

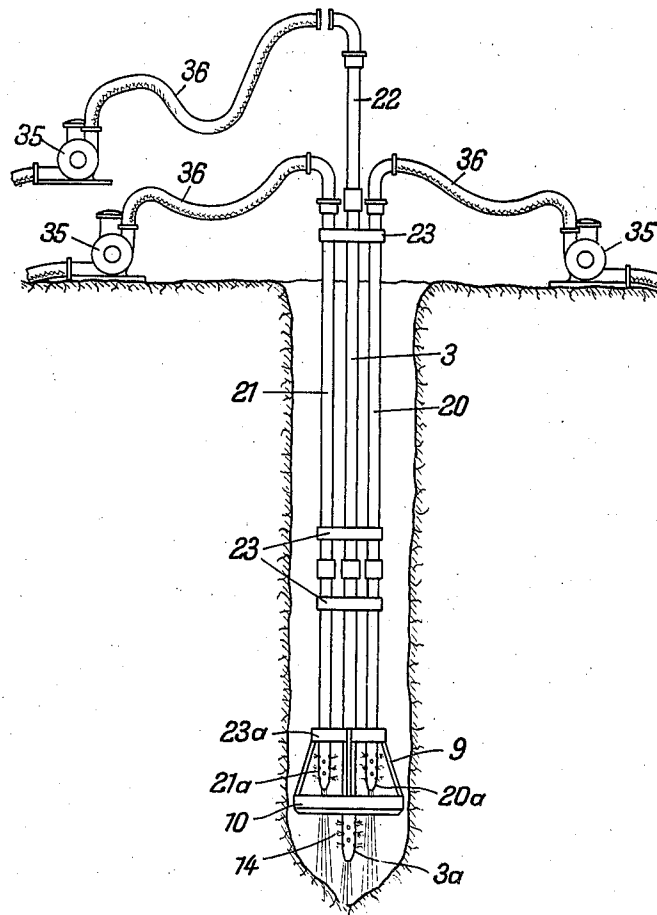
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HYDRAULIC EARTH-BORING APPARATUS

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HYDRAULIC EARTH-BORING APPARATUS

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4 Claims. (Cl. 255-24)

This invention relates to earth boring apparatus, the present application being a division of our copending application now U. S. Patent No. 2,137,261 of Nov. 22, 1938.

In boring holes for flushing-in mines as described in our said copending application, by the use of a combined cutting and flushing bit, when a depth greater than eight meters is reached, it may occur that an interruption of the supply of water to the flushing nozzles will allow the sand to settle and choke the boring hole, rendering it difficult to start the operation again. Where the depth goes beyond one pipe length, requiring the addition of pipe lengths as the hole becomes deeper, an interruption in the supply of flushing water would ordinarily occur each time a new pipe length is inserted.

It is the primary object of the present invention to provide a boring apparatus by which a continual supply of water under pressure can be maintained to keep the soil in the bore hole suspended.

The invention will be described by reference to the accompanying drawing, which shows in somewhat diagrammatic elevation a hydraulic boring apparatus in accordance with the invention.

A main flushing pipe 3 carries at its lower end a nozzle 3a perforated at its end and sides by holes 14. Parallel to the pipe 3 are two auxiliary pipes 20 and 21, the three pipes being united by braces 23. The pipes 20 and 21 carry at their lower ends nozzles 20a and 21a, similar to the nozzle 3a. Upon the lower end of the unit a circular cutting bit 10 is mounted by struts 9 extending down from the lowermost brace 23a, this cutting bit being preferably positioned at the level of the auxiliary nozzles 20a, 21a. Three separate pumps 35, each with a hose 36, are provided for the respective pipes 3, 20 and 21.

In operation the unit comprising the three pipes and cutting edge may be suspended by any suitable means (not shown) by which it can be raised and lowered to give the cutting edge a chopping action. The hoses 36 being connected to the pipes 3, 20 and 21, water is supplied to these pipes by the pumps 35 and sprayed out in jets from the nozzles 3a, 20a and 21a, thus assisting the operation of the cutting edge and

setting up a circulation of water which carries the loosened soil out of the bore hole. When it becomes necessary to add to the pipes, the central pipe 3 is first disconnected from its hose 36, while the supply of water is continued through the pipes 20 and 21. A section of pipe 22 is then connected to pipe 3 and the corresponding hose 36 coupled to the upper end thereof. The pump 35 which supplies the pipe 3 is then started and water flows once more from the main nozzle 3a. Thereupon the auxiliary pipes 20 and 21 can be lengthened simultaneously or successively while the flow of water is maintained through the main pipe 3. Thus, at no time does the loosened soil have an opportunity to settle in the bore hole and there is no danger of the cutting and flushing bit becoming bound.

Having described our invention, we claim:

1. In a device for boring in the earth, a plurality of uncommunicating pipes in sections, means for holding said pipes together as a unit, a flushing nozzle on each pipe, and means for connecting each pipe to a separate water supply.

2. In a device for boring in the earth, a plurality of uncommunicating pipes in sections, means for holding said pipes together as a unit, a flushing nozzle on each pipe, a pump for each pipe, and means for individually connecting each pump to its pipe.

3. In a device for boring in the earth, a plurality of pipes in sections, means for joining said pipes into a unit, a flushing nozzle on each pipe, means for connecting each pipe to a water supply, a circular knife surrounding said pipe unit, and radial struts joining said knife to said pipe unit.

4. In the art of sinking bore holes in the earth with the aid of flushing water, the improvement which consists in supplying the flushing water to the bottom of the bore hole through a plurality of independent pipes each fed from an independent source, and lengthening the pipes one at a time by inserting sections of pipe while stopping the flow of water through each pipe during the time it is being lengthened and continuing the supply of water through the other pipe or pipes, thereby preventing settling of the heavier solids in suspension in the water in the bore hole.

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