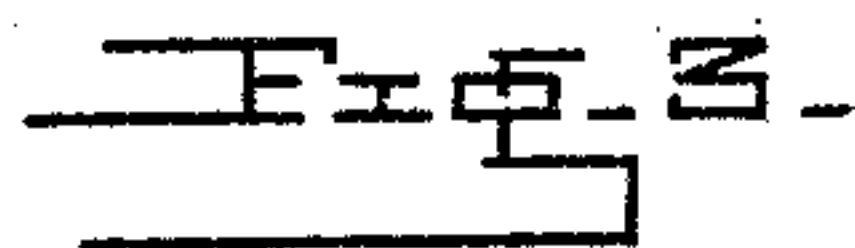
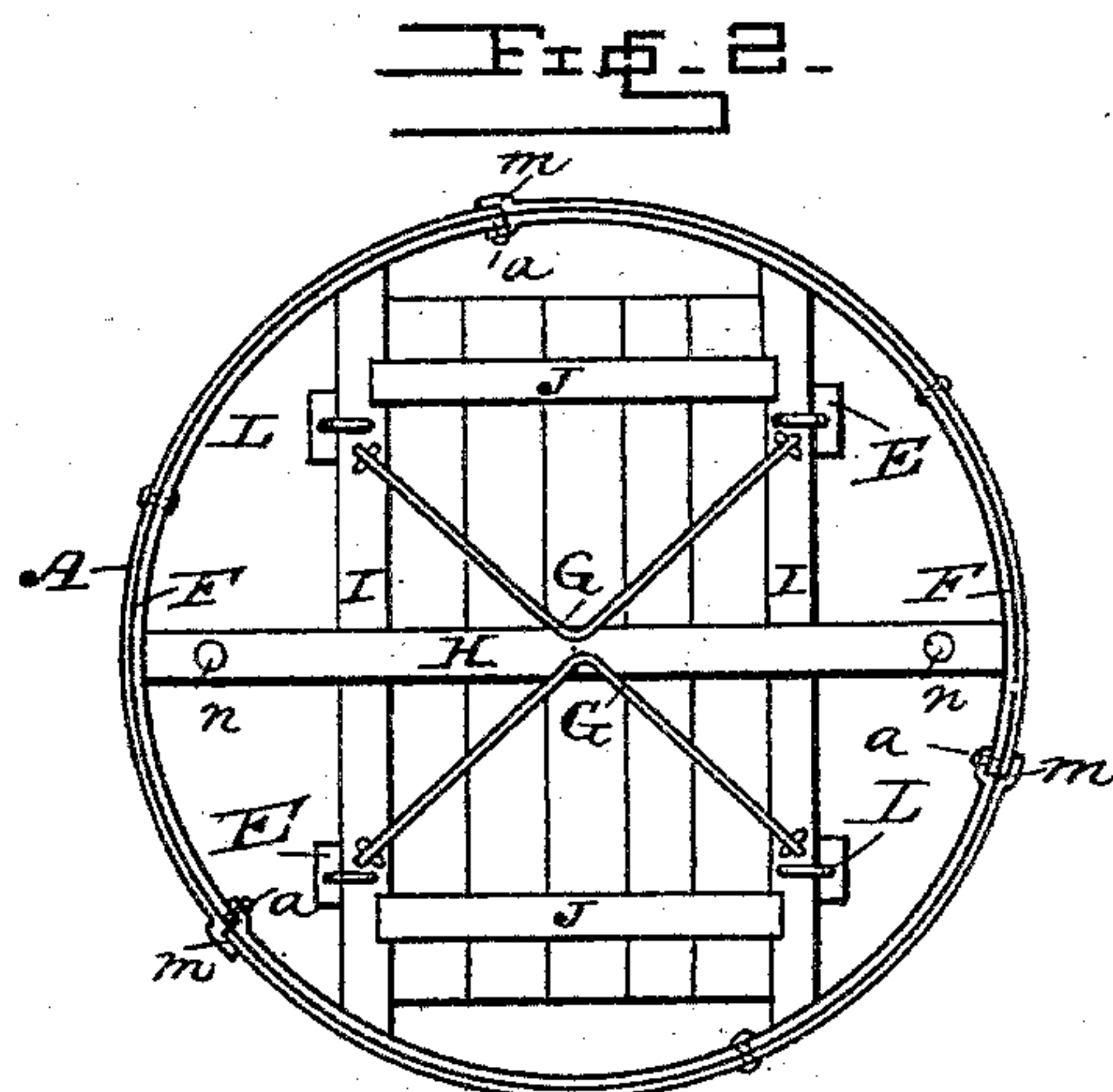
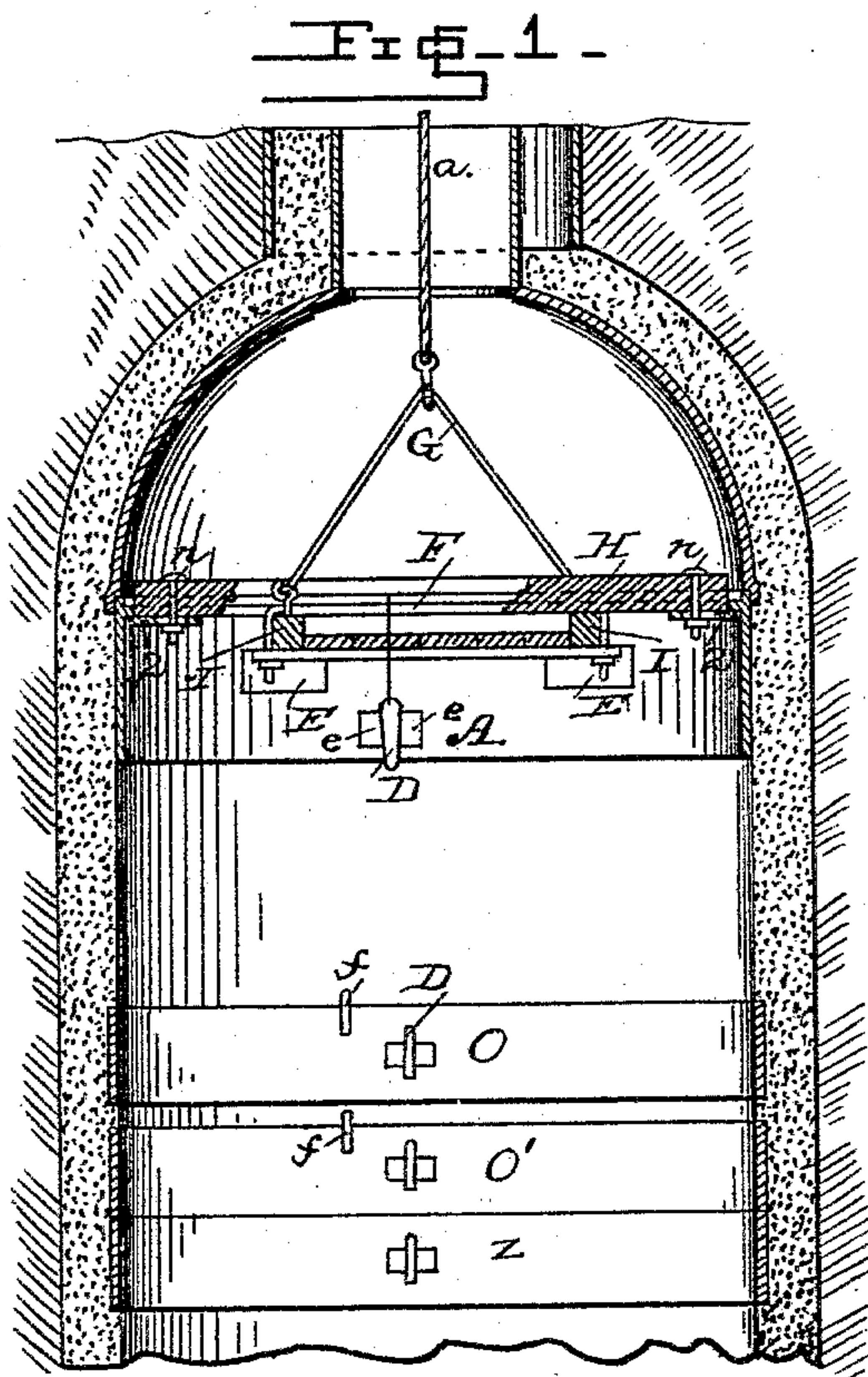


(No Model.)

W. H. H. DAVIS.
METHOD OF CEMENTING CISTERNS OR WELLS.

No. 411,981.

Patented Oct. 1, 1889.



Witnesses;

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WILLIAM H. H. DAVIS, OF OAKFIELD, MICHIGAN.

METHOD OF CEMENTING CISTERNS OR WELLS.

SPECIFICATION forming part of Letters Patent No. 411,981, dated October 1, 1889.

Application filed September 24, 1887. Serial No. 250,567. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. H. DAVIS, a citizen of the United States, residing at Oakfield, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in the Method of Building Cisterns; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the building of cisterns and wells; and it consists of the process of constructing the cement wall of a well by successive steps, in filling a space between an expansible, collapsible, and forming cylinder and the earth wall with cement, then allowing said cement to harden, and repeating the same operation with successive spaces. The means employed in performing this method are illustrated in my application, Serial No. 123,704, filed March 10, 1884, and part of these means with some others form the subject of the claims therein.

The means employed for the performance of my process are again here illustrated and described for the sake of convenience.

My invention is illustrated in the accompanying drawings, in which Figure 1 is a vertical sectional view of a cistern containing my invention. Fig. 2 is a plan view of the inside supporting-cylinder and platform used by the operator in building the walls of the cistern, and Fig. 3 is a detail view to illustrate the mode of binding the cylinder ends.

Similar letters refer to similar parts throughout the several views.

The cistern or well may be excavated in the ordinary manner where the earth walls are sufficiently stable to stand without curbing.

A is a cylinder, which I make in two or more sections, with joints *m m m*, so constructed that the sections can be taken apart when desired.

Within the cylinder A is the strengthening-rib F, made of five-eighths square iron or other suitable material, which extends entirely around the inner side of cylinder A.

Within the cylinder A is the frame composed of side pieces I I and end pieces J J. Beneath the side pieces I I are two lugs E E,

attached to cylinder A, which support I I after the bail is detached.

L L are two cross-pieces upon which are placed boards, as shown in Fig. 2, for the support of the operator in building the cistern.

To the side pieces I I are attached the bails G, having a rope *a* connected with a windlass, by means of which the platform and the cylinder A are raised or lowered.

H is a cross-piece placed within the cylinder, and has at either end an adjustable extension 2, held to the cross-piece by a bolt *n*, fitting into a slot, so that extension 2 may be pressed against the inner side of the cylinder, in order to hold the cylinder in place. In case of small cylinders the piece H is not necessary.

Near the bottom of the cylinder A and in the inside are two metal projections *e e*, so placed as to form a groove between them, into which fits the key D. The edges of the sections of the cylinders lap each other a short distance, as shown in Fig. 3, and by inserting key D into said groove it spreads the sections slightly apart, acting as a wedge and thereby firmly holding the sections of the cylinder together. The rib F is riveted to the inside of the sections A and so placed that the end of the rib on one section passes beneath the end of the rib on the next section, and a bolt *a* passes through the ends of the ribs, thereby bolting the ribs and attaching the sections, as shown in Fig. 2.

It not infrequently happens that the earth is so gravelly and loose that it will readily cave in if the well or cistern is excavated to any considerable depth without curbing; nor in this loose digging can it be curbed safely by simply keying the curbing against the earth wall of the well, as much of the loose earth or gravel is thereby caused to fall in the well when the curb is removed for the purpose of cementing. To overcome this difficulty I use curbing-cylinders O O', excavate to the depth of one cylinder into the gravel, and make the excavation larger than the curbing-cylinder to admit of a cement wall between the curbing-cylinder and the gravel wall of the well or cistern, then insert cylinder O, bind it with clips *f*, and fill the space between this cylinder and the earth wall with cement mixed well enough so that it will run and

shake down to its place behind the cylinder O without the ordinary tamping. Thus I avoid loosening any of the gravel. Then, leaving the cylinder O in place, I excavate a little more
5 than the length of another cylinder O'. I then insert another cylinder, so as to leave a small space between the lower end of O and the top of O', so as to allow the space between O' and the earth wall to be filled with cement,
10 and in this way I proceed until I have passed the gravelly or loose earth. I thus make my cement wall extend downward and save the expense of curbing, inasmuch as the cement wall acts both as a curbing and a permanent
15 wall for the cistern or well. As fast as the cement hardens and sets the cylinders may be removed.

In some cases with wells and cisterns I find that water percolates through the ground and
20 injures the cement wall. To prevent this I place a hoop or cylinder Z outside of the forming-cylinder A and lock it by a clip similar to clip in Fig. 3, and then pack the cement between Z and the earth wall, and continue add-
25 ing other cylinders and filling the space between these outer cylinders and the earth wall until the water is cemented out. These outside cylinders are large enough to allow the forming-cylinder A to pass within them, and
30 they are left in position until the cement between the earth wall and them has hardened

and set, when they may be removed. It may be necessary to use but few of these supporting-cylinders; but in some cases it may be necessary to nearly fill the well with them, as
35 the surface water percolating through the ground and gathering between the cement wall and the earth wall causes great pressure, and is liable to destroy the cement wall unless the cement wall is protected until it shall
40 have hardened and set.

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

The process of constructing the wall of a
45 well by successive excavations and cementing, consisting, first, in making a single excavation, then inserting an expansible, reducible, and forming cylinder in said excavation, then filling the space between the said cylinder and
50 the earth wall with cement, then making another excavation, inserting a cylinder, and cementing as before, thus cementing and completing the well in sections by successive
55 downward steps, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WM. H. H. DAVIS.

Witnesses:

EDWARD TAGGART,
ARTHUR C. DENISON.