



Sullivan "U S" rock drills in an Arizona stope.

straight line type, belt driven by a 40-horse-power motor which takes its current from a high tension power line coming from Sasco. This line also furnishes power for lighting purposes.

The writer is indebted to Mr. G. W. Dietz, Auditor, Mr. Chas. Blethen, Master Mechanic, and Mr. David Morgan, Mine Superintendent, for many courtesies in the past, and at the time this article was written.

MARBLE QUARRYING IN ARIZONA

(SPECIAL CORRESPONDENCE)

We believe that the knowledge of the existence of large and valuable marble deposits in Arizona will come as a surprise to many people; but, located in the Chiricahua Mountains in Cochise county, in the southeastern corner of the state, is one of the largest deposits of marble in the country. This deposit has been traced definitely over a distance of approximately 15 miles, and prospect workings made at various points over the deposit show the marble to be of a high grade throughout.

Active work is now being carried on by the Arizona Marble Company, a close

corporation, composed of Denver capitalists, and under the active management of Mr. John G. Kerr, well known in marble circles. This company owns eleven claims, totalling 1760 acres, along the strike of the deposit, and has already opened them up to a considerable extent.

The Arizona Marble Co. has been in existence since January, 1909. The preliminary work necessary to actual quarrying operations has been completed. The deposit now being worked is 14 miles from Olga Station, the shipping point (eight miles from Bowie), on the Southern Pacific Railway, and the last



A corner in the Arizona Marble Co.'s quarry.

three miles of this distance are in the mountains. A splendid road for haulage has been built. A 110-horse power traction engine was used for hauling the machinery from the railway to the quarries, and now hauls the blocks from the quarry to the shipping point. The usual load from the quarry to the station is sixty tons. The traction engine has proved very satisfactory, but the intention is to ultimately install electric haulage, and the road through the mountains was laid out and constructed so that there should be but very little special work to do later, when electric haulage should be adopted.

POWER PLANT

A great deal of thought and study was given to the power plant installation. Efficiency, economy of operation and dependability were the points most in mind. At present this consists of two

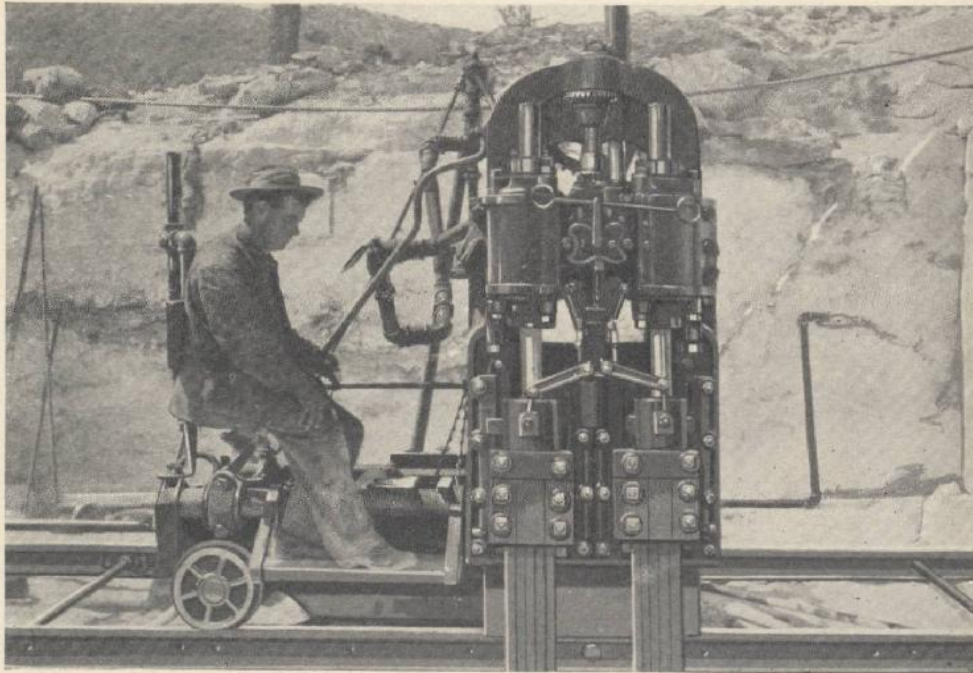
115 H. P. water tube boilers, supplying steam for driving the channelers and rock drills in the quarry, the derrick hoists, the Sullivan straight line Class "WA 3" compressor and the machinery in the experimental and testing mill.

The fuel used is wood, of which there is an abundance, cut from the company's own land.

QUARRY MACHINERY

Sullivan rock drills and channelers are used in the quarry operations; the latest addition to this portion of the equipment has been one of the new Sullivan duplex channelers, type "VW." A view of this machine in operation on the quarry floor is shown by the photograph (page 442.)

Compressed air is used for driving the Sullivan Class "DB-15" and "DB-19" hammer drills, used for "plug and feather" and "foot-hole" work. Very satisfactory results are being obtained in



Sullivan duplex channeler at Arizona marble quarry.



A fine panel of Arizona marble.

block-hole work for splitting up large blocks, by the use of the "DB-15" hammer tool. By its use, the time required in setting up a piston drill is saved, and no difficulty is observed in keeping the holes in line, in order that the blocks may split perfectly. In splitting large blocks, where holes to an average depth of four to five feet are necessary, the average drilling speed is 20 feet per hour. The air pressure maintained will average 100 pounds at the receiver.

The marble is strong and solid, and is quarried in very large blocks. An idea of the size of the blocks is given in the photograph of a corner of the storage yard, page 443.

Two derricks are in operation, one 30-ton and one 50-ton. To carry out the idea of centralizing the machinery as much as possible, the derrick hoists are located at the central plant, and one engine is used for driving both hoists.

The mill is equipped with a steel frame gang saw, a rubbing bed of the underneath geared type, and a finishing and polishing table. The mill is designed for, and intended to be used for experimental work, and might be called a testing laboratory, but at the same time it will enable the company to handle and make use of many blocks which would otherwise go to waste.

The marble now being worked is white, with pronounced dark veinings, and a predominating flesh tint. A peculiarity of this marble is the absence of any weakness in the veining, being almost unique among marbles of this nature in that particular. A most excellent idea of the marble is given in the accompanying photograph. The panels (page 442) showing the vertical veinings are 8 feet and 9 feet 6 inches in height respectively. Chemical analysis shows the marble to contain 99.98 per cent calcium carbonate, a degree of purity which is very rare. The stone has a crushing strength of 12,000 pounds to the square inch. The rate of absorption is practically nil, being .00010.

At the present time the quarries are busy getting out material for the various jobs on hand. Among the more prom-



Blocks in the storage yard.

inent buildings in which the Arizona marble is being used are: The First National Bank Building, Denver, Colo., and the bank buildings at Champaign, Ill., and Missoula, Montana.

A large quantity of marble blocks is being stored in the quarry yard ready for immediate shipment, in sizes up to 12 feet in length and containing 200 cubic feet.

STOPPING DRILL STEELS

SUGGESTIONS FOR THE PROPER SHAPE AND TEMPER OF BITS

It is essential to the most efficient results in stopping with hammer drills, that everything about the machine itself be kept in the best possible condition. It is just as essential that the drill bits be properly formed, sharpened and tempered for the work to be done, and that an abundance of sharp steel of the right gauges be constantly available. Poor blacksmithing and the use of wrongly shaped steels or those whose gauge is worn down, will cut down drilling speed and waste air power and labor to a surprising degree.

The following suggestions for the use and care of stopping drill bits are reprinted from a circular of instructions sent out with each Sullivan "DA 21" Drill.

The form of drill steel which has been found to be the most practical for use with this machine is the one-inch heavy ribbed, cruciform solid steel. This type not only by its shape provides greater clearance for the cuttings to fall from the hole being drilled, but also provides greater bearing and wearing surface for the part which enters the bushing than steels of any other shape. The shape of the bit which will give the best results in any