United States Patent

Isaksson

[15] **3,647,008**

[45] **Mar. 7, 1972**

[54] COLLAPSIBLE DRILLING TOOLS AND THE LIKE

[72] Inventor: **Karl G. Isaksson,** Blyberg 2638, Alvdalen, Sweden

[22] Filed: **July 31, 1970**

[21] Appl. No.: **59,952**

[30] **Foreign Application Priority Data**

Aug. 26, 1969 Sweden.....11810/69

[52] **U.S. Cl.**.....**175/18**
[51] **Int. Cl.**.....**F25c 5/04**
[58] **Field of Search**.....175/18, 320; 173/163

[56] **References Cited**

UNITED STATES PATENTS

2,694,552	11/1954	Vadnais	175/18
3,129,775	4/1964	Connelly	175/18
3,168,923	2/1965	Lind	175/18

FOREIGN PATENTS OR APPLICATIONS

35,746	11/1966	Finland	175/18

Primary Examiner—David H. Brown
Attorney—Woodhams, Blanchard and Flynn

[57] **ABSTRACT**

An arrangement for a collapsible drilling tool or the like, comprising a brace portion having a handle portion and a drill shaft which, through a link or the like, is connected with a drill holder shaft carrying a drill means or tool. When the arrangement is collapsed, distribution of the weight thereof is such that, when suspending the arrangement by the handle portion, the drill holder shaft lies to one side of a vertical line extending through the handle portion, and the angle between the pivoting plane of the drill holder shaft through the link in relation to the drill shaft and the vertical line is less than 90°.

4 Claims, 3 Drawing Figures

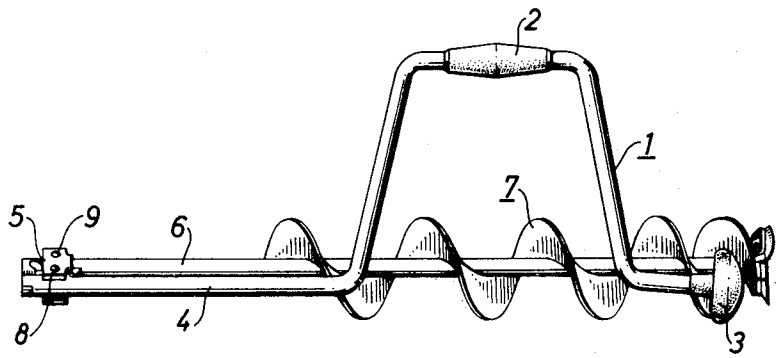


Fig.1

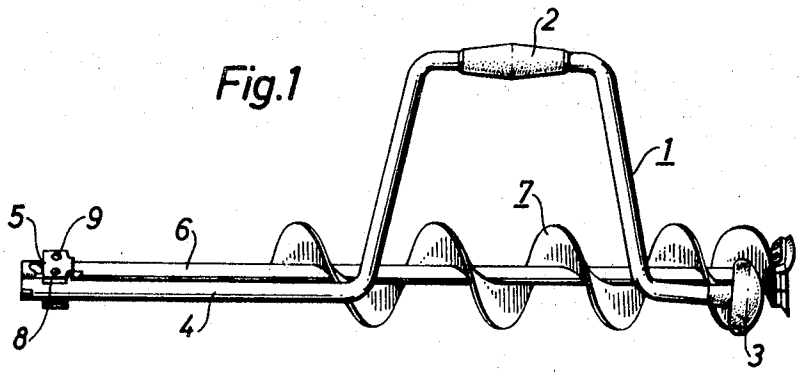


Fig.2

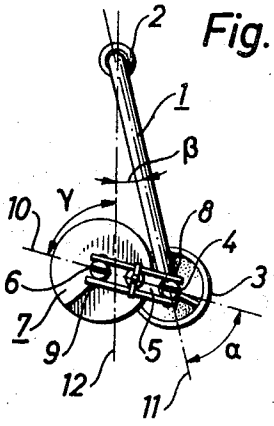
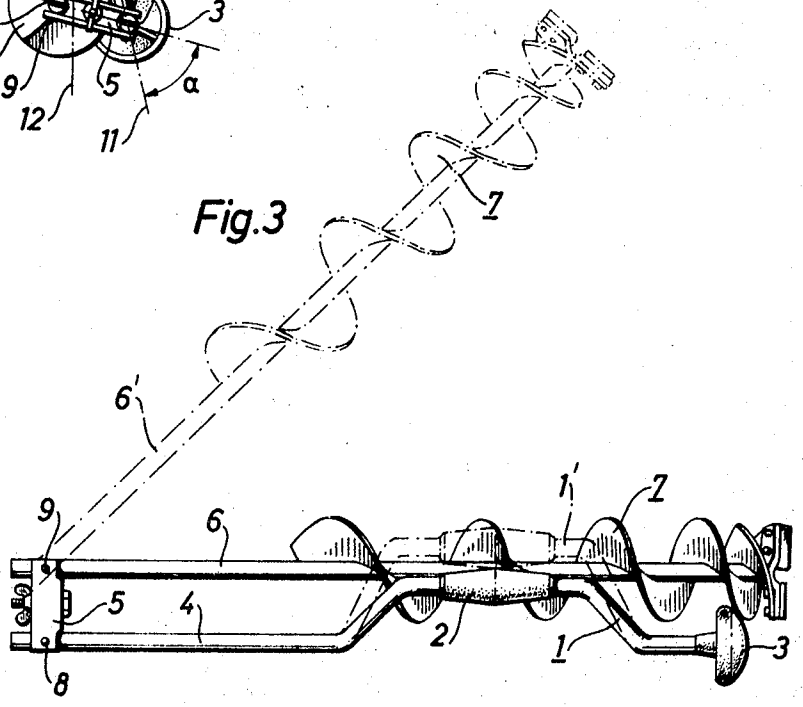


Fig.3



INVENTOR
KARL G. ISAKSSON
BY
Woodhams, Blanchard & Flynn
ATTORNEYS

COLLAPSIBLE DRILLING TOOLS AND THE LIKE

It is known to hinge the drill shaft of, for example, ice drills in order that the drill can be collapsed to a more convenient carrying form, the actual drill portion in the collapsed condition of the drill being placed adjacent the brace portion and secured thereto. During the course of a single fishing excursion, the fisherman moves many times between different locations on the ice, to bore holes through which to fish. To facilitate carrying the ice drill, the fisherman will often collapse the same when moving from site to site, it being necessary each time the drill is collapsed or extended to manipulate a locking mechanism which holds the drill portion against the braced portion while the drill is being carried. Manipulation of the locking mechanism can be a time-consuming and difficult task in extremely cold weather and when heavy gloves are worn. One object of the present invention is to eliminate this disadvantage, and in accordance therewith there is proposed a simple and expedient solution to the problem.

In accordance with a statement of invention, the improvement according to the invention is characterized in that the weight distribution of the drill in a collapsed condition is such that, when suspending the arrangement by the handle portion, the drill holder shaft lies to one side of the vertical line, and that the angle γ between the pivoting plane of the drill holder shaft through the link in relation to the drill shaft and the vertical line is less than 90°.

The invention will now be described in more detail with reference to the accompanying drawing, in which

FIG. 1 illustrates by way of an example an ice drill in accordance to the present invention seen from the side and collapsed to a carrying position,

FIG. 2 shows the drill seen from the end of the drill axis, and

FIG. 3 illustrates a plan view of the embodiment of FIG. 1.

The ice drill illustrated in the drawings comprises a brace portion 1 provided in a conventional manner with a crank handle 2 and a knob 3. The brace portion 1 is made integral with a drill shaft 4 which is provided at the free end thereof with a link 5 which pivotally connects the bore shaft 4 with a drill holder shaft 6 which carries the actual drilling means, indicated generally by the reference numeral 7. The link is connected through a pin 8 with the bore shaft 4 and through a pin 9 with the drill holder shaft 6. As will be seen from FIG. 2, the pin 8 is secured to the drill shaft 4 in a manner whereby the pivoting plane 10 of the link forms an acute angle α with the crank journal plane 11 of the brace portion 1. The pin 9 is secured parallel with the pin 8 in the link 5, so that the pivoting plane of the drill holder shaft 6 coincides with the pivoting plane 10 of the link 5 relative to the drill shaft 4 and the brace portion 1. In the illustrated collapsed position, the distribution of weight throughout the drill when carried by the crank handle 2 is such that the two shafts 4 and 6 lie on either side of a vertical line 12 passing through the crank handle. Thus, the pivotal plane 10 of the link 5 and the drill holder shaft 6 will form an angle γ less than 90° with the vertical line 12. This causes the drill holder shaft 6 with the drill means 7 to be forced by gravity into abutment with the knob 3 and thus be

maintained in the collapsed position when carried without the assistance of latching hooks or locking means. The collapsed position is maintained even when the drill is carried relatively harshly. Only when the drill holder shaft 6 with the drill means 7 is swung out as shown with the dotted lines 6', 7' in FIG. 3 is the weight distribution such that the pin 9 in the link 5 will be positioned on the same side of the vertical line 12 as the pin 8, the angle γ of the pivoting plane 10 to the vertical line 12 being greater than 90°, whereby the drill holder shaft 6 is itself swung outwardly by the force gravity. The brace portion 1 will then take a position 1', as shown in FIG. 3, since the angle β has been increased. The proposed embodiment is, as will be understood, particularly simple to manipulate and is practicably constructed with respect to conditions encountered during winter fishing.

The illustrated embodiment can, of course, be modified within the scope of the invention, particularly with regard to the design of the link connection between the drill shaft 4 and the drill holder shaft 6. The essential feature is that the distribution of weight when the drill is collapsed or substantially collapsed is such that the drill holder shaft 6 lies to one side of the vertical line 12 from the crank handle 2 and that the pivoting plane 10 of the drill holder shaft 6 forms an angle γ with the vertical line 12 which is less than 90°. The invention is naturally not restricted to ice drills, but may also be applied to other types of drills and to reamers, chisels and torque wrenches. It may also be used in connection with crane maneuvering tools for maneuvering, for example, water posts or the like placed in the ground.

What is claimed is:

1. An arrangement in collapsible drilling tools and the like comprising a brace portion having a handle portion and a drill shaft which, through a link or the like, is connected with a drill holder shaft carrying a drill means or tool, characterized in that when the arrangement is collapsed, distribution of the weight thereof is such that, when suspending the arrangement by the handle portion, the drill holder shaft lies to one side of a vertical line extending through the handle portion, and that the angle γ between the pivoting plane of the drill holder shaft through the link in relation to the drill shaft and the vertical line is less than 90°.

2. An arrangement according to claim 1, characterized in that the drill shaft and the drill holder shaft in the collapsed position of the arrangement each lie on its respective side of the vertical line extending through the handle portion and that the plane of the brace portion forms an acute angle β with the vertical line.

3. An arrangement according to claim 1, characterized in that the link is connected with the drill shaft through a pin passing transversely through the drill shaft in a manner whereby the pivoting plane of the link forms an acute angle α with the plane of the brace portion.

4. An arrangement according to claim 3, characterized in that the drill holder shaft is connected with the link through a pin passing transversely through the same and being parallel with the first mentioned pin.

* * * * *