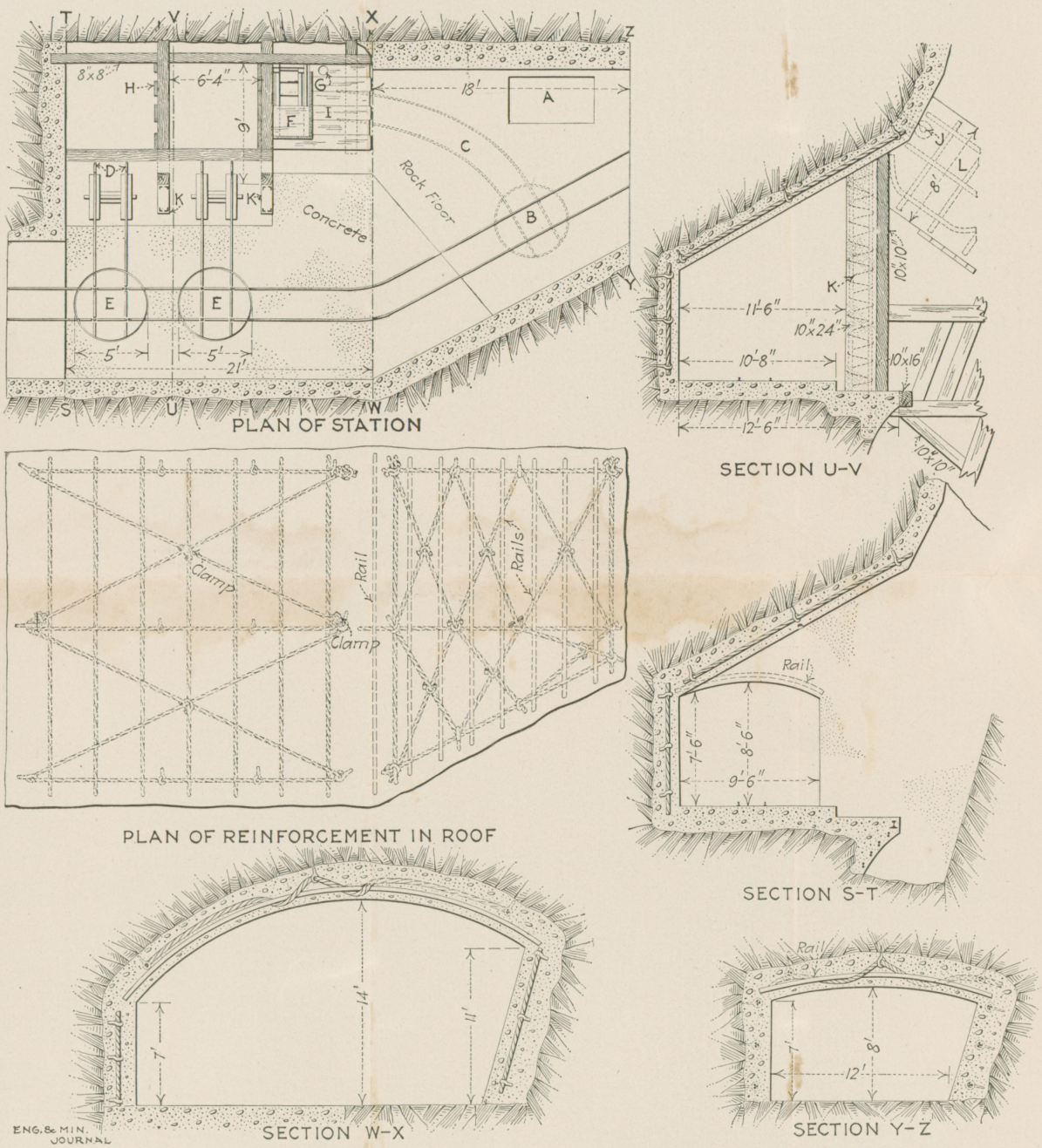
Concrete Station at Champion Mine

The large stations of the Champion mine sometimes require concreting of the back where rather large areas are exposed. Such a station is illustrated in the accompanying drawings in plan and section. The wood timbers here shown are replaced in later stations by concrete beams or pillars. The peculiar shape shown in the plan is rendered necessary in order to provide for sinking, the hoist for that purpose being situated at *A* and a temporary turntable at *B* for a temporary track *C*. The permanent turntables *E* and the cradles *D* are placed as illustrated. The mainway is covered with 10-in. timber shown at *I*; a trap-door *F* sets in this and the 8-in. air pipe *G* passes through it. Between the skip compartments, a brattice of planks *H* is built to prevent miners from stepping off the cage into the empty compartment.

The reinforcement in the concrete roof of the main part of the station, as seen in the sections and in the plan of the roofs, consists of 1¼-in. rope. Some of this is threaded through eye-pins in the back, these being disposed as shown. This cable is drawn as tight as possible, and the ends and the crossings clamped. Above it are placed six pieces of the same cable extending in the direction of the shaft. The roof is about 18 in. thick.



CONCRETE SHAFT STATION AT THE CHAMPION MINE

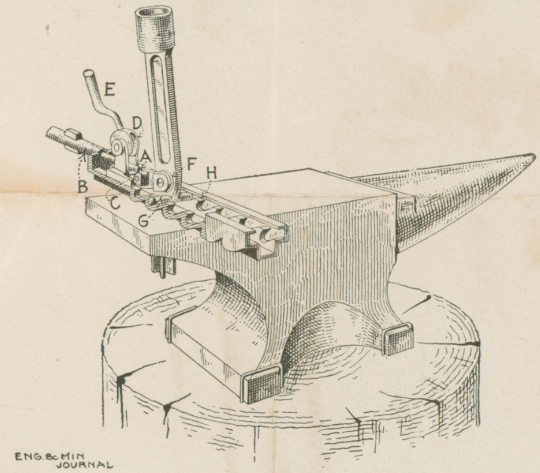
Similar reinforcement is used for the station sides, which are from 10 to 18 in. thick.

In section *UV* can be seen an eye-bolt *J*, in the brow over the shaft. One of these in each skipway is used to hold the blocks for unloading heavy timbers. The two supporting posts *K*, opposite the shaft dividers, are built of four 4-in. angles in the corners, wrapped continuously with ¾-in. wire rope, the wraps about 12 in. apart. These posts are 10x24 in. The divider in the shaft, seen at *L*, is of concrete, reinforced with 1¼-in. rope as shown.

The side extension of the station has an arched roof and includes eight 25-lb. rails in its reinforcement. These are bent to the arch of the station. Eye-pins are also set in the rock and a network of 1¼-in. cable laced through them over the rails, except that where it passes through the center pins, it is taken under the rails and up through the eye-pins again. The opposite side of the station also has a rail reinforcement in the back of the drift.

Puller for Hollow-Steel Welding Pins

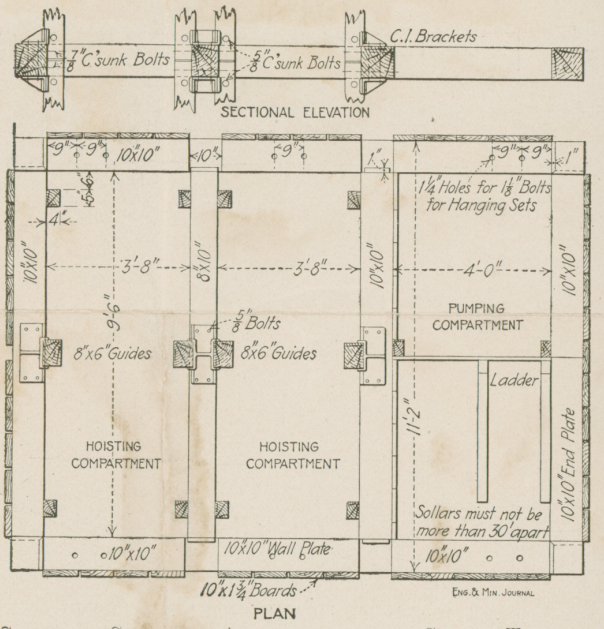
A device for pulling from the shank end of hollow-drill steel, the pin which is inserted to preserve the orifice during shanking and welding has been invented by John Q. Grant, of Denver, Colo. (U. S. Pat. 1,065,125). Ordinarily, this pin has to be driven out by a chisel, which is slow and laborious and injurious to the pin. The device as shown consists of a trough arrangement, in one end of which a slot permits the entrance of the pin *A* while opposing the entrance of the drill shank *B*, which is considerably larger. The pin *A* is gripped in a block *C*, the upper surface of which is grooved to approximately the curvature of the pin, the gripping being performed by a grooved cam *D*, the groove of which is knurled to obtain a sure grip. The cam handle *E* is bent to one side so as to pass the pulling lever. The block *C* is connected by a link *F* to a pulling lever which terminates at its lower end in a transverse pin *G*; *G* can be slipped behind the teeth *H* on the sides of the trough, which thus form successive fulcrums for the lever. The teeth slope in such a way that by reciprocating the lever handle, the pin *G* naturally slips from one set of teeth to another and the extraction of the pin is thus almost continuous. The trough in its simplest form as shown is fitted with a projecting horn below for insertion in the hardy hole of an anvil.



TOOL FOR EXTRACTING PIN FROM WELDED SHANK OF HOLLOW STEEL

Shaft Set with Powellized Guides

The accompanying illustration shows the set in use at the main shaft of the Broken Hill South Silver Mining Co., Australia. The details of the set construction are apparent from the drawings. The sets are 6 ft. 8 in. between centers. Originally, guides of Oregon pine were used, but these were found to wear excessively, and since all the hoisting was done through this one shaft, it was a matter of annoyance and expense to interrupt operations in order to replace guides. In order to avoid this difficulty, it was decided to adopt for the guides a native Australian timber called tallow-wood; this is hard, tough and close-grained. The variation in humidity conditions in shafts naturally causes swelling and shrinking of all timbers, including the guides; it was decided to minimize this by treating the guides by the Powellizing process and sawing them to gage immediately before placing them in the shaft. The shaft is downcast, and when ventilating conditions are less stable in the summer, the draft is maintained downcast by the aid of a motor-driven fan.



SECTIONS SHOWING ARRANGEMENT OF SHAFT TIMBERS

The Powellizing process is a method of wood treatment developed in England and consists essentially of impregnating the wood with a solution of saccharine. This is performed by the usual open-tank treatment method. The saccharine has the faculty of hardening the wood considerably, rendering it impervious to attacks by decay and by boring insects. Furthermore, it probably fireproofs the wood to a certain extent, or at least does not render it more inflammable, as does creosoting. This effect of hardening and fireproofing the timber treated should render the Powellizing process especially available for shaft guides.