

УДК

APPLYING OF AIR-LIFTS IN MINING

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The results of studies of a feasibility of air-lifts in mining are reviewed

One of directions of technical progress in transport is development of pipeline transport. The most perspective is hydraulic transport.

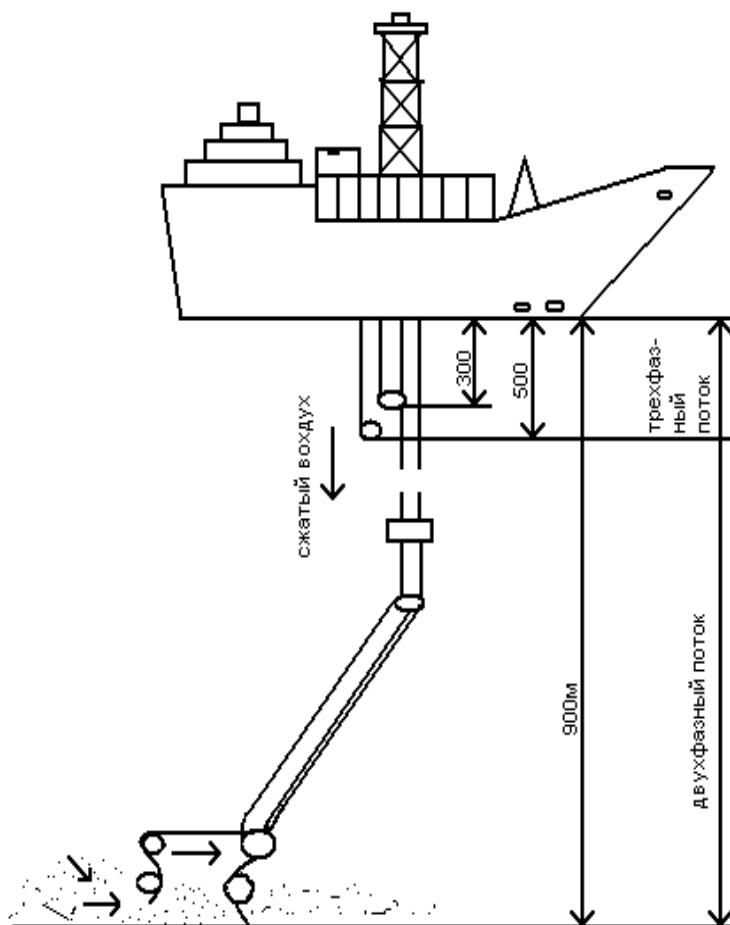
Air-lift - the device representing the hydraulic device for rise or only of a drop liquid, or a drop liquid and a firm material by means of use preliminary compressed in a supercharger and air mixed with this drop liquid. It is open in 1797 by Charles Losher.

It is intended for hydro extraction of uranium, carnality, oil, the bituminous sand, coal and other minerals. Find application in the coal industry (water pumping), in building business (extraction and rise of sand and gravel, hole extraction), at mining combines (rise of mountain weight, water-having cast), on Thermal Electrical Plant (hydro rise of ashes and slag), rise of minerals (concretions) from a bottom of reservoirs.

Work of the air-lift is possible at immersing an elevating pipe together with the mixing device in a liquid on size h.

The air-lift installation of the company «Deepsea Venchas».

The equipment for the air-lifts output installations is placed on the specially equipped vessel by displacement 7500 т, length 106 м and width 15.2 м. In the center of a vessel



the shaft in the sizes 6.0·9.2 м above which the tower with a complex of

drain-elevating mechanisms is established is cut. The pipeline of airlift is section of steel pipes $D=0.25$ м, $l=12$ м, an oil assortment. In the bottom part the elevating pipeline with the help of the spherical hinge is connected to the inclined soaking up branch pipe built in the closed metal form. The air pipe and auxiliary communications (electric and teleales) are fixed by collars in a special branch with the elevating pipeline of air-lift.

Advantages: section execution of the elevating pipeline does not limit depth of extraction; the vertical arrangement of the elevating pipeline with elements of the condenser reduces influence of wave influence.

Lacks: rigid connection of the towed unit of gathering with the elevating pipeline reduces a maneuverability of a complex.

Installation has been intended for carrying out of skilled extraction iron and manganese concretions on depths up to 900metres. Productivity 60 ton in hour is achieved.

For maintenance of reliable work of pumping air-lift installations during start-up it is necessary at its designing and manufacturing to provide a parity{ratio} of volume of an air pipe and the charge of compressed air so that size of time of dispersal was in an interval 2...38 seconds.

The air-lifts rise of minerals in conditions of the sea can work effectively only at use of system of automatic control of modes of his{its} work that is caused by complexity and diversity of the processes proceeding in elevating and submitting pipes, the amalgamator, the soaking up device of the air-lift, quickly changing conditions of operation. Practice shows, that setting up works on the automated systems of regulation are carried out in overwhelming majority of cases of repeated tests.

More and more wide application for pumping water and pulps from mine developments find pumping air-lift installations.

Application of consecutive work of the pump and air-lift for pumping clean water and a pulp is known. In this case at work under the closed circuit the amalgamator settles down directly in the delivery pipeline of the basic pump. Necessary immersing is provided with a water column created by the pump in the pipeline. Such installation has been checked up on industrial coal suction air-lift rise of mine "Belaynka".

It is established, that in industrial pumping air-lift installations at charges of air from 0,4 up to 0,8 m^3/c . The process of start-up at the working pump is unstable.