(No Model.)

O. FAY.

CONSTRUCTION OF OIL WELLS.

No. 526,346. Patented Sept. 18, 1894.

Fig. 1.

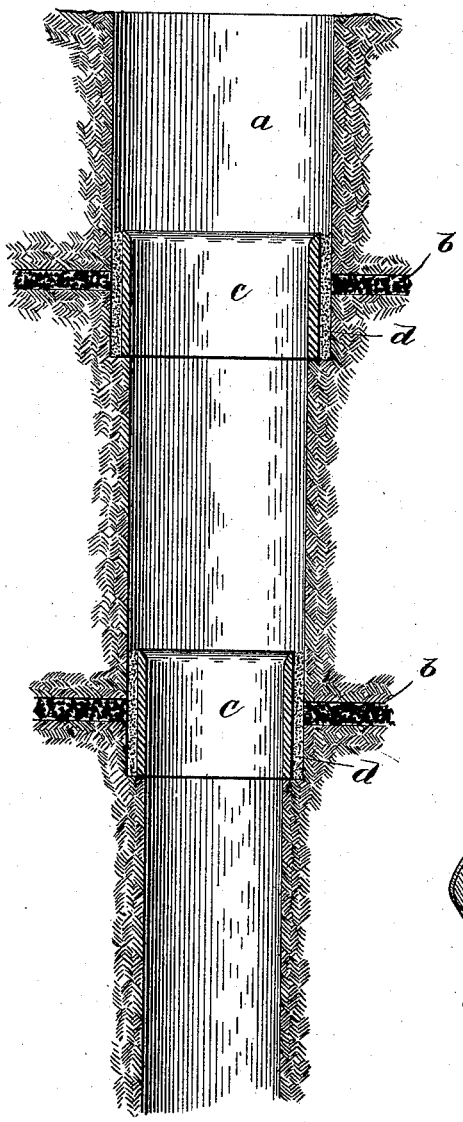
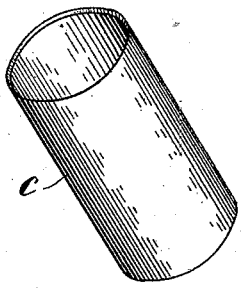


Fig. 2.



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CONSTRUCTION OF OIL-WELLS.

SPECIFICATION forming part of Letters Patent No. 526,346, dated September 18, 1894.

Application filed October 19, 1889. Serial No. 327,495. (No model.)

To all whom it may concern:

Be it known that I, OWEN FAY, of Oil City, in the county of Venango and State of Pennsylvania, have invented certain new and useful Improvements in the Construction of Oil-Wells; and I do hereby declare that the following is a full, clear, and exact description of the invention, which 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 the letters of reference marked thereon, which form part of this specification.

This invention relates to the construction of oil wells.

The object of the invention is to provide an improved method of stopping or shutting off the flow of water into oil wells during the process of drilling and after the well is completed, whereby a minimum amount of material is used and expense incurred and the water effectively shut off from the interior of the well with a minimum amount of labor and time required. These objects are accomplished by and my invention consists in the method hereinafter set forth.

Referring to the accompanying drawings:—Figure 1 is a view showing a well in longitudinal section. Fig. 2 is a detail perspective of the casing section employed.

In boring or drilling wells the plan sometimes heretofore followed is to drill down until a water vein is reached and then insert a casing or pipe section which will extend from the top of the well down to and a short distance below the vein. The water is then pumped out, and the drilling continued, so that the hole will be of the same size as the casing until another vein is reached when the same plan is followed, *i. e.*, a casing inserted through the upper casing and the water pumped out, and the drilling continued, the same plan being followed at each water vein and the hole decreasing in size after each new casing is inserted. This old method is very expensive and laborious, requiring a large amount of casing and an immense amount of work in handling the same.

In carrying out the present invention the hole *a*, is begun and drilled as usual, and is continued down until a vein of water, such as *b*, is reached. The hole is then continued down a short distance below the vein and the implements withdrawn. A short section of pipe or casing *c* (see Fig. 2) of sufficient length to reach above and below the water vein and of sufficient diameter to loosely fit in the hole is then lowered or dropped into the well, so that its lower end will rest on the bottom of the hole or wherever desired, and the casing will extend up above the vein. A quantity of cement or fine sharp sand, "sediment" or other suitable material sufficient to fill the hole to a plane above the top of the short section of casing is then poured or lowered into the well. After the cement, sand or sediment has set or settled into a compact mass, the water is pumped from the hole and the drilling is continued down again with a drill of a size to pass through the pipe or casing *c*. The cement or sand will thus be removed from the interior of the casing section and the cement or sand will firmly and solidly pack around the exterior of the casing within the wall of the hole (see *d*) to fill the crevices so that the water cannot percolate through this solidly packed cement into the well. The drilling is then continued down until another water vein is reached, when the same method as just described is followed.

Cement has a peculiar capacity of setting or packing so solidly that even water cannot percolate through it, and this peculiarity is taken advantage of in my method, although other suitable substances might be employed as fine sharp sand or sediment from drilling wells, &c.

Instead of drilling the hole to a plane below the water vein and inserting the pipe section and then filling in to a level above the vein with cement or sand, a very advantageous way is to drill the hole as before mentioned and then fill the hole up to a plane above the vein with the cement or sand and then while the filling or packing material is soft or plastic insert the short pipe section and drive or force it down through the filling material to its proper position and then drill the packing from the interior of the pipe section. By this method a very tight seal is formed around the pipe section. Thus it will be observed that the short pipe sections can be inserted before or after the filling material. The filling material can be composed wholly

or in part of cement, *i. e.*, the cement can be combined with any of the above mentioned ingredients or used separately. The great advantages of this method are obvious, the expense for casing is reduced to a minimum and there is no heavy lifting or handling of long heavy casings necessary heretofore requiring a large force of men and machinery.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The herein described method in drilling or boring wells which consists in continuing the hole below the plane of the vein or portion to be closed, and then forming a tight solid packing of a fine granular packing material, such as sand, at and above and below the plane of the vein and around a short casing extending above and below the vein of less diameter than the hole, and then continuing the hole down through the packing material in the casing after said material has set, substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

OWEN FAY.

Witnesses:
CHAS. WEAVER,
P. STUBLER.