

No. 767,443.

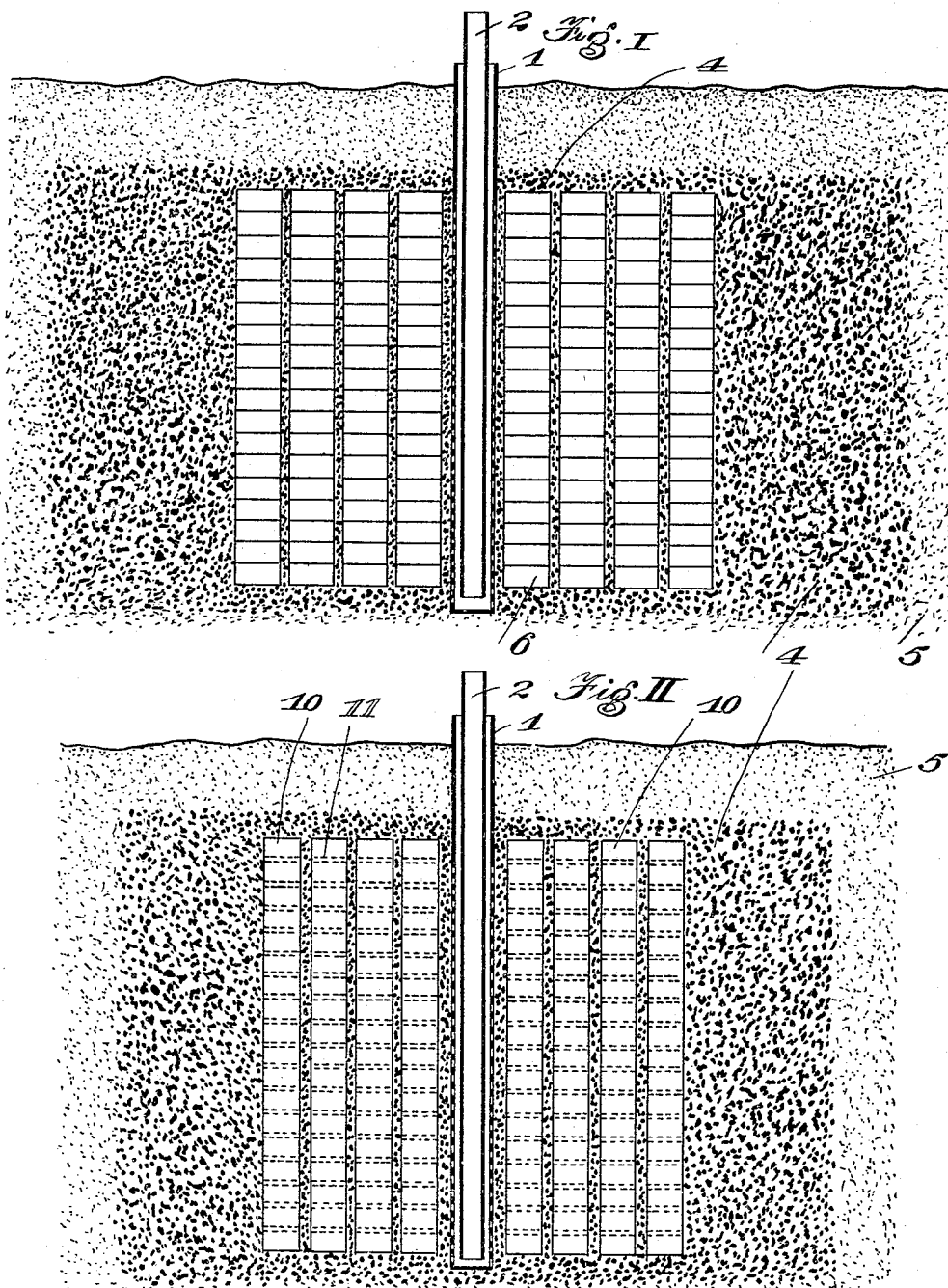
PATENTED AUG. 16, 1904.

M. D. ROCHFORD.
WELL.

APPLICATION FILED AUG. 4, 1902. RENEWED JULY 5, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
Edmund A. Strause.

G. T. Hackley

Inventor
Mark D. Rochford.

by Townsend Bros.
his attys.

No. 767,443.

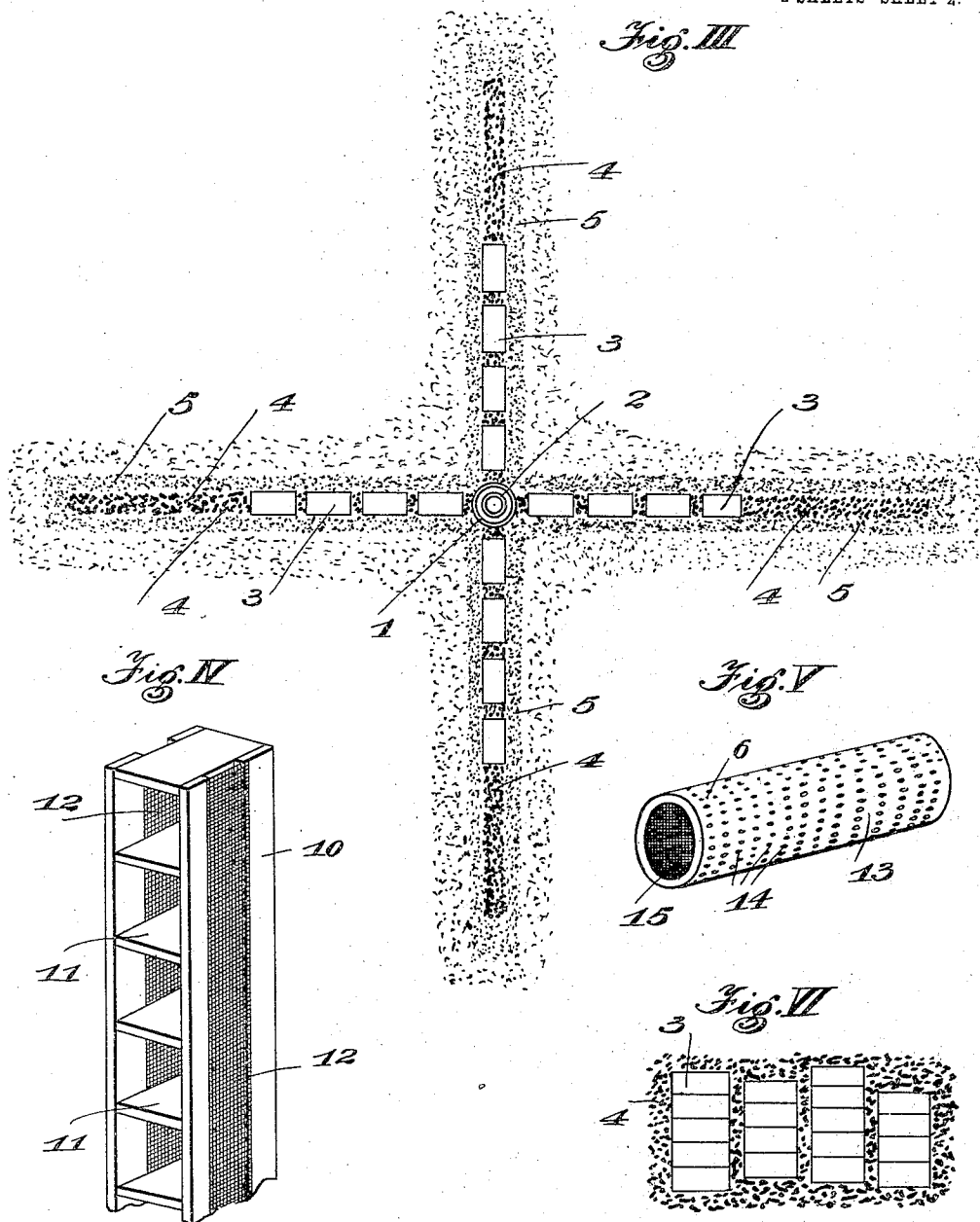
PATENTED AUG. 16, 1904.

M. D. ROCHFORD.
WELL.

APPLICATION FILED AUG. 4, 1902. RENEWED JULY 5, 1904.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses
Edmund A. Strauss.
G. T. Hackley

Inventor
Mark D. Rochford
by Townsend Bros.
his atty

UNITED STATES PATENT OFFICE.

MARK D. ROCHFORD, OF LOS ANGELES, CALIFORNIA.

WELL.

SPECIFICATION forming part of Letters Patent No. 767,443, dated August 16, 1904.

Application filed August 4, 1902. Renewed July 5, 1904. Serial No. 215,397. (No model.)

To all whom it may concern:

Be it known that I, MARK D. ROCHFORD, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Well Which is Particularly Adapted for Collecting Water or other Fluids from Sandy Soils, of which the following is a specification.

One object of the invention is to provide a large percolating area, so that a sufficient supply of water may be obtained.

Another object is to provide a well which is adapted to collect water from sandy soils and which is of economical construction.

Another object is to provide a well to which water easily flows and from which water may be pumped with the least expenditure of power.

Referring to the drawings, Figure I is a vertical section taken through the earth, showing the well in elevation and partly in section. Fig. II is a view similar to Fig. I, showing modified forms of conduits. Fig. III is a horizontal section taken through the earth. Fig. IV is a perspective showing one construction of conduits. Fig. V is a detail of a tile. Fig. VI is a view showing a modified form of construction.

The well comprises a perforated casing which extends into the earth a suitable distance and which is surrounded by a series of diverging channels, which channels are filled with percolating material, such as gravel, or with conduits or tiles or with gravel and tiles.

Referring to Fig. I, 1 designates a tubular perforated foraminous casing, which may be of the usual construction.

2 designates the ordinary suction-pipe in position in the perforated casing. The suction-pipe may be placed in position when the well is ready for use.

A series of channels (indicated by 3) diverge from the perforated casing, and as many of these channels may be employed as desired. In the drawings I have shown four channels. These channels may be of any desired length and depth. I place in these channels a suitable percolating media—such, for instance, as gravel 4—to form a central core or vertical

strata, and on each side of this central core I preferably place linings or beds of relatively finer gravel 5, which prevent the sand in the adjacent water-bearing strata from mixing with the gravel in the center of the channel. The water soaks in from the sand surrounding the channels through the fine outer gravel and into the coarser central portion of gravel, and the coarse gravel in the center forms a drain or percolating media which carries the water to the perforated casing in the center of the well, from which it may be pumped by the suction-pipe 2.

In order to facilitate the collection of water, I preferably provide near the perforated casing a series of rows of conduits 6, which are placed in the center of the channels and surrounded by the finer gravel. These conduits collect the water from the surrounding gravel and convey it to the perforated casing.

The conduits may be of any desired form. In Fig. IV, I have shown one convenient method of constructing the conduits of wood, in which side walls 10 support dividing-walls 11, the space between each dividing-wall forming a conduit. A screen 12 may cover the opening between the side walls to prevent the gravel from sifting into the conduit and filling up the same.

In Fig. V is shown a conduit in the form of a tile 13, which is provided with perforations 14. The ends of the tile may be covered with screens, as 15, to prevent the gravel from sifting into the tile and filling up the same. The perforations in the tile may be small and answer substantially the same purpose as the screens 15 over the conduits illustrated in Fig. IV, and water percolates from the surrounding gravel through the holes in the tile or through the screen shown in Fig. IV, as the case may be.

Fig. VI is a vertical section showing another manner of arranging the tiles in which the tiles do not lie in perfect horizontal alignment, but are staggered. This arrangement of tiles may give as good results as where the tiles or conduits are laid with great precision.

In Fig. I the tile form of conduit is shown, while in Fig. II the box-like form of conduit

is shown. The conduits illustrated in Fig. IV may be very cheaply constructed and may be placed in position with great facility. I do not limit myself to the employment of either form of conduit, as in some localities or under certain conditions it may be desirable to use one form, and under other circumstances the other form of conduit would be preferable.

It should also be understood that great precision of arrangement is not necessary, and the spaces between the pipes might vary in degree and might occur at other intervals than as shown. The lengths of the pipes might also vary from that shown without modifying the efficiency of the well.

The water flows easily through the conduits and with much less friction than through the sand and keeps the perforated casing constantly supplied, and the great percolating area secured by the diverging channels filled with the conduits and surrounding gravel causes an effective drainage of the surrounding water-bearing strata.

If desired, the vertical rows of conduits might be in blocks consisting of several vertical rows separated by strata of sand or earth, as in cases where a stratum of hard-pan, for instance, occurs. The lateral pipes or conduits or gravel need not be placed in that strata, but may be placed above and below the strata. It is evident that the center perforated casing should extend through the strata of hard-pan in order to convey the water from the lower conduits.

From the foregoing it will be seen that the character of the earth in which the well is placed will largely determine the condition under which parts of the well may best be arranged to secure the desired result with a minimum amount of material and labor expended.

It should be understood that this well is adapted for collecting oil or other fluids in the earth, as well as water.

It is evident that many variations in the proportions and arrangements and materials used may be made without departing from the spirit of my invention.

Having described my invention, what I claim, and desire to secure by Letters Patent of the United States, is--

1. A well comprising a perforated casing which extends into the earth, the earth adjacent the well having a channel extending laterally from the casing, a body of percolating material in the channel, and conduits separate from the casing and lying in the channel.

2. A well comprising a perforated casing which extends into the earth, conduits extending laterally from the casing but separate therefrom, and percolating material around the conduits and casing.

3. A well comprising a perforated casing

which extends into the earth, conduits extending laterally from the casing, the conduits having their ends spaced apart, and percolating material around the conduits and casing.

4. A well comprising a perforated casing which extends into the earth, conduits extending laterally from the casing but separate therefrom, screens over the ends of the conduits, and percolating material around the conduits and casing.

5. A well comprising a perforated casing which extends into the earth, perforated conduits extending laterally from the casing but separate therefrom, and percolating material around the conduits and casing.

6. A well comprising a perforated casing which extends into the earth, perforated conduits extending laterally from the casing, the conduits having their ends spaced apart and percolating material around the conduits and casing.

7. A well comprising a perforated casing which extends into the earth, perforated conduits extending laterally from the casing but separate therefrom, screens over the ends of the conduits, and percolating material around the conduits and casing.

8. A well comprising a perforated casing which extends into the earth and rows of conduits separate from the casing and which diverge from the perforated casing.

9. A well comprising a perforated casing which extends into the earth, a set of separate rows of conduits which extend laterally from the casing in substantially one vertical plane, and another set of separate rows of conduits which extend laterally from the casing and lie substantially in another vertical plane.

10. A well comprising a perforated casing which extends into the earth, a set of rows of conduits which extend laterally from the casing in substantially one vertical plane, another set of rows of conduits which extend laterally from the casing and lie substantially in another vertical plane, and percolating material around the conduits and extending beyond the ends of the rows of the conduits.

11. A well comprising a perforated casing which extends into the earth, bodies of coarse gravel diverging from the casing and bodies of finer gravel contiguous the bodies of coarse gravel.

12. A well comprising a perforated casing which extends into the earth, conduits extending laterally from the casing and detached therefrom, and gravel around the conduits and casing.

13. A well comprising a perforated casing which extends into the earth, conduits separate from the casing and extending laterally from the casing, screens over the ends of the conduits, and gravel around the conduits and casing.

14. A well comprising a perforated casing which extends into the earth, perforated conduits separate from the casing and extending laterally from the casing, and gravel around the conduits and casing.

15. A well comprising a perforated casing which extends into the earth, perforated conduits extending laterally from the casing, screens over the ends of the conduits, and gravel around the conduits and casing.

16. A well comprising a perforated casing which extends into the earth, a set of rows of conduits which extend laterally from the casing in substantially one vertical plane, another set of rows of conduits which extend laterally from the casing and gravel around the conduits and extending beyond the ends of the rows of the conduits, said conduits being separate from the casing.

17. A well comprising a suction-pipe which extends into the earth, a perforated casing around the suction-pipe, and a series of contiguous pipes in the earth extending laterally from the suction-pipe, the pipes being arranged with gaps between their adjacent ends.

18. A well comprising a perforated suction-pipe which extends vertically into the earth, a perforated casing around the suction-pipe, and a plurality of pipes in the earth extending laterally in various directions from the casing, the pipes being arranged with gaps between their adjacent ends.

19. A well comprising a suction-pipe which extends into the earth, a perforated casing around the suction-pipe, a series of pipes in the earth extending laterally from the suction-pipe in one direction, and another series of pipes in the earth extending laterally from the suction-pipe in another direction, said pipes being arranged with their contiguous ends spaced apart.

20. A well comprising a suction-pipe which extends vertically into the earth, a perforated casing around the suction-pipe, and a plurality of pipes in the earth extending laterally in various directions from the suction-pipe; said pipes being arranged with their contiguous ends spaced apart.

21. A well comprising a suction-pipe which extends into the earth, a perforated casing around the suction-pipe, and a vertical row of parallel pipes in the earth extending laterally from the suction-pipe, the ends of the parallel pipes which are contiguous the suction-pipe being spaced a short distance from the suction-pipe.

22. A well comprising a suction-pipe which extends into the earth, a perforated casing around the suction-pipe, and a vertical row of parallel pipes in the earth extending laterally from the suction-pipe, the pipes being in close relation to each other and having their ends which are near the suction-pipe spaced slightly apart from the suction-pipe.

23. A well comprising a suction-pipe which extends into the earth, a perforated casing around the suction-pipe, and a plurality of vertical rows of parallel pipes the rows extending laterally from the suction-pipe in various directions, the ends of the parallel pipes which are contiguous the suction-pipe being spaced a short distance from the suction-pipe.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, at Los Angeles, in the county of Los Angeles and State of California, this 30th day of July, 1902.

MARK D. ROCHFORD.

Witnesses:

G. T. HACKLEY,
JAMES R. TOWNSEND.