

FIG. 1

Fig 1 shows a section of entry where top rock has been taken above the coal seam for additional head room. Fig. shows channel section bolted to roof rock with a smooth roof surface or with that surface nearly within the same plane a steel channel used as a bearing plate is placed against the roof, and one hole near the middle is marked to be drilled. That hole is drilled to proper depth, the bolt entered with the wedge started in the slot in the top end of the bolt. The bolt is then driven and the channel replaced and a washer and nut tightened with an impact wrench bind the strata together and hold the channel in place. Then bolts are placed in like manner in the remaining pre-punched holes in the channel. End bolts as shown by broken lines to be used for experimental purposes to determine if better stability is acquired.

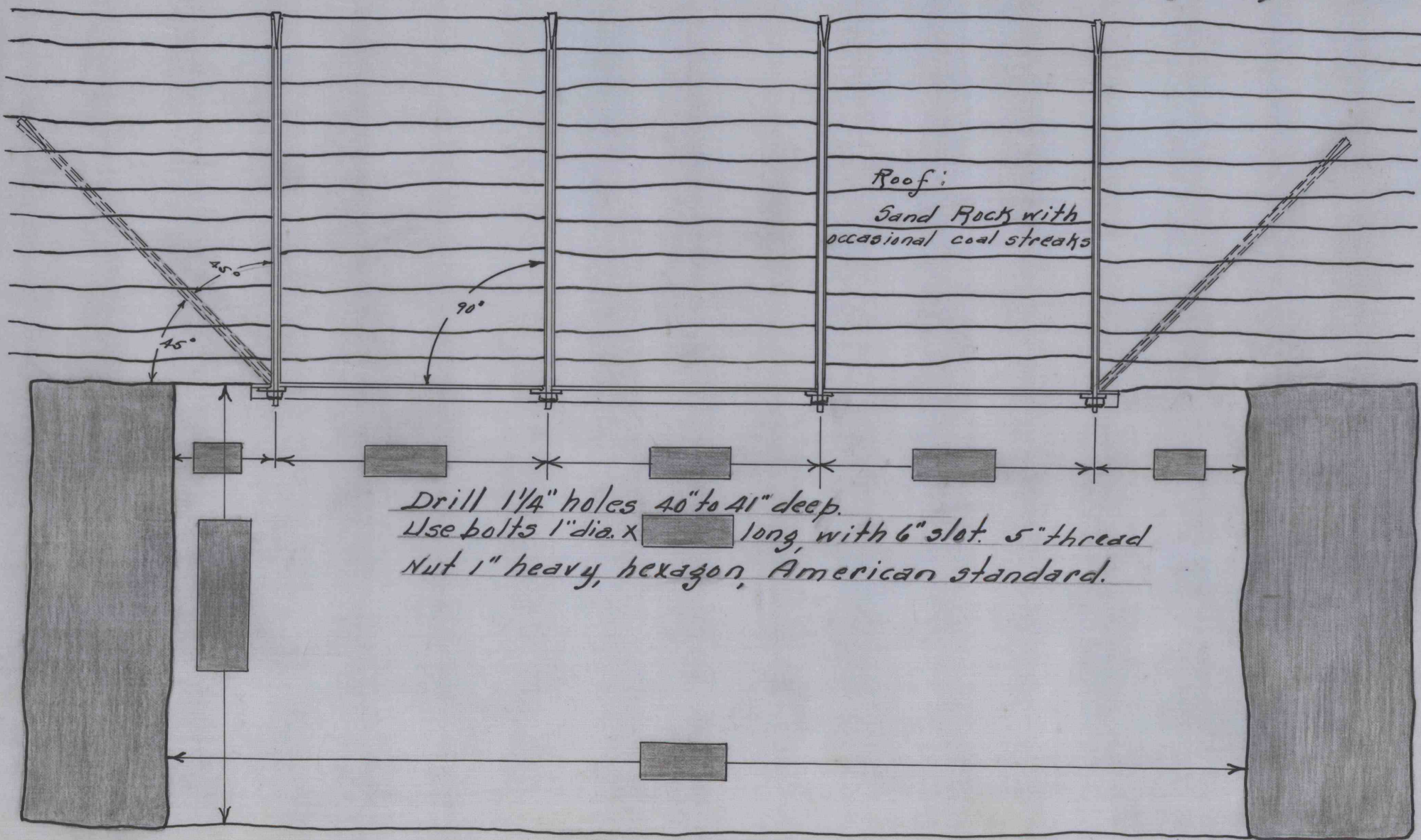


FIG. 2

Fig 2 shows a section of entry where no top rock is taken above the coal seam. Channel and bolts are placed in the same manner as described under Fig 1

When a steel channel is used and a depression exists where a bolt is to be placed (Fig. 3) and it is deemed not practical to bend the channel to conform to that depression, then a steel bearing plate of proper area and thickness is to be used against the rock in that high area with the bolt passing thru the plate, also a spacer, such as a piece of strong steel pipe of proper length to fill or almost fill between the channel and the bearing plate. Having the spacer a small fraction of an inch short is no objection, for then the channel may be drawn up tight against the roof rock adjacent to the depression.

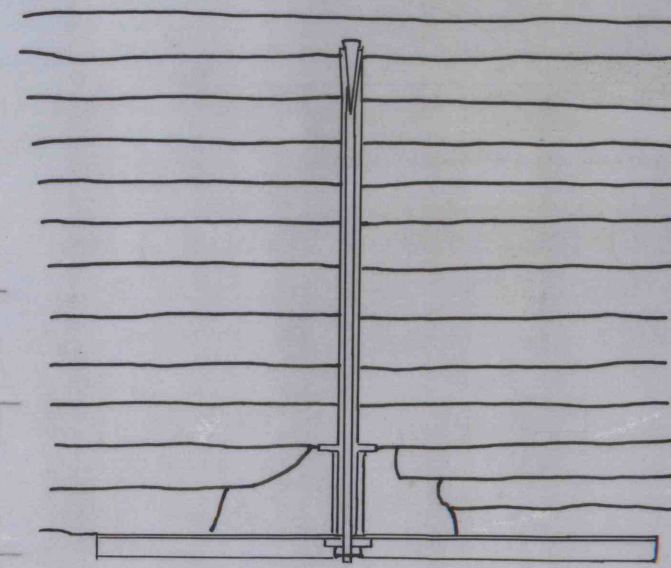


FIG. 3

Steel bearing plate, both channel or thin plaster to be used 8"x8"x 3/8" thick, center punched. Angle washer 3"x3"x 3/8"

To help maintain the relative positions of rocks adjacent to a natural cleat or slip (Fig 4), use bolts from 1 foot to 2 feet longer than for vertical bolting with the slot in the top of the bolt in a plane perpendicular to the cleat or slip, so that tightening of the wedge will not exert a force in the direction of the cleat or in a vertical direction.

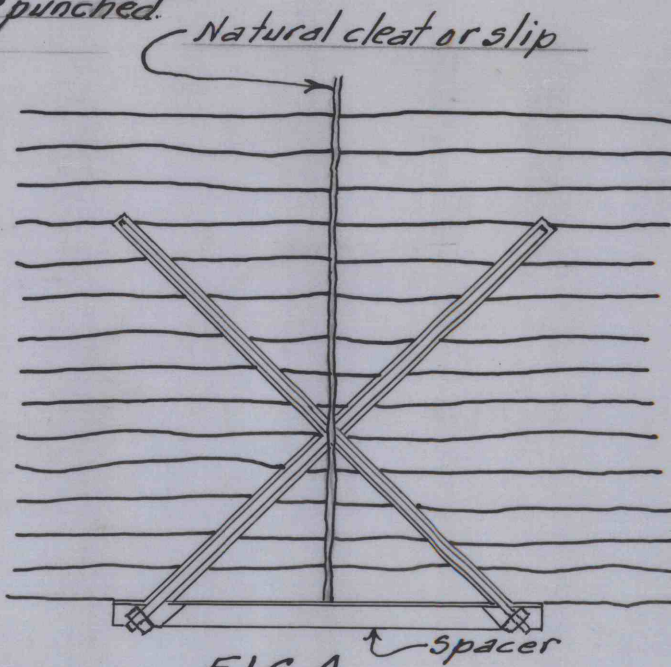


FIG. 4

Use also a stiff steel spacer between bolts and adjacent to the roof surface to prevent the bolt under tension from breaking or grinding off small portions of rock in that angle which action would relieve the tension in the bolt and destroy its usefulness.

These bolts are not intended to serve the same purpose as vertical bolts, but are to be used in addition thereto.

### ROOF BOLTING

The purpose of roof bolting as shown on this sheet is to reinforce sand rock, shale and other rocks where planes of weakness, usually planes of stratification, exist found due to laminations of coal or lack of effective natural cement between rock strata.

It is considered that the binding together of a number of thin strata by bolts perpendicular to the planes of weakness so that no movement or sliding of one stratum against another is permitted, the strength of that reinforced compact mass becomes several times greater than the aggregate strength of all those thin layers working separately.

In this work no dependence is placed in the loose or broken rock being safely suspended from rocks which might be considered stable.

Standard wedges 5 1/2" long by 3/4" wide and tapered from 3/8" to 0 to be modified when change in rock hardness as indicated by drilling warrants. Channels are 4" wide x 5.4 pounds per foot. 12 feet long, 1/2" thick.

FOR

Mine	Entry	Location
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OPERATOR

[Redacted]
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APPROVED BY

[Redacted]
[Redacted]

Timbering:  
Steel rail bars 70#  
supported by legs on 6 feet centers.

Barnes and Tucker Company  
Barnesboro, Pa. March, 2, 1950  
(W.)

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