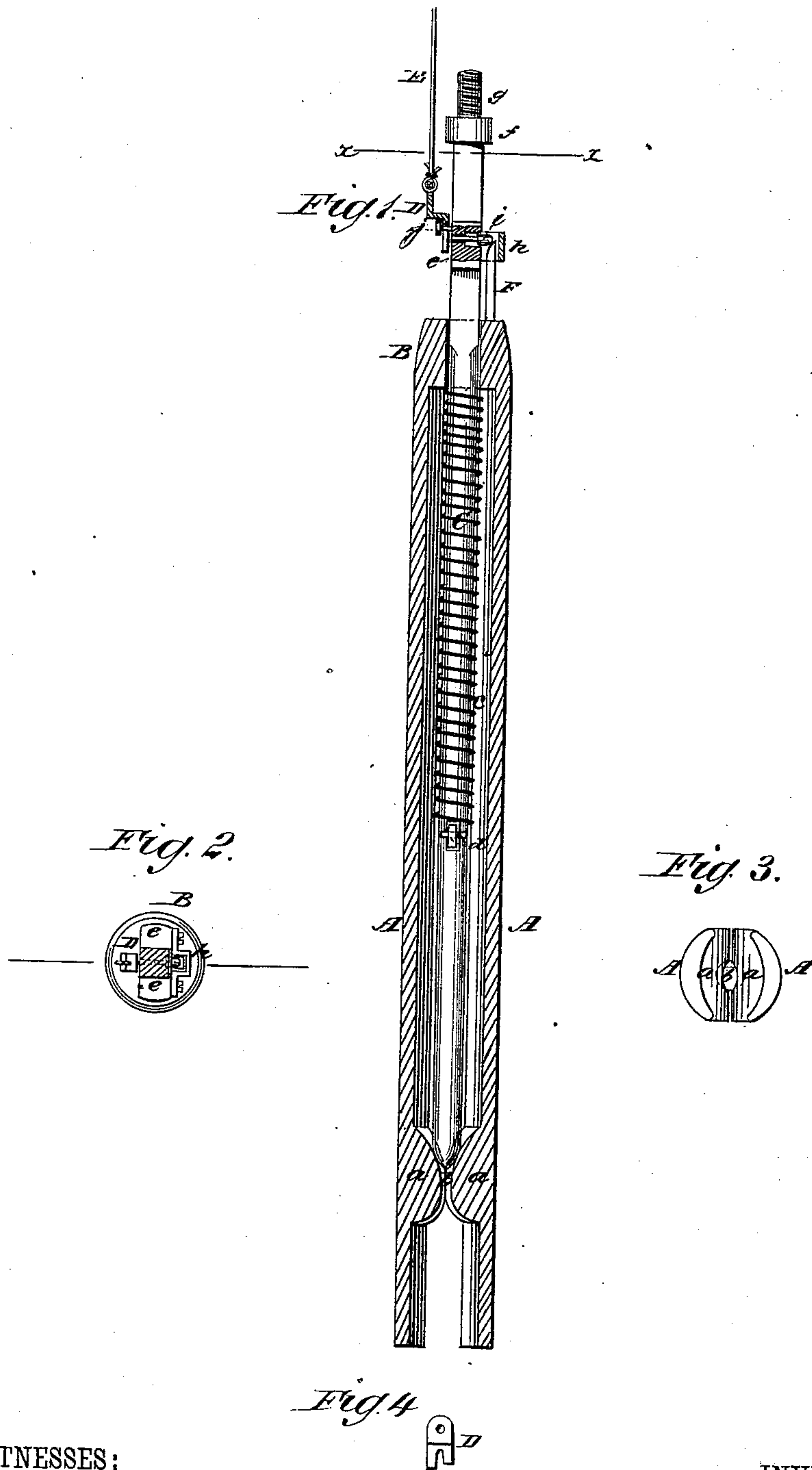


C. A. MENTRY.
Reamer for Deep Wells.

No. 217,740.

Patented July 22, 1879.



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IMPROVEMENT IN REAMERS FOR DEEP WELLS.

Specification forming part of Letters Patent No. **217,740**, dated July 22, 1879; application filed March 12, 1879.

To all whom it may concern:

Be it known that I, CHARLES A. MENTRY, of Newhall Station, in the county of Los Angeles and State of California, have invented a new and Improved Reamer for Deep Wells, of which the following is a specification.

The object of this invention is to provide an expanding reamer for increasing the bore of oil and other deep wells, that can be let down through the tube and expanded when it reaches the proper point for the reaming to begin.

It consists of a forked reamer incasing a spring-plunger projecting through the head thereof, where it is provided with a needle controlled by a trigger, from which a halyard leads up to the surface. In the head of the reamer is a rod, which, when the plunger is set, holds the plunger up; but when the reamer is lowered through the tube, by pulling the trigger the plunger is released, and the spring forcing it down, it strikes between bosses on the inside of the two forks of the reamer and expands them.

In the accompanying drawings, Figure 1 is a longitudinal section of the improvement. Fig. 2 is a cross-section on line *xx*, Fig. 1. Fig. 3 is an end view. Fig. 4 is the trigger.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A A are the two forks forming the reamer, joined together at one end in a head, B. The forks are convex outside and concave inside, and near their open ends, on the inside, are bosses *a a*. The adjacent faces of these bosses are provided with grooves *b*, so that when together an opening is formed between them; and their upper sides are chamfered off, so that a double incline is given to them leading to the dividing-line.

C represents the plunger. It is passed through the head B, and inside is wrapped with a strong spiral spring, *c*, one end bearing against the under side of head B, while the other bears against a key, *d*, run through the plunger. The spring operates to throw the plunger in and between the bosses. The upper part of the plunger is square, and is provided at a suitable distance from the end with square shoulders *e e* on opposite sides, and above

these is a square portion for the wrench, a collar, *f*, and a screw-stud, *g*, for connecting with the operating mechanism, in the usual manner.

Through the plunger from a side between shoulders *e* is made transversely a hole enlarged at one end, and on the side adjacent to the enlarged end is placed a guard, *h*, with a hole in line with the shank, and at right angles to the hole made through the shank. In the hole in the shank is placed a needle, *i*, with an enlarged portion or head, which, being placed in the enlarged part of the hole, prevents the needle from slipping out at one end, while the guide *h* prevents it from slipping the other way. Just above the needle-hole, on the side of the shank opposite the guard, is placed a stud, *j*.

D represents the trigger, having forked portion that fits over the stud *j* and covers the needle-hole, thus holding the needle incased in the hole. To the opposite end of the fork is attached one end of the halyard E, which runs up to the entrance of the well when the tool is lowered.

On the side of the head adjacent to the guard *h* is placed, close up to the shaft and parallel with it, a rod, F, the upper end whereof is rounded off on the side next to the shaft. This rod, when the plunger is sprung down, passes through the slot in the guard.

The operation of the invention is as follows: When the reamer is to be lowered through the tubing to enlarge the bore of the well below, the plunger is first drawn up until the rod F is below the end of the needle *i*. Then the needle is thrust out until its enlarged end bears upon the rounded part of the end of the rod, and the forked trigger is placed over the stud *j*, so that it will cover the needle-hole, as clearly shown in Fig. 1. The drawing out of the plunger allows the reamer to contract to a smaller diameter than the tubing. It is now lowered into the well, and when it is below the end of the tubing the halyard is drawn up, pulling the trigger off, and the needle, under the pressure exerted by the spring, through the rod F, is thrown back, and the resistance being thus removed, the plunger is sprung downward between the

bosses *a a*, and thus expands the reamer to a greater diameter than the pipe, thereby putting it in condition to operate in the well to increase the size of the bore. In drawing the reamer out the plunger yields sufficiently to clear the bosses, thus permitting the forks to contract sufficiently to be drawn through the tubing. Thus an expanding reamer is produced that works with perfect certainty, is simple in construction, and easily operated.

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

1. In combination with the bifurcated reamer provided with rod *F*, projecting upward from the head, and spring-plunger *C*, provided with shoulders *e e*, to limit its movement in the reamer, the needle *i*, passed transversely through the shank between the shoulders, and adapted to bear against the end of the rod *F*, and thus hold the plunger out of the reamer to allow the same to contract, substantially as described.

2. In combination with the needle *i* and rod *F*, for holding the plunger out of the reamer, the forked trigger *D*, adapted to be placed over stud *j*, so as to cover the needle-hole and prevent the needle from coming out, and connected with a halyard, *E*, for pulling it out when the plunger is to be sprung, substantially as described.

3. In combination with the needle having an enlarged head, the hole for the same having an enlarged portion to receive the enlarged part of the needle, and the slotted guard *h*, whereby the needle is prevented from slipping out in either direction, substantially as described.

4. In combination with the needle *i* and rod *F*, the slotted guard *h*, to form a bearing for the rod *F* when engaged by the needle, substantially as described.

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Witnesses:

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