRock	y Mountain Fuel Co	I.ouisville5	$\frac{1}{2}$ to $7\frac{1}{2}$ ft.	Shaft	Lignite	28	-	623
GorhamRock	y Mountain Fuel Co	Gorham	6 ft.	Slope	Lignite	251	108	\$1,047
IndustrialRock	y Mountain Fuel Co	Superior	6 ft.	Shaft	Lignite	219	96.4	74, 851
Monarch No. 1 Natic	onal Fuel Co	Downer	.3½ to 7 ft.	Shaft	Lignite	238	108.9	77,582
Monarch No. 2 Natic	nal Fuel Co	Broomfield	.4½ to 9 ft.	Shaft	Lignite	185	57.1	46, 821
CapitolAmer	ican Fuel Co	Lafayette	6 ft.	Shaft	Lignite	195.9	101.5	69, 843
FoxAmer	ican Fuel Co	Gorham	8 ft.	Shaft	Lignite	158	77.4	59, 005
MatchlessAmer	ican Fuel Co	Louisville	4 to 6 ft.	Shaft	Lignite	194	86.3	48,500

TABLE 33

BOULDER COUNTY

Total Produc- tion. (Tons.) of 2,000 lbs.)	47,121	15, 265	30, 677	23, 066	22, 509	19, 272	1, 053, 091
Average No. of Men Average No.	84.4	44	27	31.3	27.5	34	1, 365
No. of Days Worked	200.5	126	280	204.5	210	176.5	
Character of Coal	Lignite	Lignite	Lignite	Lignite	Lignite	Lignite	
to briiX Zain9qO	Shaft	Shaft	Shaft	Shaft	Shaft	Shaft	
Thickness of Coal-Bed Under Operation			9 to 10 ft.	f to 10 ft		5 ft.	21
Name of Mine Post-Office Address or Operator	ntennial	nator	unparellJrooks-Harrison Fuel CoJouisville	rathmoreStrathmore Fuel CoLayette	mmitRussell Gates Mining CoLayette	nnysideIsix Six Coal CoLouisville	Total number of mines in operation

TABLE 33—Concuded

BOULDER COUNTY

,

Total Produc- tion. (Tons.) of 2,000 lbs.)	56, 733	3, SS6	3, 663	413	253	270	65,218
Average No. of Men Employed	63.5	ro	5.6	~	1	¢1	S0.1
Xo, of Days Worked	148	293	151.5	25	68	39	120.7
reter (/)aracter (soO to	Bituminous	Bituminous	Bituminous	Bituminous	Bituminous	Bituminous	
to bniM zninsqO	Slope	Slope	Drift	Drift	Slope	Drift	
Thickness of Coal-Bed Under Under	9 to 14 ft.	to 8 ft.	16 ft.	to 9 ft.			9
Post-Office Address or Location of Milk	Bowie	Joal Co.Cedaredge	Paonia	Paonia	Hotchkiss	0Hotchkiss	• • • • • • • • • • • • • • • • • • •
Name of Operator	Juanita Coal & Coke Co	Surface Creek Co-Operation (Cowan Coal Co	Paonia Coal Co	Leroux Creek Coal Co	Hotchkiss Fuel & Supply Co	mines in operation
Name of Mine	King	Cedaredge	Black Diamond	Farmer	Leroux Creek	Hotchkiss	Total number of 1

TABLE 34

DELTA COUNTY

INSPECTOR OF COAL MINES, COLORADO

Total Produc- tion. (Tons of 2,000 to .)	153, 847	46,086	46,005	60, 172	23, 117	10, 720	1,638	 341.885
Average Xo. of Men Employed	140.1	59.5	52.4	57.7	27.5	13.2	3.7	354.1
Xo. of Days Worked	264	277	193	296	232	236	148	 235.1
('haracter 0f Coal	Lignite	Lignite	Lignite	Lignite	Lignite	Lignite	Lignite	
to briM Znin9qO	Shaft	Shaft	Shaft	Slope	Slope	Slope	Slope	
Aline Thickness of Thickness of Toerstion Operstion	rings	wings	rings ft.)rings71/2 ft.)rings18 ft.	prings6 to 18 ft.	prings	
P 90ff0-jso ^T 70 kgo ff0 10 kgo		Colorado Sp	Colorado Sp	Fuel CoColorado Sp	Colorado Sl	Colorado Sp	Colorado SI	
ine Name of Operato	Pike's Peak Fuel Co.	Curtis Coal Mining Co	Rapson Coal Mining Co.		Mexander Patterson	Tudor Coal Co		ober of mines in operation
Name of M	Pikeview	Curtis	Rapson No. 2.	El Paso	Patterson	Danville	Williamsville .	Total nun

TABLE 35

EL PASO COUNTY

FIFTEENTH BIENNIAL REPORT
Name of Name of Name of Name of Operator Post-Offic Coal-Be Uocation Mine Under	Post-Offices Address Locsation Mine Coal-Bed Under Under	Jo buiM ZninsqO	19132726fer 1800 10	No. of D a Vorked	Employe of Men Average I	Total Proj tion. (T 10,000 10	
ockvaleRockvaleColorado Fuel & Iron CoRockvale	ockvale3½ to 4 ft.	Shaft	Semi-bituminous	201	452.2	221,014	
oal CreekColorado Fuel & Iron CoCoal Creek3 to 3½ ft.	oal Creek3 to 3½ ft.	Slope	Semi-bituminous	234	236.1	121, 657	
remontColorado Fuel & Iron CoFremont5 to 51% ft.	remont $\ldots 5$ to $51/_{2}$ ft.	Shaft	Semi-bituminous	154	269.5	118, 053	
handlerVictor-American Fuel CoChandler4½ to 5 ft.	handler $\dots 4^{1/2}$ to 5 ft.	Shaft	Semi-bituminous	206.4	176.5	114, 467	
adiantVictor-American Fuel CoRadiant3 ft. 10 in.	adiant3 ft. 10 in.	Slope	Semi-bituminous	219	11.4	41,980	
lagnetRocky Mountain Fuel CoWilliamsburg4½ ft.	'illiamsburgt½ ft.	Slope	Semi-bituminous	196.2	95.5	41,465	
loyal GorgeE. G. Bettis	anon City3½ ft.	Slope	Semi-bituminous	261	58.3	34, 803	
meraldWilliamsburg Slope Coal CoWilliamsburg2½ to 31¼ ft.	'illiamsburg $^{21/_{2}}$ to $^{31/_{4}}$ ft.	Slope	Semi-bituminous	166	60.5	20, 174	
olorado CentralColorado Central Coal & Mining Co.Canon City5 ft.	nnon City5 ft.	Shaft	Semi-bituminous	163	28.3	7,191	
Villiamsburg SlopeDonnelly Coal Co	orence	Slope	Semi-bituminous	214	6	5,020	
trooksideBrookside Coal CoCanon City31/2 ft.	anon City31/2 ft.	Slope	Semi-bituminous	187.5	10.8	4, 222	
Villie	orence ft.	Slope	Semi-bituminous	199	9	3, 142	
				9			
Total number of mines in operation 12	12			200	1.480.1	733 188	

INSPECTOR OF COAL MINES, COLORADO

TABLE 36

FREMONT COUNTY

s

-Jotal Produc- tion, (Tons.) of 2,000 lbs.)	72, 987	72, 955	32, 514	178, 456
.Average No. of Men Alage No.	53.4	54.4	71	 178.8
No. of Days. Worked	175	285	276	 243.3
rststrato lsoO lo	Bituminous	Bituminous	Bituminous	
10 bniA Znin9qO	Slope	Drift	Drift	
Post-Office Adress or Location of Jine Thickness of ('oal-Bed Uoal-Bed Thick		Newcastle14 ft.	South Canon15 ft.	en
Mine Name of Operator	Rocky Mountain Fuel Co	Coryell Mining & Leasing Co.	South Canon Coal Co	umber of mines in operation
Name of 1	Midland	Vulcan	South Canon.	Total nu

GARFIELD COUNTY

TABLE 37

Name of Mine	Name of Operator	Post-Office Address or Location of Mine Cosl-Bed Cosl-Bed Under	Dperation Mained Dopening	Character of Coal	No. of Days Worked	Lmployed of Men Employed	Total Produc- tion. (Tons of 2,000 lbs.)
somersetUtah Fu	lel Co	Somerset	t. Slope	Bituminous	246.2	212	266, 504
Crested ButteColorado	Fuel & Iron Co	Crested Eutte5 to 25 1	t. Drift	Bituminous	178.8	193.5	116, 788
rlorestaColorado	Fuel & Iron Co	.Crested Butte \dots 31/2 f	t. Slope	Anthracite	172.2	157.8	55,041
Porterlittell C	oal & Mining Co	Crested Butte15 and 8 1	t. Drift	Bituminous	236	53.5	45,026
foraceIvueblo F	ⁿ uel & Mining Co	Crested Butte3% f	t. Slope	Anthracite	231	30.5	13, 996
3ulkleyCrested	Butte Coal Co	Crested Butte7 f	t. Slope	Bituminous	227.6	27.3	35, 218
KublerRocky M	countain Fuel Co	.Baldwin5½ f	t. Drift	Semi-bituminous	139.6	37.9	22, 023
3aldwin StarBaldwin	Fuel Co	Gunnison	Drift	Bituminous	168.5	2	4, 531
Total number of mines in	operation	8			199.9	719	559, 127

GUNNISON COUNTY

INSPECTOR OF COAL MINES, COLORADO

Name of Mine	Name of Operator	Post-Office Address or Location of Thickness of Coal-Bed Under Under	to bring Bring()	Tharacter IsoD To	No. of Days Worked	Average Xo. of Men Employed	Total Production Total Production Total Production Total Production Total Production Total Product T
Robinson	olorado Fuel & Iron Commun.	Walsen41/2 to 6 ft.	Slope	Bituminous	283.5	352	280, 716
Rouse	blorado Fuel & Iron Co	Rouse6 to 7 ft.	Slope	Bituminous	216.6	233.5	216, 781
PictonC	olorado Fuel & Iron Co	Pictou	Slope	Bituminous	242.8	200.6	135, 289
IdealCo	Jorado Fuel & Iron Co	ldeal to 4 ft.	Slope	Bituminous	224.9	119.1	97, 561
LesterCo	Jorado Fuel & Iron Co	Lester	Slope	Bituminous	109.6	189.2	69, 491
Cameron	olorado Fuel & Iron Co	Farr	Slope	Bituminous	275.3	65.9	53, 253
WalsenCo	Jorado Fuel & Iron Co	Walsen5 to 6 ft.	Slope	Bituminous	,51	97.6	15, 632
Ravenwood	ctor-American Fuel Co	Ravenwood2½ to 3 ft.	Slope	Bituminous	292	148.6	99,589
MaitlandVi	otor-American Fuel Co	Maitlandft.	Slope	Bituminous	263	103.8	64,416
Oakdale	akdale Coal Co	Oakview14 ft.	Slope	Bituminous	241.5	202.7	222, 361
Pryor1	nion Coal & Coke Co	Pryor4, 6 to 7 ft.	Slope	Bituminous	174.5	102.2	100, 440
Huerfano11	Werfano Coal Co	Walsenburg41/2 ft.	Shaft	Bituminous	239	92.4	64, 069
Big FourBi	g Four Coal Co	Tioga to 8 ft.	Slope	Bituminous	154	47.9	55, 826
ToltecF1	ruith & Autrey	Walsenburg	Slope	Bituminous	239.5	73.9	52,003
Sunnyside	innyside Coal Mining Co	Strong7 ft.	Slope	Bituminous	149.8	70.5	50, 119

HUERFANO COUNTY

Pinon	Shaft	Bituminous	180.3	68.2	51,110
RugbyRugby Fuel Co Rugby ft.	Slope	Bituminous	249.9	56.2	48, 973
TiogaTioga	Slope	Bituminous	174.1	49.7	44, 719
GordonGordon Coal Co	Slope	Bituminous	170	43.9	25, 507
BreenBreen Coal Mining Co Walsenburg6 ft.	Slope	Bituminous	181	26.8	23, 133
Reliance	Slope	Bituminous	261	33.5	20, 867
Round OakAlliance Coal CoRavenwood3 ft. 2 in. & 41/2 ft.	Slope	Bituminous	75.5	29.7	9,800
RocklandWalsenburg Fuel Co	Shaft	Bituminous	319.2	40.5	22, 780
Caddell	Slope	Bituminous	225.8	24.4	18, 778
Black Canon	Slope	Bituminous	194.5	21.6	15, 889
Joma	Slope	Bituminous	223	16.6	13,465
Bunker HillBunker Hill Coal CoRouse5 ft.	Drift	Bituminous	50	29	4,750
	shaft and	_			
CarbonadoCarbonado Coal Mining CoWalsenburg	Drift	Bituminous	115	22.4	4,710
PurnerRobert Turner ft.	Slope	Bituminous	22	35	3,000
armoreBeacon Mining CoStrong8 ft.	Slope	Bituminous	32	24.6	2, 876
la VetaLa Veta Coal CoOakview	•	Bituminous	ēł.	ŁQ	1,400
Total number of mines in operation			183.1	2, 627	1, \$89, 200

INSPECTOR OF COAL MINES, COLORADO 105

FIFTEENTH BIENNIAL REPORT

	Total Produc- tion. (Tons of 2,000 lbs.)	38, 799	38, 799		S Total Produc- tion. (Tons.)	12, 003 1, 106 83, 442
	Average Xo. of Men Employed	53.2	53.2		Employed Sof Men Average No.	26.6 6.3 220.6
	Xo. of Days Worked	142	142		ZVo. of Days	127 300 191.3
	Character of Coal	-bituminous			E Character a of Coal	Lignite Lignite
		Semi			to baiN u BainagO g	Shaft Shaft
	lo bniM Snin9qO	Slope			 Coal-Bea Under 	.7 ft. 11 ft.
	Thickness of Coal-Bed Tader Deration	65 ft.			lo zzandzidT	
JACKSON COUNTY	Post-Office Address or Location of Mine Mine	Coalmont	1	TABLE 41	and the second s	
	Name of Operator	Northern Colorado Coal Co	f mines in operation		Name of Operator	Leyden Coal Co
	Name of Mine	Coalmont	Total number o		Name of Mine	Leyden No. 2 Leyden No. 3 White Ash

TABLE 40

LAS ANIMAS COUNTY

INSPECTOR OF COAL MINES, COLORADO 107

Name of Mine Name of Mine Name of Operator Address or Address or Nine	Thickness of Coal-Bed Under Operation	to baiXi gain9qO	factorial for the factorial fo	хо: от 123, Уотked	Average Xo. of Men Employed	Total Produc- tion. (Tons of 2,000 lbs.)
PiedmontPiedmont		Slope	Bituminous	280	183.7	188, 837
ForbesForky Mountain Fuel CoForbes		Drift	Bituminous	245	155.8	130, 467
MajestieRocky Mountain Fuel CoMajestic	4½ to 9 ft.	Drift	Ilituminous	2.59.5	77.5	87,460
TollerTollerburg		Shaft	Bituminous	270	137.8	156, 537
GreenvilleCedar Hill Coal & Coke CoLudiow	5 to 6 ft.	slope	Bituminous	224	56.5	59, 079
Black DiamondCedar Hill Coal & Coke CoCedarhurst		Slope	Bituminous	8.1	40.7	10, 378
BeaconBeacon. 3 ft.	t. 8 in. to 4 ft. 8 in.	Slope	Bituminous	280.5	107.8	.69,021
ThorBowenBowen	5 to 6 ft.	Drift	Bituminous	188	69.4	60,746
WoottonWooton Land & Fuel CoWootton		Drift	Bituminous	289	161.3	138, 666
Ludlow	4 to 5 ft.	Drift	Bituminous	198.5	106.7	61,432
Empire	5 to 7 ft.	Slope	Bituminous	309.5	45.5	54, 649
Brodhead No. 9Southern Colorado Coal CoBrodhead		Slope	Bituminous	275	80.8	51,970
PrimroseRugby	3 ft. 4 in.	Slope	Bituminous	268.4	85.7	48,004
McLaughlinTrinidad	5½ to 6 ft.	Slope	Bituminous	281.5	71.2	45, 365
Kenneth	4 ft.	Drift	Bituminous	265.5	45	52, 163

TABLE 42—Concluded

LAS ANIMAS COUNTY

RoyalRoyal Fuel Co61/2 ft.	Shaft	Bituminous	285	11	35, 050
Southwestern	Slope	Bituminous	208	63	32, 836
Rapson No. 1Rapson Coal Mining CoRugby	Slope	Bituminous	193	38	22, 364
fewel	Slope	Bituminous	148.8	36.8	15, 586
3loomJeffryes Coal Mining CoTrinidad5 ft.	Drift	Bituminous	306	14.7	16, 243
ViolaJohnston Coal & Coke CoTrinidad3 ft.	Drift	Bituminous	136	32.6	12, 230
AltaAlta Fuel Co Arta rei Co	Drift	Bituminous	178	12.4	6, 895
3aldyTrinidad5 to 7 ft.	Slope	Bituminous	241	7.6	5,499
AmadorAmador Fuel CoAguilar	• • • • • •	Bituminous	186	ĽΦ	2, 852
starStar Coal Mining CoCedarhurst ft. 3 in.	Drift	Bituminous	25	15	1,400
			-		and the summary of summary
Total number of mines in operation			241.6	5,490.7	4,770,292

INSPECTOR OF COAL MINES, COLORADO 109

I.A. P	LATA COUNTY					
Name of Mine Post-Office Name of Operator	Address of Location of Coal-Bed Coal-Bed Under Operation	to bniM gain9qO	Character of Coal	Xo. of Days Worked	Average Xo. of Men Employed	Total Produc- tion. (Tons (.zdi 000,2 lo
Perin's PeakCalumet Fuel CoDura	ango5 ft.	Drift	Bituminous	206.9	72.1	62, 309
Hesperus	ango5 ft.	Drift	Semi-bituminous	139.2	37.9	25,066
		Slope a	nd			
San JuanCarbon Coal & Coke CoDura	ango5 ft.	Drift	Bituminous	279	22.2	21,032
CityRoyal Coal & Coke CoDura	ango21/2 ft.	Tunnel	Bituminous	278	21	12,704
Total number of mines in operation	4			226.7	153.2	121, 111

FIFTEENTH BIENNIAL REPORT

Name of Mine	Name of Operator	Post-Office Address or Location of Mine Address of Forthess of	Under Under Operation	gnin9qO	Character of Coal	X0. of Days Worked	Employed of Men Averzze No.	-oubord IstoT anoT) . (Tout (.adi 000,2 to
CameoGrand	Junction Mining & Fuel Co	oCameo	6 ft. Dr	ift	Semi-bituminous	204	51.9	62, 226
Book CliffBook C	Cliff Railroad Co	Grand Junction14	f ft. Dr	ift	Semi-bituminous	115.2	11.6	11,677
Palisadepalisad	le Coal & Supply Co	Palisade3 ft. 10	0 in. Dr	ift	Semi-bituminous	160.9	19.2	10, 313
GrandviewGrandv	view Coal Co	Palisade4 to ;	5 ft. Dr	ift	Semi-bituminous	172.2	2	4,503
GarfieldGarfield	d Coal Mining Co	Grand Junction	8 ft. Dr	ift	Semi-bituminous	194	6.9	5,786
Plateau ValleyPlateau	u Valley Coal Co	Cameo6	ft. Dr	ift	Semi-bituminous	129	5.8	3, 427
StokesStokes	Stokes	Palisade3 ft. 8	8 in. Dr	ift	Semi-bituminous	791	S.5	4, 365
Farmer F. I.	De Rush	Palisade	2 ft. Dr	ift	Semi-bituminous	175	12.5	1,179
2							-	
Total number of mines i	in operation	8				155.9	123.4	103, 476

MESA COUNTY

INSPECTOR OF COAL MINES, COLORADO

111

	Total Produc- tion. (Tons (.zdI 000 [2 10	74, 182	71,152
	Employed of Nen Average No.	84.5	81.5
	No. of Days Worked	177.5	 177.5
	Tatacter IsoD fo	Bituminous	
	io bniM ZninsqO	Slope	
	Thickness of Coal-Bed Under Operation	5½ to 10 ft.	
PITKIN COU?	Post-Office Address or Location of Mine	Spring Gulch	1
	Name of Operator	orado Fuel & Iron Co	es in operation
	Name of Mine	Spring Gulch	Total number of mine

έ.

(.sdl 000,2 10	989		16	19	669	926	96	1	05
-oubord lstoT anoT) .noit	145, 5		46, 1	109,5	75, 6	4, 9	59, 0		441,0
Луегаде Хо. оf Мен Етрјоуед	151.5		61.3	78.1	81.5	7.6	67.1		117.1
No. of Days Worked	219.5		175.5	189	179.8	72.6	170		168.1
Character of Coal	Bituminous	đ	Bituminous	Bituminous	Bituminous	Bituminous	Bituminous		
to briN gningQ	Slope	Slope an	Drift	Drift	Drift	Drift	Slope		
Thickness of Coal-Bed Under Under	to 10 ft.		12 ft.	c16 ft.	c12 to 14 ft.	ζ12 to 14 ft.	c to 11 ft.		9
f O perator Addressor Post-Office Addressor or Mine				uel CoOak Creel	Joal CoOak Creel	Coal CoOak Cree			ion
tame of Mine of (Hills No. 1Moffat Coal Co		Hills No. 2Moffat Coal Co	cleRoutt County Fue	a Valley No. 1Yampa Valley Co	a Valley No. 2 Yampa Valley Co	erJuniper Coal Co		fotal number of mines in operatio
	ak		ak	inn	am	am	unij		

ROUTT COUNTY

INSPECTOR OF COAL MINES, COLORADO

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Name of Mine	Name of Operator	Post-Office Address or Location of Mine Afine	Thickness of Coal-Bed Under Operation	to bniX znin9qO	Tharacter of Coal	Xo. of Days Worked	Employed of Men Vverage Vo.	Total Produce tion. (Ton .zdl 000 lbs.
Puritan	ttional Fuel Co	Erie	8 ft.	Shaft	Lignite	207	92.9	125, 535
ParkdaleNa	ttional Fuel Co	Iafayette	to 10 ft.	Slope	Lignite	276	73.7	83, 276
Solden AshCo	nsolidated Coal & Coke Co	Dacona	to 9 ft.	Shaft	Lignite	216	181	141, 323
Frederick Fr	ederick Coal	Frederick	<u>8</u> 1/2 ft.	Slope	Lignite	178.9	51.5	47, 999
Evans	nerican Fuel Co	Frederick	8 ft.	Shaft	Lignite	195	72.7	34,690
dealId	eal Coal Co	Erie	8 ft.	Slope	Lignite	298	14.9	14,107
ShamrockSh	amrock Coal Co	Erie	11 ft.	Shaft	Lignite	277	12.6	10, 346
FirestoneI.	uisville Coal & Land Co	Firestone	6½ ft.	Shaft	Lignite	133.4	43.8	19, 355
AlphaAl	pha Coal Co	Fort Lupton	6 ft.	Shaft	Lignite	314	19.1	5,409
AndrewSt	ate Coal Co	Erie	11 ft.	Shaft	Lignite	95.5	22.6	5, 694
WarwickRe	ocky Mountain Fuel Co	Frederick4	to 5 ft.	Shaft	Lignite	42	19	1,645
								-
Total number of mi	nes in operation	11				202.9	603.8	489, 379

WELD COUNTY

TABLE 47

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COKE PRODUCTION, 1912, BY COMPANIES AND COUNTIES

	Total			Total	Total
	No. of	Total		No. of	Ton-
Companies	Ovens	Tonnage	Counties	Ovens	nage
Colorado Fuel & Iron Co	.1,398	756,831	Gunnison	52	19,612
Carbon Coal & Coke Co	. 240	160,720	Las Animas	1,678	945,985
Victor-American Fuel Co	. 92	48,046	La Plata	21	6,942
American Smelting & Refining Co.	. 21	6,942			
Totals	.1,751	972, 539		1,751	972, 539

TABLE 49

SUMMARY OF COAL PRODUCTION OF COLORADO FROM 1873 TO 1912

Year	Tons	Year	Tons
1873	69,977	1893	3, 947, 056
1874	87, 372	1894	3,021,028
1875	98,838	1895	3, 339, 495
1876	117,666	1896	3, 371, 633
1877	160,000	1897	3, 565, 660
1878	200, 630	1898	4, 174, 037
1879	322, 732	1899	4, 826, 939
1880	375, 000	1900	5, 495, 734
1881	706, 744	1901	6, 210, 405
1882	1, 161, 479	1902	7, 522, 923
1883	1, 220, 593	1903	7, 775, 302
1884	1, 130, 024	1904	6,776,551
1885	1, 398, 796	1905	8, 989, 631
1886	1, 436, 211	1906	10, 308, 421
1887	1, 791, 735	1907	10, 965, 640
1888	2, 185, 477	1908	9, 773, 007
1889	2, 400, 629	1909	10, 772, 490
1890	3, 075, 781	1910	12, 134, 887
1891	3, 512, 632	1911	10, 197, 595
1892	3,771,234	1912	11, 016, 948

NUMBER OF TONS OF COAL PRODUCED IN COAL MINES OF THE UNITED STATES, 1814 TO 1908, AND OF CANADA, 1874 TO 1908

7	Year U	Inited States	Canada	Total
1570		33, 035, 580		33, 035, 580
1871		. 46, 885, 080		46, 885, 080
1872	·····	51, 453, 399		51, 453, 399
1873		57, 602, 480		57, 602, 480
1874		52,605,920	1,063,742	53, 669, 662
1875		52, 348, 320	1,039,974	53, 388, 294
1576		53, 280, 000	994, 762	54, 274, 762
1877		60, 501, 760	1,036,670	61, 538, 430
1878		57, 935, 600	1,089,744	59, 025, 344
1879		68, 105, 799	1, 126, 497	69, 232, 296
	Total	533, 753, 938	6, 351, 389	540, 105, 327
1580		71, 481, 570	1,482,714	72, 964, 284
1551		85, 881, 030	1,537,106	87, 418, 136
1882		103, 551, 189	1, 848, 148	105, 399, 337
1583		115, 707, 525	1, 818, 684	117, 526, 209
1884		120, 155, 551	1, 984, 959	122, 140, 510
1885		111, 160, 295	1,920,977	113,081,272
1886		113, 650, 427	2, 116, 653	115, 797, 080
1887		130, 650, 511	2, 429, 330	133, 079, 841
1888		148, 659, 657	2,602,552	151, 262, 209
1889	•••••••	141,229,513	2, 658, 303	143, 887, 816
	Total	1, 142, 157, 268	20, 399, 426	1, 162, 556, 694
1590		157, 770, 963	3, 084, 682	160, 855, 645
1891		168, 566, 669	3, 577, 749	172, 144, 418
1892		179, 329, 071	3, 287, 745	182, 616, 816
1893		182, 352, 774	3, 783, 499	186, 136, 273
1894		170, 741, 526	3, 847, 070	174, 588, 596
1895	1	193, 117, 530	3, 478, 314	196, 595, 844
1896		191, 986, 357	3, 745, 716	195, 732, 073
1897		200, 229, 199	3, 786, 107	204, 015, 306
1598		219, 976, 267	4, 173, 108	224, 149, 375
1899		253, 741, 192	4, 925, 051	258, 666, 243
	- Total	1, 917, 811, 548	37, 689, 041	1, 955, 500, 589

TABLE 50—Concluded

NUMBER OF TONS OF COAL PRODUCED IN COAL MINES OF THE UNITED STATES, 1814 TO 1908, AND OF CANADA, 1874 TO 1908

-	Year	United States	Canada	Total
1900	••••••	269, 684, 027	5,777,319	275, 461, 346
1901	••••••	293, 299, 816	6, 486, 325	299, 786, 141
1902		301, 590, 439	7, 466, 681	309,057,120
1903		357, 356, 416	7,960,364	365, 316, 780
1904	••••••	351, 816, 398	8, 254, 595	360, 070, 993
1905		392, 722, 635	8,667,948	401, 390, 583
1906		414, 157, 278	9, 762, 601	423, 919, 879
1907	•••••	480, 363, 424	10, 511, 426	490, 874, 850
1908	•••••	415, 842, 698	10,904,486	426, 747, 184
	Total	3, 276, 833, 131	75, 791, 745	3, 352, 624, 876
	Grand total	7, 280, 940, 265	140, 231, 601	7, 421, 171, 866

READINGS TAKEN AT CRESTED BUTTE MINE

GUNNISON COUNTY DECEMBER 11, 1912

	By	Frank N.	Oberding, Deputy State Coal Mine Inspector
Dry	Wet	Relative	
Bulb	Bulb	Humidity	Where Taken
30	30	100	Inside radiator near parting
36	34	84	Rock tunnel
50	44	64	2nd S. above main, near face
59	54	74	5th S., 3rd incline
59	59	100	Main return

FIFTEENTH BIENNIAL REPORT

READINGS TAKEN IN TERCIO MINE

LAS ANIMAS COUNTY DECEMBER 13, 1912

	By	Henry	King, Deputy State Coal Mine Inspector	
Dry	Wet R	elative		
Bulb	Bulb Hu	umidity	Where Taken	
41	32	38	Outside of mine	
57	55	88	150 ft. from radiator	
54	53	94	3,000 ft. from mouth of drift	
57	56	94	4,900 ft. from mouth of drift	
61	60.5	97	7,100 ft. from mouth of drift	
60	59.5	97	100 ft. from face of entry A seam, No. 2 min	e
60	59.5	97	Junction A and C seams, No. 2 mine	
60	60	100	Near face of entry C seam, No. 2 mine	

READINGS TAKEN AT STARKVILLE MINE

LAS ANIMAS COUNTY DECEMBER 11, 1912

		By Henry	King, Deputy State Coal Mine Inspector
Dry	Wet	Relative	
Bulb	Bulb	Humidity	Where Taken
48	43	62	Opposite 1st S. parting
56	50	68	4th S. entry
70	66	82	8th S., Junction J-9 entry
75	70	78	12th S., Junction J-9 entry
76	74	91	Room 73, near face J-6 entry
75	74.5	98	8th S. motor road, near J-6 entry
75	74.5	98	Bottom H-1 entry
77	76	96	Top of H-1 entry

Outside temperature 20°; no reading taken.

These readings are very unsatisfactory for Starkville mine, but the radiator was broken for a week—one side only used.

INSPECTOR OF COAL MINES, COLORADO 119

READINGS TAKEN IN MORLEY SLOPE

LAS ANIMAS COUNTY DECEMBER 9, 1912

			By Henry	King, Deputy State Coal Mine Inspector
]	Dry	Wet	Relative	
E	ulb	Bulb	Humidity	Where Taken
	32	29	67	Outside of mine
	50	49.5	97	2nd S. on slope, 600 ft. from surface
	52	51.5	97	Junction 5th left on slope
	59	58	95	175 ft. from face of 5th left
	57	56	94	Inside cross-cut 1 and 2 plane 5th S.
	59	58	95	Inside cross-cut 5th right entry
	56	55	94	Inside cross-cut 1 and 2 plane off 5th right
	59	58.5	97	Inside cross-cut 4th right entry
	59.5	59	97	Inside cross-cut 3 and 4 plane off 4th righ

EAST MORLEY MINE DECEMBER 10, 1912

Dry	Wet	Relative	
Bulb	Bulb	Humidity	Where Taken
44	35	42	Outside of mine, in the sun
63.5	63.5	100	Near mouth of drift in return air
66	65.5	98	3rd N. junction with main haulage road
57	57	100	2,700 ft. from radiator, intake airway
65	64	95	5,300 ft. from surface on main drift
68.5	68	98	Junction 2nd E. and 6th N.

FREDERICK MINE DECEMBER 12, 1912

Dry	Wet	Relative	
Bulb	Bulb	Humidity	Where Taken
45	32	20	Inside radiator on main intake
52	50	89	Junction 1st E and main haulage road
56.5	55	92	Junction 3rd E. and main haulage road
63	62	95	Junction 9th W. and main haulage road
64.5	64	97	Room 24, 11th E. entry
67	66.5	98	Room 18, 11th W. entry
64.5	64.5	100	300 ft. in 14th E. entry, main haulage road
63.5	63	97	4th E. return opposite 3rd E. parting
63.5	63.5	100	Main return airway, near 2nd W. entry

Outside temperature 20°; no reading taken.

FIFTEENTH BIENNIAL REPORT

READINGS TAKEN IN TABASCO MINE

LAS ANIMAS COUNTY DECEMBER 21, 1912

		By Henry	King, Deputy State Coal Mine Inspector
Dry	Wet	Relative	
Bulb	Bulb	Humidity	Where Taken
56	56	100	1st S. entry and return airway
43.5	42.5	93	85 ft. from face of slope and 2,600 ft. from mouth of
			slope
59	58.5	97	2nd S. entry, bottom 3rd and 4th plain
59.5	59	97	1st plane, 2nd S., 1st room
57.5	57	97	1st plane, 1st S., 10th room

Outside temperature, 21°.

There is no radiator in this mine, but the mine is very wet near the slope, and ice was on the timber 1,200 feet from the mouth of the slope. Note the second reading: the low temperature and the high relative humidity, caused by the very wet zone. The air had to travel through all the workings in humid condition.

SOPRIS MINE DECEMBER 19, 1912 ·

Dry	Wet	Relative	
Bulb	Bulb	Humidity	Where Taken
64.5	64.5	100	Revolving door on return airway
64	64	100	300 ft. inside radiator intake airway
60.5	58.5	90	Opposite 15th E. parting intake airway
64.5	63	93	Return from 18th W. junction back slope and 20th W.
66	66	100	150 ft. from face of 19th E. entry
62.5	61.5	95	Intake airway 18th E., opposite 17th E. parting
64	64	100	16th E. entry, Room 92
64	64	100	17th E. entry, Room 92

Temperature one foot from roof at inside end of radiator, 72° . Temperature one foot from bottom at inside end of radiator, 59° . Outside temperature, 30° .

I consider these readings very good; same as two years ago.



ILLUSTRATION NO. 3 Radiator Installed by the C. F. & I. at Their Coking Coal Mines in Las Animas County in 1911.

INSPECTOR OF COAL MINES, COLORADO

READINGS TAKEN IN FIRST NORTH AND FIRST EAST, PRIMERO MINE

LAS ANIMAS COUNTY DECEMBER 18, 1912

By Henry King, Deputy State Coal Mine Inspector

FIRST NORTH PRIMERO MINE

Dry	Wet	Relative	
Bulb	Bulb	Humidity	Where Taken
46 ·	42	74	200 ft. from mouth of drift inside radiator
50	47	82	2,500 ft. from mouth of drift
53	50	83	4,200 ft. from mouth of drift
57	54	84	5,000 ft. from mouth of drift B-9 entry
60	58	90	Room 2 on A-12 entry
66	65	95	Room 1 of 4th blind cross-cut A-12
62.5	61.5	95	Room 4, A-11
61	61	100	300 ft. from fan return airway

FIRST EAST PRIMERO MINE

Dry	Wet	Relative	
Bulb	Bulb	Humidity	Where Taken
44.5	31	16	Outside of mine
58	46	27	150 ft. inside radiator
50.5	48	85	Junction B-8 E. on main haulage road
62.5	61.5	95	140 ft. from face of main road
56	53.5	86	B-9 W. entry, near face
66.5	64.5	90	75 ft. from face B-9 E. entry
66.5	66	98	Return airway 100 ft. below overcast

BERWIND MINE NO. 3, DECEMBER 20, 1912

Dry	Wet	Relative	
Bulb	Bulb	Humidity	Where Taken
50.5	49.5	94	Junction 12 W. and main intake air-course
60	57	85	Junction 14 W. and back slope
70.5	70	98	300 ft. from bottom of slope
72.5	72	98	Junction 18 E. and main S. entry
69	68.5	98	Junction 2nd S. motor road and return air-course
71.5	71.5	100	Junction 2nd S. and 18th E. entry
64.5	64	97	Junction 5th S. and 18th E. entry
64	63.5	97	Room 47 off 16th E. entry
65.5	64.5	95	300 ft. from fan on return air-course

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Directory of Coal Mines

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	Lucal N	lode of Railroad	
Name of Mine Name and Address of Operator Pres. or Gen'l. Mgr. S	uperintendent Vent	ilation ("onnections	Remarks
tandardRocky Mountain Fuel Co., DenverE. E. Shumway, Pres.	D. M. Sultz	Fan C. & S., B. & M.,	U. P
impsonRocky Mountain Fuel Co., DenverE. E. Shumway, Pres.	Henry Denman	Fan C. & S., B. & M.,	U. P
"ulcan	Chas. Billington	Fan B. & M., U. P.	
titchellRocky Mountain Fuel Co., DenverE. E. Shumway, Pres.	Henry Denman	Fan B. & M., U. P.	
tex No. 1 Rocky Mountain Fuel Co., DenverE. B. Shumway, Pres.	J. C. Williams	Fan C. & S.	
tex No. 2 Rocky Mountain Fuel Co., DenverE. E. Shumway, Pres.	Thos. Hilton	Fan C. & S.	
leelaRocky Mountain Fuel Co., DenverE. E. Shumway, Pres.	Ed. Hodgson	Fan C. & S.	
iorhamRocky Mountain Fuel Co., DenverE. E. Shumway, Pres.	Geo. Giles	Fan C. & S.	
ndustrialRocky Mountain Fuel Co., DenverE. E. Shumway, Pres.	F. J. L. MacCormac	Fan C. & S.	
cemeRocky Mountain Fuel Co., DenverE. E. Shumway, Pres.	J. C. Williams	Fan C. & S.	* * * * *
donarch No. 1The National Fuel Co., DenverH. Van Maler	J. F. Robbins	Fan ('. & S.	0 0 0 0 0
Ionarch No. 2The National Fuel Co., DenverH. Van Maler	Joseph Cochrane	Fan C. & S.	
apitolb. Evans Fuel Co., Denverb. E. Evans	O. M. Hopkins	Fan B. & M.	0 0 0 0 0
oxD. E. Evans Puel Co., DenverD. E. Evans	J. W. Shultz	Fan C. & S.	
latchless American Fuel Co., Denver B. Evans	Thos. Fox	Fan C. & S.	
entenrial	Elmer Ellis	Fan B. & M.	* * * * *
enator	Chris Ward	Fan B. & M.	* * * * *
trathmoreStrathmore Fuel Co., Lafayette	E. M. Cannon	Fan C. & S.	•
VonparellBrooks-Harrison Fuel Co., Louisville.	J. E. Brooks	Fan C. & S.	•
ummitRussell Gates Mining Co., DenverRussell Gates	J. J. Boyd	Fan C. & S.	•
unnysileBig Six Coal Co.,Louisville	F. N. Carveth	Fan C. & S., B. & M	•

FIFTEENTH BIENNIAL REPORT

	Local	Mode of	Railroad	
Name of Mine Name and Address of Operator Pres. or Gen'l. Mgr.	Superintendent V	Ventilation Co	onnections	Remarks
KingJuanita Coal & Coke Co., BowieAlexander Bowie	Wallace D. Bowi	e Furnace D	. & R. G	•
CedaredgeSur. Creek Co-op. C. Co., Cedaredge	A. W. Hall	Natural	•	
Black DiamondFarmers' Progressive C. Co., Paonia	Chas. Cowan, Jr	. Natural		0 0 0 0
Farmers'I'aonia Coal Co., Paonia	H. H. Stull	Natural		0 0 0 0
LerouxLeroux Creek Coal Co., Hotchkiss	J. M. Compton	Natural	• • • • • • •	0 0 0 0 0
Hotchkiss	M. W. Bennett	Natural		
EL PASO COUNT	Y Local	Mode of	Railroad	
Name of Mine Name and Address of Operator Pres. or Gen'l. Mgr.	Superintendent	Ventilation Co	onnections	Remarks
Pike View	P. L. Dixon	Fan D	. & R. G.	
CurtisCurtls Coal Mining Co., Colo. SpgsC. H. Curtis, Pres.	Ralph Wooden	Fan R	. I.	• • • •
Rapson No. 2 Rupson Coal Co., Colorado SpringsC. H. Curtis	Ralph Wooden	Fan R	. I.	
El PasoEl*Paso C. L. & F. Co., Colo. Spgs	W. S. Cook	Fan A	., T. & S. F.	* * *
PattersonAlexander Patterson, Colo. Springs	Geo. Patterson	Fan N	one	
DanvilleTudor Coal Co., Colorado Springs	Jenkin Tudor	Fan D	. & R. G.	10.010
WilliamsvilleDaniels Coal Co., Colorado Springs	T. E. Daniels			

DELTA COUNTY

	Local Mode of Railroad	
Name of Mine Name and Address of Operators Pres. or Gen'l. Mgr.	uperintendent Ventilation Connections	Remarks
Rockvale No. 22Colorado Fuel & Iron Co., PuebloE. H. Weitzel	Henry Johns Fan S. F.	
CoalcreekColorado Fuel & Iron Co., PuebloE. H. Weitzel	Ben Beach Fan D. & R. G.	
FremontColorado Fuel & Iron Co., PuebloE. H. Weitzel	A. J. Davis Fan D. & R. G.	
MagnetRocky Mountain Fuel Co., DenverE. E. Shumway	Thos. Gibbs Fan S. F.	
Royal GorgeE. G. Bettis, Canon City	P. Westwater Fan	
	and NaturalS. F.	•
Emerald	H. J. Smith Furnace S. F.	
ChandlerVictor-American Fuel Co., DenverW. J. Murray	E. W. Jones Fan S. F.	•
RadiantVictor-American Fuel Co., DenverW. J. Murray	G. H. Williams Fan S. F.	*
CentralColo, Central Coal & M. Co., Pueblo	I. A. Littell Fan S. F.	
Wil'msbr'g SlopeDonnely Coal Co., Florence	Henry Donnelly. Natural S. F.	• • • • •
BrooksideBrookside Coal Co., Canon Clty	J. Sippis Natural S. F.	• • • • •
WillieSamuel Petry, Florence	Samuel Petry Natural S. F.	•

FREMONT COUNTY

	oad	tions Remarks			* * * *	Closed down			oad	tions Remarks	. G.	. G.	. G.	. G.	. G.	G.	
TY	Local Mode of Railr	Superintendent Ventilation Connec	J. E. Smith Fan C. M.	Chas. Meerdrick Fan C. M.	Jno. Rees C. M.	C. M.		TY	Local Mode of Railre	Superintendent Ventilation Connect	R. M. Magraw Fan D. & R.	John Arnott Fan D. & R.	John Arnott Fan D. & R.	C. F. Fridley Fan D. & R.	C. F. Fridley Fan D. & R.	O. V. Roberts Fan D. & R.	Nat Colo Fan C P. S
GARFIELD COUNT		Name of Mine Name and Address of Operators Pres. or Gen'l. Mgr.	didlandRocky Mountain Fuel Co., DenverE. E. Shumway	/ulcanCoryell Mine Leasing Co., Denver	south CanonSouth Canon Coal Co., Denver	DiamondCardiff Coal, Cardiff		GUNNISON COUN		Name of Mine Name and Address of Operators Pres. or Gen'l. Mgr.	omersetUtah Fuel Co., Salt Lake City, Utah.H. G. Williams	rested ButteColorado Fuel & Iron Co., PuebloE. H. Weitzel	lorestaColorado Fuel & Iron Co., PuebloE. H. Weitzel	orter	Iorace	ulkleyCrested Butte Coal Co., DenverFrank Bulkley	ubler Rocky Mountain Ruel Co Denver 18 R Shumway

INSPECTOR OF COAL MINES, COLORADO

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Closed down New

..... Fan C. & S.

Alpine......Rocky Mountain Fuel Co.......

C. A. Partch.... Natural

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	Local Mode of Railroad
Name of Mine Name and Address of Operators Pres. or Gen'l. Mgr.	Superintendent Ventilation Connections Remarks
Robinson Wolerade Fuel & Iron Co., Pueblo E. H. Weitzel	R. K. Graham Fan D. R. G.
RouseColorado Fuel & Iron Co., PuebloE. H. Weitzel	W. G. Deck Fan D. R. G
PictonColorado Fuel & Iron Co., PuebloE. II. Weitzel	W. H. Manley Fan D. R. G.
Ideal and Colorado Fuel & Iron Co., Pueblo E. H. Weitzel	W. J. Tyson Fan C. & S.
Lester	W. G. Deck Fan D. & R. G.
Wameron	T. P. Davis Fan C. & S. & D. & R. G.
WulsenColorado Fuel & Iron Co., PuebloE. H. Weitzel	R. K. Graham Fan D. & R. G.
Haron	Abandoned
Ravenwood	John Neish Fan C. & S.
Maitland	John Shaw Fan D. & R. G.
OakdaleJakdale Coal Co., DenverJohn D. Jones	W. L. Morgan Fan D. & R. G.
Pryor	Chas. Beuchat Fan C. & S. & D. & R. G
Huerfano	R. F. Poli Fan C. & S.
Big Four Big Four Caal & Coke Co., Denver	W. B. McFaddenC. & S. & D. & R. G.
Pinon	James Hare Fan C. & S. & D. & R. G.
Tolter	Fruith & Autrey Fan C. & S. & D. & R. G.
RugbyRugby Fuel Co., Denver	John Dunmire Fan C. & S. & D. & R. G.
Sunnyside, Sunnyside Coal Mining Co., Denver	Frank Stevens Fan C. & S. & D. & R. G
Tloga	L. H. McGowan Fan D. & R. G. :
Gardon	H Cann C & S & D & R G

FIFTEENTH BIENNIAL REPORT

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erverFrank Bulkley C. H. Peet Fan D. & R. G. Reopened enver	Juver	ohn McDowell Fan Abai
Denver	DenverFrank Bulkley (), H. Peet Fan D. & R. G. Re
Walsenburg Walsenburg New Joseph Ball New Jo	, Denver	Robert Curry Fan D. & R. G.
 , Strong c. W. Rankin Furnace C. & S. & D. & R. G J. M. Brennan. Furnace D. & R. G. Netore co., Denver J. M. Brennan. Furnace D. & R. G. Netore co., Denver J. M. Bell Fan Netore deopene J. M. Brennan. Furnace D. & R. G. Netore ew JACKSON COUNTY JACKSON COUNTY Local Mode of Railroad Remark coperators Pres. or Gen'l. Mgr. Superintendent Ventilation Connections Remark Aramle, Wyo.E. R. Miller D. B. Cameron Natural L. H. P. & P 	., Walsenburg	foseph Ball
ouse	Co., Strong	C. W. Rankin Furnace C. &. S. & D. & R. G.
Co., Denver Beopene ew	Rouse	J. M. Brennan. Furnace D. W. W. G. Richard F. Bell Fan
Jas. Turner Furnace JACKSON COUNTY Local Mode of Railroad f Operators Pres. or Gen'l. Mgr. Superintendent Ventilation Connections Remark aramie, Wyo.E. R. Miller D. B. Cameron Natural L. H. P. & P	g Co., Denver vview	Jno. Deighton R.
JACKSON COUNTY Local Mode of Railroad f Operators Pres. or Gen'l. Mgr. Superintendent Ventilation Connections Remark aramie, Wyo.E. R. Miller D. B. Cameron Natural L. H. P. & P.		Jas, Turner Furnace
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	f Operators Pres. or Gen'l. Mgr. ^S Laramie, Wyo.E. R. Miller	uperintendent Ventilation Connections I D. B. Cameron Natural L. H. P. & P.
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Local Mode of Connections Remarl	f Operators Pres. or Gen'l. Mgr. S	uperintendent Ventilation Local
Local Mode of Connections Remari f Operators Pres. or Gen'l. Mgr. Superintendent Ventilation Local	vers. M. Perry	Fred Newmeyer Fan D. N. W. & P. T Fred Newmeyer Fan D. N. W. & P.
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INSPECTOR OF COAL MINES, COLORADO

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	Local Mode of Railroad	
line Name and Address of Operators l'res, or Gen'l, Mgr	Superintendent Ventilation Connections	Remarks
.Colorado Fuel & Iron Co., Pueblo, E. H. Weitzel	Chas. O'Neil Fan C & S.	
Colorado Fuel & Iron Co., PuebloE. H. Weitzel	Fan C. & W.	
Colorado Fuel & Iron Co., PuebloE. H. Weitzel	Jos. Haske Pan C. & W.	
.Colorado Fuel & Iron Co., PuebloE. H. Weitzel	Jas. Wilson Fan A., T. & S. F.	
	Chas, Chambers - Fan C. & S. & C. W.	
. Colorado Fuel & Iron Co., Pueblo E. H. Weitzel	J. R. Jenkins Fan A., T. & S. F	
.Colorado Fuel & Iron Co., PuebloE. H. Weitzel	Chas. O'Neil Fan C. & S.	
	A. W. Robinson Fan C. & W.	
	S. F., D. & R. G.,	('losed
Victor-American Fuel Co., DenverW J. Murray	B. W. Snodgras, Fan S. F., D. & R. G.,	
	('. & S.	
Victor-American Fuel Co., DenverW. J. Murray	James Cameron Fan S. F., D & R G	
	C. & S.	
Victor-American Fuel Co., Denver W. J. Murray	John Wm. Bell. Fan C. & S.	
Victor-American Fuel Co., DenverW. J. Murray	Thos. Jolly Fan C. & S.	
		C[0Sed]
.Carbon Coal & Coke Co., Denver	F. P. Bayles. Fan C. & S., D. & R. G.,	
	S. & F.	
Rocky Mountain Fuel Co., DenverE. E. Shumway	Wm. Morgan Fan C. & S., D. & R G.,	
	S. & F	
Rocky Mountain Fuel Co. Denver E. E. Shumway	Robt. Nichol Fan C & S.	

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MajesticRocky Mountain Fuel Co., DenverE. E. Shumway	I. D. Zook. Fan C. & S.	1
TollerCedar Hill Coal & Coke Co., DenverD. M. Harrington	H. F. Tennant Fan C. & S., D. & R. G.	
GreenvilleCedar Hill Coal & Coke Co., DenverD. M. Harrington	H. F. Tennant Fan C. & S., D. & R. G.	
Black DiamondCedar Hill Coal & Coke Co., DenverD. M. Harrington	M. J. McKeown. Natural C. & S., D. & R. G.	:
BeaconNational Fuel Co., DenverH. Van Mater	Thos. Wakely Fan C. & S., D. & R. G.	:
Thor	Albert Oliver Fan C. & S., D. & R. G.	÷
Wooton	James Struthers Fan	
	and Furnace A., T. & S. F.	
Ludlow	F. McDermott Fan C. & S.	:
EmpireEmpire Coal Co., Denver	Wm Waddell Fan C. & S. & D. & R. G.	:
Brodhead No. 9 So. Colorado Coal Co., Brodhead	W. M. Burt Fan C. & S. Reopened	pa
PrimrosePrimrose Coal Co., Rugby	H. Mallet Fan C. & S.	:
McLaughlinMcLaughlin Bros', C. Co., Starkville	J. E. McLaughlin Fan	
	and Natural	
KennethTemple Fuel Co., Trinidad	G. F. Bowen Natural C. & S.	:
RoyalRoyal Fuel Co., DenverH. Van Mater	James Ewart Fan Old Brodhead Reopened	be
SouthwesternSouthwestern Fuel Co., Aguilar	Ray Bisch Fan C. & S.	
	and Furnace C. & S.	
Rapson No. 1Rapson C. M. Co., Colorado Springs	Irving Mellinger Fan C. & S. & D. & R. G.	:
JewelIdeal Fuel Co., Aguilar	Robt, O'Neil Furnace C. & S.	
BloomJeffryes Coal & Mining Co., Trinidad.	A. G. Jeffryes Natural	
ViolaJohnston Coal & Coke Co., Trinidad		u.
AltaAlta Fuel Co., BrodheadA. G. Brodhead	John Tittle	
BaldyBaldy Coal Co., Trinidad	W. O. Sherman. Natural	

INSPECTOR OF COAL MINES, COLORADO

	ultroad	nections Remarks	Reopened	New	Closed		tilroad	nections Remarks	. S.	. S.	. S.	. R. G.
	of Re	tion Con		al			of Rf	tion Con	an R. G	an R. G	ce R. G	al D. &
	Mode	Ventilat		. Natura			Mode	Ventilat	Fa	Fa	Furna	. Natur
Concluded	Local	Superintendent	John Allen	L. R. Foster		11	Local	Superintendent	L. McCormick .	W. I. Gifford	F. C. Gilbert	Geo. C. Logan.
MAS COUNTY-		Pres. or Gen'l, Mgr.				PLATA COUNT	Pres. or Gen'l. Mgr.					
INA SAL		Name and Address of Operators	Amador Fuel Co., Aguilar	Star Mining Co., Cedarhurst	Congo Coal Co., Aguilar	LAN	Name and Address of Operators		Calumet Fuel Co., Durango	Porter Fuel Co., Durango	Carbon Coal & Coke Co., Denver	Royal Coal & Coke Co., Durango
		Name of Mine	Rival (Amador)	Star	Congo		Name of Mine		Perin's Peak	Hesperus	San Juan	City

FIFTEENTH BIENNIAL REPORT

			Local	Mode of	Railroad	
Name of Mine N	ame and Address of Operators	Pres. or Gen'l. Mgr.	Superintendent	Ventilation	Connections I	temarks
ameoGrano	l Jct. Mining & Fuel Co., Denver.	John McNeil	John McNeil, Jr.	Fan I). & R. G.	
Rook CliffBook	Cliff R. R. Co., Grand Junction		T. E. Sanford	Natural H	sook Cliff	• • • •
PalisadePalis	de Coal & Supply Co., Palisade		Fred Rowley	Natural C	. M. & D. & R. G.	• • • • • •
Grand ViewF. F.	De Rush, Palisade		F. F. De Rush	Natural C	'., M. & D. & R. G.	
JarfieldGarfi	eld Coal M. Co., Grand Junction.		A. E. Baylis	Natural .	• • • • • •	
P. V.	Coal Co., Cameo		F. J. Kerr	Natural (. M. & D. R. Co.	
stokesW. D). Stokes, Palisade		Walter Stokes	Natural .		
FarmersRiver	side Fuel & Power Co., Palisade.		Dan T. Lloyd	Furnace		• • • •
Name of Mine N SpencerManc	MO ame and Address of Operators os Fuel Co., Mancos	NTFZUMA COU) Pres. or Gen'l. Mgr.	NTY Local Superintendent Í	Mode of Ventilation Natural . Mode of	Railroad Connections Railroad	Remarks
						Domonito
Name of Mine N	ame and Address of Operators	Pres. or Gen'l. Mgr.	Superintendent	Ventilation	Connections	Kemarks
Suring GulchColor	ado Fuel & Iron, Pueblo	E. H. Weitzel	Richard Maloy	Fan (C. M.	

MESA COUNTY

	Local Mode of	Railroad	
Name of Mine Name and Address of Operators Pres. or Gen'l, Mgr.	Superintendent Ventilation	Connections	Remarks
Lion Canor Montgomery L. & Cattle Co., Meeker.	N. S. Babcock Natural		
ROUTT COUNT			
	Local Mode of	Railroad	
Name of Mine Name and Address of Operators Pres. or Gen'l. Mgr.	Superintendent Ventilation	Connections	Remarks
Oak Hills No. 1Moffat Coal Co., DenverS. M. Perry	T). W. Jones Fan	D. N. W. & P.	• • • • • • •
Oak Hills No. 2Moffat Coal Co., Denver	D. W. Jones Furnace	D. N. W. & P.	New.
PinnacleRoutt County Fuel Co., DenvecE. L. Prentiss, Pre	s. 3eo. Morrison Fan	D. N. W. & P.	
Yampa Valley No. 1. Yampa Valley Coal Co., Denver	R. C. Jones	D. N. W. & P.	
Yampa Valley No. 2. Yampa Valley Coal Co., Denver	R. C. Jones	8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	New
JuniperJuniper Coal Co., Denver.	Jas. Matthews	D. N. W. & P.	Closed
Electric		D. N. W. & P.	Closed
No. One W. G. Schnessler, Oak Creek			Closed

RIO BLANCO COUNTY

FIFTEENTH BIENNIAL REPORT
	LUCAI MOUE OL MAILUAU	
Name and Address of Operators Pres. or Gen'l. Mgr.	uperintendent Ventilation Connections	Remarks
National Fuel Co., DenverH. Van Mater	John Webb Fan I'. P.	
National Fuel Co., DenverH. Van Mater	James Etchells Fan B. & M.	* * * *
Consolidated C. & Coke Co., DenverC. L. Baum	C. W. Smith Fan U. P.	
Frederick Coal Co., FrederickD. M. Simpson	Geo. White Fan U. P.	
American Fuel Co., DenverD. E. Evans	Will Fox Fan I'. P.	• • • • • • • •
Ideal Coal Co., EriePhineas Woolley	Fan	
Shamrock Coal Co., Erie	Thos. P. Morgan Fan I. P.	
Louisville Coal & Land Co., Firestone.	Fan	
Alpha Coal Co., Denver	W. H. Brown Fan D. L. & N. W.	New
State Coal Co., Erie	D. L. Jones Natural	
Rocky Mountain Fuel Co., DenverE. E. Shumway, Pres.	I', P.	Closed
David Brimble, Erie	I'. P.	Idle

WELD COUNTY

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