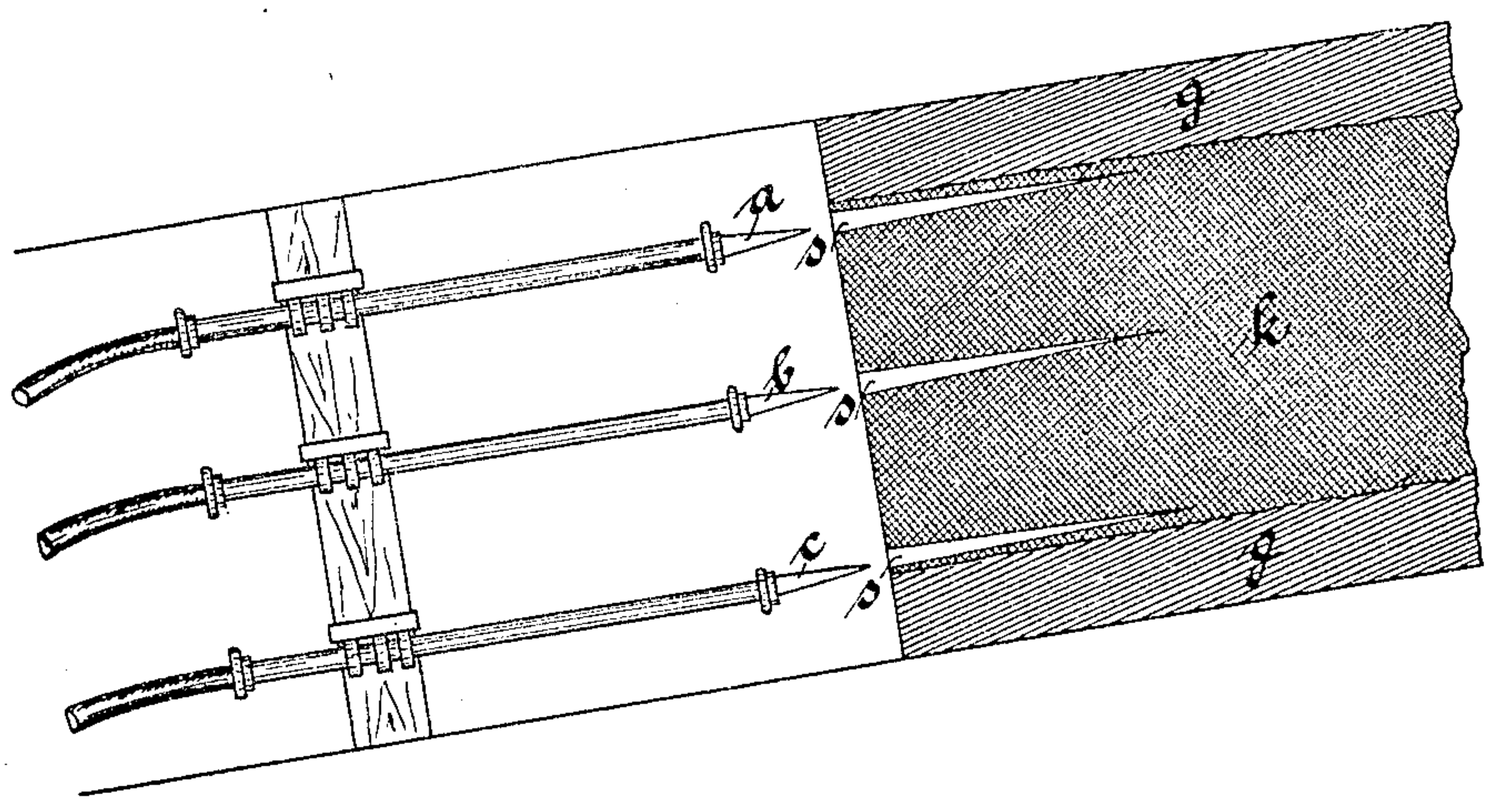
No. 878,208. PATENTED FEB. 4, 1908.

J. KIRSCHNIOK.

MINING PROCESS.

APPLICATION FILED MAY 27, 1904.



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UNITED STATES PATENT OFFICE.

JACOB KIRSCHNIOK, OF ZABRZE, GERMANY.

MINING PROCESS.

No. 878,208. Specification of Letters Patent. Patented Feb. 4, 1908.

Application filed May 27, 1904. Serial No. 210,019.

To all whom it may concern:

Be it known that I, JACOB KIRSCHNIOK, mining engineer, of Zabrze, Upper Silesia, in the Kingdom of Prussia, Germany, have invented a new Mining Process, of which the following is a specification.

The present invention relates to a new mining process and more particularly to a cutting process, that is to say to a process for the production of incisions for facilitating the obtaining of coal or the like. Such incisions or holings have hitherto been produced by means of the wedge-pick, the cutting-bar or by means of the coal-cutting machines. Apart from the difficulty and expensiveness of this work, a great deal of dust is naturally formed by the same and it is quite certain that the majority of explosions are caused by coal-dust resulting from these incisions.

By means of the process according to the present invention, the work of making these incisions is extraordinarily simplified and cheapened. First and foremost, however the unpleasant and dangerous formation of dust is entirely avoided by the same.

The invention substantially consists in the production of the incisions, holings or blast-holes in the coal seam or at the boundaries of the same in the overlying and underlying rock, by means new for this purpose, namely by a fine jet of water, under high pressure, which has a mechanical sawing cutting or boring action.

Water has indeed for long been employed in mining even in the form of a high-pressure water jet, particularly in salt mining and in gold mining. Nevertheless this latter application is distinguished fundamentally from the process according to the present invention.

In carrying out the present process, the natural pressure of a high column of water can be employed with advantage, as the working of coal-seams mostly occurs at great depths. This pressure can by means of pumps be further considerably increased up to 100 atmospheres and over.

If a coal-seam is to be separated from the overlying and underlying rock, the blast-holes are formed at the upper and lower boundaries of the coal-seam. In the majority of cases, as the rock is mostly harder than the coal, the blast-holes will be made in the coal; especially as the loss in material through the production of the blast-holes is of no importance at all. If on the contrary the rock can be worked by the water-jet to greater advantage, it will be preferable to form the blast-hole in the rock, naturally always close to the boundary of the coal-seam.

The high-pressure water jet can be likewise advantageously employed also for the production of the blast-holes in the coal-seam itself. The coal-seams can in this manner be divided into strips, which can then be easily severed by the introduction of explosives.

The accompanying drawing illustrates the application of apparatus to a coal-seam for the carrying out of the present invention.

Referring to this drawing, *k* is the coal-seam and *g g* denote the overlying and underlying rock, *s*, *s* are the incisions or blast-holes and *a*, *b*, *c* represent the mouth-pieces of the devices serving for the carrying out of the present process. By means of the device or pipe-support provided with the mouth-piece *a*, an incision is made at the device, with the mouth-piece *c* an incision is made at the boundary of the underlying rock. By means of the device with the mouth-piece *b* an incision is worked into the middle of the coal-seam. The coal-seam is in this manner divided into two strips, which can be easily blasted off. Several incisions can of course be worked in the coal-seam itself, and the coal-seam be cut into several strips. This method can be suitably employed in cases where the seams are very thick. In cases where there are two seams which are separated by an interval of only slight thickness, the incision is naturally arranged in this interval, so that by the formation of the incision a double effect is obtained.

In the case of seams of slight thickness, it will suffice, in the majority of cases, for the incision to be worked at the boundary of the overlying or at the boundary of the underlying rock, so that in these cases, the device with the mouth-piece *b* will accordingly not be used.

As the result of experiment it has been shown that with a pressure of about 30 atmospheres, a water jet of 3 millimeters thickness is most advantageous. The more the pressure is increased, the finer naturally can the water jet be and the greater is the cutting or sawing action of the same.

What I claim is:—

1. The process of cutting holes or slots in minerals which consists in directing one or more fine jets of water under a very high pressure against the mineral in the direction the hole or cut is desired.

2. The process of cutting holes or slots in minerals which consists in delivering one or more fine jets of water under a pressure of from 50 to 100 atmospheres against the mineral in the direction which the hole or cut is desired and in close proximity to the mineral surface on which the jet acts.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JACOB KIRSCHNIOK.

Witnesses:
CARL ILGNER,
FRITZ HULDSCHINSKY.