

C. CAHN & E. SEEBERGER.
METHOD OF LAYING CONDUITS.
APPLICATION FILED DEC. 17, 1909.

973,752.

Patented Oct. 25, 1910.

Fig. 1.

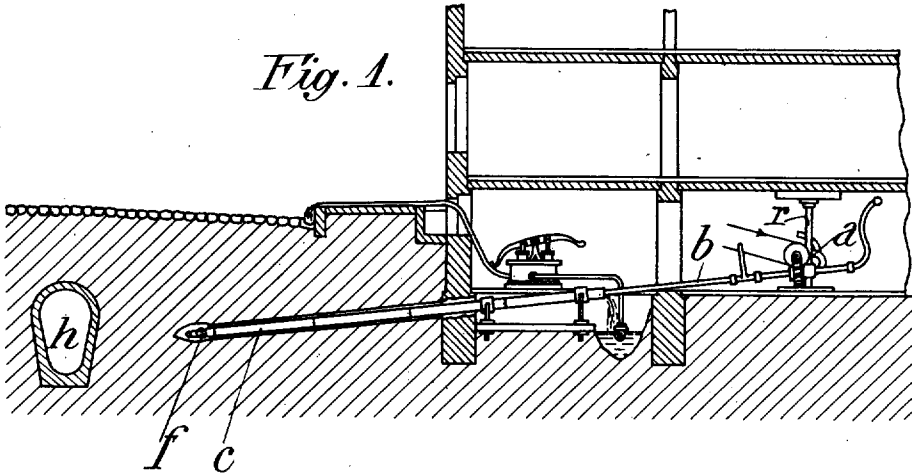


Fig. 2.

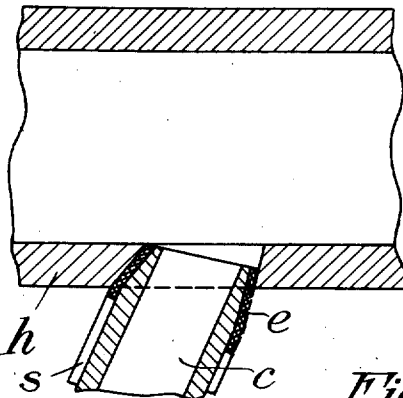
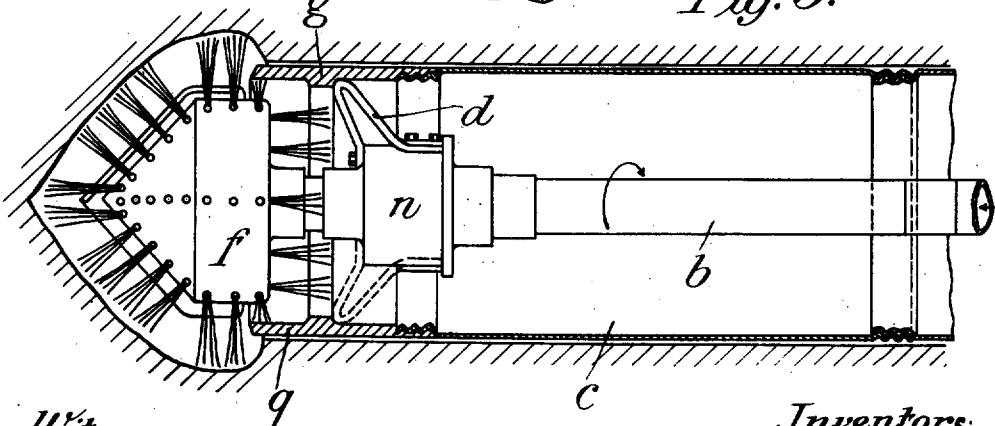


Fig. 3.



Witnesses:
R. L. Peterson
Clara French

Inventors:
Carl Cahn
Eugen Seiberger
by *Attorney.*

UNITED STATES PATENT OFFICE.

CARL CAHN AND EUGEN SEEBERGER, OF AACHEN, GERMANY.

METHOD OF LAYING CONDUITS.

973,752.

Specification of Letters Patent.

Patented Oct. 25, 1910.

Original application filed April 20, 1909, Serial No. 491,153. Divided and this application filed December 17, 1909. Serial No. 533,718.

To all whom it may concern:

Be it known that we, CARL CAHN and EUGEN SEEBERGER, subjects of the German Emperor, and residing at Aachen, Germany, have invented certain new and useful Improvements in the Method of Laying Conduits, of which the following is a specification.

This invention relates to an improved method of laying conduits.

In laying conduits according to the ordinary methods in use, more especially in laying conduits for drainage purposes, for gas and water supply, cable conduits, and the like, it has been a great drawback that for those purposes it has been necessary to open the ground to a greater or less extent. Especially in laying and connecting branch conduits and at least at the junction of the branch conduit with the main conduit, it has been necessary to open the ground in order to bring the branch pipe up to the main conduit and make the joint between the two conduits.

The present improvements have now for object to remedy this drawback by enabling such conduits to be laid wholly underground, and also enabling a branch conduit to be connected to an existing conduit without having to open the ground for this purpose.

The improved method is illustrated in the accompanying drawings.

Figure 1 is a vertical longitudinal section showing the apparatus for laying and connecting a branch conduit to a main conduit. Fig. 2 illustrates the manner of making the joint at the junction of two conduits. Fig. 3 illustrates on a larger scale the arrangement of the retractable boring tool in the foremost tube section.

a, is the boring machine located in the basement of the house which is to be connected by means of a conduit tube *c* to the main conduit *h*; it is mounted on two supporting pillars *r*, so that it can be set at any desired height and adjusted for any desired direction of boring. The supporting pillars serve for the fixing of the machine between the basement floor and the ceiling. The machine is driven by hand or by power in any suitable manner.

b, is a tubular boring rod which serves to transmit rotary motion from the machine to the boring tool *f*. While boring the boring

tool *f*, carries the conduit tube *c* forward with it but without communicating rotary motion to said tube. This is effected by the arrangement of a ball bearing between the boring tool *f*, and the boring rod *b*. The casing *n* of the ball bearing is provided with projections or dogs *d* which bear against the collar *g* of the tube shoe *q*, as the boring rod *b* advances, and through the medium of this tube shoe carry the tube section *c* that is screwed to it along with them.

The machine is provided with a means for guiding the boring tool and the tube.

The soil dug away by the boring tool *f* is conveyed away by a water jet, worm conveyor, compressed air, or other means. The water flows through the boring rod *b* to the boring tool *f* and returns through the tube *c* being laid. Holes to suit the nature of the ground are provided in a suitable manner in the boring tool *f* for the exit of the water (Fig. 3); this facilitates considerably the work of boring through the ground.

When the length of the conduit tubing required to meet the main conduit *h* has been completed by screwing or bolting together the necessary separate tube sections that is to say, when the boring tool *f* has reached the wall of the main conduit *h* the tool is withdrawn.

Any suitable boring tool, such as an enlarging drill, undercutting drill, etc., may be used. A boring tool may also be used which is smaller in diameter than the inside diameter of the tube to be laid. By this means it is possible to withdraw the boring tool from the work at any time for the purpose of changing it for the new tool when required.

In the drawing the boring tool *f* is shown as a pointed drill from holes in which the flushing water issues in jets during the boring process for the purpose of widening the bore hole to the diameter of the tube shoe.

By reason of the fact that the boring tool can be withdrawn and changed at any time, it is possible to use at all times a boring tool suited to the soil to be excavated, whether it be a flushing, enlarging, undercutting or diamond crown drill, or the like. The small thickness of the soil between the boring tool and the outside of the tube being laid is removed by the water issuing from the holes in the tool.

A joint is made when required in the fol-

lowing manner:—An outer tube *s* of sufficiently large diameter to accommodate the tube *c* is first carried up to the main conduit *h* in the manner above described. Then the boring tool employed for inserting the outer tube *s* is withdrawn, and a suitable conical drill is inserted and by its means a conical hole is drilled through the wall of the main conduit *h*. This conical drill is then withdrawn. Then the foremost section of the tube *c* to be joined to the main conduit, having been formed with a conical front end on which a jointing material *e* such as red lead, has been placed, is inserted in the outer tube *s* and pushed forward until the said front end has entered the conical hole previously formed in the wall of the main conduit *h* by the conical drill. The engagement of the conical front end of the inner tube *c* in the said conical hole, forms with the aid of the jointing material *e*, a tight joint at the junction of the tubes *c* with the main conduit *h*.

In laying drains and the like the machine is located in the pits which are to be used subsequently for constructing the various cesspools or manholes. In laying cable conduits the working pit will serve for building the inspection boxes. Existing cable boxes

may be utilized for working the machine therefrom.

Having now described and ascertained our said invention what we claim as new and desire to secure by Letters Patent is:—

The improved method of laying a branch conduit underground to join a main conduit without opening the ground for the purpose, which consists in boring a passage through the ground for the branch conduit tube, carrying an outer conduit tube along with the boring tool, boring an approximately conical hole through the wall of the main conduit, applying jointing material to the conical front end of an inner conduit tube, and inserting said inner conduit tube through said outer conduit tube until the conical front end of the inner conduit tube, provided with jointing material, has entered and become jointed in the conical hole in the wall of the main conduit, as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

CARL CAHN.
EUGEN SEEBERGER.

Witnesses:

HENRY QUADFLIEG,
ELISE KALBUSCH.