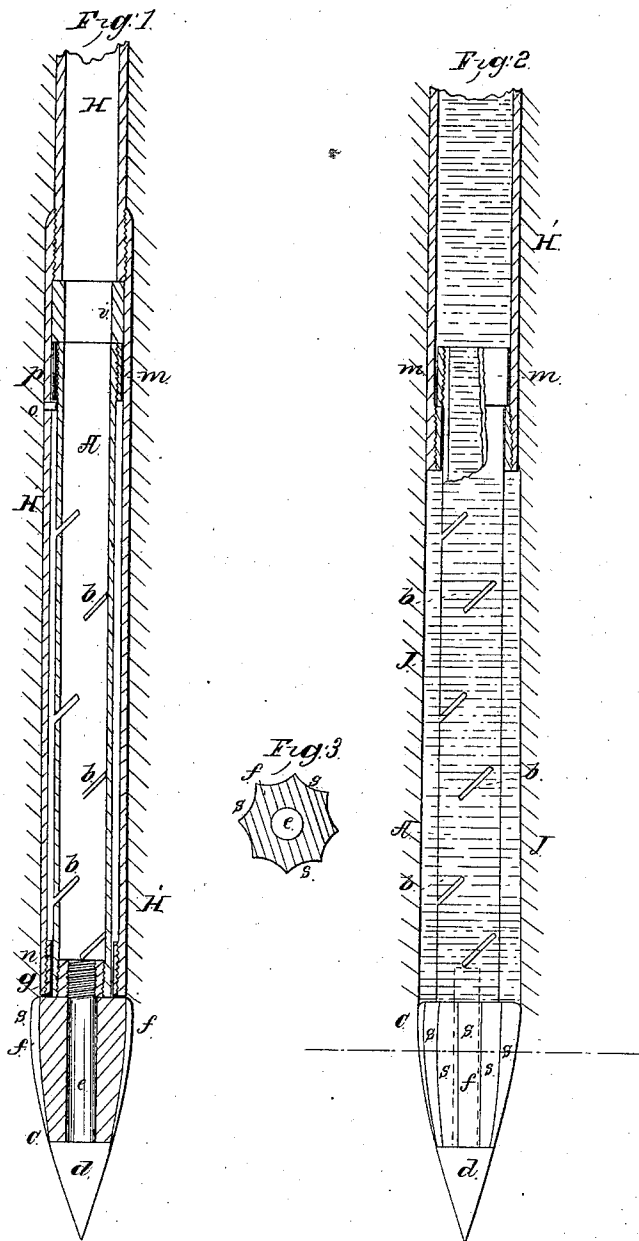


H. Arnold,

Well Tube.

N^o 73,688.

Patented Jan. 28, 1868.



Witnesses:
J. R. Drake
Jay Hayatt

Inventor:
Horatio Arnold
by J. Francis & Co., attys.

United States Patent Office.

HIRAM ARNOLD, OF GOWANDA, NEW YORK.

Letters Patent No. 73,688, dated January 28, 1868.

IMPROVEMENT IN WELL-TUBES.

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, HIRAM ARNOLD, of Gowanda, in the county of Cattaraugus, and State of New York, have invented a certain new and useful Improvement in Tube-Wells; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a sectional view of my improvement in the act of being driven into the earth.

Figure 2 is a view, partly in section, of a well, after it has been completed.

Figure 3 is a cross-section of the point in plane of red line.

Like letters of reference designate corresponding parts in all the figures.

My invention consists in the construction, combination, and arrangement of a well-tube, consisting of a driving-point, made as described, and combined with a short obliquely-slotted inner tube, to which it is fastened, and an outer main tube, enlarged at the bottom, which surrounds and protects the openings in the inner tube while the tube is being driven, and which is afterwards drawn partially up, so as to uncover the openings and admit the water, the two tubes being connected together, and locked, when required, in the peculiar manner hereinafter described.

In the drawings, A represents a short inner tube, affixed to the driving-point, provided with oblique openings or slots, *b b*, (arranged as shown,) for the admission of the water. C, the driving-point, consisting of a steel or hardened point, *d*, having a stem or shank, *e*, which passes through a cast-iron fluted portion, *f*, and screws into the end of the tube A, or into a reducing-nut, *g*, within the latter, as clearly shown in fig. 1. H is the main tube of the well, the lower end of which screws into an enlarged portion, H', that surrounds the inner tube. A ring, *i*, is arranged within the portion H', filling the space between the lower end of H and the top of the inner tube, so that the percussion in driving will be received and divided between both tubes, A H', instead of only one, as in the ordinary methods in use. To prevent the tubes A H' from becoming disengaged during the operation of elevating the latter to uncover the slots in the former, I secure, by welding or other suitable way, a thimble or collar, *m*, to the top of the inner tube, and a similar one, *n*, in the lower end of the water-tube, forming shoulders, which, coming in contact after the tube has been raised to the proper point, prevent their separation, as clearly shown in fig. 2.

In driving wells, it is frequently required, from various causes, to elevate the entire apparatus, in which case it is desirable that the two tubes be locked together, as they are more easily withdrawn in that position, (shown in fig. 1,) from the fact that the point offers less resistance than it would in the other position, shown in fig. 2. This I accomplish by means of a pin, *o*, that is made to project a short distance within the outer tube H', and secures the tubes together by engaging under the shoulder formed by the thimble *m* on the top of the inner tube. In order to permit this pin to pass the shoulder *m*, when it is required to raise the outer tube in uncovering the inner one, I provide a slot, *p*, formed in the surface of the thimble, in which it freely slides when the outer tube is turned, so that the pin coincides therewith. The tubes are locked together by simply giving the outer one a partial turn to destroy that coincidence, when the pin, engaging under the shoulder, prevents their separation, as above stated. The corrugations *s s* of the cast portion of the point begin at the lower edge, and gradually increase in depth to the outer edge of the tube H', as shown in fig. 1, and operate to prevent the point from turning with the main tube in locking the latter. They also enable the point to more easily penetrate the earth, from the cutting-edges that are formed at their junction; and by displacing the earth, and leaving it impacted in the form given by the flutes, leave the hole for the tube so as to present less friction-surface, and hence drive more easily than if it were round.

Constructing the point in two parts enables the corrugated and greater part, *f*, to be cheaply and readily made of cast metal, while the point can be made of steel, which is desirable, and comparatively of little cost, owing to the small amount of metal required, and capable of being hardened, so as not to batter when driven against stones, which, when small, will be displaced by it. The use of the ring *i*, by causing the blows in driving the tube to react on both A and H', diminishes the strain, and tendency to batter and bruise their lower ends.

It has been found from experience that when the slits for the admission of the water are made in the outer tube, they frequently become so plastered up, in passing through strata of clay and moist earth, as to effectually

ally prevent the entrance of the water, and which the suction from the pump is insufficient to relieve, both on account of the fineness of the slits and the adherent quality of the clay. It is evident that my improvement entirely prevents this difficulty.

A prominent feature consists in making the slot *b* oblique, in connection with the insulating portion, *H'*, of the pipe, so that when the latter is withdrawn, and water fills the space *J*, which it occupied, the sand and earth will be directed downward by the inclined edges of the openings, and fall outside the tube, instead of entering it. The slots are arranged spirally around the tube *A*, so as to meet small water-veins in every direction.

I claim the combination of the interposed shoulder *f* of the driving-point *C*, and the interposed section of tubing *i*, with the external tube *H H'* and internal tube *A*, said interposed portions being of a different material, for the purpose of relieving the parts in contact from the injurious effect of the concussion in driving, constructed and arranged substantially as set forth.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

Witnesses:

JAY HYATT,
ALBERT HAIGHT.

H. ARNOLD.