

State inspector of coal mines reports

Section 23, Pages 661 - 690

These reports of the Kansas State Mine Inspector mostly concern coal mining, though by 1929 the scope of the reports broadens to include metal mines. The content of individual reports will vary. The reports address mining laws and mining districts; industry production and earnings; fatal and non-fatal accidents; accident investigations and transcripts of oral interviews; labor strikes; mine locations; mining companies and operators; and proceedings of mining conventions. The reports document the political, economic, social, and environmental impacts of more than seventy years of mining in southeastern Kansas.

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made a serious mistake. He also finds that the company is contemplating making another change, and he (the foreman) is therefore the victim of the unqualified superintendent, who holds him responsible for the condition of affairs when miners cannot be induced to work under such disadvantages; but, if there is any honor or credit due the foreman, the assuming superintendent who holds such a position very often, by influence, claims that part which is justly due the foreman; therefore, the average foreman trudges along, subjected to the ridicule of the miners and the displeasure of the company.

As to practical and theoretical knowledge, about one-half of the mine bosses or foremen in Kansas are capable and qualified, if they were only empowered to operate and ventilate the mines as they should be. Instead, they are subjected to the dictates of a superintendent who scarcely knows coal from black-jack. The consequences are, timbering is neglected, air courses are not looked after, curtains and doors are not kept in order, break-throughs are not filled and built air-tight, the roofs in entries begin to fall, rooms cave in, stagnant water is allowed to stand in air courses, entries, and at the face of rooms; and that most important matter in mining, and worthy the attention of the foreman, superintendent, and mining student, is neglected and left to take care of itself, viz., ventilation.

It is true, expenses may have been curtailed for a few months; nevertheless the condition of the mine becomes so alarming that the intelligent miner knows when he enters the mine it is at the risk and peril of his life. When he complains about the condition of the mine, very often the foreman or superintendent takes the precautionary step and politely dispenses with his services, at the same time informing the company that such a man was and is a crank and an agitator. Naturally the company believes the official statement of their agent, and consequently the miners, through fear of being discharged, are forced to labor under all these disadvantages.

Such are the indignities and impositions practiced, and the miner's lot in life is not very commendable. However, the companies learn many lessons, only, in many instances, when too late, especially when a misunderstanding exists between their employés and their superintendent, whose repulsive and domineering ways and rulings create uncalled-for suspensions and strikes, causing the mine to undergo an additional expense, and often a depreciation in value, the capacity of which cannot be increased under such circumstances as I have herein enumerated; consequently, the conservative, intelligent, unprejudiced, practical and theoretical foreman or superintendent is the most successful, and the cheapest man that can be employed, giving satisfaction to employers and employés alike.



RECOMMENDATIONS.

Having become convinced that it is imperatively necessary to amend or obliterate many of the worthless mining laws that now appear upon the statutes, I would respectfully request that a penalty be attached to all mining laws made in the future, and to those already enacted where neither fine nor imprisonment is prescribed therein for violation thereof.

Section 6 of chapter 143, Session Laws of 1885, repealed section 4, chapter 117, of Session Laws of 1883, which read as follows:

SEC. 4. Where the natural strata are not safe, every working, pumping and escapement shaft shall be securely case lined or otherwise made secure, and all escapement shafts shall be provided with ladders securely fastened, so as to bear the combined weight of not less than 10 men ascending or descending the same; and where ladders cannot be conveniently used, other safe means of hoisting the persons employed in any such coal mine shall be kept ready, so as to be available in case of any accident to the regular hoisting shaft, or to the machinery in use at the same.

The repealing of this section left no provision nor means of escape by a second opening in case of accident to the main hoisting shaft, thus rendering two of the principal provisions of the law nugatory. This section, or one similar, should be enacted into law as soon as possible.

I would recommend the following:

Where the natural strata are not safe, every working, pumping and escaping shaft shall be securely case lined, or otherwise made secure, and all escapement shafts shall be provided with stairs, securely fastened, so as to bear the combined weight of not less than 15 men, ascending or descending the same; said stairway shall be so constructed as not to exceed 45 degrees of elevation by each section of said stair, and the stairways shall be separately partitioned from the parts of such shafts used as upcasts or downcasts, and the traveling ways between the bottom of the main shaft and escapement shaft or stairway, shall be at least five feet in height. Said traveling ways shall be kept clear of all obstructions, and standing or stagnant water; and where stairways cannot be conveniently used, other safe means of hoisting the persons employed in any such mine shall be kept ready at all times, so as to be available in case of accident to the regular hoisting shaft, or the machinery in use at the same; and it shall be the duty of the foreman, cager, or whoever may have charge of the bottom of any shaft, to give the proper signal to the topman and engineer whenever any six employes who work therein are ready to ascend, by day or night.

The enactment of the foregoing recommendation (as to escapement) is one of the most important and necessary requirements in connection with shaft mines.



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BREAK-THROUGHS BETWEEN ROOMS AND ENTRIES.

I would recommend the passage of a law prohibiting entries, air courses, rooms or any other working places in the mine, operated on the room-and-pillar system, to excavate in advance space of 40 feet, unless break-throughs are made between such entries, air courses, rooms, or any other working places, irrespective of the thickness of pillar between such working places, excepting in cases of emergency when air courses are being constructed or connected; and that such break-throughs shall be at least five feet in width and full height of mineral vein, making it obligatory on the operator or his agent to fill or build in the center of all such break-throughs a solid wall of either rock, brick, slate, or a partition of strong boards, securely fastened and made air-tight, as soon as the second or succeeding break-through is made between entries, air courses, rooms, or other working places.

It is impossible to ventilate the working places in a mine operated on the room-and-pillar system unless a law is passed necessitating the closing up of such break-throughs, as every sensible man will acknowledge that the air always takes the nearest and shortest course, leaving the miner at the face, who may be probably 70 or 100, and in some cases 120, feet inside of the course taken by the air when break-throughs are not filled. When the miner is about worn out, he generally retreats to the air way to fill his lungs with a fresh supply, and, when recruited a little, goes back to his working place again, where he labors under a disadvantage, suffering under a languid feeling and a headache, with a pulsation of the heart, and none but those who have had the experience of working in such places know the agony and suffering endured by the miner on all such occasions.

SINGLE-ENTRY SYSTEM.

As the mining law of our state, in its full spirit, was, and is, intended for health and safety, I would recommend the enactment of a law by which coal companies, or individual operators, adopt the system of double entries where coal or mineral is mined on the room-and-pillar system, provided the area of such mine or mineral vein exceeds 20 acres.

It is an indisputable fact that the single-entry system is a complete failure in the maintaining of ventilation, and very injurious to the miners' health, also. Large blocks of coal are very often left when the miner is compelled to vacate his working place, owing to the poorly ventilated condition of his chamber. Consequently, such places receive little, if any, attention, as timbering is neglected; and, in the course of time, those rooms cave in, causing additional danger; as the surface water flows into the mine, particularly after a heavy rain, air ways are closed or filled with water, in many instances, thus leaving the mine in a condition which requires considerable labor and uncalled-for expense to overcome the obstacles which were considered an economic saving. Often portions of the mine are abandoned. I might assign several other reasons justifying abolition of the single-entry



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system, which I believe is a detriment to both employer and employé. Happily for all concerned a brighter day has dawned, and more attention is being directed to this important branch of mine management. The fact is impressing itself on the minds of intelligent mine operators that no part of the capital invested yields a higher rate of interest than that which is judiciously expended on ventilation.

SHOT FIRING.

I would recommend the following amendment to section 1, ch. 172, Laws of 1889, "An act to provide for the protection of life and property in and about coal mines:"

All owners, lessees, operators of, or any other person, having the control or management of any coal shaft, slope, drift or pit in the state, employing miners therein, shall employ shot firers to fire the shots therein. Said shots shall not be fired by anyone except by regular shot firers, and once a day only, after the hour of 5:30 P. M., on each day when any such shaft, drift or pit is in operation, except shafts, drifts or pits whose mine openings or excavations have not exceeded 150 feet in distance from the bottom. In opening new mines, shots shall not be fired more than twice a day, and only in mines whose excavations have not exceeded the aforesaid distance, viz, 150 feet from the bottom of such shaft, drift, pit, or slope. All employés working therein shall vacate such mines, and, where necessary, shall be hoisted to the surface, before any shot or shots are fired. Shot firers and all other employés employed therein shall not enter the mine for a period of not less than one hour after shot or shots are fired. Operators, miners, shot firers or others who shall refuse to comply with the provisions of this section shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be fined a sum of not less than \$50 nor more than \$200 for each offense, or imprisoned in the county jail in the county where such offense is committed for a period of not less than 60 days, or by both such fine and imprisonment. Proceedings to be instituted in any court having competent jurisdiction.

TO ORGANIZE DISTRICTS.

Section 4, chapter 143, Laws of 1885, provides that it shall be the duty of the Inspector to visit each mine in the state at least twice each year. As there are 243 mines in the state, and to make even a cursory inspection of each one would take the greater part of one day, it would require 486 days to comply with the law. As some of the mines in the state are 400 miles apart, and a great many over 200 miles, it can be plainly seen that it is a physical impossibility for one individual to fulfill this requirement of the law as Mine Inspector.

As no provision is made for any assistance, or for office, or for expenses of any kind, not even for postage, which of itself is quite an item, I have (although not empowered to do so) employed assistance in the inspection of



the mines, which had to be paid out of my salary, besides traveling expenses, including livery hire.

It is customary in all other states having mining interests which have district and state inspectors for the legislature to appropriate funds to defray the expense of the office and expenses incurred by the inspector while discharging the duties intrusted to him in his district or state.

I have labored unceasingly to comply with the requirements of my obligation in the discharge of my duties as Mine Inspector. To give the best possible satisfaction, I appointed a deputy, whose supervision extended over one district or territory. In addition to this, I appointed deputies temporarily to attend to any emergency that might arise in my absence, causing an additional expense, which has been paid out of the limited compensation of the Inspector. I am convinced that it is utterly impossible for one Inspector to perform the duties assigned to him by law.

Therefore, I would recommend that the mineral-producing counties of the state be divided into three different and separate districts, including salt, lead and zinc and gypsum producing counties, appointing an inspector for each district or territory, whose compensation shall be regulated by the legislature of the state. One of these inspectors shall have full supervision over the entire mining district of the state, whose duties shall be as prescribed by the present mining law.

The mining interests of the state are becoming so important that the question of the qualifications and ability of the Mine Inspector should be put beyond a cavil or doubt. Therefore, I would suggest the passage of a law embodying the features set forth in the following from the mining law of Iowa, under which the chief inspector of the state of Kansas should qualify:

The executive council shall appoint a board of examiners composed of two practical miners, two mine operators, and one mining engineer, who shall have at least five years' experience in his profession. The members of said board shall be of good moral character, and citizens of the United States and state of Iowa, and they shall, before entering upon their duties, take the following oath (or affirmation): "I, _____, do solemnly swear (or affirm) that I will perform the duties of examiner of candidates for the office of Mine Inspector to the best of my ability, and that, in recommending any candidate, I will be governed by the evidence of qualification to fill the position under the law creating the same, and not by any consideration to political or personal favors; that I will grant certificates to candidates according to their qualifications and the requirements of the law." They shall hold their office for two years.

Said board shall meet biennially, on the first Monday in April of each even-numbered year, except that for the year 1888 said board shall meet on the second Monday, in the office of the State Mine Inspector, at the capitol, and they shall publish in at least one newspaper published in each mining district of the state the date fixed by them for the examination of candidates. They shall be furnished with the necessary stationery and other necessary material for said examination, in the same manner as other state officers are now provided. They shall receive as compensa-



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tion the sum of \$5 per day for time actually employed in the duties of their office, and actual traveling expenses. The said compensation and expenses shall be paid in the same manner as the salaries and expenses of other state officers are now paid: *Provided*, That in no case shall the per diem received by any member exceeds \$50 for each biennial session.

Certificates of competency shall be granted only to citizens of the United States and state of Iowa, of good moral character, not less than 25 years of age, who shall have at least five years' experience in the mines, and who shall not have been acting as agent or superintendent for any mine for at least six months prior to their appearance for examination.

The examination of candidates for the office of Mine Inspector shall consist of oral and written questions in theoretical and practical mining and mine engineering, on the nature and properties of noxious and poisonous gases found in mines, and on the different systems of working and ventilating of coal mines. The candidates shall not be allowed to have in their possession, at the time of their examination, any books, memoranda or notes to be used as aids in said examination. The board of examiners shall give to all persons examined who, in their judgment, possess the requisite qualifications, certificates of such qualifications; and from the persons holding such certificates the governor shall appoint the State Mine Inspector.

SCALES.

Much dissatisfaction exists among miners, at times, at mines where the coal is weighed before being credited to them, in regard to the alleged inaccuracy of the scales. They complain that the scales do not weigh accurately, and that they are being cheated out of their earnings by this means. I will not attempt to vouch for the truth of such complaints. It may only be the miner's suspicion, and it may be true. However, it would be a great satisfaction to the miner, and I do n't think would be disapproved by the operators, if the legislature would pass a law giving some person authority to act as sealer of weights and measures for the coal miners. In some states the inspectors are given this authority, with the instruments and weights necessary to act as such. A separate fund is appropriated to defray the expense incurred through hauling the weights, etc., from one mine to another. Such a law should be passed in this state, with due regard to the present duties of the Inspector, which would bring about a better feeling between miner and operator in this respect.

PILLARS LEFT.

I would recommend that not less than 25 feet of a solid pillar or body of coal, or other mineral mined therein, be left standing in advance of every working place, when the same is driven toward and in dangerous proximity to any abandoned mine suspected of containing inflammable gases or which is inundated with water.

The most necessary and requisite recommendations are herein submitted to the consideration and approval of our honorable legislators.



MINING LAWS OF KANSAS.

GENERAL LAW.

[General Statutes of 1889, ch. 66a, pp. 1093-1103.]

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Escapement Shaft. SECTION 1. That the owner or owners or lessee of each and every coal mine or colliery in this state, which is worked by means of a shaft, shall make and construct an escapement shaft, making at least two distinct means of ingress and egress for all persons employed or permitted to work in such coal mine or colliery. Such escapement shaft, or other communication with a contiguous mine, shall be constructed in connection with every stratum of coal worked in such coal mine or colliery; and every escapement shaft or other communication with a contiguous mine, as aforesaid, shall be so constructed as to be accessible from every entry, plane or level in said coal mine or colliery, in case of a fire or other accident to the main shaft: *Provided*, That the provisions of this law shall not apply to the coal mine at Leavenworth until the chambers, drifts or passages shall have reached the east side of the Missouri river.

Construction. SEC. 2. That the time allowed for such construction shall be four months for the first 50 feet or fractional part thereof, and three months for each and every additional 50 feet in depth of said escapement shaft so to be constructed. And every such escapement shall be separated from the main shaft by at least 100 feet of natural strata; and all owners of coal mines or collieries that are in operation before the passage of this act shall, on or before the 1st day of July, A. D. 1875, proceed to construct such escapement shaft or other communication with a contiguous mine as aforesaid.

Penalty. SEC. 3. Any owner or owners or lessee of any coal mine or colliery, who shall neglect or refuse to comply with sections 1 and 2 of this act, shall be deemed guilty of misdemeanor, and subject to a fine of not less than \$100 nor more than \$1,000, or by imprisonment in the county jail not more than three months, or by both such fine and imprisonment.



Obstructions, etc. SEC. 4. Any miner, workman or other person who shall knowingly obstruct or throw open any air ways, or carry lighted lamps into places that are worked by the light of safety lamps, or shall move or disturb any part of the machinery of the hoisting engine, or whim, or open a door in the mine, and not have the same closed again, whereby danger is produced either to the mine or those at work therein, or who shall enter into any part of the mine against caution, or who shall disobey any order given in pursuance of this act, or who shall do any willful act whereby the lives and health of persons working in the mine, or the security of the mine or miners, or the machinery thereof is endangered, shall be deemed guilty of a misdemeanor, and upon conviction shall be punished by fine or imprisonment, at the discretion of the court.

Terms Defined. SEC. 5. The terms "owner" or "owners" or "lessee," as used in this act, shall include the immediate proprietor, lessee or occupier of any coal mine or colliery, or any person having, on behalf of any owner or owners or lessee as aforesaid, the care and management of any coal mine or colliery, or any part thereof.

Protection of Owners. SEC. 6. Whenever an affidavit properly verified by the person aggrieved, or his agent or attorney, shall be presented to the district court of the proper county, during term time, or to the judge thereof in vacation, in which it shall be made to appear that such person shall have good reason to believe that any other person or persons, corporation or corporations, are without authority encroaching upon the land of the person aggrieved, whether the same be held by lease or otherwise, and are mining, or taking coal therefrom, it shall be the duty of the said court, or judge, to order and direct the county surveyor to survey the mines or mines, of the person or persons, corporation or corporations, accused thereof, for the purpose of ascertaining the truth thereof; the party applying for such survey to first give bond in such a sum as may be deemed sufficient by said court, or judge, and the same to be at the time approved by said court or judge, conditioned for the payment of the costs of said survey.

Survey. SEC. 7. Upon the making of such order and approval of said bond, it shall be the duty of the county surveyor to forthwith make such survey, and to file his written report thereof with the clerk of such district court.

Injunction. SEC. 8. When it shall be made to appear by petition verified by the oath of the plaintiff, his agent or attorney, and by the survey of the county surveyor, that any person or persons, corporation or corporations, is or are, without authority, mining or taking coal from the land of the plaintiff, whether held by lease or otherwise, it shall be the duty of the proper district court in term time, or the judge thereof in vacation, to grant a temporary injunction restraining such person or persons, corporation or corporations, from mining or taking coal from such land until the further order of the court or judge.



Proceedings. SEC. 9. The proceedings in such cases shall be in all respects similar to the course of procedure in actions for injunction.

Ingress and Egress. SEC. 10. It shall be the duty of every person or corporation owning coal mines, and every person in charge of the same, to provide the county surveyor with all the ordinary means of ingress and egress to make any survey thereof he may be ordered to make; and any person or persons in any way interfering, molesting or hindering such county surveyor in making any survey he may be ordered to make under the provisions of this act, shall be guilty of a misdemeanor, and shall be liable for each offense to a fine of not less than \$10 and not more than \$100, to be prosecuted and recovered as in other cases of misdemeanor.

Cities May Contract. SEC. 11. That any city of the first or second class, in which an organized coal company shall exist, may by ordinance, contract with such company for the exclusive and perpetual right to mine beneath the streets, alleys and public grounds thereof, upon the agreement to pay one-fourth a cent per bushel upon each and every bushel raised by said company; one-half of which amount shall be paid into the general fund of said city, and the other half shall be paid to the treasurer of the state in aid of the school fund.

Certain Contracts. SEC. 12. Any coal company which shall have heretofore attained by ordinance from any city of the first class a contract for the exclusive right to mine under the streets, alleys and public grounds thereof, shall be entitled to the priority, exclusion and perpetuity of such ordinance, which is hereby validated and confirmed: *Provided*, That within 30 days after the passage of this act such company shall file with the secretary of state their consent thereto and stipulate to pay amount specified in the first section hereof and to comply with the conditions named in the ordinance.

Construction. SEC. 13. That nothing in this act shall be construed to relieve such company from making compensation to the owners of private property for any injury done in mining operations.

Survey Drifts, When. SEC. 14. When any owner, tenant or subtenant of a lot or lots or tract of land shall file with any justice of the peace within the county in which said lot or lots or tract of land may be situated, his or her affidavit, or the affidavit of any other creditable person for them, stating, that from knowledge, information, or belief, the party or parties owning, controlling or working the adjoining lot or lots or tract of land, and upon which said party or parties are sinking shafts, mining, excavating and running drifts, and that said drifts, in which said parties are digging, mining and excavating any mineral ore or veins of coal, extend beyond the lines and boundaries of said lot or lots or tract of land owned, controlled or worked by them, and have entered into and upon the premises of the party or parties making said affidavit, or for whom said affidavit is made, the justice of the peace, after first being tendered his lawful fees, shall issue



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his written order, and deliver or cause the same to be delivered to the county surveyor or his deputy, commanding him, after his reasonable fees have been tendered, to proceed without delay to survey said drift, by entering any and all shafts upon said lot or lots or tract of land, that he, the surveyor, may see fit, for the purpose of ascertaining the course and distance of said drift or drifts, and to locate the same upon the surface.

Read Order. SEC. 15. The surveyor shall, before entering upon said duties, read said order to the party or parties owning, controlling or working any shaft or shafts on said lot or lots or tract of land.

Persons Refusing. SEC. 16. If any person shall refuse, hinder or prevent said county surveyor or his deputy and his assistants from entering said shaft or shafts or drifts to make the survey so ordered by the justice of the peace, said person or persons so offending shall on conviction be adjudged guilty of a misdemeanor, and punished by imprisonment in the county jail for a term of not exceeding one year, or by fine not exceeding \$300, or by both such fine and imprisonment.

Map or Plan. SEC. 17. That the owner, agent or operator of every coal mine shall make or cause to be made within six months after the passage of this act, an accurate map or plan of the workings of such coal mine, and each and every vein thereof, on a scale not exceeding 100 feet to the inch, and showing the bearings and distances, which shall be kept in the office of such coal mine; and it shall be the duty of the owner, agent or operator of such coal mine to furnish the State Inspector with a true copy of said map or plan, the same to be deposited at his office. And such owner, agent or operator shall cause, on or before the 10th day of July of each year, a plan of the progress of the workings of such coal mine during the year past to be marked on the original map or plan of the said coal mine, and the Inspector shall correct his map or plan of said workings in accordance with the above plan or map thus furnished. And when any coal mine is worked out or abandoned, the fact shall be reported to the Inspector, and the map or plan of such coal mine in his office shall be carefully corrected and verified: *Provided*, If the owner, agent or operator of any coal mine shall neglect or refuse, or for any cause fail, for the period of two months after the time prescribed, to furnish the said map or plan as hereby required, or if the Inspector shall find, or have reason to believe, that any map or plan of any coal mine furnished in pursuance of this act is materially inaccurate or imperfect, he is hereby authorized to cause a correct map or plan of the actual workings of said coal mine to be made at the expense of the owner, agent or operator thereof, the cost of which shall be recovered from said owner, agent or operator as other debts are recoverable by law: *Provided*, That if the map or plan which the Inspector claimed to be incorrect shall prove to have been correct, then the aforesaid expense shall be paid by the Inspector.

Opening; Penalty; Metal Tubes, etc. SEC. 18. It shall not be lawful,



after six months from the passage of this act, for the owner, agent or operator of any coal mine to employ any person at work within said coal mine, or permit any person to be in said coal mine for the purpose of working therein, unless they are in communication with at least two openings, separated by natural strata of not less than 80 feet in breadth if the mine be worked by shaft or slope, and if worked by drift not less than 50 feet: *Provided, however,* That such coal mine shall not exceed 100 feet in depth, from the surface to the coal; and for every additional 100 feet, or fractional part thereof, six months additional time will be granted; but in all cases the number of men shall be limited not to exceed 25 until the second opening is perfected and made available; and a roadway to the same shall be kept open, not less than three feet high and four feet wide, thereby forming a communication as contemplated in this act, but the limit herein prescribed as to the number working in the shaft before the completion of the second opening shall not apply to mines exceeding 700 feet in depth. And for a failure to do as provided in this section, the owner, agent or operator shall be subject to the penalty provided for in section 31 of this act. And in case furnace ventilation being used before the second opening is reached, the furnace shall not be within 40 feet of the foot of the shaft, and shall be secured from danger from fire by brick or stone walls of sufficient thickness; and the flues shall be composed of incombustible material to an extent of not less than 30 feet from the furnace and the mine while being driven for making or perfecting a second opening. In all cases where the human voice cannot be distinctly heard, the owner, agent or operator shall provide and maintain a metal tube from the top to the bottom of the shaft or slope, suitably adapted to the free passage of sound, through which conversation may be held between persons at the bottom and top of such shaft or slope; and there shall also be maintained the ordinary means of signaling to and from the bottom and top of such shaft or slope. In all mines of 100 feet in depth or over from the surface of the ground an improved safety catch shall be used, and sufficient horns or flanges shall be attached to the sides of the drum of every machine that is used for lowering or hoisting persons into and out of said mine where steam is used, and adequate brakes shall be attached thereto. The main link attached to the swivel of the wire rope shall be made of the best quality of iron, and shall be tested by weights or other means satisfactory to the Inspector of Mines of the state; and bridle chains shall be attached to the main link from the crosspieces of the cage, and no single-link chain shall be used for lowering or raising persons into or out of said mine; and not more than six persons shall be lowered or hoisted by the machinery at any one time; and only sober, competent and experienced engineers shall be employed, and said engineer shall have attained at least the age of 18 years; and on no account shall any coal be hoisted, or timber or any other material sent up or down, or empty cars, while persons are descending into or ascending out of said mine. In all



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coal mines hereafter opened, or that shall hereafter go into operation in the state, the owner thereof, or owner, lessee, agent or operator shall construct such escapement shaft as is now required by law in this state, at the rate of 50 feet every six months until such escapement shaft shall have been fully completed; and until such escapement shaft is fully completed and connected with the main shaft, it shall be unlawful to work over 25 men in said mine: *Provided further*, That the number of men to be employed in any mine 700 feet deep or more prior to the time when a second or air shaft is sunk, shall be designated by the State Mine Inspector after a careful examination of all the conditions as to the safety and health of the men in the mines.

Steam and Water Gauge. SEC. 19. Every steam boiler used in or around the coal mines of this state shall be provided with a proper steam gauge and water gauge, to show respectively the pressure of steam and the height of water in the boiler, and to be also provided with a proper safety valve; and the owner, agent or operator shall have the said boiler or boilers examined and inspected by a competent boiler maker, or other qualified person, once in every six months, and the result of every examination shall be certified in writing, and conveyed to the mine inspector to be filed in the records of his office.

Ventilation; Fire Damp. SEC. 20. The owner, agent or operator of every coal mine, whether shaft, slope, or drift, shall within six months after the passage of this act provide and thereafter maintain for every such mine ample means of ventilation, affording 100 cubic feet of air per minute per person in all mines where the coal strata are three feet thick or over, and a proportionate amount for thinner strata, which shall be circulated wherever any person or persons may be working in said mine. The Inspector may increase the amount when necessary, to such an extent as will dilute, carry off and render harmless the noxious gases generated therein; and all mines generating fire damp shall be kept free of standing gas, and every working place shall be carefully examined every morning with a safety lamp by a competent person, before any workman is allowed to enter therein; and it shall be the duty of the owner, agent or operator of every coal mine to provide and maintain air ways of sufficient dimension to supply the requisite amount of air.

Overseer; Duties; Manholes. SEC. 21. In order to better secure the proper ventilation of every coal mine, and promote the health and safety of the persons employed therein, the owner, agent or operator shall employ a competent and practical inside overseer, to be called "mining boss," who shall keep a careful watch over the ventilating apparatus, the air ways, traveling ways, pumps and pump timbers and drainage, and shall see that as the miners advance their excavations all loose coal, slate and rock, overhead, are carefully secured against falling in upon the traveling ways. And every underground plane on which persons travel, worked by self-



acting pulleys, engines, windlasses or machinery of whatever description, shall be provided with proper means of signaling between the stopping places and the ends of the plane; and shall furthermore be provided in every case, at intervals of not more than 30 feet, with sufficient manholes for places of refuge. And every road on which persons travel underground, where the coal is drawn by mules or other animals, shall be provided, at intervals of not more than 60 feet, with sufficient manholes for places of refuge. And every mine shall be supplied with sufficient prop timber, of suitable length and size for the places where it is to be used, and kept in easy access to. And it shall also be the duty of the mining boss to measure the air current at least once per week at the inlet and outlet, and at the face of the workings, and keep a record of such measurements, and report the same to the Inspector of the state once in every month. The safety lamps used for examining mines, or which may be used for working therein, shall be furnished by and be the property of the owner of said mines, and shall be in charge of the agent of such mine. And in all mines generating explosive gases, the doors used in assisting or directing the ventilation of the mine shall be so hung and adjusted that they will close themselves, or be supplied with springs or pulleys so that they cannot be left standing open; and bore holes shall be kept, not less than 12 feet in advance of the face of every working place, and when necessary, on the sides, if the same is driven toward and in dangerous proximity to an abandoned mine suspected of containing inflammable gases, or which is inundated with water.

Explosions. SEC. 22. It shall be unlawful for any miner or other person to take into or have in his possession in any coal mine shaft, slope or pit in this state more than 12½ pounds of powder, or any other explosive substance, at any one time; and all such powder or other explosive substance shall be kept in a tight box, securely locked, and such boxes shall be kept, at least 20 yards from the working face in all such coal mine slopes, drifts, or pits; and it shall be the duty of all pit bosses or other persons who shall be in charge or control of any coal mine slope, drift, or pit in this state, to keep watch over and see that the provisions of this act are complied with; and any person violating or neglecting to comply with the provisions of this act shall be deemed guilty of a misdemeanor, and shall, on conviction before any court having jurisdiction thereof, be fined in any sum not less than \$10 nor more than \$50, or by imprisonment in the county jail not more than 30 days, for each and every such offense; and the possession of more than 12½ pounds of powder or any other explosive substance in such coal mine, slope or drift, shall be *prima facie* evidence of the person taking said powder or other explosive substance into such mine, slope or drift. Any miner, workman or other person, who shall intentionally injure any safety lamp, instrument, air way, brattice, or obstruct or throw open air ways, or

NOTE.—Section 22, as it reads above, is in its amended form. See ch. 147, Session Laws 1891.



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carry lighted lamps, pipes or matches into places worked by the light of safety lamps, or shall move or disturb any part of the machinery, or who shall open a door and not close it again, or enter any place of the mine against caution, or disobey any order given in carrying out the provisions of this act, or who shall do any willful act whereby the lives or health of persons or the security of the mine or the machinery is endangered, shall be guilty of a misdemeanor, and on conviction shall be punished by a fine or imprisonment, at the discretion of the court.

Abandoned Shaft. SEC. 23. All machinery about mines, and the entrance of every abandoned shaft or slope, shall be properly fenced off, and the top of each shaft and each landing of the same shall be fenced around with a fence not less than three feet high on every side, except the side or sides used for loading and unloading the cages, and this side or sides shall have gates or bars, which shall be kept closed at all times except during the active use of the cages at these places; and there shall be cut in the side of every hoisting shaft at the bottom thereof a traveling way sufficiently high and wide to enable persons to pass the shaft in going from one side of the mine to the other without passing over or under the cages or other hoisting apparatus.

Inspector; Term; Compensation. SEC. 24. As soon as practicable after the passage of this act, the governor of the state, with the advice and consent of the executive council, shall appoint a qualified person to be Inspector of Mines, provided for in this act. The qualifications for said office of Inspector of Mines shall be as follows, namely: He shall be a citizen of the United States, and shall have resided in the state of Kansas for two years, of temperate habits, of good repute, a man of personal integrity, shall have attained the age of 30 years, and shall have had at least five years' experience working in and around coal mines; and he shall furnish evidence of such practical as well as theoretical knowledge of the working of coal mines and noxious gases as will satisfy the governor and executive council of his capacity and fitness for the performance of the duties imposed upon an inspector of mines by the provisions of this act. His commission shall be for two years, to be computed from the 30th of June next. As often as vacancies occur by death, resignation or otherwise, in said office of Inspector of Mines, the governor, in the same manner, shall fill the same by appointment for the unexpired term. Nothing in this act shall be construed to prevent the reappointment of any Inspector of Mines. The Inspector of Mines shall receive for his services an annual salary of \$2,000, to be paid in installments at the end of each quarter, by the state treasurer. He shall reside in the state, and keep an office as centrally located as practicable to the mining districts of the state. The executive council is hereby authorized to procure such instruments and chemical tests and stationery, from time to time, as may be necessary for the Inspector in the proper discharge of his duties, under this act, at the expense of the state, which shall be paid



by the state treasurer, upon accounts duly certified by the executive council and audited by the auditor of the state. All the instruments, plans, book memoranda, notes, etc., pertaining to the office, shall be the property of the state, and shall be delivered to his successor in office.

Bond. SEC. 25. The Inspector of Coal Mines shall, before entering upon the discharge of his duties, give bond in the sum of \$3,000, with sureties to be approved by the executive council, conditioned for the faithful discharge of his duty, and take an oath (or affirmation) to discharge his duty impartially and with fidelity, to the best of his knowledge and ability.

Ineligible. SEC. 26. No person who shall act as a manager or agent of any coal mine, or as a mining engineer, or be interested in operating any coal mine, shall at the same time act as an inspector of coal mines under this act.

Violating Act. SEC. 27. For any injury to person or property occasioned by any violation of this act, or any willful failure to comply with its provisions by any owner, lessee or operator of any coal mine or opening, a right of action against the party at fault shall accrue to the party injured for the direct damage sustained thereby; and in any case of loss of life by reason of such violation or willful failure, a right of action against the party at fault shall accrue to the widow and lineal heirs of the person whose life shall be lost, for like recovery of damages for the injury they shall have sustained.

Duties of Inspector; Record. SEC. 28. The Inspector of Mines shall devote the whole of his time to the duties of his office. It shall be his duty to examine each mine in the state as often as possible, and at least twice each year, to see that all the provisions of this act are observed and strictly carried out; and he shall make a record of all examinations of mines, showing the condition in which he finds them, the number of persons employed in and about each mine, the extent to which the law is obeyed, the progress made in the improvements sought to be secured by the passage of this act, the number of accidents and deaths resulting from injuries received in the mines, and all other facts of public interest concerning the condition and progress of mining in this state. In order to facilitate the Inspector in his duties, it shall be the duty of all coal operators to make quarterly statements to the Inspector of the amount of coal mined, and the number of miners and other persons employed around the mines each quarter. The Inspector's record and all matters concerning the coal-mining business of public interest, shall be embodied in the Inspector's annual report made to the governor on the first day of February each year.

Enter Mines; Injunction; Costs. SEC. 29. That the Inspector may be enabled to perform the duties here imposed on him, he shall have the right at all times to enter any coal mine to make examination or obtain information. He shall notify the owners, lessees or agents immediately of the discovery of any violations of this act and of the penalty imposed thereby for



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such violation; and in case of such notice being disregarded for the space of 10 days, he shall institute a prosecution against the owner, owners, lessee or agent of the mine, under the provisions of section 16 of this act. In any case, however, where in the judgment of the inspector delay may jeopardize life or limb, he shall at once proceed to the mine where the danger exists and examine into the matter, and if after full investigation thereof he shall be of the opinion that there is immediate danger, he shall apply in the name of the state to the district court of the county in which the mine may be located, or to the district judge in vacation, for an injunction to suspend all work in and about such mine; whereupon said court, or judge in vacation, if the cause appears to be sufficient, after hearing the parties and their evidence as in like cases, shall issue a writ to restrain the working until all cause of danger is removed. And the cost of said proceedings, including the charges of attorney prosecuting said application, shall be borne by the owner of the coal mine: *Provided*, That no fee exceeding the sum of \$25 shall be taxed in any one case for the attorney prosecuting such case: *Provided further*, That if said court (or judge in vacation) shall find the cause not sufficient, then the case shall be dismissed, and the cost shall be borne by the state or county, in the discretion of the court (or judge in vacation).

Loss of Life, or Injury. SEC. 30. Whenever, by reason of any explosion or other accident in any coal mine, or the machinery connected therewith, loss of life or serious personal injury shall occur, it shall be the duty of the person having charge of such coal mine to give notice thereof forthwith to the Inspector, and, if any person is killed thereby, to the coroner of the county, who shall give due notice of the inquest to be held. It shall be the duty of the Inspector upon being notified as herein provided, to immediately repair to the scene of the accident, and make such suggestions as may appear necessary to secure the future safety of the men; and if the results of the explosion do not require an investigation by the coroner, he shall proceed to investigate and ascertain the cause of the explosion or accident, and make a record thereof, which he shall file as provided for; and to enable him to make the investigation, he shall have power to compel the attendance of persons to testify, and to administer oaths or affirmations. The cost of such investigation shall be paid by the county in which the accident occurred, in the same manner as costs of inquests held by the coroner or justices of the peace are paid.

Penalty. SEC. 31. Any owner or owners, lessee, agent or operator of any coal mine who shall neglect or refuse to comply with sections 17, 18, 19, 20, 21 and 23 of this act, shall be deemed guilty of a misdemeanor, and subject to a fine of not less than \$100 nor more than \$1,000, or by imprisonment in the county jail not more than three months, or by both such fine and imprisonment. All penalties recovered under this act shall be applied, in the county in which the fine is collected, to the support of common schools.

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Minors. SEC. 32. No person under 12 years of age shall be allowed to work in any coal mine, nor any minor between the ages of 12 and 16 years unless he can read and write and furnish a certificate from a school teacher, which shall be kept on file, showing that he has attended school at least three months during the year; and in all cases of minors applying for work, the agent of such coal mine shall see that the provisions of this section are not violated; and upon conviction of a willful violation of this section of this act, the agent of such coal mine shall be fined in any sum not to exceed \$50 for each and every offense.

Terms Defined. SEC. 33. The terms "owner," "owners," "lessee," "agent," or "operator," as used in this act, shall include the immediate proprietor, lessee or occupier of any coal mine, or any person having on behalf of any owner or owners, or lessee, as aforesaid, the care and management of any coal mine, or any part thereof.

Repeal. SEC. 34. All acts or parts of acts in conflict with any of the provisions of this act are hereby repealed. (Laws of 1883, ch. 117, § 19.)

Shot Firers. SEC. 35. All owners, lessees, operators of, or any other person having the control or management of any coal shaft, slope, drift or pit in this state employing miners to work therein, shall employ shot firers to fire the shots therein. Said shots shall be fired once a day on each day when any such shaft, slope, drift or pit is in operation, but shall not be fired until after all miners and other employés working therein shall have been hoisted out of said mine.

Conditions. SEC. 36. It shall be unlawful for any miner or any other person other than the shot firers provided for in section 35 this act to fire any shot in any coal shaft, slope, drift or pit in this state. Any miner or other person engaged in mining coal in this state who shall drill any hole or fire any shot in the coal vein at the working face of any room or entry until so much of said coal vein at said working face as the said shot or shots are intended to throw down shall have been undermined to the depth of not less than two feet, or sheared or cut to the full depth of the drill or shot hole and the full thickness of vein in entries, or who shall so direct the drilling of such holes as to include between such shearing or mining and the back or rear end of the hole a greater width of coal than is contained between such shearing or mining and the mouth of the hole, shall be deemed guilty of a misdemeanor, and fined as hereinafter provided.

Managers; Penalty. SEC. 37. Any owner, lessee, operator, or other person having the control or management of any coal shaft, slope, drift or pit, who shall refuse to furnish the shot firers, as provided for in section 36 of this act, shall be deemed guilty of a misdemeanor, and on conviction therefor shall be fined in any sum not less than \$50 nor more than \$200 for each offense, or imprisonment in the county jail in the county where such offense is committed for a period not to exceed 30 days, or by both such fine and imprisonment; proceedings to be instituted in any court having competent jurisdiction.



Miners; Penalty. SEC. 38. Any miner or other person who shall fire any shot in violation of section 36 of this act shall be deemed guilty of a misdemeanor, and on conviction therefor shall be fined in any sum not less than \$50 nor more than \$200, or imprisonment in the county jail in the county where such offense is committed not to exceed 30 days, or by both such fine and imprisonment; proceedings to be instituted in any court having competent jurisdiction.

WEIGHING OF COAL AT THE MINE.

AN ACT to regulate the weighing of coal at the mine.

[Session Laws of 1893, ch. 188, p. 271.]

SECTION.

1. Screen.
2. Weighman.
3. Miners can employ check weighman.

SECTION.

4. Scales.
5. Annulment of this act void.
6. Shall apply to all workers.

Screen. SECTION 1. It shall be unlawful for any mine owner, lessee or operator of coal mines in this state, employing miners at bushel or ton rates, or other quantity, to pass the output of coal mined by said miners over any screen or other device which shall take any part from the value thereof before the same shall have been weighed and duly credited to the employes and accounted for at the legal rate of weights as fixed by the laws of Kansas.

Weighman. SEC. 2. The weighman employed at any mine shall subscribe an oath or affirmation, before a justice of the peace or other officer authorized to administer oaths, to do justice between employer and employe, and to weigh the output of coal from mines in accordance with the provisions of section 1 of this act. Said oath or affirmation shall be kept conspicuously posted in the weigh office, and any weigher of coal, or persons so employed, who shall knowingly violate any of the provisions of this act, shall be deemed guilty of a misdemeanor, and upon conviction, shall be punished by a fine of not less than \$25 nor more than \$100 for each offense, or by imprisonment in the county jail for a period not to exceed 30 days, or by both such fine and imprisonment.

Miners Can Employ Check Weighman. SEC. 3. The miners employed by or engaged in working for any mine owner, operator or lessee in this state shall have the privilege, if they so desire, of employing at their own expense a check weighman, who shall have like rights and privileges in the weighing of coal as the regular weighman, and be subject to the same oath and penalties as the regular weighman.

Scales. SEC. 4. Any person or persons having or using any scale or scales for the purpose of weighing the output of coal at mines, so arranged or constructed that fraudulent weighing may be done thereby, or who shall knowingly resort to or employ any means whatever, by reason of which such coal is not correctly weighed and reported in accordance with the pro-



visions of this act, shall be deemed guilty of a misdemeanor, and shall, upon conviction, for each offense be punished by a fine of not less than \$200 nor more than \$500, or by imprisonment in the county jail for a period not to exceed 60 days, or by both such fine and imprisonment.

Annulment of this Act Void. SEC. 5. Any provisions, contract or agreement between mine owners or operators thereof and the miners employed therein, whereby the provisions of section 1 of this act are waived, modified, or annulled, shall be void and of no effect; and the coal sent to the surface shall be accepted or rejected, and if accepted shall be weighed in accordance with the provisions of this act; and right of action shall not be invalidated by reason of any contract or agreement.

Shall Apply to all Workers. SEC. 6. The provisions of this act shall also apply to the class of workers in mines known as loaders, engaged in mines wherein mining is done by machinery. Whenever the workmen are under contract to load coal by the bushel, ton, or any quantity the settlement of which is had by weight, the output shall be weighed in accordance with the provisions of this act.

WEEKLY PAYMENT OF WAGES.

AN ACT providing for the weekly payment of wages in lawful money of the United States by certain corporations, and providing a penalty for the violation thereof.

[Session Laws of 1893, ch. 187, p. 270.]

SECTION.

1. Paid not later than Friday.
2. Penalty.
3. Employé discharged.
4. Employé may recover penalty.

SECTION.

5. Evasion of this act void.
6. Contractor; corporation liable to employé of.
7. Lawsuit for recovery.

When to be Paid. SECTION 1. All private corporations doing business within this state, except all steam surface railways and except corporations engaged in the production of farm and dairy products, shall pay to their employés the wages earned each and every week in lawful money of the United States, and all such wages shall be due and payable and shall be paid by such corporation not later than Friday of each week for all such wages earned the preceding week.

Penalty. SEC. 2. Whenever such corporation fails to pay any of their employés, as provided in section 1 of this act, then a penalty shall attach to such corporation and become due to such employés, as follows: A sum equivalent to a penalty of 5 per cent. per month as liquidated damages, and such penalty shall attach and become a judgment in any court of competent jurisdiction, and the penalty shall continue in full force and effect including all the time intervening up to time of final payment.

Employé Discharged. SEC. 3. Whenever any employé is discharged from the employ of any such corporation, then the wages of such employé shall



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become due and payable in the same manner as heretofore described in section 2.

Employé May Recover Penalty. SEC. 4. Any employé may recover all such penalties that may, by violations of sections 2 and 3 of this act, have accrued to him at any time within six months succeeding such default or delay in the payment of such wages.

Evasion; Contract Void. SEC. 5. Any contract or agreement made between any such corporation and any parties in its employ, whose provisions shall be in violation, evasion or circumvention of this act, shall be unlawful and void in its effects as to such corporations.

Contractor. SEC. 6. Whenever any such corporation shall contract any or all its work to any contractor, then it shall become the duty of such corporation to provide that the employés of such corporation or contractor shall be paid according to the provisions of this act, and such corporation shall become responsible and liable to the employés of such contractor in the same manner as if said employés were employed by such corporation.

Lawsuit for Recovery. SEC. 7. Whenever it shall become necessary for employés to enter or maintain a suit at law for the recovery or collection of wages due as provided by this act, then such judgment shall include a reasonable attorney fee, to be taxed as part of the costs in the case, and collected under the same provisions of law as such judgment.

RELATING TO PAYMENT OF WAGES.

AN ACT to secure to laborers in and about coal mines and manufactories the payment of their wages in lawful money of the United States.

[General Statutes 1889, ch. 31, p. 724.]

SECTION.

301. Laborers to be paid.
302. Coercion of employés.

SECTION.

303. County attorney to prosecute.

Laborers to be Paid. SECTION 301. It shall be unlawful for any person, firm, company or corporation to sell, give, deliver, or in any manner issue directly or indirectly to any person employed by him or it, in payment of wages due for labor, or as advances on the wages of labor not due, any scrip, token, check, draft, order, or other evidence of indebtedness payable to bearer or his assignee otherwise than at date of issue in lawful money of the United States. Any violation of the provisions of this section shall be punished by a fine of not less than \$25 nor more than \$100, or imprisonment of not more than 30 days, or both; and the amount of any scrip, token, check, draft, order, or other evidence of indebtedness sold, given, delivered, or in any manner issued in violation of the provisions of this section, shall be recovered in money at the suit of any holder thereof against the person, firm, company or corporation selling, giving, delivering, or in



any manner issuing the same: *Provided*, That nothing contained in this section shall apply to or affect the right of any person or private individual from giving orders on any store or business house or firm in the business or the business or profits of which he or it has no interest, directly or indirectly: *Provided further*, That such order shall only be given at the solicitation of the employé of such person or private individual: *Provided further*, That nothing contained in this section shall apply to contracts made and entered into between farmers and their employés, where mutual arrangements are made between them otherwise.

Coercion of Employés. SEC. 302. Whoever compels or in any manner seeks to compel or attempts to coerce an employé of any person, firm or corporation to purchase goods or supplies from any particular person, firm or corporation, shall be fined not more than \$100 nor less than \$20, or imprisoned not more than 60 days, or both.

County Attorney to Prosecute. SEC. 303. The county attorney of any county, upon complaint made to him, shall proceed to prosecute the violators of this act as prescribed in other cases of misdemeanor.



GLOSSARY OF TECHNICAL MINING TERMS.

The following is a glossary of the terms most frequently used by miners throughout the states:

After Damp.—The mixture of gases remaining in a mine after an explosion of fire damp, which may consist of carbonic acid gas, carbonic oxide, water vapor (quickly condensed), nitrogen, oxygen, and in some cases free hydrogen, but usually consists principally of carbonic-acid gas and nitrogen, and is therefore irrefragable.

Airpipe, or Air Box.—Square boxes made of wooden boards, in sections 8 to 16 feet long, for the conveyance of air into tunnels, etc.; also, iron pipes used for conveyance of compressed air.

Air Stack.—A ventilating chimney.

Air Way.—Any passage used for passage of air for ventilation.

Anemometer.—An instrument used for measuring the velocity of the ventilating current of air.

Arenaceous.—Sandy rocks are arenaceous when they contain a considerable percentage of sand.

Argillaceous.—Clayey. An argillaceous rock is one that contains a considerable percentage of clay, or has some of the characteristics of clay.

Band.—Interstratified rock in coal.

Brushing.—To cut down the roof of an entry or passageway in the mine, after the coal has been mined away, to make height for mules, etc.

Bank.—A word often used among miners in referring to the coal mine.

Battery.—Any structure built of timber or plank to keep the coal in the room, or prevent it from sliding down a chute when not wanted. This is used on pitching veins.

Bear; to Bear in.—Usually applied to underholing or undermining.

Bed.—A regular member of a stratified series deposited or formed after the underlying and before the overlying rock.

Bed Rock.—The solid rock underlying the soil, drift or alluvial deposit.

Bench.—A natural terrace marking the outcrop of any stratum; a division of a coal seam separated from the remainder by a parting of slate, shale, iron pyrites, sulphur, or other foreign matter.

Bit.—A drilling-chisel.

Black Damp, Choke Damp.—Carbonic acid gas = CO_2 ; thus distinguished from white damp or carbonic oxide = CO .

Blossom.—Outcrop of a coal bed or mineral deposit.

Blower.—A strong discharge of gas from a fissure.

Blow Out; to Blow Out.—A blast is said to blow out when it acts like a cannon, throwing out the tamping without bringing down the rock or coal.

Bone Coal; Bone.—Slaty or argillaceous coal, or carbonaceous shale, occurring in coal seams.

Bottom Lift.—The lowest or deepest lift.

Bottom.—The landing at the bottom of the shaft or slope; the lowest point of mining operations; the floor-bottom rock, or stratum, underlying a coal bed.

Brattice.—A board or plank lining or partition, in any mining passage, to confine



air and force it into the working places. Its object is to keep the intake air from finding its way by a short route into the return air way.

Brattice Cloth.—A heavy cloth or canvas, often covered with some waterproof material, for temporarily forcing air into the face of the room or entry; also used in place of doors at the entrance of rooms. They are then frequently called "sheets." Such brattice cloth should be unflammable in gaseous mines; this is not so, however, in many instances.

Bridle Chains.—Safety chains to support the cage if the middle link should break; when two chains are used in a slope (instead of attaching the rope by a single chain to the drawbar of a car), they are also called bridle chains.

Bucket.—The piston of a lifting pump; or a bucket used in sinking shafts.

Buntins.—Timbers placed horizontally across a shaft to carry the cage guides and column pipes, also to strengthen the shaft timbering.

Butty.—A partner or comrade working with another in the coal mine.

Cage.—A platform on which men and cars are raised to the surface from the mine.

Cap, Cap Piece.—A piece of plank put on the top of a prop next the roof.

Cap.—The pale bluish elongation of the flame of a safety lamp, caused by the presence of gas—fire damp.

Carbonaceous.—Coaly; containing carbon of coal.

Carboniferous.—Containing or carrying coal; thus, carboniferous rocks, the carboniferous formation.

Cave; to Cave in.—Falls from the roof or sides of the entries or rooms of a mine.

CH₄.—The chemical notation for carbureted hydrogen, or fire damp.

Chain Pillar.—A pillar left to protect the top of entry and air way, and running parallel between these passages.

Charge.—The amount of powder used in one blast or shot.

Chocks.—Shanties; a building built with logs or props crossing one another to support the roof, in a place where an extra creep of the stratum takes place.

Clanny Lamp.—Safety lamp invented by Doctor Clanny. This lamp differs from the Davy in having the lower portion of the covering made of glass, instead of being wholly gauze.

Clinometer.—A small pocket instrument, provided with a spirit level and graduated arc, for measuring the angle of a dip.

Coal Measures.—The carboniferous formations.

Cleavage.—The property of splitting more readily in some directions than others.

Collar.—The horizontal timber resting upon two upright or inclined legs or props, for the support of the roof in an entry or air way.

Colliery.—This term is used to denote not only the mine, but includes also all the structures that make up the plant of the surface: the mine and all its adjuncts.

Column Pipe.—Cast-iron or wrought-iron pipes through which the water is conveyed from the mine pumps to the surface.

Conglomerate.—The rock formation, consisting of pebbles and fragments of various rocks cemented together.

Creep.—A squeeze or crush, forcing the pillars down into the floor or up into the roof, which often gives the miner the impression that the floor is rising.

Crevice.—A fissure in rock or coal.

Crib Work.—A structure composed of horizontal frames of timber laid one upon another, built like a log cabin.

Cribbing.—Timbering a shaft with crib work; it commonly extends from the surface down to bed rock.

Crop.—To come to the surface, and crop out.

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Crosscut or Cross Heading.—A passage driven for ventilation through the pillar between entry and air way.

Davy Lamp.—A safety lamp, invented by Sir Humphrey Davy, with a fine wire gauze inclosing the flame; 784 apertures to the square inch; framework, brass.

Dead Air.—The air of a mine is said to be dead or heavy when it contains carbonic-acid gas (black damp), or when the ventilation is sluggish.

Dead Work.—Work not in itself productive of enough coal to pay the cost of driving, or producing nothing at all.

Derrick.—The structure erected for drilling or hoisting process.

Dip.—The angle of inclination of the coal seams or mineral bed or vein, measured from a horizontal line.

Door.—Doors are placed in the passages of mines to prevent the ventilating current from taking a short cut to the upcast shaft.

Door Trapper.—A boy whose duty it is to open and close a mine door before and after the passage of a mine car.

Downcast.—The passage or air way through which the ventilating current passes into a mine.

Draw.—To draw the pillars; robbing out the pillars after the room is exhausted.

Drift.—A level tunnel driven in on the bed from the surface.

Driving.—Excavating horizontal passages.

Dump.—The tipple by which the cars are dumped on the slate or slack dump.

Entry.—A level used for a haulage road, from which rooms are turned.

Face, or Working Face.—The place at which work is being done in a room entry or air way.

Fault.—The place where the stratum is broken by some upheaval, and disappears from the continuous line.

Feeder.—A spring of water encountered in mining operations, or a small blower of gas.

Fire Board.—A board on which the fire boss indicates by chalk marks where gas is found in different parts of the mine.

Fire Boss.—A man whose duty it is to examine the workings of the mine for accumulations of explosive gas.

Fire Damp.—CH₄, light carbureted hydrogen, an inflammable gas, explosive when mixed with air in certain proportions.

Floor.—The rock underlying the coal seam.

Free Coal.—Coal is said to be free when it is loose and easily mined.

Gang.—A set of miners; a shift.

Gas.—Fire damp.

Gob.—A space from which the coal has been mined, and refuse or waste left therein.

Gob Fire.—Fires originating spontaneously from the heat of decomposed gob.

Guide.—Vertical timbers fastened to the buntins to steady and guide the cage in a hoisting shaft.

Head Frame.—A structure erected over a shaft to carry the sheaves and steady the cage.

Head Gear.—That portion of the winding machinery attached to the head frame.

Heading.—A term usually given to an entry going to the rise of the vein or cross heading.

Hogback.—A short, anticlinal axis of limited extent.

Holding Through.—Driving a passage through to make connections with another part of the working, or with those of an adjacent mine.

Incline.—A slope; any inclined plane, whether above or beneath the surface.



Indicator.—An instrument or device for indicating the position of the cage in the shaft.

Intake.—A passage by which air enters the mine or downcast.

Keeps, or Keps.—Catches or rests to hold the cage when it is brought to rest at the top, or any intermediate landing (commonly called shuts or fans).

Lagging.—Small round timbers, slabs or planks driven in behind the legs and over the collars, to prevent pieces of roof from falling through.

Landing.—Any place where cars are taken off or put on a cage or slope.

Latches.—Synonym for switch, applied to split rails or hinge switches.

Leg.—Props on which the collar rests in entry or other timbering.

Level.—A horizontal passage in a mine.

Lift.—The number of entries from which coal is raised in a colliery. This term refers to the number of pump lifts also.

Long Wall.—A method of working coal where no pillars are left, and the roof is supported by pack walls, gob, etc. This method is often adopted where the coal vein does not exceed four feet.

Loose End.—A place mining alongside of a place previously worked out.

Manhole.—A small place cut back into the side of self-acting planes, slopes, or entries, for the safety of the miners during the passage of the mining cars.

Manway.—A small passageway used as a traveling way for the miner; also used as an air way for rooms on a pitching vein.

Measures.—Rocks or a series of rocks having some attribute in common; thus, coal measures, containing coal, etc.

Narrow Work.—Entries and air ways, crosscuts, and cross headings.

Needle.—An instrument or tool placed in a drill hole during the tamping of a charge, to leave on its withdrawal an opening through which the charge can be fired by a squib.

Outcrop.—That portion of a vein, bed, or any stratum appearing at the surface or occurring immediately beneath the soil or alluvial debris.

Outlet.—A passage furnishing an outlet for air (upcast, outtake) for miners, for water, etc.

Output.—The product of a mine sent to market.

Overcast.—A passage through which the ventilating current is conveyed over an entry or air way.

Pack Wall.—A wall or pillar built of gob to support the roof.

Parting.—A layer of slate or other matter dividing two benches of a coal seam.

Pillar and Room.—Pillar and stall, stoop and room, etc., a method of mining or working out coal.

Pillars.—A mass of coal left to support the roof.

Plane.—Usually applied to self-acting inclines, but any slope or incline on which coal is raised or lowered may be called a plane.

Plat or Plot.—A map of the surface and workings underground, or of either.

Post.—Any upright timber; applied to timbers used for propping.

Prop.—A timber set upright, or at right angles to the dip, to support the roof rock.

Regulator.—A frame with a sliding door, to regulate the air passing into any part of the workings.

Rendrock.—A variety of dynamite.

Rib.—To take out the pillars, or to reduce by skipping the side of the pillars left to support the roof.

Safety Cage.—A cage provided with an automatic safety catch.



Safety Lamp.—A lamp surrounded by a wire gauze, to prevent the direct contact of the flame with explosive gases.

Sand Pump.—A sludger; a cylinder provided with a stem (or other) valve lowered into a drill hole to remove the pulverized rock.

Scraper.—A tool used for cleaning out drill holes.

Sheave.—A wheel with a grooved circumference, over which a rope is turned, either for the transmission of power or for winding or hauling.

Sheets.—See "Brattice Cloth."

Siliceous.—Containing or having the characteristics of quartz.

Slack.—Small coal or dust from coal.

Slides.—See "Guides."

Slope.—An inclined passage driven in the bed or vein, opening up the surface.

Soapstone.—A term incorrectly applied to an unctuous rock.

Split.—Any division or branch of the ventilating current.

Sprag.—A short billet of wood or iron used to block the wheels of a mine car, in place of a brake.

Spring Latch.—A spring or automatic switch.

Stopping.—A brattice, or, more commonly, a masonry or brick wall built in a crosscut, to confine the air or direct to face of workings.

Stratum.—Any bed or layer; plural, strata.

Stump.—A small pillar of coal left between the entry and the rooms to protect these passages.

Sump.—An excavation in the coal or rock made below the level of the entry or shaft bottom to collect the mine water; the ditches or drains empty into it, and the pump draws it from thence.

Swamp.—A local depression in the coal bed in which the water collects.

Trapper.—A door tender in the mine; almost always a boy.

Trouble.—A dislocation or fault; any irregularity in a coal seam.

Upcast.—The opening or passage through which the air goes out of the mine.

Vein.—This term is often applied to stratified beds, but its use should be restricted to mineral deposits.

Water Gauge.—An instrument for measuring the ventilating pressure; the term is also used to denote the ventilating pressure in inches.

Whim.—A horse gin used for hoisting.

White Damp.—CO (carbonic oxide), a gas that may be present in the after damp of a fire-damp explosion, or in the gases given off by a mine fire; rarely met with in mines under other circumstances.

Winding.—Hoisting coal, etc.



COMPARISON OF COALS.

We give herewith tests made by the United States quartermaster general, at Washington, D. C., which shows how many pounds of coal are equal to one cord of standard oak wood. This we consider one of the best guides to a company or individual that pays fuel bills. By the aid of these equivalents, you can tell what is the best coal for your use for the least money.

	<i>Pounds.</i>		<i>Pounds.</i>
Weir, Kas., lump.....	1,988	Linton, Ind.....	2,698
Elk Mountain, Colo.....	2,028	Lexington, Mo.....	2,734
Trinidad, Colo.....	2,066	Spring Valley, Ill.....	2,751
Pittsburg, Kas.....	2,069	Piñon, Colo.....	2,794
Litchfield, Kas.....	2,069	Girard, Ill.....	2,840
Weir, Kas., mine run.....	2,165	Branch, Ill.....	2,852
Rouse, Colo.....	2,252	Hocking Valley, Ohio.....	2,971
Leavenworth, Kas.....	2,307	Lyford, Ind.....	3,015
Cañon City, Colo.....	2,323	Streator, Ill.....	3,076
White River, Wyo.....	2,323	Boulder Valley, Colo.....	3,176
Rich Hill, Mo.....	2,369	Burlingame, Kas.....	3,301
Pleasant Hill, Utah.....	2,407	Marshall, Colo.....	3,373
New Kentucky, Ill.....	2,477	Seranton, Kas.....	3,418
Gallup, N. M.....	2,489	Star, Colo.....	3,429
Snake River, Colo.....	2,558	Mitchell, Colo.....	3,645
Mount Olive, Ill.....	2,641	Osage City, Kas.....	3,710
Ladd, Ill., third vein.....	2,660	All Pennsylvania anthracite.....	1,700
Fort Scott, Kas.....	2,670	Los Cerrillos, N. M., anthracite.....	1,657



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