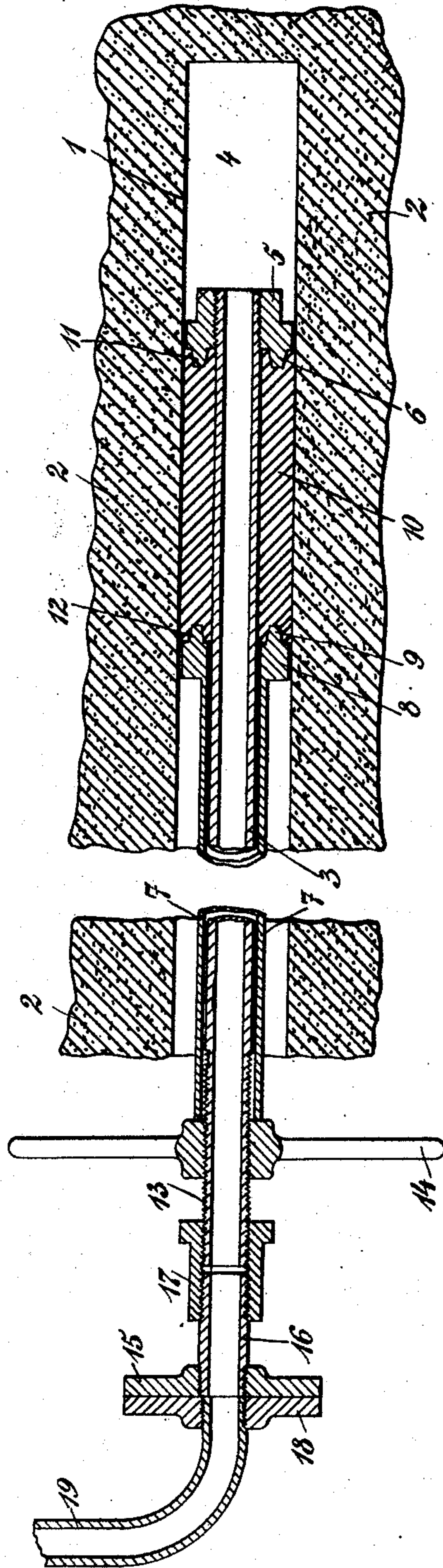


F. TRIPPE.  
 ROCK LOOSENING AND IMPREGNATING DEVICE.  
 APPLICATION FILED DEC. 23, 1910.

999,000.

Patented July 25, 1911.



Witnesses  
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# UNITED STATES PATENT OFFICE.

FRITZ TRIPPE, OF DORTMUND, GERMANY, ASSIGNOR TO GEWERKSCHAFT DORSTFELD,  
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## ROCK LOOSENING AND IMPREGNATING DEVICE.

999,000.

Specification of Letters Patent.

Patented July 25, 1911.

Application filed December 23, 1910. Serial No. 599,029.

*To all whom it may concern:*

Be it known that I, FRITZ TRIPPE, a citizen of the Empire of Germany, residing at Dortmund, in the Empire of Germany, have  
5 invented a new and useful Rock Loosening and Impregnating Device, of which the following is a specification.

My invention consists of a device adapted to tamp a bore-hole made in any rock or  
10 coal-stratum and to force any quantity of water under pressure from an end portion of the bore-hole through the faults and crevices in the rock or coal-stratum for breaking  
15 down or loosening the rock, while the water is prevented from escaping directly through the bore-hole to without.

The new device essentially comprises a forcing tube adapted to be introduced into the bore-hole, a sleeve of elastic material  
20 tightly surrounding the end of the forcing tube between a flange at the end of the tube and another flange at the end of the wider tube put over the forcing tube. Means are provided on the forcing tube without the  
25 bore-hole for displacing the outer tube so as to compress or release the elastic sleeve. In its compressed state the elastic sleeve is pressed for its whole length on the one hand against the inside of the bore-hole and on  
30 the other hand against the outer surface of the forcing tube, so that the water under pressure is prevented from escaping through the bore-hole.

I will now proceed to describe my invention with reference to the accompanying  
35 drawing, which represents a longitudinal section through the device and the rock, an intermediate part being omitted.

1 denotes a bore-hole of any suitable  
40 length driven into the rock or coal-stratum 2 by means of any rock-drilling machine. A forcing tube 3 of a suitable length is introduced into the bore-hole 1, so that a chamber 4 of a convenient length is left at the  
45 end of the bore. A flange 5 is fastened at the end of the forcing tube 3 in any known manner, for example by means of a screw-thread as shown. The flange 5 is shown to have on the inner side an annular projection  
50 6 of a tapering or wedge-shaped cross section. A wider tube 7 is loosely put over the forcing tube 3 and has at its inner end a flange 8 with an annular projection 9 on its outer side. The projection 9 is similar in

cross section to 6. The tube 7 should project from the bore-hole 1. A sleeve 10 of  
55 elastic material (rubber for instance) is put on the forcing tube 3 between the two flanges 5 and 8 and is made of such a diameter, that it loosely fits the bore-hole 1. It is provided  
60 at its end faces with grooves 11 and 12, in which the projections 6 and 9 respectively engage. The outer projecting end of the forcing tube 3 is provided on its outside  
65 with a screw-thread 13 of a suitable length, with which a handle 14 can engage. The handle 14 is adapted to bear with its nave against the outer end face of the outer tube  
7. It will be understood, that by turning  
70 the handle 14 in the respective direction the elastic sleeve 10 can be compressed for its whole length with the aid of the outer tube 7, so that the material of the sleeve 10 can be  
75 forced on the one hand against the wall of the bore-hole 1 and on the other hand against the outer surface of the forcing tube 3. By  
turning the handle 14 in the opposite direction the sleeve 10 can be released, so that the  
80 whole device can be withdrawn. The forcing tube 3 may be connected with a flange 15, either directly or by means of suitable parts 16 and 17 as the case may be. The flange 15  
85 may be connected by means of screws with the flange 18 of some other forcing tube 19 leading to a pump or other source of water under pressure.

When the water under a sufficiently high pressure (of say from 25 to 30 atmospheres)  
is introduced through the two forcing tubes  
19 and 3 into the chamber 4, it will penetrate  
90 the faults, cleavages and crevices in the rock or coal-stratum for breaking down or loosening and impregnating the mass before it returns to without through the rock. The  
properly tightened elastic sleeve 10 prevents  
95 the water under pressure from returning from the chamber 4 directly to the remaining part of the bore-hole 1. In this manner the rock can be easily and without danger  
turned into a state which permits its easy  
100 removal without the use of explosives. In the case of a layer of coal it can be not only loosened, but also moistened for preventing the formation of dangerous dust in getting  
the coal.  
105

The device described can be varied without departing from the spirit of my invention.



I claim:

1. In a rock loosening and impregnating device, the combination with a forcing tube adapted to be inserted in a bore-hole, of an elastic sleeve surrounding said forcing tube at its end and loosely fitting the bore-hole, and means for compressing said elastic sleeve over its whole length so as to press its material on the one hand against the inside of the bore-hole and on the other hand against the outer surface of said forcing tube, whereby the tube is thoroughly and carefully packed against the walls of the bore-hole, said tube being adapted to permit the introduction of any quantity of water under pressure into an end portion of the bore-hole for penetrating the faults and crevices in the rock, and said means being adapted to release at will said sleeve for withdrawing the device from the bore-hole.

2. In a rock loosening and impregnating device, the combination with a forcing tube having a flange at one end and adapted to be therewith inserted in a bore-hole, of an elastic sleeve surrounding said forcing tube and adapted to bear against its flange while loosely fitting the bore-hole, an outer tube surrounding said tube and adapted to bear against said sleeve, and means for displacing said outer tube with regard to said tube so as to compress and release said sleeve, said sleeve being adapted to be compressed over its whole length so as to press its material on the one hand against the inside of the bore-hole and on the other hand against the outer surface of said forcing tube, whereby the forcing tube is thoroughly and carefully

packed against the walls of the bore-hole, and said forcing tube being adapted to permit the introduction of any quantity of water under pressure into an end portion of the bore-hole for penetrating the faults, cleavages and crevices in the rock.

3. In a rock loosening and impregnating device, the combination with a forcing tube having a flange at one end and a screw-thread at the other end, it being adapted to be inserted with its flange in a bore-hole and to project therefrom, of an elastic sleeve surrounding said forcing tube and adapted to bear against its flange while loosely fitting the bore-hole, an outer tube surrounding said tube and adapted to bear against said sleeve and to project from the bore-hole, a nut fitting the screw-thread of said tube and adapted to bear against said outer tube, and means for turning said nut so as to compress and release said sleeve, said sleeve being adapted to be compressed over its whole length so as to press its material on the one hand against the inside of the bore-hole and on the other hand against the outer surface of said forcing tube, whereby the forcing tube is thoroughly and carefully packed against the walls of the bore-hole, and said forcing tube being adapted to permit the introduction of any quantity of water under pressure into an end portion of the bore-hole for penetrating the faults and crevices in the rock.

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Witnesses:

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