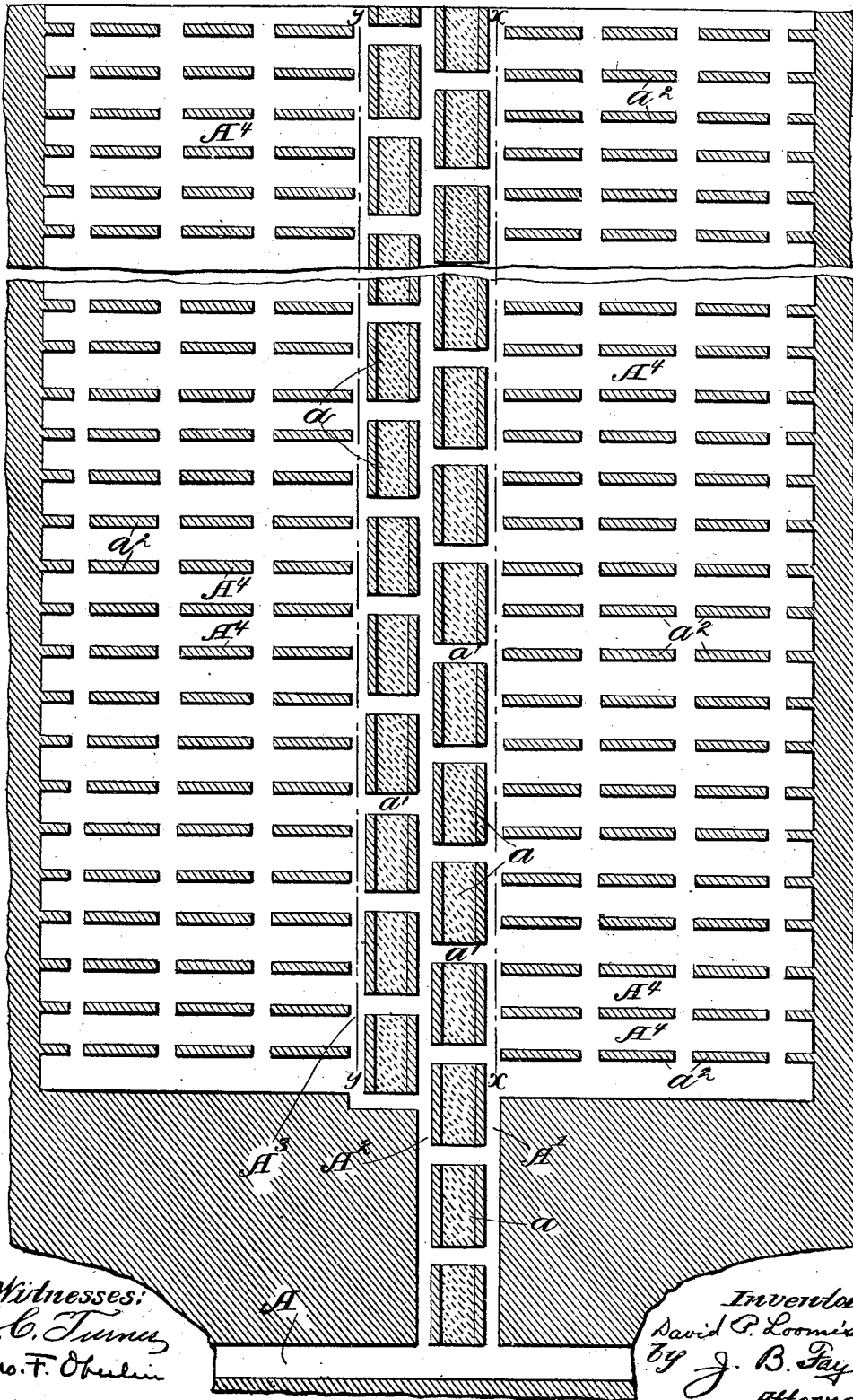


D. P. LOOMIS.
METHOD OF MINING COAL.
APPLICATION FILED SEPT. 26, 1908.

935,762.

Patented Oct. 5, 1909.



Witnesses:
J. C. Turner
Jno. F. O'Brien

Inventor:
David P. Loomis
by J. B. Fay
Attorney

UNITED STATES PATENT OFFICE.

DAVID P. LOOMIS, OF NEW PHILADELPHIA, OHIO, ASSIGNOR OF ONE-HALF TO JOSEPH A. BEIDLER, OF CLEVELAND, OHIO.

METHOD OF MINING COAL.

935,762.

Specification of Letters Patent.

Patented Oct. 5, 1909.

Application filed September 26, 1908. Serial No. 454,912.

To all whom it may concern:

Be it known that I, DAVID P. LOOMIS, citizen of the United States, resident of New Philadelphia, county of Tuscarawas, and State of Ohio, have invented a new and useful Improvement in Methods of Mining Coal, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

The present invention, relating as indicated to the art of mining coal, has more particular regard to what is known in the United States as "room-and-pillar" mining, in which narrow chambers or "rooms" of from 25 to 50 feet in width are formed, these being carried from one to another of the cross or butt entries that are extended laterally from the main or face entry. Such rooms are so formed as to leave walls or "pillars" of coal at their sides, and each has but a single entrance. The coal is removed from the rooms by first under-cutting it along the wall, and then breaking it down by shooting or otherwise, whereupon it may be loaded into cars brought to and from the loading point along the butt entry.

The object of the present invention, is to improve upon the present practice in "room-and-pillar" work, so as to render possible the removal of a considerably larger percentage of coal than is the case at present, all without endangering the safety of the operation, or decreasing the practical working economy.

To the accomplishment of the above and related objects, said invention, then, consists of the steps, and mode of operation, hereinafter fully described and particularly pointed out in claims.

The annexed drawing and the following description set forth in detail one approved method of carrying out the invention, such disclosed mode, however, constituting but one of various ways in which the principle of the invention may be used.

In said annexed drawing:—the single figure there appearing, is a horizontal sectional view of a portion of a mine that has been worked in accordance with my improved method of mining.

In order to fully distinguish my improved

method from "room-and-pillar" work as at present practiced, some faults of the present system should be noted: The coal that is left is too generally distributed over the area being mined, and much is located so remote from air courses and haulage ways, as to cause practically the whole overlying strata to stay up or come down together, thereby bringing on the "squeezes," "creeps," and "falls" common to coal mine operation, and seriously interfering therewith by blocking the ways and cutting off communication between different parts of the mine. At the same time such practice involves considerable waste of coal because the pillars are left so close together, and so small that they are not worth mining or removing, since such removal would have to be effected by what is called narrow, or entry, work, which is a great deal more expensive than the machine work employed in removing the coal from the rooms. Moreover the pillars between the rooms, which would include the major portion of such coal thus wasted, become surrounded with the waste from the operation in the next adjoining room, in the form of gob, slate, and the other impurities that naturally accumulate from the mining of coal. The manner in which these several difficulties are obviated will more fully appear from a detailed description of the mining plan constituting the drawing already referred to.

In such drawing then, the cross-hatched portions, it should be explained, represent the pillars as they are left upon the removal of the coal in the regular course of operation. The blank spaces represent the entries, or ways, and the rooms, from which such coal has been removed. Of such entries, the main or face entry is designated by reference letter A, the side or butt entries branching therefrom, by letters A', A², A³. These latter entries, thus seen to be three in number, are so spaced as to leave pillars *a* therebetween of a width considerably in excess of that left in the present practice, preferably 40 or 50 feet. The transverse openings *a'* between such pillars, moreover, for the purpose of connecting the several butt entries, are so spaced as to leave the detached pillars in staggered relation to each other. The rooms A⁴ are then worked

from the two outermost butt entries A' A^2 in much the usual way, except that the cutting is made the full width for the entire length of the room, and the pillars a^2 between successive rooms are left considerably lighter than is the present practice. Indeed it is contemplated that these pillars shall be so weakened that upon the completion of the working of any series of rooms, as for instance, the series along one side of the set of butt entries A' , A^2 , A^3 , such rooms will cave in with a reasonable degree of promptness. This caving in of these rooms, while the heavy blocks of coal constituting the pillars a along the line of entries still remain intact, will result in a more or less well defined line of cleavage $x-x$ or $y-y$, parallel and adjacent to such line of entries. As a result of the foregoing, the pillars along the entries are relieved of any abnormal burden, and being heavy enough to sustain their normal share of superimposed strata, there will be little danger of the breaking down of their walls and interruption of traffic or air there-through. When finally all of the rooms along any set of entries have been thus worked out and abandoned, the major portion of the coal in the pillars sustaining the entry roof may be safely and economically removed, for as has been noted, these blocks are left of an unusual width, such that machine work is quite possible just as in operations in the rooms; in other words, a room may in effect be driven lengthwise through such blocks or pillars, the presence of refuse or other material being a matter of indifference. Such removal of the pillars is begun at the end of the side entries farthest removed from the main entry, and the place of operation upon successive pillars is amply protected by the adjacent pillar standing as it does in staggered relation to the one being worked out. Accordingly, the coal left standing in the form of pillars along the entry way is reduced to a minimum, since such pillars may be made at least as weak as those between the rooms, communication from the point of operation with the main entry being at all times protected by the unweakened pillars behind.

It is not necessary to go into an extensive comparison of the foregoing method with the prevailing practice, to indicate wherein increased efficiency and economy are attained, for it should be obvious that not only is a much larger proportion of the coal removed, but that such removal is in all instances effected without requiring cleaning up even in the case of the pillars along the entry ways, as a result of which the cost of mining is kept at the minimum obtainable by the use of machine work.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as re-

gards the method of procedure herein disclosed, provided the step or steps stated by any one of the following claims, or the equivalents of such stated step or steps be employed.

I therefore, particularly point out and distinctly claim as my invention:—

1. The method of mining coal, which consists in driving in the vein to be mined a series of entries for haulage and air ways, said entries being spaced apart so as to leave pillars heavy enough to permanently sustain their normal share of the superimposed strata, and then working out rooms substantially at right angles to said entries, the pillars between such rooms being weakened so as to cause the rooms to cave in after being thus worked out and abandoned, whereby said first-named pillars are relieved of any abnormal burden, substantially as described.

2. The method of mining coal, which consists in driving in the vein to be mined a series of parallel entries for haulage and air ways, said entries being spaced apart so as to leave pillars heavy enough to permanently sustain their normal share of the superimposed strata, and then working out rooms substantially at right angles to said entries, the pillars between such rooms being weakened throughout their entire length so as to cause the rooms, after being thus worked out and abandoned, to cave in leaving a line of cleavage parallel with and contiguous to the line of said ways, whereby said first-named pillars are relieved of any abnormal burden, substantially as described.

3. The method of mining coal, which consists in driving in the vein to be mined a series of entries for haulage and air ways, said entries being spaced apart so as to leave pillars heavy enough to permanently sustain their normal share of the superimposed strata, then working out rooms substantially at right angles to said entries, the pillars between such rooms being weakened so as to cause the rooms to cave in after being thus worked out and abandoned, whereby said first-named pillars are relieved of any abnormal burden, and thereupon working out said first-named pillars, substantially as described.

4. The method of mining coal, which consists in driving in the vein to be mined a series of parallel entries for haulage and air ways, said entries being spaced apart so as to leave pillars heavy enough to permanently sustain their normal share of the superimposed strata, then working out rooms substantially at right angles to said entries, the pillars between such rooms being weakened throughout their entire length so as to cause the rooms, after being worked out and abandoned, to cave in leaving a line of cleavage parallel with and contiguous to the line of said ways, whereby said first-named pillars

are relieved of any abnormal burden, and thereupon working out said first-named pillars, substantially as described.

5 5. The method of mining coal, which consists in driving in the vein to be mined three parallel entries for haulage and air ways, so spaced as to leave pillars heavy enough to permanently sustain their normal share of the superimposed strata, connecting these entries by cross openings in staggered relation to each other, then working out rooms substantially at right angles to said entries, the pillars between such rooms being weakened throughout their entire length so as to cause the rooms, after being worked out and abandoned, to cave in leaving a line of cleavage parallel with and contiguous to the line of said ways, whereby said first-named pillars are relieved of any abnormal burden, and thereupon working out said first-named pillars successively, beginning with the far end of said entries.

6. The method of mining coal, which consists in driving in the vein to be mined three parallel entries for haulage and air ways,

so spaced as to leave pillars heavy enough to permanently sustain their normal share of the superimposed strata, the width of said pillars transversely of the line of said ways being sufficient to permit a regulation room to be driven lengthwise therethrough, then working out rooms substantially at right angles to said entries, the pillars between said rooms being weakened throughout their entire length so as to cause the rooms, after being thus worked out and abandoned, to cave in leaving a line of cleavage parallel with and contiguous to the line of said ways, whereby said first-named pillars are relieved of any abnormal burden, and thereupon working out said first-named pillars by driving rooms lengthwise therethrough in succession, beginning with the far end of said entries.

Signed by me this 21st day of September, 1908.

DAVID P. LOOMIS.

Attested by—

G. E. McMILLAN,
Jno. F. OBERLIN.