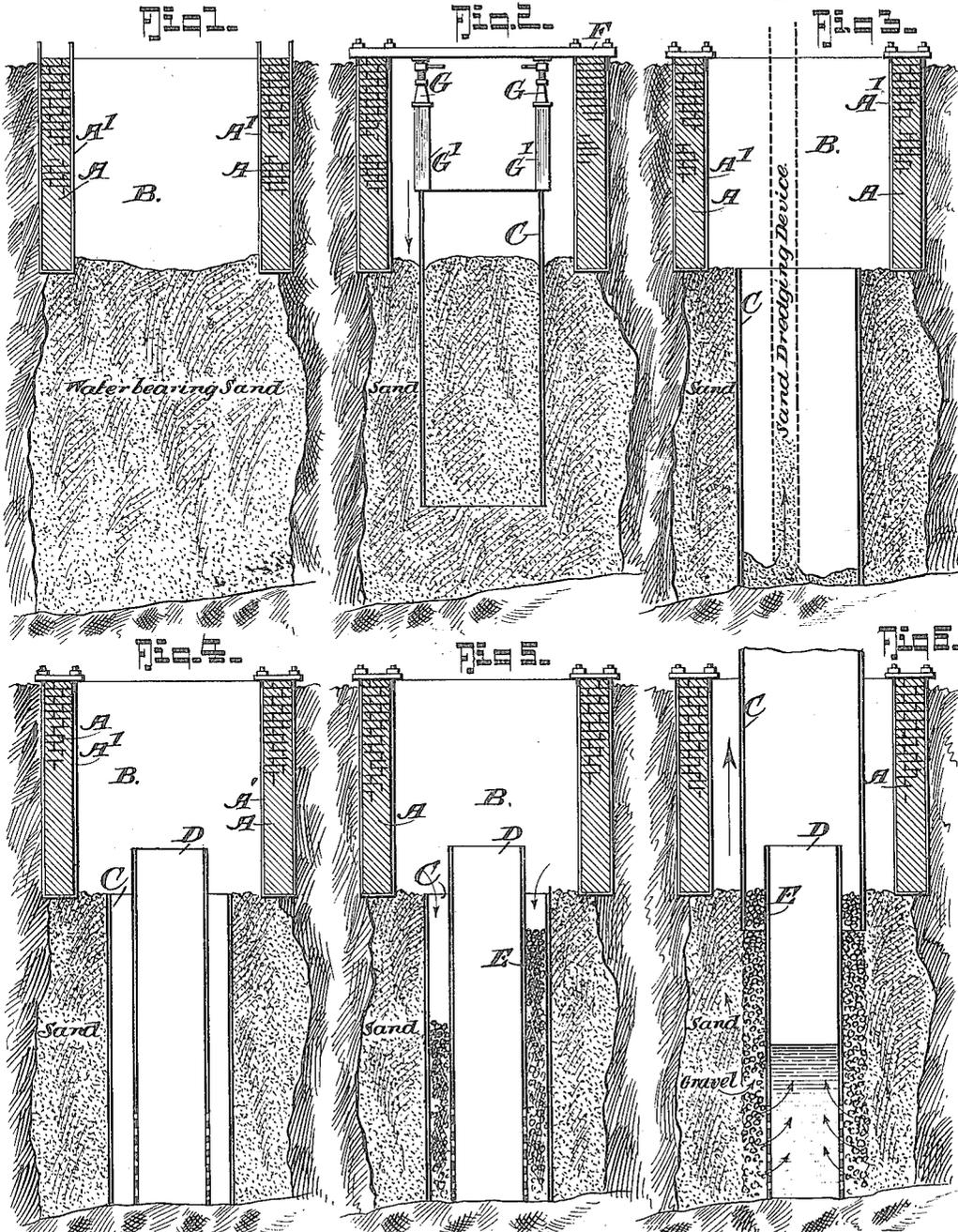


L. A. NITSCHÉ.
 WATER SUPPLY SYSTEM.
 APPLICATION FILED MAY 11, 1915.

1,161,512.

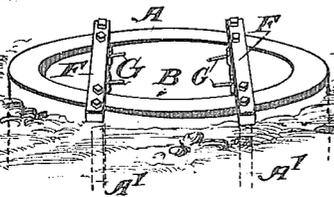
Patented Nov. 23, 1915.

2 SHEETS—SHEET 1.



WITNESSES:

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INVENTOR

Louis A. Nitsche.
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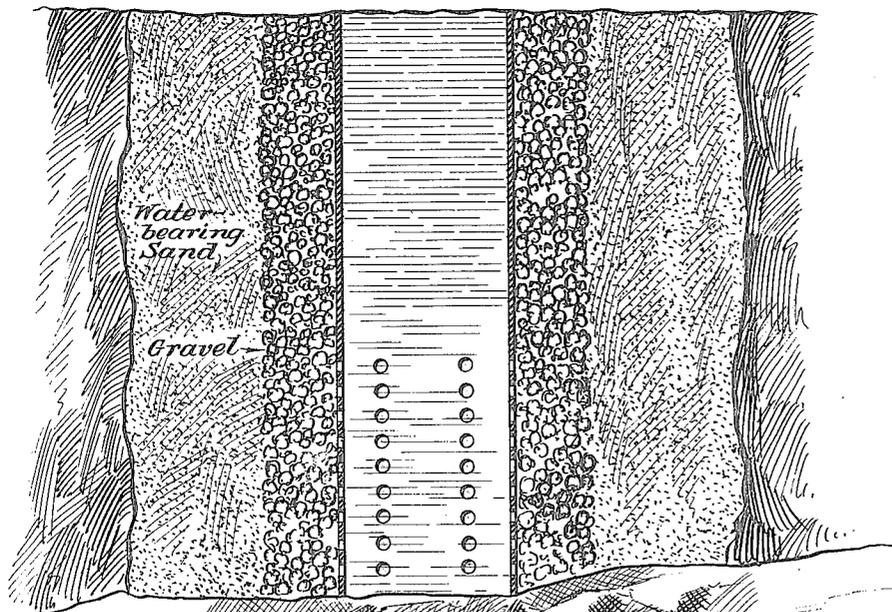
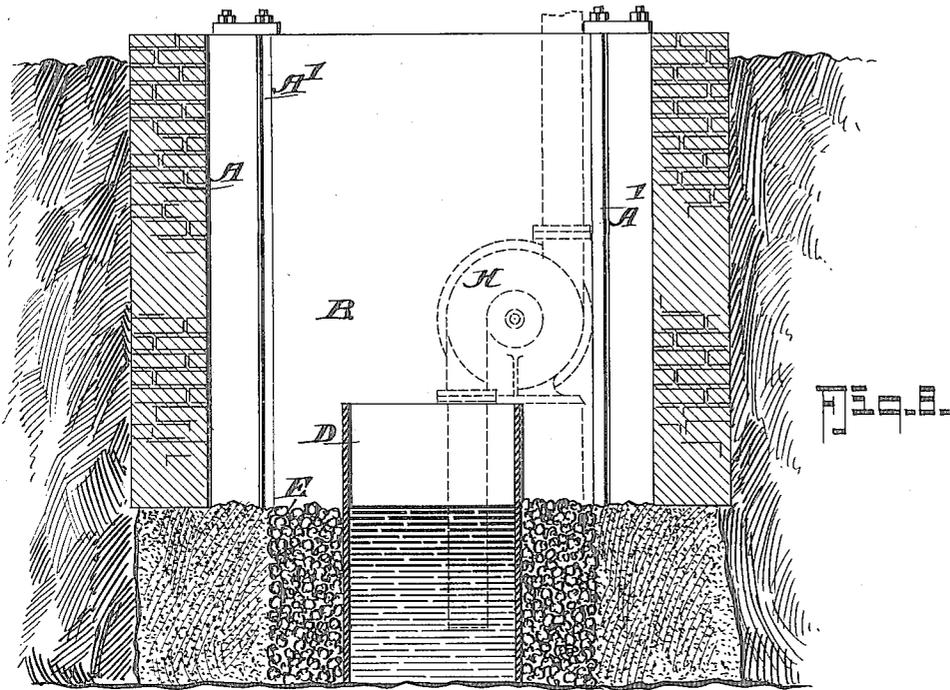
ATTORNEYS

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WATER-SUPPLY SYSTEM.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LOUIS A. NITSCHÉ, a citizen of the United States, and a resident of Tulsa, in the county of Tulsa and State of Oklahoma, have invented certain new and useful Improvements in Water-Supply Systems, of which the following is a specification.

My present invention relates generally to methods and means for constructing water supply wells, and more particularly to the construction of wells of a stable permanent nature in shifting soils such as quicksand, my primary object being to provide for the formation of such wells without the necessity for the use of pile drivers and other expensive and cumbersome apparatus, such as is now necessary for this purpose. Briefly referring to the development of such method and means at the present time, the coffer members in which the perforated well casings are set and surrounded by gravel before withdrawal of such members, are invariably of sheet piling, necessitating the use of pile drivers to sink the piles into desired position, and other expensive apparatus to effect their withdrawal.

In accordance with my invention, a single piece coffer tube, as distinguished from a piling construction, is lowered under pressure of, and may be withdrawn by, means which form part of this invention and find their support upon an anchor wall sunk around a pit at the upper end of the well casing and coffer tube, and a suitable distance below the surface of the soil, preferably to the water level.

The various steps of the method proposed by my invention, and the means employed in carrying out these steps, are clearly shown in the accompanying drawings, forming a part of this specification, and will be better understood from the following description in which reference is made to the drawings wherein—

Figure 1 is a central vertical section illustrating the completed first step, namely, the finished anchor wall sunk to water level. Fig. 2 is a similar view illustrating the second step, namely, the sinking of the coffer tube by pressure means finding their support upon the anchor wall. Fig. 3 is another similar view illustrating the third step of removing the sand from within the coffer tube. Fig. 4 is an other similar view illustrating the next step of setting the perforated well

casing in position within the coffer tube. Fig. 5 is another similar view illustrating the next step of filling, with gravel, the space between the well casing and coffer tube. Fig. 6 is still another similar view illustrating the last step of withdrawing the coffer tube. Fig. 7 is a detail perspective view showing the upper end of the anchor wall with the cross bars secured to its anchor bolt, and Fig. 8 is an enlarged central vertical section illustrating the completed well.

It is usual as above stated, to sink a coffer member consisting of sheet piling, from the surface of the ground, the piles being driven in by the use of a pile driver, withdrawing the sand from the coffer tube so formed, and setting the well casing within the space enclosed by the coffer member to provide for the reception of gravel around the well casing before the coffer tube is removed.

Referring to these figures, however, it will be seen that in order to do away with the necessity of expensive apparatus utilized both in sinking and withdrawing the sheet piling tube, I sink a brick wall indicated at A in the surface of the soil, and of circular form surrounding a selected spot, this wall extending some distance below the surface of the soil as clearly seen in the several figures, and being preferably extended downwardly to the water line or level. The wall A thus formed, constitutes a permanent support for the operating means to be hereinafter described for both sinking and removing the coffer tube, the latter being in this case in the form of a single piece tube as distinguished from a tube formed of sheet piling. In length, of course, this coffer tube may be in any desired number of sections. This coffer tube is indicated at C in the several figures, and after disposition in place as shown in Fig. 3, provides for the reception of the well casing D, in the usual manner as shown in Figs. 4, 5, and 6 to enable the filling of gravel as indicated at E in Figs. 5 and 6 to be placed around the well casing before the coffer tube is removed, and thus effectively prevent the sand from getting into the well casing itself.

Referring now to Fig. 1, it will be seen that the wall A as erected and disposed in the desired position above described, is provided with a series of U-shaped anchor bolts A', the free upper extensions of which are adapted to receive and rigidly secure upon

the upper portion of the wall, the transverse supporting or cross bars F adapted for engagement by jack screws or other similar pressure means, as shown in Fig. 2, at G, for lowering the coffer tube C into the position shown in Fig. 3.

Referring now more specifically to the method by which the well is formed, it will be seen that the first step as shown in Fig. 1, consists in the erection and sinking of the wall A, with its anchor bolts A', into place.

The next step as illustrated in Fig. 2, is the sinking of the coffer tube C from the water level at the base of the pit B formed by the wall A, through the coöperation of the pressure means G finding their ultimate support in the anchor wall A, and operating directly upon the coffer tube or through the use of cribbing G'.

It is to be observed, during the two operations, that of sinking the wall A and the next step of sinking the coffer tube C, all danger of shifting of the sand is obviated, and the desired result accomplished without disturbing the natural formation of the surrounding soil.

The third step as illustrated in Fig. 3, namely the withdrawal of the sand from within the coffer tube C, is in reality a part of the step of taking the coffer into position, inasmuch as the sand must be removed from the coffer tube as the same is lowered, although following at sufficient distance above the lower end of the coffer tube to obviate all danger of sucking up surrounding sand and disturbing its natural formation.

The step illustrated in Fig. 4, that of setting the well casing D within the coffer tube C, the perforated lower end of which well casing is constructed as usual and indicated at D', will be well understood as providing for the reception of the gravel E in the space between the well casing D and the coffer tube C in the next step as illustrated in Fig. 5, which shows the filling in course of disposition.

The last step as indicated in Fig. 6, is thus the withdrawal of the coffer tube C, which may be effected by the same pressure means, similarly finding their support in the anchor wall A, as illustrated in Fig. 2, for the sinking of the coffer tube in place.

My improved method, and the means utilized to carry out the same, will thus be seen to entirely obviate the necessity of all expensive machinery of the nature now required for this work, to enable a considerable saving in time and expense of forma-

tion of the well, through these means, and to provide for the sinking of a one-piece coffer tube as distinguished from a coffer tube formed of sheet piling, of such dimensions as would be impossible to sink by the use of a pile driver such as now employed for this purpose.

In Fig. 8 the complete well, formed in accordance with my improved method and through the use of the means specified, is shown, a pump H being indicated in dotted lines in the position in which the same will be disposed, that is, within the pit B, for the purpose of withdrawing the water from the well casing D.

I claim:—

1. The method of well formation herein described, which consists in sinking an anchor wall a suitable distance below the surface and around the selected point, sinking a coffer either partly or wholly through the coöperation of said anchor wall, removing the sand from the coffer tube, setting a well casing in spaced relation within the sunken coffer tube, filling the space between the casing and the tube by a porous sand excluding material, and removing the coffer tube.

2. The method of well formation herein described which consists in sinking an anchor wall to water level, sinking a coffer tube from within the wall and downwardly from the water level, removing the sand from the coffer tube, setting a well casing in spaced relation within the sunken tube, filling the space between the casing and tube by a porous sand excluding material, and removing the coffer tube.

3. In a well, spaced inner and outer tubes, the latter of which forms a removable coffer dam and the former of which constitutes the well casing, and an anchor wall surrounding the upper end of said tube and forming a support by means of which the outer tube may be initially positioned.

4. In a well, spaced inner and outer tubes, the latter of which forms a removable coffer dam and the former of which constitutes the well casing, an anchor wall surrounding the upper end of said tube and extending downwardly from the surface of the soil, and pressure means supported by the said anchor wall for initially sinking the outer tube in the sand, substantially as described.

LOUIS A. NITSCHÉ.

Witnesses:

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 SOLON C. KEMON.