

Sul Khanov D.A.

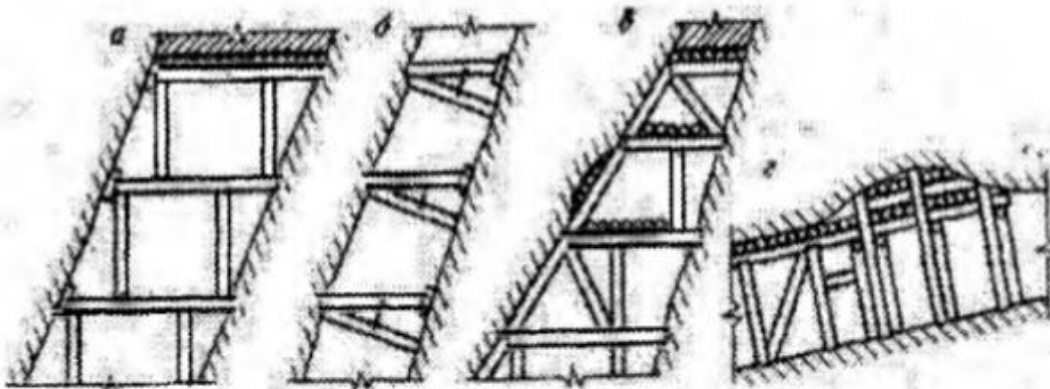
*Tashkent State Technical University named after Islam Karimov, Almalik branch 3f-21 UMO group
student sulxonovdiyorbek2@gmail.com.*

MINING SYSTEMS BASED ON ARTIFICIAL MAINTENANCE OF MINED SPACE

Annotation: The article is about the choice of mineral extraction system, the system of mining by strengthening the dug space, installation of reinforcements depending on the physico-mechanical properties of rocks, disadvantages and advantages of this system are discussed.

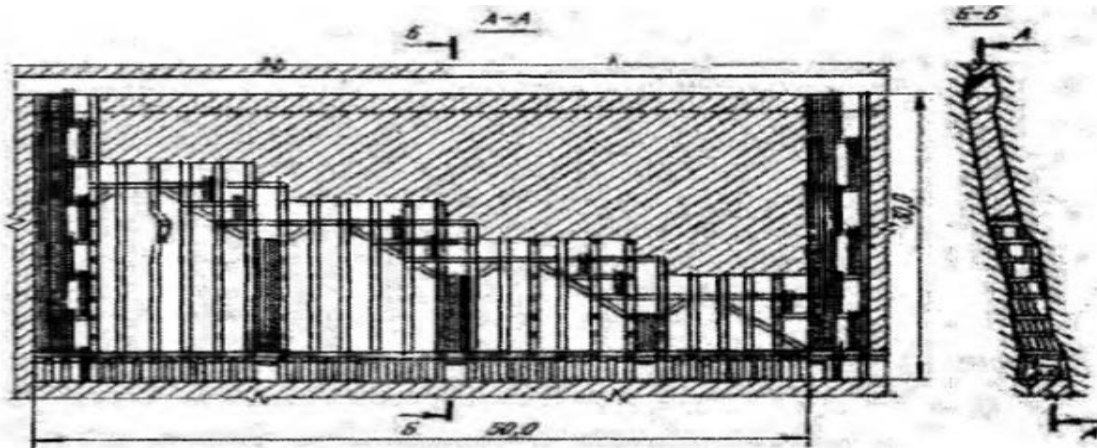
Keywords: ore, rock, mining system, stagnation, well, drilling, charging, mud, ceiling mud, layer, chamber, mine.

Leaving the excavated space open. This system differs from the excavation system in that the installed reinforcements are used as an auxiliary holding device or a working platform. system of digging with regular installation of reinforcements is characterized by serving to ensure the stability of ore and mixed rocks. reinforcements simultaneously perform the main function of the working platform. Although the system of reinforced excavation of the excavated space is similar to the systems of reinforced and backfilling excavation according to the conditions of use, there is also an important difference. similar mining systems mentioned above can be used in the mining of deposits of different thicknesses and shapes, with different angles of deviation. the system of digging without filling the cavity with reinforcement is used in ore deposits with ore thickness of 4 m, sometimes larger. strengthening the excavated space and increasing the thickness of the ore when digging without filling the space complicates the work of strengthening. It is impossible to dig unstable ore with thin layers in between, leaving the space open or using the backfilling system, even if the mixed rocks are stable. Excavation without backfilling is usually carried out by dividing the excavation into horizontal layers or using a ceiling step system in which the layers are successively placed from the bottom to the top, each layer or step in the longitudinal direction of the ore. can be dug. The row of studs and the distance between the studs are selected depending on the mine pressure, the volume of the holding cavity, the thickness of the ore body, and the design and thickness of the reinforcements. Often, the distance between the posts is determined based on the thickness of the existing timber. Sometimes, depending on the operating conditions, the spacing of the strut reinforcements and the thickness of the reinforcement are selected.



✓ Structure reinforced with a pillar reinforcement, in the mining of ore located close to the vertical (a, b) and when the ore body is slightly inclined (g).

Bundled stiffeners are sometimes used in individual posts. If the initial mine pressure in the excavation pits is large, the strut reinforcements should be compressible. For this purpose, compressive materials are used with the strut reinforcement, or the ends of the strut reinforcements are sharpened. In the system of reinforced pile reinforcements, excavation works are carried out in stages in the longitudinal direction of the ore body.



✓ Excavation system supported by reinforced stud reinforcements.

Usually, the reinforcement is installed behind it as the excavation progresses. The ore is lowered into the main ore chute via a winged chute, which extends every 6–8 m as the excavation progresses. Depending on the mining technology and the organization of their transportation, the appearance of the ore and mixed rocks also changes depending on the physical-mechanical properties and elements of the ore body. In a mine with a slight slope, the technology of digging using this system is similar to the technology of digging on the edge, but the difference is that the reinforcements are regularly installed. It is similar to the shape of the excavation of the excavated pit, and it moves along its length in the direction of the slope downwards or upwards. In this system, it is convenient to transport the ore with a scraper. Frame-shaped, saijin-shaped, and stone-concrete columns are used as reinforcement.

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