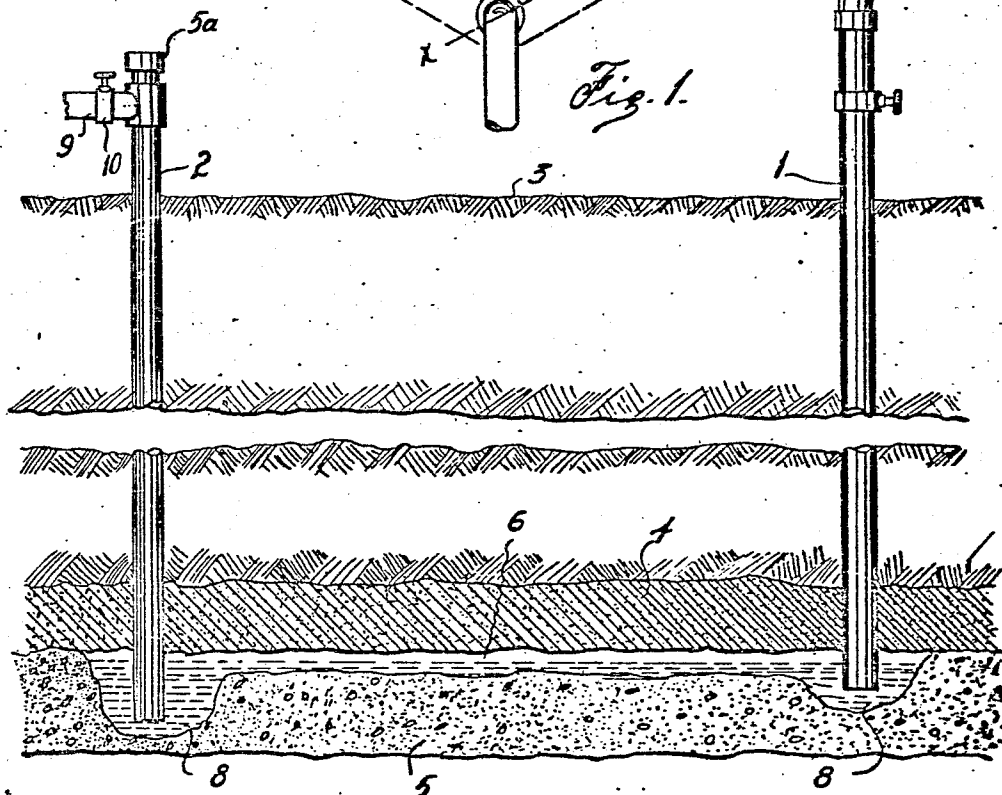
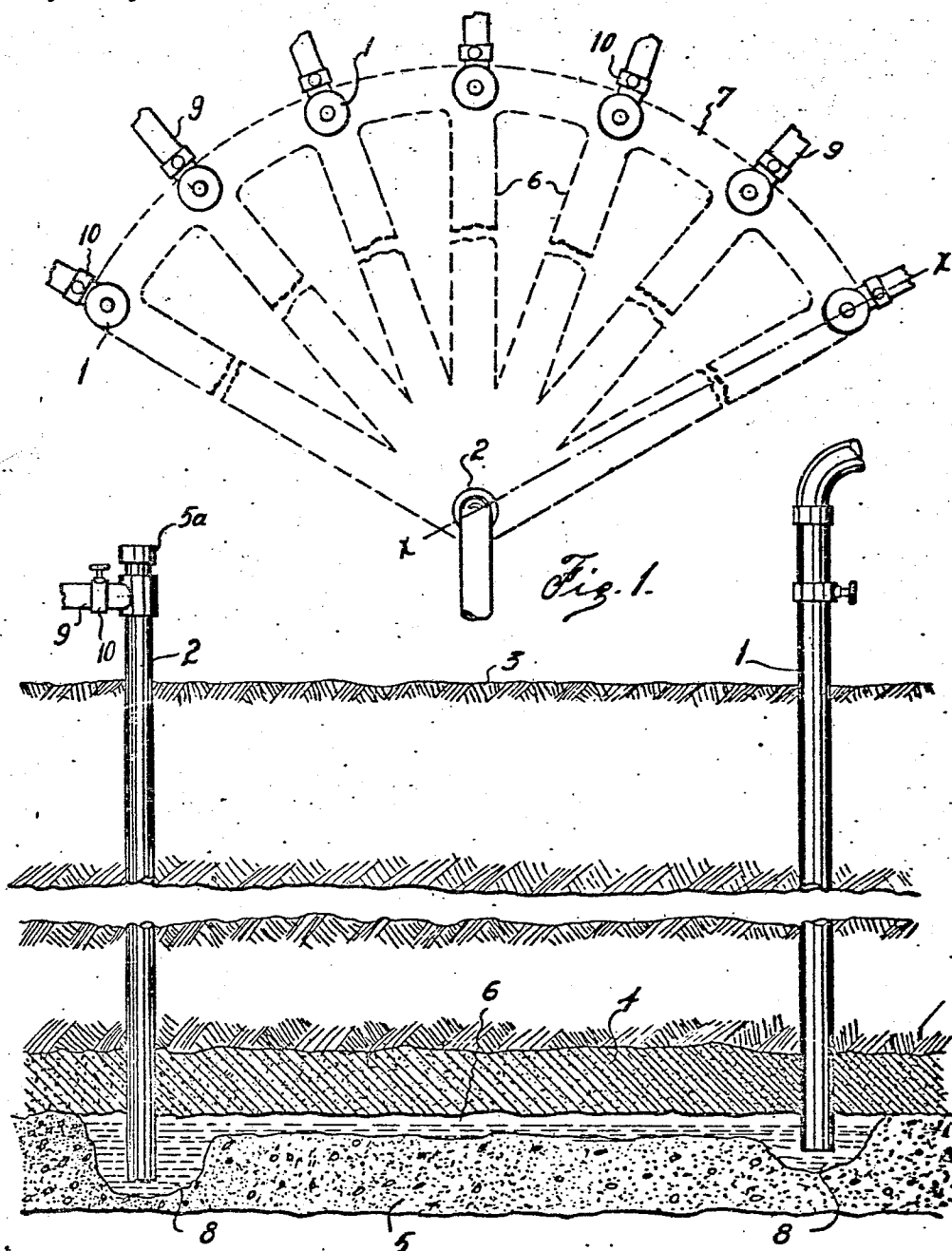


F. O. BROWN.
METHOD OF RAISING FLUIDS FROM ARTESIAN WELLS.
APPLICATION FILED MAY 6, 1913.

1,093,031.

Patented Apr. 14, 1914.



WITNESSES:

J. C. Lattin
J. L. Mathin

Fig. 2.

INVENTOR

Frank O. Brown

BY

John M. Spilman
ATTORNEY

UNITED STATES PATENT OFFICE.

FRANK O. BROWN, OF DALLAS, TEXAS.

METHOD OF RAISING FLUIDS FROM ARTESIAN WELLS.

1,093,031.

Specification of Letters Patent.

Patented Apr. 14, 1914.

Application filed May 6, 1913. Serial No. 796,751.

To all whom it may concern:

Be it known that I, FRANK O. BROWN, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Methods of Raising Fluids from Artesian Wells, of which the following is a specification.

My invention relates to a new and useful method for raising fluids from Artesian wells, and the object of my invention is to provide a practical and efficient method for utilizing compressed air to force Artesian water or oil from bored wells.

It is well known that all fluids, at various depths in the earth, are under a hydrostatic pressure varying at different points according to the elevation of the source of fluid supply above said points, said pressure being further regulated by the friction set up by the medium through which the fluid flows.

The construction employed in putting my method into operation, is more particularly set forth hereinafter, and is illustrated in the accompanying drawing, wherein:

Figure 1 is a plan view of a series of wells connected at their bottoms by channels shown in dash line. Fig. 2 is a sectional elevation, the section being taken upon the line $x-x$ of Fig. 1.

Like reference characters are employed to designate similar parts in both figures of the drawing.

The numeral 1 denotes a series of bored wells arranged in the arc of a circle and 2 denotes another bored well situated at the center of said arc. The wells 1 and 2 are extended through the surface soil 3 and through the cap rock 4 into the bottom portion of the fluid bearing strata 5 usually consisting of sand or gravel. The projecting upper extremities of the well forming pipes are capped as indicated at 5*, this being a preliminary step in carrying out my method.

The center well 2 is now connected up through a powerful force pump with a water or other fluid supply. One of the wells 1 is now uncapped, and is connected with a pipe to conduct a fluid to be pumped from the well. The pump is now put into operation, forcing the fluid into the well 2, and exerting a strong pressure upon the medium constituting the fluid bearing strata. The fluid will gradually permeate the strata 5, and on reaching the uncapped well 1 will rise therein and will be conducted from the

top thereof by said pipe. The pump will be maintained in operation until the fluid in its passage from the well 2 to the uncapped well 1 has formed a passage 6 in the fluid bearing strata, the material removed in forming said channel being carried up and out of the uncapped well due to the pressure acting upon the fluid. The well 1 which during the operation above described has been uncapped is now closed, and another of the wells 1 is uncapped. The pump is again set into operation, and another channel 6 is thus formed. This operation is repeated until there has been formed a channel 6 between the well 2 and each of the wells 1. The well 2 is now disconnected from the pump and is closed or capped at its projecting upper end. One of the wells 1 will now be uncapped and the well 1 adjacent thereto will be connected with the pump. The pump will now be put into operation forcing some fluid down the well 1 with which it is connected and causing the fluid to rise in the uncapped well producing a channel 7 between the two wells. This operation will be repeated until all of the wells 1 are connected at their lower ends by a channel 7. During the time that the well 2 and each of the wells 1 is connected with a high pressure pump, the fluid escaping at the lower end of the well will form sump or pit 8 in the fluid bearing strata just beneath the well as is best shown in Fig. 2.

After the channels 6 and 7 have been formed, the center well 2 is connected with a powerful air compressor, and after one or more of the wells 1 has been uncapped, the compressor is set in operation. The Artesian water or oil which has accumulated in the passages 6 and 7 will be subjected to an air pressure sufficient to force water or oil up through the uncapped wells, which will be connected with pipes 9 to conduct the water or oil where desired.

The numeral 10 designates a valve provided in each of the pipes 9 to control the flow of oil or water through said pipes.

In a well in which the normal height of the fluid is equal to or greater than one-half the entire depth of the well, it will be necessary only to force the air near to or slightly above the bottom of the well in order to cause the oil or water to flow out of said well. Under such conditions, no more power will be required than is necessary to hold the pressure as stated until the fluid

has been exhausted from the strata 5. Consequently there is no continuous escape of air to the surface until all the oil or water is exhausted, after which the air will commence to escape and it will then be necessary to close the well in order to confine the air.

The operation above described will continue until all the fluid in the entire strata 5 has been exhausted.

In order to save a great portion of the energy stored up in the compressed air, the effluent wells are closed up at the surface as soon as the air begins to escape, and said wells may then be connected through suitable pipes with a duplicate system of wells sunk in another portion of the fluid bearing strata, the air being permitted to escape from the first series of wells into the second, until the air pressure in the two series of wells is equalized. The well 2 of the first series will now be connected with an air compressor and the balance of the air in said first series will be forced therefrom into the second series of wells. After a sufficient air pressure has been created in the second series of wells to force the oil or water from the channels 6 and 7 of said wells, the communication between the two series of wells will be cut off by a suitable valve and the wells 1 of the first series will be uncapped to relieve the air pressure in the channels 6 and 7 of the first series so that the oil or water may again accumulate in said channels. It is thus seen that my method is carried on intermittently, the operation being interrupted periodically for a sufficient length of time to allow the channels 6 and 7 to be replenished with oil or water.

In case only one series of wells is employed in putting my method in operation, after the oil or water has been exhausted from said wells and from the channels 6 and 7, the compressed air may be allowed to escape from the wells into a receiver on the surface until the pressure in said receiver and in the well is equalized. An air compressor may then be employed to withdraw the balance of the compressed air from

the wells and channels forcing the same into the receiver and reducing the pressure within the wells to that existing under normal atmospheric conditions.

My invention is presented as including all such modifications and changes as properly come within the scope of the following claims:

What I claim is:

1. A method of establishing communication between the lower ends of two bored wells extending into a sand or gravel strata, consisting in pumping water under high pressure into one of the wells causing it to force a passage through said strata to the other well.

2. A method of raising fluids from a subterranean fluid-bearing strata, consisting in boring two adjacent wells into said strata, forming a channel between the lower ends of said wells, forcing compressed air into one of the wells, thereby forcing out through the other well the fluid normally standing in both wells and in the passage connecting the same, subsequently connecting either well with a receiver equalizing the air pressure in the receiver and wells, and then pumping air from the wells into said receiver until the air pressure in the wells becomes substantially atmospheric.

3. A method of raising fluids from a subterranean fluid-bearing strata, consisting in forcing compressed air into one of two wells extending into the strata and communicating at their lower ends, thereby forcing out through the other well the fluid normally standing in both wells and in the passage connecting the same, subsequently connecting either well with a receiver, equalizing air pressure in the receiver and wells, and finally pumping air from the wells into said receiver, until the air pressure in the wells becomes substantially atmospheric.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANK O. BROWN.

Witnesses:

J. S. MURRAY,
DELWIN B. CARR.