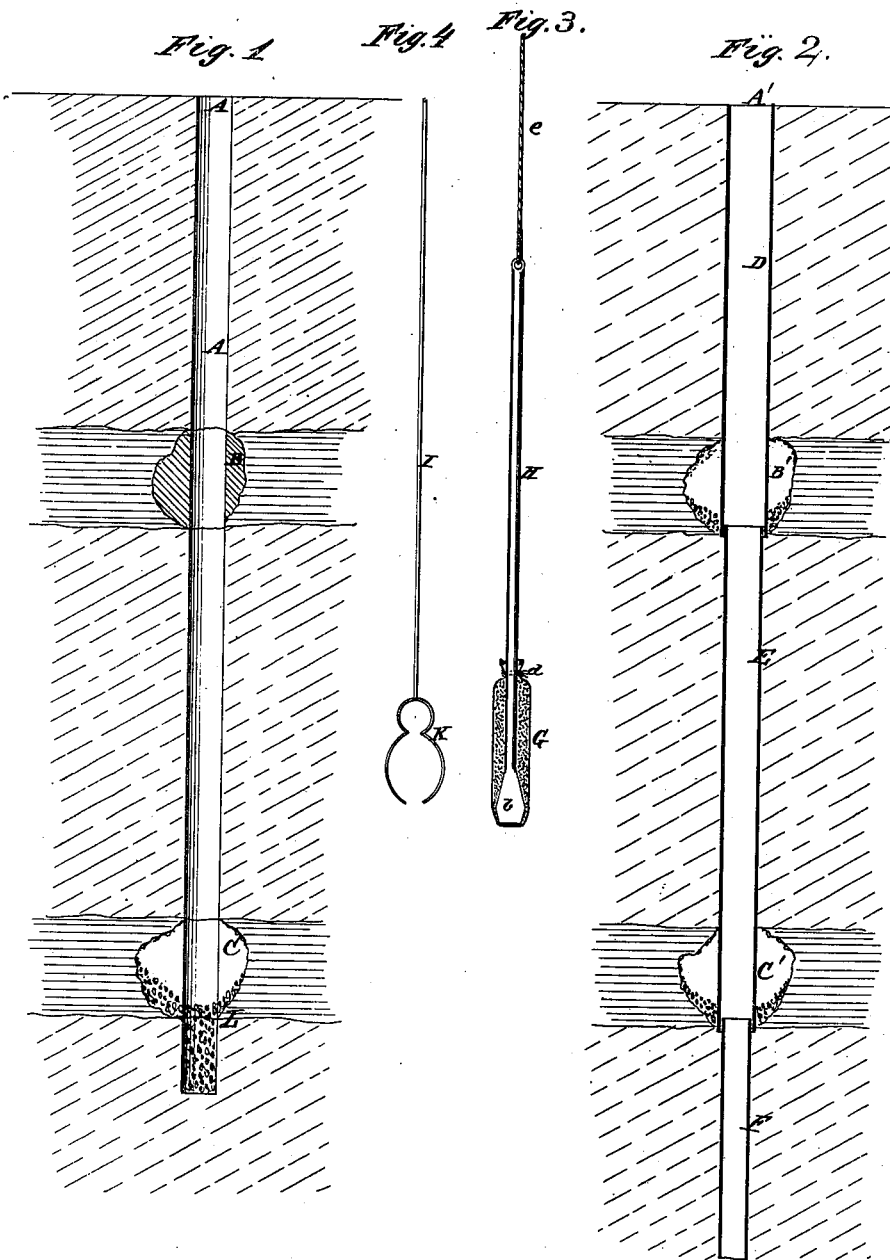


W. T. DOBBS.  
Method of Tubing Wells.

No. 159,805.

Patented Feb. 16, 1875.



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# UNITED STATES PATENT OFFICE.

WILLIAM T. DOBBS, OF PANA, ILLINOIS.

## IMPROVEMENT IN METHODS OF TUBING WELLS.

Specification forming part of Letters Patent No. 159,805, dated February 16, 1875; application filed November 22, 1873.

To all whom it may concern:

Be it known that I, WILLIAM T. DOBBS, of the city of Pana, county of Christian and State of Illinois, have invented a new and useful Improvement in the Method of Tubing Wells, of which the following is a specification:

My invention consists of plastic tubing formed of cements to shut off caves, slides, gravel-beds, sand and gravel, soap-stone, fire-clay, or other formations of the earth that give way and slip down, causing a break in the walls of coal-wells, salt-wells, coal-oil wells, artesian wells, or other deep borings in the earth.

The compound with which the cave or break of any kind in the wall is filled and crammed is perfectly soft and plastic, adjusting itself to the cavity. It undergoes a chemical change and hardens under water at any depth in a few hours, completely binding and securing all fragments and loose particles, so that being subsequently drilled through it will not cave, but leave a solid and strong wall. I call it plastic tubing, because it adjusts itself to the cavity, whatever the form may be, filling every part and binding every piece. It sets perfectly hard in six to twelve hours, is easily drilled through, and absolutely dispenses with tubing in the usual way to shut off caves.

The compound used is a mixture of gypsum, (plaster Paris,) hydraulic cement, (water-lime,) and fine sharp sand in any proportion that will form a solid cement. Gypsum, three parts; hydraulic cement, two parts; and fine sharp sand, one part, is perhaps the best combination, all things considered. Gypsum alone, or gypsum and sand, will do in some cases. The same is true of hydraulic cement alone, or hydraulic cement and sand.

Figure 1 is a sectional elevation of a tubed well according to my invention. Fig. 2 is a section of a well tubed according to the plan now and heretofore used, and Fig. 3 is a section of a filling-bag of cements and an elevation of the sinking-bar arranged for applying the cements to the cave, and Fig. 4 is an elevation of the sinking-bar and springs arranged used for locating the caves.

A represents the bore of the well; B, a cave

filled by my method; C, a cave partly filled. A' represents a well with caves B' C' tubed by the method heretofore and now in use by metal telescopic tubes D E F, showing that the size has to be reduced after each cave is tubed, so that if many caves are met with only a limited depth can be reached on account of the contraction of the size, so that in case water or oil is not found within the limits the well is ruined. G represents a bag containing the cement or plastic tubing of my invention tied to the sinking-bar H ready for being let down into the well. I represents the sinking-bar, with springs K for locating the caves.

The process of cramming a breach or cave is—

First. Locate its position definitely by the use of the sinking-bar and springs.

Second. If a bridge is not already formed by the falling particles at or near the bottom of the cave, as at L, form one artificially by driving down a bag of sawdust, charcoal, or other soft substance two or three feet below the cave; then fill up to the bottom of the cave with balls of tempered clay, and let down the drill or rammer to be sure you have a secure bridge formed.

Third. With the sinking-bar and chisel proceed to cram the cave or fill the cavity. Take ten or twelve bags made of thin cloth about one inch less in diameter than the bore of the well, and two or three feet long. Lay a thin piece of shingle in the bottom of the bag, or not, as may be needed. Hold up a bag and set the chisel end of the sinking-bar in the bag full down to the bottom on the piece of shingle; then fill the bag with the compound in a dry state (thoroughly mixed) full as you conveniently can by shaking it down. When full tie the top with a strong twine securely around the bar, as at *d*, and let it down with the pump-rope *e*. When near the bottom let it drive full weight to cause the chisel to cut open the bottom of the bag; then, by a few quick movements up and down, deposit the contents of the bag in the cavity, and the bag, if securely tied, comes out with rod. Remove the bag and dry it for repairs, and put on another. Continue the process rapidly as you

can conveniently, taking care to dry the wet bags thoroughly over the fire before using a second time.

Fourth. When satisfied that the cavity is filled let it remain perfectly quiet for six to eight hours; then, to be certain, put down your springs and examine; if not sufficiently filled, fill in more in the same way as before, and let it remain as before.

Fifth. Put on your drill without reducing its size at all in six to twenty-four hours after you know the cavity has been crammed full, and bore along as though nothing had happened.

Sixth. Each break or cave must be treated in the same way, and no change of the size of the bore is necessary from the commencement to the end.

Seventh. When boring with pole-tools a tapering pin small enough to move up and down without difficulty might be set down into the compound immediately after the filling is done, to cram with greater force the plastic compound to the farthest extremity of the cave, care being taken to keep the pin or cylinder turning round and round quietly to prevent adhesion; also lifting or drawing it up frequently to be sure that it is not bound. Remove it entirely in one-half to three-quarters of an hour.

Eighth. Cavities of like kind may also be filled by the use of small bags filled with this compound, and shoved down hard and strong with the tools, leaving the bags in the well; but it takes a longer time to set the cement, and the cement is more liable to break in drilling through when the bags are left in; be-

sides, the plastic tubing cannot adjust itself to the cavity as well in the bags as when emptied in the cave.

Ninth. Sand and small gravel that offer a resistance to farther progress may be packed together and rendered suitable by filling in eight or ten inches of the compound and drilling a short time to mix it thoroughly, and then taking out the drill and allowing the mixture to set about twelve hours; then drill through it, and with sand-pump exhaust the cavity a few inches below, and fill again as before full to the top of the break or bed of gravel or sand, so as to repair any breach that may be made in drilling through the compound. Continue to fill a few inches, eight to twelve at a time, in the same way until all is made secure.

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

1. The method of stopping or cramming caves or cavities in the bore of a well, consisting in obstructing said bore below the caves or cavities, and lowering and depositing cement in suitable quantity, as herein shown and described.

2. The process of cramming, shutting off, and tubing caves, &c., in wells, by cement let down in bags and discharged, or left in the bags and packed in the caves, substantially as specified.

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Witnesses:

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