To all whom it may concern:

Be it known that I, NATHANIEL EDWARD JENKINS, a citizen of the United States, residing at Goldfield, in the county of Espen-笸, and State of Nevada, have invented certain new and useful Improvements in a Return Water Connection used in Diamond-Drilling; and I hereby declare the following, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain novel and useful improvements in a return water connection adapted to be employed in core drills of the type used by miners and prospectors in obtaining the core or sample of the strata of earth through which the core passes, the invention being employed in what is commonly known as a "double tube" drill, that is to say one wherein an inner tube or core barrel is arranged concentrically with, but spaced apart from an outer tube or casing, this core barrel being adapted to receive and hold the core cut by the drill bit.

In carrying out my invention it is my purpose to provide a connection for the water used during the drilling operation, this connection being attached at its upper end to the coupling at the lower end of the usual drill rod, and is connected at its lower end to the core barrel, also having connected therewith the upper end of the barrel or casing which surrounds the core barrel. During the drilling operation a stream of water passing down through the drill rod and its coupling will flow into the upper portion of my connection, passing down through such connection and leaving the same at a point above the point of attachment of the core barrel, the water then passing down between the outer casing and the core barrel to the bit at the bottom of the drill. After passing all of the bit, a portion of the water returns up through the core barrel or inside tubes, assisting in lifting or floating the core within the barrel, and then passes from the core barrel into my improved water connection, passing up through diverging channels in the connection and lifting the latter at a point above the point of attachment of the outer casing to the connection, the water then passing up the outside of the drill in the manner readily understood.

In the present instance it is my purpose to provide an improved form of water circulating connection for drills of this character so that the circulation of the water is directed in such manner that the liability of the drift becoming stuck or wedged or blocked in a hole is obviated, for by the use of my invention I am enabled at all times to provide water to and around the drill so that the ground will be kept wet or moistened, thereby enabling the drill to be easily withdrawn.

With the above recited objects and others of a similar nature in view, my invention consists in the construction, combination and arrangement of parts set forth in and falling within the scope of the appended claims.

In the accompanying drawings: Figure 1 is a view in side elevation of a water circulating connection embodying my invention. Fig. 2 is a bottom plan view thereof. Fig. 3 is a longitudinal sectional view taken on the line 3—3 of Fig. 2. Fig. 4 is a bottom plan view of the connection with the perforated cap removed therefrom. Fig. 5 is a longitudinal sectional view taken on the line 5—5 of Fig. 2 and at right angles to Fig. 3, and showing the device attached to the lower end of a drill rod coupling and to the core drill and the outside casing surrounding the core barrel. Fig. 6 is a top view of the parts shown in Fig. 5. Fig. 7 is a similar view taken at right angles to Fig. 6.

Referring now to the accompanying drawings in detail, and especially to Fig. 5, the letter D indicates the lower end of a drill rod coupling, while E indicates the outside casing or barrel at the drill and F indicates the upper portion of the core barrel. These parts D, E and F form no part of the present invention, and are merely included to more clearly illustrate the use of my water circulating connection which constitutes the present invention, and which is indicated as an entirety by the letter C. The member C includes an upper tubular section 5 interiorly threaded as at 6 to receive the adjacent end of the tubular drill rod coupling D. The lower end of the tubular section 5 communicates with the bore or passage 9 leading down through the member C, the lower end of this passage 9 terminating in downwardly diverging channels 10 which open through the side of the lower shank 11 of the member C. This shank 11 is exteriorly threaded
as at 11' and on this threaded section of the shank is screwed the outside casing E. The lower end of the shank 11 is reduced and shouldered as at 12 to form the threaded stud 13. On this threaded stud is screwed the upper end of the core barrel F. Furthermore, the threaded stud 13 is bored to form a recess 15, the wall of which is in turn threaded to have screwed therein a perforated cap 1. I make the cap removable so that when desired one cap may be taken out and replaced by another having different sized perforations, and furthermore, should the perforations of the cap become clogged, such cap may be taken and cleared out by running a wire through the holes or perforations. This cap, as will be seen by reference to Figs. 3 and 5, does not completely fill the recess 15, and from the space between the inner face of the cap and the opposing wall of the recess, there leads a pair of return water channels 2 which extend upwardly through the shank 11 of the member C, these channels diverging so that their outlet ends 18 are at opposite sides of the member C. Extending at right angles to the channels 2 are oppositely disposed ports 4, which communicate at their inner ends with the water passage 9 and open through the wall of the member C, these ports forming emergency outlets for the passage of water, should the drill become blocked, as hereinafter described. In the present instance these ports are shown as closed by means of small screws 3, one or both of which screws may be removed when using the drill as the operator may deem necessary. When the drill is in operation the water passes down the drill rod to and through the coupling D, thence through the upper tubular section 5 of my connection into the passage 9, the water then passing through the diverging channels 10 in the shank 11 and into the space between the core barrel F and the outside casing E and so on down to the bit at the end of the drill. On its return the greater part of the water after passing the bit usually flows up the outside of the drill, and referring to the drawings, will pass up the outside of casing E and past the outer face of the tubular section 5 of my coupling C. A portion of the water, however, is forced by back pressure upward from the bit through the core barrel F, lifting or floating the core in the barrel until the top end of the core brings up against the top portion of the core barrel directly below the perforated cap 1. The water flowing up through the core barrel passes through the apertures 19 in the cap to the space above the cap and thence through the diverging channels 2 and out through the upper outlet ends 18 of these channels leading through the wall of the water distributing member C, the water so conducted thence passing up the outside of the drill to the surface of the ground. Should the downflow of water be stopped or blocked below the passage 9, the water backing up in the latter will flow out through the emergency outlet ports 4, and a part of the water will flow down the outside of the drill to the bottom of the hole keeping the drill from sticking or wedging, while a portion will also pass up the drill at the outside of the latter to the surface. Meanwhile the operator or drill runner will have noted the break or irregularity in the circulation of the water, and may withdraw the drill. Should a block or stoppage occur at the drill bit, such as might be caused by a piece of soft core, or other substance stopping the bore of the bit, and thus making what is known as a "face block", the water backing up the drill will, at the passage 9, pass through the emergency outlet port 4 and pass down and around the drill to the bit and also up the outside of the drill to the surface thus keeping all of the ground around the bit wet and well watered so that the drill may be easily withdrawn. Heretofore when a drill runner encountered a "face block", he was liable to have his drill stick, and the bit ruined and the diamonds destroyed by grinding or wearing against the hard dry ground, it being practically impossible with the ordinary drill to get water down to the bit and around the outside of the casing when the flow of water has been blocked. The result has been that when the drill stuck under such conditions, a great deal of time and labor, with the consequent expense and delay, had to be expended in getting out the drill, and frequently the operator lost the bit which, as is well known, is of itself very valuable. In addition to the loss of the bit, it is necessary under such conditions to start drilling a new hole, a very expensive proceeding. With my system of circulation, it is impossible for the drill and bit to stick so that it cannot be withdrawn.

While I have herein shown and described one particular embodiment of my invention, I wish it to be understood that I do not confine myself to all the precise details of construction herein set forth by way of illustration, as modification and variation may be made without departing from the spirit of the invention or exceeding the scope of the appended claims.

What I claim is:

1. A water distributing connection comprising a body section having an axial water passage communicating with an outlet port opening through the side of the body section, said body section having a recess therein separate from and below the outlet port, and a longitudinally extending channel leading from the recess and opening...
through the side of the body section at a point above the outlet port.

2. A water distributing connection comprising a body section having an axial water passage terminating at its lower end in diverging outlet ports opening through the side of the body section, said body section having a recess in its lower end separate from and below the diverging outlet ports, and longitudinally extending diverging channels leading upward from the recess and opening through the side of the body section at points above the diverging outlet ports.

3. A water distributing connection comprising a body section having an axial water passage communicating at one end with outlet ports opening through the side of the body section, and longitudinally extending channels leading from the recess at points above the outlet ports, and perforated cap for the recess.

In testimony whereof, I affix my signature, in presence of two witnesses.

NATHANIEL EDWARD JENKINS.

Witnesses:
P. J. MILLER,
E. C. PERSON.