Nov. 13, 1928. 1,691,715

C. C. HANSEN

STEEL GUIDE FOR SUBMARINE DRILLS

Filed Oct. 5, 1927 2 Sheets-Sheet 1

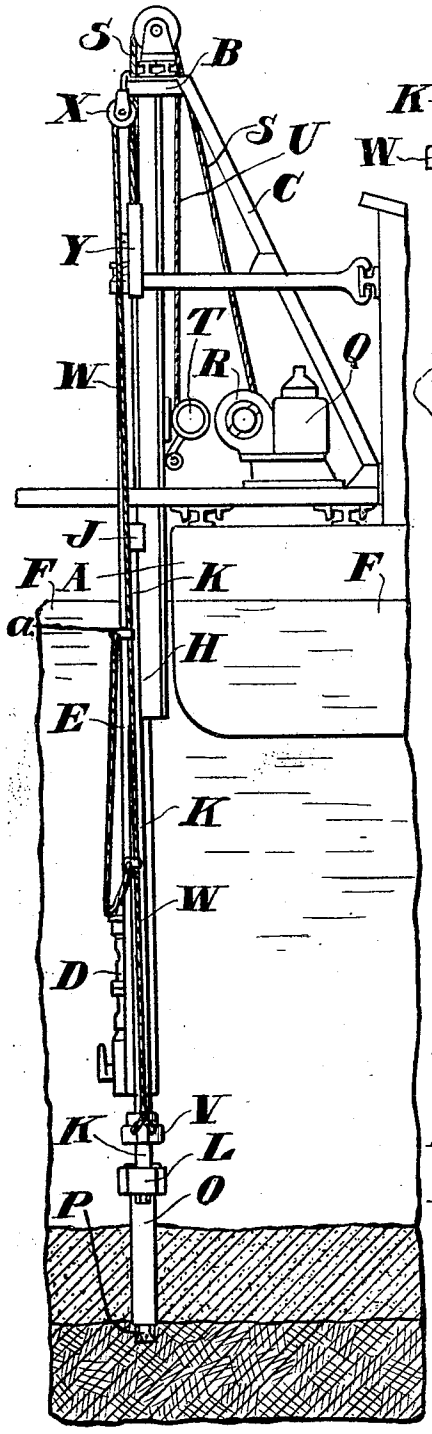


FIG.-1.

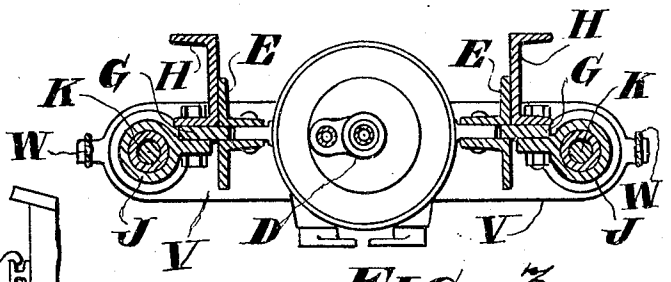


FIG-3.

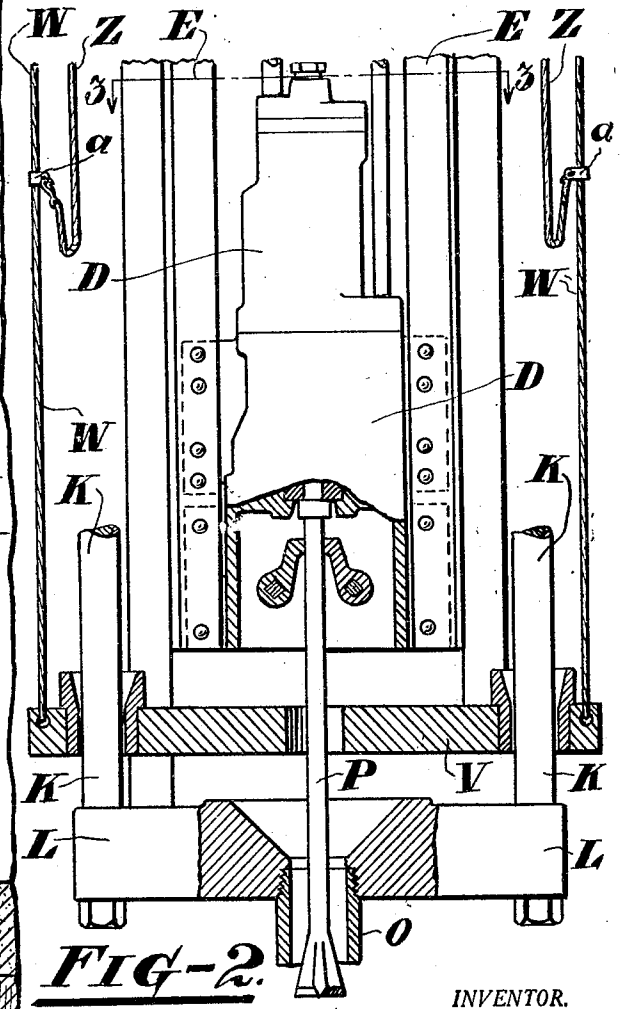


FIG-2.

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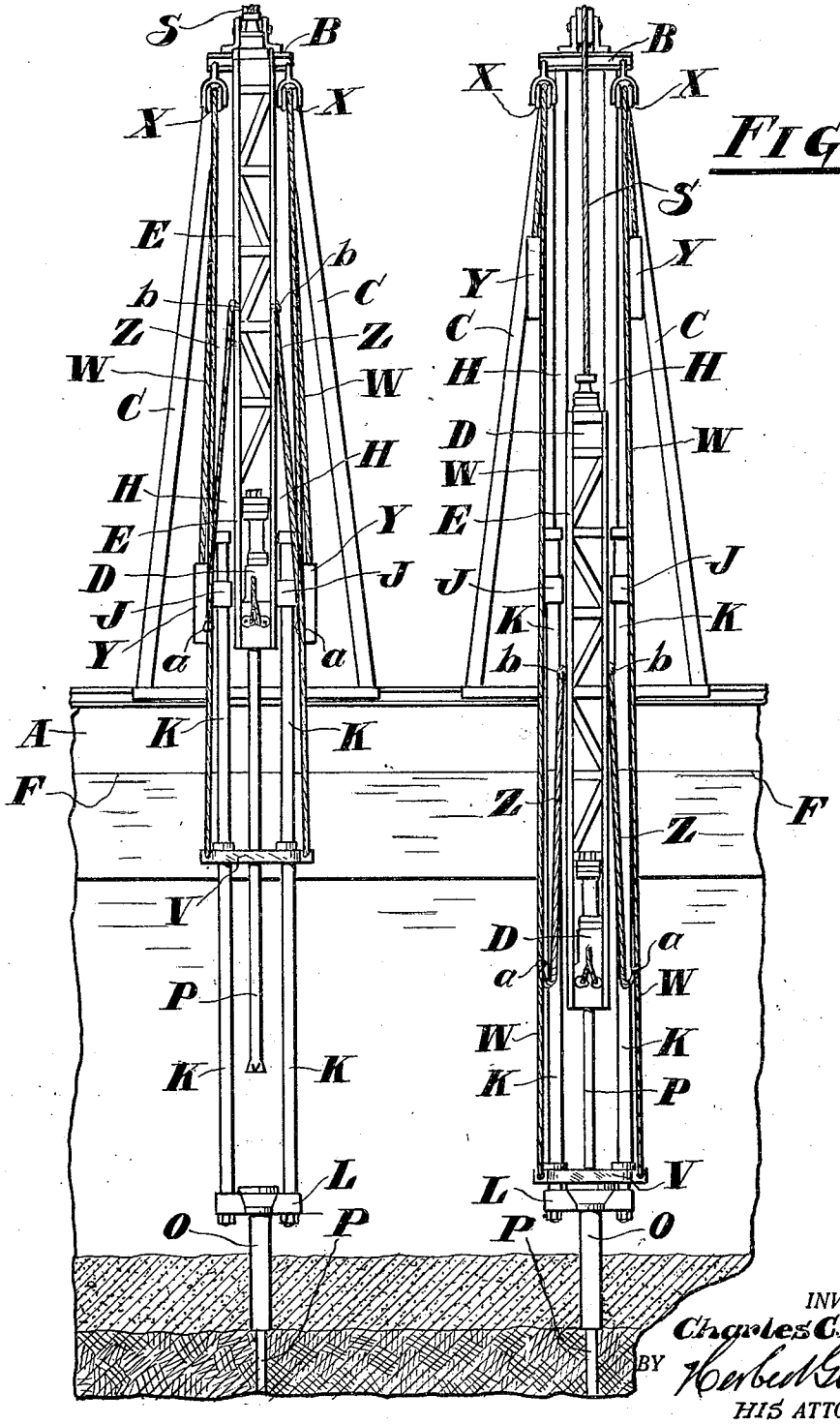


FIG.-4.

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UNITED STATES PATENT OFFICE.

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STEEL GUIDE FOR SUBMARINE DRILLS.

Application filed October 5, 1927. Serial No. 224,162

This invention relates to submarine drills, but more particularly to the type of submarine hammer drill unit disclosed in United States Patent No. 1,610,372, granted December 14, 1926.

The object of the present invention is to enable the drill steel to be guided by means of a suitable drill steel guide which is moved up and down the guide frame of the unit as the drilling apparatus is moved. By this means the drill steel guide is automatically adjusted to guide the steel in any position, as for instance, when changing steels or when lowering the drilling apparatus to insert the steel in the submerged mud guard. The necessary operations of submarine drilling with a hammer drill and short or long steels are thus facilitated and the time consumed in making adjustments considerably lessened.

The invention is shown in one of its preferred forms in the accompanying drawings, in which

Figure 1 is an end elevation, partly in vertical section and partly broken away, showing so much of a barge and submarine drill unit as will serve to illustrate the invention,

Figure 2 is an enlarged detail view, partly broken away and partly in vertical section, of the lower portion of the drilling unit and the drill steel guide,

Figure 3 is a transverse sectional view of Figure 2 taken on the line 3—3 looking in the direction of the arrows, and

Figure 4 is a side elevation, partly broken away, showing two drilling units on a barge.

Referring to the drawings, a barge A is shown broken away and in this instance two submarine drilling units B having a main frame C are illustrated on the barge. A submarine hammer drill D for each unit carried by the movable drilling frame E is adapted to be submerged in the water F.

The main frame C of each drilling unit is provided with guides G connected to the channels H and the drilling frame E is guided on said guides G. The main frame is also provided with brackets J and a supplemental guide frame formed of the rods K connected by the foot piece L is slidable in the brackets J.

The foot piece L carries a tubular mud guard or protective shield O adapted to be forced down through the loose material to the rock to be drilled and the short hollow drill steel P carried by the rock drill D extends through the mud guard during the drilling operation. A suitable motor Q having the winding drum R carries the cable S for raising and lowering the guide frame K and other motor T may be provided for operating the cable U for raising and lowering the drilling frame E.

In accordance with this invention, a drill steel guide V in the form of a plate is freely slidable vertically on the rods K forming the guide frame and in order that this drill steel guide may guide the steel both during the drilling operation and when steels are to be changed, suitable means are provided for raising and lowering the drill steel guide. For this purpose flexible connections preferably in the form of cables W are connected to the steel guide and pass upwardly over sheaves X located on the main frame C. In order to keep the cables taut, counterweights Y are provided connected to the upper ends of the cables. Additional flexible looped connections Z are secured to the main cables W at *a* and are also secured to the drilling frame E at the point *b*. By this arrangement, as the drilling frame E is raised, the loops Z are drawn taut and raise the drill steel guide V upwardly. The counterweights Y keep the main flexible connections and the loop connections taut and take up slack when necessary. The drill steel guide V may also be manipulated from the barge by means of the flexible connections W.

I claim:

1. A submarine drill unit, having a main frame provided with guides, a guide frame vertically movable on said guides, a drilling element, a tubular mud guard adjustably supported at the lower end of said guide frame below the drilling element whereby the weight of the drilling element may rest upon the mud guard to force it down to the rock to be drilled, a drill steel guide freely slidable vertically on the guide frame, and means for raising and lowering said drill steel guide.

2. A submarine drill unit, having a main frame provided with guides, a guide frame vertically movable on said guides, a drilling element, a tubular mud guard adjustably supported at the lower end of said guide frame below the drilling element whereby

the weight of the drilling element may rest upon the mud guard to force it down to the rock to be drilled, a drill steel guide adjustable vertically with respect to the guide frame, and a flexible connection between said drill steel guide and the drilling element.

3. A submarine drill unit, having a main frame provided with guides, a guide frame vertically movable on said guides, a drilling element, a tubular mud guard adjustably supported at the lower end of said guide frame below the drilling element whereby the weight of the drilling element may rest upon the mud guard to force it down to the rock to be drilled, a drill steel guide adjustable vertically with respect to the guide frame, main flexible connections secured to the drill steel guide and extending to points on the main frame, and flexible looped connections between said main connections and the drilling element, whereby the raising of the drilling element also lifts the drill steel guide.

4. A submarine drill unit, having a main frame provided with guides, a guide frame vertically movable on said guides, a drilling element, a tubular mud guard adjustably supported at the lower end of said guide frame below the drilling element whereby the weight of the drilling element may rest upon the mud guard to force it down to the rock to be drilled, a drill steel guide adjustable vertically with respect to the guide frame, main flexible connections secured to the drill steel guide and extending to points on the main frame, flexible looped connections between said main connections and the drilling element, whereby the raising of the drilling element also lifts the drill steel guide, and means for taking up slack in said connections as the drilling element is moved upwardly.

5. A submarine drill unit, having a main frame provided with guides, a guide frame vertically movable on said guides, a drilling element, a tubular mud guard adjustably supported at the lower end of said guide frame below the drilling element whereby the weight of the drilling element may rest upon the mud guard to force it down to the rock to be drilled, a drill steel guide adjustable vertically with respect to the guide frame, main flexible connections secured to the drill steel guide and extending to points on the main frame, flexible looped connections between said main connections and the drilling element, whereby the raising of the drilling element also lifts the drill steel guide, and counter-weights connected to said main connections for taking up slack when the drilling element is moved upwardly.

In testimony whereof I have signed this specification.

CHARLES C. HANSEN.