E. FRANKIGNOUL.

TUBING FOR BORING.

APPLICATION FILED DEC. 2, 1914.

1,210,160.

Patented Dec. 26, 1916.

Fig 1.

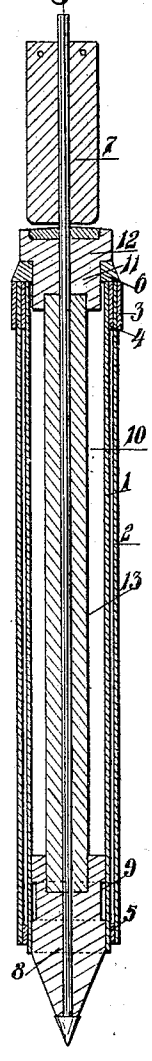


Fig 3.

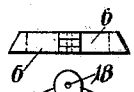


Fig 3a.

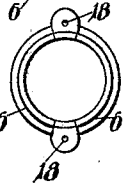


Fig 2.

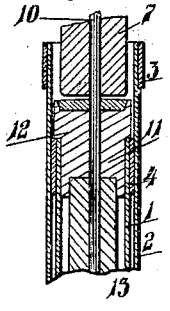


Fig 5.

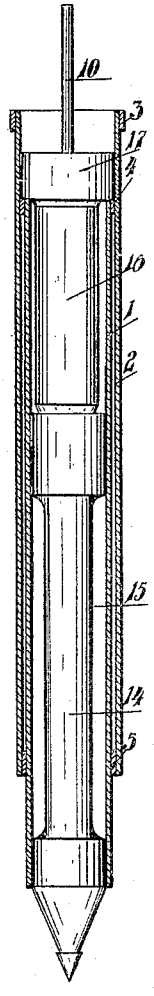
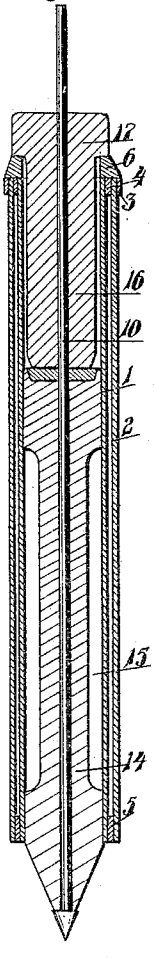


Fig 4.



Witnesses:

J. Langner.

V. Belletti.

Edgard Frankignoul,
Inventor,

by Lawrence Langner.

Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

EDGARD FRANKIGNOUL, OF LIEGE, BELGIUM.

TUBING FOR BORING.

1,210,160. Specification of Letters Patent. Patented Dec. 26, 1916.

Application filed December 2, 1914. Serial No. 875,196.

To all whom it may concern:

Be it known that I, EDGARD FRANKIGNOUL, a subject of the King of Belgium, residing at 196 Rue Gretry, Liege, Belgium, have invented certain new and useful improvements in Tubings for Boring; and I do hereby declare the following to be a full, clear, 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, reference being had to the accompanying drawings, and to letters or figures of reference marked therein, which form a part of this specification.

This invention relates to the boring or sinking of holes in soil, such as is necessary in constructing pile foundations and the like, the chief object being to provide an apparatus which will permit of heavy blows being imparted thereto at the commencement of the operation, and thereby enable the boring or sinking of holes in hard soil to be effected in less time than has heretofore been possible with existing apparatus of this type.

According to this invention, the apparatus comprises a plurality of telescoping tubes which are adapted to be driven into the soil in the collapsed condition and subsequently operated in such a manner that the inner tubes are extended one after the other until the whole series is fully extended. In this manner the exterior tube first assumes a definite position in the soil and subsequently serves to guide the adjacent inner tube during the extension thereof, in completing the sinking or boring of the hole. Each tube will in turn serve as a guide for the adjacent inner tube and in this manner an effective support and guide is afforded for all the sections of tubing during the sinking operation.

The power for operating the apparatus may be derived from a monkey which is adapted to impart its blows in a regulated manner to the sections of tubes comprised in the apparatus so as to obtain the sequence of extensions referred to above. The upper ends of the telescoping tubes may be provided with collars or rings which when the tubes are in the collapsed condition are brought together and adapted to form a seating for a ring which in turn supports an anvil or top piece which receives the blows of the monkey. The initial portion of the sinking operation is effected with the ring and anvil in the aforesaid position and the subsequent portion of the sinking operation is effected by withdrawing the ring and allowing the anvil to rest on the collars carried by the inner sections of tubes. In order to allow of the extension of the inner tubes the external diameter of the anvil is made a working fit in the interior of the outer tube of the apparatus, and in this way it is free to move within the same and effect the extension or displacement of the said inner tubes.

The innermost tube of the apparatus may be provided at its lower end with a boring head or plug and between this latter member and the anvil at the upper end of the apparatus, a suitable rod or distance piece may be arranged. A rod may be provided within the interior of the apparatus so as to extend through the same and serve as a guide for the monkey during its operation. In some cases the boring head at the lower end of the inner tube of the apparatus may be extended in such a manner as to pass up within the interior of the tube into a position that will permit of the same being struck by the hammer simultaneously with the upper edge of the tube.

In order that the said invention may be clearly understood and readily carried into effect, I will now proceed to describe the same more fully with reference to the accompanying drawing in which:—

Figure 1 is a sectional elevation taken through the axis of the apparatus showing the position of the parts during the first period of the sinking operation. Fig. 2 is a partial view of the apparatus in longitudinal section showing the position of the parts during the second period of the operation. Fig. 3 is a side elevation of a ring employed with the apparatus. Fig. 3ª is a plan thereof. Fig. 4 is a sectional elevation of a modified form of the apparatus showing the parts during the first period of the sinking operation. Fig. 5 is a similar view showing the parts during the second period of the operation.

Referring to the arrangement shown in Figs. 1 to 3, the apparatus comprises two telescoping tubes 1 and 2, which are provided at their upper ends with collars or ribs 3 and 4 which when the tubes are in the collapsed condition lie adjacent to each other as shown in the drawing. These collars or ribs form a seating for a ring 6, Fig. 3, which is built up of two elements 6—6′ each provided with lugs having holes 18

into which pegs or pins may be inserted to connect the two elements together. In this manner the rings may be readily detached from the apparatus when desired. On the ring 6 is arranged an anvil or top piece 11 which is provided with an annular enlargement 12 of external diameter somewhat smaller than the internal diameter of the outer tube 2 of the apparatus, so as to make said enlargement a working fit therein.

The lower end of the inner tube 1 is closed by a boring head or plug 8 which is capable of sliding in said tube and provided with a reduced portion 8 similar to the plug disclosed in the specification of my prior Patent No. 1,048,304. A central guiding rod 10 passes through the plug 8 and distance piece 13 in a similar manner to the arrangement shown in the aforesaid prior patent. The rod 10 passes through the anvil 11 at the upper end of the apparatus and is extended beyond the same to serve as a guide for the monkey during its movements.

During the initial period of the sinking operation, the parts of the apparatus are in the position shown in Fig. 1 and the blows of the monkey 7 are imparted to the anvil 11 and in turn through the rings 6 to the collars 3 and 4 carried by the upper ends of the telescoping tubes. It will be observed that the tubes are in their collapsed position and they are driven into the soil in this condition until the outer tube 2 has been sunk into the soil a sufficient distance. When this has been effected the ring 6 is removed so as to allow of the annular enlargement 12 of the anvil to rest on the collar 4 of the inner tube 1. If blows are now imparted to the anvil this member will serve to displace the inner tube with respect to the outer tube 2 and in this manner complete the second period of the sinking or boring operation. As previously mentioned the annular enlargment 12 of the anvil is a working fit in the interior of the outer tube 2 so that the displacement of the anvil therein is readily effected. It will be observed that during the initial period of the sinking operation, the tubes are in their collapsed condition, and consequently are able to withstand harder blows from the monkey than they would be if in the extended condition. When the collapsed tubes have been sunk to the desired depth the outer tube will serve as a guide and support for the inner tube 1 during its subsequent sinking into the soil.

In the arrangement shown in Figs. 4 and 5, the reduced portion 14 of the boring head is extended in such a manner as to bring the upper end of the head into a position to receive the blows of the monkey 16. The latter member is provided at its upper end with an enlargement 17 which is a working fit in the interior of the outer tube 2 of the apparatus. In this manner the monkey is adapted to impart its blows directly to the upper end of the inner tube 1 and at the same time strike the upper end of the boring head 8. In this arrangement the anvil 11 used in the prior arrangement is dispensed with as the blows are directly imparted to the inner tube or tubes by the monkey 16. During the initial period of the sinking operation the ring 6 is employed as previously described and after the initial sinking operation has been effected the ring is removed so as to allow the monkey to pass within the outer tube and impart its blows to the upper end of the inner tube.

It will be understood that the apparatus may comprise any number of concentric tubes and in this case a corresponding number of rings 6 would have to be provided so as to permit of the various sections of tube being sunk one after the other into the soil. If desired, the rings 6 may be connected to the anvil or top piece 11 or to the monkey 17. In this case a number of anvils 11 or monkeys 17 would have to be employed with the apparatus having enlarged bases of sizes corresponding to the respective rings. This arrangement would be extremely useful when the invention is applied to tubing having more than two sections and difficulties would be avoided which would otherwise result from the necessity of withdrawing the rings driven with the tubing into the soil.

What I claim is:

1. Apparatus for boring or sinking holes in soil, comprising in combination, a plurality of telescoping tubes, means for imparting blows to the said tubes, means for distributing the blows to all the tubes so as to sink the same in the collapsed condition into the soil and means for imparting the subsequent blows to the inner tubes so as to extend the same in sequence one after the other until the whole series is fully extended.

2. Apparatus for boring or sinking holes in soil, comprising in combination, a plurality of telescoping tubes, collars secured to the upper ends of said tubes, a detachable ring seating on said collars, an anvil or top piece resting on said ring, and a monkey for imparting blows to the anvil so as to sink the tubes in the collapsed condition into the soil and to subsequently extend the inner tubes one after the other when said ring is removed.

3. Apparatus for boring or sinking holes in soil, comprising in combination, a plurality of telescoping tubes, collars secured to the upper ends of said tubes, a detachable ring seating on said collars when the tubes are in the collapsed condition, an anvil resting on said ring, a monkey for imparting blows to the anvil so as to sink the tubes in the collapsed condition into the soil and to subsequently extend the inner tubes one after the other when said ring is removed,

a boring head inserted in the bottom of the innermost telescoping tube and a rod or distance piece between said boring head and the said anvil.

4. Apparatus for boring or sinking holes in soil, comprising in combination, a plurality of telescoping tubes, collars secured to the upper ends of said tubes, a detachable ring seating on said collars when the tubes are in the collapsed condition, an anvil resting on said ring, an annular enlargement on said anvil having an external diameter equal to the diameter of the ring on the tube adjacent the outer tube of the apparatus, a monkey for imparting blows to the anvil so as to sink the tubes in the collapsed condition into the soil and to subsequently extend the inner tubes one after the other when said detachable ring is removed, a boring head closing the bottom of the innermost telescoping tube, a rod or distance piece between said boring head and the said anvil and a rod passing through the interior of the apparatus for guiding the movements of the monkey.

5. Apparatus for boring or sinking holes in soil, comprising in combination, a plurality of telescoping tubes, collars secured to the upper ends of said tubes, a detachable ring seating on said collars during the initial period of the sinking operation and adapted to be subsequently removed, an anvil resting on said ring, an annular enlargement on said anvil which is a working fit in the interior of the outer tube, a monkey for imparting blows to the anvil and through the latter to the upper ends of the tubes so as to sink the tubes as a collapsed unit into the soil and subsequently extend the inner tubes one after the other until the whole series is fully extended, a boring head closing the bottom of the innermost telescoping tube, a rod or distance piece between said boring head and the said anvil and a rod passing through the interior of the apparatus for guiding the movements of the monkey.

6. Apparatus for boring or sinking holes in soil, comprising in combination, a plurality of telescoping tubes, collars secured to or formed on the upper ends of said tubes, a detachable ring seated on said collars during the initial period of the sinking operation and adapted to be subsequently removed, a monkey for imparting blows to the said detachable ring and through the latter to the upper ends of the tubes so as to sink the same as a collapsed unit into the soil and to subsequently extend the inner tubes one after the other when said detachable ring is removed, a boring head closing the bottom of the innermost telescoping tube, an extension on said boring head which is adapted to receive the blows of the monkey simultaneously with the upper end of the innermost tube, and a rod passing through the interior of the apparatus for guiding the movements of the monkey.

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

EDGARD FRANKIGNOUL.

Witnesses:

A. FOURDAIN,

GEORGES VANDERHAYDEN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."