# A. S. Brown,

## Well Tubing.

No. 76,985. Patented Apr. 21, 1868.

Fig: 1.

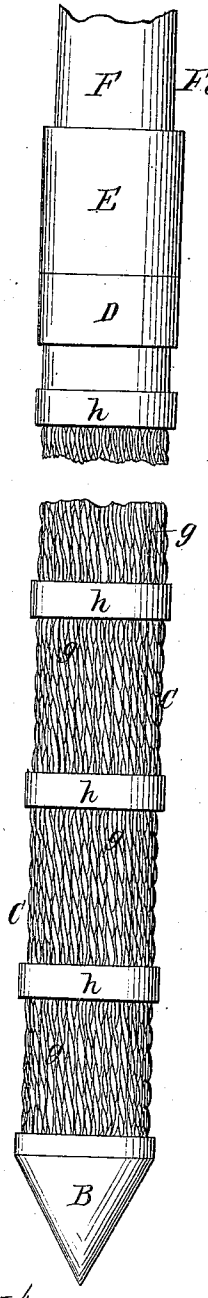



Fig: 2.

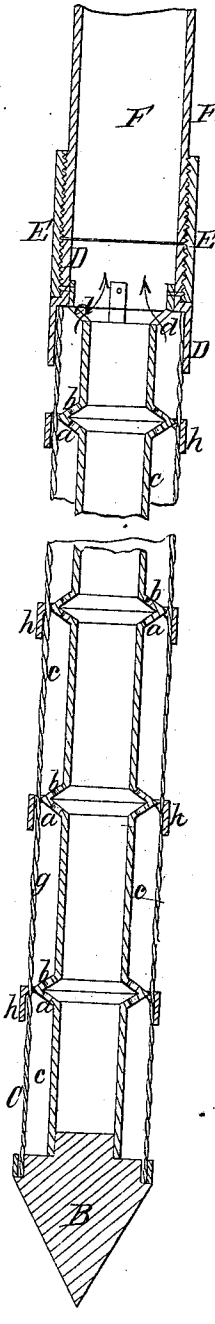



Fig: 3.

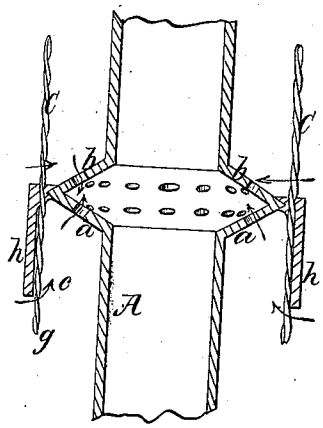
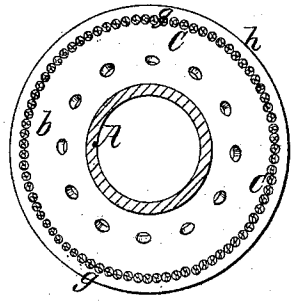



Fig: 4.




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# United States Patent Office.

ADAM S. BROWN, OF LEBANON, PENNSYLVANIA.

*Letters Patent No.* 76,985, *dated April* 21, 1868.

## IMPROVEMENT IN TUBE-WELLS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, ADAM S. BROWN, of Lebanon, in the county of Lebanon, and State of Pennsylvania, have invented a new and useful Improvement in Tube-Wells; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is an external view of my improved tube-well.

Figure 2 is a diametrical section through the same.

Figure 3 is an enlarged sectional view of a portion of the tube, showing one of the annular flanges or flaring water-inlets to the tube, and also its guard or shield.

Figure 4 is a top view of fig. 3.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to certain novel improvements on the construction of devices which are designed for obtaining water from beneath the surface of the earth, and which are known as "tube-wells." Such wells are made by driving pipes into the earth far enough to reach water, and they usually consist of perforated pipes enclosed by casings, and provided with a conical spike for penetrating the earth.

One of the greatest difficulties experienced with this kind of wells is that their water-apertures frequently become choked with sand and earth, and the supply of water thereby checked, or entirely cut off. This is owing to the close proximity of the inner tube to the wall of earth surrounding it, which leaves but a narrow space for the circulation of water before it is drawn into said tube on its way to the penstock or pump-tube above.

The nature of my invention consists in enclosing the inner perforated tube by means of twisted wire cables, arranged so as to form a circular external wall or screen around the said tube, and to have an annular space between this wall and tube; and in making the orifices for the entrance of water into the inner tube, through the upper and lower inclined sides, of annular flaring enlargements, which are encircled by bands which serve as shields for breaking the currents of water on their way to said orifices, as will be hereinafter explained.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A represents a tube, which is constructed with annular enlargements, arranged at suitable distances apart, which enlargements consist respectively of an upwardly-flaring flange, *a*, and a downwardly-flaring flange, *b*, united at their outer edges, as shown clearly in figs. 2 and 3. Suitable apertures are made through these flanges *a b*, directly opposite one another, so that currents of water will enter from above and below said flange-enlargements in opposite directions, and thereby operate to keep said apertures clear of sand and earth. The descending currents, rushing through the apertures which are made through the flange *b*, will meet the ascending currents passing through the flange *a*, and thus wash away any sand which might accumulate either above or below the enlargement. Thus it will be seen that the tube A will not only not become clogged, but that it will operate to clear itself of sand which might accumulate about its induction-apertures.

The lower end of the tube A has secured to it, in any suitable manner, a conical point, B, which is designed to facilitate the passage of the tube into the earth in the operation of driving it therein. This cone B is of sufficient diameter at its base to receive around it a wire screen, C, and to leave a space or spaces, *c*, between this screen and the tube, as shown in the drawings. The upper end of the tube A is secured in a substantial manner to collar D by means of outwardly-flaring arms, *d*, which leave spaces between them for the free upward passage of water during the operation of the pump.

The upper part of the collar D is reduced in diameter, and upon this reduced portion a screw-thread is cut for receiving a coupling, E, by means of which the pump-tube or penstock F is attached to the tube A. It will be seen that the coupling E and pipe F are not of greater diameter than the collar D, to which the pipe A is secured; hence these parts will not offer an obstruction in driving the tube-well into the earth, nor will they offer an obstruction to the ascent of water after passing between the arms *d* at the upper extremity of the pipe A.

The outer wall or casing, C, which surrounds the inner tube A, is composed of wire cables *g g*, twisted as shown in the drawings, and arranged sufficiently close together to form a strong screen or reticulated wall, with spiral passages through it for the admission of water into the space *c*. The lower ends of the cables *g g* are secured in a suitable manner around the cone-point B, and the upper ends of these cables are secured to the lower or largest portion of the collar D, as shown in fig. 2. At the outer edge of each flanged enlargement of the pipe A, the cables are secured by brazing, or otherwise, so that a wall is produced which will allow a free passage of water through it, and at the same time possess sufficient strength to resist the pressure of earth and sand against it when embedded in the earth.

At each one of the enlargements of pipe A, a wide ring, *h*, is secured around the outside of the cable-wall or casing C, the upper edge of which ring is in, or nearly in, a plane intersecting the greatest diameter of the enlargement to which it is secured, and the lower edge of which is some distance below said enlargement, as shown in figs. 2 and 3.

These rings are designed to serve two purposes. They embrace and strengthen the wire casing C at intermediate points between its ends, and also serve as shields for protecting the holes which are made through the bottom flanges *a* of the several enlargements of the tube A from clogging with sand.

When the pump is started, water, mixed with more or less sand, will pass through the casing C into the chamber *c*, and from this chamber the water will be drawn upward and downward through the apertures, which are made through the several enlargements of the pipe A, into this pipe A. Water will also be drawn up between the arms connecting the pipe A with its collar D. The sand which is precipitated upon the perforated flanges *b b* of the several enlargements of pipe A will be carried down through the perforations of these flanges into this pipe or tube A, so that there can be no accumulation of sand at these points.

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

1. The outer wall or casing C of a tube-well, constructed of twisted wire cables, *g*, arranged, secured, and braced substantially as described.

2. One or more annular perforated and flaring enlargements upon the inner tube A, substantially as described.

3. The rings or shields *h*, in combination with a tube, A, which is constructed with annular perforated enlargements, and with an outer perforated or open-work casing, C, substantially as described.

Witness my hand in the matter of my application for a patent on a tube-well, this 24th day of January, 1868.

ADAM S. BROWN.

Witnessess:

E. B. WILSON,

R. T. CAMPBELL.