

of an air chamber or in fact several of them within the shield itself. These are especially useful when the men have to work out in front of the shield because they can be used as air locks and save excessive pressure within the tube itself. The whole shield except the cutting edge is built of structural steel and reinforced in every manner to withstand the enormous pressure placed upon it. The hydraulic jacks which apply this pressure are eleven in number and are built into the outer rim. The plunger of each jack pushes back against the end of the last ring placed and so forces the shield ahead. A small auxiliary jack is placed in the center of the large one to force the plunger back to its original position when the pressure on the large jacks is released after a shove. A small copper tube carries the pressure down from the power house on shore. This tube runs into a general receiver at the back of the shield, from which it is distributed through separate connections to each jack. This allows each jack to be worked independently and in this manner the shield can be kept in alignment and to grade. The grade is checked roughly during each shove by the inspector in charge who uses a plummet suspended from the top of the apron where it joins the shield proper. He has a check mark at the bottom by which he can give the shield its proper inclination. Measuring rods are used at the sides to keep the proper alignment and accurate instrument checks are made every shift, but these will be given in more detail later. The shield seems to have a great tendency to rise which makes it very hard to keep to a minus grade. This was accomplished by opening one of the upper doors and letting the silt pass through, thereby relieving the pressure on